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INTERNATIONAL CONFERENCE

ON

RAPID RURAL APPRAISAL

Khon Kaen University

Rural Systems Research and Farming Systems Research Projects

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PART I SUMMARY REPORT

SUMMARY REPORT

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INTRODUCTION

In the late 1970's a good deal of enthusiasm was generated for the use of Rapid Rural Appraisal (RRA), an emerging new methodology which seemed to hold much promise for improving the cost-effectiveness, timeliness and quality of rural development-related research. A workshop and conference on RRA were held at the Institute of Development Studies, University of Sussex in 1978 and 1979. Papers and articles began to be circulated (e.g., Chambers 1979, 1980; Collinson 1981; Hildebrand 1979, 1981; Honadle 1979, 1982; Rhoades 1980, 1982 — see 'Bibliography on Rapid Rural Appraisal'). By the mid-1980's, experience had increased considerably through various applications by a growing number of adherents, scattered throughout the world. Lessons had been learned and methodology was gradually developed and refined. While RRA practitioners continued to find that the flexibility, insights and rapidity of RRA made it attractive and useful, there was increasing interest in methodological concerns, specifically, interest in determining what made good RRA, what the range and limits of methodology were, and what circumstances affected its successful application. Such concerns could only be addressed through a pooling of experience, thus the time seemed right for an international conference of RRA practitioners to draw lessons from the experience that had taken place and to begin a process of setting these down. This conference would aim to identify emerging principles, methodological and conceptual frameworks, processes, guidelines, tools and techniques; to compare and contrast them; to discuss their advantages and disadvantages under various conditions; and then to make detailed findings widely available. At the operational level, it was already clear that RRA was never the same in every circumstance, thus an underlying intention would be to begin stocking a 'supermarket' of RRA lessons, tools and techniques useful to current and future RRA practitioners.

The International Conference on Rapid Rural Appraisal was held in Khon Kaen, Thailand, during the period September 2-5, 1985. It was hosted by Khon Kaen University, with funding from the Ford Foundation. The conference brought together over seventy participants from Indonesia, Malaysia, the Philippines, Singapore, Thailand, Bangladesh, Pakistan, Peru, Australia, the United Kingdom, Papua New Guinea, Canada and the United States. One third of the participants were experienced RRA practitioners who served as resource persons during the conference with the remainder composed of persons who were interested in learning about the methodology but with little or no actual experience in RRA.

Activities at the four-day conference included fifteen presentations, four panel discussions, and many small-group discussion sessions in which everyone participated. Presentations and discussions spanned four major areas of concern:

(1) The need for RRA, its evolution and underlying concepts;
(2) The range of RRA methodology — important methods, tools and techniques;
(3) Contexts, issues and types of application; and
(4) Assessment of methods and contexts to set out guidelines for RRA methodological development and training needs.

All participants were provided opportunities to ask questions and to raise issues for clarification and discussion. Participants were seated around eight tables during the conference. Seating at each table was arranged so that disciplinary background, country representation, and RRA experience were mixed. Discussion among the members of each table group followed each presentation. To initiate each discussion, the individual participants at each table were asked to note what they considered the most important issues in the presentation. Differences of opinion as well as points of agreement then provided the basis for the discussion. Following table discussions, group rapporteurs shared principal discussion points with all conference participants verbally and by use of transparencies and photocopied materials. Some of the issues and questions raised were addressed by individuals while others were considered by small working groups. On the afternoon of the third day, five field trips, led by Khon Kaen University RRA researchers knowledgeable on pre-identified topics, were conducted simultaneously in five villages. The conference concluded with a plenary session on 'Reflections, Realities and Frontiers' of Rapid Rural Appraisal.

Although the major areas of concern provided an overall organizational framework, much of the conference's day-to-day activity was organized in an iterative, developmental manner, rather than in a more conventional predetermined format. This organizational process was made possible by the participation of a specialist in innovative management techniques (Dr. Merlyn Kettering of the Development Program Management Center, U.S. Department of Agriculture).

In the remainder of this summary report we provide an overview of the discussions and findings of the conference. To do so, we have relied upon the papers presented, our own notes, the notes of the discussion group rapporteurs, and audio and video recordings of the entire conference. It should be kept in mind, however, that in attempting to report on and synthesize these materials, it is not possible to cover all topics or all expressed points of view. The diverse backgrounds, experience and expertise of the seventy-plus participants resulted in wide-ranging, free-wheeling, and sometimes 'spirited' discussions that not always ended in total agreement. The diversity, excitement, and value of these discussions are also difficult to capture in a written essay which necessarily imposes structure and requires selectivity.

In presenting what we believe to be the more salient points of RRA and ideas about it from the conference, we have further decided against trying to attribute particular ideas and points of view to particular participants. In many cases, it was not possible to trace an expressed idea back to its original source, even with

videotapes. In other cases, points of view emerged as a consequence of constructive discussions and interactions between several and sometimes many participants during informal gatherings and of our own later reflections. In many sections of this overview, however, major ideas have been borrowed from the presentation of papers, and in these cases the papers are cited. Much of what is included here came from the rapporteurs, the commentators and discussants in the final session of the conference, and even more so, from the combined efforts of all the participants. Thus, we claim no originality in this summary report. At the same time, however, we accept full responsibility for any errors or misinterpretations contained herein.

THE EMERGENCE OF RRA

The difficulty of obtaining accurate information when decisions must be made in a limited period of time is a familiar problem encountered by those working in rural development. Over the years, many development projects have been implemented before information about the area, the issues and the implications was adequately obtained and understood. Thus, it is not surprising that many projects started with the best intentions nevertheless failed, or were not accepted by the people they were intended to help. In part this occurred due to preoccupation with lengthy research methods that were too complex and inflexible, or that attempted to achieve unrealistic and unneeded levels of precision. Information that was attained more quickly by development professionals, however, suffered from a number of biases (see paper by Chambers). Examples of such biases include primarily visiting research sites that were close to urban centers, talking only to village elites, going only where projects were accepted, and travelling only where roads were good or only making visits during more favorable seasons. Frequently, there has also been a bias among many professionals in believing that, because of limited formal education, rural dwellers possessed little or no information useful for development purposes. Thus, better as well as more timely information was needed and it became crucial that methods be developed that could provide accurate information, at appropriate levels of precision, in a timely manner.

These considerations played an important role in the emergence of RRA. As an emerging methodology, many questions have been raised about RRA, ranging from questions about its definition, conceptual basis, core principles, and legitimacy, to questions about how and in what circumstances it can be applied and in what manner RRA training should be conducted. One of the first questions that is often asked about RRA is whether it is a methodology with a distinct conceptual approach or just a collection of tools and techniques. Certainly it relies upon a large and growing collection of tools and techniques, many of which are not new but were instead adopted from many different fields, such as anthropology, geography, psychology and journalism. However, the ways in which these are employed and the rationale for so employing them substantially differ from more conventional forms of rural development research. The methodology is becoming systematized and, for the first time, is beginning to challenge many conventional research methods in effectiveness.

RRA is essentially a process of learning about rural conditions in an intensive,

iterative and expeditious manner. It characteristically relies on small multidisciplinary teams that employ a range of methods, tools and techniques specifically selected to enhance understanding of rural conditions, with particular emphasis on tapping the knowledge of local inhabitants and combining that knowledge with modern scientific expertise. Many RRA tools and techniques were adopted to achieve increased accuracy at low cost, in terms of time and money. But RRA is characterized by accelerated learning, not just overall speed: rapid rounds of field interaction that result in the accumulation of increasingly accurate knowledge. This highly 'iterative' process reduces error in that acquired knowledge is continually subjected to testing and reconfirmation, for example, through direct observation and on-site 'probing' in semi-structured interviews, to check, revise, re-check and refine information. RRA's reliance on small, intensively engaged interdisciplinary teams allows the exploration of subjects which do not fit neatly within disciplinary boundaries. Flexibility is another crucial aspect of RRA process, given the speed at which knowledge is being discovered and refined. Practitioners must creatively adapt the methods of RRA, not only in planning specific appraisals, but throughout the process of conducting them. Taken together, RRA's many aspects combine in a learning approach which is uncharacteristic of other research methods, and which shortens the chain and process of research analysis.

Another question that is often raised concerns the reliability of information acquired through RRA. Many people feel that rapid studies are automatically less reliable than conventional research. They argue that although conventional research usually requires a much longer period of time than RRA to arrive at even a first approximation, the obtained results are always closer to reality. This is an arguable point, perhaps, but the iterative nature and multidisciplinary perspective of RRA allow even a new team to gather momentum quickly. First approximations of reality may be somewhat crude, depending upon the skills and experience of the RRA team, but substantial refinement soon takes place. Experienced RRA practitioners normally start with a higher level of approximation, but, even for a new team, there seems to be something built into the nature of the process that allows them to learn, to increase the rate at which they learn, and to surpass those who are learning through more conventional techniques. RRA practitioners seem to agree on this point, although differences of opinion exist about the degree to which RRA accelerates learning, and exactly how and why this occurs.

RRA has important potential for helping to reorient development planners and practitioners. Professional reorientation is usually threatening at a personal level and opposition to RRA has sometimes arisen because people felt they were expected to do something they were not trained to do and were unsure about how to proceed. For example, some agricultural scientists may feel awkward in conducting an RRA in the field because they are used to teaching and prescribing, rather than directly learning from and discovering with farmers. Experience in the practice of RRA helps to overcome these feelings of awkwardness and its role as a training and reorientation process may be as important as its role as a cost-effective research methodology. This and other aspects can be better understood by examining how the emergence of RRA is related to a paradigm shift, or changing view, concerning rural development.

RRA AND THE NEW DEVELOPMENT PARADIGM

The context in which RRA has emerged can be examined in terms of some very basic issues about the nature of development in the modern era. To a large extent, rapid rural appraisal represents not only a new research methodology but also a different understanding of development. The paper and presentation by Jamieson dealt with this subject, and it is worthwhile summarizing some of his major points here, in that they offer an important and comprehensive way of further understanding the emergence of RRA.

The new view of development may be thought of as an emerging 'paradigm' in the sense that it is an evolving, yet still distinctive, set of shared ideas about the nature of rural problems and approaches to their solution. In this paradigm, the world is seen as composed of a highly interactive set of variables, rapidly changing and subject to a high degree of uncertainty. Communication and cooperation between rural dwellers and development practitioners are seen as essential for understanding rural problems and issues, for monitoring trends and changes, for reducing the degree of uncertainty, and for proposing viable solutions. Strategies which allow more direct and more intensive dialogue between principal researchers/planners and rural inhabitants are favored over more conventional research methods such as socio-economic surveys.

The new paradigm has emerged primarily as a result of the past dissatisfaction encountered by professionals in their efforts toward rural development. Results of development activities have generally not been what was hoped and expected forty years ago. At a basic level, this seems to have occurred because of an implicit paradigm which development professionals accepted. They assumed the world to be an orderly place subject to a great deal of control and manipulation. This led to the belief that problems and causes could be readily identified and straightforward remedies could be developed and implemented with predictable and successful outcomes. And yet, the collective experience of development has shown time and time again that the world is neither as orderly nor as subject to control and manipulation as had been assumed (and hoped).

In the past forty years, development has been an extremely powerful force in modern life. During this same period, however, a number of ideas and ways to look at the world have also emerged and taking account of them is important. In particular, there have been three basic ideas or sets of ideas that should have much more influence on development thinking. The first set of ideas conceives of both evolution and development as 'adaptive change' rather than as 'progress,' i.e., evolution and development are viewed as processes of change driven by the need to solve problems in existing systems (adaptive change) rather than as a series of inventions and discoveries whereby older and intrinsically inferior systems are steadily replaced in a linear fashion by newer and intrinsically better systems (progress). History and experience indicate that solutions to one problem almost invariably sow the seeds of another set of problems. It is thus more useful to perceive development as constant adaptation and readaptation, a balancing process as things move along. As a consequence, there is a constant need to monitor the environment for new problems that are emerging and to take additional corrective actions.

The second major set of ideas is that of cybernetics, a set of ideas about the dependency of any system on the flow of information, especially information about differences between the ideal and the actual and between the intended outcome of an action and what actually happens. A well designed feedback system permits an organism, an organization, or a society to learn as it goes along. Rural development is in some ways analogous to driving an automobile in that the higher the speed and the more unfamiliar the road, the more danger there is, with factors such as visibility affecting the amount of information received, the speed it is received, and whether it is received in time to react to new conditions and possible hazards. There is a need to think of development programs not only in terms of obtaining a steady flow of reliable information but also in terms of building into the programs and into the thinking of researchers the capacity to react to new information in a timely manner.

The third set of ideas deals with cognitive models and with the nature of perception itself. These ideas recognize that different groups of people have different models for comprehending, organizing and interpreting what they perceive as reality. That people see and know different things does not imply one being right or another being wrong. All bodies of knowledge are derived through such models; they are all therefore necessarily incomplete and imperfect because they are derived in a very selective and, inevitably, in a very subjective way. Thus, rural peoples and development researchers often perceive and understand rural environments in ways that are very different, but equally important. That the perception and understanding of the former group are traditional while the latter group's are scientifically sophisticated does not make the latter better. In some ways, in fact, rural knowledge may be seen as superior in that it is often the result of generations of direct experience in dealing with particular rural situations. It is therefore encumbent upon development professionals to learn as much indigenous knowledge as possible.

Taken together, the cluster of these three sets of ideas contributes much to a development paradigm that sees the world as a place characterized by a fair amount of uncertainty, relativity, interconnectiveness, and change. It stresses the need for technology that can be adapted to solve local problems and the importance of constant feedback from existing rural situations, and it allows the development process to take advantage of a larger knowledge base.

Rural societies throughout the world are currently experiencing a high and accelerating rate of change and the rate of change in many countries has been dramatic. From that fact alone, there is reason to believe that conventional ways of researching rural issues and conducting rural development should be assessed and probably changed because information quickly becomes out of date. Information is not the only thing that becomes dated, however. So do people's training, skills, and, indeed, their understanding. Many academicians, for example, by the time they become influential are usually ten to twenty years out of date in substantial ways. High-level government administrators suffer the same problem. In light of the rapid change taking place in the world, the ability to keep up with knowledge becomes crucial.

Rapid Rural Appraisal has much to offer in this regard. It has the potential for

establishing a direct learning experience for those in senior positions to go out and learn in face-to-face situations, explicitly trying to learn rather than to teach or prescribe. RRA allows learning to take place not only between researchers and farmers but also among researchers and between farmers and farmers. This is crucially important in improving the speed and quality of feedback and learning in universities and other teaching and training institutes and in government.

An important and related aspect of RRA concerns the relationship between RRA and the attitudes and values of its practitioners. When done correctly, RRA works, not just because of the power of its tools and techniques, but because of the underlying worldview and values of the people who practice it. While basic elements of that worldview have been identified, values are somewhat more difficult to discuss because there are different kinds of values, for example, epistemological values, disciplinary values, programmatic values, personal values, and so on. As we attempt to understand and improve the world, a world we perceive to be characterized by rapid change, relativity, uncertainty, and unpredictability, more explicit recognition of these values is important. Humility and sensitivity are two such values, as are cooperation and equity. The importance we attach to rapid iterative learning and feedback represents another value.

It seems probable that RRA does change in desirable ways the worldview and values of those who practice it, although it is admittedly difficult to sort out the extent to which this actually takes place and the extent to which there is a selection process in which certain people are drawn to or selected for involvement in RRA. There are several reasons why this seems to take place, but perhaps the two most important reasons are that researchers are brought into direct interaction with rural villagers in an intensive and iterative learning experience about the nature of rural life, and that they are forced to operate, and ultimately to think, as members of interdisciplinary teams in which their particular expertise is not preeminent, but is instead only one of a number of contributing elements.

THE CORE PRINCIPLES OF RRA

Although RRA is still evolving as a research methodology, experience suggests that certain principles account for the strength and potential of this research mode. While not all RRA practitioners employ the same rules and procedures, the following seems to provide a basic set of equally important underlying core principles.

Triangulation

At a very basic level, RRA can be seen as a methodology that consciously combines things, or that approaches information from several intentionally different points of view (usually a minimum of three, hence 'triangulation'). There are several reasons for this. RRA stresses researcher intensity, interaction and progressive learning. Research is compressed in time and respondent 'sampling' is normally less than that required for statistical confidence. Often there is no one best way

to obtain information or the 'best' way cannot be foreseen in advance. Triangulation is therefore adopted as a principle in RRA research process in order to improve accuracy.

Triangulation normally involves conscious, non-random selection in a number of different dimensions. For most rapid rural appraisals, at least three major dimensions should be triangulated: (1) team composition; (2) units of observation; and (3) research methods. Triangulation of team composition involves having team members with the ability to approach the same piece of information or the same question from different perspectives. This is normally accomplished by a proper mix of disciplinary background/training of the members. Triangulating the units of observation is similar to stratifying a sample to improve the understanding of variation. In examining rural fuelwood usage, for example, villages might be consciously chosen based on their distances from the nearest forest and households in each village selected for interviewing based on household composition and size of land holdings. The idea is to arrive at the information from several different angles, as viewed and felt by different people. Triangulation of methods, tools and techniques is used to improve the quality of information and to crosscheck it. Interviewing of key informants and individual respondents might be used in combination with secondary data and direct measurement, for example, and semi-structured interviewing of individual respondents might be combined with the use of field diagrams and direct observation. Combinations are chosen for their ability to get at needed information, and for their degree of mutual independence.

Exploratory and Highly Iterative Research

Although hypothesis formulation and testing form the heart of research, RRA researchers must be ready to abandon old hypotheses and to form and explore new ones when evidence indicates the need to do so. The sooner inappropriate hypotheses can be abandoned or reformulated based on new information, the faster one learns. RRA process is designed to be highly iterative so that this can take place. For example, semi-structured interviewing is normally one of the principal methods used because it enables researchers to rapidly change questions, interviews and directions as new information appears. One of the major purposes of any study is to look for patterns and opportunities for generalization, but RRA researchers must particularly be on the lookout for the unexpected. Methods such as the use of indicators and direct observation are thus important because they often provide clues and good leads to new sets of questions and new hypotheses.

Rapid and Progressive Learning

The exploratory and iterative nature of RRA allows a process of rapid and progressive learning to take place and explicit emphasis is placed on RRA as a progressive learning process. RRA is not designed to produce the last word on particular resource issues or a quick, final solution to general development problems. The conduct of an RRA frequently results in as many new questions as

answers. Nevertheless, the new questions and new insights usually allow researchers to move more directly toward an understanding of real problems and their solutions. The dialogue between and the proximity of researchers and farmers who are the major source of information as well as the rate at which new information is being accumulated also seem to work against researchers becoming overly attached to particular hypotheses or ideas. Rapid learning also means that delays and distractions in the course of RRA work must be minimized (see 'Major Categories of RRA Activities,' below). RRA's emphasis on rapid and progressive learning is one of the most distinguishing traits of the methodology. This contrasts sharply with survey research and its predesigned and fixed questionnaires where there is a general absence of progressive learning during the majority of field activities.

Substantial Use of Indigenous Knowledge

Rapid rural appraisal is carried out as close to the source as possible. Farmers' perceptions and understanding of resource situations and problems are important to learn and comprehend because solutions must be viable and acceptable in the local context and because local inhabitants possess extensive knowledge about their resource settings. In many instances, RRA researchers have also discovered that farmers are capable not only of devising viable solutions to local problems based on their own understanding, but also of conducting relatively sophisticated field experiments in response to local constraints and opportunities. Many activities we now associate with innovative rural development, such as agroforestry to insure a continuous supply of fuelwood and food, and integrated paddy management to strike an optimal balance among rice, fish, shellfish, wild vegetables, insects and even small game, have in fact been practiced by some indigenous groups for many generations. For the above reasons, an understanding of indigenous knowledge and practices is extremely valuable for viable and appropriate rural development, and many of the methods, tools and techniques of RRA have been selected for their abilities to elicit, evaluate, understand, and avoid misunderstanding indigenous knowledge.

Interdisciplinary Approach and Teamwork

In RRA, an interdisciplinary approach is always deemed important, no matter what the subject of the study. The rural context of practicing farmers is complex. They have to deal not only with crops and crop conditions but also with many other variables that together comprise the total rural system. Given the overall complexity of local systems, it is seldom possible for a professional specializing in any single discipline to adequately understand all of the factors with which the farmer must contend or to provide recommendations for improvement that are entirely appropriate and viable within the local context. A small team of researchers representing different disciplines is normally used in RRA to obtain the range of expertise needed to better understand rural situations. But the need for teamwork and close interaction is also seen as essential due to the nature of the RRA process.

During RRA, researchers are exposed to a tremendous amount of new information, which different people process in different ways. Team members acquire valuable additional learning from each other when they interact closely in the field, especially if they come from different backgrounds. Methods and techniques are employed that facilitate this (e.g., conducting interviews as a team with everyone participating and taking notes, and frequent team meetings to compare notes and perceptions).

Flexibility and Use of Conscious Judgment

Although careful planning, preparation and organization are prerequisites for successful research of any type, an important principle in RRA is not just to 'plan the work,' but also to 'work the plan' in a flexible manner that allows for creativity and modification where appropriate. Whenever necessary and possible, the RRA team must be prepared to revise their time schedules and travel and interviewing plans in the same manner that they are prepared to revise hypotheses. Sometimes, the additional information to be gained by spending more time in one village may not be worth foregoing the opportunity to interview in an additional village. Extending or reducing the time on each trip may also be necessary in particular cases to achieve maximum efficiency. Flexibility here also includes the ability to choose, alter, or combine methodological options, tools and techniques or even to invent new tools as the RRA progresses.

To benefit from flexibility, the RRA team relies upon evaluation and conscious judgment to make effective and appropriate decisions. Two of the most important and basic types of decisions the team has to make, at the start of and during the course of an RRA, are what types of information are needed and what degrees of precision are required or possible (see 'appropriate imprecision' and 'optimal ignorance' in paper by Chambers). In making these decisions, the team must take into account the purpose of the RRA, the nature of the subject matter, hypotheses and data, and the time, cost, and other constraints involved. Frequent meetings among team members for explicit assessment through the use of conscious judgment and critical evaluation of RRA plans and progress are thus essential.

The principles described above provide the basis for a research process that is distinctive from other types of research. In other research methodologies there is a tendency to generate theories and hypotheses that are based on, and to investigate aspects of, the perceived realities of individual scientific disciplines, although elements of 'holistic' or 'systems' theories/models are now being added. Theories and hypotheses may be relatively broad or specific, but the techniques employed usually emphasize the degree of confidence or precision/reliability of the data collected and used for the testing of hypotheses. As a consequence, the time required for a given cycle (iteration) of the methodology is often relatively long.

In contrast, RRA emphasizes rapid and frequent iterations of the methodological cycle. As a result, more frequent 'reality checks' on the growing body of knowledge occur and the overall learning process is accelerated. This also limits the techniques which can be employed to those that can be conducted more rapidly. Hypotheses that cannot be adequately tested by such techniques are discussed and

noted, for follow-up by other research means. (For additional information, see 'Applications of RRA,' below, especially subsections on 'Supplementing, Complementing and Improving Other Methodologies,' and 'When and When Not to Use RRA.')

RRA engages multidisciplinary team researchers in intensive interaction, both among themselves and with informants/respondents from outside the research community. This interactive context enables all parties to participate in synthesizing and refining knowledge and in socially constructing a new reality. In the process, the knowledge and the perceived realities of all participants are altered, usually in a direction which increases consensus. Relevance and validity are evaluated in the short term through the repeated iterations of the RRA process and in the long term by the effectiveness of actions based on the knowledge and perceptions generated or altered by the RRA.

THE METHODOLOGICAL RANGE OF RRA

People engaged in rural development constantly see a need for new, or at least improved, methodologies to increase the quality and effectiveness of their work because existing methods are often found to be unsatisfactory or inappropriate. It was in relation to such a need for new perspectives, levels of understanding, and ways of acquiring information that RRA emerged. The development of RRA, however, is far from complete. Many elements of the methodology require further development and refinement and new elements will be added as research progresses. Assuming that RRA will continue to be a viable methodology for learning about rural conditions, it should also be envisioned that the methodology will evolve as rural development efforts continue worldwide and as rural conditions change.

Many of the papers presented at the conference contain details on the activities, methods, tools and techniques of RRA (e.g., papers by Beebe, Chambers, Conway, Grandstaff and Grandstaff, Limpinuntana, Rhoades, and Samart). It is difficult to adequately describe this wide range in summary form. In fact, many RRA practitioners feel that it is difficult to convey the details of RRA in anything other than extended field sessions. Nevertheless, a summarization here is important, in order to illustrate the nature of the many concrete and detailed actions that take place in RRA. Perhaps this can best be done by describing, first, some broad categories of activities that usually take place, and second, the types of methods, tools and techniques that have been most commonly employed.

Major Categories of RRA Activities

Based on RRA experience thus far, it is possible to describe RRA activities in three broad categories which may also be seen as roughly representing stages or phases in RRA work: (1) activities of a preparatory or initiating nature at the start of the RRA; (2) activities that take place during field visits; and (3) activities necessary to the completion of an RRA study. Some of the activities described in

these categories are more characteristic of RRAs conducted by professional researchers than of those done by field personnel in 'action' agencies, but, as will be discussed later, these two are related.

Preparatory Work

Before fieldwork is begun, activities normally include selection of a multidisciplinary team appropriate for the research topic, collection and team examination of all available relevant background information (published and unpublished reports, maps, aerial photographs, environmental and social data, etc.), and team discussion of the research topic and background information aimed at developing preliminary hypotheses, specifying interviewing topics and subtopics, and initial selection of methods, tools and techniques for the research. Preparation also usually includes consultation with persons having knowledge of the topic or the geographic area. Preliminary field visits may be undertaken. The team must also discuss and plan sites, logistics and protocols for fieldwork.

Field Visits

Central to RRA work is an intense period of day-to-day fieldwork in the rural area. Depending on the purpose, the main field study can consist of a single visit or multiple visits to a particular village or visits to a number of different villages. Most of the tools and techniques used in the RRA are employed during this period (see 'Methods, Tools and Techniques,' below). Fieldwork always involves various consciously chosen forms of researcher-villager interaction, including but not limited to extensive semi-structured interviewing. Use of observation, visits to areas outside residential places, and frequent team meetings also normally occur during this period. For best results, work unconnected to the RRA, or any other distractions, should not be allowed to intrude during the main period of fieldwork.

The full benefit of concentration, focus and interaction can seldom be achieved in RRA without at least one extended fieldwork period of this nature. The period should be long enough to achieve this purpose, but not so long that it wears the team out and has the opposite effect. Several conference participants suggested four to ten days as a guideline. Most of the learning the team undergoes will take place during this period. An RRA would normally include one major field study period, but more complex RRAs may require several such periods. In addition, if time and distance permit, shorter field visits are often made prior to the main fieldwork (to test tools, better develop subtopics, etc.), and sometimes after the main fieldwork as well (usually to follow up on key pieces of missing information).

Completing the RRA

Throughout the course of the RRA, team members should participate in discussion and analysis which are aimed at reaching consensus on what has been learned and what is still unclear. After any major period of field study, the RRA

team should meet to refine and consolidate field notes. It is important that this takes place immediately following fieldwork as any delay normally results in a loss of valuable information and insight.

When the above activities have been completed, the results of the RRA should be formalized and recorded. This normally consists of preparing a written report which may be supplemented by audio-visual materials as appropriate. The report can be written either jointly by the team or by one individual in consultation with the other team members. It should contain not only the results of the study but also a brief discussion of how the study was conducted and what methods and procedures were employed. In many RRAs, especially those related to 'action' programs and projects, formal recommendations will also be included. Copies of the report, or a summary based on it, should then be distributed to all interested agencies, offices, and individuals. Publication of the research findings to insure a wider audience should also be considered where appropriate.

Despite formalization of the study's findings it is important to remember that RRA is part of a larger learning process and learning should not stop when the report is written. RRA studies often serve as guidelines for future research, and their findings should be updated in line with new information.

The entire RRA sequence, from preparation to completion, should be characterized by timeliness. Although activities should never be done hastily, because this will strongly reduce the quality of the findings, it is nevertheless important to maintain momentum or quality will also suffer. Moreover, failure to complete the RRA and disseminate results in a timely manner reduces its utility in the larger learning process.

Methods, Tools and Techniques

In actual practice, RRA involves the deliberate selection and combination of a number of research methods, tools and techniques to suit particular research needs. The need to utilize local indigenous knowledge efficiently means that the use of semi-structured interviewing and related techniques will almost always be important. Other methods often include direct observation, use of indicators, use of time-space and logic schematics (see papers by Conway and Limpinuntana), use of maps and, in particular, aerial photographs (see paper by Carson), use of simple direct measuring tools, interview guides, key informants, etc.

An even larger variety of specific tools and techniques has been employed in RRA work, and the collection is steadily growing. A small but representative selection of tools and techniques that have proven useful might include organizational techniques, such as interview protocols, selection of respondents, focus groups, and ways of handling interview introductions, settings and contexts; schematic tools such as the crop calendar, sketch map, cross-section diagram, labor schedule, decision tree, folk taxonomy, and family structure diagram; measurement and recording tools such as a camera, videocamera, tape measure, immersion gauge, scale and rangefinder; interviewing techniques such as probing, the 'six helpers' ('who-what-where-when-why-how'), and non-leading questions; and

observational techniques such as field walks, transects and spending time in central places.

Some of the tools and techniques listed above can be used in most if not all types of RRA studies. Others are much more specific to particular needs (for example, the indicators used to study fuelwood situations – see paper by Subhadhira et al.). In general, however, the tools and techniques are not pre-determined by the methodology, although their selection is affected by the information sought as well as by the type and purpose of the RRA (discussed below). The selection of tools and techniques is consciously considered not only at the start of the RRA, but also during the course of the study. For example, even a technique such as 'probing', which can be used on most if not all RRAs, is not automatically employed in a predetermined fashion. The interviewer must decide whether and when to use it during the course of an interview. RRAs usually seem to combine a number of tools and techniques, more than would normally be expected during a short-duration study. To be most effective, team members should know how to use most, if not all, of the potentially useful tools and techniques in advance.

Effects of Purpose and Type of Information Needed

To examine how RRAs differ depending on their purpose, participants in one working group at the conference identified five general types of Rapid Rural Appraisal: RRAs for 'action,' for general understanding, for methodological development, for training, and for developing community self-awareness (for related information, see 'Applications of RRA,' below). The first type, RRAs for 'action,' is the broadest type and may be subdivided into three sub-types: program conceptualization and planning, site-specific development activities, and technology development, the last including both specific techniques/technologies and institutional arrangements such as tenure. Although many RRAs can be readily classified by specific type and sub-type, others are more difficult to categorize because they have been undertaken with more than one purpose in mind. Many RRAs at Khon Kaen University, for example, have been conducted not only to explore and understand a particular research topic, but also to test and refine specific methods, and to train researchers.

In Table 1, these basic RRA types and sub-types are summarily considered in terms of five important characteristics: 1) Who does it (relative to the 'appraised') and what degree of experience, training, and education do they usually possess? 2) For whom is the RRA done, who is learning? 3) What criteria are used to select a particular site, area, or population for study? 4) What is the source and degree of the multidisciplinary perspective? and 5) What degree of guideline development is possible or needed?

The information presented in Table 1 reveals the considerable diversity which RRAs may exhibit. For example, these studies may involve individuals ranging from highly trained researchers or high-level planners to members of a local rural community. Similarly, the information obtained through RRA can be used for different purposes, from stimulating community self-awareness to improving policy formulation to planning site specific activities. Table 1 shows that the conduct and

Table 1 Typology of Rapid Rural Appraisal

Dominant Purpose / Dominant Characteristics	Action						
	Program Conceptualization, Planning, Monitoring, Reformulation	Site Specific Interventions - Planning - Monitoring - Reformulation	Technology Development (in very broad sense) **	Research Methodology Development	General Understanding (exploratory, topical)	Community Self/Group Awareness (participatory RRA)	Training
Who Does It? Relative to "the Appraised"	Outsider H *	Outsider H/L	Outsider H +	Outsider H +	Outsider H	Community + Outsider H/L Catalyst	Outsider L/H Catalyst/ Learner
Who For? Who Is Learning?	Program Planners, (national, district), Implementing Agencies, Donors	Intervenor (agency, organization)	Tech Devt Institute (intl, nat ag research centers)	Researchers, Universities, Research Centers	Research Institution, University, Organization, Program Planner	Community	Administrators, Educators, Trainees, Students, Volunteers
Criteria/Choice for Particular Site, Area or Population	Representative of the Area or Population for (that) Program	Site of Intervention	Representative of the Area for Application	Relevant to Type and Focus of Methodology, Ease of Access and Existing Knowledge	Representative, Relevant to Understanding Sought	Location of Community	Relevant to Training Purpose, Appropriateness
Source and Extent of RRA's Multidisciplinarity	Team (or 'guidelines' can be used)	Guidelines	Team (or guidelines)	Team	Outside Team H	Community (total community experience with some input from catalyst)	Experience, Training and Local Community (i.e. combined result of all involved)
Degree of Guideline Development Possible or Needed	Low (< H)	High	Low (< H)	Low	Low	H/L	High

* H, L = high or low experience, training or education

** (technology development = technique (seed, tools, etc.) *and* institutional arrangements (tenure, etc.)).

characteristics of an RRA are affected by its particular purpose, and that for some purposes it is necessary to develop more explicit and extensive guidelines in advance. Use of developed guidelines does allow a wider range of participants to become involved, but it also reduces flexibility in the learning process, and the ability to select methods, tools and techniques as needed, during the course of the RRA.

The methodological range of RRA can also be better understood if one considers how the type of information sought affects the choice of methods, tools and techniques. For fairly specific tools (such as the crop calendar) this can be readily seen, but it is also true of some rather general tools and techniques. A working group of conference participants illustrated this by comparing individual and group interviews in terms of the type of information sought and the type of person to be interviewed (Table 2). In this case, different types of information clearly indicate the need for different techniques (individual vs. group) and different types of interviewees.

Methodological Development Needs

Participants at the conference foresaw two major tracks of methodological development for RRA. The first track will be primarily concerned with the development and refinement of RRA as a professional research methodology and the exploration and testing of new applications for it. This work will normally be done by researchers based in universities and research institutions. The second track will involve the adaptation, modification and use of RRA methodology in rural and community development programs and projects by a much larger group of people who are involved in specific development work on a day-to-day basis.

These two tracks should not be viewed as independent, conceptually or in practice. Strong linkages between the two tracks are necessary and important. RRA expertise from universities and research institutions is needed to help develop the specific tools and procedures necessary for widespread use in action programs. Development programs and personnel, in turn, need to make available information not only on the value of particular techniques, but also on their current methodological needs. Substantial feedback between the two tracks will be critical for more widespread usage and further development of RRA methodology.

To date, very little has been written on the methodology of RRA and even less on how it has or might be developed. If the methodology is to develop and improve, however, these subjects deserve more direct and explicit attention. Practitioners must be prepared to record, analyze, and generalize about the methodology as well as its tools and techniques and to share their information and insights with others. Many methodological topics deserve examination, but several seem particularly in need of consideration at this time. Methods for quickly establishing rapport are an important area of concern, especially given the short duration of RRA studies. Practitioners have found that a variety of factors, many of them non-verbal, are involved and it would be extremely useful to have these systematically explored and analyzed. Efficient and effective group interviewing also needs to be examined in greater depth as do procedures for asking and probing specific

Table 2 Comparison of Individual vs. Grcup Interviews in Terms of Types of Interviewees and Information

INDIVIDUAL INTERVIEWS

Type of Informant/Respondent	Information
1. Model farmers, innovators	Appropriate 'advanced' techniques
2. Teachers, educated people	Initial overview, identify key information
3. Government officials	Experience of projects, regulations
4. Village, religious leaders	Political, religious beliefs; community activities
5. Women's leaders	Women's activities
6. Health workers	Nutritional/health status
7. Old people	History, tradition, folklore, experiences
8. Children	Local current knowledge
9. Businessmen	Marketing, processing
10. Research/development assistants	Experience of projects

GROUP INTERVIEWS

Type of Group	Information
A. Special Groups	
1. Village leaders	Community interactions
2. Poor/landless	Poverty issues
3. Gov't agency officials	Agency interactions
4. Model farmers	Exchange of techniques
B. Random Groups	
1. Encounter groups	Serendipitous information
2. Coffee shop groups	Serendipitous information
C. Stratified Groups	
1. Age	Age interactions
2. Landholding/wealth	Wealth/poverty interactions
3. Occupation	Activity linkages
4. Sex	Men/women interaction/activities
5. Whole household	Household relationships
6. Ethnic/religious/political	Interaction of culture/belief
7. Kingroups/exchange labor groups	Kin relationships
8. Immigration	Long established/newcomer interactions

types of questions (e.g., follow-up questions and sets of questions designed to uncover trends). Another related topic that needs to be better understood is how to quickly evaluate and probe interviewee responses during the course of an interview.

It is also essential to find out what the research frontiers and priorities of farmers are, i.e., which problems and topics are in greatest need of research from their perspective. The success of rapid rural appraisal depends not only on the abilities of the investigators but also on the willingness of rural villagers to participate in the research. There is a feeling that many RRA techniques are in their present stage of development still too 'outsider-oriented,' relegating farmers to the passive role of respondent to questions of the researchers' choice. New techniques need to be developed and refined to give villagers a more active role.

Perhaps most of all, it is important that continued methodological development in RRA be guided by a fundamental respect for the ways of life of rural people. It is the role of RRA to understand and appreciate the knowledge, concerns and priorities of rural inhabitants, and to articulate these with those of scientists and other 'outsiders.'

APPLICATIONS OF RRA

The range of potential applications of Rapid Rural Appraisal is quite broad, reflecting the many spheres in which development is undertaken (e.g., agriculture, forestry, fisheries, water management, health and nutrition, and education – see paper by Gibbs) and the variety of development activities which require timely, cost-effective, and focused information. With regard to the latter, some of the more important applications and uses of RRA are:

1) to explore, identify and diagnose rural situations, problems, or issues;
2) to design, implement, monitor, and evaluate programs, projects and development actions;
3) to help develop, extend, and transfer technology;
4) to assist in policy formulation and decision making;
5) to respond to emergencies and disasters; and
6) to improve, supplement, or complement other types of research.

Exploration, Identification and Diagnosis of Problems and Issues

Rural development research and planning are frequently hindered by limited knowledge and insufficient data. In many situations there is a need for open-ended learning about a topic, a problem, a community or a region to provide a basis for subsequent research or planning. In such cases, RRA is useful for identifying and exploring topics, questions and problems related to development and research. RRA can also be used not only to generate hypotheses but to test them. A major role in this regard is RRA's ability to disconfirm incorrect hypotheses before major research efforts have been invested. Where the topic or problem is known, but poorly understood, RRA has additionally proven useful as a method for intensely

examining the topic or problem in an interdisciplinary manner. This increases the likelihood that all important elements are identified and understood.

Project Design, Implementation, Monitoring, and Evaluation

RRA researchers can obtain direct information on local problems and needs and on the kinds of development projects that will be appropriate for and acceptable to particular rural communities (see papers by Galt, Conway and de los Reyes for examples). RRA can also obtain information that helps in recognizing and identifying unfounded assumptions about the type(s) of assistance needed. RRA provides a timely and cost-effective way to learn about characteristics, opportunities, and constraints of the local situation that may affect implementation. Specific problems encountered during implementation can also be examined and analyzed by RRA.

RRA research methodology has proven useful for ongoing monitoring and evaluation. In development projects there is a frequent need to examine progress to see whether or not a project is working and is moving toward its goals. RRA has been effectively used for this purpose and the timely information it provides can be valuable for fine tuning or changing project activities. When project final evaluations seek detailed quantitative determination of project results and impacts, RRA can be used to hone the methods (e.g., benefit-cost assessments and formal surveys) which evaluations normally rely upon to determine and measure project results. RRA can also be used to supplement evaluation studies because it often provides insights into why things have or have not worked, insights that are often difficult to obtain using conventional evaluation methods.

Technology Development, Extension, and Transfer

The development and transfer of new or improved technologies have long been major thrusts in rural development. The results have been mixed, however, and a frequent problem has been that the technologies developed were inappropriate for the actual conditions and constraints faced by rural villagers. This has often occurred because there was inadequate communication between the technology developers and the intended users of the technology, or because there was insufficient awareness and understanding, on the part of the technology developers, of the biophysical, social, and economic factors that affect farmers' activities.

RRA can contribute to the solution of these and related problems encountered in developing appropriate technology. The information it provides can be used to increase the technologists' awareness and enable them to develop technologies that are more appropriate for the actual conditions of usage. This information can be used not only in the initial design of a new or improved technology, but also during testing and refinement. If technologists are included on the RRA team, direct communication between technologists and farmers is also possible. This creates an important opportunity for common recognition of problems and cooperative development of the technology. (For more information on technology development,

extension, and transfer, see 'Uses of RRA for Farming Systems Research and Extension,' below.)

Policy Formulation and Decision Making

In examining alternative courses of action and in formulating policies, decision makers frequently need additional timely data to enable them to make better and more informed decisions. Very often, the information they need is qualitative, rather than quantitative, in nature. For example, a decision maker may not need to know exactly how many people or what specific percentage of a population would be affected by a particular course of action, but rather only require a general, but accurate assessment of the expected outcome and consequences, the issues involved, and the segments of the population that would be most affected. RRA can be and has been effective in providing answers at this level.

In other cases, the appropriateness of a decision or change may be known but action is nevertheless prevented due to opposition from other decision makers who are less well informed. RRA can be used to strengthen the argument for change by actively involving the crucial decision makers in a topical RRA that examines the issue.

Responses to Emergencies and Disasters

When natural or human-induced catastrophes occur there is a need for quick assessments of emergency or disaster conditions to determine the types and scales of assistance that are most critically needed. The appropriateness of RRA with its small, integrated, interdisciplinary teams for assessing such situations seems obvious. It should be recognized that depending on the sorts of information needed by relief agencies and relief planners, however, RRA may not always be the most appropriate strategy. Estimations of large, but unknown areas of damage (for example, the extent of damage to standing crops by widespread flooding) might be better undertaken through other techniques such as satellite imagery.

Supplementing, Complementing, and Improving Other Methodologies

Certain kinds of development activities and planning demand data that can be better obtained through conventional research methodologies than through RRA. Many research topics, for example, require detailed information on spatial and temporal patterns that can only be obtained by area-wide surveys and longer-term studies. Other research topics necessitate studies which are highly quantified, precise and statistically reliable. Although RRA would seem to be inappropriate as the primary research methodology in such cases, it can be and has been used to improve the effectiveness of methodologies that are believed to be more appropriate. RRA can be employed, for example, to better understand and better specify research topics and problems and to help select the conventional methodology that is most appropriate for a given situation. RRA can also be used for cross-checking

conventionally collected data and for exploring and evaluating unexpected results that are suggested by conventional data analysis. In addition, RRA methodology can provide a cost-effective and timely means of evaluating the soundness of conclusions resulting from other methodologies and other types of research (see paper by Thomas and Suphanchaimat).

RRA may also be used to supplement and complement more intensive, community-specific rural studies, such as ethnographies. Ethnographers and other types of anthropologists often spend one or more years residing in and studying a particular village or community. Relying upon a combination of participant observation and interviewing, they normally acquire in-depth knowledge about the community and frequently develop considerable insight into how community residents perceive their situation and problems (the 'insider' perspective). Although ethnographic analysis is usually an intensive, lengthy, and comprehensive learning experience, information gaps and blindspots normally exist because these studies are almost always disciplinary or sub-disciplinary in character, are usually confined to a single location, and are usually studied by a single principal researcher. A skilled, interdisciplinary RRA team can frequently acquire information that will enhance, supplement or complement even the most comprehensive community-specific rural study.

When and When Not to Use RRA

Although the potential applications of RRA are numerous and wide ranging, certain considerations should be taken into account in deciding whether or not RRA is appropriate for particular situations and projects. Perhaps the most important considerations are the availability of appropriate people to conduct the study, the degree to which project structure and decision making are sufficiently flexible to make use of new and increasingly refined information, and the intended use of the findings.

Human Resources

RRA is extremely valuable as a research and information acquisition methodology when conducted by a multidisciplinary team of investigators who possess interviewing, observational, and analytical skills, who can cooperate well with each other, and who are experienced in RRA work. Experience, qualifications, teamwork, and varied disciplinary perspectives are critical to the success of RRA studies. If these attributes are not available, rapid appraisal may be counterproductive and result in questionable findings.

Flexibility in Project Structure and Decision Making

One of the important advantages of RRA is its ability to supply timely information for improved understanding throughout the entire research and project sequence. To fully exploit RRA's potential, however, projects and research

must be structured in a manner flexible enough to permit, and react to, the input of new information as their specific activities proceed. Projects that require definitive information and final answers in advance to design detailed work plans that cannot be modified later seem less appropriate for RRA studies. In some of these cases, however, RRA can be used to examine the feasibility, appropriateness or inappropriateness of particular actions or interventions.

Intended Use of the Information

Whether or not to employ RRA also depends on the intended use of the information to be obtained. In general, RRA is particularly appropriate whenever relatively open-ended learning is needed or desired (see the six types of RRA use and application, above). RRA may not be appropriate for research and projects that require more precise and statistically reliable data from a large number of units. Similarly, research that requires the long-term, continuous study of particular units or situations should probably be undertaken using methods other than RRA. Nevertheless, the methodology can often be used to better design and to complement/supplement these other research methods.

Uses of RRA for Farming Systems Research and Extension

RRA can play a number of important roles in farming systems research and extension (FSR/E) because timely information is required throughout these activities (see paper by Galt). RRA can be used, for example, to obtain information necessary for predesign identification and description of sites, for designing technologies, and in on-site testing. It can also be valuable for assessing the production potential, economic feasibility and social acceptability of particular technologies. Monitoring and evaluation of specific FSR/E project activities can also be done in a more timely and focused manner using RRA techniques. Although there are certain activities, e.g., crop trials, that RRA cannot replace, it can be used nevertheless to gather information crucial to designing trials and to selecting appropriate conditions in which to conduct trials.

The experience of the International Potato Center (CIP) is instructive. At this international agricultural research center, small teams of social scientists and technologists employ informal agricultural survey (see paper by Rhoades), a form of RRA, to design appropriate technology. Rapid techniques are used to acquire information from farmers to develop an understanding of their knowledge and the problems they face. This enables a common definition of the problem by both scientists and farmers which becomes the basis for jointly identifying potential solutions. Testing and adapting these possible solutions in line with local conditions then follows on experimental stations and in on-farm trials, with farmers as well as scientists actively involved. The final and most crucial stage involves the independent use and evaluation of the new technology by farmers under their own conditions, resources, and management. This final stage determines the suitability and acceptability of the technology and enables the scientists to see how it may be

adapted in line with local conditions and constraints. Thus, there is a cycle that begins and ends with the farmer (the 'farmer-back-to-farmer' model). The process may be repeated several times enabling technologies to be better identified, developed, tested, and refined.

At Khon Kaen University in Northeast Thailand, an RRA study of a group of farmers in a province where peanuts have been planted in paddy fields after the rice harvest for the last fifteen to twenty years was followed by more specialized studies of topics and issues identified by the RRA. It was concluded that it would be possible to adapt and transfer the farmers' technology to another area in the Northeast. RRA was then used to identify potential sites in the new area as well as to identify households to participate in the experiment. Experiments using various forms of extension, e.g., slide shows, field days, and exchange field visits by farmers, have been successful and there is considerable potential to expand the technology to other parts of the region.

RRA and Irrigation Systems

RRA has proven to be very useful in the study of irrigation systems and in the planning and implementation of irrigation projects. RRA use has been fairly widespread in this regard, and its role is evolving (for examples, see Chambers 1983 in 'Bibliography on Rapid Rural Appraisal'). In the Philippines, social scientists have worked closely with personnel at the National Irrigation Administration (NIA) in developing a participatory approach to irrigation development. Many RRA techniques were applied in identifying constraints on and opportunities for the implementation of irrigation projects. The experience led to the development of a sociotechnical profile (see paper by de los Reyes): detailed guidelines for community-level personnel to carry out study needed for specific project planning and implementation. The involvement of villagers throughout the process greatly increased local participation and improved working relations among project personnel. Social data are now consistently and routinely incorporated into irrigation development activities at NIA. Innovative NIA leadership at top levels was a key factor in these developments.

An interdisciplinary team of researchers from Khon Kaen University, under the Small-Scale Irrigation Systems Project, has used RRA to examine small-scale irrigation systems in Northeast Thailand. A comparison of projects constructed and managed by different agencies enabled the team to identify and analyze a variety of natural, economic, social and operational factors that greatly influenced the maintenance and utilization of the irrigation systems. This information is being used to better design future activities and to achieve better management of existing small-scale irrigation systems in the region.

RRA in Forest Land Use and Agroforestry

In much of the developing world, issues of deforestation and forest land management are receiving considerable and increasing attention. National govern-

ments and international donor agencies are now spending large sums of money to design and implement forestry-related rural development programs and projects. Foresters, long accustomed to their roles as custodians and production managers of forest reserves, have suddenly been cast in new and unfamiliar roles as rural development workers and change agents. RRA has considerable potential, and is beginning to be used, to help foresters and forestry agencies better understand the forest land use and dependency of local communities.

In Indonesia, for example, the Ministry of Forestry is responsible for managing over 150 million hectares of land. Large numbers of rural people depend on this land, but dependency patterns are not well understood and generally have not been taken into account in management. RRA techniques are now being adopted in Indonesia to analyze and understand both the formal and non-formal dependency patterns of rural communities located on or around state forest lands. RRA seems particularly suited for this, given the magnitude of the situation. Using sketch maps, landuse transects, aerial photographs, graphic tables, and flowcharts, in combination with semi-structured interviewing, researchers are able to analyze dependency patterns with respect to land zone, seasonal patterns, and social factors such as social groupings, socio-economic status, gender roles and tenure status. From these, issues can be identified that can hopefully lead to better planning and more sustainable land use. In Northeast Thailand, similar efforts are underway, using a similar array of RRA tools and techniques, with an additional special focus on the use of observational indicators in initial phases of study. RRA training and conduct at the start of the project were also valuable for project team integration and orientation.

The U.S. Agency for International Development in Dhaka, Bangladesh, has also used RRA to improve project design with respect to the Homestead Agroforestry Project. This project would initially involve several hundred homesteads in technology testing and promising technologies would then be expanded to include several million homesteads throughout the country. Thus, it was crucial to have a very concrete sense of what the proposed project was about. A two day intensive look at trees and bamboos, watching how people used them and asking questions, resulted in a better understanding of what homesteads were and what research should be undertaken. A related RRA application was a more open-ended study of homesteads to understand their complexity and problems. Prior to planning the Homestead Agroforestry Project, there had been a general feeling that the project should be concerned with fuelwood supply in particular, and perhaps with building materials and fodder. A five-day visit to, and interviewing in, two Eastern Bangladesh districts confirmed that fuelwood acquisition was a very important issue – villagers were spending burdensome amounts of time collecting fuelwood – but also that there were a number of other issues that needed to be examined. In addition, a range of other useful information on relationships between households and homestead holdings and on how households use their economic base was also obtained. This allowed for adjustments in project design and consideration of appropriate research issues for the project. Although these examples of RRA application from Bangladesh relate to project design, it was also clear that RRA or something like it would additionally be needed in implementation and evaluation.

TRAINING PROGRAMS AND INSTITUTIONALIZATION

Given RRA's many applications, the methodology's potential importance in rural development work, and the existence of RRA core principles, methods, tools and techniques, it would seem appropriate and needed to develop training programs to disseminate the methodology and increase the number of capable RRA practitioners. And yet, there is some debate about who can learn RRA and the extent to which it can be learned in training courses. Perhaps the most realistic assessment is that while the methodology's principles, concepts, and techniques can certainly be taught, good RRA skills can only be developed through practice and through an accumulation of experience in the field. Further, it should be expected that not everyone can become highly skilled at RRA, even with considerable practice and experience.

Characteristics of Trainees and Trainers

Although almost all individuals possess at least some basic skills and knowledge, not everyone can apply their skills and knowledge in research. Of those who can, many prefer to work alone and only a subset of capable researchers are willing and able to apply their skills and knowledge in multidisciplinary or interdisciplinary efforts. Members of this latter group are better candidates for RRA training than those who either possess research skills, but do not like to function in a team context, or those who have the appropriate team attitudes, but find it difficult to apply their knowledge and skills in research.

RRA trainers should obviously possess skill and experience in applying the methodology, but it is not always easy to find qualified practitioners who can also function effectively as trainers to pass on their principles, techniques, and hints to other people. One reason seems to be that some experienced practitioners have internalized the necessary 'learning' mode to the extent that they find it difficult or uncomfortable to operate in a more traditional teaching and prescriptive role. Thus, in developing training programs it may be necessary for individuals with good RRA skills to team up with people with good training skills.

Training Context and Design

At Khon Kaen University one of the most effective training modes used has been a form of 'learning by doing,' where one trainee is included as a member of a small, experienced team that is actually doing an RRA. This situation allows the trainee to be fully exposed to and integrated in all the activities taking place and to directly learn from the more experienced members of the team. Although effective, this training mode produces small numbers of new, qualified practitioners and places a heavy demand on experienced researchers. Because the training of increased numbers of capable researchers is extremely desirable, there is a need to develop high-quality training programs which not only teach the methodology to more people but also allow them to develop the skills to apply it effectively. Experience has shown that the latter aspect is of great importance and some

training activities have been ineffective because they were run as short, single events in which trainees were provided with basic information and training but then left to their own devices both to apply the new knowledge and to develop skill and experience. Trainees who were not able to consult trainers when they encountered problems often experienced frustration and dissatisfaction with the methodology.

RRA training must not only convey all the principles, ideas, methods, hints, tools and techniques needed for research, it must also develop the attitudes, skills and procedures necessary for interdisciplinary teamwork. An issue which needs to be considered is whether it might not be better to train a team, as a team, rather than to train individuals for team work. There seems to be general agreement, however, that training should be done in an iterative manner involving both lectures/classroom work and field practice which is as realistic as possible. In fact, it is most desirable that trainees also undertake an actual RRA as a part of their training, to include producing a completed report.

For training larger numbers of researchers there appears to be a need for intensive training over an extended period, with participants and trainers engaged in an extended, interactive dialogue and learning process. It would certainly seem possible to create and develop programs of this nature, although much would depend upon strong institutional support and sufficient funding.

Training Tools

RRA training should employ an array of tools that provide different ways of learning, in order to best convey the complex range and scope of RRA methodology. Tools and techniques such as films, manuals, videotapes, slides, transparencies, workbooks, lectures, field practicums, simulations, role-playing and games are probably all desirable. The tools and techniques of RRA itself can and should also serve as training tools. For example, initial field exercises should provide practice using simple questions starting with 'who, what, where, when, why and how,' as well as other basic field techniques of information gathering. As skills improve, many other tools can be added (for examples, see paper by Limpinuntana). Videotapes of actual field situations can be used to illustrate good practices and point out common mistakes. They can also be used to record and provide feedback on the progress of the trainees. Techniques to improve teamwork might include team discussions and self-criticism, group decision making, and use and revision of working protocols. Group effort and integrated results should be stressed. It is likely that additional training and sensitization techniques will need to be developed to facilitate this.

Institutionalization of RRA

Most of the conference participants expressed the belief that institutionalization of RRA is possible and that it would be beneficial for improving the effectiveness of rural development work. It was recognized, however, that institutionalization is often a lengthy and difficult process entailing significant changes in existing

attitudes. For RRA, greater documentation of methods and results will be necessary, as well as publication in well respected academic and applied journals. The effectiveness and value of the emerging methodology will have to be demonstrated time and time again and resistance from people who were trained in and have long relied upon conventional research methods will have to be overcome. Sample surveying, when first introduced as a way to approximate census data, may have encountered opposition in much the same manner that RRA is now being opposed: compared with census, sample surveying must have initally seemed to many to be 'quick and dirty.' A historical study of the acceptance of sample surveying might provide useful lessons.

CONCLUSION AND RECOMMENDATIONS

It is evident in the papers included in this volume that there is now a wide variety of tools and techniques for conducting rapid rural appraisal, as a result of the cumulative experience of RRA application in many countries. While the number of experienced practitioners is still small, a proliferation of RRA work, or work that is being called RRA, is occurring and this is expected to continue. Rapidity is a basic characteristic of this work and indeed one of the important advantages of RRA, but the quality and value of the information obtained depend heavily upon other things. Carelessly done RRAs are not just of questionable accuracy and value, they also reflect unfairly both on the worth and utility of a methodology that has much to offer and on the efforts of conscientious RRA practitioners worldwide.

