Social Science Research Methods and Approaches for Research and Development Work with Farmers

A guide for thesis students and researchers with
a formation in biological sciences

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Introduction to the guide

Why is social research important in small-farmer related agricultural research and development work?

In the process of designing, adapting, transferring and/or promoting the adoption of new agricultural technology, agronomists frequently work with people and perform interviews, surveys and case studies to study if, how and why a technology is received. These methods are used for example to determine the preferences of farmers in their choices of varieties; to establish what cropping systems are being used by farmers; to define the characteristics and reach of traditional seed systems; to describe the effectiveness of harvest and processing technologies; to determine why a recently released pest-control technology or variety is not accepted by the producers; and to clarify the workings of each component in market-oriented value chains. The methods are used to identify the strategies that farmers utilize to reduce their vulnerability in terms of economic and climatic risks, from the management of genetic material to temporary emigration. They are also used to estimate impacts on farmers' nutrition, income or quality of life as a result of the adoption of the technology promoted by the agronomists. Moreover, social science methods are used to establish base lines and to do evaluation studies that permit a comparison of the benefits received by different groups depending on whether or not they adopt the technology.

In spite of the large number of situations in which these interviews, surveys, case studies, as well as other social sciences methods, are used, the agronomists commonly use them without having received proper training or without being sufficiently familiar with the topic. As a result, in practice the instruments tend to have weaknesses in terms of design, reliability and validity of the data obtained as well as the analysis of the data. In other words, these methods are not applied effectively.

This guide aims to fill that vacuum. The guide is a quick and practical introduction to the methods used by social scientists and to the norms that allow these methods to be used properly and efficiently. It is hoped that the correct use of these methods will strengthen the research and practice of agronomists and other biological sciences specialists in order to provide solid evidence to the global community as well as opportunities for learning and improvement to immediate stakeholders and beneficiaries.

Many times as researchers we enter a farm or community with an idea of what the problems and the solutions are for the people who live there (low production, lack of food diversity, poor soils, etc.) but without considering the system and the logic of the site, as well as our potential role within this system to improve or support endogenous processes. For example, the perspective and priorities of the local population, its history, its current context and future trends should all be part of understanding the local context. Without this basic understanding, we run a large risk of generating knowledge and technologies that are not relevant for the community and that will not be used nor will they cause change.

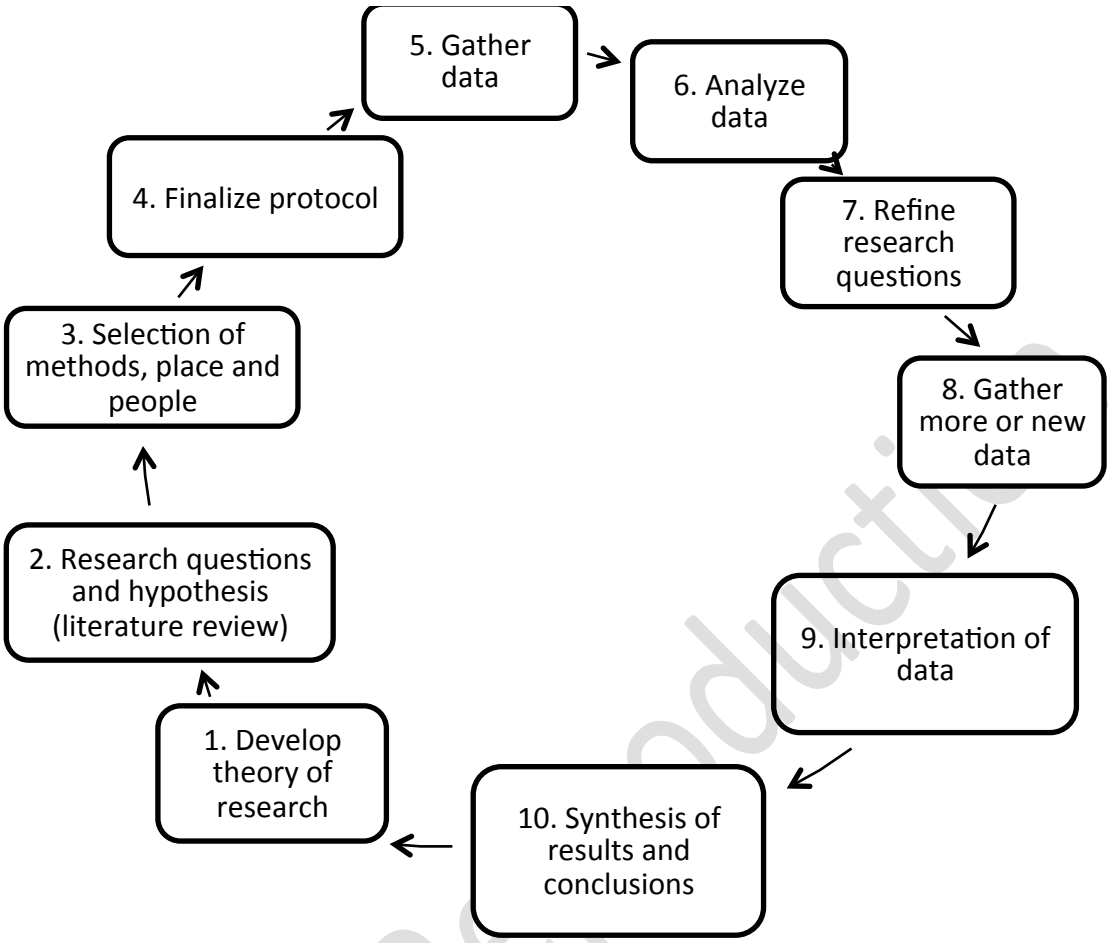
Many researchers say, “but I know very well what the problems are because I am part of the community” or “I have worked with the community for fifteen years.” Others say, “It is true that we don’t know what the community’s problems or needs are, so we will do a survey to ask them.” These comments refer to another important topic dealt with by this guide: information quality and reliability. That is, we have to examine our beliefs to make sure that they are based on evidence and that this evidence is good quality.

The guide is aimed at agronomists who are students, who work for research centers or are agricultural development specialists and who use social science methods in field research with families and communities. The users of this guide are expected to have some knowledge and previous experience, even if limited, regarding social research methods.

The purpose of this guide is not to convert agronomists into anthropologists. Rather, it attempts to guide agronomists so that they can more efficiently use social science-based methods in their work. This will allow the agronomists to use the methods themselves in some cases. At the same time, it is hoped that the agronomist will acquire a sufficiently sophisticated understanding of the social sciences so as to be able to define the terms of reference for the hiring – whether permanent or as a professional consulting service - of a social scientist, and to understand and evaluate the quality of that professional’s work.

The guide does not aim to substitute or to synthesize the wealth of information available on social science research methods.

This guide is organized by how to design a research project, select methods, gather data and analysis data. This sounds like a linear process, but in reality it should be part of an interative cycle where researchers can learn and adapt.



Theory and Research Questions

The first impulse in research is to define what methods should be used. In reality, the methods are one of the last pieces of the protocol that should be defined. A research project usually begins with a question, which provides the reasoning behind why the research is being done and also helps us realize what information is already known about the area of interest.

Research questions, however, don't simply occur to us. Explicitly or implicitly we have a notion of how certain conditions are related to others, that is, we have a "theory" of these relationships. This theory helps us to define clearly what issues or variables we are going to study and what we are not going to study. Without this theory we could ask everything, including a number of questions that are necessary and that are included "just in case." The theory gives us a precise focus on the nature and extent of the research, but in order to formulate it, we need social theories that help us guide our research, even when the topic that we are dealing with is very specific or basic.