Experience reviewed at the conference has shown that rapid appraisals are most successful when a shared conceptual framework and certain key principles are present, when practitioners are experienced, and when an array of methods, tools and techniques designed to improve the quality and insightfulness of the appraisal are available, mastered and used. The process and procedures of RRA are critical to success. Iterative learning in an exploratory manner leading to progressive understanding of issues by a small multidisciplinary team should take place. The team must interact in a highly interdisciplinary way, make full use of local indigenous knowledge, and pay special attention to variation and implication.

The discussions at the conference also resulted in several recommendations intended to advance methodological development, increase application, and promote the recognition of RRA as a legitimate research methodology:

(1) The preparation of a short 'management brief' on RRA was recommended. This should provide project managers and those in a position to hire researchers with a clear statement of what RRA is, the advantages and limitations of the methodology, and the qualifications needed for those who are to conduct it. It should also state how to evaluate the quality of the results of an RRA.

(2) To increase the use of RRA and to further legitimize it as a sound and well-grounded research methodology, it was recommended that more reports with emphasis on methodological aspects be published, especially in highly respected journals. Related to this were the hopes that more time and energy would be devoted to working on methodological development and that there would be

greater exchange of such findings through some form of network. The purpose of the network would be to facilitate the exchange and dissemination of information and to allow RRA practitioners to remain in contact with each other more easily. Such a network might also enable more RRA practitioners who have been working in somewhat isolated environments to learn about the experience of others and to share their own.

(3) It was recommended that the use of RRA methodology be introduced into governmental 'action' agencies responsible for resource development and management. This should take two forms. RRA methodology, with relatively little adaptation, can be used by those involved in or responsible for decision making to achieve closer contact with rural inhabitants and to provide themselves with better means to identify and understand local needs. The advantages to be gained are well worth the investment in training and in professional assistance that this would require. RRA methodology can also be adapted and tailored for more widespread use within such agencies. This will undoubtedly entail increasing the specificity of guidelines and procedures. The reduced flexibility and exploratory capability that this implies should be a matter of concern. Experience has shown, however, that, with care, many useful elements of RRA, such as use of semi-structured interviewing and data source triangulation, can be applied in this context, and that the information and insights gained are often superior to information obtained by other methods widely used in such agencies.

(4) Several conference participants mentioned the need for a methodological handbook. The need for a volume of carefully selected case studies was also expressed. The handbook should contain a compendium ('supermarket') of RRA tools, hints, methods and techniques, highlighting those that have not been well-documented elsewhere. It should also cover theory, principles and process. Extra care should be taken that it not become a 'cookbook.' A volume of RRA case studies could provide, in one place, examples of the scope of RRA. If this volume could be cross-referenced with the handbook, the value of both should be enhanced. However, it was also felt that a handbook might be premature, given the current and evolving state of RRA development. While compendiums of RRA methods, tools and techniques are certainly needed, it is important to the further development of the methodology that RRA not be overly defined or limited before reaching its full potential. In addition, a handbook based on an insufficient scope of RRA experience and expertise could set back the process of legitimization.

(5) There is an urgent and important need for more people to be highly qualified in RRA expertise, and there is increasing interest in learning how to use and apply the methodology. Appropriate programs, curricula, and materials should therefore be developed for training, and opportunities for training should be made more readily available. It was recommended that consideration be given to using modern technology to produce high quality and easily used training materials, and to creating comprehensive training courses that allow students to effectively learn and acquire experience in RRA.

PART II THE NEED FOR RRA, ITS EVOLUTION AND UNDERLYING CONCEPTS

SHORTCUT METHODS IN SOCIAL INFORMATION GATHERING FOR RURAL DEVELOPMENT PROJECTS[1]

Robert Chambers

1. THE PROBLEM

Decision-makers need information that is relevant, timely, accurate, and usable.[2] In rural development, a great deal of the information that is generated is, in various combinations, irrelevant, late, wrong, and/or unusable anyway. It also often costs a lot to obtain, process, analyze, and digest. Although many professional social scientists have given thought to improving information gathering it remains a remarkably inefficient activity. Criteria of cost-effectiveness have not often been applied, and manifest inefficiency is sometimes met by demanding not better information, or less, but simply more.

The challenge is to find ways for outsiders to learn about rural conditions which are more cost-effective — which lead to information and understanding which are closer to the optimal in trade-offs between cost of collection and learning, and relevance, timeliness, accuracy, and actual beneficial use. Some of the approaches and methods which seek such optimal trade-offs have come to be known as Rapid Rural Appraisal (RRA).[3] RRA has been developed for and can be applied to generating social information on various variables, whether visible, such as housing, physical assets, and some services, or invisible, such as social organization, power structure, and social institutions.

In the context of designing rural development projects, RRA appears especial-

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1. This paper is an earlier version of "Shortcut Methods of Gathering Social Information for Rural Development Projects," in Michael M. Cernea, ed., *Putting People First: Sociological Variables in Rural Development* (Oxford University Press, World Bank, 1985). It was presented at the Conference and appears in the proceedings here with permission of the editor and author.

2. This paper is a substantially revised and updated version of a paper prepared for and presented to the World Bank Agricultural Sector Symposia, January 1980, subsequently published as "Rapid Rural Appraisal: Rationale and Repertoire," *Public Administration and Development* 1,2(1981):95-106.

3. Rapid Rural Appraisal was explored at a Workshop, 26-27 October 1978, (referred to as RRA1) and a Conference, 4-7 December 1979, (referred to as RRA2) both held at the Institute of Development Studies, University of Sussex, Brighton BN1 9RE, U.K. This gave rise to three main publications: Arnold Pacey, *Taking Soundings in Developing Communities: An Approach to the Information Needs of Rural Development Workers, District Officials, and Health Service Staff* (Geneva: WHO, 1981); Richard Longhurst, ed., *Rapid Rural Appraisal: Structure and Rural Economy, IDS Bulletin* 12,4(1981); Ian Carruthers and Robert Chambers, eds., *Special Issue on Rapid Rural Appraisal, Agricultural Administration* 8,6(1981). For a good practical guide to informal agricultural appraisal, see Robert E. Rhoades, "The Art of Informal Agricultural Survey." (Lima, Peru: International Potato Center, Aptdo 5969, March 1982). There are also useful insights in some of the methodological appendices to USAID's published series of project evaluation studies.

ly necessary and relevant for the initial phases: project identification, preparation, and appraisal. Information is needed quickly, decisions are preempted by the passage of time. Commitment to projects and to details of projects sometimes become irreversible early on, setting a premium on timely information. But RRA is also relevant later, during project implementation, monitoring, and evaluation. Its relevance is enhanced by the view that rural development projects are not like construction works, with engineering blueprints which precisely predetermine what will be done, but rather like voyages into uncharted seas where direction and steering will change with new soundings and sightings. Techniques of RRA are hardly a new radar to prevent shipwreck; but they may at least reduce the dangers by showing more clearly and more quickly what is happening.

In practice, however, we seem to be trapped by two sets of inappropriate methods for generating social information. These can be described as the "quick-and-dirty" and the "long-and-dirty", where "dirty" means not cost-effective.

Quick-and-dirty

The most common form of quick-and-dirty appraisal is rural development tourism -- the brief rural visit by the urban based professional.[4] This can be very cost-effective with the outstanding individual; one example is Wolf Ladejinsky[5] who in two remarkable short field trips in India saw what was happening in the green revolution and reported it years before plodding social scientists came to the same conclusions to two (spurious) points of decimals. But more commonly, rural development tourism exerts biases against perceiving rural poverty, reinforcing underestimates of its prevalence and failing to understand its nature. These anti-poverty biases are:

(i) *Spatial.* Urban, tarmac, and roadside biases. The poorer people are often out of sight of the roadside, having sold out and moved away,[6] tending to be concentrated in the regions more remote from urban centers, and living on the fringes of villages or in small inaccessible hamlets.[7]

(ii) *Project.* Outsiders link in with networks which channel them out from urban centers to those rural places where there are projects, where

4. For a more detailed description of the pathology of rural development tourism, and its anti-poverty biases, see Robert Chambers, *Rural Development: Putting the Last First* (Harlow, U.K.: Longman, 1983), pp. 10-26. See also Mick Moore, "Beyond the Tarmac Road: A Guide for Rural Poverty Watchers," *IDS Bulletin* 12,4(1981):47-52.

5. Wolf Ladejinsky, "The Green Revolution in Punjab: A Field Trip," *Economic and Political Weekly* 4,26(1969); Ladejinsky, "The Green Revolution in Bihar — the Kosi Area: A Field Trip," *Economic and Political Weekly* 4,39(1969).

6. Joseph Ssennyonga, "The Cutural Dimensions of Demographic Trends," *Populi* 3,2(1976):2-11.

7. Thus Moore on one part of rural Sri Lanka: "The proportion of houses with earth floors ranged from 14% in one locality to 41% in another. The remarkable fact is that one could drive along all the motorable roads in these localities and see scarcely a single mud floored house. Moore, "Beyond the Tarmac Road...," p. 47.

something initiated by outsiders is happening or is meant to be happening, to the neglect of non-project areas.

(iii) *Biases of personal contact.* Those met by rural development tourists tend to be the less poor and the more powerful, men rather than women, users of services rather than non-users, adopters rather than non-adopters, the active rather than the non-active, those who have not had to migrate, and (inevitably) those who have not died. In all cases the bias is against perceiving the extent of deprivation.

(iv) *Dry season bias.* In many tropical environments the wet season is the worst time of year especially for the poorer people (with hard work, food shortage, high food prices, high disease incidence, high indebtedness, etc.),[8] but urban-based professionals travel most in the post harvest dry season when things are better.

(v) *Biases of politeness and protocol.* Courtesy and convention may deter rural development tourists from enquiring about and meeting the poorer people. The visitor is also short of time and the poorer people stand at the end of the line.

Moreover, these biases interlock. The prosperity after harvest of a male farmer on a project beside a main road close to a capital city may color the perceptions of a succession of influential officials and foreigners. The plight of a poor widow starving and sick during the wet season in a remote and inaccessible area may never in any way impinge on the consciousness of anyone outside her own community, and not even all of them. The biases pull together towards those who are better off, and away from those who are poorer and more deprived.

Many of the other defects of quick-and-dirty investigations are well-known, but a short list can serve as a warning:

- lack of rapport and misleading replies — they may be deferential, prudent or designed to avoid penalties or gain benefits; they may evade sensitive topics, state social ideals not actual practices; and so on.
- failure to listen — especially on the part of outsiders who are "old hands" and who "know it all" or who want to talk and teach rather than themselves learn, and who reinforce misperception and prejudice in projecting their own ideas and selecting their own meanings.
- overlooking the invisible — physical things and activities are seen, but social and cultural relationships are not. Crucial social facts may not be enquired about or correctly understood, such as patron-client relations, factions, informal organization, norms, indebtedness, interest rates,

8. See Susan Schofield, "Seasonal Factors Affecting Nutrition in Different Age Groups and Especially Pre-school Children," *Journal of Development Studies* 11,1(1974):22-40; Robert Chambers, Richard Longhurst and Arnold Pacey, eds., *Seasonal Dimensions to Rural Poverty* (London: Frances Pinter, 1981); Robert Chambers, "Health, Agriculture and Rural Poverty: Why Seasons Matter," *Journal of Development Studies* 18,2(1982):217-238.

wages and control of assets and decision-making within the family.
- seeing only a "snapshot" — only a moment in time is seen. Cyclical and periodic events like seasonal activities and regular weekly markets may never be uncovered. Trends, so often more important than a static view of current conditions, are easily missed.

This list could be lengthened, but the point is made: quick appraisals can be seriously misleading, especially when there is a concern with the poorer people. Rapid is often wrong.

Long-and-dirty

At the other extreme, traditions of academic research have valued investigations which are much longer and more costly, often involving the collection of massive volumes of data. The real or imagined requirements of Ph.D. research induce students to seek safety and respectability in avoiding shortcuts, and trying to find out more, not less. So social anthropologists immerse themselves for long periods in alien cultures, and sociologists and agricultural economists plan and perpetuate huge questionnaire surveys. Sometimes the outcome is academically excellent and makes a long-term contribution to understanding and action. All too often, though, the delays are excessive: the social anthropologist's fieldwork which is published (if at all) ten years later; the massive survey which takes years to process, if it is processed at all.

In its still not uncommon pathological form, the survey questionnaire has thirty or more pages (multi-disciplinary, each discipline with its questions), which if asked are never coded, or if coded never punched, or if punched never processed, or if processed and printed out, never examined, or if examined, never analyzed or written up, or if analyzed and written up, never read, or if read, never understood or remembered, or if understood or remembered, never actually used to change action. Large-scale multi-disciplinary rural surveys must be one of the most inefficient industries in the world. Benchmark surveys are often criticised, and yet these huge operations persist, often in the name of the science of evaluation, preempting scarce national research resources, and generating mounds of data and papers which are an embarassment to all until white ants or paper shredders clean things up.

Some investigations are long and clean. Many of the insights of social anthropologists later prove useful. Some of the best surveys are those which repeatedly monitor the same villages or people. Examples are the health and nutrition work of the Dunn Nutrition Unit, Cambridge, in Keneba village in the Gambia and of the International Centre for Diarrheal Diseases Research in Matlab Thana in Bangladesh, and the social and agricultural village survey of ICRISAT in India. But most large-scale surveys, except those of a strict census type, are monumentally inefficient, both in the quality of data obtained and in the long delays in analysis and reporting of that data. Often the most useful information comes not from the survey itself but informal observations (in fact forms of RRA) by those who conduct it. The survey itself is often hardly used at all. Long is often lost.

Cost-effectiveness: fairly-quick-and-fairly-clean

The question is, then, whether there is a middle zone between quick-and-dirty and long-and-dirty, a zone of greater cost-effectiveness. People in many disciplines and professions have converged on this question, but until recently may have been deterred from writing it up because the activities were not considered quite proper. They have a sense of responsibility to their professional training, or, put differently, they have been brainwashed by their professional conditioning and reward systems. And yet in appraisal of natural resources and the environment,[9] of health and nutrition projects,[10] of farming systems,[11] of social, cultural, and economic conditions in agricultural projects,[12] and of organizations[13] — in these fields and others there is an active search for shortcuts with trade-offs between timeliness, accuracy, relevance, and actual use of information.

Formidable obstacles impede this process and this search. In the words of one participant at the [1979] RRA conference, "By the time people leave university the damage has been done," -- inappropriate and rigid professional methods have been imparted and internalised. Another contributor recorded how she had been forced to abandon the employment of university graduates as enumerators because of their questionnaire mentality and had instead had more success with high school students who were more flexible and more open to learning from respondents.[14]

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9. Nick Abel and Michael Stocking, "Rapid Aerial Survey Techniques for Rural Areas," RRA2; Stocking and Abel, "Ecological and Environmental Indicators for the Rapid Appraisal of Natural Resources," *Agricultural Administration* 8,6(1981):473-484; Jeremy Swift, "Rapid Appraisal and Cost-Effective Participatory Research in Dry Pastoral Areas of West Africa," *Agricultural Administration* 8,6(1981):484-492.

10. Lincoln C. Chen, Alauddin K.M.A. Chowdhury, and Sandi Huffman, "Classification of Energy-Protein Malnutrition by Anthropometry and Subsequent Risk of Mortality" (International Centre for Diarrheal Disease Research, Bangladesh, 1978); Gill Gordon "Finding Out about Child (0-5 Years) Feeding Practices," RRA2, Philip Payne, "Assessment of Nutrition Problems: What Do We Look at and What Do We Measure," RRA2; Godfrey Walker, "Notes on Rapid Appraisal of the Utilization of Health Care Services," RRA2; and Arnold Pacey *Taking Soundings in Developing Communities* (Geneva: WHO, 1981).

11. Stephen Biggs, "Timely Analysis in Programmes to Generate Agricultural Technologies," RRA2; Derek Byerlee et al., "On-Farm Research to Develop Technologies Appropriate to Farmers" (Paper presented at the Conference of the International Association of Agricultural Economists, Banff, Canada, 1979); Ian Carruthers "A Mental Construct for Unstructured On-Farm Interviews," RRA2; Michael Collinson, "A Low Cost Approach to Understanding Small Farmers," *Agricultural Administration* 8,6(1981):433-450; Peter Hildebrand, "Combining Disciplines in Rapid Appraisal: the Sondeo Approach," *Agricultural Administration* 8,6(1981):423-432; Rhoades, "The Art of the Informal Agricultural Survey."

12. See articles in Longhurst, ed., *Rapid Rural Appraisal* especially Deryke Belshaw, "A Theoretical Framework for Data-economising Appraisal Procedures to Rural Development Planning;" Mick Howes, "Confessions of a Fieldworker - How I Stratified a Rural Population;" Richard Longhurst, "Research Methodology and Rural Economy in Northern Nigeria;" Mick Moore, "Beyond the Tarmac Road: A Guide for Rural Poverty Watchers;" Ingrid Palmer, "Women's Issues and Project Appraisal;" and Geoffrey D. Wood, "The Social and Scientific Context of Rapid Rural Appraisal."

13. George Honadle, "Rapid Reconnaissance for Development Administration: Mapping and Moulding Organizational Landscapes," *World Development* 10,8(1982):633-649.

14. Rosaline Eyben, "Rapid Appraisal in Non-Formal Education: An Account of an On-going Research Experience with a United Nations Project," RRA2.

Perhaps the biggest single blockage is the hegemony of statisticians and the failure to treat statistical methods as servant not master.[15] More generally, professional values and reward systems deter improvisation in learning about rural conditions which though cost-effective may not seem pure. Better, it is thought, to be long and legitimate than short and suspect.

But cost-effectiveness has its own rigor and should generate its own values. Two linked principles can be suggested:

- *Optimal ignorance.* This refers to the importance of knowing what it is not worth knowing. It requires courage to implement. It is far, far easier to demand more and more information than it is to abstain from demanding it. Yet in information gathering there is often a monstrous overkill.
- *Appropriate imprecision.* Especially in surveys, much of the data collected has a degree of accuracy which is unnecessary. Order of magnitude, and directions of change, are often all that will be used.

2. PRECEPTS AND PRINCIPLES

What methods are best depends on purpose and circumstances. Some general precepts can, however, be suggested:

Taking time. RRA will avoid the tyranny of strict sampling, of the formal questionnaire, of the massive survey-in vain if time saved is dissipated in rushing. Many of the defects of rural development tourism come from haste.

Offsetting biases. Taking thought about biases (urban, tarmac, roadside, project, elite, male, user, dry season, etc.), and deliberately offsetting them. Wherever possible male bias should be offset by including women in appraisal teams.

Being unimportant. Avoiding the limousine-best village-garland-speeches syndrome.

Listening and learning. Treating rural people as teachers and being their pupils. Assuming that they have much valid knowledge that outsiders do not have. Trying to get inside their skins and see the world as they do. Being open to unexpected information.

Multiple approaches. Investigating the same questions with different methods, both to crosscheck and to fill out the picture.

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15. See Mick Moore, "Denounce the Gang of Statisticians. Struggle Against the Sample Line. Unite the Researching Masses Against Professional Hegemony," RRA2; Ian Carruthers and Robert Chambers, "Rapid Appraisal for Rural Development," *Agricultural Administration* 8,6(1981):415-417; Anthony Ellman, "Rapid Appraisal for Rural Project Preparation," *Agricultural Administration* 8,6(1981):465.

3. A SHORT REPERTOIRE FOR RAPID RURAL APPRAISAL

(i) Existing Available Information

For a rural area and its people, there is often already a wealth of information available for those who take the trouble to look for it. Much can be learnt from maps, aerial photographs (especially where time series are available), and satellite imagery about ecology, land use, settlement patterns, communications, and remote and isolated communities. Departmental reports, district gazetteers, technical department surveys, and government statistics can be most useful. Academic papers and books and reports of surveys can be invaluable.

Yet there is a recurrent tendency to ignore these sources and start ignorantly from scratch. The costs can be high indeed. In Northern Nigeria a World Bank-financed rural development project introduced in 1975 emphasised sole cropping, improved varieties less resistant to local weeds (and so demanding more labor), and encouraged cotton as a cash crop. Yet the work of David Norman and his colleagues at Ahmadu Bello University from between 1965 and 1972 had shown the importance of mixed cropping as a strategy, the crucial constraint of the labour peak at first weeding, and the allocation of farm labour preferentially to food crops, all of which should have warned the project designers against their proposals. Moreover, the project relied on an implicit trickle-down from large to small farmers and within households from men to women when existing socio-economic literature, especially Polly Hill's *Rural Hausa*, should have warned that this was unlikely to occur.[16] In contrast, the USAID impact evaluation missions now deliberately devote time to studying the sociological, economic, and geographic literature before going to the field. Such study is even more important with project identification and appraisal; and time spent searching for information even when it is not known whether it exists, is often well repaid and may avert grave errors as well as saving unnecessary demands for new data collection.

(ii) Learning from Rural People

Development disasters can follow from failing to learn from rural people. The fiasco of the Groundnut Scheme might have been foreseen by spending more time on the ground asking local inhabitants why they did not cultivate in the proposed project area. Rural people often have a wealth of knowledge.[17] The Hanunoo in the Philippines are said to have had, on average, a knowledge of 1,600 names of

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16. See Richard Longhurst, "Research Methodology and Rural Economy in Northern Nigeria," pp. 28-29 for this case. Longhurst emphasises the difficulties of project design in such a complicated rural economy and concludes that the appraisers may have lacked time in the field or been biased initially in favour of a particular type of project.

17. See "Rural Development: Whose Knowledge Counts?" *IDS Bulletin* 10,2(1979); David Brokensha, D.M. Warren, and Oswald Werner, eds., *Indigenous Systems of Knowledge and Development* (Lanham, Maryland: University Press of America, 1980); and Chambers, *Rural Development: Putting the Last First*, pp. 75-101.

plants, 400 more than those in a botanical survey.[18] The !Kung San of Botswana have a knowledge of animal behavior often superior to that of scientists.[19] Examples could multiplied. Knowledge of soils, seasons, plants, domestic and wild animals, farming practices, diet, cooking practices, and child care, not to mention social customs and relations, are often rich and in some or all respects superior to those of the outsider.

But techniques for eliciting, learning, and using such knowledge are still quite primitive. Promising innovations include adapting a local game to facilitate quantification and ranking,[20] using different sized squares of paper to enable farmers to estimate the relative sizes of their fields, only one of which was actually measured by the investigator,[21] and using holes in the ground and camel pellets placed in them to enable pastoralists to rank and discuss the problems they face.[22] On the social side, there is underexploited scope for asking rural people themselves to identify their needs, the ways in which they can be helped, or who in the community are most vulnerable and most in need.

(iii) Identifying and Using Key Indicators

Some indicators integrate several variables. Investigating, calibrating, observing, and counting such indicators may then provide a shortcut avoiding more expensive, direct, and time-consuming investigations. One cost-effective approach may often be to ask the rural people themselves to suggest the indicators, for example, for relative wealth or poverty, and to ask them to discuss their merits and weaknesses.

Indicators are usually thought of as visible. The most favoured social indicator in the rural South is house type. In its crudest form this involves counting tin roofs as a measure of the relative affluence or poverty of families or villages, either at one time or over time. A slightly more elaborate approach is a simple house score, multiplying the number of rooms by factors for quality of construction and dividing by the number of household members. This has been found a good proxy for level of economic well-being in part of Northern Nigeria.[23] Other much used visible indicators are anthropometric measures to assess nutritional status.

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18. H.C. Conklin, *Hanunoo Agriculture. A Report on an Integral System of Shifting Cultivation in the Philippines*, FAO Forestry Development Paper No. 12. (Rome: FAO, 1957).

19. Nicholas Blurton Jones and Melvin J. Konner, "!Kung Knowledge of Animal Behavior (or: the Proper Study of Mankind is Animals)," in *Kalahari Hunter-Gatherers: Studies of the !Kung San and Their Neighbors*, eds. Richard B. Lee and Irven Devore (Cambridge, Massachusatts: Harvard University Press, 1976).

20. David Barker, "Appropriate Methodology: An Example Using a Traditional African Board Game to Measure Farmers' Attitudes and Environmental Images" *IDS Bulletin* 10,2(1979):37-40.

21. Richard Longhurst, "Research Methodology and Rural Economy in Northern Nigeria," citing the work of Peter Matlon.

22. Jeremy Swift, personal communication.

23. See Longhurst, "Research Methodology and Rural Economy in Northern Nigeria," for this point, and for a useful discussion of different cost-effective methods for stratifying a rural population. Howes, "Confessions of a Fieldworker – How I Stratified a Rural Population" discusses some of the pitfalls and difficulties of stratification.

Indicators which are not visible may be at least as important especially in assessing social stratification and in monitoring program or project performance. Social stratification can be identified in various ways: according to resource base; or according to threshold values such as whether a household is self-sufficient in grain, whether the household head goes out to work on other people's farms, whether certain inputs are purchased, and so on; or by occupation. In appraising organizations, one proxy suggested (with qualifications) for organizational capability is the rates of transfers and turnover.[24]

While these and other indicators require local validation, they may provide shortcuts to insights; some may also provide simple measures for baselines if before-after evaluation is required, avoiding massive data collection.

(iv) Adaptations of Hildebrand's "Sondeo"

Peter Hildebrand, working with ICTA,[25] developed an ingenious method for multi-disciplinary work in preparation for on-farm agricultural research.[26] A homogeneous cropping system among many farmers in an area was first identified. Hildebrand then took a team of five agricultural scientists and five social scientists to the area for a week. The team worked in pairs, one agricultural scientist and one social scientist. They went out each day and learned what they could from farmers and from others, returning in the evening to share experiences, take stock, and decide on further priorities. Each day the pairs changed so that each agricultural scientist worked for one day with each social scientist and vice versa. A report was written over the weekend. This was "not a benchmark study with quantifiable data that can be used in the future for project evaluation; rather it (was) a working document to orient the research programme."[27]

Hildebrand's method has been used to familiarize staff with an area in which they were to work, and to identify innovations which might be tried out directly with farmers. It could be adapted for other purposes. For project identification and appraisal, visiting teams might pair with themselves or with local officials. For monitoring and evaluation, it might be used to identify what changes have taken place and their causality. In principle, it might be applied in many fields including rural people as sondeo team members, natural resources appraisal, health and nutrition, and social and economic change. It might complement very nicely the Benor Training and Visit system of agricultural extension by helping to generate quickly recommendations of a sort which farmers would appreciate and be able to adopt. It provides a structure for mutual learning between disciplines, and its time-bound form and the mutual checking in the evening sessions provide a stimulus for speed and accuracy.

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24. Honadle, "Rapid Reconnaissance for Development Administration," pp. 636-637.

25. Institut de Ciencia y Technologia Agricolas, Guatemala.

26. Hildebrand, "Motivating Small Farmers to Accept Change" (Paper for the conference on Integrated Crop and Animal Production to Optimize Resource Utilization on Small Farms in Developing Countries, Bellagio, 18-23 October, 1978); and "Combining Disciplines in Rapid Appraisal: The Sondeo Approach," *Agricultural Administration* 8,6(1981):423-432.

27. Hildebrand, "Combining Disciplines in Rapid Appraisal," p. 429.

(v) Ad Hoc Local Research

Ad hoc investigations by national researchers or by local residents can be extremely valuable. The researchers may be university students, schoolteachers, or others. It may be important to avoid the tyranny of the pre-set questionnaire, unless it is very, very short, and to concentrate on qualitative insight (unless, of course, numbers are for some reason, vital). In a matter of a few weeks, a Murundi refugee student in Zaire investigated fishing among Barundi refugees and produced an excellent and practical report. A student who has links with a rural area can be not just a key informant but also a key researcher, able to find out very quickly and efficiently what needs to be known. (Conversely, urban-based, urban-biased students can be worse than useless).

(vi) Direct Observation

One danger with RRA is being misled by myth. Rural people (like others) often have beliefs about their values and activities which do not correspond with the reality. It is common to be told about a custom, but probing for the last occasion when it was practised reveals that it has either lapsed or perhaps was never practised at all. Conlin records[28] how he worked as a social anthropologist in an area in Peru where a former researcher carried out a survey. According to the survey results, people invariably worked together on each others' individually held plots of land. That was what people answered to the survey questionnaire. The belief was important to their understanding of themselves as a certain sort of people. Yet in one year's residence in the village as a participant observer, Conlin only noted the practice once.

However, direct observation may often not be possible with RRA; in that case, multiple checks on information about customs and practices are desirable. The importance of walking, seeing, and asking questions is a commonplace. One of the most effective, though time-consuming, ways of learning is by doing. John Hatch hired himself out as a laborer to farmers and found the labour requirement of maize cultivation to be fifty percent higher than that recorded in surveys besides learning much else from his farmer teachers.[29]

(vii) Key Informants

While there are well-known dangers, and cross-checking is necessary, key informants are a major tool for RRA. Some of the most useful are social anthropologists in the field. They are often very knowledgeable but do not fully realize what they know. If questioned, they can provide most useful insights and raise unexpected issues. Other key local informants are local officials (such as the agricultural

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28. Sean Conlin, "Baseline Surveys: an escape from thinking about research problems and, even more, a refuge from actually doing anything," RRA2.

29. John K. Hatch, *The Corn Farmers of Motupe: a study of traditional farming practices in Northern Coastal Peru.* Land Tenure Center Monographs No. 1, (Madison, Wisconsin: Land Tenure Center, University of Wisconsin, 1976).

extension worker, or the person in charge of the clinic), local leaders, and school teachers. They tend to be those who are better off, better educated, and more powerful. The biases this introduces need to be consciously offset by seeking out those who tend to be left out and uncontacted — women, and the poor people, who are often much better informed and articulate than outsiders are conditioned to expect.

Special efforts to identify key informants can pay off. In organizational appraisal, Honadle[30] asked staff a question on the lines: "In all organizations there is at least one pain-in-the-neck, there is always someone who disagrees with all decisions and promotes trouble. Can you tell the names of those people in your association?" Answers were immediate and enthusiastic; individual interviews with those named provided valuable cross-checks and revealed useful additional information. More generally, for any subject of interest, it is worthwhile spending time asking who, or which group of people, are most knowledgeable and then working with them.

(viii) Group Interviews

Group interviews have several advantages, including access to a larger body of knowledge, and mutual checking. They can also be seriously misleading when the questioner is believed to have power to control benefits or sanctions. They are especially useful for natural resources information, when a wider geographical area and subject matter can be covered than with one respondent. I have used this method for very rapid mapping of soil/vegetation associations in the northeast province of Kenya.

Group interviews may also be good for certain sensitive types of social information. To ask, for example, about land quality may arouse suspicion in an individual that his land may be subject to some penalty if he replies truthfully, whereas a group gathered together as people knowledgeable about farming will not feel so threatened.[31] Ladejinsky records of a landlord in Bihar: "He first informed us that he owned sixteen acres of land but corrected himself under the good humoured prodding of a crowd of farmers that he failed to mention another 484 acres. The lapse of memory might have had something to do with the ceiling on land holdings...."[32]

Convening specialised panels of local people who are experts on a subject can also be a revealing and efficient approach, besides being enjoyable and interesting for the experts themselves. For example, group interviews have been used to gather information rapidly on changes in infant feeding practices. Small clusters of five or six women of two or three generations were assembled, and past, present and expected future patterns of infant feeding discussed. "There was a self-correcting mechanism within the group because if one person put across an over-favourable

30. George Honadle, "Rapid Reconnaissance for Development Administration," p. 643.

31. Cecile Jackson, Sattar Mandal, and Ian Carruthers, "Notes on Rapid Land Ownership and Management Studies," RRA.

32. Wolf Ladejinsky, "The Green Revolution in Bihar," p. 9.

picture of her own or her group's behavior, a peer would give a more realistic observation. In cross checking with other groups a high degree of uniformity of information was found."[33]

(ix) The Informal Interview

The informal interview, without a questionnaire schedule, is perhaps the most widespread method of RRA.[34] It is an art, needing a sensitive balance between open-endedness and directed enquiry, identifying questions the outsider does not know how to ask, and yet covering the major concerns. Establishing rapport is not always easy, but is obviously crucial. Conviviality can help,[35] and not being in a rush.

A variant is the guided interview where there is no formal questionnaire but a checklist of questions which the interviewer uses as a flexible guide. Ellman's two-page checklist devised for appraisal of a rural refugee situation in Africa[36] and Carruthers' critical review procedure[37] are examples of approaches to interview without pre-set questionnaires but with an agenda to be covered. Collinson has developed this method with guidelines for discussion with farmers,[38] in which not all points are raised with each farmer, but through which a composite picture is built up over a number of interviews so that a scenario can be written. This is evidently an effective tool for diagnosing farming problems and opportunities in a matter of weeks, and can be used by investigators with a professional training but who lack extensive field experience.

(x) Aerial Inspections and Surveys

Jokes about airborne experts should not detract from the selective value of inspection and surveys from planes, or, often better, helicopters. The utility of aerial surveys for counting animals and for certain types of natural resource surveys is well established.[39] Less well recognised is their value for purposes more closely related to people. It is not just that they can give a general spatial perspective on an area, making possible in a matter of minutes broad overviews of land use, crop zoning, irrigation distribution, and the like; they can also offset the urban, tarmac, and roadside biases of rural development tourism, identifying where the poor

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33. Gill Gordon, "Finding Out About Child (0-5 Years) Feeding Practices," RRA2, p. 11.
34. See especially Rhoades, "The Art of Informal Agricultural Survey."
35. Thus Paul Richards, on failing to identify unasked questions, "Luck, persistence, a sixth sense and palm wine are potential antidotes, but palm wine is probably the best" ("Geography is a bottle of Heineken lager beer How to be the most boring person in development planning and still get your facts wrong," RRA1, p. 3); and Marie Therese Feurstein on rapport: "Good informal rapport can be established by moderate drinking, smoking, singing and particularly dancing or the playing of a musical instrument" ("Establishing Rapport," RRA2).
36. Ellman, "Rapid Appraisal for Rural Project Preparation," pp. 469-471.
37. Ian Carruthers, "A Mental Construct for Unstructured On-Farm Interviews," RRA2.
38. Michael Collinson, "A Low Cost Approach to Understanding Small Farmers," pp. 444-450.
39. Abel and Stocking, "Rapid Aerial Survey Techniques for Rural Areas," RRA2.

live – on the outskirts of villages, in scattered hamlets, and in more remote areas – and used to select such places to visit on the ground. One risk is that aerial inspection and surveys become substitutes for work on the ground and for learning from local people. An antidote is to fly with someone who is locally knowledgeable and who can interpret what is seen.

The earthbound appraiser's alternative of climbing a hill has more limited use but should not be neglected.

Other methods can be added to this repertoire: the use of small informal samples and very short lists of questions; transects, for example walking off at right angles from a road; specialised investigations seeking a narrow band of information, such as rural innovators' surveys to find out about a new practice; one-day consensus of users of services;[40] "piggy-backing" on research in progress by asking social anthropologists who are in the field or those conducting longitudinal surveys to investigate a question, adding it, as it were, to their list; or monitoring a small panel of families who are understood in social anthropological depth, with revisits at intervals to learn about changes and how and why they come about.[41] Hopefully enough has been said to show that RRA has a range of techniques which can be used singly or in combinations, and which for many purposes may be more cost-effective than either shorter or longer alternatives.

4. THE POTENTIAL OF RAPID RURAL APPRAISAL

Much good RRA is little more than organized commonsense, freed from the chains of inappropriate professionalism, and informed by continuous doubt and self-criticism. It has perhaps more to gain from the approaches of development social anthropology than from any other discipline. In its choice of method, it has to be eclectic, versatile, and inventive. Because it can so often be more cost-effective than either uncritical rural development tourism or the long approaches of traditional research, it deserves to be accorded more attention, more prestige, and more coverage in professional writing.

It has much to contribute to the project process. For identification, preparation and appraisal, it presents a battery of techniques which, if well used, should improve realism and subsequent performance, not least by providing relevant information and insight when it is needed. Less obvious, but at least as important, is the application of RRA to monitoring and evaluation. All too often, monitoring and evaluation are superficial, measuring indicators which do not reflect changes in well-being, or failing to penetrate multiple causality. Longitudinal applications of RRA can be used to monitor trends in indicators like real wages for agricultural labourers, in and out-migration, women's command over resources, and the nutritional value of children. In the social anthropological mode, and using various techniques, it can explore the great and crucial gaps in knowledge which surround

40. Godfrey Walker, "Notes on Rapid Appraisal of the Utilization of Rural Health Services," [illegible].

41. As used in a Save the Children Fund Project in Nepal. The approach was thought of by David Nabarro and developed in practice by him and Nigel Roberts. Roberts had described it in an unpublished paper, "Monitoring Field Programmes (A new role for a project visitor)," (June 1980).

causality and also help in assessing the counterfactual – what would have happened without the project. The dangers of RRA are as serious as its potential is large. Some superficiality and error are inevitable. The key to successful RRA is not to avoid superficiality and error completely, but to control them and achieve cost-effectiveness through optimal ignorance and appropriate imprecision.

The most critical factors are time and the personal commitment of appraisers. RRA, by its sparing demands for information, should release time which can be used for checking, for identifying unasked questions, and for noting and pursuing the unexpected. Above all, it should release time for more contact with and learning from the poorer rural people. In most investigations, whether quick or long, they are the residual category, the last in line, those least consulted (although their needs are greatest), and those whose problems are least well articulated (although they are the most acute). Shortage of time compounds the interlocking biases which shut them out. More time can be used to let them in. The danger is that RRA, by saving time, will merely mean that appraisers spend less time in the field, and the poorer remain, as in the past, unseen and unheard.

To prevent that requires personal commitment. It requires planning to spend longer time in particular places, to visit more remote areas, and to spend more time with those who are worse off. It requires that those who conduct rapid appraisals do not just put people first in their thinking, actions and priorities, but put the poorer people first of all.

If RRA can enable rural appraisers to spend more time more efficiently learning about and understanding the nature of rural poverty, then the choice, design and implementation of rural projects and programmes should improve. The poorer should then lose less and gain more. That may appear the naive faith of an optimist: but big changes occur through many small actions which build up into larger trends and movements. By outlining the scope and dangers of RRA, the hope has been to encourage more project appraisers to use it intelligently and to reinforce the commitment of those who see in it one way of putting the poorer people first.

RAPID APPRAISAL: THE EVOLUTION OF THE CONCEPT AND THE DEFINITION OF ISSUES

James Beebe*

If Rapid Appraisal is to be recognized as a useful development tool, it will be necessary for its present proponents to better define it, understand its limitations as well as its potential, and find ways of explaining it to others. Part of the problem, as identified in the working definitions of terminology provided to participants in this conference, is that "people often use different terms for the same thing and the same terms to mean quite different things." The purpose of this paper is to define some of the key issues relevant to Rapid Appraisal and to provide an introduction to how these issues have evolved. This paper does not attempt to provide a definitive history of Rapid Appraisal nor to review all of the available literature. Instead, this paper will examine the influence of several relatively available publications on the identification and definition of issues relevant to Rapid Appraisal.

Four different types of publications have helped shape the concept of Rapid Appraisal. These are: (1) publications that have argued the need of an approach to data collection that can be carried out quickly and with minimum investment of other resources, (2) publications that describe a general methodology for carrying out a Rapid Appraisal, (3) publications that synthesize the work done by others and make it available to a wider audience, and (4) publications that refine the methodology based on actual experience in carrying out Rapid Appraisal under different conditions.

Much of the work describing the need for the methodology and describing general methodologies were done by Robert Chambers, Peter Hildebrand and Michael Collinson during the nineteen seventies. The work of these individuals, as well as others working along similar lines, were brought together in two workshops at the Institute of Development Studies, University of Sussex, UK in October 1978 and December 1979. These conferences were very important in stimulating thought and in suggesting possible uses for Rapid Appraisal. Photo copies of papers presented in these conferences provided the first introduction of the concept to many of us. Others learned of the concept through the publications of papers from these conferences in *Agricultural Administration* (November 1981), the *IDS Sussex Bulletin* (October 1981) and the publication as a working paper by Development Alternatives of the paper by George Honadle (November 1979).

Publication of the book *Farming Systems Research and Development: Guidelines for Developing Countries* (Shaner et al. 1982) and distribution of Robert

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Rhoades (1982) paper "The Art of the Informal Agricultural Survey" were extremely important contributions to the evolution of the concept of Rapid Appraisal which focuses on agriculture. The Shaner book provides a summary of the approach as well as reproductions of papers by Hildebrand and Collinson. Rhoades' paper is an attempt to refine the methodology, especially regarding interviewing and the use of direct observation. My paper "Rapid Rural Appraisal: The Critical First Step in a Farming Systems Approach to Research" (Beebe 1985) distributed by the Farming Systems Support Project was an attempt to bring together ideas and to identify specific issues relevant to Rapid Appraisal and Farming Systems Research. Based on the literature I could locate, limited personal experience participating in Rapid Appraisal (Beebe 1982), and observation of Rapid Appraisals carried out by USAID funded projects in the Philippines, I attempted to provide suggestions on ways of dealing with some of the problems I could identify. By focusing on our collective experience implementing Rapid Appraisal as well as the different routes by which individuals have learned of and advanced the concept of Rapid Appraisal, this conference should be able to reach agreement on a list of issues relevant to Rapid Appraisal and, hopefully, agreement on ways of improving the methodology.

At least eleven issues face practitioners of Rapid Appraisal. Resolution of these issues determines what will be discovered and how results will be used. These issues are: (1) definition of the concept, (2) duration of the study, (3) participation on the Rapid Appraisal team, (4) research orientations, (5) structuring the research time, (6) information to be collected in advance, (7) use of interviews, (8) use of direct observation, (9) preparation of the report, (10) getting results factored into decisions, and (11) potential problems.

DEFINING THE CONCEPT

Rapid Appraisal is a way of organizing people and time for collecting and analyzing information where time constraints demand decisions before a local situation can be fully understood. Sometimes these decisions concern additional research such as the content of a formal survey or the focus of long term ethnographic research. Oftentimes decisions must be made immediately after the Rapid Appraisal on interventions such as cropping trials or other new technology. Even when the Rapid Appraisal will be followed directly by an intervention, the assumption is that information on the local situation will continue to be collected and organized. The intervention itself becomes a way of better understanding the local situation. Results of the intervention combined with the continued application of the research methodologies of Rapid Appraisal should serve to correct mistakes in the initial study, deepen understanding of the local situation, and modify initial and future interventions.

One of the strengths of Rapid Appraisal is the flexibility to adjust it to specific objectives. While much greater rigor in the use of the standard social science methodologies is needed, Rapid Appraisal can not and should not have a single standardized methodology. Local conditions, available resources and specific research objectives should always determine how Rapid Appraisal is implemented.

Because of the options available, the implication of the choice of specific research methodologies must be carefully considered.

The working definition of Rapid Appraisal proposed for this conference is broad enough to include almost any research activity:

> Any systematic activity designed to draw inferences, conclusions, hypotheses, or "assessments," which includes the acquisition of new information, in a limited period of time.

If agreement could be reached on the use of a more limited definition, some of the confusion surrounding the concept might be avoided. In my other paper on Rapid Appraisal (Beebe 1985:2), I suggested the following definition:

> a study used as the starting point for understanding a local situation; carried out by a multi-disciplinary team; lasting at least four days but not more than three weeks; and based on information collected in advance, direct observation and interviews where it is assumed that all relevant questions can not be identified in advance.

The phrase "Rapid Appraisal" is taken from the title of a workshop in October 1978 at the Institute of Development Studies, University of Sussex, UK. In addition to being called Rapid Appraisal or Rapid Rural Appraisal (Chambers 1983), research methods meeting the above definition have been referred to as "Sondeo" (Hildebrand 1982), "Informal Agricultural Survey" (Rhoades 1982), "Rapid Reconnaissance" (Honadle 1979), "Informal Methods" and "Reconnaissance Survey" (Shaner et al. 1982) and "Exploratory Survey" (Collinson 1981).

Rapid Appraisal has been described as: "modified survey" (Hildebrand 1982:289), "survey undertaken without questionnaires" (Shaner et al. 1982:73), "informal," "exploratory," "largely unstructured interviews combined with observation" (Honadle 1979:2), "organized common sense, freed from the chains of inappropriate professionalism" (Chambers 1980:15), and "a form of appropriate technology: cheap, practical and fast" (Bradfield 1981 quoted by Rhoades 1982:5)

DURATION OF THE RAPID APPRAISAL

The working definition of Rapid Appraisal suggested for this conference defines "rapid" as "limited time" and defines "limited time" as "probably well less than half a year, for any type of rapid appraisal under any circumstances, but usually a period of a few days or a few weeks." I do not disagree with the observation that the difficulty in specifying a minimum and maximum time period is that it depends on what it is being compared to in terms of the time it takes and what is to be accomplished. Nevertheless, I believe many of the potential problems that proponents face in defending the concept of Rapid Appraisal can be met by agreement on at least a minimum time. The most common problem is too much rushing and haste. The key to good rapid appraisal is allowing enough time to be observant, sensitive and eclectic and to follow up on leads (Carruthers and Chambers 1981:418). Anything less than four days is inadequate for carrying out discus-

sions, and for identifying, discussing, modifying and rejecting ideas that emerge from these discussions, and for putting these ideas together in a usable form (Chambers 1983:28). An appraisal that is too long may waste project time and cause participants to view the Rapid Appraisal as an end in itself instead of as a development tool. Anything less than four days is probably "Development Tourism," and anything more than three weeks probably puts too much emphasis on Rapid Appraisal. The flexibility inherent in Rapid Appraisal must extend to the definition of the term "rapid" even if a minimum and maximum time is stated. Likewise defining a minimum and maximum time does not preclude a series of rapid appraisals. Field experience under different conditions should provide guidance on whether there is a need for an explicit minimum and maximum time.

PARTICIPATION ON THE RAPID APPRAISAL TEAM

Team Size. Because of the important role of discussion between individuals involved in implementing Rapid Appraisal and the need for several perspectives, Rapid Appraisal is defined as a study carried out by a multi-disciplinary team. The argument that it is necessary to have an integrated and coordinated approach to research can not be used as an argument for having only one well-informed and intelligent person do it all (Chambers 1983:23). I propose not using the term Rapid Appraisal to describe studies done by one person.

Smaller teams are preferred to larger teams and a ten-member team as suggested by Hildebrand is probably too large. Members of large teams are more likely to talk to one another and less likely to listen and learn from others than members of small teams (Rhoades 1982:16). Large teams often intimidate rural people. Large teams are also more likely to be conservative and cautious, and to take longer to produce a report and recommendations (Chambers 1983:23).

Team Composition. Complex systems are more quickly understood by a team consisting of several disciplines. Rapid Appraisal teams that focus on agriculture will often have a mix of biological and social scientists and may include plant breeders, plant pathologists, economists, general agronomists, anthropologists, sociologists, agricultural economists and engineers (Hildebrand 1982:290). The disciplinary specialty of team members is not critical as long as several disciplines are represented. Both men and women should be included on the team (Shaner et al. 1982:74), and all team members should have some familiarity with all aspects of the system being investigated (Chambers 1983:23).

Teams should be composed of a mix of insiders and outsiders. It is assumed that some team members are already familiar with the area (may even be from the area and are likely to remain there) and will provide an insider's perspective to the problem. Other team members will be able to share experience and knowledge from the outside. The outsiders' participation can be extremely valuable to the insiders in identifying possible options and in noting constraints that might otherwise be overlooked. Outsiders also gain insights and knowledge that can guide their research activities away from the farm.

Experience implementing Rapid Appraisal should provide guidance on the best mix of team members for different types of Rapid Appraisal conducted under

different conditions.

Prior Training and Experience. The effectiveness of Rapid Appraisal is improved by including as participants individuals who have already participated in another Rapid Appraisal (Hildebrand 1982:292). Given the different approach to research required by Rapid Appraisal, the presence of even one person on the team who feels comfortable with the approach can mean the difference between successful research and frustration. It may be that at least some members of the team should participate in a trial-run Rapid Appraisal before doing one where the results will be used. Opinions differ on the need for team training before going to the field. Rhoades (1983:7) argues that because Rapid Appraisal is more art than science there is no substitute for experience as the teacher. On the other hand, Collinson (1982:48) argues the need for pre-Rapid Appraisal training. Specific pre-Rapid Appraisal training based on simulating Rapid Appraisal through the use of slides and role playing has been suggested by the Farming Systems Support Project at the University of Florida. Training in Rapid Appraisal has even been suggested as part of a program of administrative development and management training (Honadle 1979:54). Rhoades (1982:5) seems to provide the best answer as to who can do Rapid Appraisal. He asserts that anyone can do it – agronomists, extension workers, biologists, and social scientists as long as they have a little time, pencil, paper, common sense, and a down-to-earth approach to farm people.

Unless results from other field experience in the use of Rapid Appraisal suggest otherwise, it is proposed that: (1) it is impossible for an individual to carry out Rapid Appraisal and smaller teams are preferred to larger teams; (2) team composition is not critical as long as there is a mix of technical backgrounds and insiders and outsiders; and (3) special training and prior experience with Rapid Appraisal are desirable but not necessary, and professional training is not as important as common sense and good observational skills.

RESEARCH ORIENTATIONS

Implicit assumptions often determine to a large extent what happens during Rapid Appraisal and how the results are interpreted. This section of this paper will cover important research orientations with implications for Rapid Appraisal. These sections consider: (1) whether questionnaires and guidelines should be used and if guidelines are to be used, how long they should be; (2) whether the team should seek averages or emphasize variability; (3) whether to focus on problems or opportunities; and (4) whether to focus only on individuals or also look at groups and the community.

Questionnaires and Guidelines

I believe that survey research can not substitute for Rapid Appraisal as the beginning point for understanding a local situation because survey research assumes that the problem is already sufficiently known to articulate questions. Rapid Appraisal assumes that it is impossible to identify all relevant questions in advance. A

questionnaire can not identify unanticipated site-specific problems, and is limited to validating problems articulated by outsiders. While Rapid Appraisal is not guaranteed to succeed in identifying such problems, survey research based on a questionnaire can certainly not.

Survey research is also rejected as a Rapid Appraisal substitute because it does not consider data context and relies only on the prepared questions for data gathering. "Units are sampled and weighed, contexts are not" (Stone and Campbell 1984: 36). Especially when survey research is not based on prior qualitative research, it is subject to such serious non-sampling errors that the analytical and policy conclusions based on such studies must be questioned (Stone and Campbell 1984:36). The Rapid Appraisal based on intensive and qualitative field work is a better starting point for research because of its attention to context.

It is sometimes incorrectly argued that survey research is quicker and can be done with less experienced and less qualified researchers than Rapid Appraisal. While data collection by survey sometimes requires less time, data analysis almost always takes more time. Data usually must be coded, keypunched or entered into a computer and then analyzed in separate steps and at places removed from the research site. While survey enumerators may not have to make many independent decisions, good survey research can not be carried out without training and close field supervision

Survey research as a starting point for an activity where it is assumed that the individuals involved in the study will also be involved in the intervention deprives the participants of the opportunity for training and team building across disciplines and perpetuates the practice of having decisions made about the future of rural people by outsiders. Survey research has a definite role in investigating development problems. The argument here is that survey research should not be the first step.

Reports of Rapid Appraisals where short questionnaires have been successfully used may require careful consideration on when and how they might be used as part of the methodology of Rapid Appraisal.

Even if there is agreement that Rapid Appraisal can not be based on a questionnaire, there is considerable disagreement on the extent to which the team should develop hypotheses and general guidelines before starting the Rapid Appraisal (Shaner et al. 1982:74). The Exploratory Survey (Collinson 1982:49) at one extreme uses more than 11 pages of questions as guidelines. This detailed guideline is to be followed closely, with all questions being asked of at least some farmers. Interviews using such detailed guidelines are incorrectly referred to as "unstructured." At the other extreme, the Sondeo does not even offer a list of topics beyond what is proposed as an outline for the written report. Failure to offer specific questions appears to be premised on the belief that interviews should be very general and wide-ranging, "because the team is exploring and searching for an unknown number of elements" (Hildebrand 1982:291). It is claimed that a framework prepared before meeting farmers will predispose team members toward their own ideas, thereby blocking out opportunities to gain new insights.

This paper advocates the use of short guidelines prepared in advance, but cautions against too much reliance on them. "In this early phase the researcher is

like an explorer, making a rapid survey of the horizon before plunging into the thickets from which the wider view is no longer possible" (Rhoades 1982:5). While one may begin with guidelines, important questions and direction of the study emerge as information is collected. "One must be able to accommodate new information and adjust plans accordingly" (Rhoades 1982:7). Rhoades (1982:9) proposes the following short list of topics for a Rapid Appraisal focusing on agriculture:

- What are the agro-climatic zones?
- What are the principal crops?
- What is the cropping (or post-harvest) system?
- What are the types of farmers?
- What are the farmers' practices?
- Why do farmers follow these practices?
- What do they feel are their main problems?

The responses to these wide ranging questions are used to decide the specific topics to be emphasized during the remainder of the interview (Shaner et al. 1982:76). Even a comprehensive guideline need not be viewed as an agenda to be diligently worked through, but as an aid to memory and a reminder of what might be missed (Bottrall 1981:248 as quoted by Chambers 1983:25). "Not everything needs to be known. The key to rapid appraisal is to move quickly and surely to the main problems, opportunities and actions" (Chambers 1983:25).

The definition of Rapid Appraisal proposed in this paper is premised on the impossibility of identifying all relevant questions in advance. Research based primarily on the use of a prepared questionnaire is thus not consistent with this definition. Despite arguments against the use of very long and very detailed guidelines, the use of short guidelines is advocated but only if there is not too much reliance on them. In examining the experience people have had using guidelines in carrying out Rapid Appraisal, an important variable to consider will be the level of training and prior experience of the participants on the team. It may be that less qualified and less experienced teams will require more detailed guidelines, at least in carrying out their initial Rapid Appraisals.

Variability and Averages

Even though variability, especially in resources, may be the most important characteristic of a population, researchers who seek averages are likely not to perceive it. It is sometimes assumed that a rapid investigation should focus on identifying the characteristics of the average farmer, or average user of health services, etc.

Experience, however, has shown that within any given geographic area there are several important groups and different practices. Instead of trying to define the average, the Rapid Appraisal team is urged to seek variations in the general practices of the area (Shaner et al. 1982:76). For example, typologies of farmers can be based on factors such as the size of holding and the purpose of production as

well as the cropping system (Rhoades 1982:20). Trying to understand why variations occur helps the team understand why certain practices are used. Towards the end of the Rapid Appraisal, the team should estimate the approximate frequencies of different practices. Rhoades (1982:20), however, cautions that typologies are merely ways of organizing thinking and that people cannot be so easily stereotyped. There is real danger in automatically assuming that all members of a group will behave the same. Recognition of the tremendous variability present in most systems should lead to new research approaches that recognize the limited applicability of any given technology (Beebe 1978). Attention to variability should also lead to new extension approaches that present people with *options* that they can *adapt* to their existing systems as opposed to *packages of technology* that they are expected to *adopt* instead of their existing system.

Problems and Opportunities

Most Rapid Appraisal teams concentrate on identifying problems. While this can be a useful beginning point, it is not necessarily the most cost-effective approach since not all problems are worth solving (Chambers 1983:12). Determining whether problems are worth solving depends on costs, benefits and alternatives. The alternative is the exploitation of opportunities. A problem orientation seeks to diagnose the deficiency, evaluate present status against some original design specification and look for ways of easing constraints. An opportunity orientation seeks to identify the potential, evaluate the present situation against what might now be achieved, and look for ways of exploiting resources.

> "There is a sense in which some problems are opportunities. But not all are. And not all opportunities begin as problems. It is not a question of either a problem-orientation or an opportunity-orientation, but of a balanced mix. The recurrent danger is that preoccupation with problems will prevent the recognition and exploitation of opportunities" (Chambers 1983:13).

Since most research naturally tends to be problem oriented, the Rapid Appraisal team should give at least some attention to opportunities.

Individuals and Communities

Since most information is collected from and about individuals, the Rapid Appraisal team may fail to consider the importance of community organizations and groups. While an individual may appear to have control over a resource and to have freedom to make decisions without reference to others, community opinions may in fact govern decisions. Only a group can make certain decisions. Timing of agricultural practices may depend on labor availability and this may be determined by when others in the community time their practices. Timing of agricultural practices may have to be coordinated to prevent having the only crop ready for harvest and thus inviting damage by pests and predators (Beebe 1982:10). The

Rapid Appraisal team should carefully consider the influence of groups and the local community on the actions of individuals. Failure to do so can result in suggestions for change that will never be implemented.

STRUCTURING THE RESEARCH TIME

Opinions differ considerably on how to structure the time of a Rapid Appraisal, but there is almost universal agreement on the importance of dividing time between collecting data and team interaction to make sense out of the collected data. Interaction between researchers at the end of each day and at the end of the field work is essential in determining the success of the Rapid Appraisal. Collinson (1982:7) suggests that one of the three weeks devoted to the Rapid Appraisal be spent in team interaction and reaching conclusions.

Scheduling Rapid Appraisal time can ensure that time for group interaction will be adequate and that a variety of different activities can be covered in a short period of time. Hildebrand provides very detailed instructions for structuring time for the six-day Sondeo. Specific time is provided for general reconnaissance of the area by the whole team as a unit, with group discussions following each interview. This is followed by dividing the larger team into pairs. After each half or full day, the entire team meets to discuss what was learned and to formulate tentative hypotheses to explain the local situation. Following the discussions, the team pairs are changed to maximize interdisciplinary interaction and to minimize interviewer bias. After several days in the field, before the team returns to the field for more interviews, team members are assigned a written section of the report. After another half a day in the field, the team begins to write the report. All members work at the same location so that they can circulate freely and discuss points with each other. After at least one writing session together, team members return to the field to collect missing data. On the next to the last day of the Rapid Appraisal, each team member reads his or her written report to the group for discussions, editing and approval. As a group, the team approves and modifies the presentation. On the last day, after the report is read again section by section, conclusions are reached and recorded. When this is finished, the conclusions are read once again for approval and specific recommendations are then made and recorded.

Even before deciding on how to structure the Rapid Appraisal time, it is necessary to decide on whether to invest a preliminary visit by one or two members of the team (Chambers 1983:28). This advance team could be expected to explain the forthcoming Rapid Appraisal, find a place to work, arrange vehicles, identify a few local participants for the first interviews and request maps, reports, etc.

Experience implementing Rapid Appraisals should help better define how much time should be allocated to team interaction, the types of schedules that optimize the use of time and ensure time for group interaction, and when a preliminary visit by a team member may be useful.

INFORMATION TO BE COLLECTED IN ADVANCE

Chambers (1980:8) notes that despite the wealth of information in archives,

annual reports, reports of surveys, academic papers, government statistics, etc., Rapid Appraisal participants tend to ignore them and to start *de novo*. This failure to collect basic data in advance of the Rapid Appraisal means that field research time is wasted in collecting already available data. It also means that important research leads and topics suggested by this material may be missed.

Secondary data often provides good information on physical environmental factors such as rainfall patterns, soil types, etc., but usually contain little information about actual behavior and inadequate information on the socioeconomic and biological aspects of the local system (Shaner et al. 1982:73 and Honadle 1979:39). The amount of data to be collected in advance should be a factor of the specific Rapid Appraisal objectives, the available resources for data collection, and an assessment of data validity.

Sources of secondary data include the national census, reports of village administrators, local marketing or credit offices, local extension service, local publications, consultant studies (Shaner et al. 1982:72), feasibility studies, design documents, evaluations, administrative reports, and organizational by-laws (Honadle 1979:39).

Since one of the most difficult early decisions in many Rapid Appraisals is defining the geographical region to be studied, Rhoades (1982:8) suggests the use of aerial photos, and land-use, relief, or ecological maps. "In fact, do not even think of going to an area without at least one map, preferably a topographic map."

A Rapid Appraisal uses interviews and direct observation to build upon information collected in advance. Information collected in advance will (1) save time and suggest additional areas of inquiry for the Rapid Appraisal; (2) be more valid on physical and environmental factors than on socioeconomic and biological aspects of the local system; (3) be determined by the objectives of the study; and (4) often should include maps or aerial photos.

INTERVIEWS

An important way of learning about local conditions is to ask local participants what they know. Individual knowledge, however, varies greatly. People also differ greatly in their willingness and verbal capabilities for expressing information (Pelto and Pelto 1978:73). Some are widely knowledgeable, whereas others depend on their friends for routine information.

Seven related issues concern interviews as part of Rapid Appraisal: (1) selection of respondents, (2) individual versus group interviews, (3) timing of interviews, (4) strategies for getting the most out of interviews, (5) use of interpreters, (6) note taking, and (7) appropriate locations for interviews. It is assumed that Rapid Appraisal interviews do not use a formal questionnaire but at most a checklist of questions as a flexible guide. The interview is usually the most important research methodology used by the Rapid Appraisal.

Selection of Respondents

Two types of individuals are usually interviewed. The "individual respon-

dents" can tell about what they actually do with special attention to their role in the system being investigated, while the "key informants" with their more extensive knowledge can talk about the system beyond their own limited participation.

Interviews are conducted with an opportunity sample of purposely selected "individual respondents" who are likely to be beneficiaries of any program being planned or implemented. They should be chosen because they represent a cross section of the expected target population. An opportunity sample of farmers would include farmer leaders, farmers who have tried recommended technologies, innovative farmers who have successfully developed improved technologies, women farmers who are both members and heads of households, farmers who represent major cropping systems in the area, very poor farmers with very limited resources, and traditional farmers who have resisted new technology. The bias of interviewing only men must be avoided. "Normally all family members are involved in agricultural decision-making and especially in regions of high male labor outmigration, women, old people, and children are the backbone of farming (Rhoades 1982:13).

Following Honadle's (1979:45) strategy for avoiding biases when investigating organizations, the Rapid Appraisal team could ask for the names of one or more people who disagree with all decisions, generally promote trouble, and never cooperate with development programs. Responses from these persons should provide valuable cross-checks and reveal useful insights that may not result from the other interviews. Better information is collected from "individual respondents" when it is clear to both respondent and Rapid Appraisal team members that questions concern only the individual's knowledge and behavior, and not what he or she thinks about the knowledge and behavior of others.

Key informants, however, are expected to be able to answer questions about the knowledge and behavior of others and especially about the operations of the broader systems. Key informants are accessible, willing to talk, and have great depth of knowledge about an area, certain crops, credit, marketing and other problems. Key informants relevant to a Rapid Appraisal focusing on agriculture might include bankers, landlords, ministry officials, merchants, middlemen, extension agents, buyers of agricultural products and suppliers of inputs. It is worthwhile spending time asking who, or which group of people, are most knowledgeable, and then working with them (Chambers 1980:13). "Do not believe everything key informants say but do not pass up the old-timers who enjoy talking" (Rhoades 1982:14).

Only experience implementing Rapid Appraisals will indicate the usefulness of these concepts for team members. Even if one assumes it is important for the Rapid Appraisal team to: (1) be able to differentiate between "individual respondents" and "key informants;" (2) purposely select "individual respondents" to represent the variability that exists within the community; and (3) select "key informants" to include individuals able to describe the broader system beyond their own direct participation, a way of communicating these concepts to Rapid Appraisal team members will have to be found.

Interviewing Individuals and Groups

Group interviews can be extremely useful in collecting information such as: (1)

natural resource information (traditional names for soil types and their location), (2) local histories (age of the community), and (3) depending on the culture, certain sensitive information (land quality and size of landholding). Group interviews can be used in some cultures to collect information on topics where an individual may be penalized if he or she replies truthfully, but where a group talking about the community may not feel threatened (Chambers 1980:14). Often similar topics can be taken up in interviews with group and "key informants." Group interviews where individuals are free to correct each other and discuss issues can identify variability within the community and prevent an atypical situation from being confused with the average.

Honadle (1979:39) refers to group interviews as an informal "delphi" technique. Informed persons are engaged in a dialogue designed to expose varied interpretation of events, policies or objectives. The investigator makes extensive use of "What if?" questions to develop a logical sequence and to focus participant attention on different contingencies. Group interviews must be skillfully orchestrated to be effective.

Experience suggests that group interviews may reveal what people believe are preferred patterns as opposed to what actually exists. A very detailed description of the local crop rotation system by a group of farmers was later found not to be practiced by any of them exactly as described (Beebe 1982). Even when some topics have been covered by a group interview, the same topics should still be covered with individuals. The question changes from "What do people here generally do?" to "What do you do?". Because the presence of others often influences answers, those who are present during an interview should be noted. The presence of the local health worker will influence a mother's comments about the health service she has received.

The number and length of interviews are assumed to be determined by common sense and local conditions. Relatively homogeneous populations require fewer interviews than highly heterogeneous populations. Collinson's (1982:49) suggestion of spending between one to two hours per farmer, however, is probably a good guideline for all individual respondent interviews.

In summary, skillfully orchestrated group interviews would seem to have an important role in Rapid Appraisal. Group interviews are useful in collecting certain information and in providing important leads for further investigation. Many topics taken up in group interviews will also need to be covered in individual interviews. The Rapid Appraisal team should (1) note the possible influence on responses of the presence of others; (2) where possible conduct some interviews without the presence of others; and (3) limit interviews to between one and two hours.

Scheduling Interviews

The timing of the interview can be extremely important and the interviewer has to be aware of the daily work schedule, seasonal activity, work habits, climate, and their effect on respondents' willingness to talk (Rhoades 1982:15). While it is desirable to observe operations, the sensitive interviewer will ensure that the interview does not hamper important work.

The Rapid Appraisal team should be aware of the impact of timing on the responses and where possible, choose the optimal season and the time for interviews. Both the season and time, and their possible impact on the interview should be recorded.

Getting Better Information from Interviews

The Rapid Appraisal team should get people to talk on a subject and not just answer direct questions. The interview should be a dialogue or process where important information develops out of casual conversation. The key to successful informal interviewing is to be natural and relaxed while guiding the conversation to a fruitful end. "Talk with people and listen to their concerns and views" (Rhoades 1982:17). Rhoades (1982) recommends the following to improve the interview:

"Don't pull out an official-looking questionnaire."
"Oversized vehicles bearing official looking numbers driven by chauffeurs should, if possible, be avoided."
"Walk as much as possible."
"Do not go in large numbers."
"Be sensitive to the fact that people may be suspicious of you."

To get respondents to talk instead of just responding to questions, they can be asked to tell their life histories. Other techniques for increasing dialogue include the use of ratings and ranking where the respondents are asked to group or rank a series of occupations, problems or other lists of items. Respondents can also be asked to complete in any way they want statements where the first few words are provided (Pelto and Pelto 1978:78-94). One suggestion for collecting some quantitative data as a first step towards a formal survey is the use of ranking scales developed from responses to the open-ended question: "What is the most important problem you have in producing...? The second most important, the third, and so on...?" It should be noted, however, that concerns elicited through this approach will depend upon the season (Rhoades 1982:24). Traditional board games such as "count and capture" to get farmers' perceptions of weeds, pests and farm methods can also be used (Barker 1978).

Better ways of getting answers other than asking straight questions are numerous. Even as the Rapid Appraisal team works to improve the quality of dialogue with respondents based on questions, team members should experiment with other ways of getting respondents to talk about the subject under investigation. It should be possible to identify specific ways of getting respondents to talk about different subjects and to identify ways of helping team members use them based on the actual experience of people in carrying out Rapid Appraisal.

Use of Interpreters

Ideally all members of a Rapid Appraisal team should speak the local language. In the real world, one or more members of a Rapid Appraisal team may not

speak the local language and an interpreter will have to be used. Interpreters should be chosen carefully to ensure that they understand the questions. Before the interview, the team should go over the interview strategy with the interpreter, emphasizing that the team is interested in more than just "answers" to "questions."

The interpreter should not be physically between the speaker and the person being interviewed, but rather beside or slightly behind so that his or her function is clearly indicated. The team member should speak in brief sentences using a minimum number of words to express complete thoughts. The interpreter should be given time to translate before proceeding to the next thought. The team member should talk directly to the respondent, as if the respondent could understand everything said (Bostain 1970:1).

Taking Notes

Opinions differ over the desirability of recording information in front of respondents. Some believe that writing down the information during the interview restricts the spontaneity of respondents' reactions (Shaner et al. 1982:74). Others recommend writing down everything and keeping complete field notes. Rhoades (1982:19) points out the obvious, "Whether one should take notes...depends on the situation." Experience with different subjects under different conditions should provide guidance on whether notes should be taken.

Location for Interviews

As a general rule interviews should be conducted under conditions most relevant to and revealing about the local system being investigated.

> "The successful survey may require sloshing through muddy fields, scrambling along rocky paths and dangerous slopes, or whiling away hours in fly-ridden tea shops casually talking with farmers. The surveyors must be country-oriented, grubbing out information in fields, market places, bars, or wherever farmers' daily routines carry them" (Rhoades 1982:7).

For agriculture, wherever possible, interviews should be carried out in farmers' fields with visible evidence of farmers' management before the Rapid Appraisal team (Collinson 1982:20; Shaner et al. 1982:73; and Rhoades 1982:7). Interviews in the field permit more confidential discussions. Actual observation whether farming, child rearing practices, cottage industry, or interaction with government agencies permits the identification of new topics for discussion. The Rapid Appraisal team should always note where interviews were conducted.

USE OF DIRECT OBSERVATION

Direct observation is an important Rapid Appraisal tool that can be used to validate data collection in advance, provide multiple checks on data collected from

interviews, and suggest additional topics for interviews. Direct observation prevents Rapid Appraisal from being misled by myth (Chambers 1980:12). Since rural people, like others, sometimes have unrealistic beliefs about their values and activities, direct observation and multiple checks on information are desirable. The Rapid Appraisal team should keep their eyes open for patterns (Rhoades 1982:14). Rapid Appraisal depends on walking, seeing and asking questions.

Direct observation of "key indicators" often provides more valid and less costly information than other research methods. The use of "key indicators" for Rapid Appraisal is discussed in detail by Honadle (1979). Examples of key indicators include: (a) soil color to indicate particle size distribution, fertility, and drainage properties (Stocking and Abel 1979 as quoted by Chamber 1980:9); (b) birth weight of children to indicate health and nutrition in an area; (c) housing to indicate poverty or prosperity (Honadle 1979:14); (d) soap inventories in village shops to indicate changes in purchasing power (Honadle 1979:19); (e) the appearance of new bicycles and sewing machines in areas adjacent to a project activity to indicate degree of trickle down of benefits (Honadle 1979:10); and (f) transfers and turnover in organizations to indicate organizational capability.

Where locally accepted a camera can be an important research tool for direct observation. Photos can be used to document conditions before an intervention. Sometimes the Rapid Appraisal team can do a favor by sending or returning with photos (Rhoades 1982:19).

One strategy for improving observational skills is to record only actual observations in the field notes. Field notes should contain what is actually seen and heard as opposed to the observer's interpretation of the event. Far too often the field notes will say something like:

> Clean drinking water is a problem.

The more useful field notes would report:

> The village headman said that clean water is the most important problem.
> Only two pumps were observed and one of them was broken.

Field notes limited to careful observations can often prevent the observer from imputing false meaning to people's actions (Honadle 1979:42).

Direct observation can be as important as interviews for Rapid Appraisal. Thus the Rapid Appraisal team is encouraged to use special techniques that can improve direct observation such as: "key indicators" as proxy measures and cameras. Finally, to improve observational skills, the Rapid Appraisal team is encouraged to maintain carefully written field notes. Experience shows identify both general techniques for improving direct observations as well as specific techniques for specific topics.

All proposals for improving the methodology of Rapid Appraisal require validation under field conditions of their usefulness and importance, and the identification of ways of training team members to make use of them.

PREPARATION OF THE REPORT

The Rapid Appraisal is not complete until the report is finished. The descriptions of the Sondeo includes specific suggestions for preparing the report that may be relevant to most Rapid Appraisals. Team members are assigned a portion of the report to be written on the fourth day. With all members working at the same location, individual sections of the report are drafted and additional trips are made to the field if data is missing. Each team member reads his part to the group for discussion, editing and approval. The team approves or modifies the individual sections of the report. On the final day, following a repeat reading of each section, conclusions are drawn and recorded. Upon approval of conclusions on second reading, specific recommendations are made and recorded.

The organization of the report is not as crucial as the need to finish it quickly. Initially the team should not worry too much about grammar and style since re-writing can come later. "It is important to get the information down while still fresh on everyone's minds" (Rhoades 1982:26). The goal is to write a report that reflects the interdisciplinary nature of Rapid Appraisal.

GETTING RESULTS FACTORED INTO DECISIONS

"Good rapid appraisal will be bad rapid appraisal unless it leads to better performance" (Chambers 1983:30). Most Rapid Appraisal models assume that since the Rapid Appraisal team will be involved in the decisions, results of the Rapid Appraisal will be factored into the decisions on subsequent interventions. Experience in the Philippines, however, suggests that even when subsequent activities are implemented by the same team members, the Rapid Appraisal results are not always used in making decisions (Farming Systems Development Project-Eastern Visayas 1983:32).

The failure to base subsequent activities on the Rapid Appraisal findings can be explained in several ways. It is easy to overlook the overriding role in final decisions of non-team members such as senior government officials, researchers and experts from universities, and representatives from funding agencies. Their role in decision making may argue for their inclusion in the Rapid Appraisal team. Since this is not always possible, decisions influenced by non-team members should be documented. Perception of team members of the likely type of intervention to follow the Rapid Appraisal may prevent the team from considering other problems that are even more important. Even problems for which there are no recommended actions or proposed solutions should be documented in the report.

Chambers (1983:15) makes three recommendations to increase the chances of Rapid Appraisal influencing decisions:

a. full involvement of project staff,
b. meshing with current programs including budget allocations,
c. priority to what can be done soon.

The most critical element in ensuring the use of the Rapid Appraisal results is not to let the report be shelved away "only to gather dust" (Rhoades 1982:26). The

Rapid Appraisal should be the guide for the future and should constantly be upgraded as the activity progresses. The Rapid Appraisal report should include "updates" at given intervals such as every six months. Updates should be based on new data and better understanding of the situation. Updates should identify and justify present activities inconsistent with the original report. The experience of other Rapid Appraisals should indicate whether this is a widescale problem and the specific conditions that appear to be associated with either the utilization or the non-utilization of results. It may not be enough to assume that Rapid Appraisal results will be factored into decisions, instead specific strategies may be needed to increase the chances that results will be used.

POTENTIAL PROBLEMS

If Rapid Appraisal is to be a useful research tool, several pitfalls must be avoided. These include over reliance on the initial findings, too much focus on Rapid Appraisal as an end in itself, insufficient time and effort resulting in "Development Tourism," failure to recognize the differences between Rapid Appraisal and a baseline study, and lack of agreement on what constitutes Rapid Appraisal resulting in serious questions about the confidence that can be placed in the data.

Diagnosticism. The belief that a quickly done Rapid Appraisal at the outset of a project can provide a sufficiently valid understanding of the situation to serve as bases for all future interventions is dangerous. The Rapid Appraisal is best used as a heuristic device to initiate additional formal studies and interventions. Results of participant observations and additional formal studies that document the response to interventions can eventually lead to sound conclusions. Price (1982:4) suggests that the final conclusion will usually be at odds with the initial appraisal since first guesses are often wrong. Initial guesses given undue credibility because they are results of Rapid Appraisal can lead to irrelevant research.

Inappropriate focus. Investing too much time and effort in Rapid Appraisal can delay a project. It can also confuse the uses of Rapid Appraisal as a tool and as an end product. Recognizing the limits of Rapid Appraisal can prevent inappropriate focus. The objective should not be to produce good Rapid Appraisal reports, but rather to do good Rapid Rural Appraisals that will produce information for better decisions.

Development tourism. Rapid Appraisal when carried out with insufficient time and inadequate planning is nothing more than "development tourism — the brief rural visit by the urban-based professional" (Chambers 1980:2). The same biases that cause development tourism to underestimate rural poverty apply to Rapid Appraisal done incorrectly. These include (1) roadside bias although it is known that poorer people are often out of sight of the roadside; (2) project bias since only places with projects are visited; (3) bias of personal contact since those met by rural tourists tend to be less poor, more powerful, men, service users, adopters, active, non-migrants, and "inevitably, those who have not died;" (4) dry season bias since most travel occurs during the post-harvest dry season while the worst time of the year for poorer people is the season before harvest; (5) bias of politeness and protocol since courtesy and convention may deter rural tourists from enquiring

about and meeting the poorer people (Chambers 1980:3).

Other potential problems Rapid Appraisal shares with Development Tourism include: (1) too much attention to the observed things and activities, but not enough to the relationships (seeing the indebtedness but failing to see the relationship of interest rates, wages, patron client relations, etc.); (2) failure to recognize that what is seen is a "snapshot," a moment in time and not trends that may be more significant; (3) failure to recognize gaps left by disciplines which are not represented among the team and the less obvious gaps which lie between the disciplines themselves and their traditional territories and concerns.

Trying to do Rapid Appraisal in less than four days will usually result in development tourism. General adherence to the use of a multi-disciplinary team and combination of semi-structured interviews, information collected in advance, and direct observations will minimize problems of development tourism.

Baseline studies. Since the Rapid Appraisal collects only limited quantifiable data, and since the sample is an opportunity sample, purposely chosen and not a random sample, its future use for project evaluations is limited (Hildebrand 1982:292). Even though it is a mistake to think that a Rapid Appraisal can replace a baseline survey, the Rapid Appraisal provides an important first step for considering difficult questions of evaluation on impacts, trends and causality (Chambers 1980:16).

Checklists and confidence in the data produced. Flexibility in adapting Rapid Appraisal to specific study needs and available resources is the most important strength of the methodology. The same flexibility that is so critical to making the study relevant to the local situation, when abused permits individuals to do anything, on almost nothing, and call it "Rapid Appraisal." The lack of agreement on what constitutes Rapid Appraisal and the lack of discussion on methodology in most Rapid Appraisal reports make it difficult to estimate the degree of confidence that can be placed in the data (Honadle 1979:3). Standard methodology could solve this problem but only at the expense of the needed flexibility. The alternative to standardization is to document the methodology as part of the Rapid Appraisal report.

A checklist to be attached to the Rapid Appraisal is proposed below. In addition to allowing readers to judge the quality of the work, this checklist will remind the Rapid Appraisal team of important issues during the appraisal. Field experience with the use of checklists is necessary to determine whether they are useful and what they should contain. Separate checklists may need to be developed for specific types of Rapid Appraisals.

SUMMARY AND CONCLUSIONS

It is argued here that the Rapid Appraisal should be the key first step in identifying problems. Rapid Appraisal is proposed as a way of organizing people and time for collecting and analyzing information where time constraints demand immediate decisions before the local situation can be fully understood. Rapid Appraisal provides the starting point for gaining better understanding, over time, usually through a combination of additional formal studies, documenting the re-

sponses to interventions, and participant observation. Rapid Appraisal assumes that in the beginning not enough is known of the problem to articulate specific questions. Since questions needed to investigate the problem can not be articulated, survey research based on questionnaires can not substitute for Rapid Appraisal.

An important advantage of Rapid Appraisal is its flexibility. To standardize the methodology would limit this flexibility. Yet, to make Rapid Appraisal more useful and to prevent it from falling into the traps of "development tourism" there is a need to establish minimal requirements, to use more efficiently standard tools of social science, and to pay closer attention to the implications of the choice of research tools and research assumptions.

To achieve these objectives there is a need for agreement on a definition of Rapid Appraisal and general guidelines for implementing them. Agreement on these can only be expected when there is extensive field experience and analysis of this experience. Pending this, the following are provided as tentative suggestions of the types of guidelines that could be developed:

(1) use at least four days but not more than three weeks;
(2) use a small team with a good mix of technical backgrounds;
(3) use short guidelines as memory aids and increase attention to variability, opportunities, and communities and groups;
(4) structure research time to allow for team interaction;
(5) use information collected in advance;
(6) improve the quality of interview information through careful selection of individual respondents and key informants, use of group interviews, use of strategies other than asking straight questions, correct use of interpreters, and combined interview and direct observation;
(7) improve the quality of direct observation by using special techniques, key indicators and cameras;
(8) complete a single team report quickly;
(9) ensure that results of the report get factored into decisions;
(10) avoid the potential problems of diagnosticism, inappropriate focus, development tourism, and confusion with baseline studies; and
(11) use data checklists to remind team members of important issues and to enable an outside reader to determine the level of confidence that should be placed in the study.

CHECKLIST FOR RAPID APPRAISAL DATA COLLECTION

Title:[1] .....

Objectives: .....

Field work dates: .....

Report completion date: .....

Rapid appraisal team composition:

Name	Occupation/ Technical Background	Language[2]	Local[3]	Experience[4]
1.				
2.				
3.				
4.				

Number of hours spent in field collecting data: .....

Number of hours spent by team in discussions of data: .....

Information collected in advance and reviewed by the team: .....

.....

Types of information collected by direct observation: .....

.....

Number of individual respondents interviewed: .....

Method of selection: .....

Place of interviews: .....

Among individual repondents approximately what percent were:

women.....%, old people.....%, youth.....%

from among the poorest 25 percent.....%

1. Title: should include the name of the geographic or administrative unit and the unit of analysis
2. Language use categories
   1. Exclusive use of respondents' first language
   2. Use of respondents' second language
   3. Mixture of respondents' first and second languages
   4. Mixture of respondents' languages and use of interpreter
   5. Exclusive use of interpreters
3. Categories for whether local or outsider:
   1. From site, living and working there
   2. From general area, but not living and working in the site
   3. From outside the area
4. Categories for prior experience
   O. No prior experience doing Rapid Appraisal
   1. to n. Number of prior Rapid Appraisals.
   T. Participation in a training course on Rapid Appraisal

from among the 25% who live farthest from the road.....%

(note average distance in km. from road)

from significant ethnic or cultural minorities.....%

from those identified as "trouble makers".....%

Number of key informants interviewed: .....

Method of selecting key informants: .....

.....

Positions/occupation of key informants: Topics they reported on .....

.....

Topics for group interviews: Composition of groups .....

.....

Date set for reviewing and updating this report: .....

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A CONCEPTUAL BASIS FOR METHODOLOGICAL DEVELOPMENT IN RAPID RURAL APPRAISAL

Terry B. Grandstaff and Somluckrat W. Grandstaff

A degree of ambiguity or conflict in the definition of Rapid Rural Appraisal (RRA) exists among those who commission or conduct this type of activity, concerning who should do RRA, how long it should last, what its uses are, and how it should be done. How RRA is viewed, or defined, obviously affects how the activity is conducted. Without consensus, RRA becomes whatever it is people do who refer to their activity by this term. But existing definitions seem either too broad (almost anything goes) or too narrow (somewhat arbitrary, or context specific). If defined too broadly, RRA may look less impressive or useful than many of its practitioners have found it to be; if too narrow, rivalies may occur of a sort that inhibit rather than advance understanding. Either situation can do damage to a methodological realm unfortunately already beset from the beginning by questions of legitimacy.

A good comprehensive definition of RRA is hard to come by for at least two reasons. On the one hand, RRA is still an emerging subject and questions still exist that can only be answered by further experience. Many research methods that are well-defined today went through similar evolutionary transitions. On the other hand, it is recognized, even by those who prefer relatively narrow definitions, that one of the principal values of RRA is its ability to be flexible and innovative, the very opposite of a lock-step methodology. This, too, makes it hard to define. The confusion about RRA is not simply one of definition in a strict sense (e.g., key features that distinguish it from other research forms). Rather, we need a comprehensive understanding of what RRA is and is not in order to answer some very important questions about methodological development and training. For example: How detailed should RRA training be? What methods, tools and techniques can be used universally and how can one develop others for specific contexts? How can experimentation with RRA methodology be conducted in the most efficient manner to find out what works best? Many questions of this sort cannot yet be answered, but perhaps guidelines can be found, or some sort of strategy for going about finding answers.

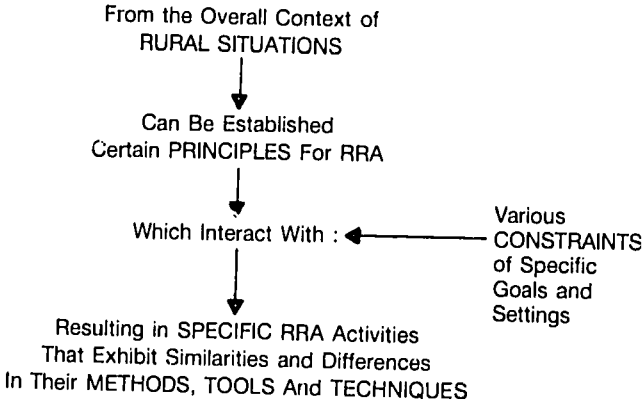
One strategy to alleviate some of the confusion about RRA (that is compatible with both the above reasons for the present confusion) is to focus on how underlying principles involved in RRA interact with various goals and contexts of RRA to produce similarities and variation in methods, tools and techniques. To do this, one needs to examine all the principles, goals and contexts, and the activities themselves. At the present state of RRA development, no one individual or institution could adequately conduct such an examination. An international conference, such as the present one, is needed to undertake it. Some sort of workable conceptual framework might make the task easier, however. The present paper

proposes a candidate framework in the abstract, then elaborates this framework with certain principles and contexts that affect RRA methodology. Finally, we will use examples to illustrate the process by which principles and context interact. This may give us some ideas on how to go about finding the "core" of RRA.

INITIAL CONCEPTUALIZATION

Figure 1 proposes that the similarities and differences in the ways RRA is conducted are the result of two conceptually different sets of factors : (1) the overall context in many rural areas of the world, from which certain principles about the role of RRA can be derived, and (2) a multitude of factors in the goals and settings of specific RRAs. Presumably, initial methodological guidelines spring from the principles in a more or less deductive fashion, but they are then "operated on" by the constraints of various RRA goals and settings. These constraining effects of specific RRA contexts are uncovered more or less inductively, as RRA experience accumulates. To the extent that the goals and settings are similar, or ways can be found to alleviate some of their constraints, methodological similarity among various RRAs, increasingly occurs as we learn from experience what works best. Perhaps this then becomes the "core" of RRA. To the extent that the constraints are different and non-adjustable, they produce methodological differences that must be developed and taught to suit particular situations. (They may, however, be amenable to classification at higher levels of generalization – a point we will return to later in the paper.)

Figure 1 Initial Conceptual Model to Begin Examining Methodological Development Process in RRA



PRINCIPLES FROM THE NATURE OF RURAL SITUATIONS

Most advocates and practitioners of RRA stress the exploratory aspect (flexible, open-ended, not all questions known in advance, able to find the unexpected and redirect research to examine it, etc.). Another aspect usually stressed is the use of a multidisciplinary team. A third aspect, of course, has to do with speed, which we would like to redefine as "rapid learning," for reasons which will become clearer below. In this section we will argue that the nature of rural situations in many areas of the world has created a demand for forms of rural research that are "interdisciplinary," "exploratory," and "rapid learning," and that these can be taken as principles of RRA. When these three are considered together, more specific principles emerge, especially rapid "iterative" learning through intensive interaction with local rural inhabitants.

The need in many areas of the world for rapid learning methodologies that are both exploratory and interdisciplinary can be traced ultimately to the fact that, at least in terms of demographic transition, these areas have evolved differently from rural areas in countries that first underwent industrialization. Early industrialization preceded the rapid population growth brought about by the imbalance between birth and mortality rates experienced in recent times. Early industrial labor demands created "pull factors" that drew people off farms into industrial centers, while the industrialization of agriculture replaced labor with machines operating at increasingly larger scales on the most suitable lands, as capital-intensive technologies were used to sustain agricultural output at a level (more than) sufficient to feed the increasingly urbanized population. As time went on, these societies were also among the first to decrease their birth rates. In many other areas of the world, however, rapid population growth has preceded industrialization, at a time when capital-intensive technologies have become dominant. The high rural population densities now found in many of these societies, particularly in Asia, were never experienced in the earlier-industrialized countries. Rural overpopulation, declining farm size, dependence on increasingly marginal land, and stagnant agricultural productivity are creating "push factors" for migration into urban centers, straining industrial absorption capacity.

Sociocultural and biophysical diversity or complexity is characteristic of many such rural areas, moreso than in societies that underwent industrialization earlier. Many tropical areas of the world exhibited greater ecological complexity and diversity in the first place, and increasing use of marginal land further complicates the situation. Sociocultural diversity is connected to biophysical variation through resource practices, and endures when communications are restricted. In any case, with large rural populations and small farms, such characteristics become more of an issue in the ways standards of living and resource utilization practices are affected.

Industrialized commercial farming, technologically intensified but ecologically simplified, is less easily employed in many rural areas of the world partly because there are too many interdependencies in local situations and the potential gains are not worth the losses: land leveling losing scarce topsoil, pesticides in rice paddies killing fish, fertilizer in swiddens increasing weed growth, irrigation causing schistosomiasis, waterlogging and salinity, etc. Market instability, lack of cash for invest-

ment, and farms too small to justify expensive inputs are other drawbacks. Ultimately, however, the arithmetic for this kind of solution restricts its application, as long as agricultural producers are more than a fraction of the total population. In many countries they vastly outnumber non-agricultural populations, and will do so for the foreseeable future. The major need in such situations is not for increased agricultural production to feed the cities, but rather for increased standards of living for the enormous rural populations that cannot be absorbed in urban areas.

Many rural inhabitants today will not be able to make the changes needed to adopt most existing tools and techniques that were designed for larger markets, bigger farms, higher finances and better land or simpler biophysical environments. We are left with the conclusion that improvements in standards of living in rural areas will have to occur in ways more tailored to the particular rural settings in which rural societies exist. This will require far greater *knowledge* about rural situations than was necessary for the industrialized farming solutions that began in other areas in other times. Rural inhabitants know a great deal about their local environments, but there is a limit to what local communities and households can by themselves accomplish with local resources. The resources of the larger society — markets, industry, research, technology — will be needed as well.

The need for exploratory interdisciplinary research methodologies arises from the necessity of drawing on the resources of the larger society to help create better standards of living for rural inhabitants. People and institutions outside the local setting will have to be involved, but in a way more cognizant of local sociocultural and biophysical conditions than ever before. A very real and sizeable knowledge gap exists that will have to be overcome. Rural complexity and interdependence demand an interdisciplinary approach, whereas rural diversity and the size of the knowledge gap itself require that the approach be exploratory in nature, capable of finding the unexpected and redirecting effort to understand it.

It can be argued that even in highly industrialized countries a knowledge gap also exists to varying degrees, and for the same reasons: living in different circumstances, being educated in different ways, and restricted communications. The situation persisted because there was insufficient need to change it. In most of these countries, however, the knowledge gap was less important to rural welfare: the low density of rural population and the flexibility of their resource base allowed rural dwellers to adapt to the situation rather effectively, to acquire and maintain enviable standards of living (thus far, at least). In some rural areas in highly industrialized countries, however, the resource base has not been so flexible, and pockets of rural poverty remain, qualitatively different in adaptation but largely ignored because of remoteness and because of being such a very small percentage of the total national population. Such people are in a position not greatly different from poor rural dwellers in any other part of the world.

In many rural areas of the world, however, rural populations in the above situation are the *majority* of national populations. The size of the knowledge gap may be no different, but here it is by no means irrelevant to national well-being. Instead, it becomes (or should become) a crucial issue, necessitating an exploratory interdisciplinary approach. "Farming systems research" (FSR), "bottom-up development," "community development," "community management," "appropriate technology," and "RRA" (which may also play a part in these others) can all be

considered responses to these types of considerations, even when not explicitly formulated as such.

What distinguishes RRA from other exploratory interdisciplinary approaches that focus on the local level is the preoccupation with *rapidity in learning*. The need for speed in both learning and action goes beyond the operational restrictions of rural development projects and programs - it is inherent in the rural situation itself. Rural populations are reaching the limits of present resource practices, resulting in increasing poverty, deforestation and extinction of wildlife, greater effects of flooding and drought (to include greater loss of human life), soil fertility depletion, salinity and erosion, land holdings too small to divide among children or support existing households, cropping practices susceptible to failure from pests and diseases, etc. All these conditions are by no means found in all rural areas, but the extent to which they already exist is more than sufficient to necessitate speed in finding solutions.

RRA is concerned with the learning, or "appraisal," part of the process. The speed of learning, however, depends not only on methodology. Even if we develop what are potentially the fastest learning methods presently possible, solutions to problems can only proceed as fast as learning actually progresses, not necessarily as fast as we would like it to. Finding the fastest way to do this is an admirable and necessary goal. But the time period for learning also depends on what needs to be learned. Because RRA studies things that are not well understood in advance, it is difficult to predict what it will find in any given period of time. We will return to this issue below.

When the requirement for rapid learning is combined with the need for exploratory research that is likely to be interdisciplinary in nature, further principles for RRA can be found. First among these is the recognition that the *primary* source for this type of learning is rural inhabitants themselves. Because their lives, experiences, and occupations are tied into the local setting and are "interdisciplinarily" integrated, rural inhabitants have a great deal of useful knowledge. Not to tap this knowledge in the most efficient manner would be a very severe methodological failing for RRA. Because of the need for speed and the exploratory nature of the research, the methods used must be highly interactive. We will argue that, when this need is combined with a further principle, "iteration," it results in what should be a dictum for RRA: "semi-structured" interviewing (interviewing with a set of special techniques in combination with some form of interview guide) should always be the principal (but never the only) method used in RRA.

Another derivative principle for RRA is that rapid exploratory learning requires "iteration," progressive repetitive or cyclical learning methods. The concept comes from systems theory and characterizes how an open system uses feedback to "learn" from its environment and progressively change itself. Iterative process is highly suited to exploratory learning as it allows changes in direction based on information obtained during the learning process itself, so that progressive understanding can occur. Rapidity in learning is achieved by maximizing the frequency of the iterations, or cycles, and by maximizing the learning that takes place during each round.

We will give an example that illustrates this rather abstract concept more concretely. The example is chosen to be highly compatible with the other principles

discussed above, as well as those to be discussed below. In Figure 2, we schematize some characteristics of the fieldwork portion of a hypothetical RRA study. For simplicity, in this example we assume that *all* new information during RRA comes from semi-structured interviewing in which RRA team members can ask "new" questions. (In fact, on real RRAs, information is likely to come mostly from semi-structured interviewing, but it should never come only from use of this method.) The learning cycles, or iterations, occur at four different levels, each level offering different kinds of options for redirecting learning in order to get the most learning accomplished in the shortest time possible:

Figure 2 Hypothetical Example of Five-Person Team RRA

	Week 1	Week 2			Week 3			Totals
	Sat	Sat	Sun	Thur	Fri	Sat	Sun	
Number of Interviews Per day (per sub-team)	4(2)	8(4)	6(3)	8(4)	6(3)	6(3)	4(2)	42(21)
Number of Subteam Discussions (per subteam)	2(1)	6(3)	4(2)	6(3)	4(2)	4(2)	2(1)	28(14)
Number of Whole Team Discussions Per Day	1 1	1	1 1	1	1	1		8

Opportunities to Make Changes After Learning Something from an Interview or Team/Subteam Discussion :

To change planned major sites :	2 - 3	
To change planned villages :	6	
To change criteria for selecting respondents :	41	
To change questions		
- of whole team :	8	
- of each subteam :	27	
- of individuals :	1,050	(see text)

Interviewing in 2 subteams of 3 and 2 persons each – only that portion of RRA from beginning of first field trip to end of last field trip. Data here is hypothetical but, in authors' experience, is typical of many RRA activities.

(1) Within interviews, the use of various techniques, such as "protocols" allows each team member to ask new questions that occur to him or her while listening to what the interviewee says and to what other team members ask. In our example, there are 42 such interviews. During each, the number of iterations in questioning is limited by how well the techniques work, how experienced and skilled the team is, and how "good" and enduring the interviewee is. Let's say each team member can go back and probe a previous answer or ask a related but unplanned question an average of five times in an interview session. (In real interviewing, skilled interviewers operating in skilled teams typically ask dozens and dozens of such questions.) For the three-person subteam in our example, then, the total number of iterations is 5 x 3 x 42 = 630, while for the two-person team it is 5 x 2 x 42 = 420, for a grand total of 1,050 times at the interview level. It can be seen that, even when the skill of the team is very conservatively estimated, an enormous number of iterations at this level can be produced during a typical RRA study.

(2) During the day, between interviews, the interview subteams review notes and discuss what they have learned and what they need to find out next. (Experience has shown that this cannot be done effectively within the interview session without significantly decreasing the quality of the interview itself.) In our example, this occurs 28 times, thereby allowing the redirection of subteam initial questions, choice of interviewees, etc., a total of 27 times.

(3) Each evening the subteams meet and compare notes. In our example, this offers six times to revise questions as a whole team, to choose different villages and household selection criteria, or to redirect the study in any other way advisable. If this is done at lunch also, twice as many times occur. Two additional meetings before the second and third fieldtrips allow further choices to be made. The major sites, villages, households, questions, techniques, etc., can all be changed at these points.

(4) Between RRA studies or additional field trips, further revision or redirection can take place. It is only at this highest level that the speed of the *overall* study contributes directly to "rapid learning."

The above example illustrates that most of the iterations upon which rapid exploratory learning depends occurs within the RRA study itself and are progressively numerous at progressively lower levels. All levels are important targets for methodological improvement, since they offer qualitatively different options for redirecting the study. The very lowest level, however, because it is by far the most iterative, offers tremendous opportunity for increased pay-off from methodological improvement. This is why at Khon Kaen University such emphasis has been placed on tools, techniques and practice in semi-structured interviewing (adapted for use by multidisciplinary teams, the advantage of which we will argue below).

Before moving on to other principles, a few brief examples from actual RRA work may help to illustrate the value of iteration in RRA. To study the fuelwood

situation in Northeast Thailand, a KKU team started out studying a few villages near the university. One of the methods used was to record the sizes of fuelwood using a tape measure. Due to the odd shapes encountered, this proved cumbersome, and a fuelwood volume gauge was built to use in most of the subsequent measurement. Later, a research assistant was sent back to the villages studied before the gauge was available, to measure fuelwood using the gauge. The important point here is that the fieldwork itself indicated the need to change the tool. If the measurement tool had not been changed, the RRA would have been in trouble, and in this case, if the RRA had been designed to take place all on one fieldtrip, the team would have had to do without the gauge.

On another RRA the subject was the role of trees in Northeastern rice paddy field areas. It was first thought that it would be useful to measure out sample areas and record tree densities within them. Observation and semi-structured interviewing, however, revealed that it was possible to use far less time-demanding indicators: visual estimates of tree density in field areas and of the ratio of trees on dikes to trees on paddy "floors" (ordinal comparison among sites). This actually proved to be more helpful conceptually in guiding the RRA and also speeded up the overall study.

A very high pay-off from flexibility through iteration occurs in the ability to reform questions and formulate new questions, especially within the interview itself. Major breakthroughs in learning can occur. On the subject of trees in paddies, the team was able to uncover a complex, managed system in one area, involving relationships among trees, fodder for livestock, bean poles and fuelwood, fertilized grass on paddy dikes, etc. Without "probing" and other semi-structured interview techniques, none of this would have been discovered. Not *all* new questions in semi-structured interviews will produce blinding insights and major revisions in learning or subsequent methodology. In fact, very few of them will. The pay-off from any individual question cannot be determined in advance. It comes fairly assuredly from the overall process, however, because the process itself can maximize rapid, iterative learning.

A further overall principle for RRA has to do with sample representativeness and accuracy of findings, which become problematical because of RRA being iterative and rapid learning. The principle has been called "triangulation" (a term we heard about by word-of-mouth and would like to find a source to cite for its definition here). It means systematically combining methods (e.g., using semi-structured interviewing in combination with observation, physical measurement and pre-existing data) and systematically varying sites and respondents (stratified sampling, really). The term "triangulation" is used to suggest that, whenever possible, at least three methods or three points should be used, although more are always better. The principle is an expedient one, but many useful guidelines and techniques have been developed by beginning with this principle. When used in RRA that is iterative in nature, the principle must always be used in the field, throughout RRA work. That is, decisions must always be made about where to go next and what to do there, and these decisions must be logically based on an assessment of how confident the RRA team is in what it has learned and what else needs to be known or checked. One type of decision that frequently has to be

made, for example, is whether or not it will be worth it to return to a previous site to ask questions that were only found out at later sites.

Another principle concerns the use of personnel in RRA, especially multidisciplinary teams. Because of the rapid, in-the-field, on-your-feet, nature of learning in RRA, learning will be much increased when the RRA investigator can *talk* to someone, to verbally interact and reason through what is to be learned. Local inhabitants have a wealth of local knowledge, thus one can conclude that this knowledge should always be used on RRA, through semi-structured interviewing, and other methods, such as putting a local inhabitant on the team. However, having at least one other outside-educated person to talk to is very worthwhile and if that person is from a different discipline, it opens up even further opportunity that he or she will see things you do not, further increasing the opportunity to learn. If this is taken as a principle for methodological development, experience at Khon Kaen University shows that it is possible to find methods, tools and techniques to overcome some of the drawbacks and lessen reluctance to operate in such teams.

Finally, we would like to summarize an overall principle that integrates many of those we have discussed above: RRA is a rapid-learning *process*, during which the researchers *progressively* learn from rural inhabitants, from each other, and from observation (and from existing data, secondary sources and key informants). RRA activity is time-sectioned into iterations so that conscious decisions can be made about methodology *throughout* the process: what questions or subtopics to revise, add or delete; what methods, tools and techniques to change; what places to go next and what to do there; etc. It is through the flexibility of the process – not just the flexibility of particular methods, tools and techniques – that rapid learning can occur.

When RRA is conceptualized in this manner, it becomes obvious that rapid surveying using fixed questionnaires cannot be a central method for rapid rural appraisal. In fact, the more the detailed methodology for any particular study becomes fixed in advance, or flexibility is any other way significantly reduced, the less any *progressive* learning can take place. If progressive learning is the basis of the appraisal, there may come a point where constraints become so heavy that what takes place can no longer be considered RRA. Potentially constraining factors on RRA are thus of critical importance. We will examine them next.

CONSTRAINING FACTORS

In this section we attempt to further elaborate the framework in Figure 1 by examining in more detail the "various constraints imposed by specific goals and settings." (The term "settings" here should be broadly construed, to include the influence of particular institutions and institutional contexts, as well as the study areas and their populations, etc.) "Real world" constraints to RRA may be to the extent that they seriously challenge "principles." What does one do, for example, when scarcity of institutional resources prohibits the use of an interdisciplinary team? Issues like this will not be treated in depth in this paper, but we will try to understand the nature and scope of the constraints likely to be encountered. These constraints are potentially very numerous, so both choice (based on estimated

importance in influencing RRA) and classification (for simplicity) must be used. We propose the following general classes which we discuss in turn: (1) Resources Available, (2) Research Role, (3) Subject Matter, (4) Type of Learning Needed, (5) Prior Information Available, and (6) Characteristics of the Study Area. A seventh consideration has to do with how the other six interact.

Resources Available

Time, personnel and funding would seem to be the main factors influencing RRA methodology in this category. The time constraint has been the one most emphasized in RRA literature. The time *needed* is highly affected by other factors, such as the characteristics of the area, the skill of the team and the goals of the study. The time *allowed* strongly influences the amount of preparation that can be done in advance, the number of sites that can be studied, and what can be done at each site.

The personnel issue is one that directly affects RRA methodology in certain predictable ways. We propose a generalization that is both deductively rational and also justified by experience:

> The more constrained the RRA team in terms of (1) level of attainment within each discipline, (2) interdisciplinary expertise, and (3) RRA expertise, the more overt, routinized and less flexible will be the methodology if acceptable results are to be obtained.

This explains why a highly skilled team may be able to start an RRA with little more than a topic or issue and develop everything else as the RRA proceeds, whereas an RRA to be accomplished by inexperienced junior researchers, for example, might need assigned sites, detailed interview guides, indicators identified and tested in advance, a set of operational procedures, etc. Between extremes is a broad range of methodological variation.

The size of the team also matters. Even with high levels of expertise, large numbers of people need to be highly organized to be most productive as a group. Special methods will be needed in order to interact and share knowledge. With very small teams, the "levels" in Figure 2 can be greatly reduced, maximizing the changes that can be made at the most frequent level of iteration, although small teams limit the number of disciplines that can be represented and decrease the number of interviews that can be done in a given period of time.

For any particular RRA team, however, experience at Khon Kaen University has shown some guidelines for the amount of time that can be spent in continuous fieldwork and the amount of time that can be spent in direct interviewing per day. If a skilled team is given high methodological flexibility, RRA becomes potentially most rewarding but also most demanding and intensive. Because of the high concentration needed, more than about five hours per day spent directly in semi-structured interviewing sessions will exhaust even the heartiest interviewer, making subsequent interviews less productive, sometimes counterproductive. Similarly, more than about five days of this kind of fieldwork, without a break of at least a day, will exhaust even the heartiest. With more predetermination of specific

methods, sites, interview guides, etc., time constraints of this sort can be somewhat eased. Note that these kinds of time constraints operate on the *period of fieldwork*, not the overall length of RRA.

Research Role

In this category we mean the larger process in which RRA is to be used, related to the purpose or use of the particular RRA. Examples include: development project (1) identification or planning, (2) monitoring, or (3) evaluation; independent research in which the RRA is (4) a study in itself, or part of a larger study in which the RRA is used to (5) plan further research, such as a follow-on formal survey, (6) accompany or complement other study, or (7) follow up a study to explore what perplexing findings may "mean," and "policy" research to (8) shed light on a subject or issue of interest to policy makers or to (9) explore a subject or issue area about which little is known, to see if research institutions or government planners ought to be paying more attention to it. Another context might be RRA used for training, developing rural awareness, or to help integrate a project team, etc.

RRA has been used in all the above categories at various times and places. Each category of RRA research role does not produce a distinctive methodology, but clearly this kind of context does have effects. Development project monitoring and evaluation, for example, usually constrain time and personnel and deal with a discrete, given number of sites, whereas policy research may be interested in the state of a research issue in an entire region or the entire country. Large implementation programs may need a set of routinized activities, whereas policy-directed RRAs or self-directed academic research projects may have a great deal of flexibility and can often be conducted by highly skilled personnel.

When RRA is used in initial stages of larger action or research projects or programs, it is crucially important to realize that RRA need not, and usually must not, be confined to initial activities alone. RRA frequently produces information of a sort that indicates various actions or study by other means, but there is still a need for RRA whenever a subject or issue is insufficiently understood in its basic dimensions in rural settings. Experience has shown that the size of the "knowledge gap" (discussed above) is such that, for the foreseeable future, there is likely to be a role for RRA throughout any rural action or research program. Confining it to the first few stages is usually to seriously underestimate the size of the knowledge gap.

Subject Matter

Specialized tools and techniques may be developed to suit particular subject areas, such as forestry, fisheries, irrigation, upland crops, rural health, education, etc. Whatever is at the core of RRA transcends differences in subject matter, but one can certainly find very clear differences in *some* of the tools and techniques. This has implications for how "catalogues" will be organized and has had strong effects thus far on the organization and aims of RRA literature (see "Biblography on Rapid Rural Appraisal"). The sensitivity of the subject matter is another aspect

that can have strong effects on methodology. It is not true, however, that RRA cannot be used to investigate a highly sensitive subject. In many cases it can (the KKU fuelwood study, for example, or presently ongoing upper watershed landuse studies). Particular tools and techniques may be needed, but the best way to investigate a highly sensitive topic is to put a very skilled team on it, including especially, people highly skilled at semi-structured interviewing.

Type of Learning Needed

In this category, the goal of the RRA has a direct effect on the type and specificity of the information which the RRA is to provide to its practitioners or some other audience. An RRA that aims to examine the general agricultural problems and opportunities of an area, will have a very different methodology from one that, for example, sets out to examine why farmers continue to raise native pigs in some areas and not in others. This category of constraint also has one of the strongest effects in interaction with other constraints and will thus be mentioned again below.

Prior Information Available

All research should start with as thorough a review as possible of prior research and available data on the subject or issue under investigation. What information is available and what it shows can have major effects on methodology – even to the extent of showing that something else is needed instead of or in addition to RRA. The content of the review will affect the initial hypotheses and categories for investigation, and thus how they will be investigated. The amount and quality of existing data will affect procedures and methods. Needed information that is not available ahead of time must be gathered during the field trip(s), and extra time and special techniques may be required to do this. For example, villages and households to be studied may be chosen in advance if information is available. If not, various key informant techniques must be used to do this in the field.

Characteristics of the Study Area

Both biophysical and sociocultural conditions in the study area, and the *variation* therein, will have major effects on RRA methodology. With respect to biophysical conditions, for example, such things as location and condition of roads affect timing and/or geographical spread of the study, the type of transportation needed, the amount of observation that can be done in an area, etc. Time of the year, uniformity of farming conditions, weather, etc., may all have effects. For sociocultural conditions, language(s) of the inhabitants, their attitudes toward outsiders, their customs regarding roles of men and women, religious characteristics, etc., can all have strong effects on how the RRA should be conducted, or indeed, if an RRA can be conducted at all.

The size of the study area also affects RRA methodology and effectiveness, if

too large an area to "sample" effectively, or too small to find sufficient variation in hypothesized influencing variables. In policy and program work the former case may occur more often, in project work, the latter. In project planning or evaluation, or whenever site selection is constrained in advance, "triangulation" of sites and respondents is still needed to assess variation. This can be done by making sure to record the variation encountered (landholding size, household composition or whatever is hypothesized as influencing the subject or relationship under study) and assessing whether the team has found out enough about it under the given constraints. In some cases the team may be lucky enough to find adequate variation among given sites and households. If not, other areas or households must be added on, even if not within the assigned scope of work, so that more accurate, higher quality conclusions can be reached.

Interactions

The above six categories interact in ways which produce further constraints on methodological choice. For example, if there are no women on the team, but local customs forbid men interviewing women, much extra effort will be needed in techniques other than direct interviewing even to partially compensate for the loss of interview information. Language barriers between the team and local populations will require a whole set of techniques to deal with the use of interpreters. Low funding, little time, and transportation difficulties will shift the study much more in the direction of key informants and use of pre-existing information than would otherwise be the case. Scarcity of pre-existing information requires longer time in the field. Subject matter may be highly affected by seasonality and require a series of field trips, one for each season.

The depth and type of information and learning required to be produced by the RRA probably have the strongest implication of all for how serious other categories of constraint will affect the choice of methodology and the overall outcome of the RRA. For example, if a large amount of information needs to be known about a large geographic area, this may be so difficult to accomplish that even radical changes in methodology may not help much. If both time and information needs are inflexible, there may be very little that can be done to rescue an RRA if research proves to be more difficult or complicated than envisioned in the plan.

If constrained too far by circumstances and contexts, whatever activity occurs is no longer RRA – it becomes "data-gathering," or "just visiting," or Chambers' "development tourism." Because RRA potentially has such methodological flexibility, far better results will be obtained whenever constraints can be significantly reduced. When not constrained, the above six categories become opportunities for methodological flexibility that allow a greater degree of learning. For this to occur, people who commission or plan RRAs must be knowledgeable about RRA methods and flexible in their planning. Often it is impossible to determine ahead of time whether an RRA will be able to meet objectives under a given set of constraints. Difficulties may thus result when RRA is embedded in a longer process where crucial decisions for the next step must be based on results of an RRA whose

resources and timing are fixed in advance. A combination of two adjustments can ease this problem: (1) allowing flexibility in time and resources for the RRA itself and (2) allowing flexibility in what is to follow the RRA. For example, if the second step is "allocating resources among activities indicated by the RRA in research, experimentation and testing," this is far less dangerous than planning to "design technology based on RRA findings."

FINDING THE "CORE" OF RRA

Our principal thesis from Figure 1 is that the interaction of certain principles with a set of constraining conditions results in the degree of convergence and variability in RRA methodology. The model has been elaborated through a discussion of some of these principles and constraining conditions. The result is summarized in Figure 3. Sufficient empirical experience in the application of RRA, examined comparatively along the lines suggested by the categories of constraints, can be expected to show us to what extent convergence occurs, as well as to help us understand the conditions under which various methods, tools and techniques are more or less useful and why. It may be worthwhile to take the discussion one step further — to illustrate the process in which principles and circumstances interact, and explore what this tells us about finding the "core of RRA," the potentially universal methods, rules, guidelines, tools or techniques which could define RRA, could be taught as such, and could indicate directions for further methodological development.

Figure 4 is intended to suggest that there is potentially a great deal of methodological breadth and depth in RRA. The breadth is mostly constrained by there being a limit on the methods and number and types of information sources that can be used in a rapidly iterative study (i.e., where information is needed quickly in order to decide what to do next during the RRA process, as well as after). The methodological depth of RRA, however, is potentially very great, limited primarily by experience. It will be useful to understand better how the depth of RRA evolves with experience as it will tell us more about where the core of RRA may be found.

From Figure 4 one can see that guidelines for RRA can potentially be found at many different levels of generalization/specificity. In the process of applying principles of RRA in particular settings and circumstances, a particular team or institution could start at any level it can "guess" at or deduce as having potential. It then tries specific applications (the lowest, or most specific level). What happens next then depends on what it learns from doing this. For example, Khon Kaen University started with the idea of interviewing in multidisciplinary teams. First experience revealed that interviewers "stepped on each other's toes." A specific set of "protocols" was devised that handled the problem. This was then "revised up" to a set of more general "guidelines for establishing protocols" when it was found out through more experience that not all teams could use the particular set of protocols first devised. As experience accumulates, however, it is likely that some specific protocols will prove to be generally superior to others, while we may also find out that some protocols, or particular sets of protocols are best for certain types of teams or interview situations.