The research questions are essential but not sufficient on their own. Before beginning the research one needs to have answers to those questions. These provisional answers are the hypotheses. For example,

the researcher says: “my impression, based on my experience or review of similar cases, is that I am going to find that the more communities are immersed in market relationships the more problems they have with resource management.” The research seeks precisely to prove if these expectations, this “bet” or hypothesis, are good or not when confronted with reality. That is, before even thinking of what kind of research method will be used, one must have a clear vision of the research theory, the questions and the tentative answers (hypotheses) that the researcher proposes.

A review of the literature is essential first step. Unless one is willing to perform research that does not contribute new information, one must know what other researchers, thesis students, etc. have written about the issue until now. A review of the literature also helps to discover questions that can be verified in other contexts. For example, if one determines that an intervention did not work in the valleys, one can still study if the same intervention could work in the mountains. The review allows us to discover methodologies and analytical approaches that have been used in other studies and that we could use in our own research, even if the topic is different. The review also allows us to discover sources of secondary information that we could use in our work. In other words, a literature review allows us to build on what others have already established, or question and qualify what others have defined as “true.” A review of the literature, then, should be performed before designing the research, not after. Doing the review at the end of the research is an enormous waste of the potential benefits that it could give us in terms of designing and implementing a valuable study.

Once the theory, scope, questions and hypotheses of the research have been decided, it becomes possible to define which is the best method to be used to obtain the information needed in the research. Various methods or approaches can be used to collect and analyze the data. The choice of method depends on the research question. What do you want to find? (The question.) And given this, what is the best path to obtain the answer? (The method or approach.) (Mayan, 2001)

Quantitative and qualitative approaches and mixed methods

In social research, one can use qualitative and quantitative approaches and data. In general, the qualitative approach helps us understand the “why” of an issue, while quantitative analysis helps us understand the frequency. Many times qualitative and quantitative methods are presented as being juxtaposed: that if you do one, you should not do the other. But in reality, the two approaches are complementary. It makes much more sense to perform a qualitative investigation before starting a quantitative one if one does not know the topic well. In this case, the qualitative research points out how rich and complex reality is, and also shows what topics should be generalized and which numerically defined. Based on this information it is possible to design a focused quantitative study. It makes no sense to perform a survey and ask hundreds of questions just to determine after having performed the survey that the key questions were not included. For this reason it is better to begin with an open interview (qualitative method) to see the options that exist and based on this one can construct a codified questionnaire (quantitative method). It is also possible to review the results of the survey with the application of qualitative and participatory methods in order to understand the data from the questionnaire from the perspective of the participants.

In many cases, the most powerful way to understand a complex situation is to use "mixed methods" that combine qualitative and quantitative information from various disciplines such as agronomy, biology, ecology, economy, geography, sociology and anthropology. When and how to combine the information that stems from each of these sources is an issue that the researcher will have to face in his design. Nevertheless, the objective of using the qualitative methods is not to gather up the greatest amount of information but rather to choose simplicity and rigor and reliability (discussed below) and not to try to have the complete image of a problem. It is unrealistic to have complete understanding of a situtaion, given that there will always be "black boxes" or aspects that will not be dealt with or that are irrelevant for finding an answer to our research questions. This goes along with the idea that the researcher does not need to understand all of the facets of the problem.

Qualitative research generally focuses on the meaning of real life events, not just in the occurrence of the events. The important sets of meanings are those held by the participants in the events, and an advantage of qualitative research is its ability to capture those meanings instead of limiting itself to the meanings imposed by researchers.

The search for meaning constitutes, in reality, a search for concepts – ideas that are more abstract than the information itself in an empirical study. A collection of concepts, including a small collection, can be gathered in some logical form that could later represent a theory about the events being studied. The degree to which one chooses to develop the concepts and theories as part of the study – as well as the sequence in which one chooses to recognize them in relation to the information gathering activities – is a research design choice. (Yin R. K., 2011).

Qualitative inquiry is frequently labeled as subjective in contrast to quantitative inquiry, which is labeled as objective. No science, qualitative or quantitative, is free of values. Absolute objectivity is impossible and even undesirable in many cases due to social nature and the human purposes of the research (Patton, 1990). The stories and written reports are always selective and reflect a posture or the orientation of the speaker or writer (Patton, 1990). Instead of thinking about the terms, subjective and objective, think about making the research rigorous (valid and reliable) without worrying about whether it is qualitative or quantitative (Patton, 1990).

Rigor

Rigor is the integral part of any research, be it biophysics, social sciences or evaluation. Rigor means adhering to the rules or norms of the method. When this is done research with be both valid and reliable.

Internal Validity

To be internally valid, the conclusion of the research must be supported by the data. Internal validity is judged in terms of the exactitude with which a description of the particular events represents the data. In qualitative inquiry, the question is "Did we get the right story?" In quantitative inquiry, the question is: "Were all the external variables controlled for in order to get the dependent variable?" The essence

of internal validity for both quantitative and qualitative inquiry is the complete confidence that the conclusions stem from the data (Mayan, 2001).
Internal validity is applied to explanatory or causal studies and not to descriptive or exploratory studies. They aim to establish a causal relationship, as a result of which it is assumed that some conditions lead to other conditions, unlike in false relationships (Yin R. , 2009).

External Validity/Generalization

In both qualitative and quantitative inquiry, external validity or generalization can be understood by means of the following question: "How can one determine the degree to which the findings of a particular investigation can be applied in other contexts?" In quantitative inquiry, external validity can be described as an adjustment, that is the degree to which the readers of the report are able to transfer the findings of the research to other scenarios, to contexts that differ from the study's situation (Guba & Lincoln, 1981). In order for a reader to do this, the researcher should supply a substantive narrative with detailed and clear information or a dense description of the phenomenon/topic studied and of the scenario in which the topic/phenomenon was found. (Goetz & LeCompte, 1984) (Guba & Lincoln, 1981) (E.G. & Lincoln, 1982) When one knows in detail both the context to be transferred (in other words, the scenario of the research) as well as the context to which it is being transferred, it is possible to decide if the results can fit or be transferred. The degree in which the transfer is possible is a direct function of the similarity or "adjustment" between the two contexts.

For example, if a technician who works in Bolivia's Central Altiplano (highlands) found a study that was made regarding the use of barter by the central part of the Peruvian highlands, the technician from Bolivia would then need to determine if the study is or is not transferrable to the Altiplano context. It is important, nevertheless, for the researcher who performs the study in Peru to provide sufficient descriptions to allow others to decide if they can use the results (Mayan, 2001).

Reliability

The discussion about reliability in qualitative inquiry is different in the social sciences. In quantitative inquiry, reliability is generally linked to replicability. The idea of replication, however, contradicts some of the basic principles of qualitative inquiry and cannot always be applied to it (Mayan, 2001). Reliability in qualitative analysis depends on the following elements: (1) the consistency of the data collected, the quality of the data we collect; (2) the management of the information, that is to say, its later analysis and codification; (3) the presentation of the data, that is, how refutable is the information that we have; (4) the codification that we will perform with the information. This point is, perhaps, important because there is a tendency amongst agronomist to count (as a form of validity) how many interviews refer to the problem at hand. When the answers are counted (for example, 90% of those interviewed say the following) the diversity of the answers is lost, as is the identity of the respondents and from which perspective they are speaking (social position), as well as the causal explanations of the answers that we have. In this sense, reliability is not based solely on the data collection process but also on the analysis process and the presentation of the data.

Strategies for Verification

Participant Review

Review by the participants or local actors is performed when the researcher reviews or verifies with the participants the hypothesis that is under development, the preliminary categories or the interpretations. (Lincoln & Guba, 1989). This is a process for obtaining feedback from the participants in order to ensure that the researcher is listening to and correctly interpreting their narratives. (Mayan, 2001). There is also a large body of work on participatory research methods, where the subjects of the investigation are also the researchers, we will not explicitly cover participatory research in this document, but many of the methods and underlying issues are similar.

Peer Review

Peer review is the process of involving a colleague in a broad and extensive discussion about the findings and conclusions themselves, as well as about the tentative analysis. (Morse & Field, 1995, p. 147) The colleague formulates questions regarding the values, conjectures and decisions of the researcher and suggests possible future steps (Mayan, 2001).