Figure 3 Conceptual Model for Factors Influencing Methodological Development in Rapid Rural Appraisal (c.f., Figure 1)

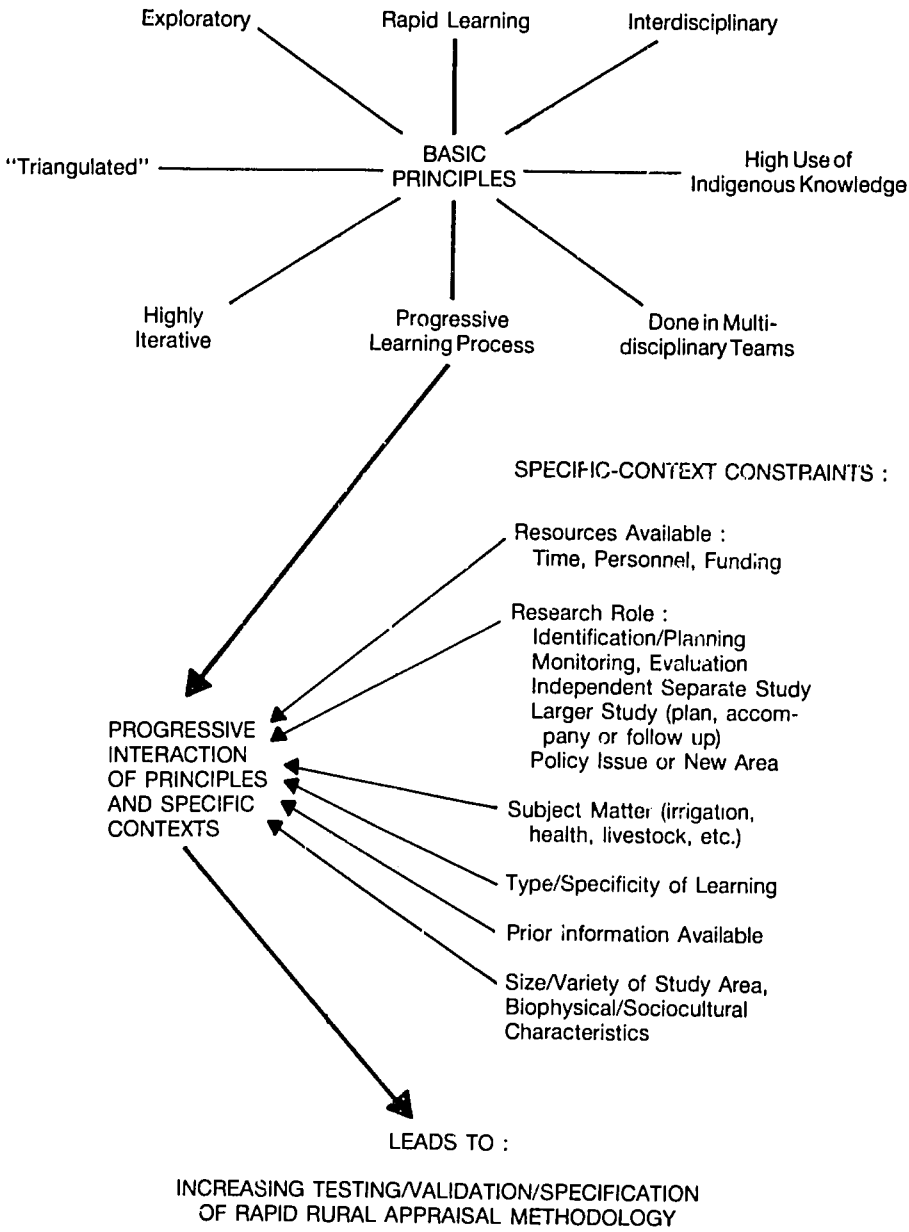


Figure 4 Examples of Potential Breadth and Depth of RRA Methodology

MAJOR METHOD :
SEMI-STRUCTURED INTERVIEWING
(of household members and key informants)

METHODS TO COMBINE WITH SEMI-STRUCTURED INTERVIEWING :

METHODS FOR ORGANIZATION/ OPERATION	INTERVIEW TEAM TECHNIQUES	INDIVIDUAL/ GENERAL TOOLS OR TECHNIQUES	TIME/SPACE AND LOGIC SCHEMATICS	FOR VERBAL INFORMATION	PRE-EXISTING INFORMATION	ON-SITE OBSERVATION	INDICATORS	PHYSICAL MEASUREMENTS
- RRA Literature and Training - Interview Guides (Sub-topics) - Site Selection (triangulation) - Use of Available Information and Key Informants - Techniques for Team Information and Decision Sharing - Etc. RECORDING : - "Gradeschool" notebooks - Cameras - Videocameras - Tape recorders - Sketches/Diagrams/Graphs - Bringing back actual items/samples - Etc.	- Fixed Team vs Rotate ("Sondeo") - Guidelines for Protocols - Specific protocols - Etc.	- Nonleading questions - "Six Helpers" - Probing - Local Names - Folk Taxonomy - Oral History - Etc.	- Crop Calendar - Specific types of crop calendar - Time Line - Cross-section - Transect - Historical Transect - Village Map - Field Map - Logic/Decision Trees - Labor Calendar - Activity Sequence - Etc.	- "Focus Group" - Open Discussion - "Compact Questionnaire"	- Studies/ Reports - Site Data - Statistics - Maps - aerial photos - Expert Opinion	- Roads/ Trails - Transects - Village Walks - Field Visits - High Place with View - Houses/ Compounds - Shops/ Meeting Places - Etc.	- General - Specific COUNTS - Houses - Fields - Vehicles - Etc.	- Tape measure - Scales - Volume Measurement (e.g., immersion gauge) - "Bicycle wheel" odometer - Pedometer - Transits - Levels - Rangefinders - Altimeters - Etc.

In some cases, very specific but potentially universal findings can emerge rather quickly from the application of general principles. For example, KKU experience showed that the rule "interview in a multidisciplinary team" should be "revised down," i.e., made more specific. It was learned that it is virtually impossible to interview effectively with more than three or four persons on the interview team. This is a very specific rule, but one could argue that it ought to be among those at the core of RRA. It is not always a bad idea to have more than three or four persons working together in RRA, however, so this indicated experimentation with organizational techniques to share information and decision-making within a larger group (among interview teams).

Another example of a rather specific methodological finding concerns guidelines for how to record interview information. KKU experimented with one person taking notes, all interviewers on the team taking notes, one or more persons per team writing up the notes after the interview, tape recording the interview, and videotaping the interview. For notetaking within the interview, various formats were also tried (everything in chronological order vs tabular formats by subject heading, etc.). It was a pleasant surprise to find out that the use of tape recorders and videotaping was feasible during interviewing in Northeastern Thai villages, without seriously affecting the quality of the interview. However, the most important finding was that, whatever else was done, every person on the interview team should take notes in chronological order on everything said in the interview (*notes*, of course, not a transcript). The reason for this comes from the principle of iterative learning within the interview. Without such notes, a team member is severely handicapped in the degree he or she is able to return to a point made and probe for further detail or ask new but related questions. Until such time as sufficient experience indicates that there are no cultures or situations where this absolutely cannot be done, a core RRA rule might at least be that every effort should be made to find ways to do this. (There are even more specific guidelines to help, such as using a gradeschool notebook instead of something that looks like what the tax collector carries around, etc.).

One further example helps show the manner in which a core of RRA may be emerging. Tools like the "crop calendar" have been around for a long time, but the crop calendar is used in RRA work at Khon Kaen University because it offers several advantages: it is easy to use and gets a lot of information without having to refer to a lot of prepared questions, and it quickly arrays and relates information that is of interest in more than one discipline, which can be used immediately within the interview, and after. KKU work modified it so that it would reveal even more information for interdisciplinary use (a vertical axis was added to show field sizes and start and stop dates for initial and final activities on each field, and other calendrical information below this, such as labor and activity schedules). This produced a more powerful tool that was both more specific and more elaborate. But at a more general level, use of tools like the crop calendar suggested that "simple time and space schematics" are of great use in RRA, and thus more and more of them are being developed and tested. Use of the crop calendar itself may be situation or subject-matter specific, but the more general guideline seems to be a core one for RRA.

The above examples illustrate a process of methodological development in RRA. The interaction of principles and particular contexts produce methodological findings at various levels of specificity. Potentially universal ("core") methods, rules, guidelines, tools and techniques emerge, but are subject to continued revision "up" (made more generalized) or "down" (made more specific) as experience continues to accumulate. In order to speed methodological development and make it as easy as possible for people to learn and apply RRA, the process should be guided by considerations of efficiency. If it is known, for example, that there are several ways to accomplish the same thing, but one way is clearly better, that way should be considered a core method and used whenever possible. If it is not (yet) known which way is better, it is more efficient to use a core generalization that subsumes alternatives methods and uses them as examples. This allows flexibility and encourages further development of more specific methods (the "guidelines for protocols" example).

If some methods are better than others only in certain contexts, the appropriate methods should be "filed" for use in these contexts, but the core generalization should also be used in order to encourage development of other tools and application to other contexts (the crop calendar/ time-space tools example). The important thing to remember is that this process cannot occur without considering *both* principles and contexts. In the interview notetaking example, it was a principle that was needed to select among competing techniques. For the size of the interview team, however, it was experience that revealed the rule.

CONCLUSION

This paper is in no conceivable way intended to be the last word on methodology in rapid rural appraisal. The examples used, in particular, illustrate only a very small part of the potential. What we would like to convince the reader of is the *need*:

- to agree on principles;
- to identify contexts and assess the influence of constraints on RRA effectiveness;
- to assemble all the methods, rules, guidelines, tools and techniques;
- to examine their potentials for specificity and generalization;
- to evaluate them comparatively and, where appropriate, classify them contextually;
- to begin to define a potential "core" of RRA methodology and identify training priorities and issues for further methodological development; and
- to make the methodological development process as conscious, overt, and widely based as possible, so that it will be more rapid and more fully productive.

We have tried to use this paper to demonstrate, in effect, why these should be the goals of the present conference, and to suggest ways of going about meeting these

goals. At the present stage of development, the breadth of RRA experience worldwide is needed to do it.

There is, however, one point, discussed above as an integrating principle, that we would not wish to see qualified in any way. Although it has not received much attention in RRA literature, we believe it is one that *must* lie at the very center of the core of RRA because so many other things about RRA depend on it:

> Most conceptually important to RRA methodology is the need for rapid learning to take place *progressively, during* RRA activities in rural areas.

This puts the focus squarely on RRA learning *process*, whereby many other important principles can be derived and a great deal of methodological progress made. Without this principle, we very much doubt that definitional problems can ever be resolved, or that we will ever be able to find the core of RRA.

NOTES AND ACKNOWLEDGEMENTS

Our framing of RRA's role in "the overall context of rural situations" in this paper owes much to discussions with David E. Thomas. Our treatment of initial "principles" was influenced in part by the writing of Robert Chambers (see "Bibliography on Rapid Rural Appraisal"). Insights into the interdisciplinary nature of rural problems and the skills needed to operate in interdisciplinary teams came from Terd Charoenwatana. Both KKU staff and the authors benefitted from Merlyn Kettering's understanding of the nature and causes of the "knowledge gap" in rural areas. Our understanding of the "principle of triangulation" grew from a discussion in 1982 with Timothy Mahoney (presently with USAID/Jakarta) from whom we also first heard this term used in a research sense. Our treatment of "constraining factors" benefitted from discussions with David E. Thomas and Romana P. de los Reyes and was based on our own and Khon Kaen University experience and a comparison of RRA contexts from most of the works listed in the "Bibliography on Rapid Rural Appraisal." Michael Calavan and the authors began working on tools and techniques of semi-structured interviewing for use in rapid rural learning in the late 1970's and the authors' understanding on this topic has benefitted frequently from his insights since that time. Gordon Conway was active in promoting the rapid use of various time and space schematics at KKU and these were among the earliest forms of "RRA" used at Khon Kaen.

Among Khon Kaen University staff, more than forty persons have been actively involved in the development of RRA methodology. Most RRA reports and methodological papers, unfortunately, are in Thai language. The examples in the present paper relating to fuelwood and trees-in-paddies studies are reported (in English language) in S. Subhadhira et al. (1985) and S. Grandstaff et al. (1986) respectively. These two references contain methodological discussion as well as RRA findings. Methodological examples used in the present paper present only a very small portion of methodological progress made at KKU, but the following individuals have contributed to the particular examples we used: Sathit Wacharakitti at Kasetsart University and Suchint Simaraks (fuelwood measurement tool development); Suriya Smutkupt and Nongluk Suphanchaimat (procedures for iterative learning above the interview level; thanks also to Peter Hildebrand, referenced in "Biblography on Rapid Rural Appraisal"); Viriya Limpinuntana and Anan Pholthanee (crop calendar development); Pong-

charn na Lampang and Suchint Simaraks (team notetaking techniques,. Overall thinking in the paper (and some of the items in Figure 4) owes a debt to the writings of Ian Carruthers, Robert Chambers, Robert Rhoades, Peter Hildebrand, Michael Collinson, Romana P. de los Reyes, and James Beebe (see "Bibliography on Rapid Rural Appraisal").

The authors assume sole responsibility for any errors, reinterpretations, or misinterpretations contained in the paper.

THE PARADIGMATIC SIGNIFICANCE OF RAPID RURAL APPRAISAL

Neil Jamieson

INTRODUCTION

Rapid Rural Appraisal (RRA) has arisen amidst a fairly recent crisis of faith in the field of development. With the end of World War Two and the formation of the United Nations in 1945, the faith was flourishing; it was widely believed that a new era of progress was dawning for all humanity. In 1949 the *Universal Declaration of Human Rights* constituted of formal public commitment by all nations to eliminate poverty and injustice from the face of the earth. By 1960 it appeared that these hopes and ideals were well on the way to fruition as about 40 countries, containing some 800 million people, had achieved independence from colonial rule during the preceding 15 years.[1] There was virtually universal acceptance of the proposition that by transferring capital and technology from the richer industrialized nations to the poorer ones, all governments in the world could and soon would lead their citizens into genuine material and spiritual progress.

Over the past 40 years, much has unquestionably been accomplished. In the name of development, countless billions of dollars and hundreds of thousands of technical advisors have been dispatched from industrialized nations to the rest of the world. All nations by now have vastly larger and better-trained indigenous natural and social scientists, technicians, and administrators. Planning bureaucracies have p[illegible]rated at both the national and international levels. And many thousands of [illegible] and articles have been written on the subject of development.

As a result of these activities, most people now lead longer and healthier lives than their parents and grandparents did. Both agricultural and industrial production have been substantially increased. Educational opportunities are greater than before almost everywhere, and transportation and communication facilities have been greatly improved and access to them tremendously expanded. There has even been a real, and in some cases considerable, increase in per capita income in many of the poorer nations, despite their growing populations.

Yet, even while this was taking place, the enthusiastic hopes and broad consensus that characterized the early decades of development were being eroded by disappointment, controversy, and most recently, even cynicism and bitterness. It was noted that the gap between the rich and the poor nations was increasing rather than diminishing, as was the gap between rich and poor people within most countries. What was originally hailed as a triumphal march of progress seemed to

1. Alexander Woodside, "Vietnamese History: Confucianism, Colonialism, and the Struggle for Independence," in *Vietnam: Essays on History, Culture and Society* (New York: The Asia Society, 1985), p. 20.

be generating unforeseen economic hardships, environmental dangers, political nightmares, and ethical dilemmas. By the mid-1970s almost every premise of the original development model was being vigorously challenged, often from several different and even contradictory points of view. Critical/Neo-Marxist schools of thought arose to denounce development as either a chimera or an outright fraud. A Communitarian/Emancipatory trend challenged the very goals of development with both political and intellectual vigor. And so on to this day.[2]

Regardless of its basis, the very existence of such widespread discontent and disillusionment provides ample demonstration that development has failed to live up to expectations. And there is no denying that this sense of dissatisfaction with development has become widespread, that it is real, and that it is, at least to some extent, justified. The number of very poor and undernourished people in the world today is roughly equal to the entire world population of 150 years ago. And even where economic growth has taken place, unintended consequences of development programs have frequently been cited as contributing factors in the occurrence of a host of social, cultural, psychological, environmental, physical, and even spiritual maladies.[3]

It has become increasingly difficult to ignore the possibility that perhaps there is something fundamentally wrong with the way development has been conceptualized, planned, and implemented. Within the development community and academia, a critical examination of the assumptions upon which earlier work was based has begun and is growing in intensity. In response to the disapointments, the disasters, and the criticism, a sense of ferment and experimentation has appeared, fostering a creative search for alternative models, ideas, programs, and types of research support for development activities. Resisting both complacency and cynicism, various initiatives have been undertaken to make development activities more effective.[4] Rapid Rural Appraisal came into being in this context.

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2. It is in many cases difficult to assign a particular author to one category. But over the past twenty years the original development model has been seriously challenged by hundreds of serious intellectual critics, including such diverse thinkers as: Gunnar Myrdal, Johan Galtung, E.F. Schumacher, Denis Goulet, Andre Gunder Frank, S.N. Eisenstadt, Ivan Illich, Peter Berger, Nicholas Georgescu-Roegen, Soedjatmoto, Immanuel Wallerstein, Samir Amin, Jurgen Habermas, and Alvin Gouldner. The Green Party in West Germany, the Sarvodaya movement in Sri Lanka, and the Asian Cultural Forum on Development based in Bangkok are illustrative of institutionalized alternatives, or even resistance, to development as commonly understood and practiced.

3. See, for example, N. Ching, ed., *Questioning Development in Southeast Asia* (Singapore: Select Books, 1977); *Rural Development and Human Rights in Southeast Asia* (Penang: the International Jurists Association and the Consumers' Association of Penang); C. MacAndrews and C.L. Sien, eds., *Too Rapid Rural Development* (Athens, Ohio: Ohio University Press, 1982).

4. A number of examples are available from Southeast Asia. A shift to community-based strategies of development that stress greater experimentation, learning, public participation, and genuinely multi-disciplinary and inter-agency cooperation can be seen in programs in the Philippines initiated first in the National Irrigation Administration (NIA) and subsequently adopted by the Bureau of Forest Development (BFD) to improve its social foresty programs. The Highland Agricultural and Social Development Project (HASD) in Northern Thailand has also worked at devising techniques to increase early inputs from local people and to generate better feedback in development activities (see P.W.C. Hoare, "Improving the Effectiveness of Agricultural Development: A Case Study from North Thailand," *Manchester Papers on Development* 10(1984):13-43).

One might also mention the flourishing Southeast Asian Universities Agroecosystem Network

Over the past decade, interest in RRA has increased dramatically, and the number of practitioners has grown at a remarkable rate. Its value has been amply demonstrated and its methods have been tested and improved. There is no need to advocate it or to defend it. Its very success, however, demands that we now take a closer look at the relationship of RRA, as a coherent body of activities, to the theory and practice of development. How does it relate to and interact with the larger intellectual, political, and human issues of the times? What assumptions, values, and propositions are involved in its growing use and acceptance? Is it contributing to, or obviating the need for, a new paradigm for development?

BACKGROUND: THE HISTORICAL AND PHILOSOPHICAL UNDERPINNINGS OF DEVELOPMENT PARADIGMS

It is necessary to begin a consideration of such questions by specifying the paradigm that guided those first decades of development. What precisely do we mean by the "old paradigm for development"? At an even more basic level, what do we mean by the word "paradigm"?

Over the past 40 years a great deal has been learned about the cultural bases of perception. It is now clear that all human beings use cultural models to simplify, organize, and interpret their perceptions of the world around them. In filtering and interpreting our perceptions of reality through the use of cultural models, we actively monitor the environment for certain kinds of stimuli and actively block out other kinds. We then "interpret" all perceptions in the sense that the reality we are aware of – even that portion of it we think of as "direct" experience – is actually a reconstruction. We make decisions and take action on the basis of those coded perceptions of reality – as derived through the categories of our models – rather than on the basis of some universal, directly observable, "objective" reality.

These paradigms – conceptual models or patterns – are a crucial part of the human experience. Yet they are seldom discussed directly for what they are or for the role they play in human affairs. Buddhism, Marxism, Newtonian physics, Keynesian economics, Darwinian evolution, and Freudianism are all examples of very powerful paradigms, or exemplars, that have had a profound influence far beyond the time, place, and situation in which they arose. They have shaped the

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(SUAN), linking six institutes and programs from academic institutions in Thailand, the Philippines, and Indonesia in development-oriented, transdisciplinary research activities, with further ties to the Imperial College Center for Environmental Technology (ICCET) in London and the Environment and Policy Institute (EAPI) at the East-West Center in Honolulu. The Ford Foundation has supported SUAN as well as innovative programs in NIA and BFD in the Philippines.

Indonesia has created a State Ministry for Population and the Environment to coordinate approaches to what were previously treated as isolated problems. The Ministry has helped to establish regionally-based Environmental Study Centers and has recently launched a major research effort to learn how to learn more about local perceptions, values, and knowledge relating to the environment. The Agency for Agricultural Research and Development within the Indonesian Ministry of Agriculture has established a Research Group on Agro-ecosystems (KEPAS) to provide a broader based interdisciplinary approach to agricultural, social, and natural resource management issues in Indonesia, building in part upon the SUAN, NIA, and BFD experiences, again with some assistance from Ford Foundation.

way people think, and have thus been applied to a wide range of phenomena they were not originally intended to address.

The term "paradigm" itself has been used and misused in ways that have generated confusion and misunderstanding. Some of this controversy arises from insufficient recognition that paradigms may differ along at least three dimensions (each of which represents a continuum rather than a dichotomy).

1) Paradigms vary in *scope*. They may be very broad or very narrow in the range of phenomena they encompass.
2) Paradigms vary in degree of *specificity*. They may be detailed and precise rules; or they may be much more general, even vague, guidelines or assumptions.
3) Paradigms vary in the degree of *conscious awareness* with which they are held or applied. The imitation of a model may be very self-conscious and explicit; or it may occur in more subtle, implicit, and unconscious ways.

Most scientific paradigms are explicit, specific, and limited in scope; but even this view of scientific thought can be misleading. Keynesian economics, for example, is a consciously and explicitly imitated model in the field of economics, a specific model of limited scope. But it can also be viewed as a variant of the broader "Smithian paradigm" that arose from the *Wealth of Nations* (1776) by Adam Smith. And Smith's own work may in turn be seen as a particular variant or application of the even broader Newtonian paradigm, which was explicitly developed and employed in many areas of 18th century thought but has now become a very general and implicit, albeit quite influential, model.

Perhaps the story of development began when the Renaissance in Europe generated a new and radically different way of looking at the world. Philosophy, art, and science began breaking away from the narrow confines of tradition and theology in a fresh effort to see the world as it actually was, and as it might become, instead of merely repeating and elaborating what others had asserted it must be. These diverse trends toward secularity, closer observation and reporting of natural phenomena, and skepticism toward the old verities were systematized and popularized as a new and powerful paradigm by Francis Bacon (1561-1626) and Rene Descartes (1596-1650). Empiricism and induction were confidently offered as keys that could open doors to a vastly improved state of human life. The scientific method and the ideology of progress were thereby joined in powerful alliance.

The sharply dualistic perspective in Cartesian thought contributed to establishing a basic dichotomy of modern thought that was to become a central element in the development paradigm of the 1940s, '50s, and '60s. Descartes posited two distinct orders of reality in the world. One encompassed subjective experience: mind, consciousness, spirit. The other consisted of the physical universe. It was believed that the latter, being quantifiable, could be investigated empirically and inductively to the immense betterment of mankind. The former was held to be a separate order of reality that required a more idealistic and deductive methodology (i.e., *cogito, ergo sum*). Thus was our intellectual division of labor shaped and our

epistemological world polarized in an important and enduring way.[5]

The brilliant achievements of Isaac Newton (1642-1727) consolidated and legitimated earlier scientific work, producing the overarching paradigm of modern civilization. An entire worldview was enthroned that affected profoundly not just the natural and physical sciences but also architecture, poetry, music, city planning, legal codes, political philosophies, and education – the dominant institutions of the modern world. This paradigm was thoroughly and explicitly dominant for a century in Western art, philosophy, and science.[6] Its influence, now largely implicit, persists today and has spread to every corner of the globe.

This paradigm involved a view of the world as a mechanism: orderly and understandable, hence manageable and ultimately perfectible. This central concept had several key characteristics. A mechanism can be taken apart and put back together again. The whole is equal to the sum of the parts. And the outcome of all interaction is totally and always predictable. By the end of the 18th century the ideology of progress based on the apparently demonstrated tenets of Newtonian science appeared to have been confirmed by experience.

Meanwhile the concept of "utilitarianism" was arising to support and expand the practical application of rationality and science to perfecting human life and society. The assumptions of Newtonian physics and the cultural beliefs and values that their acceptance generated were becoming "plain common sense." Self-consciously "practical" men assumed a greater role in political and intellectual life. Several fundamental postulates about the nature of the world provided a common core to the think g of these men, whose influence is still heavily upon us. In simplified form, one might say that these men all took for granted that:

1) There is an unchanging natural order in the world and it has an objective, material reality.
2) Human beings are capable of observing and discovering this order.
3) Knowledge of the natural order is progressively (cumulatively) developed through careful observation and inductive reasoning.
4) Human misery and happiness, prosperity and poverty, have their origins in the material conditions of existence as determined and modified by social institutions (such as government and law).

The age of exploration and discovery had meanwhile confronted thoughtful Europeans with a new view of the world and of their place in it. Awareness of previously unsuspected diversity among peoples raised the question of how such vast differences between human groups could be explained, especially in light of the belief in universal natural law. It required, however, merely a creative exten-

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5. See N. Jamieson and G. Lovelace, "Cultural Values and Human Ecology: Some Initial Considerations," in *Cultural Values and Human Ecology in Southeast Asia*, eds. K. Hutterer, A.T. Rambo, and G. Lovelace, (Ann Arbor: University of Michigan Press, 1985), pp. 27-54.

6. Just by way of illustration, one might consider the similarities in form and tone between the music of Bach (1685-1750) and Handel (1985-1759), the poetry of Alexander Pope (1688-1744), the design and architecture of Williamsburg, Virginia (built in the early-mid 18th century), or the 18th century formal English gardens. All emphasized formal regularity, complex but balanced structure, and a sense of confidence and control. All may be seen as cultural expressions of the Newtonian paradigm.

sion of the concept of natural law into this new context to come up with the theory of evolution based upon natural selection. Following the publication of Darwin's *Origin of Species* in 1859, many writers applied the model of evolution to the study of human societies. This provided the final piece of conceptual apparatus upon which later thinking about development would be constructed.

The influential writers of social evolution postulated that all humanity shares a common developmental sequence and that major differences between human groups reflect their relative rates of progress up this universal evolutionary ladder. All people were assumed to be moving inexorably, albeit at different speeds, toward what was seen to be the higher plane of existence typified by the industrialized Western societies.

Despite the ideological conflicts of the past 80 years, Marxists, socialists, and capitalists have shared these evolutionary, unilineal, universalistic, positivistic, and utilitarian assumptions. They have shared a common faith in the capacity of techno-scientific bureaucracies to shape the world in desirable ways, based upon these assumptions. They have held the same fervent belief in progress, based upon the larger paradigm developed by Bacon, Descartes, Newton, and Darwin. These assumptions and beliefs have been, in essence, the paradigm of development for the past four decades.

AN EMERGING NEW PARADIGM FOR DEVELOPMENT

Several different intellectual perspectives have emerged over these same four decades to suggest a very different way of looking at the world. A new paradigm for development seems slowly to be arising and gathering cohesion and support. By sketching briefly some of these new perspectives and the relationship of their conceptual characteristics to recent trends in development, we attain a clearer view of the strengths and weaknesses of Rapid Rural Appraisal as it has been and is being practiced, and are enabled to imagine its potential for even further contributions to development in the future.

First of all, it should be noted that a new perspective on evolution, especially social evolution, calls into serious question the notion of progress as it has been generally understood for the past two centuries. Most if not all of the great changes in human history – the shift from brachiation to bipedal locomotion, the shift from a hunting and gathering existence to the domestication of plants and animals, the rise of cities and states, etc., – can increasingly be viewed as having been forced upon the species by altered circumstances, as a form of problem-solving under pressure, rather than as part of an inexorable progress toward some ideal state. The alleged superiority of more recent modes to earlier ones can now be seen as the result of value changes that took place after the fact. But the solution to one set of problems has always generated new sets of problems requiring further change and leading to further alteration in the values by which change is assessed. In other words, human evolution may more usefully be viewed as an unending process of adaptive change.[7]

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7. For somewhat more elaboration see N. Jamieson, "Paradigms, Perceptions, and Changing

But no adaptation can be taken to be an ultimate good. It is "better" or "worse" only in terms of certain values and within a particular context. It is the context – a complex set of relationships – that "evolves." This process has moved human society from lesser to greater complexity, but not toward any predetermined goal.[8] Once concepts like evolution, progress, and development are seen to be *processes of change driven by the need to solve problems in existing systems* rather than as the sequential, cumulative invention or discovery of new and intrinsically better systems, one element of the new paradigm begins to appear.

But the implicated notions of "system" and "context" suggest several other conceptual shifts of paradigmatic significance with powerful implications for the theory and practice of development. Since World War Two our understanding of systems has radically altered. The field of cybernetics, first set forth by Norbert Wiener in 1948, emphasizes the processes of communication and control by which a system becomes a system and maintains itself as a system rather than remaining a mere assemblage of parts. In this perspective, a system is much more than a mechanism and the whole is greater than the sum of its parts. The parts of the system interact and adapt to each other through a process of mutual influence. A system functions and maintains itself through feedback. Complex living systems may be highly self-regulating. They learn from experience. And the flow of information is seen to be as important as the flow of energy and matter.[9] The focus of cybernetics is ultimately upon relationships, not things. Causality is seen to be circular and complex, not simple and lineal, and this imposes a new and very different set of epistemological conditions upon us.[10]

Achieving or maintaining some desired state of a system is now recognized to be dependent upon feedback. What is minimally required is a communications network that produces action in response to an input of information and then *includes the results of its own action* in the new information by which it modifies its subsequent behavior. Consideration of feedback systems focuses attention upon several other key concepts that are crucial in enabling a complex society to manage effectively the relationships between its constituent social, cultural, and ecological elements. Among these key concepts would be "negative feedback," "lead time," and "lag time."[11]

Reality," in *Cultural Values and Human Ecology in Southeast Asia*, eds. Hutterer et al.; Ester Boserup, of course, forcefully presented the basic idea 20 years ago in her influential and controversial work, *The Conditions of Agricultural Growth: The Economics of Agrarian Change Under Population Pressure* (Chicago: Aldine, 1965).

8. See Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 2d ed. (Chicago: University of Chicago Press, 1970), pp. 170-173. See also Gregory Bateson, *Steps to an Ecology of Mind* (New York: Ballantine Books, 1972), pp. 338-339.

9. Norbert Wiener, *Cybernetics* (New York. John Wiley and Sons, 1948). See also A. Terry Rambo and Percy Sajise, "Introduction: Human Ecology Research in Southeast Asia," in *An Introduction to Human Ecology Research on Agricultural Systems in Southeast Asia*, eds. A. T. Rambo and Percy Sajise, (College, Laguna, Phillipines: University of the Philippines at Los Banos, 1984), pp. 1-24; Gordon Conway, "What is an Agroecosystem and Why is it Worthy of Study?" ibid., pp. 28-38; A. Terry Rambo, "Human Ecology Research by Social Scientists on Tropical Agroecosystems," ibid., pp. 39-60; and A. Terry Rambo, "Information Flow in the Functioning of Tropical Ecosystems," ibid., pp. 186-193 (hereafter cited as *An Introduction to Human Ecology Research*).

10. See Bateson, *Steps to an Ecology of Mind*, pp 315-410, 448-465.

11. For a brief but lucit account of some of these factors, see Karl W. Deutsch, *The Nerves of*

Negative feedback is a measurement of error. It refers to a flow of information to the actor or decision point about the *difference* between the intended outcomes and the actual outcomes of action. Lead time is a measure of the extent to which relevant information is received in advance of the point at which it becomes too late to use it. Lag time is a measure of the time that elapses between the point at which a piece of negative feedback is received and the point at which corrective action is completed.

In any complex, self-regulating system an increase in the rate and/or intensity of change (be it internal or in the environment) generates a corresponding need (1) for a steady and reliable flow of negative feedback, (2) to ensure adequate lead time, and (3) to reduce lag time. The growing importance of these concepts for development can readily be seen in historical context. For the human species as a whole, the rate and intensity of change has been increasing at an exponential rate over the past several hundred years. The Newtonian paradigm, combined with the belief in progress, has changed the very nature of change itself in human life. For the past 40 years development has existed as a field devoted to even further acceleration of the rate and intensity of change, especially in the rural areas of low-income countries. To many people, in fact, development has basically come to mean "catching up" with more "advanced" nations – i.e., changing even faster. The universalist model of social evolution is now implicit in strategies of development, and in human aspirations, around the globe.

This phenomenon has unintentionally created an information gap for villagers, government officials, and development agencies themselves. Rapid change in both villages and in the larger physical and social context in which they are embedded has increased uncertainty and reduced predictability. Change is being promoted without any possible certainty as to its ultimate social or environmental outcomes. It is now virtually impossible for anyone to get enough negative feedback, to maintain adequate lead time, or to keep lag time within safe and reasonable bounds.

The necessity to reconsider the world in these terms is seen even in the realm of theoretical physics itself, where the determinism of the 18th and 19th centuries has largely been displaced by notions of relativity and uncertainty. The possibility of truly precise and objective measurement has been abandoned, and confident predictions about future states of complex physical systems are no longer held up as realistic goals except in terms of probabilities.[12]

It is becoming clear that within the even more complex and rapidly changing context of rural development, predictability is much more tenuous than in the physical sciences; and it is probable that unexpected consequences, both desirable and undesirable, will result from virtually any large-scale intervention. The emerging new paradigm suggests the addition of two major lines of defense against unanticipated negative outcomes. The first of these consists of substantively involving local people in the selection, design, planning, and implementation of programs

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Government: Models of Political Communication and Control (New York: The Free Press of Glencoe, 1963), pp. 88-90.

12. Margaret J. Osler and J. Brookes Spencer, "History of Physical Sciences," in *The New Encyclopaedia Britannica*, 15th ed. (Chicago: Encyclopaedia Britannica, 1984), 14:391.

and projects that will affect them, thus ensuring that local perceptions, attitudes, values, and knowledge are taken into account as fully as possible and as soon as possible. The second is to make more continuous and comprehensive feedback, and the capacity to respond to it, integral parts of all development activities. RRA is admirably suited to contribute in both areas.

Greater participation by local people in development planning is dictated by reasons that go far beyond ideological fads or purely political theories or concerns. As noted earlier, different groups of people use different cognitive models to code, organize, and interpret their perceptions of reality. Each group, therefore, sees something the other overlooks and misses something the other sees. In recent years it has become increasingly clear that traditonal knowledge systems often constitute alternative models of reality that are more valid and effective than educated urban elites (including scholars and development workers) have generally thought them to be. There is much that scientists and development planners and policy makers can learn from traditional knowledge systems.[13] But much traditional knowledge is being lost or rendered inappropriate or invalid because of forced-pace modernization.

No body of traditional knowledge, no academic theory, no existing body of institutional experience is now adequate to cope effectively with the host of complex and interacting problems inherent in the evolving context in which we must live and work. Precisely because of concerted efforts to induce and accelerate change in rural areas over the past four decades we all suffer from an information and knowledge gap; and we are all struggling to apprehend, organize, and interpret our perceptions of reality through models that have to some greater or lesser extent been rendered inadequate by accelerating change in the systems we seek to manipulate. This is why now more than ever it is necessary to recognize that local people, scientists, and officials working together can create something that is superior to that which any of them working alone could reasonably expect to come up with. Better communication between cultures and sub-cultures, across disciplines, and between social classes is an important but still underdeveloped aspect of the new paradigm for development. And again, by its very nature, RRA appears to have a comparative advantage in strengthening this weakness in existing research and development activities.

The models of reality, beliefs, attitudes, values, and operating procedures of *all* concerned parties are part of the context in which development must take place. The idea of context serves to bring together the related notions of relativity, uncertainty, systemicity, and culture-bound perception.

A key element in the emerging new paradigm for development involves a growing awareness that the meaning and function – of a piece of technology, or a value, or a particular type of institutional arrangement – are determined by

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13. See, for example, Paul Richards, "Community Environmental Knowledge and African Rural Development," *IDS Bulletin* 10,2(1979):28-36; Paul Richards, "Ecological Change and the Politics of African Land Use," *African Studies Review* 26,2(1983):1-72; George Lovelace, "Cultural Beliefs and the Management of Agroecosystems," in *An Introduction to Human Ecology Research*, eds. Rambo and Sajise, pp. 194-205.

context.[14] People with different values may behave quite differently in the "same" situation because they will perceive it and organize its constituent elements in different ways. But people with identical values may also behave quite differently in different situations because they will be operationalizing their values under different sets of constraints. This is why one cannot with much confidence predict behavior by studying only values, nor infer values by studying only behavior. Only by studying both values and behavior in a specific context can one begin to understand why some people do certain things in a certain way at a certain time why they choose not to do something else, and what would be involved in motivating them to change their behavior (or to persuade other people to stop trying to change it).

Increased understanding of local conditions, goals, values, systems of meaning, and knowledge should be accompanied by a growing awareness of one's *own* values, systems of meaning, and models of reality and those of one's professional colleagues. It is not merely ignorance of what and how villagers think about and act upon their world that limits the effectiveness of many programs. Blindness to one's own cultural preferences and assumptions is as common in technicians, officials, administrators, and researchers as it is in villagers. In a truly systemic view of the process of development the models, beliefs, attitudes, values, and operating procedures of all involved parties must be taken into account.[15] These, too, are part of the context, and part of the problem. And these, too, are in a state of flux.

The focus of research is, of course, as it should be, upon local systems – the nominal "objects" of development. It is usually local systems that development is by definition aimed at changing. And certainly those who plan and implement development programs need to know much more than is usually the case about local knowledge, local systems of meaning, and local constraints in the physical and social environment. Beyond this, they need to increase significantly their understanding of how these things all fit together, interact, and affect and influence each other in complex ways. We all need to learn humility and to learn to learn more effectively from people who see the world in different ways. But a crucial part of all

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14. See Neil Jamieson, "Relata, Relationships, and Context: A Perspective on Borrowed Elements in Vietnamese Culture," in *Borrowings and Adaptation in Vietnamese Culture*, eds. Truong Buu Lam (Honolulu: University of Hawaii, Center for Asian and Pacific Studies, Southeast Asia Paper No. 25, in press); A. Terry Rambo, "Black Flightsuits and White *Ao Dias*: Borrowing and Adaptation of Symbols of Vietnamese Cultural Identity," ibid.

15. For examples of diverse perceptions and their significance for development see: Michael Dove, "Theories of Swidden Agriculture and the Political Economy of Ignorance," *Agroforestry Systems* 1(1983):85-99; M. Dove, "The Agroecological Mythology of the Javanese and the Political Economy of Indonesia," *Indonesia* 30(April 1985):1-36; M. Dove, "Peasant Versus Government Perception and Use of the Environment: A Case Study of Banjarese Ecology and River Basin Development in South Kalimantan," *Journal of Southeast Asian Studies* (in press); George Sherman "What 'Green Desert'? The Ecology of Batak Grassland Farming," *Indonesia* 29(1980):113-148; R. Rhoades, R. Booth, R. Shaw, and R. Werge, "The Role of Anthropologists in Developing Improved Technologies," *Appropriate Technology* 11,4(1985):11-13; Stephan Biggs, "The Multidisciplinary Approach to Development," *Appropriate Technology* 11,4(1985):1-4; Neil Jamieson, "Multiple Perceptions of Environmental Issues in Rural Southeast Asia: The Implications of Cultural Categories, Beliefs, and Values for Environmental Communication," Working Paper, Environment and Policy Insitute, East-West Center, Honolulu, Hawaii, 1984.

of this is learning more about ourselves, learning to see ourselves and others as both subjects and objects in this process, to become more aware of our own cultural assumptions, our own values, more aware of the essentially arbitrary nature of some of our own beliefs. RRA can help us accomplish these things, and hopefully can help us to promote desirable changes in others as well as in ourselves.

RAPID RURAL APPRAISAL AND THE EMERGING CONTEXT OF DEVELOPMENT

The potential of RRA to respond to the needs and opportunities inherent in this new context and new paradigmatic view of development deserves careful attention. We know that RRA is a source of quick feedback. Unquestionably it helps with the problem of lead time. It is valued primarily because it can produce relevant information on a much more timely basis than can survey research or participant observation especially in rural areas. But to what extent does it actually reduce lag time? Does it, in fact, enable decision and policy makers to respond more quickly? This depends on the perceived relevance and reliability of the information. If key people feel that the information is unreliable or irrelevant, action will be delayed by debate or validation activities. And information that does not fit into the cognitive categories of the decision-maker is unlikely to have much influence.

What is fundamentally at issue here is the worldview of the decision-maker, including his or her epistemological and social values, cognitive models, and assumptions about the nature of reality. The impact of information generated by RRA is initially determined not by whether it is true, but by the degree to which it is persuasive; not by whether it is important, but by the ease with which it can be incorporated into the decision-making model of the recipient. Note that even in the simplest case, three potentially distinctive worldviews are involved: that of the local people, that of the researchers, and that of the sponsors/utilizers of the research product.

Upon whose perceptions of reality should the planning of development be based? By what set of values is it determined that one model is superior to another? By what means can any of the parties involved assess the validity of perceptions derived from and expressed in terms of a different model? RRA confronts us with these questions and similar ones in an unusually direct manner because of its unconventional, interactive nature. The commonly-asked questions about sample size, representativeness, lack of time depth, and so forth, are all symptoms of epistemological unease.

Most of the skepticism that is expressed regarding the results of RRA work derives from an internalized set of rules for determining validity that are much more arbitrary, culture-bound, and outmoded than is commonly recognized. Statistical validation techniques are certainly useful tools, but there is nothing magical about them and the claim to scientific rigor so frequently invoked by their use is often a spurious one. They tell us certain things about some relationships between some parts of a system at one or more points in time. They do this based upon

imperfect measurements of imperfectly defined elements. This is much better than nothing, but it is not the final word nor is it the ultimate basis for making any sort of decision.

Yet people do feel uneasy and practitioners of RRA must decide how best to react to this uneasiness. The response should be multi-faceted and take several factors into consideration. On the one hand, epistemological criticism should not be ignored, even if one disagrees with it, especially if it comes from the intended users of the research. If the approach is valuable because it is rapid and if speed is desirable because timely information is essential, then concerns about validity and reliability can, if they delay the acceptance and use of research results, undercut the presumed advantages of the entire approach. Slowness in utilization may outweigh the advantage of speed in delivery.

On the other hand, one should not be too ready to agree that speed is the sole advantage of this approach, nor even its greatest advantage. There are other unique and valuable qualities associated with some of the characteristics of RRA work. Because of the short duration of the research, practitioners of various disciplines can interact with each other and with villagers in *context* – as is seldom possible in a longer participant observation-type study. Yet because it is fieldwork based in larger part upon interviewing villagers (however structured or unstructured the interviews may be), the people who ask the questions are brought face to face with the people who answer them – as is seldom the case in larger field surveys. The individual researcher in an RRA team, in other words, receives an extraordinary amount of feedback of various kinds from multiple sources. Both colleagues and respondents can suggest important variables that are being ignored, challenge the ambiguous or inappropriate question, add useful information that was not asked for, and make comments or ask questions that unmask the implicit underlying assumption that impedes understanding.

This kind of feedback is still grossly undervalued in the theory and practice of development itself and within the various academic disciplines with which development is intellectually entwined. So while it is important to take the epistemological values of the sponsors and potential users of research into account and to try to make the findings of RRA useful and persuasive to them, it is not desirable to accept those epistemological values oneself, to internalize them, or even to let them go unchallenged in others.

It is part of our professional responsibility to confront directly the epistemological challenges of intervention in a complex and dynamic world that is characterized by relativity and uncertainty. We must attempt – even at the cost of some personal inconvenience and professional discomfort – to inculcate in ourselves and in others greater epistemological humility and flexibility.[16] RRA constitutes an almost ideal vehicle for doing this. It pushes us into situations where our favorite intellectual tools are likely to be inappropriate and where our assumptions are

16. For a discussion of the role of values in epistemology, see Henry Skolomowski, "The Twilight of Physical Descriptions and the Rise of Normative Models," in *The World System*, ed. E. Lazlo (New York: Braziller, 1973): 99-118; Albert Wilson, "Systems Epistemology," ibid. pp. 121-140. The issue is also discussed in Jamieson and Lovelace, "Cultural Values and Human Ecology: Some Initial Considerations, ' in *Cultural Values and Human Ecology in Southeast Asia*, eds. Hutterer et al.

likely to be called into question. And this is a very good thing. This is the kind of negative feedback that enables us to learn and to grow intellectually. It is this process, repeated, shared, and pondered, that can transform our view of rural life in ways that will benefit ourselves as well as others.

It is the openness and multiplicity of feedback circuits that compensate those engaged in RRA for their small sample sizes and brief time in the field. The director of a survey research project inevitably gets much less feedback than this (although most could get much more if they tried harder, i.e., valued it enough to divert more time and money to it). At the other end of the continuum, an anthropological fieldworker gets a great deal of feedback from the small group of informants with whom he or she works, but typically gets much less feedback from colleagues representing differing points of view. The member of an interdisciplinary team in the field is much more likely than either the anthropologist or the survey researcher to discover which of his or her assumptions are wrong, inappropriate, or irrelevant. In training and in practice, considerable care should be taken to ensure that this is and remains so. The opportunity to be proven wrong or to discover more appropriate questions before committing lots of time and resources to an effort is a precious thing, something to be cultivated.

CONCLUSIONS

RRA is a valuable supplement to the older, more established modes of doing research in rural areas. It will not, and should not, replace other techniques; they have their own advantages. It should enrich them and be enriched by them. But as a flexible, quick and relatively inexpensive source of feedback, RRA can supplement conventional approaches in an important way by providing a more continuous and balanced flow of information about local systems in rural areas. And because of its interactive, dialogic nature, RRA can help us learn to learn more effectively, to modify our models, to understand rural people, ourselves, and the larger systems in which we function in more profound and more humane ways. It can help us clarify, refine, internalize, and legitimize through practice a new and more effective paradigm for development.

We can learn to think and to plan in terms of circles rather than straight lines as we come to appreciate more fully the vital role of feedback in steering dynamic and complex systems through the shoals of adaptive change in a stochastic world characterized by relativity and uncertainty. We can come to realize how damaging arbitrary and rigid distinctions between planning, design, implementation, monitoring, and evaluation can be as we learn to appreciate the need for constant, error-correcting adjustments in development programs and their research support systems.

We can learn to refocus our work with greater sensitivity to and respect for local peoples and their problems, goals, values, and knowledge. As we grow more aware of the harm that is sometimes done by thinking too much in terms of aggregate statistics, illusory technological imperatives, and abstract universal categories, we can come to understand how these deeply engrained thought patterns can all too easily convert local people into objects of a process that is external to

them, generating paradox and discontinuity in the concrete local instance rather than development. RRA can teach us to perceive how local people, ourselves, and all other parties to the development process are both subjects and objects, each with our own selective cognitive models, each acting in and being acted upon by a complex, imperfectly understood, and subjectively perceived world.

We may come to grasp more clearly the reasons why in an increasingly complicated, rapidly changing, and fundamentally interconnected world, neither top-down nor bottom-up approaches are adequate to cope with the expanding array of truly global problems that manifest themselves so variously in a multitude of local contexts, and why neither more centralization or more decentralization has proven to be very effective.We may better comprehend why the incremental modification of existing systems to make them better adapted to the larger, changing context – building on local knowledge, responding to local needs, and respecting local values – may be safer, cheaper, and more effective than the imposition of new and different systems. We might learn how people who are deprived of the opportunity to learn for themselves at their own rate are deprived of dignity – and why systems in which change is imposed at a rate which exceeds the capacity for internal readjustment lose their integrity as systems and malfunction, increasing rather than alleviating human suffering.

If RRA teaches us humility and increases our appreciation of the need for more interactive, dialogic communication between all parties implicated in the development process, we may outgrow that certain "professional deformation" inevitably imposed by our disciplinary training to achieve a multi-disciplinary outlook with greater epistemological flexibility and sophistication. Perhaps even a pan-disciplinary perspective may arise, integrating diverse perspectives in ways not yet imagined.

In the meantime the holistic, relationship-oriented perspective inherent in interactive, multi-disciplinary field research may help us discover complementary or synergistic linkages between what we now see as isolated or competing activities and functions. These same characteristics of RRA can also help us avoid the common error of assigning undue weight to any one variable, not just because we lack a deep systems perspective on causality, but merely because it is readily quantifiable, or easily translated into economic terms, or simply appears obvious because it is overtly expressed in some portion of the local culture that overlaps with the culture of the researcher. It may even help us reconceptualize the processes of aggregating, storing, and disaggregating data in more useful and less misleading ways.

But RRA will not necessarily do or become any of these things. It merely possesses the potential for doing so. Only by doing RRA and doing it well while thinking about its relationship to larger paradigmatic issues can such transformations be brought about. If RRA activities are expanded and refined with due attention to their capacity for further contributing to and benefiting from the expansion and refinement of other elements in the emerging new paradigm for development, the whole should increasingly become greater than the sum of the parts. And we may become, as a species, somewhat better adapted to the world in which we must live. That is what development is all about.

PART III THE RANGE OF METHODOLOGY: IMPORTANT METHODS, TOOLS AND TECHNIQUES IN RRA

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THE USE OF RRA IN CROSS-SECTIONAL AND LONGITUDINAL STUDIES

David E. Thomas and
Nongluk Suphanchaimat

Rapid Rural Appraisal (RRA) methods have evolved primarily in response to the need for cost-effective ways to investigate rural resource management systems. RRA seeks to understand, to various degrees, the sociocultural, economic, biological, and physical components of such systems and how they interact and respond to changes in their environment. The method stresses the acquisition of timely, relevant, and useful information (Chambers 1985). An important goal of this conference is to seek to identify more clearly the past and potential domains of research where RRA is used most effectively. But, as in all research methods, there will be limits to RRA's ability to obtain desired information. Thus, it will continue to be necessary to conduct detailed quantitative studies of various aspects, levels, and components of rural resource management systems, in order to measure quantitative relationships with a sufficient degree of confidence to identify subtle patterns and to adequately test various hypotheses about systems behavior.

An important use of detailed empirical research often of direct interest to those concerned with "rural appraisal," is in testing the validity of hypotheses used in constructing conceptual and quantitative models of rural systems behavior. Both conceptual and quantitative models can be used to develop explanations of past and current behavior, and predictions of future behavior under current or altered conditions. Quantitative models further require the accurate determination of mathematical relationships and coefficients to an appropriate level of precision. But because the construction of both types of models requires an understanding of human behavior and its interactions over time with its social, biological and physical environments, it is often necessary to conduct detailed empirical investigations of system behavior over space and/or time. Spatial distributions are often investigated with cross-sectional studies, and temporal distributions with longitudinal studies. When subject populations are widely distributed over space or system behavior must be studied in depth over relatively long periods of time, these types of study may require large amounts of research time and resources.

Of course, such studies are usually constrained by the time available and/or by human or financial resources. In many cases, RRA by itself may be able to provide adequate information, conserving time and resources in the process. This may especially be true when the goal of the investigation is to determine the direction of change or effect, rather than a precise measurement of its magnitude. Indeed, due to its exploratory and iterative nature, RRA may be able to provide information which is not feasible to obtain through more traditional methods. But data may also be required for which there is not yet any substitute for more resource-intensive

research methods. We are attempting to explore, therefore, ways in which RRA methods can be used to supplement more traditional research methods to increase the depth, productivity, and efficiency of these resource-intensive forms of research.

The following discussion will look at some of the potential uses of RRA to supplement resource-intensive cross-sectional and longitudinal studies of rural resource management systems. We are not attempting to be definitive or all-inclusive on such uses of RRA. We only want to offer some examples to open a broader discussion of the issues involved.

CROSS-SECTIONAL STUDIES: RRA AS A SUPPLEMENT TO QUESTIONNAIRE SURVEYS

Sample survey is the most popular social research method, and is a primary source of data used in most socio-economic and resource management models. Crop and animal sciences also depend on surveys for use in spatial analysis of various types of information when direct measurement is not feasible. Sample survey involves the administration of questionnaires to a sample of respondents selected from a given population. The scale of its current use ranges from small research projects to nation-level planning and program evaluation; sample size also varies widely. In rural areas, the use of trained interviewers is considered to be the most flexible form of implementing this method, and can be managed so that it (1) insures a high percentage of respondents, (2) provides an opportunity for explaining easily misunderstood questions, and (3) allows for special observations. The interview survey generally has advantages in terms of the amount of data which can be collected, and provides a method for some degree of information standardization in a relatively short period of time.

Survey reseach suffers from the disadvantages of its inflexibility and potential superficiality. In addition to "sampling error," it is difficult to gain a deep understanding of social processes through surveys, and if questions are imported from a different culture, one may also encounter problems of cultural reinterpretation and contextual bias (Stone and Campbell 1984:31). In comparison with other research methods, the relative inflexibility of survey questionnaires begins with the advance preparation of sequences of questions. Interviewers are trained to administer questions as designed to a pre-selected sample of the population of interest. The inflexibility is even greater when there is insufficient interaction among researchers while conducting an interview survey. Such interaction is not emphasized because it is not anticipated that the questionnaires will be changed during the survey process.

RRA methods, however, provide the research team with opportunities to interact and evolve their concepts during the research process, since questions must be revised along the way. An RRA interview is guided by the topics under study, which are formulated through the examination of pre-existing information. The degree of reliability and validity can be improved by the use of multiple indicators. Observation and physical measurement can also be used. RRA sample selection is different from the survey methods: in RRA, the use of key informants is often necessary, along with sampling stratification techniques sometimes referred to as

"triangulation" (for more information, see Grandstaff and Grandstaff, 1985).

Thus, we see a complementarity between the two methods, since there are often appropriate topics for using more intensive and qualitative RRA methods to revise and supplement interview survey methods during the research process.

LONGITUDINAL STUDIES: RRA AS A SUPPLEMENT TO RECORD-KEEPING STUDIES

Longitudinal studies are needed to investigate the behavior of time-related factors that may not be adequately understood by studies confined to a single cross-section of time. Rural resource management systems are influenced by many such factors. Rural life is strongly influenced by the diurnal and seasonal rhythms of nature, and their variation through multi-year cycles and over longer-term trends. As rural people grow more dependent on larger social systems, their life also affects and is affected by more distant events, cycles, and trends. Rural resource management models are usually constructed to understand a system's past and current behavior, in order to influence its future behavior consistent with human objectives. Longitudinal studies gather a time series of observations on a given sample or an entire population. The frequency of data points in the time series can vary from the constant monitoring in time and motion studies, to a decade separating observations in a national census.

As human and financial resoures available for research are usually limited, there is often a trade-off between sample size and frequency of observation, at a given cost per observation. A cross-sectional sample survey, in this sense, is a single observation across a broad sample. Longitudinal record-keeping and field monitoring studies are used to study aspects of rural resource management systems through single or multiple seasonal cycles, usually with a more limited sample. Observation frequency depends on the cycles under study, commonly daily for labor allocation and expenditures, or weekly for crop growth or soil moisture. The duration of and instrumentation for a given observation also vary with the topics of study.

Record-keeping studies have more potential flexibility and detail than sample surveys. Record-keeping formats, while requiring comparability over time, can range from formal questions to open-ended listings within broad categories, and if data is monitored as it is compiled and record-keepers clearly understand data needs, record formats can be adjusted and improved during implementation. Record-keepers can be outside observer/enumerators, or members of the social unit under study. Other potential advantages of record-keeping include a minimal respondent recall period, more potential for exposure to unanticipated aspects of the topic, and a large number of data points for mapping seasonal or multi-year trends.

In addition to its overall time requirements, disadvantages of record-keeping in rural areas include incentives, supervision and training of record-keepers, logistical requirements for data collection, and data management and processing demands. Thus, sample size is often small. If record-keepers have little direct interaction with researchers and formats are too strict, record-keeping can also become inflexible and superficial. Additional problems and biases arise when literacy rates

in the subject population are low.

RRA methods, on the other hand, have greater flexibility in format than record-keeping studies and seek to minimize time and resource demands. RRA also emphasizes direct researcher-respondent oral interaction, and is thus less subject to problems arising from illiteracy. While record-keeping study provides more time for researcher interaction and for exposure to unanticipated aspects of research topics, RRA places more emphasis on the pursuit of interaction and exploration, through its interdisciplinary analysis and intensified researcher-respondent and researcher-researcher interaction.

Thus, we also see a complementarity between these two methods, wherein the more intensive and qualitative RRA methods can be used to direct and supplement detailed record-keeping studies, helping to prevent superficiality even with fairly structured formats.

TARGETS OF OPPORTUNITY: ENTRY POINTS FOR RRA IN THE RESEARCH PROCESS

For the sake of discussion, a research process utilizing sample survey or record-keeping methods can be broken down into four sequential phases: (1) Developing a research framework, (2) Preparing for detailed studies, (3) Conducting detailed studies, and (4) Evaluating research results. Each phase has its potential for utilization of RRA methods. Usually, this will mean a full RRA, conducted by an interdisciplinary team utilizing the concepts, processes, and tools discussed in detail by Limpinuntana in this volume. But, there may also be occasions where formal organization is less needed, and important concepts, processes, or tools utilized and elaborated by RRA can be integrated into other methodologies.

Phase 1: Developing a Research Framework

Activities conducted during this phase move from the general to the specific, as researchers increasingly focus on articulating hypotheses to be tested, and defining the specific studies to be conducted, the methods they will use, and specific objectives and schedules. This phase is similar for both sample survey and record-keeping, since it is the phase during which the decision is made as to what type of research should be conducted.

When a variety of key questions or research topics have been raised for study in a rural area, as in agroecosystem analysis, RRA can be a useful way to explore a range of topics and evaluate their relative importance according to the overall objectives of a research program. If a need for more detailed studies is indicated, it can also explore, for example, whether studies should focus on a single observation of a broad sample to capture current spatial variation, or on monitoring of a smaller sample over time to discern seasonal patterns. The intensive interaction in such an RRA assists team members in reaching a common basic understanding of the problem and agreement on research objectives and methods. RRA is probably most effective during this phase when a full interdisciplinary team is used.

Phase 2: Preparing for Detailed Studies

Once the decision on research methods has been made, considerable preparation must be made for either a sample survey or a record-keeping study. There is usually pressure to keep this phase as brief as possible, but the quality of preparation has a great influence on the quality of the research product. Brief, but intensive RRA methods offer considerable promise for improving the quality and productivity of these preparations.

If a sample survey has been selected, RRA can help design the formal questionnaire. RRA's conducted in preparation of formal surveys should help identify and define topics to be covered in the questionnaire, and suggest phrasing and sequencing to reduce cross-cultural problems of interpretation. They can also explore the importance of various population attributes under consideration as formal survey stratifying variables, and can help in estimating the amount of variation to be considered in sample size calculation.

If a record-keeping study is deemed necessary, RRA can be useful in helping locate sample sites, and in establishing a basic understanding of local frames of reference. Selection of areas within which sample sites will be chosen often follows from the hypotheses the research seeks to test. Record-keeping samples are often small enough to warrant purposive selection of specific villages or households, yet secondary sources of village characteristics, for example, are limited in many rural areas. Thus, an intensive RRA in and around several potential village sites within the areas selected can help to more carefully target specific villages or households and assure their representativeness.

Similarly, if individual households or their fields are to be the target of record-keeping studies, RRA can be used to obtain estimates of village distributions of stratifying variables, and to identify households in each stratum. We have used semi-structured interviewing of key informants, for example, to generate lists of households in various classes of land-holding and labor force size. Households from these lists were selected for a one year daily household record-keeping study. Later cross-checks indicated the preliminary information was adequate for our purposes, whereas cross-checks in another village where we had based sample selection on a large-sample compact questionnaire, revealed many villagers had been suspicious of our motives and grossly under-reported certain types of land-holdings. The use of key informants allowed us to more fully explain ourselves to people who had sufficient knowledge of local conditions to furnish the information we needed. A more full-scale RRA is capable of gathering information for use with more complex sampling frames.

Since record-keeping involves, in essence, a dialog between researcher and record-keeper over a relatively long period of time, it is important for researchers to understand local vocabularies and frames of reference. This is particulary true when record-keepers are members of the social unit under study and topics are most readily described using local terms. RRA methods can be used to examine many types of local terminology, and can thus improve communications in record-keeping and decrease problems with record-keepers placing items in unfamiliar categories. Since our daily household record-keeping study was interested in the spatial allocation of household labor, we used aerial photos, simple base maps

made from them, and semi-structured interviews of key informants, to assist us in mapping the highly localized place names villagers use in refering to various land areas where they conduct their activities. These names could then be used on record-keeping forms and later translated into coded data. This exercise not only provided a useful means of communicating important data, but also helped us establish rapport with villagers whom had never had outsiders ask about such names, much less put them on a map. In addition, examination of these place names from our five sample villages has revealed the outlines of a folk taxonomic system for classification of various types of land, which is itself worthy of further future investigation.

RRA also appears very useful for collecting essential preliminary information on such topics as sociocultural history, past and present migration patterns, and local estimates of seasonal and year-to-year variation and long-term trends of key variables to be covered by a study.

Phase 3: Conducting Detailed Studies

Once the actual field work has begun in conducting sample surveys or record-keeping studies, RRA still has a potential role in supplementing data collection activities.

With sample questionnaire surveys, such RRA's may be quite directed. They can be used to cross-check respondent answers, as discussed by Stone and Campbell, and to capture more qualitative aspects of key topics covered in the questionnaire. Since the RRA should be a learning process, it should go beyond simple cross-checking of questionnaire responses. The RRA can be conducted simultaneously in the same community, or with the same sample subsequent to questionnaire administration.

Another use of RRA with sample surveys may be useful in situations where only selected strata of a larger population are being sampled. In this situation, RRA can be an efficient method for exploring key questionnaire topics in the strata or areas not sampled. This could provide useful information for comparison with survey results in interpreting data, drawing conclusions, and indicating directions for further research. This type of RRA could be conducted simultaneously, but topic selection may be improved by waiting for preliminary survey results.

With record-keeping studies, one or more simultaneous RRA's can help to more clearly define the context of the studies and the extent to which generalization is possible. As we have noted, record-keeping studies are often conducted with a rather limited sample. RRA can be used at various points during the record-keeping process to cross-check the observations being reported with activities in other households in a sample village, for example, or with activities of other households in the same stratum or general area. Many topics are only observable or are best discussed during the appropriate season, so these RRA's can help to further clarify the confidence level with which generalizations can be made from conclusions based on the record-keeping data. In rural resource management contexts, for example, RRA methods show much promise for exploring more qualitative aspects of decision-making, and for comparing current conditions and

behavior with that of previous years.

An advantage cited for record-keeping studies is its potential for exposure to unanticipated aspects of the topics under study. This results largely from the time over which the study is conducted, but relates closely to the flexibility of the record-keeping format and the extent to which researchers monitor incoming data and the record-keeper understands the domain of the research topic. Unanticipated results are common, however, and when they arise, RRA has great potential for exploring their nature and importance. RRA may be able to gather enough information by itself, or it may result in a recommendation to adjust the record-keeping format to improve data collected on such newly-emergent aspects. Either way, the feedback obtainable through RRA can be very important in expanding researcher understanding of the topics under investigation. In our record-keeping study, listing of activities in broad categories revealed numerous unanticipated activities, as well as the need to further disaggregate activities such as methods of raising livestock, and various RRA methods were used to explore their dimensions. RRA methods also revealed that times recorded for resting during the day were the result of a variety of interpretations, resulting in inconsistent and incomparable data.

Phase 4: Evaluating Research Results

This phase occurs after the detailed studies have been concluded and the results have been examined. Study findings are used as the basis for drawing conclusions about the validity of the hypotheses tested by the research. If hypotheses are rejected, questions will be raised as to why, and RRA can be a means for pursuing the issues involved. Study data may suggest modifications or alternative hypotheses, and RRA can be used to further define them and explore the utility of further detailed research to confirm or reject them. If detailed studies have been used to gather data for regression or simulation models, RRA may have potential as a rough check on whether and to what degree their estimates or projections in other situations are reasonable. In analysis of sample survey data, it may be desirable to check key topics in areas not surveyed before reaching larger conclusions about interactions of the sampled population with other areas. As mentioned under section 3, above, RRA can be very useful for such purposes. With either sample surveys or record-keeping studies, post-fieldwork analysis of findings may identify unanticipated key aspects of topics, about which additional knowledge is desirable before drawing final conclusions. Again, RRA can help.

In any of these cases, RRA offers itself as a tool for improving the conclusions of the research, and in identifying fruitful directions for future research. Its relatively low cost and time requirements are particulary important for rapid, more qualitative cross-checks of research conclusions and exploration of emergent key topics.

REASSESSMENT OF RESEARCH METHODS: PRAGMATISM IN RESEARCH ON RURAL AREAS

The academic training received by many researchers has encouraged them to adopt the classic research methods of their disciplines, and usually to have great skepticism for major new changes. This conservative, skeptical nature of the scientific community helps to maintain the standards demanded of research which is to be broadly accepted. But when standard methods are applied in a context other than that in which they evolved, new questions are raised regarding their effectiveness.

Further, for those interested in the applications of research to problem solving in rural areas of the world, someone must begin to put the pieces of reductionist science back together again. Conceptual and quantitative models of rural natural resource management systems are one tool which can be used in this process. Researchers working on such models often find that their investigations lead them beyond the boundaries of their own academic disciplines, usually resulting in collaborations of interdisciplinary research teams. But team members must be able to reach common understandings and compatible forms of modeling, if the model relationships between components investigated by various disciplines are to be adequately understood. The current state of knowledge and degree of quantification also vary greatly among academic disciplines, so researchers must also come to understand and appreciate the research methods and data requirements of other disciplines. This is particulary true when bridges are required between broad disciplinary aggregations, as among the physical, biological, and social sciences.

The development of Rapid Rural Appraisal as a research method, and the elaboration of practical research tools it has encouraged, offers the promise of pragmatic ways for dealing with such issues. In some cases, RRA as a method will probably be able to replace more costly and time-consuming methods, and perhaps even improve on at least more qualitative aspects of understanding. This will free research resources for use in other activities. Such changes inevitably raise skepticism amongst traditionalists, such as those who charge RRA with being only "quick and dirty." But the overall goals of rural research are best served when dogmatic beliefs about the value of any research method are set aside, to be replaced by careful, but pragmatic evaluation of the most cost-effective ways to conduct high-quality research. However, as we have argued above, RRA and other research methods are not necessarily competitors in a zero sum game. There are many cases where RRA methods can be used to supplement and enhance other methods by filling knowledge gaps within and between more traditional reams of disciplinary research, and by helping build bridges between and among more narrow disciplinary analyses. The very fact that the RRA learning process depends heavily on intensive interdisciplinary interaction can make it a very useful tool for such purposes.

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BASIC FIELD TECHNIQUES FOR RAPID RURAL APPRAISAL[1]

Robert E. Rhoades

INTRODUCTION

This paper discusses the ethnographic techniques and methods valuable for the informal or exploratory agricultural survey, the first and crucial stage for many rural development projects. Agricultural development or crop improvement projects in developing countries can rarely afford the expense or time of the traditional ethnographic study or the equally expensive, bulky and hard-to-process questionnaire survey (Hildebrand 1981; Collinson 1980). As a result, agricultural research teams have often opted for the informal survey or *sondeo*. The informal survey can produce at minimum cost a rich description of life in a farming community, an understanding of local ecology, cropping systems and how farmers, merchants, extension workers, and others perceive their conditions and make decisions.

As the springboard of planning, the informal survey has the advantage of placing project implementors in contact with their clients for the first time and on the client's home ground. In this early phase the researcher is like an explorer, making a rapid survey of the horizon before plunging into the thickets from which the wider view is no longer possible. If the researcher observes keenly at the start, the remainder of his journey stands a better chance of success. However, if he gathers faulty information he may wander aimlessly throughout the project or lose precious time and funds backtracking. This paper, therefore, discusses basic survey techniques necessary to guarantee the efficient and successful execution of the informal survey.

WHY CONDUCT INFORMAL SURVEY?

Feasibility Study

Informal surveys can function to provide basic information on the feasibility of beginning a project in a region. This is especially the case when dealing with target areas or farming systems about which little is known. In this situation, the informal survey may be of more immediate use to policy makers than field agronomists, and it will probably be less concerned with specific production problems than with a balanced overview of the region, unless the introduction of a specific technology is under consideration.

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1. Adapted and condensed from an earlier paper, "The Art of Informal Agricultural Survey," produced as Social Science Department Training Document 1979-1, International Potato Center, Lima, Peru.

Reconnaissance to Prepare Formal Surveys

The informal survey can be used to quickly obtain basic information specifically for the design and execution of formal surveys or more in-depth investigations. Thus, the immediate purpose is to help focus a subsequent formal survey that will utilize random sampling and quantify critical aspects of rural life or the production system. The need is not simply to get a "feel" of the area but to discover important, albeit tentative, organizing concepts upon which to base future research. For example, we may want to map agroecological zones, develop a working typology of farmers or find out how people feel about their problems. The exploratory, informal survey can also help insure that the questionnaire is written in a manner understandable, sensitive, and relevant to local issues.

Planning Tool for Agricultural Experiments

In this case, the formal survey stage is omitted and on-farm experiments or projects are designed on the basis of a rapid survey which pinpoints specific production or post-harvest problems. Most developing country projects will, out of financial necessity, opt for this approach. In cases where the informal survey is the only investigation for planning, the team should be interdisciplinary, made up of at least one technical person and one social scientist (Hildebrand 1981). If this is not possible, team members should try to incorporate the missing perspective, be it social or biological, into the research.

THE FRAME OF MIND

The informal survey is methodologically simple but usually physically tough. It normally cannot be accomplished by driving along a main road looking at fields, although a "windshield survey" may be a way to begin. The successful survey may require sloshing through muddy fields, scrambling along rocky paths and dangerous slopes, or whiling away hours in fly-ridden tea shops casually talking with farmers. The surveyors must be country-oriented, grubbing out information in fields, market places, bars, or wherever farmers' daily routines carry them. Those unwilling to face a few village hardships have no business doing informal surveys.

The successful informal survey also requires mental and methodological flexibility. It does not proceed like the formal questionnaire survey where predetermined hypotheses are tested. Instead, important questions and the direction of study emerge as information is collected. This is not to say the informal survey lacks logic, but that one must be able to accommodate new information and adjust research plans accordingly. As the survey advances, the team will pass initial vagueness to a mid-way focussing and finally arrive at a stage where the threads can be pulled together and specific ideas tested.

GETTING READY: PRE-FIELDWORK PREPARATION

Literature Review

Before going to the field, researchers should assemble and review any relevant secondary socioeconomic and production information about the general area to be studied. A surprising amount of data can be found if an effort is made to dig it out of libraries, research stations, and government offices. Secondary materials, especially government statistics, should be taken as suggestive of possible lines of inquiry and not as absolute truth. An attempt should be made to acquire secondary data on rainfall, soils, population, market and prices. Studies conducted by other disciplines should be consulted. It is a mistake for an anthropologist to read only anthropology, an economist only economic studies, or an agronomist to consult only agronomic reports.

Defining the Region

The most difficult early decision in the informal survey centers on delineating the geographical region to be studied. This depends, of course, on time, available manpower, and the project's aim. One must be careful, however, not to define the study region too broadly or narrowly. If the target area is vast, covering more than 300 square kilometers, it will be better to plan mini-surveys in representative areas.

In agricultural research, a target region will generally share common physical and economic characteristics or linkages. In Peru, for example, the highland area selected for on-farm research was the Mantaro Valley, a high intermontane river valley marked clearly by right and left marginal slopes (Mayer 1979). On the arid coast, research was conducted in Canete, a lowland valley the territory of which is defined precisely by its irrigation system. In the Peruvian jungle, however, the informal survey was carried out in selected farming communities located at various points along the major river which served to link communities with the nearest commercial center. In this case there was no concept of a valley or plain but a broad study area linked by transportation arteries.

Using Aerial Photos and Maps

The best way to get a rapid overview of a region is to acquire aerial photos, land-use, relief, or ecological maps. In fact, one should not think of going to an area without at least one map, preferably a topographic map. A few hours studying such visual materials can reveal more than years on the ground trying to figure out agroecological zonation or land use patterns. Contrary to popular belief, excellent maps and aerial photos now exist in the geological or military survey offices of most underdeveloped countries. Satellite imagery already provides excellent coverage for some of the most remote areas of the world.

The ability to read maps and aerial photos is of greatest importance for conducting informal surveys. The images on an aerial photo may at first seem strange because one is not accustomed to a view from the air. With a little practice,

however, the kaleidoscopic patterning of an aerial photo can reveal a great deal about both the historical and present structure of man-land relationships. By tracing field distribution and size, shadows and tones which reflect variations in crops or soil texture, irrigation channels, location of towns and roads, the regional organization of agriculture can rapidly be understood.

Later, on the ground, the reality of the photo (called "ground truth" in satellite imagery interpretation) can be checked. For example, in planning on-farm research in Canete, an International Potato Center survey team examined aerial photos of the valley. Three outstanding images were observed: (1) marginal belt circling most of the valley's edge made up of tiny fields, (2) center region made up of medium to larger fields, (3) area of seemingly mixed field sizes and perhaps wasteland reflecting a light tone. The team hypothesized that these images may represent distinct agroecological belts.

With additional data on communities in each zone and soil maps from the national resources office, the team conducted a windshield survey of the valley for two days and talked to farmers. By using aerial photos, field clusters were located. It was discovered that the zonation reflected in the photos did correspond to ground level reality, although some modification was required. The marginal zone, characterized by poor, rocky soil, was inhabited by small-scale producers. The center zone, historically the location of large states, turned out to be a zone of large fields and the best soil in the valley. The third zone was mixed in terms of landholding size but was characterized by a common problem of extreme soil salinity and poor drainage and thus better suited for livestock and saline adapted crops such as sweet potato, peppers, and cotton. Field observations and interviews with farmers revealed that each zone was characterized by distinct combinations of crops, farming practices, and production problems. The differences between zones and similarities within zones were taken into consideration in implementing on-farm agronomic trials.

Basic Questions and Techniques

Before setting foot in any farmer's field, the research team needs to go to the drawing board and decide: what kinds of information is needed and for what end? General objectives should be clear, even though the relevant questions may not be known. A list of tentative topics for investigation should be drawn up. The questions should cover socioeconomic, ecological, and technical areas.

- What are the agro-climatic zones?
- What are the principal crops and cropping systems?
- What are the types of farm households?
- What is the social organization of agriculture?
- What are the farmers' practices?
- Why do farmers follow these practices?
- What do they feel are their main problems?

IN THE FIELD

Armed with the tentative questions and available secondary material, field research can begin. At first, everything will seem confusing in the field, an initial disorientation that is inevitable. However, before long the region can become comprehensible if researchers follow three simple techniques of fieldwork.

Observe Keep the eyes open for patterns in crop production, land use, and farm behavior.
Converse Talk *with* people and *listen* to their concerns and views.
Record Discretely, write everything down. Complete fieldnotes are crucial. This is especially essential in the early stage to help organize thinking.

Interviewing Farmers

The key to a successful informal survey, especially in relation to understanding how farmers see their problems, is the successful interview. It is important to decide early who is to be interviewed. A frequent bias in agricultural development is to think in terms of "the farmer." Farmers, however, usually do not live in isolation. They belong to groups – families, communities, nations – and decisions about farming are often made by these groups. Although an interview may be with an individual, it is necessary to place his or her comments in the context of social pressures and beliefs. Interviews with groups of farmers are frequently more lively than with only one person. Local leaders should know why the research is being conducted. Informal does not mean incognito. In fact, in many parts of Asia and Africa one *must* go through the local headman or village leader to gain cooperation. Shortcutting the local chain of command can only cause difficulties later. However, it must be realized that local leaders will often selectively introduce researchers to the people that support their biases.

The importance of community decision-making in peasant agriculture must not be overlooked. Enrique Mayer (1979:78) in writing on the Andes stresses how important this aspect can be:

> "Many of the modifications an extensionist might recommend with regard to changes (e.g., seed, varieties, planting dates, rotation and fertilization practices) must be communally approved and generally accepted before they can be put into practice by any farmer."

One way to understand the total farming system (not just on-farm production) is to construct a chain of "key informants." The key informant is an individual who is accessible, willing to talk, and has great depth of knowledge about an area, crops, credit, marketing and other agricultural problems. One should not believe everything key informants say but likewise should not disregard the old-timer who enjoys talking. In any community it will not take long to construct a chain of key informants: banker or money-lender, landlord, ministry official, extension agent, farmer, merchant, and middlemen. Each person in the chain may see the problem differently.

It is generally believed that 'key informants' provide only qualitative data. However, if the interview is properly handled, most "key informants" can give in informal discussion an enormous amount of quantitative data. Tremblay (1957:688) gives an example of interviewing a sawmill operator:

> "One is likely to get a large amount of specific data such as the number of thousand feet of lumber sawn in a day, the number of workers required to maintain a certain rate of woodcutting, the predicted production of a piece of woodland, and so forth."

Gaining quantitative data in rural areas through key informant interviewing is equally feasible but local measurements, units, weights, and concepts must normally be used.

Executing the Interview

The mechanics of the informal interview itself can be arbitrarily divided into five stages (Rhoades 1980): 1. *Approach*, 2. *Warm-up*, 3. *Dialogue*, 4. *Departure*, and 5. *Recording*.

Approach

It is best to keep as low a profile in the rural setting as possible. Oversized vehicles bearing official looking numbers driven by chauffeurs should, if possible, be avoided. Researchers should walk as much as possible and in small numbers. Two in a team is often best. If the team is large it is advisable to divide the study area into a number of zones in order to avoid duplicating efforts or interviewing the same farmers. Once a man is spotted in a field or a woman in her garden who appear as persons to be interviewed, it is best not to drive around indecisively creating suspicion. They should be approached directly. However, we should avoid the "opinion poll syndrome," where the farmer is startled by the researchers driving up to him in his field and jumping out with notebook in hand ready to interview. Blending into the local context as much as possible is obviously the best strategy. We should always be sensitive to the fact that people may be suspicious of outsiders.

Timing is extremely important. One should be aware of the daily work schedule, seasonal activity, work habits, climate, and how in these Peru's highlands, for example, interviewing is acceptable early in the morning before the day's activities get underway. In Indonesia, however, the best time for interviewing is between 4 pm., after prayer, and the evening meal when people are in their homes.

By taking the time and physical effort to walk in the field, interviewing will be more successful since discussions can center around ongoing agricultural activities. If appropriate, one can lend a helping hand without getting in the way (Hatch [1976] illustrates an interesting variation on this idea). The slack season is also an excellent opportunity for informal interviewing.

Warm-up

Informal interviewing is a dynamic process in which importance develops out of casual conversation. The first interviews may be very simple but soon, as knowledge of an area increases, questions will become more penetrating and valuable. It is not advisable to go directly to the subject at hand. The farmer should first be greeted accordingly to local custom and treated with courtesy and respect. If the local language requires it, use the "polite" form of address. The researcher should avoid positioning himself above the farmer or conducting an interview from a vehicle. The conversation should begin with locally accepted polite talk about the weather, how the crops are doing, or the price of potatoes. The farmer must know exactly who the researcher is and the nature of the work.

The situation should be observed to make sure the context is conducive to an interview. For example, if the farmer is irrigating and receives water only once a week for an hour, he may not be interested in small talk. It may be better to set up an appointment. Sometimes farmers can suggest the best time and place to continue.

Dialogue

Burgess (1982) writes: "The unstructured interview may, therefore, appear to be without a structure, but nevertheless the researcher has to establish a framework within which the interview can be conducted; the unstructured interview is flexible, but it is also controlled." The key to the successful informal interview is to be natural and relaxed while guiding the conversation to a fruitful end. At first sensitive questions should be avoided. People should be allowed to stray onto another topic or tell stories since what is said may be revealing of local customs and psychology. One can return to the main line of thought later. By all means, too many questions back-to-back are confusing. The conversation should be interspersed with the researcher's own personal comments.

One method that gains farmer cooperation anywhere in the world is the straightforwards, honest admission on your part that the farmer is the "expert" about farming in his area and you are the learner.

If a question is asked that causes silence or it is obvious the farmer cannot answer, the Socratic method of suggesting answers to lead the conversation along the researcher's biases should be avoided. The question should be rephrased. It is generally best to use plain, understandable language with farmers although sometimes their scientific understanding is quite sophisticated. Farmers have a rich vocabulary tied to their profession and area, but they normally do not understand esoteric scientific jargon. Questions that are too abstract or sensitive should be avoided. The interview should not be extended beyond 30 to 45 minutes unless the farmer is in a talkative mood. Throughout the interview facial expressions should be observed as they may reveal a great deal about farmers' concerns or reservation. Frequently, information on sensitive matters may be obtained through indirect questioning. However, it should be remembered that what people say and do may be two different things.

Departure

After all relevant topics have been covered or the farmer's time exhausted, the conversation should be brought to an end. If the weather is unfavorable (too hot, raining) or the farmer seems pressed for time it is probably best to prematurely stop the informal interview. It is best done gracefully, naturally, and not too abruptly. The "gringo syndrome," the business-like "gotta go" departure should be avoided. The farmer should be thanked for his time and given the proper local farewell.

If culturally acceptable, the camera can be an important research tool. Photo analysis can be used later to help design formal surveys or experiments. Sometimes a favor can be done for the farmer by sending or returning with photos of the farm or family. The farm family should not be let down by failing to send promised photos. Also, in most world areas farmers appreciate receiving small packages of vegetable seed for their gardens or technical brochures written in plain language.

Recording of Information

Immediately after (or if permissible during) the interview, memory-prompting notes should be made. Agricultural scientists, in particular, tend not to write down what farmers say or their own personal observations. However, it is amazing how facts, ideas, and important observations that one "will never forget" quickly slip away. My observations reveal that 50 percent of the details of an interview are lost within 24 hours and by the end of the second day, over 75 percent. After that, only skeletal notes can be salvaged (Rhoades, forthcoming). Jotted notes will serve to aid memory later when full field notes on interviews and a day's observations are written up.

Whether one should take notes in front of farmers depends on the situation. The main point is that we should be sensitive to our actions. The best rule is to abstain from using pencil until the team feels the situation is truly relaxed. Informal interviews lasting more than 30 minutes will usually be causal enough to allow the writing of some notes. An official-looking questionnaire should not be pulled out in any case. This will surely destroy confidence. The ground should first be tested by "interacting" with the farmer on paper by drawing a field layout or cropping pattern. If he does not react suspiciously to the pen and paper, we can probably continue to take notes. However, if issues turn sensitive, it is imperative that we stop writing. Try to get the farmer's name and address unless he prefers not to give it so that you can contact him or if you visit the area again you can make specific personal reference to your previous visit.

How long one waits before jotting down notes or writing full field notes depends by and large on the setting, people interviewed, and personal style. In cases of team research, it may be best to appoint a scribe, a person whose job is to write everything down. After interviewing farmers in the morning, for example, we should stop around midday and write out field notes while they are still fresh in mind. It is also valuable for the research team to meet daily in the evening to go over notes and plan for the next day (Hildebrand 1981).

Organization of ideas can come through writing in the field notebook. One

method of recall is to think in terms of a "sequence of event," that is writing while remembering the activities surrounding an interview. If it is discovered that the questions are not yielding new information it may be time to ask them in a new way or change the questions themselves. Through this rethinking process and "brainstorming" among team workers, there will result analytical flashes where sudden realizations will consolidate into a pattern. For example, when once only isolated fields and crops were seen, now we can see how they associate to form agroecological zones.

INFORMALLY ORGANIZING DATA: TYPES OF FARMERS AND CROPPING SYSTEMS

One purpose of the informal survey is to define relatively homogeneous types of farmers and agroecological or production zones. Technology is frequently locational and group specific. What works for one group of farmers in one ecological zone may not work elsewhere. This fact is complicated through a widespread tendency of technical agriculture scientists to select larger, "better" (more successful) farmers for experimental research since this group is more accessible and has resources to carry out experiments. Also agronomists have been known to prefer level fields with quality soil near roads rather than perhaps more representative sloping, rocky, fields located far from the main road. Thus, one should be sensitive to the representativeness of the farmer or the experimental plot for extrapolation of research results.

Types of Farmers

Early in the informal survey a working typology of producers can be developed. Typically, such groupings are based on a predetermined and quantifiable landholding size (e.g., 1-5 hectares is small farmers, 5-10 hectares is medium, over 10 hectares are large farmers). However, care must be taken not to assume size is necessarily correlated with specific cropping patterns or even economic status. Often large and small farmers in the same area pursue similar cropping strategies. And it may be that the "small" farmer with his limited farm size is more efficient or a better farmer because he must be able to subsist on a much smaller landholding. Thus, multiple factors have to be considered in developing a typology of producers, e.g., size of holding, purpose of production, and cropping system. In terms of potatoes, for example, one might develop a typology involving large to small commercial seed growers, small-scale subsistence farmers and large, medium and small-scale commercial growers of ware potatoes. However, it should be stressed that typologies are merely ways of organizing thinking and that farmers cannot be so easily stereotyped. It cannot be automatically assumed that all farmers in a type will behave the same.

Agroecological Zones

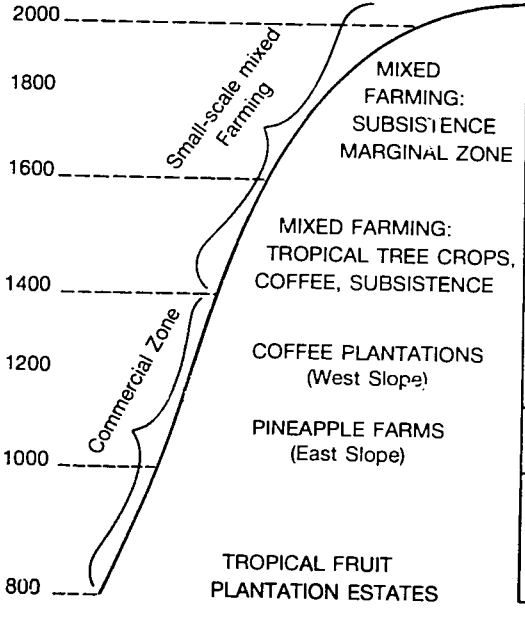
An agroecological zone represents an association between a set of natural conditions (climatic, topographic, soils) and agricultural activity (farming, herding) utilized to exploit that environment. The usefulness of zones resides in the possibility for extrapolation since conditions within zones are more similar than between zones. Presumably, farmers living in the same zone would have similar problems and technological needs. Studying agroecological zones can be facilitated by two simple techniques: agroecological transects and field plotting.

The transect is simply a cut-cross section of a territorial expanse wherein fields are mapped, cropping patterns and practiced observed through space, and the boundaries of agroecological zones defined. Transects are relatively easy to do, depending on the ruggedness of terrain and visibility as affected by topography and vegetation The transect is especially appropriate when relatively rapid changes in topography and natural conditions are found such as mountainous regions. For example, a transect was made in Peru's Chanchamayo Valley to determine agroecological zonation and crop distribution (Figure 1). The Chanchamayo stretches between Peru's high jungle on the eastern Andean slopes down to the lower Amazon Basin. The region ranges in altitude from 500 to 800 meters on the valley floor up to surrounding 2,000 meters ridges.

Using an altimeter, aerial photos, and topographical maps, the survey team started walking from the valley floor along an access road toward higher elevations. Detailed notes were periodically taken of natural vegetation and sketches of field shapes and crop associations made. Technological observations were likewise taken and, whenever possible, farmers interviewed. It is important to observe settlement patterns, distance between fields. These aspects might be important, for example, in determining labor or time requirements in getting to fields or transporting the harvest to market. Agroecological transects similar to this were made in several parts of the valley and later the information assembled to give us a general idea about land use in the region.

Field plotting is a second technique for rapidly understanding cropping patterns and practices in a region. It can be conducted in relation to the transect exercise or while systematically driving through a region. Periodically, especially if it is sensed that the ecology has altered, the team should stop and plot a field in terms of its crop associations and observed farming practices (Figure 2). One does not even have to talk to a farmer to learn a tremendous amount. In a single day, data on several hundred fields in an area of open terrain with good roads can be recorded. For example, agronomists at the International Potato Center were considering trials related to intercropping in the Peruvian highlands. A subsequent informal survey conducted in one day yielded data on 275 fields. Field plotting was done for representative types. The results showed that 86% of the surveyed fields were monocropped and that potatoes are rarely intercropped even in the remaining 14 percent. Agronomists dropped the idea of conducting on-farm intercropping trials for this region (Werge, n.d.).

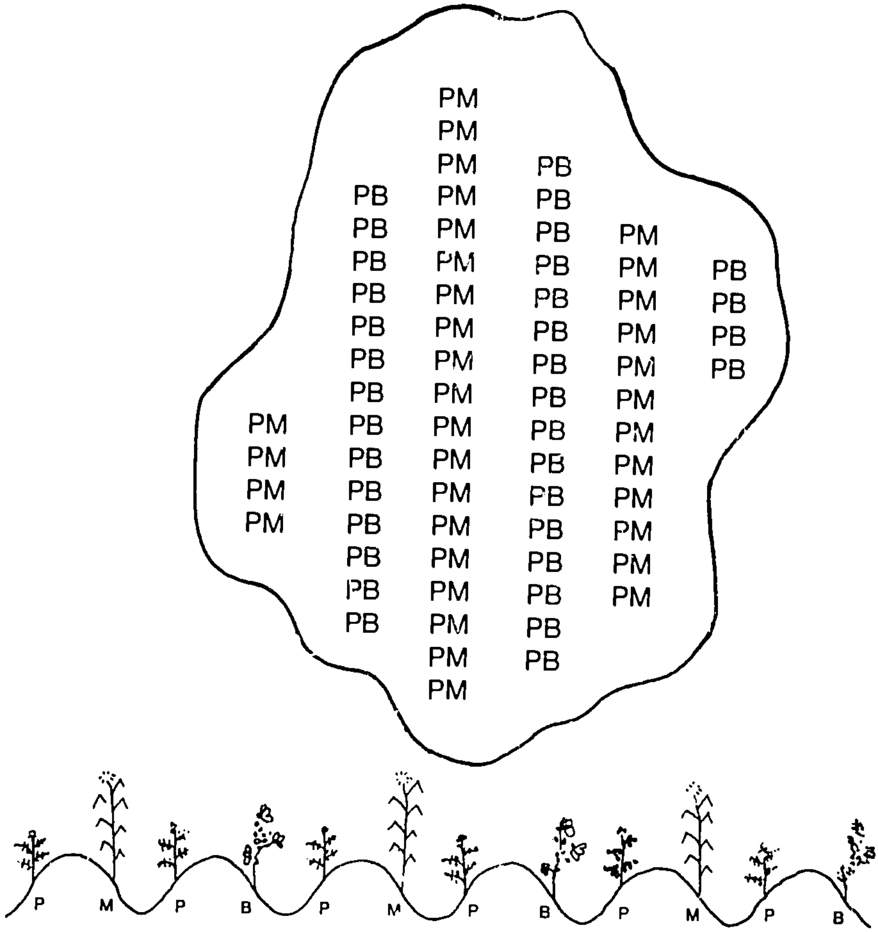
Figure 1 Agro-Ecological Transect. Chanchamayo, Peru.



OBSERVATIONS

Landholding	Cultivation Type	Associated Crops	Origin of Farmers
Family units 8-10 hectares	Semi-shifting cultivation Vegetable garden No pesticides No fertilizers Mixed cropping	Vegetables (potatoes) Livestock Maize Bananas	Recent settlers from highlands
Families tied to Cooperatives	Semi-shifting (until permanent crops put in)	Papaya Palta Banana	Recent migrants from highlands
Cooperatives Large units	Hired labor pest - fertilizer	Banana Palta Papaya	Long-term residents
Household; private	Hand cultivation	Yuca	Second generation settlers
Large units; coops (haciendas)	Permanent, mechanized, pesticides, fertilizers	Banana Palta Papaya	Old-timers

Figure 2 Field Plotting



PM = Potatoes-maize (same row)
PB = Potatoes-beans (same row)

Description: at 3,175 meters we encountered a field with intercropping of maize, potato, and broad beans. Appears potatoes planted first and with first hilling up, then maize and broad beans planted. This was confirmed by farmer met later on the trail. Apparent reason is to save labor by planting maize and beans while hilling up potatoes. Also, farmers spreading risks; in case one crop fails, will have others to fall back on.

Source : Rhoades (1979). Chanchamayo field notes.

The sampling may not be random but after two to three hundred fields are covered, the cropping pattern should be generally understood. This, for example, can indicate whether crop experiments should be done with intercropping, monocropping, or what field trials might be considered.

The problem is that such field observations are time frozen. To gain a long term view of field or zone, interviews with farmers are necessary. This can be done, however, by having the farmer tell the history of a few parcels of land as far back as memory and time allow. It is important to gain an understanding of rotations and the overall cropping system so as to determine how a farmer views the role of different fields in his farming strategy.

Moving toward Quantification: Satisfying an Impulse

If the informal survey lasts more than one week, the team may feel the need for some degree of quantification, a first step toward a formal survey. It is at this point that the development of a simple one-page interview schedule is suggested. The purpose of this is to gather some very basic data, perhaps on size of operation, rotations, crops, and farmer opinions on primary production problems. By this simple quantification, it can be seen if patterns emerge in different zones and among different types of farmers. It can also be used as ammunition with colleagues who will never be convinced unless they see numbers. However, it is still not recommended that the interview schedule be pulled out in front of farmers. Generally, when a questionnaire comes out, farmers turn passive, timid, and quiet. Their boisterous, talkative mood turns serious. As with the open-ended interview, the information should be recorded later.

One valuable technique is the farmers' ranking scale developed from responses to the open-ended questions: "What is the most important problem you have in producing potatoes? The second most important, the third, and so on." Although these are abstract questions, we have found that farmers always have three or four major technical problems on their mind. After the interview, write down farmers' perceived production problems, ranking them numerically. Later a ranking table can be constructed and the data used to select technology for on-farm experimentation which relates to farmers' felt needs. It should be remembered, however, that concerns are very seasonal. In Canete, Peru, potato farmers in March always see cost or quality of seed as their main problem (because they are getting ready to plant); in August (just before harvest) it is the *mosca minadora*, an insect pest.

A table drawn from one of CIP's informal surveys is given in Table 1. Farmers were asked to rank their first four problems in order of importance. Such tables are easy to construct and useful as a sort of intermediate step toward quantification and the design of a formal survey.

USE OF MATERIALS: WRITING IT UP

Immediately after field work, the team should sit down and quickly write a summary report even if it lacks professional polish. It is not important to worry too

Table 1 Farmers' Perceptions of Production Problems Ranked in Order of Importance: Mantaro Valley

Problems	Number of Farmers' Responses				Total Responses
	Most Important	Next Most Important	Third	Fourth	
1. Climate	10	11	12	2	35
(frost)	(3)	(4)	(5)	(0)	(12)
(hail)	(3)	(6)	(3)	(0)	(12)
(drought)	(4)	(1)	(4)	(2)	(11)
2. Insects	9	6	5	0	20
3. Lack of Capital	8	2	6	3	19
4. Plant disease	5	7	3	2	17
5. Cost of Inputs	1	3	3	1	8
6. Lack of Land or Poor Land	2	1	3	0	6
7. Cost of or Lack of Labor	0	2	1	0	3
8. Lack of Irrigation	0	2	0	0	2
9. Lack of Technical Knowledge	1	0	0	0	1
10. None	1				

much about grammar and style. Re-writing can come later. It is crucial to get the information down while still fresh in everyone's minds. The exact format or outline will depend on the purpose of the survey but it is important that it is written in a language understandable to everyone. If the report is to be used to implement on-farm experiments, summarize only directly relevant material. Recommendations should be kept brief. Copies of summary and final reports should be sent to all offices, institutes, or interested individuals, especially those who assisted in the research. This final reciprocity is only fair. The people of the region have given their time. The least that we researchers can do is give them a copy of the study which they have so kindly helped prepare.

It is imperative not to let the report be shelved away to gather dust. It should

be a guide for future activities and constantly upgraded as a project progresses. It should serve to keep us honest (or at least caution us against slipping into our prior biases without reason). If, for example, a survey shows that the majority of producers in a target region are resource-poor, small growers located in a high, marginal zone 1-hour walk from the main road, the team should fight off the understandable desire to carry out agronomic trials with a few large-scale producers located on fertile valley floor lands (unless the technology being tested is relevant to all growers, large or small in either zone). The informal survey is for immediate utilization, not a historical document.

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SEMI-STRUCTURED INTERVIEWING BY MULTIDISCIPLINARY TEAMS IN RRA

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INTRODUCTION

Rapid Rural Appraisal (RRA) might be defined as a *rapid learning process* with the following essential features or criteria:

- Methodology is such that questions and hypotheses are able to be progressively revised during the study, based primarily on the acquisition of new information.
- Most of the activities are cyclical, or *iterative*, in order to gain and assess new information as quickly as possible, in order to progressively revise questions and hypotheses.
- Important parts of the new information acquired during an iteration result from questions that were not known at the start of the study. These questions come from information gained in previous iterations, including the immediately previous iteration.
- A large portion of the new information used comes verbally from rural inhabitants.

If the above features are indeed essential for good appraisal to occur as quickly as possible in rural areas, the use of semi-structured interviewing as a principal method in RRA is virtually mandated, since no other known method can meet these criteria so well. Semi-structured interviewing thus may well be the "heart" of RRA. Guidelines, hints, tools and techniques for semi-structured interviewing are then a priority area for methodological development.

The present paper discusses some ways to do semi-structured interviewing in teams in rural areas, based on experience gained at Khon Kaen University. We will try to discuss detailed hints and techniques in order to encourage information like this to be used to *teach* the method. We do not claim, however, that everything we discuss is the *only* way to do semi-structured interviewing, although we are fairly certain that many of the lessons, tools and techniques discussed will have wide applicability and we believe that some of them are definite candidates for a semi-structured interviewing "core." In addition, we want to state at the outset that, while semi-structured interviewing is a systematic research method, it is also an art or a skill. Any art or skill can be taught, but it can only be done well when it is practiced a lot; and while anyone can improve at it, some people will probably always find it easier to do than others.

SUBTOPICS AND TRIANGULATION

Instead of formulating detailed questions ahead of time, semi-structured interviewing usually starts with more general questions or issues. Factors are initially identified that seem to be relevant to these, and their possible relationships to the topic become the basis for more specific questions which do not need to be prepared in advance when RRA is done by skilled teams. We will call these "subtopics" – hypotheses, issue areas, potential cause-effect relationships, general questions, etc. Identification of initial subtopics relies heavily on the experience of the researchers, and the early rounds of identification usually take the form of "casting the net as widely as possible" in order not to miss anything of potential importance, How specific these subtopics are depends on the topic or objective of the study and the extent of prior knowledge. A multidisciplinary team will have an advantage in picking up on potentially important relationships that may not fall directly into particular disciplinary realms. Semi-structured interviewing is then conducted using the subtopics to guide the specific questions thought up by researchers during the interview. As the RRA team gains more knowledge on the subject, subtopics and questions are revised to obtain increased understanding of the issue throughout the study. Examples of initial and later (revised) subtopics from an RRA study conducted at Khon Kaen are given in the appendix.

Semi-structured interviewing is thus guided in the sense that a set of subtopics (or other form of "interview guide") is identified before any interview and with it the researchers always bring *some* "structure" to the interview. It is "semi-structured" as opposed to the formal survey method which is "fully structured," because not all questions are designed and phrased ahead of time. In fact the majority of the questions are thought up during the interview, thus allowing the researcher the flexibility to probe for more details and better understanding of the local situation.

Semi-structured interviewing is also "structured" by other tools and techniques which the team uses both within the interview and in the choice of interviewees. Given time limitations and the need for information which is as unbiased as possible, the choice of study sites and interviewees should be a conscious one. The use of rapid rural appraisal usually means the coverage of so small a "sample" that the usual rules of sampling used in formal survey work become non-applicable, but their principles can be retained in other ways. The main purpose of sampling rules in formal survey is to cover variations within the population to the extent that the samples studied will be reliably representative of the true population characteristics. In semi-structured interviewing, however, the intensity of the method, in order to obtain good quality information, makes it necessary to use principal researchers for interviewing and thus limits the number of interviewees. But, by applying the principle of "triangulation," overall validity and reliability can be improved and assessed. Hypotheses can be fairly well tested (often quite confidently disconfirmed) and fairly accurate and useful (although less precise) statements can often be made about the representativeness of findings among populations.

Triangulation is a technique employed in choosing methods, sites and interviewees (and team members and their disciplines) so that more than one of each,

usually a minimum of three, is used, thus the term "triangulation." The choices are made in as systematic a way as possible so that a range can be covered. In choosing methods or tools (or disciplines of team members), the variation is qualitative, to get more than one perspective on what is being studied. For example, on the subject of fuelwood situation and farmers' adjustment in Northeast Thailand, semi-structured interviewing was used in combination with existing survey reports and statistics; direct measurement of the sizes, volumes, and weights of fuelwood; and direct observation and observational indicators.

In choosing sites and interviewees, the researchers take into account whatever variables are hypothesized or found to be important influences on the topic or subtopics. In choosing the major sites for the fuelwood study the availability of forest was used as one of the variables; in a study on natural sources of food, yearly rainfall was one of the major site selection variables (and seasonality, which led to doing RRA work in three different seasons). Choices are made to get more than one (probably three) points along the range of the variable, avoiding, however, the most extreme or unrepresentative cases (the "tails" of a normal curve). Although not up to the sampling standards of formal survey, this is far better than having no selection plan at all, and even has a certain advantage over some forms of formal sampling in that choices can be made while the RRA is in progress, allowing investigation of things that were not anticipated ahead of time (by shifting selection variables as the study advances when some variables are found to be more important than expected).

Another aspect of triangulation on sites and interviewees is that it can be accomplished at various hierarchical levels in the "system" (e.g., agroecosystem) and different variables may be chosen at different hierarchical levels. For example, choices can be made on major sites, on the villages within each site, and on households to be interviewed within each village. Villages were chosen in the fuelwood study based on a fuelwood problem index compiled by a local area-development project. The RRA team decided that the size of land holding, among other things, would potentially affect household fuelwood availability and use, and thus chose households to get variation on this factor.

RRA work at KKU includes what might appear to be two different types of RRA: whole village-system RRA work by large multidisciplinary teams (to get analytical overviews and identify problems, etc. in a particular village) and RRA work that focuses on a more defined topic (fuelwood, native pigs, etc.) using a smaller team but covering more villages. But we would like to take the position in this paper that whatever is central to RRA applies to both – that they really just vary dimensionally within the same methodology. For example, larger team size means more time and organization needed for interaction among team members, and thus, in a given period, less time spent in semi-structured interviewing for each team member. Variation of this sort is discussed, however, elsewhere in this volume (paper by Samart) and thus will not be focused on here. With respect to the area (e.g., village) vs. "topical" objective on the RRA, however, we would like to point out that in as much as triangulation in choosing interviewees is a principle for semi- structured interviewing, it should be applied within whatever area is to be studied, whether a village or a nation. The larger or more varied the area, the more

hierarchical levels exist at which there may be variables that need to be understood, but the need to assess the effects of variation (and thereby avoid bias) is basic to RRA.

As any particular RRA study proceeds, all the methods, tools and techniques are potentially subject to change as a conscious result of considering what has been learned at any point and what needs to be found out next. But semi-structured interviewing is often the method that produces the most insights and *within* which the most changes take place (and *can* most easily take place), especially among the guidelines and actual questions asked. This occurs as a team gets "smarter" as RRA work proceeds. Because of its productivity and flexibility semi-structured interviewing invariably remains a principal method throughout any RRA study.

There are a number of rules, tools, techniques and hints – to be discussed next – that can improve the quality and efficiency of semi-structured interviewing. Both quality and efficiency contribute to the degree of learning that can be accomplished in a given time.

PREPARATION

After the identification of a topic the next logical activity, as mentioned above, is to develop a set of subtopics to be used as guidelines for field interviewing. In order to do this, a review of existing literature on the subject is essential. A set of subtopics, areas of interest for questioning based on initial hypotheses, are formulated. (The researchers usually put these in the front of their notebooks in very summary form for easy reference – specific questions put to interviewees are formulated, on the spot, during the interview.) This represents the initial conceptualization which will be revised as the study proceeds (for examples, see Subhadhira et al. in this volume). Interview of "experts" or readily available key informants near the university can lead to further revision. If villages near the university meet initial selection criteria, starting RRA fieldwork nearby has low opportunity cost and may allow better understanding needed to plan longer fieldtrips, but the triangulation principle should be carefully considered before deleting any subtopic (just because something is not important near home does not mean it may not be important elsewhere).

Plans for the interviewing trip schedule (including travel, interviewing and group meeting time) should also be made ahead of time. Whenever possible, planning should include the choice and preparation of tools such as aerial photographs and topographic maps, as well as measuring tools appropriate to the study. (Tools and techniques can also be developed and modified along with the study.) Routes must be plotted out, travel time estimated (taking into account the road conditions), and accommodations arranged. The schedule should have a lot of slack time, to handle unforeseen problems, to allow the team to visit additional villages if the need arises, or to meet as a group, or simply to rest and reflect on the subject under study. Time to "think" alone and as a team, through frequent discussions, is as important as time spent doing interviewing. Otherwise the whole trip becomes too much of a data-gathering activity and not enough learning or "appraisal" takes place. Alternative plans should also be sketched out.

Detailed but flexible planning makes for smoother, more productive RRA. *But*, everyone must understand that almost inevitably, the plans will have to be revised as the RRA study proceeds, because of what is being learned along the way, and sometimes just for reasons of expediency (a village visit taking longer than expected, a road washed out, etc.). In fact, it is necessary at every point to target more sites, villages and households than can be visited (a rule of thumb is *twice* as many). This is of major value in helping to keep the RRA flexible.

ORGANIZATION

Organization of RRA work in space and time is critical to successful RRA. The spatial organization includes the hierarchical levels involved in choosing areas, villages, key informants and households. At the household level, again, more households should be selected than are planned to be interviewed, in case an interview does not go well and should be broken off, or the interviewees are too busy, etc. If key informants are used to select households, larger numbers of households to choose from help offset possible bias (e.g., the village headman identifies 4 or 5 landless households and the team chooses one at random – longer lists mean at least that the first household he thought of can be skipped and less chance of his notifying a household before the team gets to it, affecting spontaneity). The organization and timing of activities includes the composition of interview teams (subdivision of the group if more than three or four team members are involved), time for note revision after each interview, interview team meetings, group meetings, etc. Organization for interviewing villagers in groups will also be needed if this technique is to be attempted (it's usually less useful than household interviewing but has advantages in certain situations for certain types of information – referred to again below).

At the interview level, the team should choose one of its members to take primary responsibility for organization of any particular interview (the role can be rotated or switched off, if desired). A team member, who is comfortable with the role, knows the culture, and can lead (and "read") the interview team nonverbally, should be responsible for keeping the interview under control so that the expertise and limited time are used efficiently. This person will introduce the team and explain the purpose of the visit to the interviewee, start the interview and break off at the end or when the interview is not going well. Simple introduction and straightforward explanation, without implying any promise of future benefit to the interviewee or the village, works best (to get the most reliable answers, and to be fair). KKU teams have found it works best to say "we are here to learn," and mean it. This makes it interesting for the interviewee, especially when the subject is what he or she really knows. It is important in this regard to make sure the team interviews the right person, for example, the family member who actually carries out the particular task being asked about. The interview also has proven to be much more efficient and productive when certain woking protocols are observed among the team members (discussed below).

Semi-structured interviewing always pays off better when a small interdisciplinary group – no more than 4 members (the number we found to work best

is three) works together as a team. If the total study group involves more than 4 persons it is better to break up into small teams rather than staying as a large team that makes interviewing prohibitively difficult – more chances of people interrupting each other and more chances of both the interviewee and the team members getting distracted. With multiple teams, more time must be allocated for meeting in order to increase information exchange and the opportunities for iterative learning during the study trip. A large study group may also choose to switch subteam members between interviews to increase learning from each other, although this will lose the opportunity to develop a better working relationship as an interview team, and often will also have costs in lower interview quality. This will be especially true if the researchers are working together for the first time.

PROTOCOLS

Semi-structured interviewing is a friendly activity that may have the appearance of casual conversation, but it is not – it is a professional activity. To make it most productive it needs training and practice, tools, techniques and rules. Certain types of rules can be called "protocols," rules for team member behavior and interaction during the interview. These rules need to be agreed upon ahead of time. There can be as many or as detailed rules as the team cares to have, but KKU experience has shown that, whatever the rules, they should result in at least three conditions being met if most productive interviewing is to occur: (1) every team member gets to complete his or her questions on a subtopic or interest area before the interview moves on to another one; (2) no interruptions by other team members; (3) every team member takes chronological notes on everything said.

Here are some fairly general and proven ways to go about meeting these conditions, and the reasoning behind them:

(1) It is logical to carry out interviewing following a pre-order of the subtopic list or interview guide. No one should move on to the next item on the list until all members have exhausted their questions within any one subtopic. This can be done by "passing the ball" in a pre-arranged order (by use of short signals, etc.). It can thus be done in rounds, until no one has any more questions on that subtopic, point or issue area. Everyone thus gets the chance to ask questions – especially new questions arising from other team members' questions and the villagers' answers. The agreement to exhaust questions under one subtopic at a time will insure that team members will not get off the subject, and that concentration is maximized for both team members and interviewee. Each team member is responsible to insure that he only asks questions that are related to the subtopic, with some idea in mind, and should simply pass to the next team member if no questions of this sort occur to him. This should occur fairly frequently – it would be highly unusual if everyone on the team could think of good questions on every round. Similarly, if a team member has a number of important questions that will require a long time, he should find a logical breaking point to allow the others to ask questions, and he can pick up again on the next round, otherwise questions from other team members may appear out of context if their questions are to follow up on things that occurred too far back in the conversation.

(2) Everybody must refrain from interrupting each other. This is achieved by writing down any question that one thinks of during other members' questioning period and waiting one's turn. Interruption breaks the train of thought of both the person doing the questioning and the interviewee. Sometimes there may be a long pause when the person having his turn is trying to think about phrasing a very important question and an interruption may cause a loss that cannot be recovered. Very often interruption takes the form of well-intended "helping out" – either in helping other members in explaining their questions to the villagers or in explaining or concluding the villager's answer. If an interviewer needs help he should ask for it. "Helping out" the interviewee by answering for him is a cardinal mistake of the novice interviewer and the urge to do this should be forcefully suppressed.

(3) Everybody should listen carefully to everything said and take notes in the order things are said throughout the interview including when other members are asking questions. This allows reviewing the notes so that better questions can be generated, and inconsistent information can be checked and gaps can be filled. It also is of great help in preventing repetition. Nothing is as boring and insulting to the interviewee as when the same question is asked 3-4 times during one interview. Tape recording therefore is not recommended as a *substitute* for note taking since what is already said cannot be reviewed on the spot and the opportunity for iterative learning during the interview will be significantly reduced.

Experience has shown that sometimes, although usually not too often, use of protocols will delay the progression of subtopics in an interview to the extent that not all subtopics can be covered. The quality of the learning gained, however, is more than worth this sacrifice. If it does happen often, the team may have to do more interviews or make decisions about which subtopics are most important. The built-in flexibility of RRA can handle this problem – most important is the quality of the information gained, not the ability to cover all questions with all interviewees.

Establishing rules that meet the three cardinal conditions for interview protocols will make for the most productive team interview and insure everybody gets a chance to ask questions – especially important when team members have different seniority and degrees of assertiveness. Note taking allows the researchers to iterate during the interview by reviewing the notes and filling in gaps occurring in the previous round of questioning. It also helps getting much better consolidated notes for use after the interview. All together, the rules make each team member individually responsible and most productively and intensely involved.

WHO TO INTERVIEW

The triangulation approach is applied in choosing households to interview. Some variables may not be relevant for this at household level (e.g., size of local forest, availability of water source). Land size and type, household size and composition, and income often come up as important variables in most rural resource or agroecosystem RRAs. It cannot be taken for granted, however, – it depends on the topic and thus the whole process must be gone through for each RRA and can change during the RRA. Even in the case where the sites and villages

are given one still has to go through the process in order to record and consider the effects of the hypothesized influencing variables in order to consider adding on "control" sites and in order to choose at least households through triangulation. As mentioned above, the rule is also to always identify more households than can be interviewed so that if the interviewing is not going well it can be broken off and others on the list interviewed instead. When key informants are used to generate the list, not knowing the exact households to be chosen also prevents the key informant from influencing them by telling them about the interview. This can also be avoided by not having the key informant, especially if he is the village headman, accompany the interviewing team.