Sampling

Sampling is based on first defining a population. A population in itself is a constructed entity, so it is important to explain what the population is for each research question. For example, all adults over 20 years of age in the community of Campana who own land. Unless the population that is the object of study is very small or unless the study is a census, social research normally uses a sample to produce the information that will serve as the basis for analysis (Yin, 2009). The goal of the sampling strategy is to maximize the opportunity to produce sufficient information to respond to the research question. The way to achieve this depends on the research question, its feasibility and resources, and the scenario. main issue in sampling is if it should be an intentional or representative sample. Convenience samples are neither intentional nor representative and thus have limited applicability, and are mainly used for initional diagnostic purposes. There is not one correct sampling strategy for a given question, that is why it is important, above all us, to be transparent about the rationale for the sample in the protocol and to have the protocol be reviewed by peers to double check your logic.

The purpose of using **intentionally selected samples** is to represent the range of groups that tend to have a different orientation regarding the topic as well as offering comparative information (Viedma Rojas).

The researcher chooses individuals and contexts when he/she asks himself or herself:

- Who can give me the most and the best information regarding my topic?
- In which contexts will I be able to gather the most and the best information regarding my topic?
- Who can give me the greatest response diversity?

Then, individuals and contexts are selected from which a great deal can be learned about the phenomenon (Mayan, 2001). Thus, the most important criterion for inclusion in the sample is the capacity of the subjects to produce different types of discourse. (Yin R. , 2009).

One method of intentional sampling is called snowball sampling. An example of this method is if a researcher wants to conduct a study regarding native potato seed systems in a community in Peru, the researcher could start with farmers. Intentionally, one would select those farmers who cultivate native potatoes and who are eager to speak about their experiences. These individuals might suggest friends and others who could be good interview subjects. The sampling occurs until data saturation is reached (see below). In this way, the researcher intentionally selects individuals to develop the entire range of experiences of the people interviewed in this community (Mayan, 2001). One can follow the snowball procedure but only if one takes sufficient time beforehand to think of the reasons for which one chooses the later interviewees, distinguishing between having a rational intention (for example, one believes that a possible interviewee has additional information that is pertinent to the study) and simply for convenience's sake (for example, that the interviewee is close and has an hour free to talk to you) (Yin R. K., 2011).

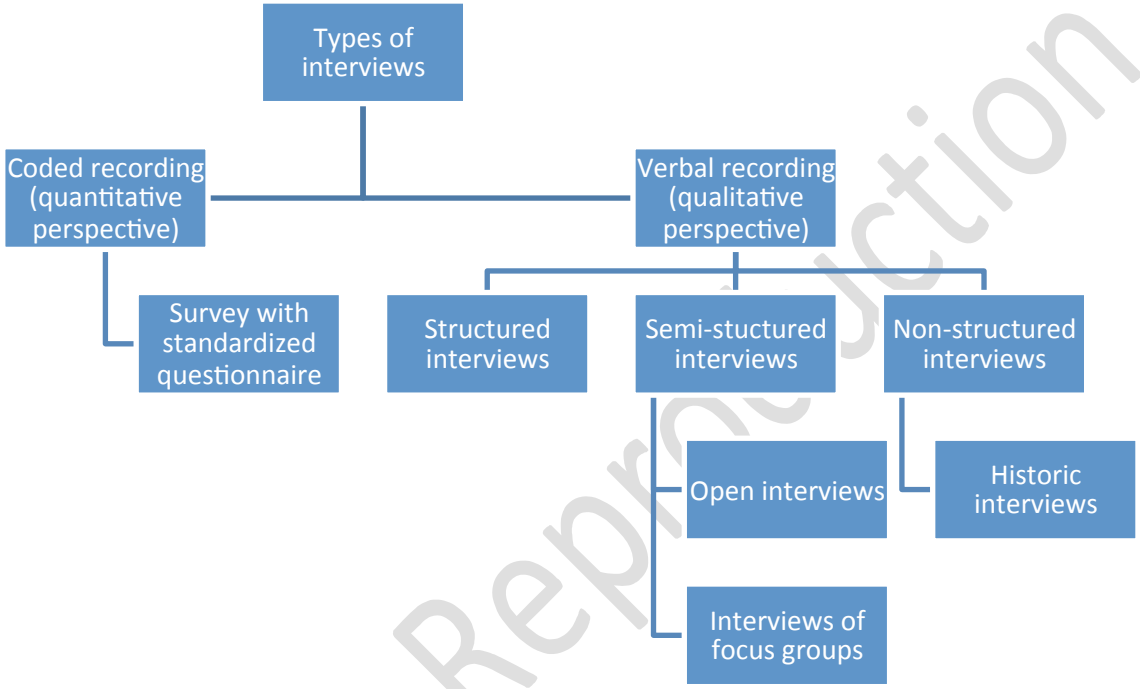
More common is for a researcher to determine what attributes they think are important in relation to their research question, and chose a sample based on getting the widest range within those attributes. Thus is the hypothesis is that women over 40 tend to eat more legumes, it will be necessary to talk with women and men in each age bracket.When selecting interview candidates the value of each case and its particular contribution to the comprehension of the phenomenon being studied must be explicitly stated. More than the number of interviews or their heterogeneity, what is important is that the sample contains all of the perspectives from which the subjects interpret the phenomenon. The end of the sampling is when the people being interviewed stop offering alternative responses in their explanation of the phenomenon (Yin R. , 2009).

With the data that comes from intentional samples, one cannot usually make declarations or generalizations about the whole population. In order to that, it would be necessary to complement the information with a study using a representative sample of that population.

Representative sampling is based on probability and size. The researcher works on randomly selected samples so that any member of the population has a chance of participating. The objective is to generalize the findings to that population. Following this example, the researcher will try to get a list of the people who dwell in a given community. Using a random sampling process, they will create a list of individuals who are able to complete the questionnaire (Mayan, 2001). The size of the sample is based on the total size of the population as well as the lever of certainty that the researcher thinks is necessary to support their claims, keeping in mind their audience and resources. Some researchers, based on experience, come up with rules of thumb, such as always trying to reach 10-30% of the total population.

Interviews

The interviews can be placed in two large groups: a) those that produce codified registries with the intention of being transformed into numerical data, susceptible to statistical analysis; and b) those that produce verbal registries to be examined through the sociological analysis of the discourse. Even when they appear to be opposites, both types of information are complementary in social research. In many cases, linking them is absolutely necessary if one is to approach study objectives as complex as those with which social sciences generally work (Callejo & Viedma, 2006). (Yin R. , 2009)



Without much effort, we can imagine an axis on which all the types of interviews lie, based on the degree of openness in the interaction between questions and answers (Patton, 1990). At one extreme would be the survey, next the structured interview, the semi-structured interviewe and at the other extreme would be the non-structured interview. But practical usage has blurred the limits between the different interview types. For example, the survey can introduce open-response questions for some exploratory topics or for topics that are complex to describe. This would situate the survey in the area of structured interviews. On the other hand, structured interviews can include groups of coded questions that permit the knowledge of some facets of the sample, which would bring them closer to the survey. Similarly, semi-structured interviews with a script that is not highly detailed are not that different in practice from non-structured interviews. In summary, then, although the classification serves to helps us distinguish some key questions, one should not forget that the interview that produces verbal registration is produced in a flexible social situation.