Unlike some research methods where the household head is usually interviewed on the assumption that he/she has the best knowledge about the household, semi-structured interviewing is flexible and allows the team to find out on the spot who actually does the work, makes the decision, etc., and can then interview that person. The team should never *assume* it has the appropriate interviewee. For example, in studying dairy cow raising, the team found that often it is the wife or daughter who actually takes care of the dairy cows although it was the husband who received the training and decided for the family to go into dairy cow raising.

WHERE TO INTERVIEW

The principle here is to interview in a place that is comfortable for and familiar to the interviewee (e.g., his/her house or field hut) but also to interview on location where the activity of interest takes place, such as in the paddy field, upland field, beside the fish pond, etc., the advantage being the ability to make observations and thereby generate new questions and cross-check answers. This provides better understanding of things being described in their proper context. Asking questions about the different resource practices and decision making process involving different field types, without seeing the fields, puts the RRA researcher in a position similar to one who designs a questionnaire from afar and has to "imagine" what may be involved (although still with the advantage of being able to ask and follow up questions in a much more flexible manner). Sometimes, important things may be missed because "you didn't ask me about that." If interviewing on location is not possible, the team should at least ask to be shown around after the interview.

GROUP INTERVIEW VS. INDIVIDUAL OR HOUSEHOLD INTERVIEW

The team must decide before the interview starts whether an individual or a group should be interviewed. If the information the team is after is about activities and decision making within the household, an interview of a group of persons from different households would not be appropriate, especially when trying to identify commonalities and differences of practices among households under different conditions in order to try to explain different behaviors. On more general subjects or issues involving decisions above the household level, however, group interviews may yield more accurate information. Examples are the issue of pests, the use and

availability of fertilizer and pesticides, rice varieties planted on different types of land, etc. The problem of interviewees answering how things "should be" instead of how things actually are, however, is more salient with groups (because rules of thumb, etc., are far easier answers for all to agree on than having to hold a lot of group discussion needed to find the variation or "statistical norms"). This can be compensated for by probing for details from individuals in the group. Isolating the interviewee from other people may be necessary when sensitive or more personal issues are involved such as family planning, income and debts, etc.

With respect to sensitive subject matter in group vs. individual or household interviews, a rule of thumb may be of some help: If it is something that is common knowledge in the village but that the interviewee may not want *you* to know (e.g., the size of his land holding), having neighbors present may produce better information (he will be more accurate, or they may help correct mistakes). If it is something that the interviewee may not want neighbors to know, or neighbors to know that he is telling *you* about, isolated interviewing is better.

CLOSING THE GROUP

When interested bystanders follow or stay around listening and trying to join in, not unusual when a group of strangers shows up in a village and interviews only some of the villagers, "closing the group" is important to control the direction of the interview. This can be achieved by inviting the interviewee to move closer and "huddle together" with the team, addressing the questions directly to him – by mentioning his name, for example, or asking questions about *his* activity or what involves only his family, etc. If, however, there are others who appear to be knowledgeable on the subject among the bystanders, they may be invited to join the interview, again, by finding out and specifically mentioning their names. Not too many people, – no more than 4 or 5 in total, should be included, however. Otherwise, other techniques different from those used in interviewing individuals, such as "focus group," may have to be employed.

NONVERBAL FACTORS

There are many nonverbal but important things that can affect the interview. It is necessary to maintain a proper and comfortable "social distance," 18-48 inches for Americans, for example (with nothing in the way in between). In Thai society, this includes not sitting on places higher than the interviewee. It is also important not to show disapproval or distaste about the conditions of the house or if drinking water or local snacks are offered to show hospitality. Reading nonverbal reactions by the interviewee can often indicate whether the answers received are truthful. Indications of contempt or disbelief in responses given by villagers, such as smirking among team members or even criticisms of the responses, must be thoroughly avoided. Other things, such as dress, type of notebook used, etc., can also influence the answers – big accounting books and official looking folders are not the kind to take along.

CONTROLLING THE INTERVIEW

Controlling the interview is essential; it is semi-structured not unstructured. "Closing the group" helps keep the overall interview manageable. "Protocols" allow the team to function as a professional unit, a prerequisite for good control. Controlling the direction of the conversation so that it does not wander off into other interesting but irrelevant subjects takes both friendliness and assertiveness on the interviewer's part. Part of control is knowing when an interview is or is not going well. Nonverbal signs and listening closely to answers will help. Two rules of thumb help: "if the interview team is doing more than a fraction of the total talking, the interview is not going well" and "you will know when you get a very good interview."

If the interviewing team cannot get a villager to "open up" or to answer their questions straightforwardly, it is better to break off, politely, by closing the conversation in such a way as if the expected answer is received and the interview is over. When the interviewers and interviewees are using different dialects but it is still possible to understand each other's dialect/language, it is recommended to use the language best understood by the interviewee and let him answer in the language he is most comfortable with. The use of interpreters should be avoided unless absolutely necessary. If such a situation arises, interpreters must be used professionally, and never be allowed to become "mediators." Professional interpreters are better for this purpose than well meaning amateurs who are fluent in both languages.

JUDGING RESPONSES

Semi-structured interviewing techniques allow asking questions in such a way that answers can be judged and "verified." Most important is not to ask leading questions (discussed below). When questioning is done correctly, answers are better and can be better judged. If the answer comes back too fast or too slow or is vague, it could be an indication that the interviewee is avoiding the issue or does not know the answer but feels he has to make it up. Interviewers should pay close attention to the non-verbal clues. Where doubts remain, cross-checking the responses by rephrasing the questions differently later can help clarifying or verifying previous answers. If the interviewee keeps asking the team to overspecify the question, it is possible that the interviewee does not want to answer the questioı and is playing for time to think of a way out.

PROBING

If semi-structured interviewing is the heart of RRA, probing is the heart of semi-structured interviewing. Probing is defined as ways to obtain increasing detail and depth on a subject of study during the interview. Questions that start with "who, what, where, when, why and how" (the "six helpers") always help to establish the basic situation. Not all these six need be asked on any given point, but

the interviewer should frequently run these over in the back of his mind to make sure nothing of potential importance is being left out. Often questions resulting from these six prompts reveal important information about such things as division of labor (who), seasonal timing constraints (when), etc.

Once detail is acquired, the questions may be expanded into a broader and more comparative nature such as "How was it different before?" "How do other people do it?" "How many people in the village do it that way?" "Who does not?" "What was it like last year, in a good year, in a bad year (defined by the villager)?. Avoiding making conclusions for the villager or helping him to finish his sentence, even when he appears to have difficulty in explaining, is important. Keeping one's own comments, knowledge, and conclusion separate from information obtained directly from the villagers through the interview is one of the hardest things to do. The natural tendency to rephrase the response in one's own words is usually very strong and therefore the researcher must consciously guard himself against this. It is crucial to understand what things mean when they are referred to by local terms – local names for places in or around the village often imply special features, properties and resource practices. Follow-up questions must always be asked when an unfamiliar term is used by the interviewee and when a familiar sounding term is used in a different context from one known by the interviewer.

In order to probe, one must listen closely to what is being said, challenge answers, ask for back-up, details, go for increased depth, specification, use the "next linkage" – forward and back in time, nail down and concretize things. Semi-structured interviewing is therefore an intense experience. If it is done well, it is tiring and should probably not be carried on for more than 4-5 hours of direct interviewing per day. Beyond this, one loses the concentration needed to follow the conversation and come up with meaningful questions.

Observing a skillful interviewer at work, one usually comes away with an impression that questions seem to come to him naturally – he never seems to run out of "good" questions. For an inexperienced interviewer, the hardest part in conducting a semi-structured interview is the ability to think of the "next question." Questions that are not prepared ahead of time usually comes from one of three sources: (1) the villager's response, (2) the use of conceptual tools, and (3) observation of things around (plus one's own background and experience). Questions should always be phrased in such a way that they require explanation rather than allowing the interviewee to answer with "yes" and "no." Questions should also be short and easy to understand, but constantly drawing out more details. Simple diagrammatic "conceptual tools," such as village sketch maps and cross-section diagrams with local place names, are simple and easy to use but very useful for getting information straight, organizing it, and finding follow-up questions. If for any reason a team member or a whole team realizes they failed to follow up – failed to probe on certain issue which may prove to be important – they should go back to those questions until the issues are understood clearly.

LEADING QUESTIONS

Learned and informed, as most educated people believe they are, or perhaps

just needing confirmation of their thinking, researchers often unintentionally ask leading questions (e.g., "Do you plant cassava because it is easy to take care of?"). This is perhaps the hardest habit to break in order to do good semi-structured interviewing. Although responses to leading questions are not necessarily wrong, there is no good way to ascertain this once a leading question has been answered in the affirmative. Leading questions make further probing for details much more difficult and subsequent answers less reliable. There are cases, however, where a skillful interviewer can bring up the issue at a later point from another angle and thereby verify or nullify an earlier response to a leading question. On other occasions, the possibility to learn about that particular issue may be lost until the next interview.

There are a few times, however, when a leading question can be used productively by a skilled interviewer, after having tried other questions, in a controlled, limited, conscious and documented way. Leading questions can also be productively used in strong expectation of a contradictory answer from the interviewee, challenging him to produce proof that the interviewer is wrong. This has sometimes produced very important information, but it is risky – if the response is in the affirmative, the answer tells us nothing and usually prevents any further productive probing on that issue with that interviewee.

OTHER TOOLS AND TECHNIQUES

Conceptual Tools. KKU teams have also employed many other tools and techniques to help solicit, record, and interrelate information during the interview. These include fairly specific tools such as the crop calendar, the labor calendar, the activity sequence calendar, animal feed calendar, etc. Village maps and cross-sections with local place names are also useful to make sure the team and the villagers are talking about the same activities and places. Tools like these are covered by Limpinuntana (in this volume) and thus will not be detailed here.

Oral History Method. This is also widely used by KKU researchers when recollection of events that took place a long time ago is needed. Important events in general or in the villagers' life and the associated years are recorded and used as the basis to recall other things that happened in the past. For example, a person may not remember the year cassava first arrived in his village but may be able to recall whether it was before or after his wedding or when a certain child of his was born, etc., from which information on the year can be deduced. Diagrammatic schemes like the "time line" can be used to record and interrelate events.

Observation. Being observant during an RRA especially during the interview always proves to pay off – many indicators are identified and used through observation. It also provides a source for the "next question" during the interview. Additional information can be obtained through observation – a photograph of a family member being granted a degree not only indicates the educational background of that member but may also indicate contacts outside the village; construction materials for the house may indicate the wealth of the household; etc.

Direct Measurement. The fuelwood study in this volume (Subhadhira et al.) provides a good example of how a simple and inexpensive measuring device can be

designed and used to obtain important information, in this case, on volume and weight of fuelwood used in various activities. When the subject is rice yield, it may be important to compare measuring containers, often referred to by the same names, but often of different sizes. A host of simple measurement tools can be designed for RRA. Direct measurement will probably be very important in RRA on health and nutritional issues.

SOME COMMON ERRORS

Because semi-structured interviewing is conducted without a set of fixed, written questions and, moreso, when it is conducted by a team, mistakes can be made at any time during the interview. These errors can be grouped into two broad types, errors that occur as a result of operating in teams and errors that are more individual.

Group errors include interrupting each other, or "helping out," not passing off, switching subtopics or getting off the topic completely, failure to deal with "outsiders" and failure to "close the group." Failure to prepare as a team by not having adequate review of existing information and planning will result in an unorganized trip and poorly-defined hypotheses. Pushing for more interviewing time at the expense of group meetings is another common error. Without meetings in between interviews, opportunities for better iterative learning are lost. When sub-teams are involved in a study, this is most critical. Team meetings may not work well if held in the village itself, especially if teams are large, and especially on sensitive subjects.

The most common errors committed by individual team members are (1) the failure to listen closely; (2) repeating questions already asked by another team member; (3) failing to probe; (4) failing to judge the answers; (5) asking vague or insensitive questions; and (6) most common of all, even for expert interviewers: asking leading questions.

CONCLUDING REMARKS

Much of what appears in this paper represents some of KKU experience in semi-structured interviewing conducted during the past two and a half years. Many techniques have been developed and refined. Protocols were tested and modified to make working as a team more pleasant and productive. We have found that typically any one semi-structured interviewing trip should last no more than one week – the particular field trip itself, not necessarily the whole RRA study. A week may be best, but with a break in the middle to allow everyone time to rest and reflect (but the team remains in the field so the momentum is not lost). Any longer is too exhausting and therefore counter-productive, and people do get on each other's nerves because the exercise is very intense. If any shorter than three days, it is too rushed and gaps in information result. The timing may be different for other areas of the world, however, if terrain and transportation routes, etc., are different.

The KKU experience also proves the advantage of working in interdisciplinary

teams. Good rapid *rural* appraisal with semi-structured interviewing as the principal method benefits greatly from interviewing in an interdisciplinary team.

A final remark about concluding successful rapid, exploratory and iterative learning concerns the write-up of the RRA. Because information is obtained through semi-structured interviewing and note-taking in the field, one cannot really record everything (especially the ideas that occurred during the interview when certain questions were phrased in certain ways with particular hypotheses in mind, etc.). It is also impossible to really record all the ideas exchanged among the team members. Writing up consolidated field notes and a preliminary report as soon as possible (i.e., in the field) therefore is necessary to prevent loss of important information and analytical ideas and in fact will also generate new ideas for further investigation.

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The particular treatment of semi-structured interviewing in this paper, however, is the sole responsibility of the authors, especially so since, due to severe time constraints at the time when this paper was written, none of the above had a chance to review the draft.

Appendix

Example of Subtopics and Revised Subtopics from an RRA on Trees in Paddy Fields

Initial Conceptualization about Trees in Rice Paddies

1. What species are there, where are they (in paddies, on dikes, on mounds), how dense are they, what patterns in distribution? How long have they been there, how did they get there, which ones are planted (where, when, etc.); if not planted are they protected when young?
2. Some paddies have trees, some do not, even in small local areas. Why? Age? Moisture? Soil type? Nearness to forest?
3. What possible uses/roles do trees play, directly and indirectly? Fodder or shade for livestock; fuelwood; lumber; good and bad effects on rice (shade, litter, rats, disease, insects, etc.)? Habitat for frogs, lizards, snakes, termites, bird, rats, etc.? Is plowing more difficult, planting? Usage patterns, exchange, common use, etc.
4. Do trees have any effects on other crops or uses in relation to other crops? What other types of plants and bushes are around? Any effects on trees?
5. What changing patterns in species, density, uses, etc.?
6. Any effects on post-wet-season soil moisture in paddy fields?

State of Conceptualization after First Few Interviews

1. How old are the paddies, how has the density and distribution of naturally occurring trees been changing, especially dikes vs. fields, higher ground vs. lower ground, etc.? Have any trees been planted: which, where, when, why? Any seedlings protected or transplanted? Is the houselot already "full?"
2. In areas where no trees occur (infrequent), does anybody know if there were ever any trees there? Does the area flood or waterlog, etc.?
3. What are the local rules for ownership and usage for lumber, leaves, fruits, dead branches, etc.?
4. Which tree leaves do livestock eat? When? Shade effects on livestock, grass, human food and shade; problems trees cause and benefits they provide; shade, litter (fertilizer effect seen or not); what lives in trees, uses; specific shading effects on rice; presence and type of birds and how they affect rice – who hunts them, when, etc.; value of lumber and how plan to use, when; degree of fuelwood supplies locally; any effects on wet and dry season moisture? Cutting of roots; trimming trees; attitudes about effect on plowing and transplanting; plan to plant trees; number of lumber trees vs. other types; insect in trees – any effect on rice?

CONCEPTUAL TOOLS FOR RRA IN AGRARIAN SOCIETY

Viriya Limpinuntana

INTRODUCTION

Rapid Rural Appraisal (RRA) is one of the methods extensively used by the KKU-USAID Farming Systems Research Project to study the existing farming systems, farmers' decision making on resource management, and farmer adoption of introduced technologies. The methodology of RRA involves casual conversation with the farmers and local authorities by an interdisciplinary team of researchers. The nature of data gathering is therefore that of semi-structured interviewing. The questions directed to the farmers are loosely based on a short checklist of guidelines (or the so-called "subtopics"). Under such circumstances it is necessary to build on-the-spot questions during the interview to communicate with the farmers in order to probe for in-depth details. But how can such questions be generated?

This paper deals with tools for conceptualization used during RRA work at Khon Kaen University. If the members of an RRA team can learn how to use these tools, they will be able to question the farmer and discuss findings with him without having to write down specific questions ahead of time.

HOW CAN THE QUESTIONS BE GENERATED ON THE SPOT?

RRA is much different from the formal questionnaire. The latter has a well prepared plan to ask definite questions with rigid lay-out under certain assumptions. Theoretically, the formal questionnaire will leave no room to fill in new findings or to probe deeply into relationships between or among components of farming systems and/or with natural and socio-economic settings, unless that questionnaire is purposively set to do so. In contrast to the formal questionnaire, the bulk of questions generated during the RRA interview have to be done on the spot while talking to the farmers. Questions asked to farmers or key informants can be built around:

1. Subtopics/checklists
2. Pre-existing information on the sites
   2.1 reports and statistics
   2.2 maps and aerial photographs
3. Resource management
   3.1 mapping on the spot
   3.2 crop or animal calendar
   3.3 labour schedule
   3.4 activity sequence
   3.5 decision making

4. Direct observation and indicators
5. General tools
   5.1 six helpers
   5.2 local terms, folk taxonomy, and sayings.

Subtopics/Checklists

Initially, subtopics (guidelines) or checklists can be prepared prior to the RRA trip from brainstorming by all members of an interdisciplinary team consisting of biophysical and social researchers. During the discussion each member of the team contributes his or her existing disciplinary knowledge toward a better understanding of the topic under study. Technical terms from each member's discipline should be explained clearly to team members from different disciplines so that a common understanding toward the topic of study can be developed. At the end of the brainstorming discussion, tentative pictures of the subject under study are drawn in the form of hypotheses upon which a number of key subtopics and checklists are based. These key subtopics and checklists will then be used as a springboard to generate questions during farmer interviews. Examples of subtopics and checklists are given by Grandstaff and Grandstaff (1985, 1986), Subhadhira et al. (1985), Rhoades (1982), and Beebe (1985).

There are a few likely mistakes that may happen and disrupt these brainstorming discussions. Firstly, since RRA involves an interaction among researchers from different disciplines individual members should not be defensive with respect to their own disciplines and should not insist that only factors related to their disciplines are influencing farmer conduct or causing key problems in the village community. Instead, members should try to be open-minded and thoughtfully work out relationships between factors of their own disciplines and those of others. It is usually the case that the observed phenomenon is generated from a chain of interaction among various factors, which necessitates investigation by an interdisciplinary team. At the end of the study, key determinants or constraints may be found to be the result of a few factors related to one or two disciplines, but such conclusions can only be drawn after the entire team has thoroughly studied the whole system together from each disciplinary angle. Another problem in interdisciplinary discussion is the background knowledge of the individual team member. Having obtained a higher degree and/or become specialized in one narrow subject, one tends to lose sight of the broad background knowledge even within one's own discipline. For example, an agronomist cannot work in place of an horticulturist. If this kind of circumstance is inevitable, as often found in the case of a small RRA team, knowledgeable persons of particular key backgrounds should be asked to join the brainstorming discussion in order to obtain the vital subtopics prior to the RRA trip.

Pre-existing Information

Once the target area has been specified, pre-existing information on the area

or on particular locations should be sought. From such information, a tentative picture of how agricultural activities interact with rural environments can be drawn, so that specific subtopics can be derived during the brainstorming discussion. Careful analysis of the secondary information will definitely shorten the time needed for RRA as well as giving a more accurate picture of the rural system under study. It has been warned that failure to analyse the pre-existing information may result in wasting time and money to gather information which has been previously collected (Chambers 1980).

Pre-existing information can be broadly divided into two kinds: 1) reports and statistics, and 2) maps and aerial photographs.

Reports and Statistics

Unless a village targetted for RRA is in an area under a long-term development project or a government-aided action program, reports written on particular villages tend to be sporadic, but often information can still be obtained from local government agencies. In Thailand, excellent background information on about every village in the rural areas has been recently collected under a joint program between the National Economic and Social Development Board (NESDB) and the Community Development Department of the Ministry of Interior. The data were collected by the local Community Development workers who spent time gathering information from village headmen, members of village committees, and from observation. The contents included in this so-called "Gor Chor Chor Song Khor" report are basic statistical figures on agriculture, socio-economic conditions, health, natural resources, etc. Primarily, the data collected are planned to be used for establishing the "Poverty Index" of the village so that appropriate strategies for rural development can be undertaken during the period of the upcoming sixth national plan. Since most of the village data was taken from opinions or observation, and not by direct measurement, certain quantitative figures included in the report may not be dead accurate. Nevertheless, the data from this report are very useful for suggestive guidelines.

Another set of basic information on rural areas of Thailand is also available at sub-district (tambon) level. The information has been included in the handbook prepared by the local sub-district agricultural extension officer during 1982-83. The objective of this handbook is to provide background information on agriculture of every rural sub-district and it therefore provides excellent supporting information to the recent "Gor Chor Chor Song Khor" report.

It is planned that the village and tambon data will be updated at regular intervals (every two years). Updating should reveal dynamic changes taking place in rural areas.

Maps and Aerial Photographs

A number of excellent and informative maps are available from a few governmental authorities in Thailand. The Map Division of the Royal Thai Army

provides aerial photographs (usually 1:50,000 and 1:20,000) and topographic maps of variable scales (usually 1:250,000 and 1:50,000), based on aerial photographs. Each 1:250,000 maps covers approximately the area of an entire province and provides information on routes of transportation, topography, vegetation, large water resources, location of administrative centers, etc. The location of particular villages may not be evident at the 1:250,000 scale, but it will be found in the more detailed map of 1:50,000 scale. The 1:50,000 map has proven to be most useful and has become a "must" for any RRA trip. It provides the location of village site, topographic features of the natural surroundings, drainage patterns in different forms, water resources, routes of transportation between villages, land occupied by different types of forest, land devoted to paddy fields, etc. (Figure 1). Transects of the area can then be prepared from the contour lines of this 1:50,000 map and with pre-existing information on soil and agricultural activities it can be used to identify suggestive agroecological zones for further ground checks (Figure 2).The scale of this map can cover the area of whole sub-districts (usually about 1,000-20,000 ha), but is too small for detailed study of the area of any particular village.

The detailed features of the village under study can be obtained from the aerial photographs of 1:20,000 scale (Figure 3). Under a pair of stereo-lenses, the topographic features and drainage patterns (Figure 4) can be thoroughly studied. Then later ground-checks with local inhabitants will provide an accurate picture of the village natural surroundings. Aerial photographs taken at different times also provide information on natural resource usage and changes in physical features of the area (Figure 5).

The weak point of army maps is that most of them are not updated frequently enough to catch up with the current land uses or changes in environmental setting. Furthermore, the use of aerial maps needs to be planned well ahead of time as it often takes a long time to obtain them from the Army Map Division.

Apart from the army maps, various soil maps prepared by the Department of Land Development are extremely useful for area study (Figure 6). The soil maps are currently available for every province of Thailand and have been prepared at the scale of 1:100,000. Different soil series are presented on the map together with topographic features. Soil series are known to be associated with types of crops grown in the areas, with degree of flooding, with water-holding capacity, with soil fertility, etc.(KKU-FORD Cropping Systems Project 1982). Maps to be used for special purposes are also prepared for certain areas by the Department of Land Development; examples of these maps are soil salinity maps, land capability maps for growing various crops, ground water maps, etc. In addition, finer detailed maps of certain areas can be obtained from action programs working in the specific areas as in the case of the USAID-supported Northeast Rainfed Agricultural Development Project (Limpinuntana and Patanothai 1982) and the Royal Irrigation Department (1971)

Careful studies of the pre-existing maps will generate a number of well-directed subtopics or checklists based on good approximation of interaction between agricultural activities and natural surroundings. Furthermore, such studies will usually reduce the time needed to be spent in target areas during the RRA.

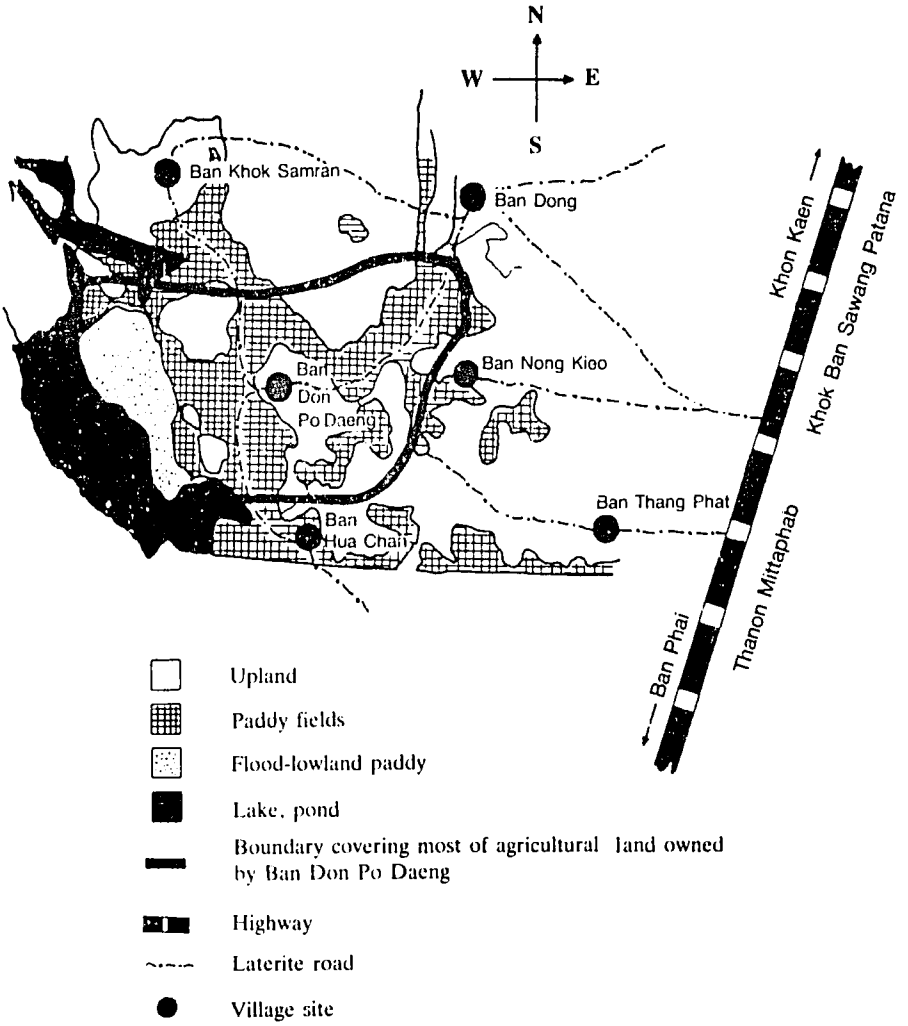
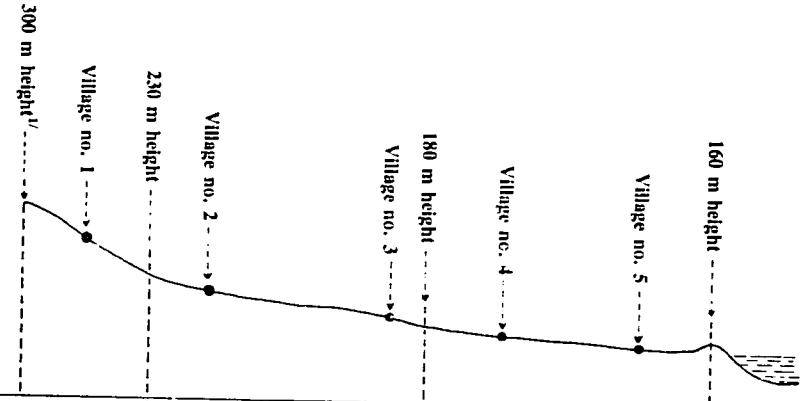


Figure 1. Map of Ban Don Po Daeng, Khon Kaen Province with Neighboring Villages and the Surroundings : Prepared from the 1 : 50,000 Army Map.

Source : Phalaraksh, Kanok et al. 1984: 6.

Figure 2. Transect Map of Po Chai Sub-district, Khon Kaen Province

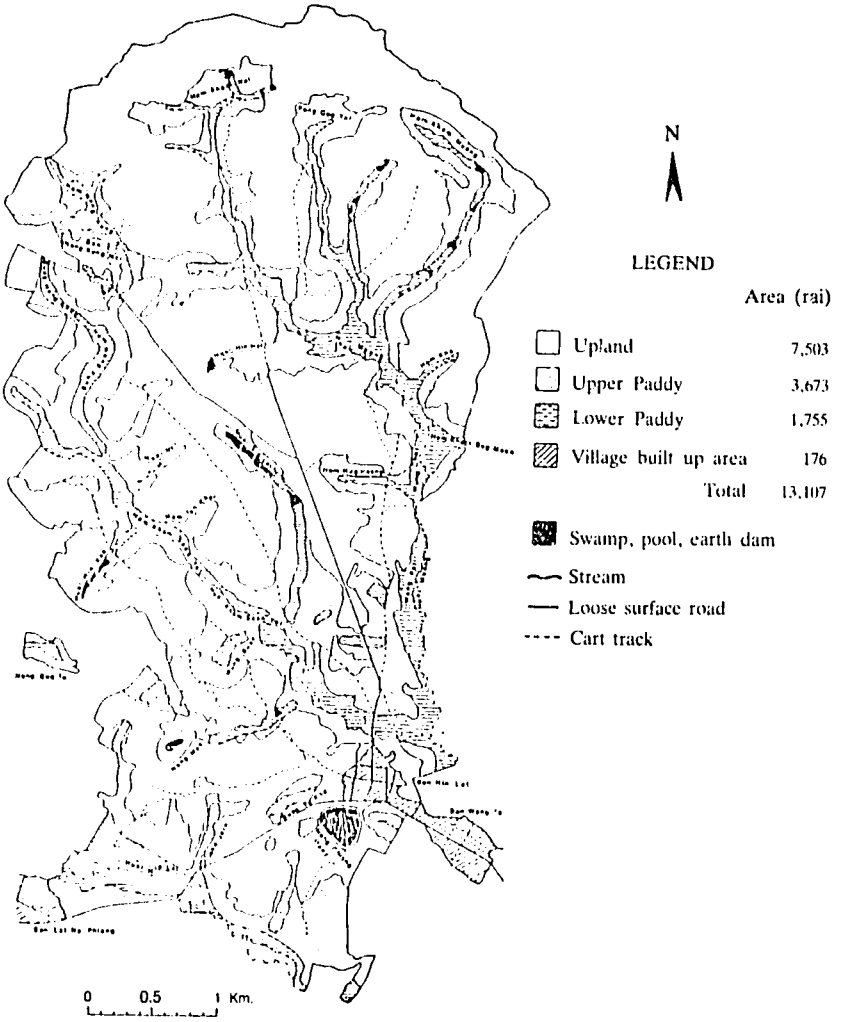


Land type	Upland	Upland and paddy field	Paddy fields on the flood Plain	Chee River
Soil	Slope Complex	Loamy Paleustult and Loamy Paleaqualt	Clayey Tropaquept	
Drainage	Good		Poor	
Existing crops	rice, cassava, kenaf		rice, kenaf	

Note : 1. Height = height in meters above sea level
2. Prepared from the 1:50,000 army map with the additional information from provincial Soil Map and the Gor Chor Chor Song Khor report.

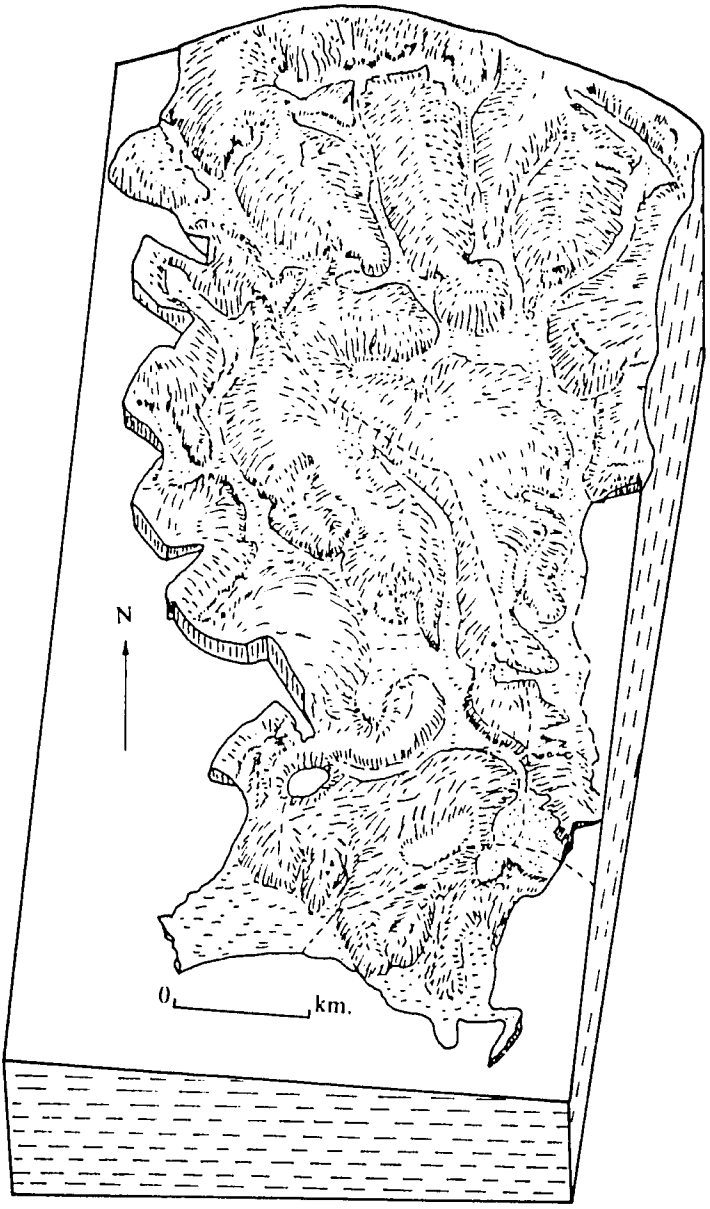
Source : KKU-USAID Farming systems Research Project, unpublished.

Figure 3. Village Map Showing Types of Land, Water Resources, and Roads Prepared from Aerial Photograph (Ban Hin Lad, Ban Khor Sub-district, Khon Kaen).



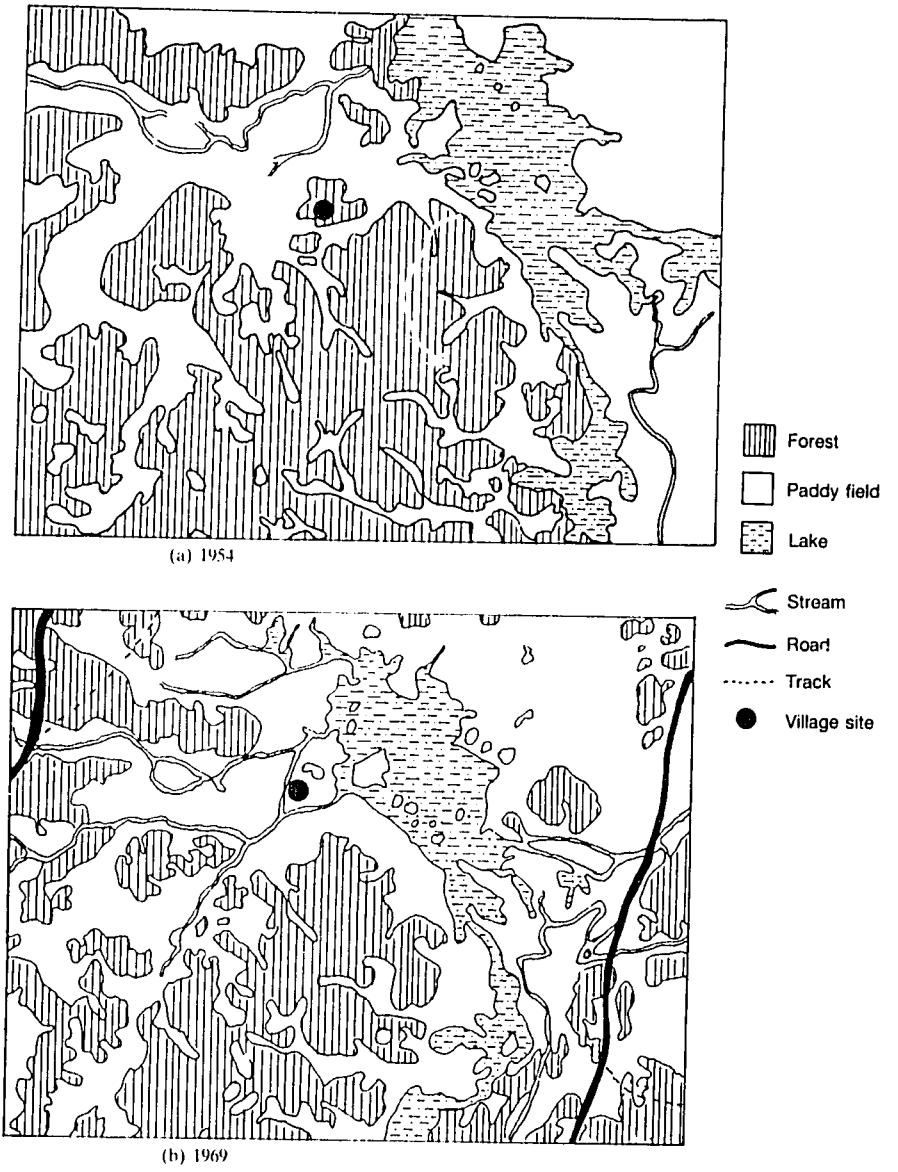
Source : Ratanasophon, personal communication.

Figure 4. Block Diagram Showing Topographic Features and Drainage Patterns of Ban Hin Lad, Khon Kaen as Prepared from Aerial Photographs.



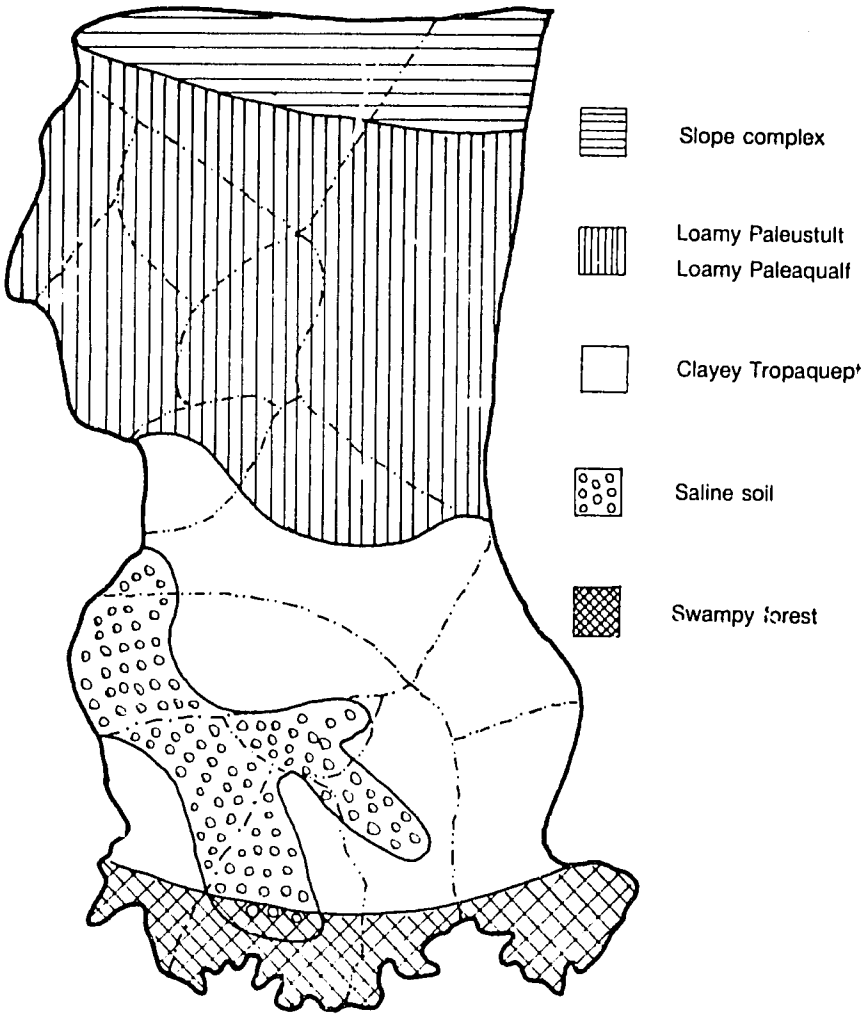
Source : Ratanasophon, personnal communication.

Figure 5. Changes in Drainage Pattern, Water Resources, Area Occupied by Forest, and Land Use in Ban Don Chang, Khon Kaen Province, Prepared from Aerial Photographs for 1954 and 1969



Source : KKU-FORD Socio-economic Studies of Farmers in Rainfed Areas of Northeast Thailand.

Figure 6. Soils of Po Chai Sub-district, Khon Kaen



Source : KKU-USAID Farming Systems Research Project, unpublished.

Resource Management

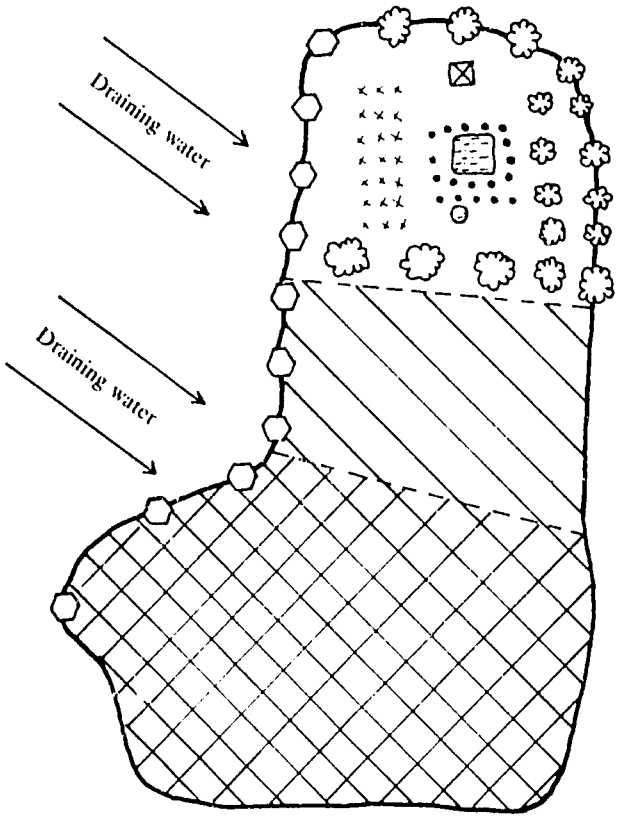
In most cases, RRA studies deal with management of rural resources of one kind or another. Therefore, a number of essential checklists on resource management can be automatically included beforehand. These checklists can later be used, together with the "six helpers" (see below), as the tools to generate a flow of questions, even when used by newcomers with no previous experience with RRA. The essentials here are mapping to show the distribution of local natural resources and agricultural commodities, calendars of animal or cropping activities and the seasonal usage of resources under investigation, labour schedules of villagers and/or representative farm families, activity sequences of any resource use or any agricultural production process, and decision making patterns of the villagers.

On-the-Spot Mapping

Study of resource management requires knowledge of the spatial distribution of resources and how those resources have been utilized for agriculture and other purposes by the villagers. Mapping of spatial distributions of resources and how they are used for agriculture will help in understanding the possible relationships between various environmental factors and agricultural activities. The relationships can be found by simply overlaying information of various kinds on top of one another. To do this effectively, the army maps of 1:50,000 scale and the aerial photographs should be made available to the key informants in the village. The key informants can then be asked to identify on the map the exact location of natural resources and the pattern of resource usages (e.g., cropping, livestock grazing, etc.) during the entire year. Different patterns of usages from year to year, particularly in years with normal and abnormal rainfall, should also be asked. Dynamic changes from past time up to the present can also be recorded on the map. Local names of particular locations in the village should be identified on the map and then should be used to develop mutual understanding on localized resource usages between the researchers and the farmers without having to refer frequently back to the map. Figure 3 shows a map with typical local names identified by a key informant.

To fully understand how an individual household utilizes the land for cropping or other agricultural commodities, a member of the household can be asked to aid in drawing the diagram of spatial distribution of various crops on his farm land (Figure 7). For the detailed study of factors affecting cropping, it is also necessary to draw a land transect showing toposequential location of crops and natural resources (Figure 8). Soil fertility and water availability, or drought, or flooding tend to be associated with topographic features and thereby dictate types of crops grown by the farmers. In studying mixed cropping or seeding pattern of crops for further agronomic improvement or on-farm trial, spatial arrangement of crop(s) within the same plot should be drawn (Rhoades 1982). If possible, map drawing should be done in the field so that direct observation can be done at the same time and probing questions can also be asked on the spot.

Figure 7. Farm Plot of a Northeastern Villager Displaying the Current Land Use Pattern



Fruit tree

Resting hut

Bamboo

Kenaf planted for seed production

Vegetables

Farm pond

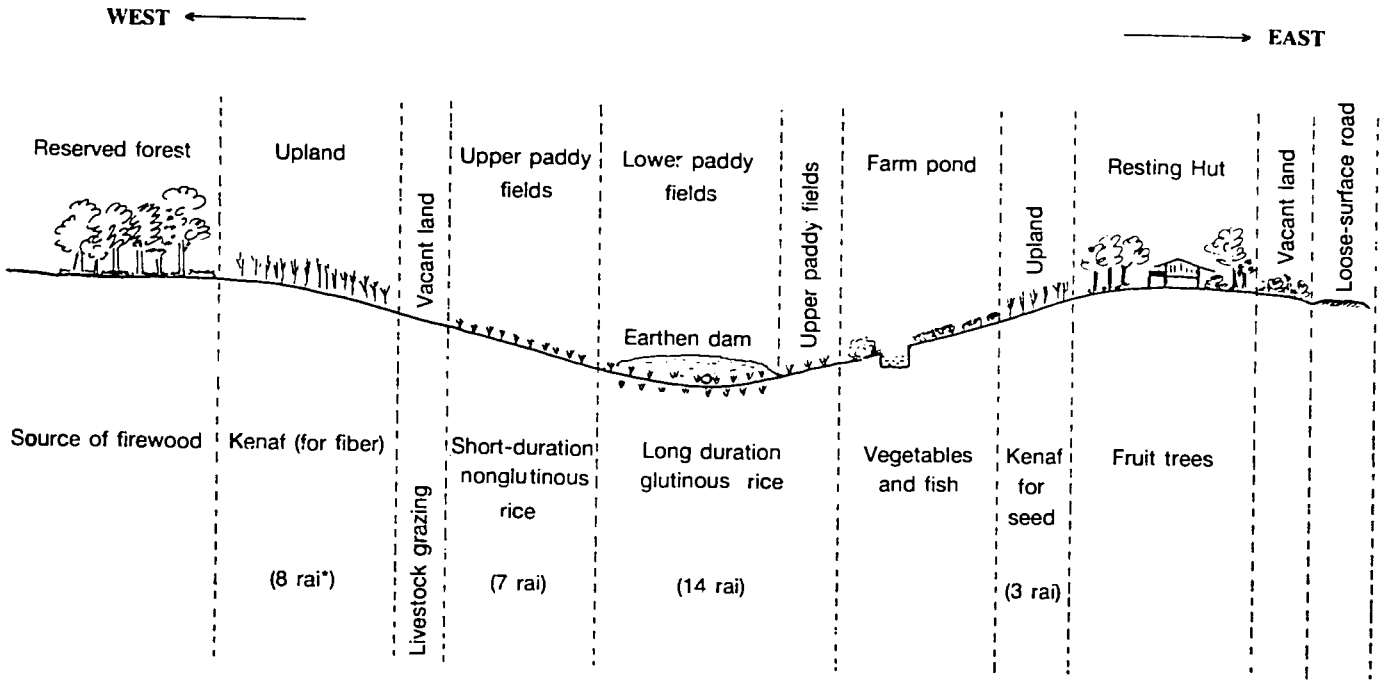
Shallow well

Upper paddy fields planted to kenaf-rice-watermelon

Lower paddy fields planted to long-duration rice

Source : Limpinuntana, unpublished.

Figure 8. Transect of the Undulating Farm Land of a Khon Kaen Farm Household



Source : KKU-USAID Farming Systems Research Project, unpublished.

Note : 1 rai = 0.16 hectare

Cooperation in drawing maps between the farmers and interviewer is also a tool to produce smooth communication between the two parties.

Calendars

Crop calendars have been extensively used by various cropping/farming systems projects (Beets 1982). They show the earliest and latest time of planting and harvesting of an individual cropping pattern and therefore the period and duration of area occupied by that particular pattern (Figure 9). Such calendars can be further modified to cover the period of labour usage in the crop activities, such as land preparation, weeding, fertilization, harvesting, and threshing for grain (Figure 10).

Other calendars can also be prepared to show the start and finish of other agricultural sectors and the seasonal usage of natural resources; e.g., animal feed availability (Figure 11), drinking water for man and livestock, sources of fuelwood, etc.

The seasonal start and finish of an individual cropping pattern has a definite relationship to certain key environmental or socio-economic features. For example, a key natural determinant that is most likely to dictate a cropping pattern is either rainfall and or water availability from irrigation, which may vary from year to year. They are the primary factors that govern the soil moisture which in turn is further modified by soil texture and topographic sequence. Certain cropping patterns are also dictated by temperature, daylength, etc. In the case of commercial crops, market demand can also dictate the time of planting and harvesting. Traditional festivals can also keep labour away from planting, weeding or harvesting crops (Figure 12). The relationship between seasonal planting/harvesting of cropping patterns and other biophysical/socio-economic features can be found by overlaying different kinds of calendar information.

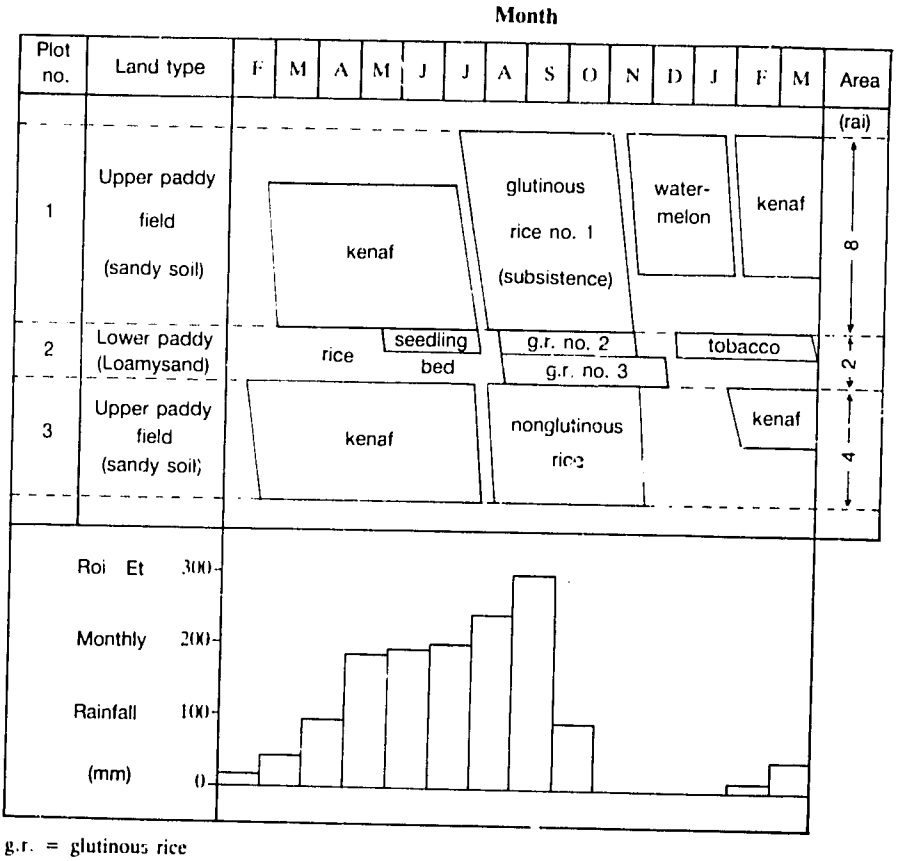
While preparing the calendar, a lot of questions can also be asked on the spot about labour schedules and activity sequences of individual cropping patterns or other resource usages.

Labour Schedules

Labour schedules are drawn to develop understanding on how labour is utilized in management of resources or agricultural commodities. Labour schedules can be prepared to show general patterns of labour usage in the village or in individual households. These schedules can be presented in the form of the seasonal or daily pattern. For seasonal schedules, a pattern similar to the crop calendar can be drawn, but in addition to crops other activities are included in the same diagram, e.g., livestock raising, wood gathering, native vegetable and fruit collecting, silkworm rearing, cottage industry, off-farm work, etc. (Figure 13). Labour schedules can also be modified to include man-hours of labour usage (Figure 13).

In the study of a household's labour management, labour schedules for individual members can be worked out roughly. It is likely that division of labour exists within a rural household. The jobs preferred to be done by people of different sex

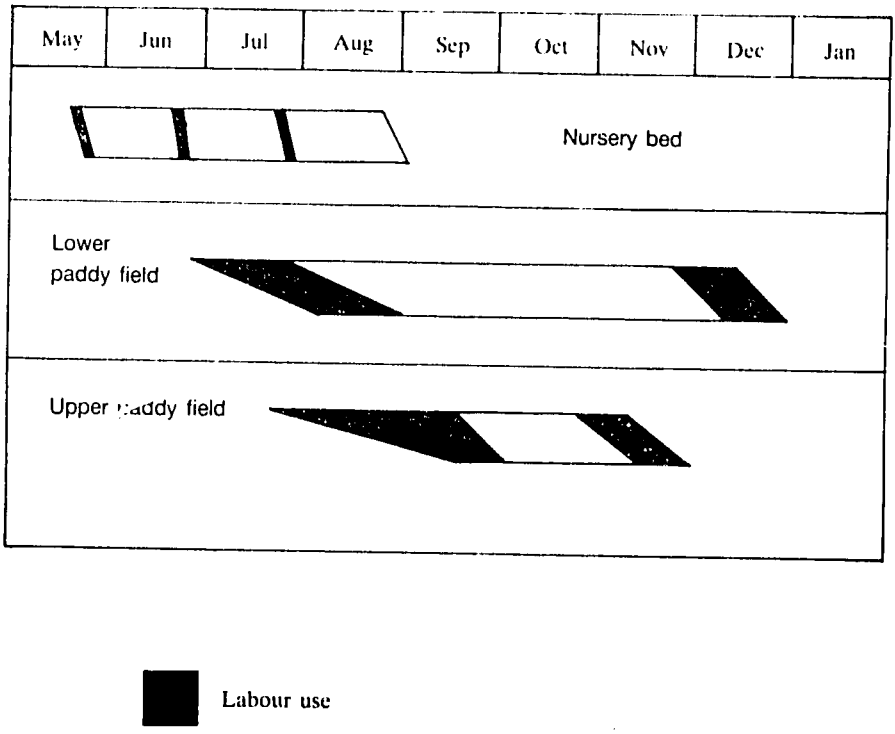
Figure 9. Crop Calendar of a Farm Household Recorded at Nong Kaew Sub-district, Roi Et Province in 1983.



g.r. = glutinous rice

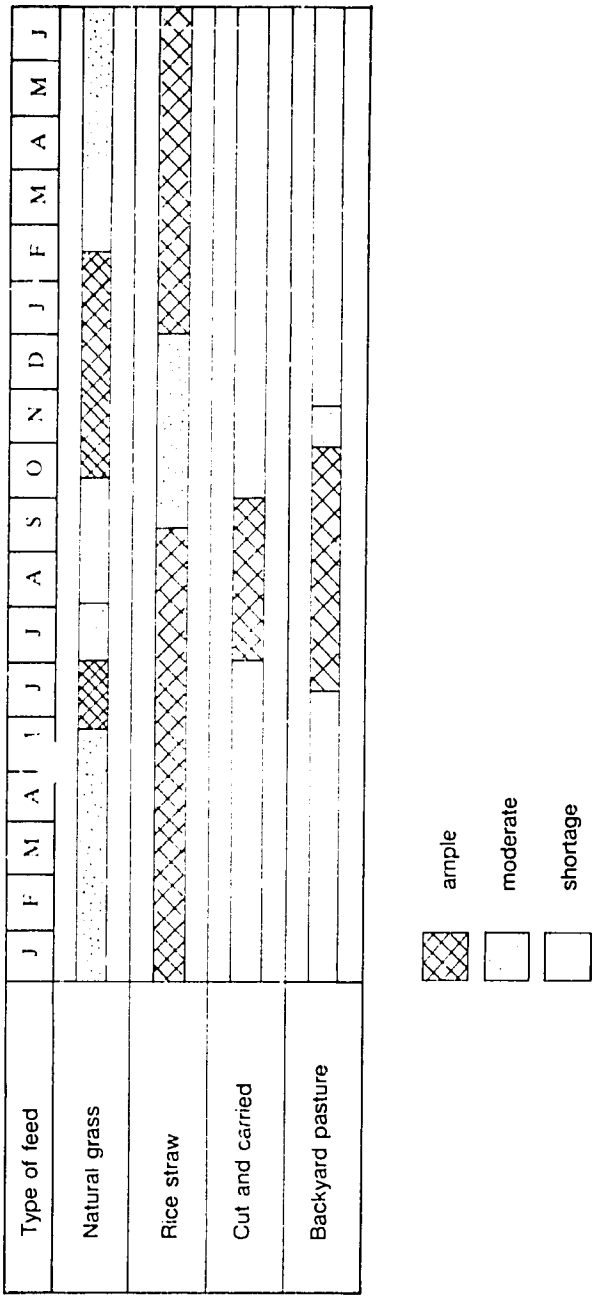
Source : Limpinuntana and Craig, Work Record of the Rapid Appraisal Techniques Team of the Northeast Rainfed Agricultural Development Project, unpublished.