There are some practices that the interviewer(s) can follow in order to obtain more real results:

1. Facilitating our relationship with the interviewee:

a) Expressions of interest and attention. Maintaining visual contact and expressing – with phrases or gestures – that one is following the discourse allows the interviewer to know if the expectations are being met. The interviewer should be careful to differentiate in his or her behavior between maintaining interest and a demonstration of approval for the story.
b) Establish the absence of value judgments. Clarify to the interviewee that there are no correct or incorrect responses. What one is looking for is the exposition of what the interviewee opines.
c) Watch the tone of voice and body language. It is very important to control the expression, the tone and the way in which the researcher behaves. These codes are signals that the interviewee perceives and that the interviewee will take as an element of judgment.
d) Give the interviewee time to respond calmly. This aspect stems from a previous condition, and the interview design should consider how much time is necessary to cover the topics of interest calmly.
e) Manage highly emotional situations. Sometimes situations develop in which the interviewee suffers, gets mad, cries or shows his anger. Normally these situations can be anticipated by observing how the interviewee expresses him or herself or in his/her body language. The first step is to avoid the situation without avoiding having the interviewees speak. If the interviewee questions the interview, the researcher should leave the interviewee to decide if he wants to continue or not. Stop the recording, rest and give the interviewee time to decide. It is also important to be empathetic.

f) The interviewer should make an initial presentation of the study being performed, its objectives, expected results and the interview steps. This will allow the interviewee to have an idea about the process and an understanding regarding what is sought through the interviews.

g) It is recommended to use the "paraphrasing" technique (repeating or synthesizing what the interviewee has told us) when necessary, in order to clarify aspects that are not clear and to deepen aspects that are of interest for the research. This will also allow us to demonstrate comprehension and to show that we are listening carefully.

h) So that the interview is as comfortable as possible for the interviewee and that the interviewer is not limited to note taking, it is considered preferable to record the interview with the prior consent of the interviewee.

i) If there is a team of researchers, it is important to review as a team, before beginning the interviews, the interpretation of the questions, the guidelines for field work, the transcription criteria, etc., so that all of the interviews are carried out in a reasonably uniform manner. Practice sessions can also be very helpful.

2. Guiding the interventions.

a) Never assume that the interviewee's discourse is his/her own when it is not fully understood. On many occasions, assuming the discourse as something that is clear impedes the interviewee

from offering a deeper explanation. It is essential to comprehend the distinct meanings that the interviewee can offer.

b) Pause or silence. Allows the interviewee to reflect, to search his or her memory, to evoke. It is a way to show respect and to reduce directivity. On the other hand, at times, silence is uncomfortable. It is a request for clarification. One must be careful to not allow this strategy to interrupt the discursive rhythm.

c) Elaboration. One intends for the individual to expand the responses, offering more details and nuances that could be relevant in the interpretative process of the topic being studies. The invitations to the interviewee are made at the end of the subject's intervention or a little bit after. The standard formulas are similar to "continue", "I understand", "and then?", "what did you feel at that moment?" In this way, the interviewer shows verbal interest and allows the interviewee's discourse to flow.

d) Avoid phrases and comments that indicate to the interviewee that the issue is closed and that what has been said is sufficient. For example: "I know", "it's OK", "right".

e) Repetition. This tactic offers two options, one that consists of repeating the question, formulating it distinctly, or another that consists simply of repeating some expression or word from the interviewee's answer: "If I heard right, you told me that…". The second alternative is more desirable than the first and tends to be proposed a few minutes later than the interviewee has done it. In this way, the researcher's interest becomes blatant, with greater intensity.

f) Recapitulation. This is put into practice long after the interviewee has used some expression that is of interest to the researcher. The subject is asked to rephrase what he or she has said, most of the times, in a retrospective manner.

g) Clarification. It is sometimes necessary to ask the interviewee to clarify something said, especially when the elaboration tactics have failed and one does not believe that that particular point will be touched upon again in what is left of the conversation. This request is made by asking for a chronological detail or through direct questions such as "why did you think that…?", "what happened in between the time that happened … and?" or "who made that decision?" (Yin R. , 2009).

Non-Structured Interview

In a non-structured interview, the researcher has identified a research question but knows little about the area of interest. The researcher simply asks the participants to "tell their story" or "speak about your experiences" and listens and learns.

The purpose of the non-structured interview is to provoke deep responses from the participants. Structured interviews follow an exact use of words, phrases, and therefore the researchers' meaning, while qualitative interviews aim to understand the participants "on their own terms and in the way in which they give meaning to their own lives, experiences and cognitive processes" (Brenner, 2006). This purpose satisfies one of the fundamental objectives of qualitative research, which consists of describing a complex social world from the participant's perspective (Yin, 2011). The non-structured interview process is, therefore, non-restrictive, and the participants have the control of the interview agenda and

how they relate their experiences. For example, if the researcher asks a farmer, “What do you like about being a farmer?”, the participant will respond however she wants. The researcher, then tries to understand the emotions and behavior of the participant as stated by her experience. The non-structured interview allows the participants to use their own language to totally describe their experiences.

In a non-structured interview, ideally one formulates just one question in order to encourage the participants to share their perspectives without interruption. The researcher maintains the interview on its course (on topic) and proves emerging hypotheses, but he does it in a friendly manner so that the participant does not feel annoyed or dominated (Mayan, 2001).

As in other questions, the time of duration of an open interview is not set previously. The temporal design fluctuates on the basis of the research objective, the topic to be discussed, the amount of information that the interviewee has, of his or her availability, access, etc. It is normal for interviews to last over an hour or one and a half hours when concrete topics are discussed. When the depth or broadness of the information requires it, it is possible for the interview to run long or to need to perform various interviews.

The interview script, also known as the script for conducting an interview, is an instrument that allows the interviewer to control the production of information during the interview situation. The script is like a thematic index with different levels of detail that guarantees that the most relevant topics for the research cannot be left out of the conversation. It is particularly useful when one performs many interviews or when various interviewers perform the interviews. In these cases, the script is a previously agreed document in which the topics to be discussed are outlined. The fact that there is an interview guide does not mean that there must be a specific questioning order, or that one must ignore interesting topics that happen to come up in the course of the situation. The script’s topics should be introduced in a way that flows with the conversation. Anything that forces the situation in order to introduce topics will distance the interview from a natural conversation flow. Sometimes the script is merely a reminder, a series of guide posts that can be suggested without following a formal presentation of each topic. The script should be used in such a way that it distances itself from the standard question-answer situation that is produced in a survey. If the interviewee senses that logic, he or she will reproduce it and will wait for the interviewer to slowly introduce the topics. This situation will stop the flow of the narration.

The moment of the interview is one of the most difficult phases to control in the research process. Even when one takes measures to eliminate possible bias in the responses that the interviewer may introduce with his or her behavior, verbal expression, style of dress or the way in which he or she guides the interaction, it is impossible for us to forget that the interview is a social situation that changes each time it happens. The interview situation is not a laboratory experiment in which all of the factors can be controlled. The interview is an experimental situation whose result depends on the circumstances in which the interaction is produced, of the expectations of the role proposed to the interviewee before and during the interview and the practical experience of the interviewer in conducting it. Factors such as ethnicity, gender and language of the interviewer must be considered in the design.

If we analyze the influence of this lack of control on the results regarding the variety and flexibility of the types of interviews, we will observe that in both the case of stimulus-response interviews (surveys and structured interviews) and in the case of the open interviews, the effect is similar. In both cases, the interviewer needs to create an atmosphere of trust so that the interviewees' reponses are offered with the least bias possible. In both cases, the interviewer must adapt the communicative process to the characteristics of the interviewee.

The most important limitations of the interview are related to the verbal expression of the interviewees and the effects that the face-to-face interactions cause on them. The limitations related to verbal expression stem from the limited capacity to understand the questions or to state the responses. Lack of knowledge of language, or the distance in the type of language used can produce a stoppage of communication, in the case of open interviews or their acceptance of responses that have really not been understood. It is common to find difficulty in providing answers in social groups that are not accustomed to producing a prolonged discourse about their actions. (Yin R. , 2009).

Semi-Structured Interview

The semi-structured interview gathers data from the participating individuals through a set of open questions formulated in a specific order. The interview focuses on a series of questions that the researcher asks each participant.

In order to gather a certain type of data, the interview can be designed as one of the following interview types (Rubin & Rubin, 1995):

- A cultural interview (to determine the shared knowledge, rules, values and expectations of a group);
- A topical interview (to learn more about a certain event or topic);
- An oral history interview (to gain understanding about a specific period from the people who have the experience of that time);
- A life history interview (to learn about the "main happenings in the life" of a person);
- An evaluation interview (to learn about the perspectives of the participants surrounding the strong and weak points of a program).

The semi-structured interview is used when the researcher knows something about the area of interest, for example, from a review of the literature, but not enough to respond to the questions that he or she is asking. Although the questions are ordered, the participants can respond freely.

Having performed a review of the literature (of all the information available) and drafted an idea based on personal experience, the researcher prepares questions prior to the interviews. The questions can be open. For example, instead of asking a closed question such as "Do you like to plant quinoa?" an open question will be prepared such as, "Tell me about your experience planting quinoa."

In addition, when designing the questions, the researcher must consider the type of information needed. The following types of questions can be useful for getting information (Patton, 1990):

- Questions based on context: Who is it? What role has this person played in his or her community or organization? From what perspective is the person speaking (as a mother, community leader, farmer, etc.)?
- Questions based on experience or behavior (to determine what the person "does or has done…"). For example, "Tell me about the crop planting planning process."
- Questions based on opinions or values (to learn what the person thinks about the topic). For example, "What do you think about the use of agrochemicals?"
- Questions based on feelings (to learn how the person responds emotionally to the topic). For example, "How do you feel about the Farmer Field Schools in your community?"
- Questions based on sensations (to learn what the person experiences through his or her senses). For example, "How are the land owners of your community feeling?"
- Questions based on demographics or background (to register routine facts about the person). Some researchers recommend placing these questions at the end of the interview, which means that the answers typically will be short. If these questions are placed at the beginning, the person may – as a result – get used to giving short answers farther on in the interview when deeper answers are needed (Patton, 1990). Other researchers, however, place these questions at the beginning of the interview so that the participant is more comfortable (Morse & Field, 1995).

The researcher also prepares follow-up and survey questions to explore an issue more deeply. Some types of survey questions are (Patton, 1990):

- Detail oriented (start with: Who? Where? What? When? How?)
- Elaboration (indicated by a gentle nod of the head, a calm "uh huh" or a question like "Would you tell me about that?")
- Clarification (a question like "I would like to be sure I understood 'x.' Could you please tell me more?").

In general, the number of questions formulated must be minimal in order to avoid interrupting the flow of the interview. The questions must be clear and neutral. They must be ordered logically and directed at just one topic. To be sure about the questions and the order, the researcher must test them and review them with colleagues or friends before performing the first interview (Morse J. , Principles of Qualitative Inquiry, 2000) (Morse & Field, 1995).

Ideally, each interview is audio recorded and transcribed for analysis purposes. Given that transcribing can take up to four times the amount of time that the interview itself required, the investment in time and cost terms also increases. In addition to recording the interviews, one should take notes in order to capture the specific points of the story in the interview that one would like to review later or in order to find these moments on the audio tape after the interview. Taking notes will reflect our careful way of listening to the participant. (Morse J. , Principles of Qualitative Inquiry, 2000) (Patton, 1990). (Mayan, 2001)

Standardized Questionnaire Interviews

The interview with a standardized questionnaire is the most common way to produce codified records. Its main characteristics are: a) information gathering through face-to-face or telephone interviews; b) use of standardized questionnaires which include different types of closed questions and answers or with very small levels of openness; and, c) application of the interviews to a sufficiently large group of people so that the results are statistically representative of the studied (sample) population.

The interview situation in the survey is conditioned by the means in which the interrogation-response is performed, the objective of the interview and the peculiarities of the communicative process created for its development. The questionnaire is the means that directs the communication. The interviewer asks one question after another in the order established in the questionnaire and registers the responses according to a predetermined coding system. In addition, before the gathering process, the interviewers receive concrete guidance regarding the manner in which they should apply the questionnaires and the interview conditions or situations that should be considered.

The objective of the survey is not to find out the opinion of each of the interviewees about the concrete topic or experience being discussed but rather to classify the interviewees according to their degree of adherence to the answers that the researcher previously had considered for the record. The fact that a closed questionnaire with codified questions and answers is offered implies that its construction derives from the researcher's previous knowledge.

Even when this knowledge is deep and in spite of previous proof or research, it is logical to think that there can be answers that differ from those foreseen by the researcher that may not have been recorded. The interviewer or the way in which the questions are formulated is a known problem, called "reactivity" and must be taken into account. The relationship between the interviewer and the interviewee produces a phenomenon known as reflexivity that affects the communicative process and can lead, as a result, to changes in the interviewee's responses in order to achieve acceptance by the interviewer (Yin R. , 2009).

In general, the researcher must be very conscious about the duration of the questionnaire and the willingness of the interviewee to answer the questions with intentionality. In many cases, researchers have seen that 30 minutes is the maximum limit for this type of interview, especially for farmers, who are very busy.

Group Interviews

Unlike the individual interviews, group interviews have the advantage of permitting interaction between participants, and thereby, allow us to see how social knowledge is generated. In addition, they can be a useful way of investigating delicate issues, such as dissatisfaction with extension services. The advantages of group interviews are also their limitations. Group scenarios can be ideal for accessing cultural norms and the manner in which they are reproduced in daily conversations, but this means that

perhaps they are less useful for accessing deep stories of marginal opinions. Group dynamics, with the predominance of certain members of the groups, constitute a useful indicator of opinion hierarchies and the ways in which marginal members are "silenced," but of course they also limit the expression or elaboration of opinions that are less acceptable or the point of view of those who are lower down in the hierarchy of positions.

By "group interviews" we refer to any type of interview in which the researcher gathers information from more than one participant at the same time. They can vary from opportunist interviews with small groups that surge naturally during field work to focus groups that have been specially recruited and gathered strictly in order to inform the evaluation of requirements, to evaluate services and to carry out investigations about group norms. The community meetings are generally used to collect data, as part of a participatory approach towards establishing research agendas and evaluating the program. What these different ways of gathering data have in common is generally used to gather data, unlike the individual interview, because they allow one to access the manner in which the people interact amongst themselves and the researcher.

Type of Group Interviews: Coreil		
Type of Interview	**Characteristics**	**Typical Uses**
Consensus panel	Generally made up of key informants or experts. Seeks group consensus and normative reactions. Tighter and more closed stimulus material	Reach agreement on protocols, establish resource priorities
Focus group	Participants selected that meet the sample criteria. Seeks a wide range of ideas on broad topics. Time and place: formal, pre-agreed, controlled. Usually recorded in audio and transcribed for future analysis.	Analyze extension materials, explore the farmers' points of view regarding the extension services
Natural group	Group exists independently of the research study. Formal or informal format. Interview guides are followed without too much rigor. Generally recorded in written notes.	Ethnographic data gathering (informal) or social research (formal)
Community interview	Open to all or to large segments of a community. Generally recorded in written notes.	Project planning, program evaluation.
Source: Adapted from (Coreil, 1995)		

The type of group interview chosen will depend on the purpose of the study and its feasibility. If the purpose is to generate "naturalist" data, the format selected could consist of pre-existing "natural" groups, while the focus groups selected would be more appropriate if one needed a wide range of

points of view that cover the entire population. The scenario will also influence the format. Coreil notes that in a study performed in rural areas, the lack of a conference room would mean that, in practice, a group interview may involve a changing group, since people enter and leave the place where the interview is being held. In many research scenarios, privacy may be impossible and the group interviews may be used simply because it is not possible to speak with people individually.

Consensus Panels

Consensus panels are groups that meet to reach some agreement about a specific topic, such as priorities in risk management, a program for seed system research or guidelines for interventions in nutrition (Murphy, 1998). Although they are not strictly an interview method, they are sometimes used in qualitative studies and can help to establish research agendas (see, for example, (Bond & Bond, 1982)).