Figure 10. Rice Growing Calendar Displaying the Period of Labour Usage



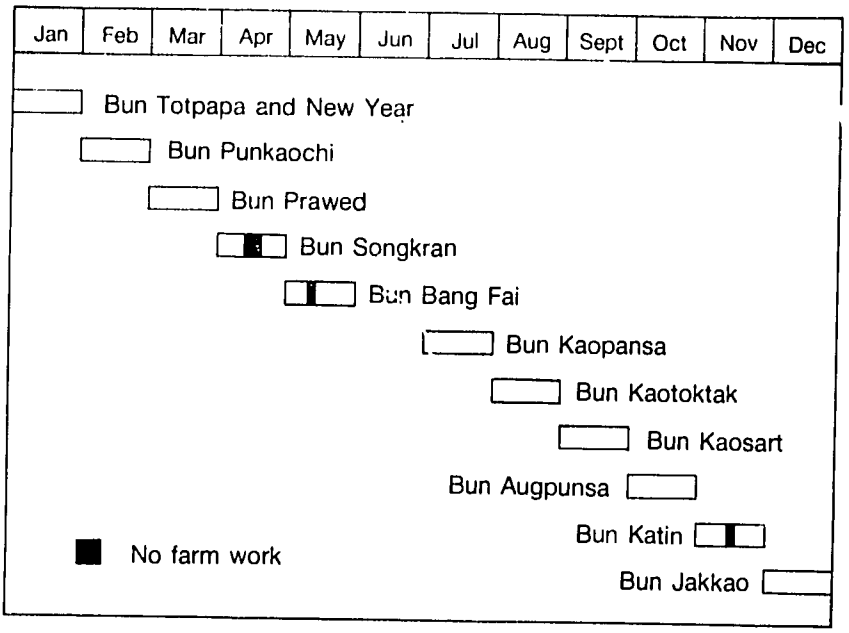
Source : Limpinuntana, unpublished.

Figure 11. Seasonal Availability of Various Types of Livestock Feeds in Northeast Thailand



Source: KKU-USAID Farming Systems Research Project, 1984, and Phalaraksh et al. 1984.

Figure 12. Monthly Festival in Northeast Thailand



Source : Polthanee, 1983.

or age should be noted. An example of a seasonal labour schedule of a typical household of the Northeast is shown in Figure 14.

Apart from seasonal pattern, daily labour schedule can also be prepared for individual activity, such as rice transplanting or dairy cow keeping (Figure 15). A daily labour schedule often involves routine work divided among household members and the time of the day.

The labour schedule information collected by RRA may not be as good in detail as that obtained by continuous monitoring by daily record keeping. Nevertheless, information obtained from RRA should be sufficient to list critical times for peak labour usage and the most likely period of competition for labour among various component activities of the farming system. Study of labour schedules is also essential for the introduction of new technologies or rural off-farm work to the farmer. Recommended technologies or off-farm work will have a better chance of success in periods of light labour usage for agriculture (as found to be successful in the cases of introduced cottage industry and the dry season job creation program by the government).

Activity Sequence

A number of questions to be asked on the spot can be discovered under the form of activity sequence. If a particular farm work can be broken down into a detailed activity sequence, a lot of information about the work can be learnt by simply asking questions on step-by-step activities. Here, leads from the six-helpers (who, when, where, why, what, and how) can be effectively combined to gain insight on details of individual activity. It is quite amazing how farm work can be broken down into several sequential activities (Figure 16). It helps if some researchers in the RRA team know the activity sequence beforehand or otherwise the researchers can simply ask the farmers what they do first and then what they do next. Separate activity sequences should also be determined for years with normal and abnormal rainfall together with the reasons for any differences found.

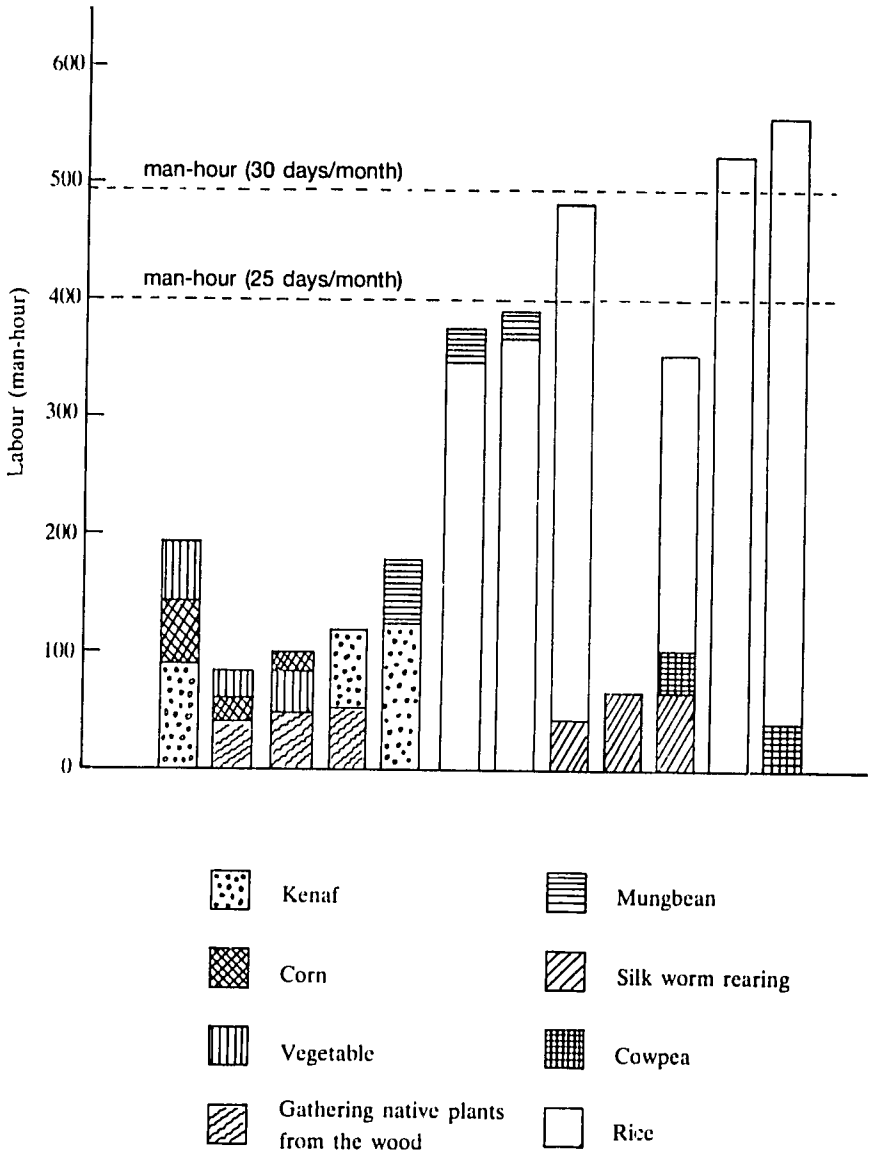
Careful investigation on activity sequence alone will reveal a lot of details in the particular work or resource usage performed by the villagers.

Logic/Decision Trees

Many RRA studies share a common goal of trying to understand how villagers manage their resources or why they take up or give up particular technologies or cropping patterns, i.e., to understand farmers' strategies and decision making. Therefore after a day of RRA interviewing, the likely factors that influence strategies and decision making should be identified and tentatively concluded, if possible, in the form of logic or decision trees. These will then be used to generate questions during the next RRA visit.

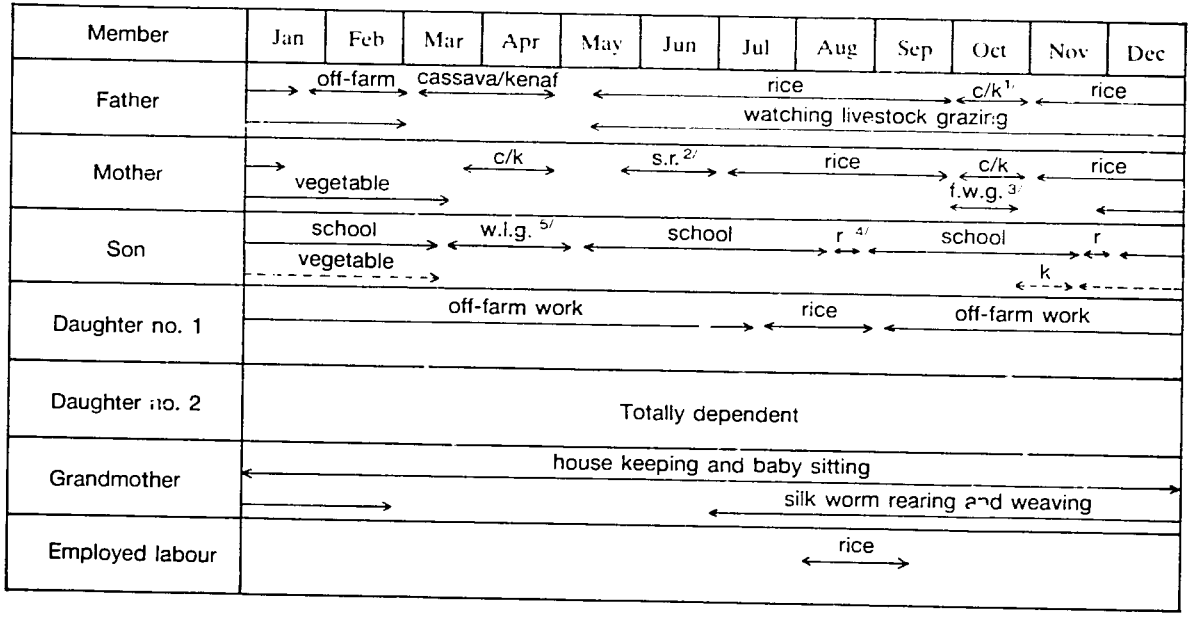
The logic tree can be drawn to classify farmers by types of operation or pattern of resource usage as observed by the researchers. The diagram of a logic tree should include key determinants pointing to or placed at strategic branching points

Figure 13. Seasonal Labour Schedule of a Khon Kaen Farm Household Showing Man-hour of Labour Use



Source : Wilairat, unpublished, 1984.

Figure 14. Seasonal Labour Schedule of Members in a Typical Farm Household of Northeast Thailand



1/ c = cassava, k = kenaf

2/ s.r. = silk worm rearing

3/ f.w.g. = firewood gathering

4/ r = rice

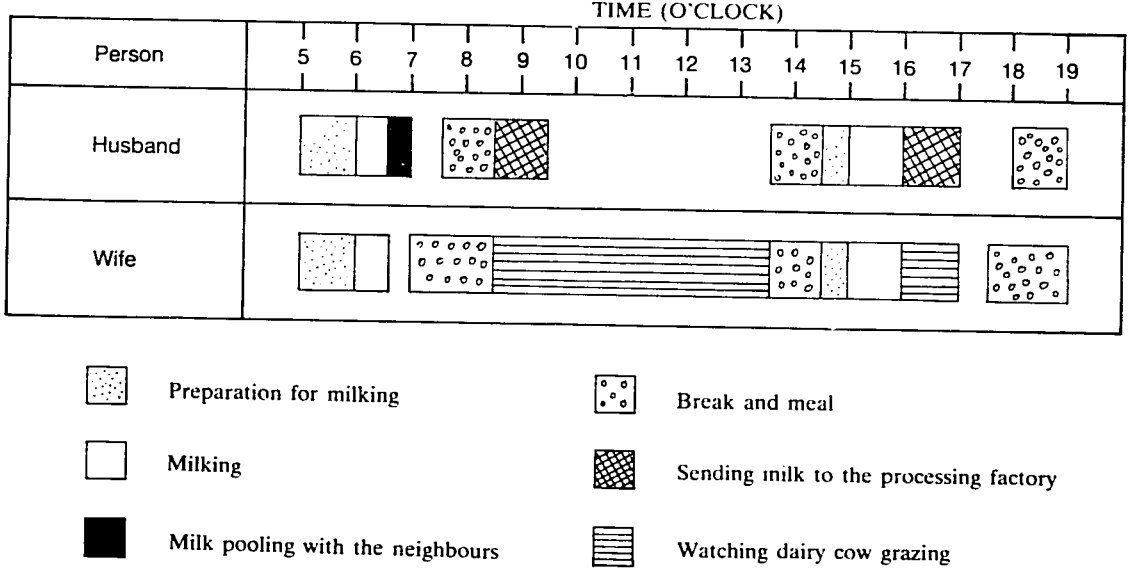
5/ watching livestock grazing

——— = full time

- - - - = part time

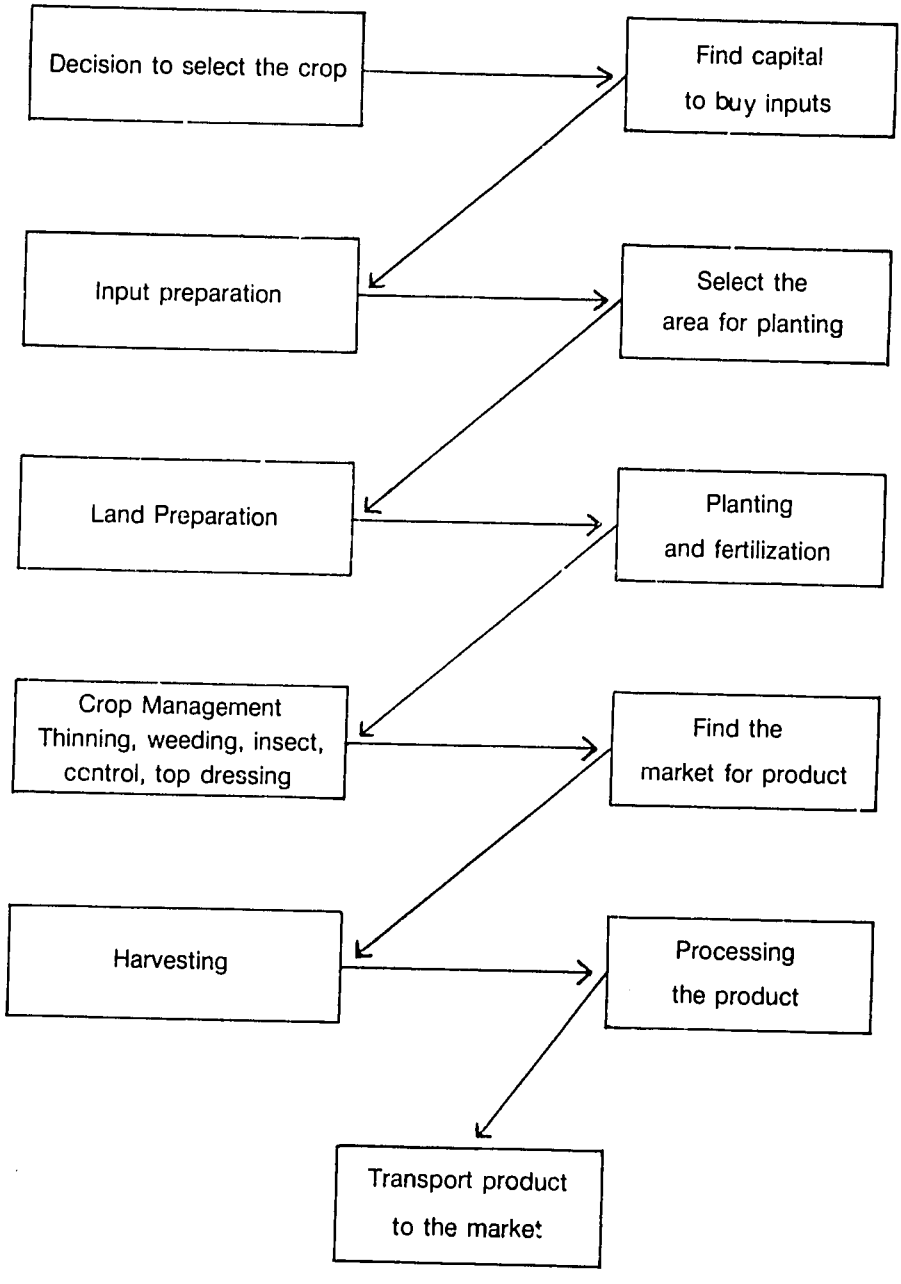
Source : Limpinuntana, unpublished.

Figure 15. Daily Labour Schedule in Dairy Cow Raising of a Husband-and-Wife Team



Source : KKU-USAID Farming Systems Research Project, 1984.

Figure 16. Detailed Activity Sequence of Growing a Commercial Crop



(Figure 17). In any given situation, however, decision making is that of the individual farmer or household. The decision tree can be drawn to illustrate the key factors or important conditions that make the farmer decide to adopt one type of cropping pattern or management in preference to others (Figure 18). In many cases, decision making involves dates or exact amounts of resources which act as deadlines or cut-off points for the farmers to choose between alternatives (Figure 18).

Logic and decision trees are important tools for researchers to come closer to understanding farmer decision making.

Direct Observation and Indicators

RRA has two limitations. The first is that most of the questions have to be prepared on the spot in order to be flexible in line with the situation. The second weak point is the short time spent in interviewing the farmers and therefore the answer given in haste by them may not represent a true story. The situation can be serious if questions on personal matters or sensitive issues are asked and the interviewees have not developed a sense of trust towards the interviewer. Anthropologists who spend a much longer time in the village will perform better than RRA interviewers in this respect. Yet, accurate information is demanded from RRA, just as it is from other research or survey studies. As a consequence, direct observations on important indicators to support the findings are essential. The indicators can also be used to generate on-the-spot questions to ask the farmers without preparing formal questions beforehand.

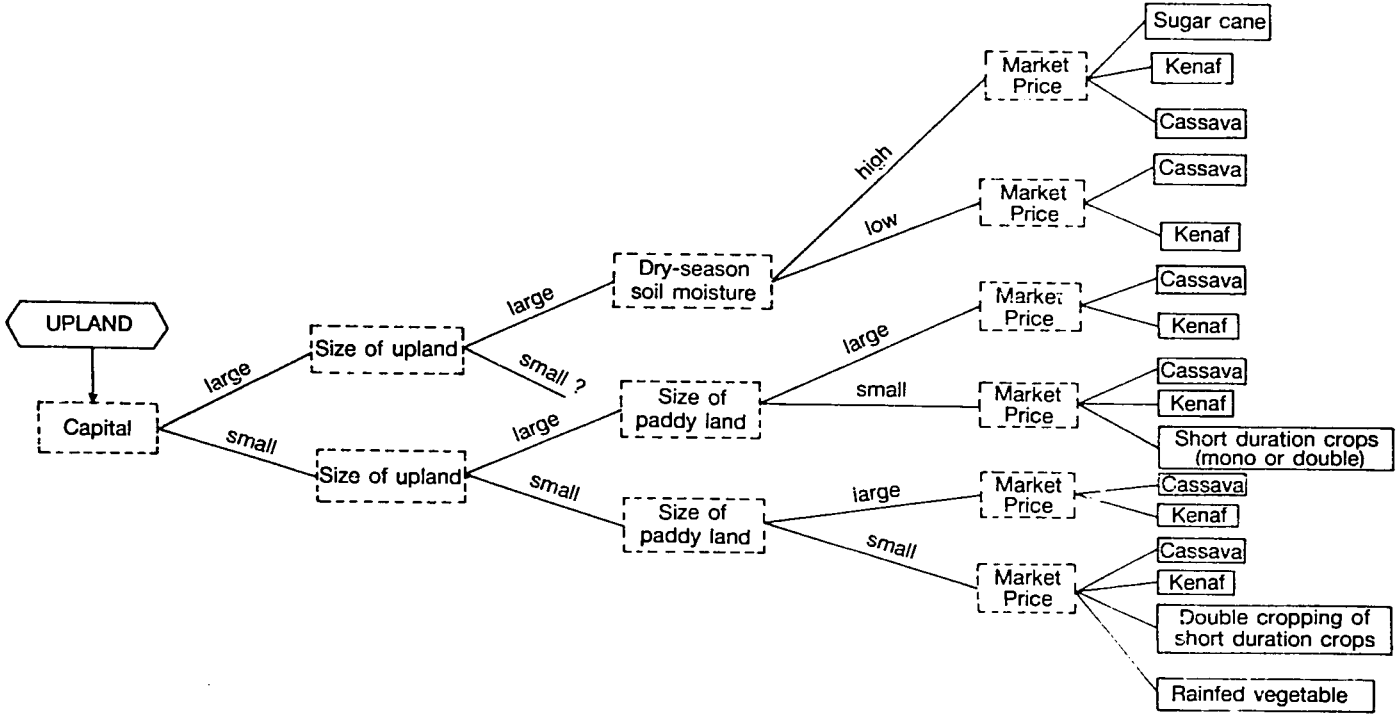
If the indicators being observed do not agree with the farmer's answers, the researchers should not hesitate to ask the farmers for the reasons. More in-depth knowledge on rural living will be learnt from doing so. It may be rather difficult for researchers who have no background information on the rural setting to identify good indicators. The first set of indicators observed by newcomers tends to come from sheer curiosity. However, the use of indicators still provides new researchers the opportunity to ask questions and thereby to communicate with farmers.

Indicators used to generate questions can be either subjective or objective. Certain indicators can be observed for the first time when the RRA team enters the village. For example, the villages which have close contacts with governmental officials tend to have fences around every house and the whole village shows a number of posted signs displaying names of roads, proverbs and slogans. A large and well-built temple may indicate unity and wealth of the village. Wealth of a household can be observed from the build of the house, health of people, array of electrical appliances, type of transporting vehicles, size of land holding, number of livestock, etc. Health of buffalo and cattle during the late dry season and during the rice transplanting period also indicates pasture availability in that particular village.

The indicators used may not be in the form of materials. A sign of community cooperation (unity) can be recognized by asking how often pooled labour for public work or share-labour in agricultural work are done and how they are organized.

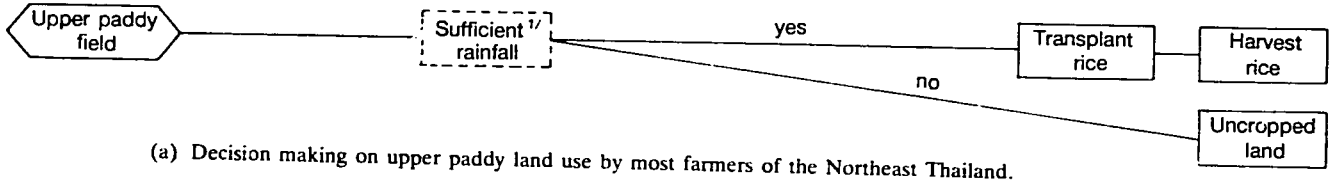
Direct observation on how the interviewee reacts to the questions being asked is also important. Sometimes the interviewee is dissatisfied with the questions

Figure 17. Logic Tree Showing Observed Key Determinants Which Influence Northeast Farmers' Decisions on Crop Selection for their Upland

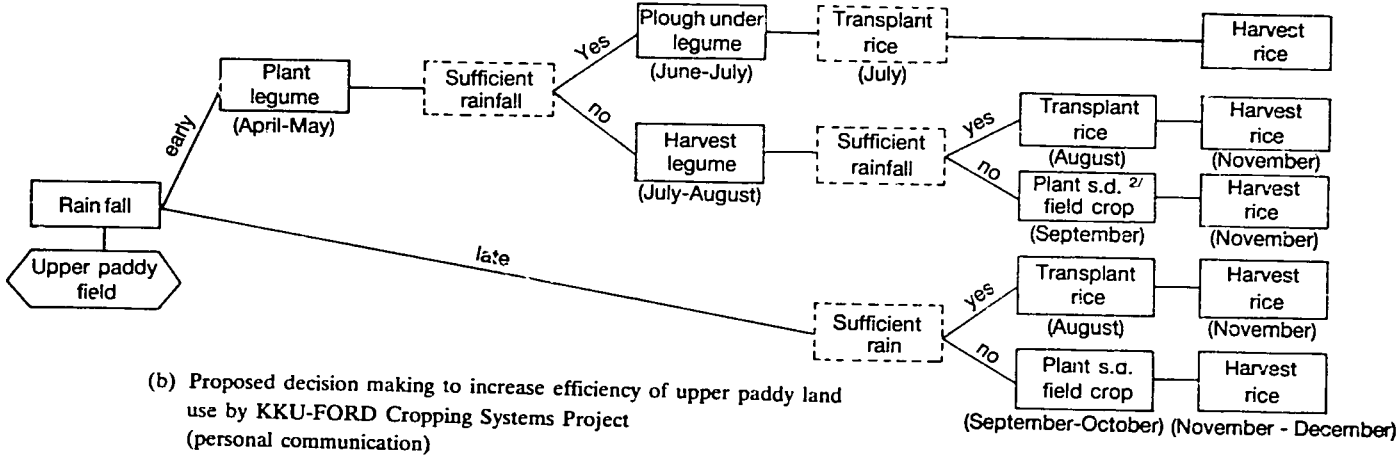


Source : Limpinuntana, unpublished.

Figure 18. Decision Tree Diagram Showing Decision Making on Upper Paddy Land Utilization as Based on Rainfall Pattern



(a) Decision making on upper paddy land use by most farmers of the Northeast Thailand.



(b) Proposed decision making to increase efficiency of upper paddy land use by KKU-FORD Cropping Systems Project (personal communication)

1/ sufficient for transplanting rice

2/ s.d. = short-duration

because they may be too offensive or too personal. In cases like this, the interviewer may have to change the subject or try to approach it indirectly, or use visual indicators, or else say goodbye politely and try to obtain the answer from other interviewees.

General Tools

Six Helpers

Some types of tools can be used to get detailed information on almost any topic and are especially helpful to newcomers to RRA who have been observed during the interview to run out of questions too quickly due to lack of experience and insufficient background knowledge on the rural setting. The six helpers, questions which include "who, when, what, where, why, and how," should be frequently used as guides to ask the farmers on the farm activity of interest. One example can be given on interviewing a key informant about "rice transplanting." On being asked "who" transplant rice seedlings, the farmer might reply that all members of the family except the kids who have to go to school, and that sometimes he has to hire extra labour; he may add that land preparation will be done beforehand by the male who is frequently the head of the family and who decides which plot should be transplanted first on that particular day. When asked, "how" rice seedlings are transplanted, the farmer would explain the techniques and may further explain how different techniques are used for soils of heavy and light texture. If asked "when" rice is transplanted, he would give the monthly period of rice transplanting (July-September in Northeast Thailand). He may also specify the period during the day that is preferred for transplanting. In response to the question of "where" rice seedlings are transplanted, the farmer would say that rice is transplanted first on the lowest part of paddy field and later on transplanting is done progressively up the slope on the upper part of paddy field. If the questions are "what" transplanting is and "why" rice has to be transplanted, the farmer might provide background knowledge on rice transplanting to the newcomers who know nothing at all about rice agriculture.

When properly used, the six helpers always generate a lot of information for RRA interviewers: newcomers and oldtimers alike. The farmers' answers are important not only because of the in-depth information they provide but also because the answers often generate the next questions on the spot to probe for further detail.

Local Terms, Folk Taxonomy, and Sayings

Very frequently, newcomers or even oldtimers on the RRA team are bewildered by local terms. In linguistically complex regions where different languages and dialects are found, recognizing and understanding local terminology can be particularly frustrating. Although people in Thailand use the same basic language there are considerable differences between the Central, Northern and Northeastern dialects. Without understanding the local terms, RRA interviewers can easily

become lost during conversation. Alternatively, the interviewers may wrongly interpret specific terms, thereby gathering incorrect information. Using the local terms when asking questions will also bring out better answers from interviewees.

Folk taxonomy is another important tool to probe deeply into the existing resource management and constraints in farming systems. Folk taxonomy helps to understand how people classify resources and environments which in turn reflects different strategies of management to cope with the local constraints. A good example of folk taxonomy is how the Northeast farmers classify their paddy fields according to toposequence and water availability. Different varieties of rice are strategically planted on different types of paddy field at different dates during the rainy season.

Beliefs of local people can be reflected from local proverbs, sayings, and taboos. Quotations are often encountered during conversation and should not go unnoticed or without clarifying their meaning.

It is rather difficult to get a published handbook on local terms and folk taxonomies. It is left to the researchers to ask the villagers for explanation.

CONCLUSION

A range of conceptual tools have been used to generate questions on-the-spot in order to probe for more details on agricultural activities and rural life. It is unlikely that all of the described tools will be used with equal importance during one RRA. The importance of individual tools is likely to depend on the nature of the particular RRA research topic and its objectives as well as on the experience of the team members. For example, the study of the resource use systems of an entire village or RRA employed in the "site description stage" of Farming Systems Research will require extensive use of secondary information and pre-existing maps of the target area. In contrast, pre-existing information may not be so essential for the RRA studies which aim to investigate certain resource management topics, indigenous technological knowledge, farmer adoption of introduced technology, etc. These latter types of RRA require more on local mapping (with the assistance of key informants), calendar details in activity sequences, labour profiles, and decision tree drawing. For newcomers to RRA who encounter difficulty in communicating with the farmers for the first time, map drawing, more frequent or conscious use of the six helpers, and probing on activity sequences have proven to be helpful.

Finally, please do not forget that the farmer's answer is the most important spring board to generating the next questions. Therefore, it is important for the researchers to listen carefully and try to understand local terms, folk taxonomy and old sayings. Whatever the topic or situation, the use of conceptual tools such as those discussed in this paper can help the RRA researcher learn a lot about villagers' lives and resource situations. Naturally, experience is required to use conceptual tools effectively; i.e., "practice always makes perfect."

ACKNOWLEDGEMENT

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APPRAISAL OF RURAL RESOURCES USING AERIAL PHOTOGRAPHY : AN EXAMPLE FROM A REMOTE HILL REGION IN NEPAL

Brian R. Carson

INTRODUCTION

Traditional land resource inventories were first conceived to assess the capability of unpopulated landscapes. With increasing population density, the value of such a traditional assessment becomes questionable. In such surveys the population is considered as peripheral, not an integral part of the landscape. Land tenure, local economy, and social and political structure are ignored or poorly presented. On the opposite extreme, the use of socioeconomic data to initiate engineering projects can result in extremely expensive, or technically unmanageable projects, particularly in road construction and irrigation development. The solution is to first acknowledge that land and human resources must be considered concurrently and secondly to develop a method for doing so.

This paper represents a methodology whereby a Himalayan village can be studied in its entirety, using large scale aerial photography. Land resource information mapped on aerial photography provides the base on which one can overlay information on settlement infrastructure, land tenure, village movement and significant social and political constraints.

THE SETTING

The Middle Mountains of Nepal lie in the subtropics between 26° and 30° N latitude. Elevations range between 300 and 2,800 meters with the majority of the population living between 800 and 1,600 meters. The landscape is steep. Most of the cultivation takes place on slopes in excess of 20 degrees, made stable by extensive terracing. Climates range from subtropical (below 1,000 meters) to cool temperate (above 2,000 meters). The major crop on irrigated land is rice and on nonirrigated land, maize followed by millet. Rainfall averages 1,500 mm, most of which occurs between June and September. The fertility of the cultivated soil is maintained by compost, derived largely from adjacent forest land.

Motorable roads are typically absent from the Nepalese village and rivers are unavailable. The movement of people is limited to the existing network of footpaths. Trade goods move on porters' backs.

The hill population of 10,000,000 exists primarily by subsistence agriculture in which cultivated land, livestock and forests provide for daily needs. There are 5 persons per cultivated hectare. Literacy rates are less than 25% for the whole population. The annual per capita income is less than $150, low compared with

other Asian countries. A great diversity of peoples, cultures and traditions exist side by side and there is considerable disparity between the rich and poor.

The Nepalese village is politically active. There are seventy-five districts in Nepal. Each district is subdivided into approximately 20 panchayats; each panchayat is subdivided into approximately 9 wards and each ward into 2 or 3 villages. The population of a village is on average, 100 people.

Against this background, the recent surge in population growth has resulted in the rapid degradation of the land resource. Population pressure is forcing peasants to quit their villages in search of work or new land. This new situation, combined with the effects of foreign aid, tourism, increasing communication and returning Nepalese soldiers is beginning to disrupt the old social order. Anyone studying the Nepalese village must be aware that the simplicity that one perceives in the villagers' "way of life" is only the setting for a complex social order and sophisticated land resource utilization.

THE UTILITY OF AERIAL PHOTOGRAPHY IN NEPAL

Aerial photography flown in 1978-79 includes all the Middle Mountains in Nepal at 1:50,000 scale and at least half at 1:20,000. Many development projects have also flown their particular study areas to get larger scale, up to date, aerial photography. The quality of the negatives usually permits enlargement of the photography at least five times. One to twenty thousand photography can be reproduced at 1:5,000 and occasionally at 1:2,500. At some point, the gains made by enlarging the working base are negated by the loss of area overview and increased graininess of the photography. At 1:5,000 a 1 centimeter square on the print represents 1/4 hectare. At these and larger scales it is possible to document parts of the complex mosaic of natural and human resources that occur in the Nepalese village.

The advantages of aerial photography for local production of detailed base maps over large scale topographic maps are considerable.

1) Once negatives are available, printing aerial photographs is much cheaper and more rapid than making large scale topographic base maps. For less than US$20 one can have a 1:5,000 aerial view of a whole village, its farm and forest lands. Comparable coverage by topographic survey will cost more than US$1,000. This assumes that errors in lineal or area measurements due to photographic distortion are not too important for the uses envisaged.

2) Rural Nepalese are adept at interpreting aerial photographs without any formal training. Within a few minutes, untrained villagers can pick out their own home, farmland, water sources, etc. This ability is not common to all peasants; but as the Nepalese often look from ridges into valleys, they are used to observing the landscape in the same manner as presented by aerial photography. Consequently, aerial photographs can form an effective link between the illiterate but practical peasants and the literate but inexperienced planner. During the planning phases, the villagers should be encouraged to participate, utilizing aerial photographs as a blue print for development.

3) The information available to even semi-skilled interpreters can form the

basis for a well conceived field survey and map production. Features that are readily distinguishable on aerial photography include:

- irrigated rice land
- non-irrigated maize land
- grazing land, degrees of degradation (gullying, slumping), percent cover of surface vegetation
- forest land, percent cover and in some cases species, overall condition, and maturity
- villagers' homes, trails, meeting places,

The utility of aerial photography does not end with the interpretation of land resource data and infrastructure. It can be used as a base on which other information can be collected and presented. Whether investigating forest biomass production, water resources utilization, health care or adult literacy, there are obvious benefits from using aerial photography as a base to organize information.

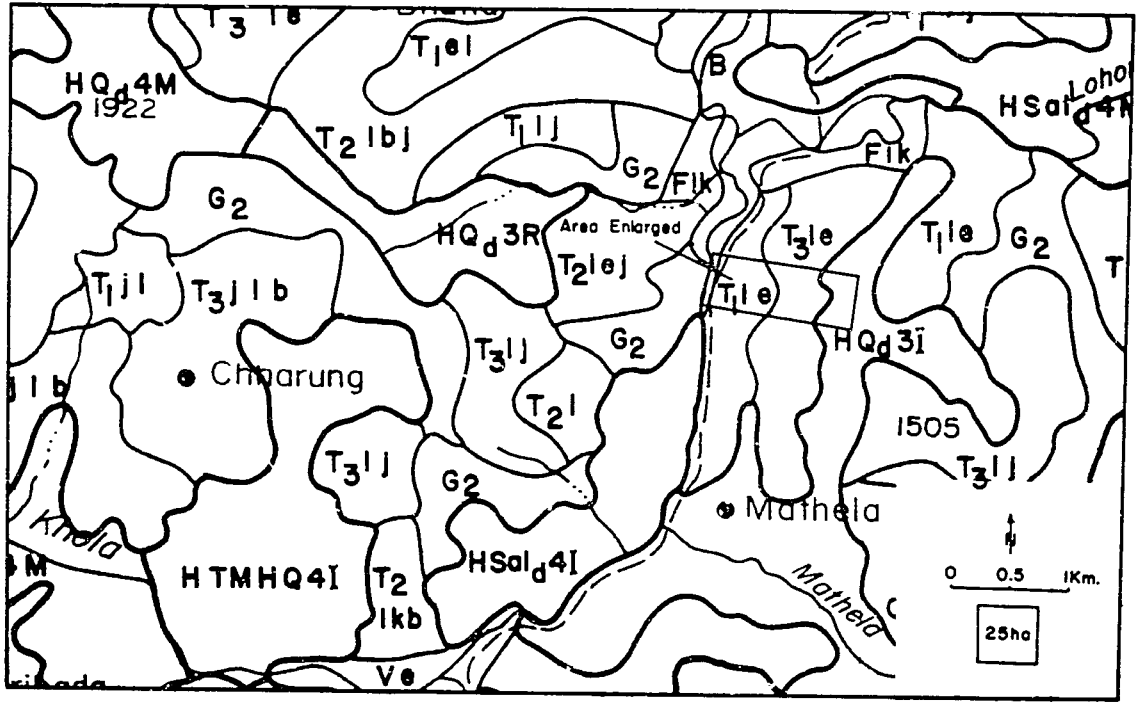
This work has been pioneered in Nepal to some extent by Bergeret (1983), Bertnet-Bondet (1983), and Wiart (1983) during their studies of Salme, a small village northwest of Kathmandu. Their exhaustive research utilizing 1:10,000 aerial photography has uncovered numerous complexities that in the past have not been considered in project implementation. Because of limited resources, such detailed investigations cannot be carried out throughout the country. They do, however, provide an excellent methodology to enhance awareness of the range of problems the social scientist must consider.

THE STEPS IN NATURAL AND HUMAN RESOURCE APPRAISAL USING LARGE SCALE AERIAL PHOTOGRAPHY

The Site

Select a village area that appears to represent the watershed, landscape or community of interest. Collect all available information including past surveys, topographic maps, aerial photography, etc. Delineate the area of village influence: in Nepal this is usually bounded by a river, a ridge and various political boundaries. In this particular example the village area of Belpatha was chosen, 63 ha of land with 33 households in Dailekh district, bounded on the west by the Lohore River and the east by a 2,000 meter ridge. The only existing mapping was land-utilization information carried out by LRMP in 1983. At 1:50,000 it provides a general indication of cropping patterns and forest situation, but is of little use for village management planning (see Figure 1).

Figure 1 Land Utilization in Lohore River Area, Dailekh District.



At 1:50,000, only broad groupings are possible, being useful primarily in Regional and District Level Planning. The whole study area is represented by only 3 map units. (Land Resource Mapping Project).

The Photographic Base

Aerial photography is available in Nepal through Topographic Survey Branch, HMG, Kathmandu. Aerial photography at 1:20,000 can be enlarged to 1:5,000 and for certain purposes 1:2,500. If a working base map is required, one can put more information on the larger scales. This has to be balanced against the insight gained by seeing the whole land area influenced by the village on a single photographic sheet. Projects with more money can fly larger scale aerial photography and make mosaics for the area of interest so that the resolution is not sacrificed. For the Belpatha village area, 1:20,000 aerial photography was available and it was enlarged to 1:5,000 for this example (see Figure 2). If more than one date of photography exists, changes in land utilization and condition can be mapped by comparing different dates. Where this has been done in Nepal it shows the reduction of mature forests and expansion of degraded grazing lands. The amount of cultivated land tends to be more stable reflecting fertility limitations under traditional management (Kenting 1982). Where roads improve the fertilizer availability and marketing potential, increases in terraced land have been found. (Kienholz 1983).

Natural Resources

The natural resources base would first be mapped including soils, land use, cropping pattern, forest type, extent of land degradation and hydrological conditions. Some of this information is presented on Figures 3 and 4.

Local Infrastructure

The major trails, canals, villages and individual houses are easily represented (see Figure 5). Villagers who cannot read are generally keen to look at these aerial photographs and by careful interviewing useful information can be collected with a minimum of effort. At present, many projects do not even utilize aerial photogaphy for these activities. Those that use photographs, rarely go beyond 1:20,000 scale, a tremendous waste of available resources.

Land Tenure

In Nepal, the cadastral survey has been completed for one half of the hill districts. With these maps and land ownership records, one can quickly gain a valuable perception of land tenure (see Figure 6) which, unfortunately, is lacking in most natural resource inventories. Land tenure is intimately tied with environmental degradation. The most severe erosion problems are on the communal lands that are managed by no one and exploited by everyone, particularly for grazing of their livestock.

Figure 2 Aerial Photograph of Belpatha Village Area, Enlarged to 1:10,000

(Further enlargement permits an analysis such as presented in subsequent Figures)

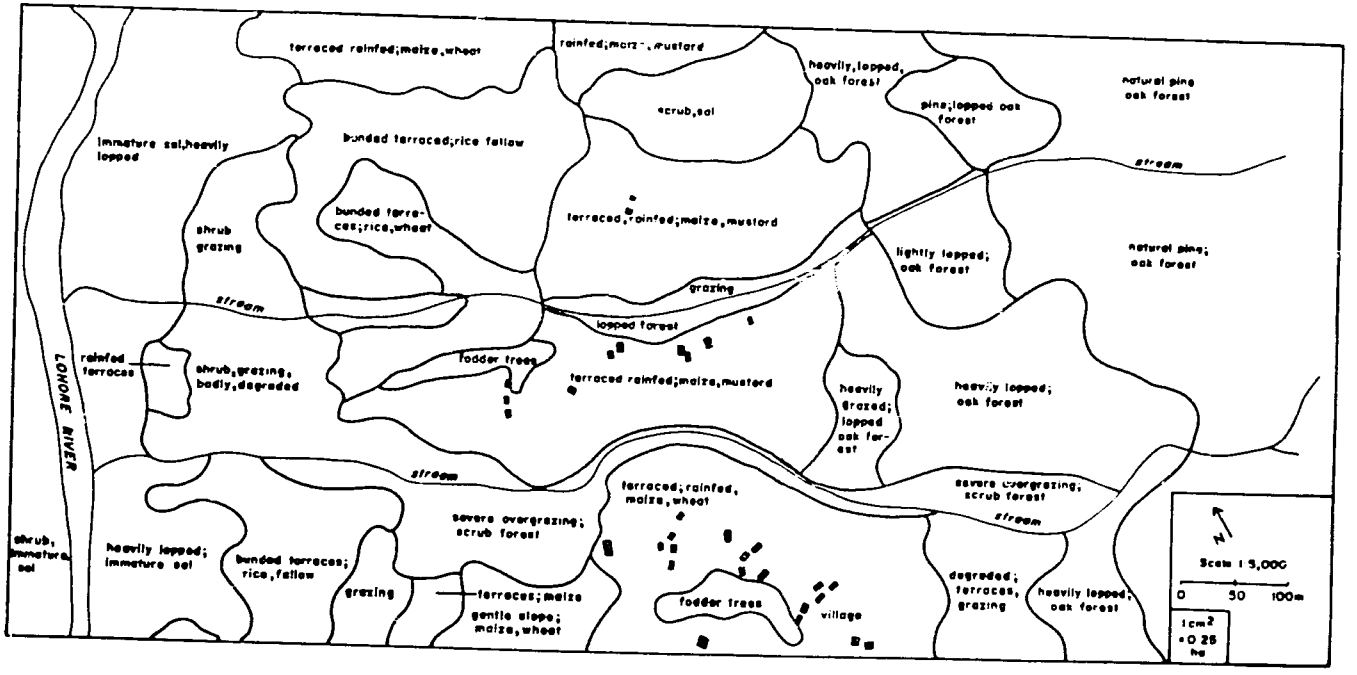


Figure 3 Land Utilization

At 1:5,000 land use is mapped in sufficient detail to be useful for village management plans. The above map is based on interpretation of the photograph only; with field work, finer divisions are possible. The forester is in an excellent position to inventory not only the forests, but how the villagers are using them. The agronomist can determine present cropping patterns and quickly determine what alternatives are possible. Backed by field work it is possible to assess gross production of agricultural and forestry land.

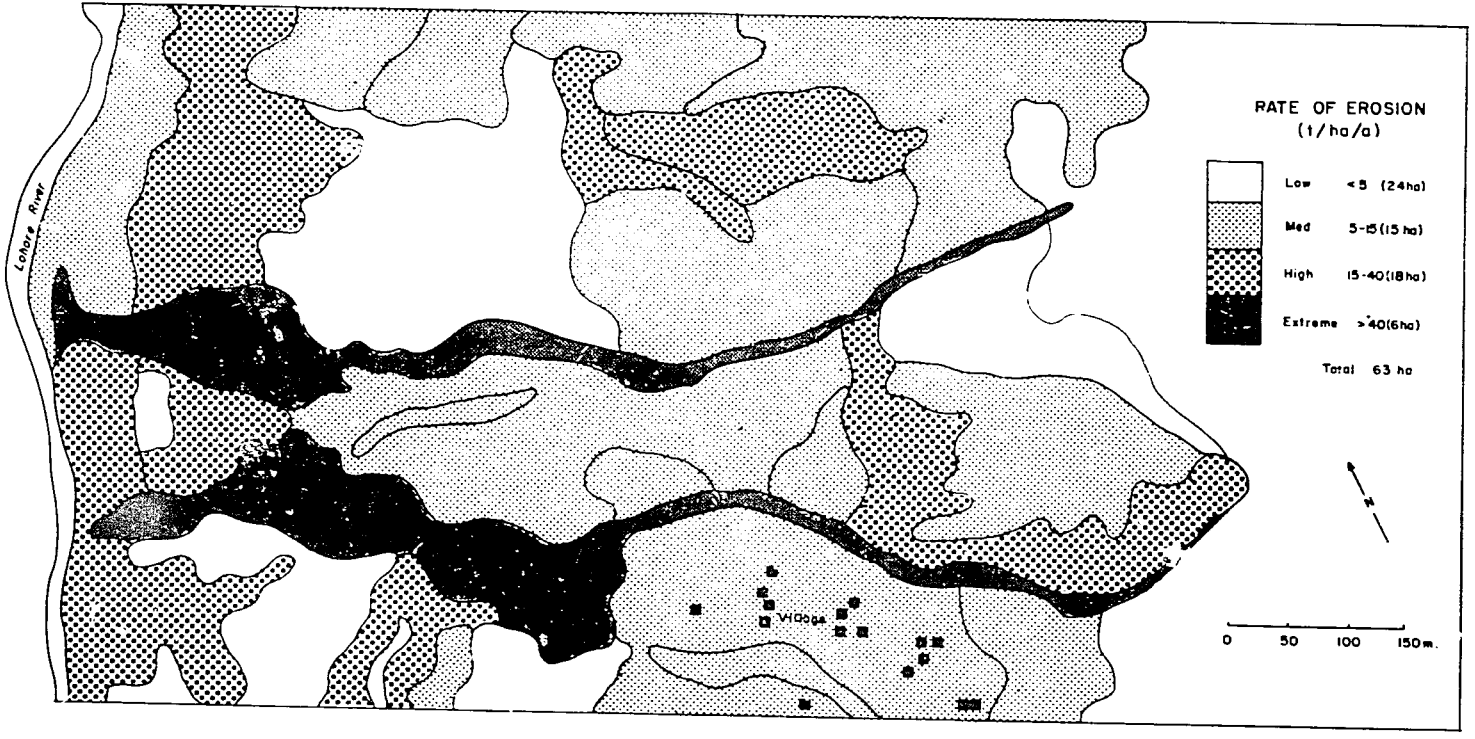


Figure 4 Estimated Rate of Erosion from Land Near Belpatha Village, Dailekh District.

This map is based on aerial photographic interpretation of both geomorphology and existing land use on 1:5,000 stereo enlargement prints.

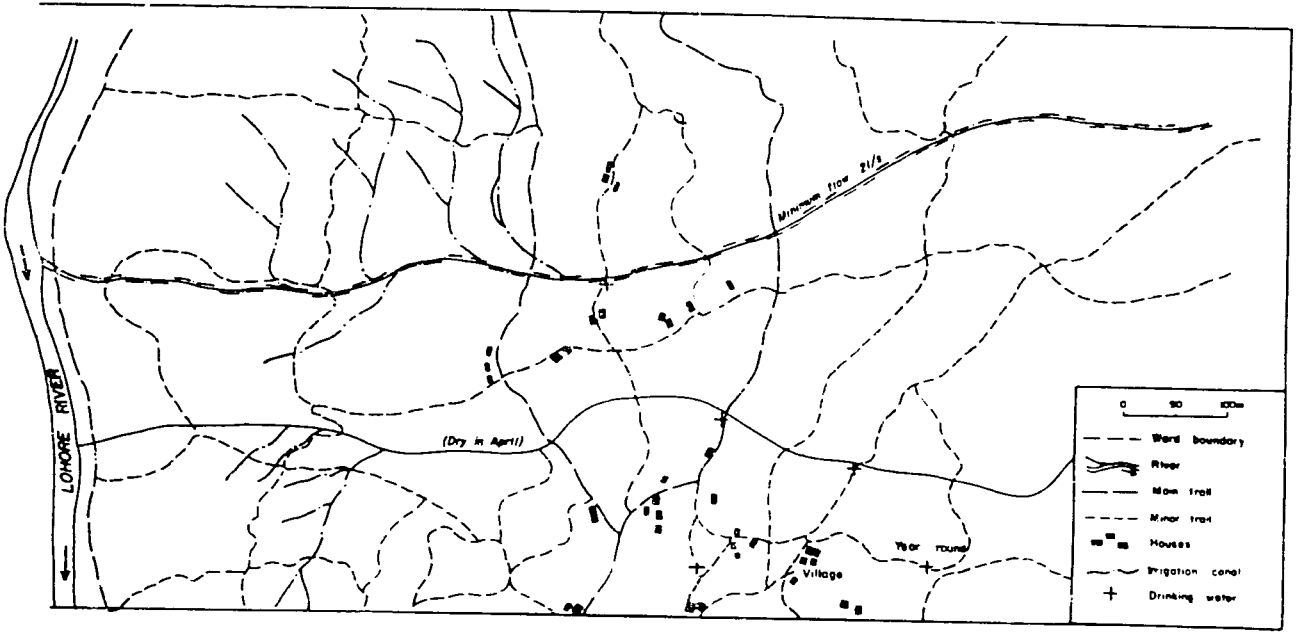


Figure 5 Village Infrastructure

Most of this information is determined directly from the 1:5,000 photography. Houses, paths and water ways are readily interpreted. A quick ground check can assess the water resources for irrigation and domestic use. By ground survey the engineer can determine if the village water needs are being met and if not, how water supplies might be upgraded. The location of trails provides clues to the major movements of the villager and thus provides a base for upgrading trail systems. Number of homes provide an indication of population density in this area. (Six members per household)

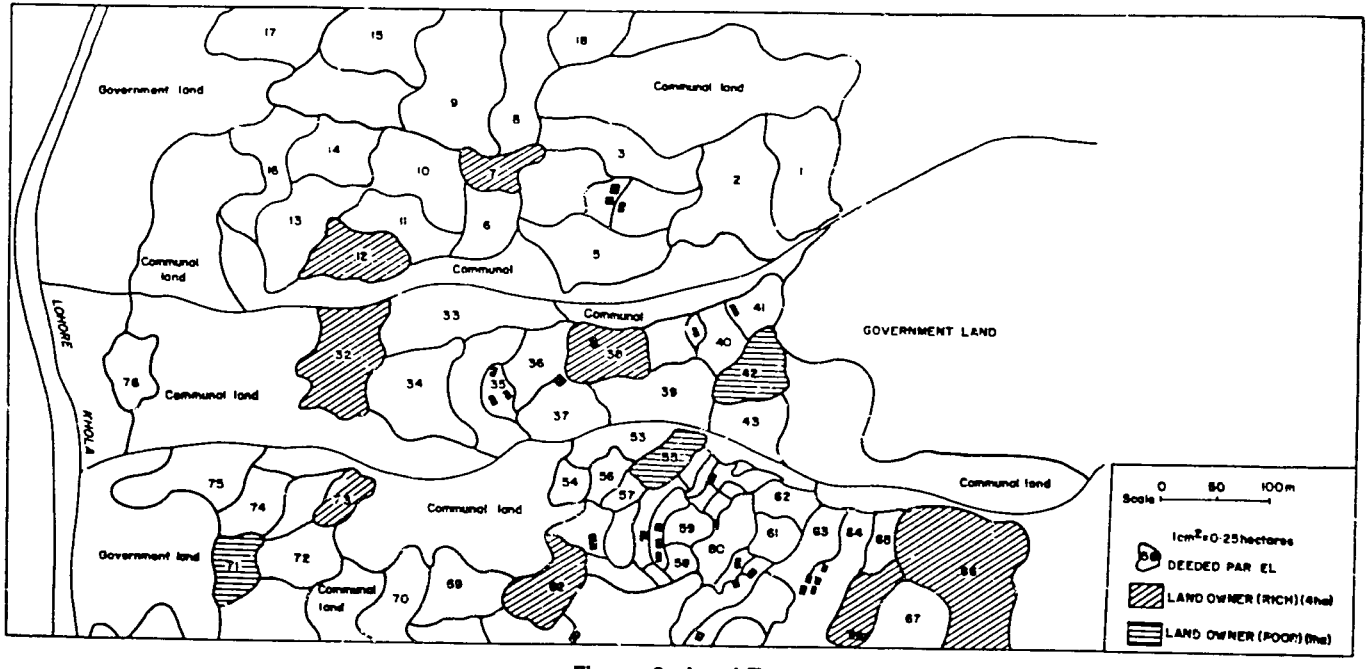


Figure 6 Land Tenure

The land tenure data was unavailable for the Belpatha Village at the time of writing this paper. However this map reoresents typical ownership patterns common throughout the Middle Mountains. Major characteristics of Nepalese land tenure are:

1) Cultivated deeded parcels are generally less than 0.25 hectare. 2) Individual farmers often own a number of small plots distributed over a fairly wide area. 3) Rich landowners tend to have more rice land, better irrigation facilities and can often fulfil their needs for fodder and firewood from their own land. 4) Poor landowners have a larger proportion of poorer rainfed land and tend to rely more on communal lands for their sustenance. 5) By overlay of land tenure onto the land use map it is apparent that degraded landscapes are communal, or without defined ownership.

With land resource and land tenure information, better informed decisions could be made regarding watershed management. Government policy has in the past actually aggravated the problems of land degradation (Regmi 1978). Up until 1978, law precluded local ownership of forested land. Attempts at reforestation failed, because without local ownership there was no commitment to proper management. The Nepalese government is presently becoming aware of the seriousness of this problem and certain areas are being turned over for management to the local government.

Dynamics of Land Management

The next step is to study the dynamics of land utilization, or how people interact with their environment. Each day, where do the villagers go and what do they do? Activities include fetching drinking water, bringing compost to the fields, cutting fodder for livestock, collecting firewood and litter from the forests, ploughing, planting, weeding and harvesting crops and shepherding cattle in grazing areas. These activities must be included as part of the village assessment. Berthet-Bondet (1983) has followed individuals' livestock throughout the year indicating the complexities of one portion of land utilization. Such studies could be plotted directly on overlays of the aerial photographic base Over 95% of the journeys will be within the study area (1.5 hours walk) and, therefore, included on the large scale aerial photograph base. By combining the movement of 5 or 6 different farmers one can actually "see" the movement of the farmers and how they exploit their land (see Figure 7). Investigation of livestock movement, feed availability and productivity of herds is critical in an assessment of land utilization. Grazing by livestock, in the early monsoon, is often the most serious problem contributing to environmental degradation. Trampling of young growth, nipping of buds and young shoots, and compaction of soil results in a tremendous reduction in the productivity of grazing land. In many areas the physical effects of grazing can be considered the major reason for declining production of grass and fodder. To improve the village situation, free roaming cattle must be tethered and fodder cut by man and brought to the cattle. Attempts to introduce exotic animal breeds and veterinary care before improving livestock feed supplies have failed because the planners did not take the effort required to understand the villagers' real constraints.