Community Interviews and Participatory Methods

Participatory methods aim to repair the uneven power relationships inherent in research, such as having the researchers share responsibility and knowledge with the participants. Based on democratic, theoretical, ethical and epistemological principles, the intention is for communities to determine the research agenda and participate in the research and development process.
The research process is also expected to help strengthen local capacities and lead to a better understanding on the part of the external researchers as well as generating relevant results for the local population. The research is no longer the exclusive domain of the external researchers; it also involves the population as both sense and knowledge producers.

Community interviews and workshops are an essential part of this type of research action, as a route to develop participatory practices in a place rather than just gathering data. At the beginning, development projects often depend on community meetings to generate interest in the project, to respond to the community's questions and to include the community's priorities in the research agenda. There are, however, limitations regarding to what extent both the participants' and the researchers' agendas can be met. The participants may have expectations regarding the researchers that cannot be fulfilled. But mostly, there are opportunities for both sides.

Community groups are also vital in the participatory studies at the end of a project in order to communicate the findings to the participants and their broader communities as well as to increase the possibilities of sustainability if the project were to have a development purpose as well as a research goal.

In participatory approaches, where one works with the participants, instead of extracting information from them, it is part of the purpose and it is considered productive to think carefully about the methods used in the group processes in order to ensure that they allow the participants to collaborate fully.

Natural Groups

The participants in traditional focus groups do not know each other before the discussion. Nevertheless, in social research, the goal often consists of learning *how* social knowledge about a topic is generated as well as *what* is the content of said knowledge. In order to achieve this, it is often useful to employ "natural groups" or groups of people who already know each other. This increases the interaction

between participants as well as between the moderator and the participants and potentially allows the research to access the culture of the shared group. The natural groups can be informal or formal. Informal groups are those that happen by chance in the course of fieldwork – interviews with groups of farmers who harvest a communal field, for example, or women meeting around a kitchen during a holiday. Home interviews are another type of natural group that can be a useful source of information. In informal interviews, especially if they happen by chance, there will not generally be a structured topic guide and the data will be registered via field notes instead of taped recordings. In practice, many interviews will be informal group interviews: when the researchers start asking questions, many people join in, and the formal protocols will be adapted in practice since the daily demands of people who come and go from work interrupt the focalized series of questions (Khan & Manderson, 1992). Interviews with natural groups are those in which the group is invited to attend for research purposes.

Focus Group Method

The ice-breaking exercises are designed mainly to promote debate amongst the participants at the beginning, so that everyone has a chance to speak and to get to know each other well enough to interact. Even when natural groups are used, where people already know each other, an introductory exercise can establish preferred titles and individual voices, so that they can be identified later in the recording. The focal exercises are designed so that the group focuses on the topic in question and sometimes are used to gather certain types of data.

The role of the moderator is crucial. As with any interviewer, his or her work consists of establishing a relaxed atmosphere, in order to allow the participants to tell their stories, and to listen actively. This implies greeting the participants when they arrive, offering snacks, information and consent forms if necessary, presenting the ice-breaking activities and promoting each new topic. This is too much work for just one person and a moderator usually administers the group with the help of a scribe or assistant. The second person takes notes and makes sure that all of the recorders are turned on and are functioning. If notes are the only way data is collected, they can also be summarized in key points of the group in order to show that the points of view are being recorded in a trustworthy way.

The abilities needed to facilitate a debate are similar to those needed in any interview, that is, the ability to listen actively, to be free of prejudice and to encourage others to speak (without interrupting, adopting a relaxed body language, transmitting the correct verbal and visual signals, without hurrying to the next question or point). The moderators do not have to be experts in the topic – in reality, in general it is better if they are not experts so that the participants do not feel inhibited in discussing their points of view.

Until what point the moderator actively directs the discussion depends on the group's purpose and how rigorously structured the topic guide is. If each group needs to cover the entire topic of the guide, the moderator should be careful to direct the debate if it "deviates" too far from the guide. In more exploratory work, one can permit the "deviations" to continue a bit longer, since the topics that seem irrelevant at that moment can be crucial in the analysis phase in order to understand people's interpretations.

Focus Group Interview

A focus group is a small group (usually 6-12 people) that meets to discuss a particular topic (such as, for example, maternal feeding practices or a specific campaign for comprehensive pest control) under the direction of a moderator, who has a list of topics to be discussed. Typically, the groups last from one to two hours and include a mixed group of participants from various social environments that do not know each other. The focus groups are commonly used in studies to analyze people's perceptions about services (health, agriculture, etc.) (Green & Thorogood, 2009)

In a focus group one must decide on which analysis unit the researcher should focus: on the individual or on the group or on both?

When the focus group data is analyzed, the researcher must determine: (Kidd & Parshall, 2000)

- The degree to which the participants have censored or conformed their opinions to those of the group dynamics (Morgan, 1997) (Kidd & Parshall, 2000);
- If some aspect is a topic for the whole group or if it is significant for only one or two members;
- If some aspects emerges only in the group or for all participants;
- If some aspect emerges spontaneously or in response to the moderator's question;
- If some aspect is considered so important or interesting, either one or the other (Mayan, 2001).

Case Study

In general, case studies are the preferred method when one postulates a question such as "how" or "why," when the researcher has little control over the events, and when the emphasis is directed at a contemporary phenomenon within the context of real life. In case studies, the richness of the phenomenon and the scope of the real life context require the researchers of the case study to face a technically distinct situation: there will many more variables of interest than data points. In response, an essential tactic is to use multiple sources of evidence with data that must converge in a triangular style.

Many people erroneously believe that they are sufficiently trained to carry out case studies because they think that is an easy-to-use method. In reality, the case study is one of the most difficult types of research to perform due to the lack of routine procedures. Case study researchers, therefore, need to feel comfortable dealing with the uncertainties of the procedure during the course of the study. (Yin R. , 2009)

Multiple Case Studies

For the purposes of the audience of this guide (agronomists), multiple case studies, even if there are just two, are preferable over individual case studies. The latter, nevertheless, can be appropriate for describing a particularly unique case. Replication logic is analogous to that used in multiple experiments. Some of the replications can attempt to duplicate the exact conditions of the original experiment. Others can alter one or two experimental conditions that are not important for the original results to see if the results can still be duplicated. Only with these replications will the original results be considered solid. The underlying logic for the use of multiple case studies is the same. Each case must be

carefully selected in order to a) predict similar results (a literal replication) or b) predict contradictory results but for predictable reasons (a theoretical replication). The ability to carry out 6 or 10 case studies, effectively organized within a multiple case study design is analogous to the ability to perform 6 to 10 experiments on related topics; a few cases (2 or 3) will be literal replications while another few (4 to 6) could be designed to follow two different patterns of theoretical replications. If the cases are in some way contradictory, the initial propositions should be reviewed and analyzed again with another set of cases. This replication logic, applied to either experiments or case studies, should be distinct from the sampling logic commonly used in surveys. Sampling logic requires an operational numbering of the entire universe or group of potential interviewees, and later a statistical procedure to select a specific sub-set of people to be interviewed. Sampling is commonly used when the researcher wants to determine the predominance or the frequency of a particular phenomenon.

Evidence Gathering in Case Studies

Case study evidence can come from various sources such as documents, archives, interviews, direct observation, participatory observation, biophysical evidence and surveys. In addition to the attention given to the potential sources of information, some overarching principles are important in any effort to gather data when performing case studies. Some of these are:

(a) Multiple sources of evidence (evidence from one or two sources that converge on the same facts or findings).

(b) A database of case studies (a formal set of proofs that is separate from the final report of the case study). Every case study project should make an effort to develop a presentable and formal database so that, in theory, other researchers can review the evidence directly and onto be limited to the written reports of the case study. In this manner, a database of case studies considerably increases the *reliability* of the entire case study

(c) A chain of proof (explicit links between the questions formulated, the data collected and the conclusions obtained). The report should mention the relevant portions of the case study database citing, for example, specific documents, interviews or observations. The database, on the other hand, should reveal the real evidence and also indicate the circumstances under which the evidence has been gathered, such as the hour and place of the interview. Said circumstances should be consistent with the specific questions and procedures contained in the case study protocol in order to demonstrate that the case study followed the procedures stipulated in the protocols. Lastly, the protocol reading should manifest the link between the protocol content and the initial study questions. (Yin R. , 2009).

Participatory Observation and Ethnography

In participatory observation, one is immersed in the scenario or culture of the group. The researcher looks for behavioral patterns of people in this group in order to have indications of the underlying values and assumptions of the group's culture. (Mayan, 2001) Many times in the agriculture area, this involves having the researcher help the farmers in planting or harvest or other activities, and during the activity, the researcher can observe and speak with the people.

The data gathered through observation and other strategies (for example, interviews) are registered as field notes that are basically crude data that must be organized and analyzed. Given that participatory observation requires investing time to gather data, this method becomes expensive. However,

participatory observation is one of the most common means of collecting data in qualitative inquiry and has the capacity to reveal data that would otherwise be unavailable.

A deeper form of participatory observation is ethnography. Ethnographers introduce themselves in a group scenario in order to learn about the culture of that group. Ethnographers use a set of data collection strategies that include participatory observation, interviews and field notes. The final result of ethnography is a dense description of the nature of a phenomenon. (Mayan, 2001)

It is not very probable that this technique will be used often by agronomists because it is must be performed by a professional. Nevertheless, if they exist, published ethnologies are an excellent means to understand a culture/region/community.

Data Collection

Tools

There are many mechanisms or tools through which data can be collected including field notes, recording devices, photo cameras, video cameras, and other recording instruments. The benefits and challenges of each method should be considered before selecting them and the rationale should be including and coherent with the protocol. Issues such as cost, data analysis, requesting consent, perceptions of the participants, time and certitude needed should be analyzed. For instance many researchers don't record their interviews because they know for each hour of recording they need 8 hours of transcription and it makes the interviewee nervous. They might take notes or have someone else take notes, especially if they are also facilitated a focus group, because it is difficult to both listen and write. When taking notes, most agree on the importance of using the time right after the interview to make sure they write everything down and validate or re-question if possible before continuing with another interview.

Secondary Information

In order to respond to the research question, the researcher collects diverse data, including recently gathered material (i.e. primary data) and pre-existing material (i.e., secondary data) and frequently a combination of both. The secondary data come from various documents that include the internet, national statistics, (Mayan, 2001), scientific articles (one can do a search of their one's term on Google Scholar), gray literature – self-published reports and documents from non-governmental organizations (NGOs), governmental organizations (GOs), such as thesis research that exist in local university libraries or other research institutions and are not available on-line.

How to contact potential interviewees?

Contacting interviewees is a task that can be complex and requires careful preparation. The special characteristics of the open interview demand a temporary effort and a level of personal involvement that is much greater than, for example, the requirements for surveys. The contact process should begin with an agreement to collaborate based on providing basic information to the potential interviewee. The generic topic, the place and the time that is going to be used, and the declaration of confidentiality must be shared with the interviewee in order for him or her to accept.

The degree of access to the interviewees is another of the factors that most highly conditions the contact process. When access is limited to the search for common characteristics, selection problems are reduced. In these cases, the researchers' social networks or those of their colleagues can be used to find potential candidates. The problem arises when the interviewees have characteristics that are difficult to find, when they belong to reduced groups or live in restricted or marginal social contexts. In the first case, professional contacting is an adequate solution, even when one must be careful with the selection and with the review of the requested typologies. Key informants are particularly useful for work in communities or spaces that are not familiar or for those that we are only recently approaching. When the restriction has to do with entire institutions, one must also get the formal consent of the interviewees. It is easy to anticipate that the difficulty requires greater preparation and adaptation of the contacting process. In any case, we should keep in mind that improper contacting could lead to failure of the interview. (Yin R. , 2009).

Once it has been decided which groups will be samples, there are two possible strategies for recruiting participants. The first is opportunism. To recruit "natural" groups, one invites key contacts or "guardians" from the work place and from social groups, especially for exploratory or pilot studies. Nevertheless, no matter how extensive the personal networks of the research topic may be, it is unlikely that they can generate a representative sample or include all of the segments of interest of the population. One can ask the leader of the community to help contact key people in order to invite them. A disadvantage of working with established community groups lies in the difficulty of determining sampling. Also, the research depends on the leaders of the community to identify the appropriate people to contact. A way of limiting this disadvantage is making maps of actors with various community groups, which will allow us to have a clearer idea of the social relationships and the groups within the community.

The second strategy consists of systematically inviting people, either as individuals or as contacts from their group of colleagues, based on a sampling framework, if it exists, of the population of interest. This framework should comprise, for example, all of the families of a community, or all of the mothers registered at the health center, or all the participants in a Field School for Farmers. Later, one can take a sample of participants from this list at random, or following a certain goal if one aims to achieve a specific mix in each group. Unless the topic is of great interest for the participants, this method can have low response levels. The use of incentives, such as snacks, can increase participation levels. (Green & Thorogood, 2009).

Field Notes

By describing precisely and as literally as possible that which is observed in the scenario, a researcher is writing field notes. When this technique is combined with participatory observation, "the field notes are descriptive stories that objectively record what is happening in the scenario. The researcher's goal is to capture the experience lived by the participants and to describe the community of which they form a part." (Morse & Field, 1995) In addition, the researcher shall record any impact that his or her presence has on the scenario. (Bogdewic, 1992) (Morse & Field, 1995) The field notes shall describe the researcher's reflections, feelings, ideas, moments of confusion, hunches and interpretations, etc. about what he or she is observing. The action of recording observations may help the researcher at the

moment in which he or she tries to make sense of the data. Field notes provide an opportunity to clarify one's own thoughts and to plan the next step in the observation process. (Jorgensen, 1989)

To ensure that all of the observations are recorded, the researcher should: (Bogdewic, 1992) (Morse & Field, 1995)

- Take notes as soon as possible after the observation
- Plan sufficient time for the recording

Since the permanent record should be as literal as possible, direct quotes from people are preferable to general observation. If the researcher does not remember the exact words, then the closest approximation should be recorded (Bogdewic, 1992) (Morse & Field, 1995) (Patton, 1990) in (Mayan, 2001).

Analysis of the Information Obtained

Data Grouping

The first stage of the analytical cycle consists of compiling all the evidence (field notes and other material and evidence) in an orderly manner (Yin R. K., 2011). This set of data can be called unprocessed data or a database.

Now the qualitative data can be joined with other types of data that have been collected, including for example, field diaries, statistics or other qualitative or quantitative data; the researcher must seek contradictions amongst the data. If two pieces of data tell different stories, then the data must be researched further. For example, biological data may indicate that there are high levels of viruses in native potatoes and that they must be cleaned, while an analysis of the content may indicate that farmers think that the yield and quality of native potatoes is excellent. The researcher has the responsibility of studying this contradiction later (Mayan, 2001).

Data Disaggregation

Once the data has been properly organized, it is ready to be broken down in specific ways. The most important decision when disaggregating the data is to decide if it will be codified or not. In the majority of qualitative investigations, the original text is a set of field notes, and so, its organized database will consist of specific points, such as events and field actions, objects and specific opinions, explanations and other points of view expressed by interviewees in the field. Associated with these points one will find well-contextualized details, such as the hour of the day, the place, and the people involved. Each point will therefore be unique.

The purpose of trying to codify these points consists of beginning to advance methodologically towards a slightly higher conceptual level. One should not ignore the singularity of the original field actions, but one assigns the same code to the points that appear to be essentially similar. This higher conceptual level allows one to order the points coming from different recordings in diverse forms, such as in similar

or distinct groups, at a later point. Once ordered, it will be possible to examine the similar characteristics of said groups and obtain a better comprehension of them (Yin R. K., 2011).

Codification can be defined as "The process of identifying words, phrases, topics or concepts within the data in such a manner that the underlying patterns can be identified or analyzed." (Morse & Field, 1995) Codification is not the process of assigning labels or categorizing the data. By means of codification, the researcher simply familiarizes him or herself with the data and begins to organize the information.

Upon initiating the codification, the research reads through all of the data, reads it again, underlines sections of the text and makes comments in the margin observing everything that stands out. These comments can include general impressions, points of interest, plans to work with the data, etc. For example, in order to continue with the barter example, the researcher can note the diverse ways in which farmers describe the process. There are programs that assist in the codification of texts.

The majority of qualitative data is analyzed for its content. The content analysis can be divided in two different types: manifest and latent. (Agar, 1999) In the analysis of manifest contest, the researcher looks for specific words or expressed ideas, which are registered and used to generate statistics regarding the content of the data. For example, if the researcher is interested in studying the importance of barter in a community, he or she can count the number of times that the people use the word "barter." This record is very reliable – it is easy to review the text and count the number of times that the word appears. However, the validity is low and lacks significance for the researcher since the context of the words is not taken into account. (Morse & Field, 1995).

The analysis of latent content is the process of identifying, codifying and categorizing primary patterns in the data (Patton, 1990). In the analysis of latent content, the research looks for the significance of specific passages in the context of all of the data. Upon using the analysis of latent content, the researcher will examine the significance of specific passages or paragraphs within the data and will determine an appropriate category. For example, before simply telling about the occurrence of the barter, the investigator will codify the type of barter and the context of the same. What is being bartered? Amongst whom? Latent analysis has more validity than manifest analysis since it permits the codification of the intentions of the participants and not just the words (Morse & Field, 1995) as cited in (Mayan, 2001).

One can also break down the data without codifying it. The process can be more discretionary and less routine, but in the hands of an experienced investigator it has the potential advantage of being a better process since the codification routines can produce their own distractions – for example, having to deal with the mechanics of the codification process instead of dedicating efforts to reflecting on the data. When the data is not codified, its breakdown process will probably imply identifying texts from the original database and creating a new set of notes that have their own significant meaning (not methodological). In these new significant notes, the researcher will take notes basically from original data, but these new notes will cover the data in some distinct order or using different ideas or concepts. (Yin R. K., 2011).

Regrouping of Data

During the data breakdown phase (i.e. when it has been codified and organized or when one reviews one's own new significant notes if it has not been formally codified), one can discover potentially broader patterns in the data. The meticulous nature of the breakdown process should not have impeded the researcher from reflecting on the broader significance of the data – for example, how it could inform the original study questions or reveal new and interesting perceptions about the topic of the original study. Noting said patterns is the beginning of the next step in the analysis cycle: the regrouping of data (Yin R. K., 2011).

In the case of codified data, the researcher can cut out the underlined sections of the text (either literally with scissors or in a computer program) and group them in categories, in separate files or folders. In order to include all of the data in a way that is significant and manageable, the number of categories should be no greater than ten to fifteen. Sometimes the same piece of data can fit in various categories. When this happens, the researcher makes a cross reference of this data in the other category or makes a copy of the data and places it in both files.

Once the data has been categorized, the researcher takes each file and reads through the clippings. Sub-categories are created if they emerge and are clear. A tree diagram should be drawn to illustrate the relationships between categories and sub-categories. (Mayan, 2001). In the case that the researcher does not codify the data, one can develop a process for finding patterns or similar categorizations, probably in a manner that is more conceptual than literal – based on the new set of significant notes taken during the breakdown phase (Yin R. K., 2011).

Negative cases often come up; this refers to cases that differ from those that the sample, in the majority, is saying. For example, one farmer may not mention barter and may say, on the contrary, that he has no exchange relationship with his neighbors or other communities. When a negative case appears, the research must seek out similar cases. If no other similar case is found, the initial case is considered, in consequence, an anomaly. If similar cases are found, they are codified and a new category emerges and is added to the tree diagram.

All the data must be considered and represented. Once the researcher is satisfied that the categories represent the cases, a summary is written for each category and sub-category.

The categories are then judged based on two criteria: internal and external homogeneity. The first refers to individual categories. Does the category reflect all of the data and does all of the data fit perfectly in the category? Does the category make sense? In the prior example, the researcher would want to respond to the following questions: Do all of the underlined sections of text in that file refer to communal work for communal benefit? External homogeneity refers to the relationships between categories. Are they all distinct and can they be distinguished amongst themselves? The differences between categories should be solid and clear.

At this point in the process, the categories should have various qualities:

- All parts of the data are included. The unique data (negative cases) has been investigated. In the last example, the farmer does not use barter because he is not part of the community; he is an immigrant.
- The categories make sense and give an impression of including all of the data.
- The categories are labeled using the same language as the data.
- The categories should make sense to others. The researcher should check them with his or her colleagues and/or informants. Although another researcher or framer may not reach the same categories, the way in which they were constructed and the reason for creating them should be clear.
- The categories should have internal validity. They should be credible for the person or the people who provided the information. The researcher should reread the data thinking about these categories. Do the categories illustrate each part of the data?

Upon integrating the categories, the research returns to the level of the "big picture" when considering the data and finding topics. The researcher should answer some questions:

- How are the categories related?
- What basic patterns are recurring in the data?
- What conclusions can be drawn?

The objective is to move towards a higher level of analysis by discovering the relationship between the categories and finding common themes or patterns in the data (Mayan, 2001).

In summary, it is possible to increase the precision and solidity of one's work by paying special attention to the manner in which one judges and categorizes the similar and distinct points, in negative or contrary cases and rival thoughts – for example, looking for alternative explanations to one's initial observations.

A successful regrouping implies observing the broader themes or the outline of their complete analysis. If said topics have not emerged, additional iterations should be performed between the breakdown and regrouping phases.

Interpretation

Interpretation can be considered the art of giving one's own meaning to regrouped data. A good interpretation may include the following attributes:

- Completeness (Does the interpretation have a beginning, a middle and an end?)
- Impartiality (Given its interpretive posture, would others with the same posture reach the same interpretation?)
- Empirical precision (Does the interpretation fairly represent its data?)

- Value added (Is the interpretation new? Or is it mainly a repetition of the literature on its topics?)
- Credibility (Independent of its creativity would the most noteworthy colleagues in one's field critique or accept the interpretation?

Some possible modes of interpretation are:

- Description: producing a good description is not easy. Creating a mundane description that wanders everywhere with no apparent purpose is one of the potential traps of qualitative analysis.
- Description plus a call to action: when a study also intends to promote some further action. For example, researching the action openly involves the researcher and the participants in a collaborative effort from the beginning of the study.
- Explanation: Explanations can always occur as part of a descriptive interpretation. The difference here lies in that the complete interpretation is dedicated to explaining how and why the events occurred, or alternatively, how or why people could follow certain courses of action.
- Participatory: how the data is interpretated depends on their perspective, thus it is often important to include as many stakeholders and beneficiaries as possible in the interpretation to both improve the process and ensure that they are aware of and benefit from the research.

Conclusions

Convincing conclusions lend unity to the rest of a study. If one's study has not achieved this type of result, perhaps one must recreate one's interpretation so that it provides a firmer guide towards an anticipated conclusion.

A conclusion is a global declaration or series of declarations that raise the findings of a study to a higher conceptual level or toward a broader set of ideas. The spirit of a conclusion lies in concepts such as "lessons learned" and "research implications." The discretion freedom topic of this section allows one to make inferences based on the overall research. One does not want conclusions that only reformulate the findings saying them in a different way (Yin R. K., 2011).

One way of structuring the conclusions is to list the hypothesis, the evidence that corresponds to them and then construct the final message. The point is to both present evidence and explain why that evidence is important.

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