From such an analysis the planner can suggest positive changes in land management to reduce the length of time spent in non-productive movement. For instance, a less productive forest site close to the village may still be the best choice for reforestation, because it will save a much greater amount of time for the villager than reforesting a more productive site far from the village. A load of wood near the village may be worth two or three loads available two hours' walk away. Fetching drinking water or fodder may be seen as a major burden on the women in a village. Firewood collection may be required only once a week whereas fodder collection may be required every day. Such information combined with the natural resource base information provide valuable direction for foresters when planning plantation sites or nursery species. Significant work has been done in this area by

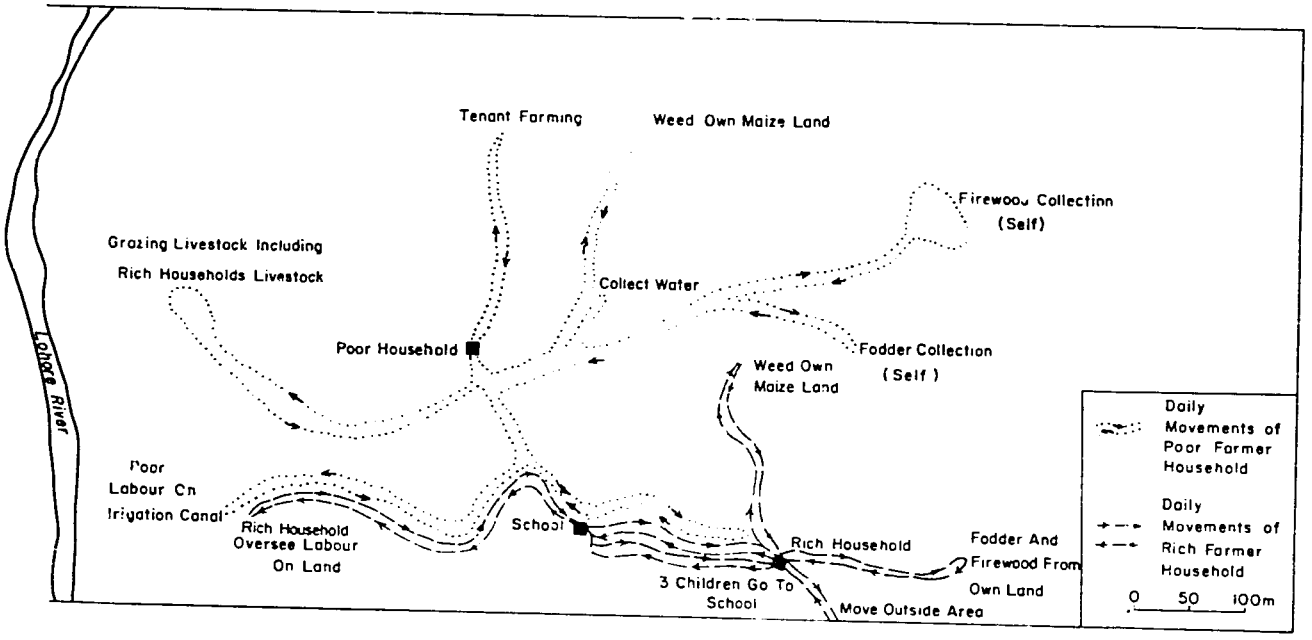


Figure 7 Daily Movements o Two Households, Belpath. Village, Dailekh District.

From this analysis it is obvious that the sphere of influence of the rich farmer's household is quite different from the poor farmer's household. The poor farmer has much greater dependency on communal forest and grazing lands and must spend a significant portion of his time working for the rich farmer. Consequently the poor farmer's household has little opportunity to go to school or to improve their economic situation.

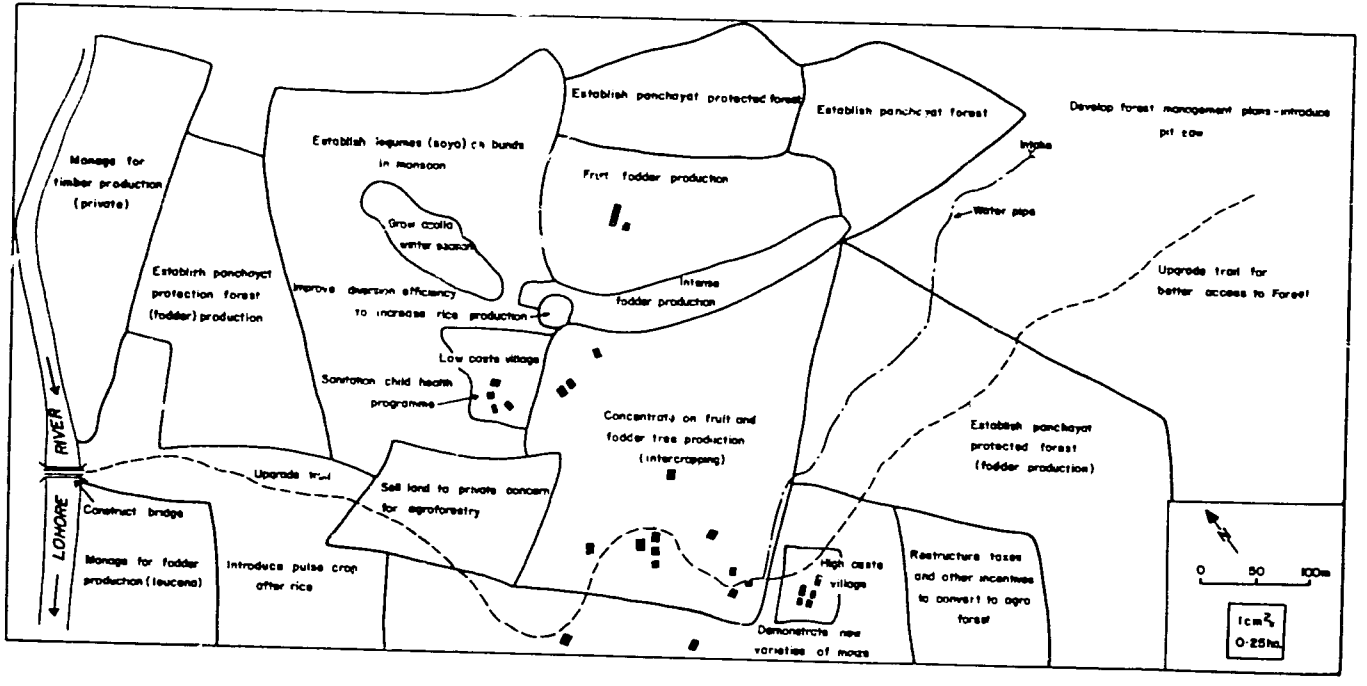


Figure 8 Village Level Management Plan

Based on Figures 4, 5 and 6, a preliminary village management plan was drawn up. By understanding the land resources and how man is using them, the planner is in a better position to suggest improvements at the village level. The ultimate development decisions, however must come from, or be approved by the villagers themselves. Without their support, projects have little hope of success.

Fox (1983) and Wiart (1983). It is painfully obvious that the attempts to improve Nepal's forestry situation are not even keeping up with present rates of degradation. A new approach, involving an understanding of village dynamics is required to improve management of existing forest land. It is not just a question of where the degraded land is, but more importantly, why did the villagers let the land become degraded.

Village Economy

The economy of the villagers can be represented in several ways depending on the needs of the study. Farmers can be divided into rich and poor based on number of livestock, amount of land, education level of children, amount of off-farm income, etc. These factors can be presented on the map by delineating ownership of houses or land. The wealthier farmers generally have more land, a high proportion of irrigated land, have more livestock, have better access to fodder and firewood, are better educated and are much more likely to take risks required in developmental processes. On the other hand, the poor, who are often the target for development programmes, have less land, of poorer quality, have less productive livestock, poorer access to fodder and firewood, are less literate and are virtually unable to take part in any process involving additional risk. To influence the poor farmers, the developer will have to know who they are, where their land is, and what these farmers feel their development priorities are.

Cultural, Religious and Traditional Values

A difficult task is integrating culture, religion and tradition to provide guidance for appropriate development. In Nepal, the diversity of culture, tribal group and caste is phenomenal. To disregard this social data is to permit serious error in development. Brahmins, the highest castes and traditionally the most conservative, are also the most likely to respond to financial gain on enterprises. To introduce new ideas in Brahmin communities, the planner will have to show obvious personal economic return or it is unlikely that they would be adopted. On the other hand, hill tribes, such as the Gurungs and Magars are known to be more community minded, and development is more likely to be instigated by the promise of community betterment. Sanitation programs are particularly difficult to introduce to high caste villagers and lower castes tend to follow the lead of the higher castes. Lower castes do not have as strict dietary laws and are likely to adopt new fruits, vegetables and meats more quickly than higher castes. The role of women, obviously, is a major consideration, in the assessment of the village situation.

In western Nepal, drinking water lines dug by low caste blacksmiths may be considered unclean by orthodox Brahmin. Obvious troubles can be expected in implementing water supply projects in mixed communities. Brahmin's and untouchables' homes, their land and water supplies should be marked to reflect potential development problems. Spatially many of these problems are easy to

denote on the overlays. In some cases, land management problems should be reinterpreted as cultural problems. The planner should not be too quick to impose technical solutions to social problems. Rather he should assess the constraints leading to the apparent lack of "development."

Village Politics

The political arena must be considered in the village. Panchayat and even ward influence can be substantial or negligible. Some panchayat leaders are motivated and public minded, others are not. If one is recommending management of a forest by a village situated in a different ward, troubles could develop. Good water sources for drinking projects are often located in a different panchayat, far from the village, and malicious damage to the system can occur if proper compensation or consideration is not given to political or traditional boundaries. Where local authorities are receptive to development and backed by the population, the planner should try to capitalize on the situation.

A MANAGEMENT PLAN FOR THE VILLAGE BASED ON RAPID RURAL ASSESSMENT

By integrating the above data, a management plan was developed for the village area around Belpatha (see Figure 8). It became obvious that apparently similar land degradation problems had to be approached differently, depending on the socio-economic reasons for land degradation.

The value of this exercise, from the point of view of the planner, is to gain an appreciation of the land and human resources, and where they are found. With this base, more appropriate development projects might be initiated.

For the villager, the situation is quite different. The local inhabitant has intimate contact with the land and is well versed in the human resources in the village. He will always know more about his immediate environment than a scientist might hope to attain by a rapid appraisal of this sort. However, the overall village situation and the philosophy leading to community development may not be known by the individual. This is particularly true in the rigid social structure found in the hills of Nepal. By participating in such an exercise, the villager may be encouraged to look at rural development more seriously. Improvements seen in other regions may, for the first time, be considered possible in their own village.

TIME FRAME

The example of rural appraisal of the Belpatha village area was not actually carried out, but it represents the typical land use and socio-economic situation found throughout most of the hill regions of Nepal. The author has spent five years in Nepal, a large portion of that time in rural areas. The different components of this methodology are well studied, although all were not carried out for this particular village area. If such a study were to be carried out by competent

scientists, familiar with the general area, the scheduling might be something like this for the 32 households on 63 hectares of the Belpatha village area.

– Collecting base information in Kathmandu	1 day
– Ordering and receiving large scale aerial photography	1 day to 2 weeks
– Travel to site (2 days in vehicle, 2 days on foot)	4 days
– Mapping natural resources	1 week
– Mapping local infrastructure	2 days
– Mapping land tenure	1 week
– Studying and mapping village dynamics	1 week
– Studying village economy	1 week
– Studying cultural, religious and traditional values	1 week

Village meetings would be held throughout the survey period and for a few days after the completion of the survey in order to assess village priorities for development. Analyses of data and final report writing might take 2 weeks.

With a team of six scientists, a good overview of the land and human resources of Belpatha Village could be made, and an enlightened management proposal could be completed in less than six weeks. Once one village had been completed in this manner other villages in the same area could be appraised much more quickly, possibly in less than one week.

CONCLUSION

Standard 1:20,000 aerial photograph enlarged to 1:5,000 provides an ideal base for the rapid appraisal of village resources in the Middle Mountains of Nepal. The presentation of natural and human resources data on an aerial photograph base permits an integration of otherwise unwieldy data. The single base presentation forces the planner to view the village resource as an integration of social and economic factors on a natural landscape.

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PART IV CONTEXTS AND TYPES OF RRA APPLICATION

RAPID RURAL APPRAISAL: AN OVERVIEW OF CONCEPTS AND APPLICATIONS

Christopher J.N. Gibbs

The purpose of this paper is to provide a brief overview of rapid rural appraisal (RRA) concepts and applications as background to in-depth discussions. The paper falls into three parts: (i) what is RRA and how is it different from other approaches to information gathering; (ii) how and where has RRA been applied; and (iii) what special problems does RRA face as an emerging methodology? The paper is based on a review of selected pieces of an emerging body of literature which is growing month by month. Undoubtedly some important examples of RRA experience were missed in the preparation of this paper and additional examples, as well as critical commentary, are requested by the author.

WHAT IS RRA AND IN WHAT WAYS IS IT UNIQUE ?

Rapid appraisal has been defined as any systematic activity designed to draw inferences, conclusions, hypotheses, or assessments, including the acquisition of new information, in a limited period of time (Grandstaff and Grandstaff 1985). Rapid rural appraisal focuses on the management of rural resources and has attracted a growing number of adherents. Despite its relative newness, RRA has already come to mean many different things to different people and runs the risk of generating confusion through competition among protagonists. The surge of interest in RRA has also produced a growing body of literature on RRA methods and applications that risks substituting volume for quality. As a consequence, RRA risks the fate assigned to other 'fashionable' techniques, i.e., to pass from the stage of euphoric adoption, to the stage of critical debate and evaluation, to the graveyard of buzz old words in a very short space of time (DeWalt 1985). Avoiding this will depend on a broad understanding of what RRA can and cannot do, and on the development of a body of concepts and methods that distinguishes RRA from other methods of information gathering and identifies if and when RRA should be applied.

The Context of RRA

As Jamieson (1985) points out, RRA has emerged at a time when the accepted development paradigms are being vigorously questioned by development professionals. The root of the 'old paradigm' is a view of the world as an orderly and understandable mechanism that can be taken apart, piece by piece, and put back together again. Knowledge of the natural order in the world can be developed through careful observation and inductive reasoning. As a consequence, progress

for people can be achieved through the modification of human customs and institutions to conform to our scientific understanding of the natural order.

In the 'old paradigm,' objective thought is separated from the subjective: the motto was 'cogito ergo sum – I think, therefore I am.' In the emerging 'new paradigm' there is a different understanding of knowledge: 'tango ergo disco – I experience, therefore I learn' (Norgaard 1984). The origins of the 'new paradigm' rest on a view of the world as a system with interacting parts that exhibits processes of communication and control, and maintains itself through feedback.

With respect to rural development, the search for a 'new paradigm' is usually described in more practical terms. For example, in the 'farmer-back-to-farmer' model of the Centro Internacional de la Papa (CIP), training is designed to be action-, problem-, and client-oriented: successful interdisciplinary research must begin and end with the farmer, farm household and community (Rhoades 1984). In the words of David Korten (1980), successful rural development projects are responsive to beneficiary needs at a particular time and place, and succeed by working progressively to achieve a fit between program design, beneficiary needs, and the capacities of existing organizations. Their comparative success is achieved through a learning process approach that is directly responsive to the context in which the beneficiaries live and development professionals must operate.

Additional expressions of the 'new paradigm' emphasize agricultural research as processes for problem solving for resource-poor clients (Biggs and Gibbon 1984), putting people first (Cernea 1984), putting the last first (Chambers 1983). It is against this background of paradigms in transition that RRA is emerging.

RRA also represents a response to practical resource limitations, (scarcities of time, trained manpower and money), to superficiality in rural research and to the limitations of conventional surveys. However, RRA represents an opportunity not only to generate timely information and at reasonable cost but also to provide information that is qualitatively different, that promotes cross-disciplinary understanding, and is linked to action. To these ends, the success of RRA will depend upon its successful institutionalization within action organizations and the rearrangement of incentives to motivate users.

Essential Features of RRA

Rapid rural appraisal includes a range of systematic methods for the generation of new information in a short period of time. RRA is typically a planned group activity conducted largely in the field by teams representing several disciplines chosen according to the focus of the study. The minimal team is a pair, including at least one rural social scientist but is usually larger than this. Field activity is preceded by analysis and synthesis of published and other available data and is carried out through semi-structured interviews and direct observation, where a major part of the questioning is determined as the interview progresses. Information prepared in advance covers the major features of climate, soils, agricultural systems, population, language, culture and local economic conditions. Subtopics to guide field interviews are based on team discussions of the purpose of the RRA and the data reviewed in advance. Key questions and strategies are potentially revised

through group discussion in the field as the RRA proceeds.

Questions posed to interviewees who are not necessarily chosen randomly, are supplemented by the direct observation of the interviewers. Interviewers frequently agree in advance on indicators which provide good measures, albeit proxies, of the status of the system under investigation. In addition, numerous other simple tools, many of them graphic, such as maps, aerial photographs, sketches, transects and crop calendars, designed to identify and portray key relationships and patterns are employed.

RRA typically employs 'triangulation,' where the observations of team members from different disciplinary perspectives are brought to bear on particular characteristics of the system being studied. Triangulation in RRA also means the application of different methods to the appraisal of a trait, e.g., through analysis of existing data, from semi-structured interviews, and from direct observation of an agreed indicator. At the same time, RRA strives to ensure that the perspective of the interviewee is respected. Indigenous knowledge and the opinions of interviewees are not only actively sought but given priority. RRA team members also strive to respect each others' perspectives, reflecting different disciplines and levels of local knowledge.

An RRA has a purpose and is a means to an end. The purpose of an RRA usually has a problem-focus as a tool for diagnosis or evaluation but RRA may be used simply to understand a new situation or environment. RRA's may be employed to identify specific researchable questions by topic or location, or to appraise the effectiveness of a treatment. Users of RRA include government bureaus, universities, national and international research stations, and training institutes. (RRA does not appear to have been used by the private sector but I suspect that the essence of RRA is deeply embedded in successful entrepreneurship.) RRA's also produce valuable by-products for practitioners, most notably cross-disciplinary understanding and teamwork, vitally important as means to ends.

RRA is not a standardized method but attempts to be systematic in order to be replicable. As such, RRA is neither 'rapid surveying' nor 'rapid participant observation.' Hands-on experience is an essential element of RRA and there can be no 'remote RRA.' At the same time, RRA is not a substitute for other information-gathering techniques. RRA seeks to inform and can complement more conventional surveys or anthropological techniques and may strengthen both of these if applied in advance. Yet when time and manpower are limited, RRA may be a superior alternative to either.

An important aim of RRA is to cope with complexity, diversity and interdependencies, and to recognize the problem and the context of problem-solving efficiently. As a consequence, RRA embodies trade-offs between timeliness and rigor which are not always clear. RRA can pose serious questions for the degree of confidence that can be placed in results. However, RRA can provide valuable information on ranges and variations in addition to totals and averages. Reliability in RRA is as dependent on the experience of the team as on the research process employed. RRA reliability increases when the team is composed of both 'insiders' and 'outsiders' (i.e., experienced people both familiar and unfamiliar with the location under study), local people and women. As the properties of a system are equal to more than the sum of the parts, successful RRA can generate quantitative

and qualitative insights that go beyond the contributions of single disciplines or the products of other research methods. However, it is becoming clearer, as RRA evolves, that there are problems to which RRA should not be addressed.

APPLICATIONS OF RRA

In this section selected applications of RRA in agriculture, nutrition, agroforestry, and health care will be reviewed. In addition, some methodological literature on RRA development will be reviewed concerned with soliciting and recognizing indigenous technical knowledge and developing tools for RRA.

The earliest references to rapid rural appraisal date back to 1978 and 1979, to a workshop and a conference at the Institute of Development Studies, University of Sussex. The emphasis there was on the disadvantages of conventional survey methods, the weakness of 'quick and dirty' alternatives to 'long' surveys, and the need for 'quick-but-not-too-dirty' methods. A related issue was indigenous technical knowledge and the value of RRA as a research method for putting the farmer and his/her needs, circumstances and knowledge squarely into the search for new technologies or approaches to management. Much of this is associated with the work of Robert Chambers (1980; 1981) who has focused more on the 'why' of RRA than on the 'how' and on the need to reorient research and rural development management if we are to produce well-adapted results that farmers will use dependably.

RRA in Agriculture and Rural Development

The majority of published examples of RRA apply to agriculture and rural development with special emphasis coming from farming systems approaches to research (FSAR). FSAR views the whole farm as a system and focuses on: (i) the interdependencies between the components under the control of members of the farm household; and (ii) how these components interact with the physical, biological and socioeconomic factors not under the household's control (Shaner et al. 1982). FSAR attempts to link agricultural research more effectively with resource-poor farmers (Zandstra 1985). Perhaps the best overview of RRA as a critical component of FSAR has been provided by Beebe (1985).

Significant agricultural research emphasizing how RRA is performed includes the work of Hildebrand (1981; 1982), Collinson (1981), Shaner et al. (1982), and Rhoades (1982). Each of these authors, their colleagues, and their respective agricultural research centres, identify forms of RRA as diagnostic tools in farming systems approaches to research. RRA is seen as a critical first step in FSAR in Latin American, African and Asian contexts for national and international agricultural research. More recently RRA has been proposed as a monitoring technique in FSAR that incorporates elements of extension in all stages of FSAR (Norman 1985).

RRA in agriculture is carried out under a variety of labels – *sondeo*, exploratory survey, reconnaissance survey, and informal agricultural survey. Each

approach is different, structuring time tightly (*sondeo*) or detailing questions explicitly (exploratory surveys) but all of the approaches identified are more than 'surveys' in the conventional sense of the word. Some approaches, most notably Rhoades', emphasise the qualitative distinction between RRA as an appraisal process and the characteristics of rapid surveys. However, all these pathbreaking agricultural RRA's include elements of appraisal based on iterative analysis, learning as-you-go, and the incorporation of passive field observations. RRA is appraisal not just quicker data collection.

Influential agricultural RRA's aimed to be problem-solving, farmer-based, sensitive to location, interdisciplinary, qualitative, quick and informative to decision-makers. RRA's took researchers to farmers' fields and educated them there about farmer needs and circumstances, the roles and perspectives of their professional colleagues, and the need to reorient agricultural research agendas.

Since then RRA has been tried and tested by a large number of agricultural organizations to diagnose topics or locational problems (Grandstaff and Grandstaff 1985), to plan technologies appropriate to farmers (Byerlee et al. 1984), to reorganize agricultural administration (Klepper 1980), to plan projects (Ellman 1980), and through the use of the sociotechnical profile to equip bureaucracies for participatory work (de los Reyes 1984). These studies demonstrate clearly the broad scope of RRA and are beginning to identify specific tools, strengths, and weaknesses of RRA aimed at different targets.

In contrast with most of the applications of RRA in FSAR, the sociotechnical profile developed for use by the National Irrigation Administration (NIA) in the Philippines was designed to help an agency plan which projects to assist in a particular year and how to intervene effectively (de los Reyes 1984). In the process of accomplishing these objectives, a highly technical agency has come to appreciate, as never before, the value and importance of social and organizational factors in water management. The sociotechnical profile includes at least five instruments for gathering, writing up, analyzing and summarizing data. Some parts of the process require trained interviewers, other parts depend on line technical staff in provincial offices. Throughout the application of the profile there is a focus on issues, semi-structured interviews, selective inquiry, and 'appropriate imprecision.' The principal value of this approach is in the way it employs RRA methods to work within an agency which has internal objectives and procedures that may hinder its ability to achieve its ultimate task of more effective water management. The approach appears to work because it is sensitively applied, generates clear guidelines and procedures, includes mechanisms to 'keep things moving,' and has a measure of institutional support at a high level.

In addition to applications, Grandstaff and Grandstaff (1985) and others have also begun to identify the conceptual and methodological 'core' of RRA based on extensive field experience and progressive experimentation with RRA preparation, field methods, and report writing. Grandstaff and Grandstaff (1985) also identify twenty-one RRA's performed by interdisciplinary teams at Khon Kaen University on a range of topical, location-specific and methodological issues. Honadle (1982) also highlights methodological issues paying particular attention to the situational character of proxies in the context of capacity-building in agencies. Special atten-

tion is given to formal and informal factors that influence the conduct and performance of bureaus and their ability to work effectively with villagers for their benefit. Rapid reconnaissance is seen to provide practical means for appraising and shaping organizations which must respond to many diverse situations. Honadle emphasizes not only reliability versus cost in information gathering but also the impact of different approaches on local capacities for problem solving.

RRA in Agroforestry

Two recent examples of RRA in agroforestry are provided in the diagnosis and design (DD) method of the International Council for Research in Agroforestry, i.e. ICRAF (1983), and the rapid community appraisal (RCA) of the Bureau of Forest Development (BFD) of the Republic of the Philippines (1984). ICRAF's methods of diagnosis and design fit within an FSAR approach for improvement of existing land use systems through agroforestry. While agroforestry is a collective term for an array of systems of land use that incorporate trees and shrubs with herbaceous crops and livestock, many agroforestry applications are in upland areas on fragile lands. These areas are characterized by ecological and cultural diversity and the employment of traditional technologies. The challenge of development in these areas is to adapt technologies that are not only productive and sustainable but also cost-effective in specific locations where high pay-offs are unlikely. ICRAF also proposes to use its DD methods as a guidance system for projects beyond the diagnostic stage.

Because of its role as an international council and its concern for a specific set of land use techniques (agroforestry systems), ICRAF's DD method appears to emphasize checklists and analytical worksheets that are generalizable and can be communicated in writing to potential users, over iterative, narrative techniques. The DD method is also the product of an approach that sees agroforestry as 'system specific' rather than 'location specific.'

The RCA of the BFD employs various methods to plan social forestry programs but stresses a standardized social survey. In fact RCA appears to be closer to 'rapid surveying' than RRA. RCA employs mainly conventional surveys techniques applied by trained interviewers to random samples of respondents, supplemented by key informant interviews. Questions and survey instruments are detailed in advance and RCA reports stress quantification. The advantages of RCA are that it is relatively rapid and it is taking place within an agency that needs to come to terms with poor rural people as major clients.

The Khon Kaen University fuelwood situation RRA (Subhadhira et al. 1985) was employed to assess how rural people adjust progressively to increasing problems of fuelwood scarcity. The main RRA fieldwork was rapid, lasting only four days, and employed two complementary teams to probe the acquisition and use of fuelwood in areas of abundance, beginning scarcity, acute scarcity and recovery from scarcity. The RRA used the triangulation approach to stratify respondents and to appraise their situations and developed a simple tool for measuring fuelwood volume quickly. The RRA highlights the social and cultural complexity of the problem of fuelwood scarcity, in addition to the biophysical and energetic. An

important result of the fuelwood RRA is a clear direction for interdisciplinary sensitivity and imagination in planning programs to alleviate shortages. Institutional and organizational arrangements, which are often neglected in project design and implementation, are clearly of great importance.

RRA in Nutrition

Examples of RRA applied to problem diagnosis in the area of food and nutrition are provided by the United Nations High Commission for Refugees (UNHCR 1982) the United Nations Food and Agriculture Organization (FAO 1982), and Tripp (1984). Topical RRA's on unconventional and natural food sources in the diets of rural families are provided by Somnasaeng et al. (1984, 1985). Like farming systems, nutritional systems are highly location specific and RRA provides a clear point of entry for precise targeting in applied nutrition. Nutrition studies also tend to focus on relatively poor areas where farm incomes are lowest. RRA in nutrition studies has given emphasis to problems of seasonality, intra-family food sufficiency, women's roles and the importance of so-called 'minor' crops. All of these are important aspects of nutrition not well identified in prior decades of conventional survey research. Information of this kind should enable more precise targeting of nutrition programs and more effective monitoring of program results. Improper targeting of nutrition programs has allowed privileged minorities to capture the bulk of the benefits frequently (Tripp 1984) and misguided interventions can cause irreparable harm.

Streefland and Streefkerk (1982) offer a very candid report of a three-week RRA designed to map out in advance candidate areas for a drinking water project in India. Two experienced researchers, familiar with the area under study (Gujarat) identify both logistical and methodological problems of RRA and their report includes important practical details ("use locally understood concepts and language," "cross-check each other," etc.), as well as methodological questions. Most important of these are questions of validity in RRA (are you measuring what you think you are measuring?) and reliability (do the answers provided by RRA correspond to reality?). In a postscript to their report written in 1985, the authors raise the issues of tension in RRA fieldwork raised by the presence of officials, errors caused by working to deadlines, and a caution to expatriates not to overstate how much 'experienced people' really know.

Tools and Special Applications of RRA

Elizabeth Croll (1984) describes the particular value of RRA to field research on rural women in China where the technique was especially appropriate because access by foreigners to the field is often limited to no more than a month. To cope with this problem Croll combined good background preparation to identify key questions in advance with a tightly-structured questionnaire administered in the field, supplemented by observation of particular indicators appropriate to her studies. The research presents a good example of complementarity between desk

research, conventional surveys, and informal observation, in rapid appraisal. Because of strong prevailing ideologies, Croll's research suggests that useful information about certain issues in China cannot be gained through rapid methods: certain questions will always elicit the same 'acceptable' answer. However, rapid appraisal is generally assisted by the high level of organization in China and by the small range of opportunities for differentials between households. In contrast to many other RRA's, Croll's research suggests the need to know specific household contexts in advance, rather than to discover them through RRA.

The most complete illustration of conceptual tools for RRA is provided by Limpinuntana (1985) who examines the use of checklists, secondary information, pre-existing maps, on-the-spot maps, agricultural calendars, labor schedules, logic and decision trees, local terms and folk taxonomy. Systematic use of questions on "who, when, what, where, why, and how" is explained for interdisciplinary teams conducting semi-structured interviews, supplemented by direct observation. The tools described have been developed mainly in agricultural RRA but are potentially useful to a vast range of applications (health, nutrition, social forestry, fisheries, infrastructure and land use planning) where questions must be developed on-the-spot and when resources are limited. With the aid of these conceptual tools, which can be learned in advance of fieldwork, RRA practitioners can become more effective interviewers, asking better questions more cost-effectively. When knowledge of these tools is combined with agreed protocols on field conduct by the RRA team, semi-structured interviews can be more reliably tailored to the purpose and context of the RRA. The value of graphic tools to synthesize agroecological features, seasonal calendars, production and marketing systems, household decision making, and institutional arrangements is described most concisely by Conway (1985) in an application in Northern Pakistan.

Carson (1985) also illustrates the value of large-scale aerial photographs (1:5000) as starting points for RRA since they permit land and human resources to be considered concurrently, are relatively inexpensive, and can be interpreted accurately by rural people without formal training. Aerial photographs provide a single base for incorporating social and economic factors on a natural landscape quickly and at low cost. Experience gained in this way may also improve the reliability of interpretation of satellite images applicable to much larger geographic areas. Carson identifies how large-scale aerial photographs have contributed to planning forestry projects in Nepal, specifically in siting nurseries and experimental plantings and establishing village-level land management plans.

Stocking and Abel (1980) indicate how proxy variables and small sample methods can be employed to appraise aspects of the physical environment which are normally assessed by longer methods, or not assessed at all. Three case studies related to soils, plant indicators, and erosion are presented. In each case, proxy variables that are obvious features of the landscape are shown to provide information on another parameter or set of parameters. The resulting information is coarse but useful if supplemented by sufficient local knowledge and if the nature and extent of the loss in accuracy associated with the rapid methods is made explicit.

PROBLEMS FACING RRA

Based on experience in application, some potential problems facing RRA have already been identified by Beebe (1985), Harrington (1980) and others. These problems range from methodological and conceptual issues to questions of institutionalization and influence over decision making. These, and a number of additional problems based on a review of RRA literature, include the following major concerns:

Acceptance of RRA Challenges Conventional Views of Information Gathering

Most current development institutions are supported by the epistemological beliefs that support objective knowledge, and traditional knowledge is discounted. We perceive the world through our Weltanschauung or world view, an interpretation that allows us to make sense of observation. Information that does not correspond closely with the world view of decision makers is unlikely to have much influence (Jamieson 1985). Acceptance of RRA and its findings will be dependent on a willingness to accept what is currently an unconventional view of reality. Since Descartes, scientists have tackled hard questions by reducing them to a sequence of small problems but RRA represents a product of systems thinking that treats complexity holistically. Despite lip-service to holism, systems thinking is still the exception rather than the rule and systems approaches pose problems of acceptability of, and confidence in results.

What confidence can we place in the results of RRA? The answer to this question will be found in part in refinement of the concepts and methods of RRA and in part in the success of development activities shaped by RRA producing desired results faster and more dependably than when RRA is not employed. RRA includes a range of practical, hands-on procedures and their worth is measured best by practical results in the form of redesigned research and aid agendas or benefits delivered to target beneficiaries.

Every Virtue of RRA Also Represents a Potential Pitfall

For example:

- key informants may be very useful or reinforce biases.
- proxies may be valid or misleading.
- inexpensive techniques may be applied indiscriminately.
- flexible methods may be diffcult to replicate.
- experienced personnel may be unavailable or unprepared to work in remote areas.
- speed may lead to superficiality.
- interdisciplinarity may prohibit consensus.
- insights gained in the field may be overly influential.

This list could go on. Each aspect of RRA that makes it appealing reflects an important methodological question that must be addressed squarely if RRA is to

gain acceptance and avoid the pitfalls of fashion. However, paying attention to these important details will take a level and type of effort that is different from that required to perform RRA. Terms and procedures in RRA ('optimal ignorance,' 'reasonable cost,' 'semi-structured interview') need to be progressively better understood and practitioners must be prepared to invest a significant portion of their time and energy to establishing the conceptual core of RRA.

Success in RRA Depends on Its Institutionalization Within Development Organizations

A major challenge to RRA is to involve local decision makers intimately in RRA in order that the field experience and subsequent action are potentially closely related. The experience of FSAR may be helpful here. FSAR has been heavily funded by aid donors, performed by expatriate staff, and 'added on' as a unit to existing research and extension systems (Biggs and Gibbon 1984). The results have often proved disappointing because farmers and local people in the research and extension system have not provided the main organizational vehicle for FSAR. In addition, FSAR has been introduced through projects with a predetermined life and discreet funding.

Nevertheless, FSAR has been influential in reorienting agricultural research systems to recognize their farmer clients, to take a more holistic view of the agroeconomic environment of the farm family as a producer and consumer, and to build up local research capabilities through an evolutionary, learning approach. Where this has been achieved, FSAR has evolved within a particular institutional and political context, not in spite of it.

RRA Must Avoid the Pitfalls of Fashion

In the well-intentioned search for progress in development, certain concepts and practices attract the attention of the development community and become elevated to 'star' status. FSAR is experiencing this. The danger is that unrealistic expectations become associated with indiscriminate growth, and a good idea is killed with 'kindness.' How is an innovative concept nurtured, tested and evaluated and permitted to mature through trial and error, modification and retrial? RRA has all the hallmarks of stardom, including the brief life. How can this be avoided?

RRA must remain an experience-based, hands-on practice. RRA teams must constantly remind themselves that RRA is not an end in itself but a means. RRA should be encouraged to evolve within the institutions which are to become better informed by the practice. Practitioners should resist pressures to standardize RRA methods and allow the current diversity of RRA to flourish. Nevertheless, RRA should not be applied indiscriminately and every RRA exercise should be critically evaluated by the team at its termination. RRA must continue to evolve as a process not a package.

Know When to Use RRA and When Not to Use It

As a learning process that links researchers and development administrators more closely to their 'clients,' RRA can be an energizing experience, providing new insights and motivation. However, we need to ask more pointedly when should RRA be used, by itself or in combination with other information-gathering methods? For example, when time is short, don't attempt to do research on highly sensitive issues, such as land tenure, is one possible rule (Streefland and Streefkerk 1982). However, Galt (1985) and others have shown that for certain activities in FSAR, RRA is quite adequate for informing research design.

Thomas and Suphanchaimat (1985) describe how RRA can be a useful complement to both cross-sectional and longitudinal studies. In either case, formal questionnaires administered by outsiders may show cultural and contextual biases. RRA methods can be added to more conventional research during the design stages to increase awareness of the context of the target group and the flexibility of the research instruments. RRA's can help interviewers explain themselves to interviewees at the outset of the process, to ask better questions, and to improve the reliability of conclusions.

Where representativeness is an important issue, RRA by itself is an inadequate substitute for data based on random sampling (Harrington 1980). Randomization methods also seem to be valuable for appraising physical traits, and aerial photographs, sketch maps and transects are useful tools for aiding random selection. Purposive sampling seems to be more effective for capturing social and cultural traits. And where quantification is important, as in the analysis of experimental results, an informal method by itself may be inadequate. People who have practiced RRA need to evaluate their experience critically vis-a-vis alternative approaches to informing action. When is precision needed, and when is it not necessary?

Survey research has dominated socioeconomic investigation in developing countries despite criticism that survey results are insensitive to context (Stone and Campbell 1984). More intensive, qualitative fieldwork methods are required which can provide guidelines for survey designs, means of checking non-sampling errors, and guide the choice of survey methods.

How Well Do Proxies and Indicators Reflect the Phenomena They Substitute For?

Because of the importance of proxies and indicators in RRA there is an urgent need for more testing of their ability to capture economically the essence of the phenomenon under investigation. An indicator captures only one dimension of a phenomenon under study, and observation of that dimension can vary with the context. For that reason a particular indicator can lose its meaning in different times and places. RRA needs to be able to explain why particular indicators are useful and not misleading by stating the assumptions that tie the indicator to the phenomenon.

CONCLUSION

RRA has been forced on rural development professionals by scarcities of resources and the demands of practitioners for progress. However, RRA appears to be capable of generating information that is not only timely and economical but qualitatively distinctive. In the words of Carruthers and Chambers (1981), "short-cut methods do not have to be second rate and unprofessional." Indeed, the experience of the last five years suggests that RRA has contributed to a new professionalism in rural development that puts the small-scale farmer and poor rural people in developing countries first. RRA's are not only cost-effective in terms of personnel, time and money but also powerful tools for directing and motivating rural development professionals.

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HOW RAPID RURAL APPRAISAL AND OTHER SOCIO-ECONOMIC DIAGNOSTIC TECHNIQUES FIT INTO THE CYCLIC FSR/E PROCESS

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INTRODUCTION

This paper contains two major sections: (1) a brief historical narrative of the evolution and use of rapid rural appraisal (RRA) in Honduras during 1978 and 1979, and (2) a look at the different uses of RRA during various farming systems research and extension (FSR/E) phases. The historical presentation of socio-economic diagnosis in Honduras, while brief and wholly dependent upon the author's own interpretation, may still be too detailed for the casual reader. If the reader has insufficient time or interest in this section, he or she may skip immediately to the second major section.

The historical review of socio-economic diagnosis in Honduras takes the reader through a progression from a reconnaissance/RRA activity, to the design, implementation and analysis of a "formal" survey, to the point of recommending the *sondeo* approach, supplemented by tailored follow-up surveys as needed. Indeed, the historic narrative leaves off where the second major section begins: a description of the better use of a range of socio-economic techniques in FSR/E. In this section, it is asserted that the specific technique to be used by FSR/E practitioners not only depends on the *phase* of the FSR/E sequence, but, just as importantly, upon the *needs* of the interdisciplinary research team and their clientele, the farm households with which they work.

The second section of the paper presents some socio-economic techniques which might be considered useful by an interdisciplinary team of FSR/E field practitioners. The techniques discussed include these five: (1) the baseline survey, (2) the formal survey, (3) RRA and the *sondeo*, (4) the tailored follow-up survey, and (5) farm enterprise records.

A major conclusion of this section of the paper is that the formal survey does not compete with the informal RRA or *sondeo* activity, but that the two techniques have unique places in the FSR/E process. The RRA represents one of the first activities of a field-level research team in their recurrent interaction with farmers. Formal surveys are often used later in the FSR/E sequence to assist teams to fine-tune their understanding of farming systems or problems at a more detailed level among their farmer households. However, such formal surveys should be strictly tailored to eliminate unnecessary questions and must be: (1) acceptable to the whole interdisciplinary team, (2) focused on important systems, sub-systems,

problems or issues, (3) implemented and analyzed by the whole team, and (4) of high potential use for further trial design or redesign.

A second major conclusion of this section is that RRA and additional socio-economic diagnostic techniques should play a continual, complementary role throughout the phases of FSR/E. RRA and follow-up surveys should not be confined to the brief diagnostic phase traditionally placed before the farm trial design sequence in the FSR/E process, but instead should help form an integral part of the cyclical diagnostic process running through all FSR/E phases.

THE EVOLUTION AND USE OF RAPID RURAL APPRAISAL IN HONDURAS

The author assumes most readers have some basic familiarity with the FSR/E process. FSR/E is herein defined as a flexible, iterative agricultural research and extension process which consists of at least these five stages: (1) diagnosis, (2) trial design, (3) experimentation, (4) verification, and (5) extension (Shaner et al. 1982; Galt et al. 1982). More frequently, major international agricultural research centers (IARCs), FSR/E practitioners, and FSR/E theoreticians are in agreement on the major phases and content of FSR/E methodology (CIMMYT 1981; Byerlee et al. 1982; FSSP Newsletter 1984).

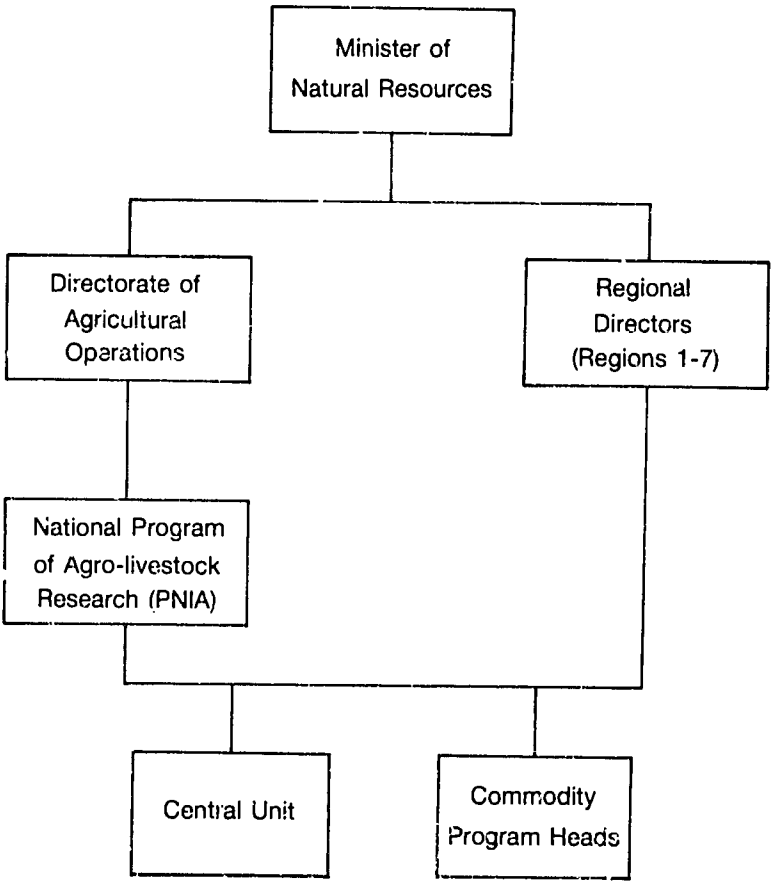
A part of the history of the multidisciplinary, farm-level research (subsequently referred to as FSR, or farming systems research) in Honduras during the late 1970's and early 1980's has already been told (Galt et al. 1982). Briefly, a core group of recent Ph.D. researchers, representing the disciplines of plant breeding, plant pathology, entomology, agronomy, forage breeding and agricultural economics, came together to compose a new Central Unit of the Ministry of Natural Resources (MRN) within the National Program for Agro-livestock Research (PNIA). The function of the Central Unit was to reorganize agricultural research in Honduras, based on interdisciplinary, farm-level research, in order to focus it more sharply on relevant, farmer-defined problems. A partial organizational chart, representing the relevant portions of the MRN during the period 1978-80, is provided in Figure 1.

This central core – referred to subsequently as the team – was supplemented during these years by several Honduran researchers from various crop research programs, and three sets of trainees. The trainees were selected from senior year agronomy students. The trainee's program with the Central Unit was approximately 40% formal (short course) instruction and 60% field work as members of smaller multidisciplinary sub-teams assigned to one of three homogeneous agro-climatic zones, or recommendation domains (Harrington 1980).

A. The Reconnaissance/RRA Process in Comayagua

Field work began in January and February, 1978, in the Comayagua Region of Honduras (see Figure 2 for a map of the agricultural regions of Honduras). During these two months, visits were made by different combinations of team members to several villages near Comayagua. The team members combined an area reconnaissance with an informal RRA. (At this time, the team was unfamiliar with the term

Figure 1 Organizational Diagram of the Honduran Ministry of Natural Resources (MRN), 1979-80



"rapid rural appraisal," and the Spanish equivalent, "*sondeo*," did not come into general usage until the concept was presented by Maria Chinchilla of ICTA, Guatemala, during the 1979 meetings of the PCCMCA (Central American Cooperative Program for the Improvement of Basic Food Crops) in Tegucigalpa, Honduras.

Figure 2 Honduran Agricultural Administrative Regions

The objective of the reconnaissance portion of the initial field activity was to explore the agro-social situation in the vicinity of the regional headquarters of Comayagua. During these trips, team members specifically did the following: (1) examined the terrain of each distinct area and/or village, (2) viewed farming populations in these surrounding communities, (3) noted the number of kilometers to each area, (4) noted the amount of time required to get to each area and return, (5) noted the condition of the dirt road to the area, and (6) obtained a subjective "feeling" for the area. The objective of the RRA portion of the initial field activity was to determine the predominate cropping systems in the given area. To do this, the team did the following: (1) interacted with key informants in each village (especially important was the local extension agent in those areas where one was stationed, and contacts in the town hall, if the village had one), and (2) informally interviewed three or four farmers, preferably in their fields, about their cropping plans for the upcoming season. Such farmer discussions lasted an average of one-half hour, and in several cases involved dialogue with more than one farm family. Usually, when two or three researchers approached a farmer, neighbors working in adjacent fields would come over to the group and add comments during the informal dialogue process.

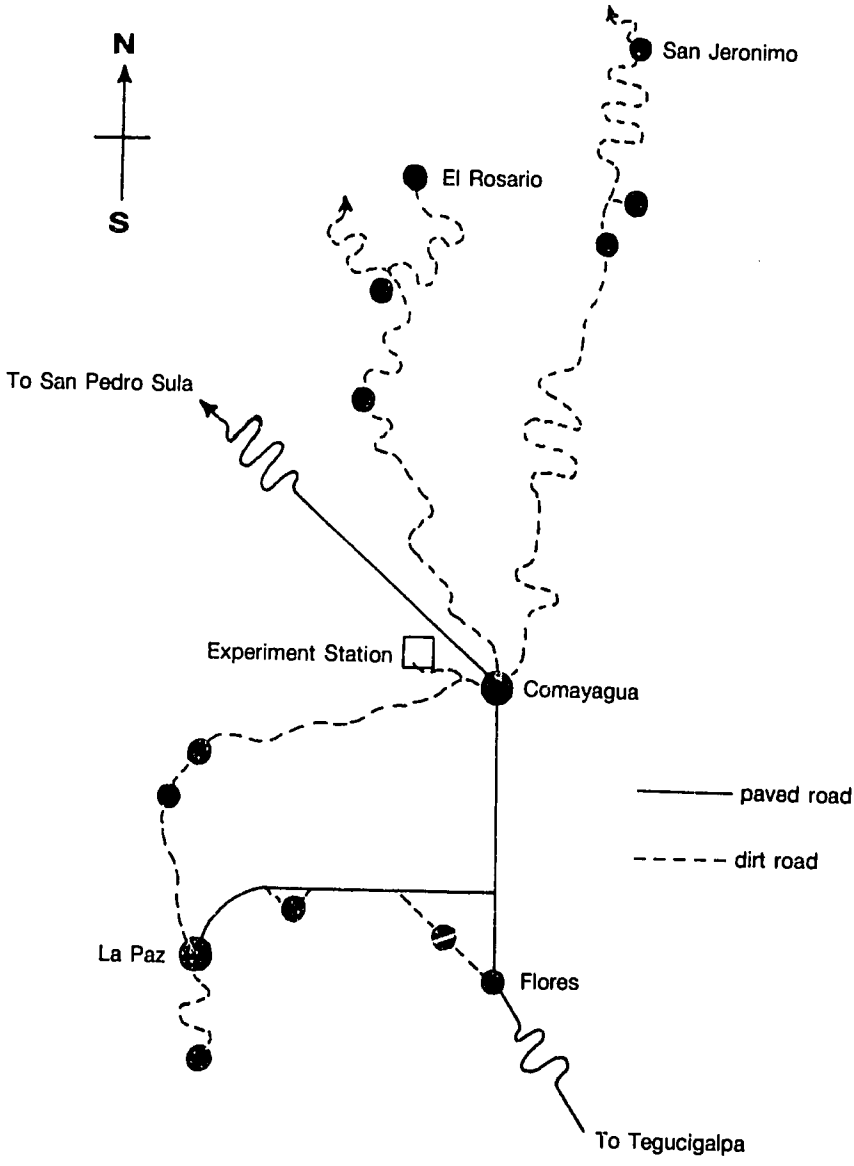
B. The Formal Questionnaire Process in Comayagua

Much essential information was obtained during these informal dialogue visits. The vast majority of this information related to specifics of farmer practices by cropping system. Much information was obtained regarding the systems of maize, beans, rice and sorghum. This reflected, in part, the team's mandate from the Honduran five-year plan to emphasize these particular basic grains. In addition, part of the details were supplied because these four crops, in fact, were the predominant foodgrains in the recommendation domains visited by the team.

Another objective of the reconnaissance/RRA process was to assist the team with the design of a formal farmer questionnaire instrument. After completing these informal RRA trips, the team met to design the formal questionnaire. This design process consisted of three stages: (1) the team members listed all of the information they would like to obtain from farmers in their particular discipline, (2) the team worked together to reduce this information to a manageable amount, and (3) the questionnaire was designed for a trial run. It should be noted that the first brainstorming session was not totally unrestricted, because team members were asked to filter out non-vital questions in advance. During the reduction step (step 2), the team placed the upper limit of length of the questionnaire at five pages. After team refinement and redesign, the final questionnaire contained five pages of written questions and a blank page for drawing field maps and cropping calendars for each farm family interviewed.

During this process, the villages which had been visited were discussed. All but four were eliminated from consideration for farm trials during the first year. Details of the four recommendation domains selected have been documented elsewhere (Galt et al. 1982). Their geographical relationship, one to another, and to Comayagua, is presented in the map, Figure 3. Briefly, the domains selected to receive the follow-up formal questionnaire were:

Figure 3 Recommendation Domains in the Comayagua Region of Honduras, 1978-80



(1) *Flores*. A level area approximately 15 km south of Comayagua via an all-weather, paved road. This domain had access to virtually limitless year-round irrigation water and can be characterized as a major vegetable-growing and small-holder, tobacco-producing area.

(2) *La Paz*. A level-to-rolling area approximately 27 km southwest of Comayagua via an all-weather, paved road. This domain is located at the end of an irrigation district, has variable access to irrigation, and can be characterized as a mixed vegetable-basic grains (maize, sorghum and common beans) area.

(3) *El Rosario*. A steeply-sloped area, with slopes of between 20-60%, approximately 26 km north of Comayagua via an all-weather, gravelled road. This domain is rainfed only, and can be characterized as having only three crop systems: maize, sorghum and common beans.

(4) *San Jeronimo*. A level-to-rolling river basin area approximately 35 km northeast of Comayagua via an all-weather, gravelled road. This domain is mainly rainfed, although some farmer groups have access to river water for irrigation if they own a pump. This domain can be characterized by basic grain production in the valley (upland rice, maize and some common beans) and coffee in the surrounding hills.

The *purpose* of following the informal RRA activity with the formal survey was to allow the team to obtain the information which was missing for specific farm trial design in each domain selected by the team for further research. The *objective* of the formal survey process was to statistically confirm the predominant systems, practices and problems previously identified in the RRA.

1. *Testing the Formal Questionnaire*

The formal questionnaire was tested in the Esperanza area of the Comayagua Region. The Esperanza area lies approximately 5 hours northwest of Comayagua via an extremely rough, twisting, mountainous gravelled road. While the four areas in the Comayagua valley range between 450-550 meters in elevation, the Esperanza area ranges between 2,000 and 2,500 meters. Major crops grown there include Irish potatoes, maize, beans (common and broad), other vegetables and tree crops.

The process of carrying out the field test of the questionnaire was as follows. The team from Comayagua arrived in Esperanza on a Sunday afternoon. The next day, the team met with local researchers and selected extension personnel. The group spent the afternoon going over the questionnaire. Issues discussed included how to ask certain questions, how to fill out the forms, and clarification about types and depths of information needed.

The next day, teams composed of one researcher and one extension agent made visits to two or three farm families. Each group of interviewers used a vehicle. Thus, local extension, local research and regional research vehicles provided mobility to the two-person teams. Average time of drive plus interview was between two and two and one-half hours. Eight two-person teams interviewed 20 farm families.

The next day was spent in pre-analysis of the questionnaires by the group. A vital part of this exercise was to refine, eliminate or add questions to the question-

naire. Some good suggestions were forthcoming from the group as to what the final version of the questionnaire should look like and what questions it should contain. Approximately two weeks later, the questionnaire had been modified to incorporate many pre-test suggestions.

2. *Administering the Formal Questionnaire*

The revised questionnaire was duplicated and administered to 111 farm families in the four domains near Comayagua over a four-day period during one week in late April, 1978. The interviews involved the team plus the researchers in the Comayagua Region on Monday and Tuesday. Twenty-eight farm families were interviewed in both Flores and La Paz. On Thursday and Friday, the team and the interested researchers from the Comayagua Region were supplemented by researchers from the other two major regions of Honduras, San Pedro Sula in the North and Choluteca in the South (Figure 2). Twenty-eight farm families were interviewed in the El Rosario area, while 27 farm families were interviewed in the San Jeronimo area. Local extension personnel were excluded from participating because the interview week conflicted with the yearly extension planning workshop.

The procedure of selecting farmers for interviewing was not consistent across the four domains. In Flores and La Paz, families interviewed had been pre-selected based on land reform maps and property lists from the national survey of 1974. These families were randomly selected from all farm families with holdings of 20 ha or less in each domain. When the property selected no longer belonged to the selected familiy, the new owner was interviewed. When the selected family could not be located in either the morning or the afternoon, an alternate farmer was interviewed. A buffer sample of 15 additional families per domain had been drawn for this purpose.

The procedure followed in El Rosario was one of casual contact of the interview teams with the farmers. No specific pre-selected sampling procedure was followed, as land reform maps and property lists did not exist.

Selection of farmers for interview in San Jeronimo was a combination of both of these methods. The randomly pre-selected household farmers were interviewed first, including the 15 family buffer. So much misinformation existed between the land reform property lists and the current residents of the area that more farmers were needed than could be provided by the sample and buffer lists. Fortunately, the local extension agent returned early from the workshop and assisted the teams to select additional families to interview.

The farmer interviews in El Rosario and San Jeronimo might best be described as "working" samples. The teams did whatever they had to do to be able to systematically describe the farmers' predominant cropping systems, practices and problems.

Little orientation was given to the two-person interview teams. Team members were told not to ask leading questions, but no mock interviews were used in advance of the activity. With the exception of the team members who had participated in the questionnaire pre-test in Esperanza two weeks earlier, none of the researchers had ever been involved in socio-economic interviewing.

Vehicles were provided by the team during the two portions of the week's activities. These were supplemented by vehicles and petrol from the two other major research regions for the San Jeronimo and El Rosario interviews. Logistic considerations are important for countries in which agricultural research budgets are provided to regional directors for discretionary expenditures. Obviously, regional directors must see something of high value in the FSR/E approach for them and for their region, or they are unlikely to agree to having their vehicles, researchers and petrol tapped for use in other regions.

A major inter-regional issue was per diem. Researchers from other regions received no per diem from their regional directors for participating in the survey. Indeed, it was a compromise to get two day's worth of participation from these researchers. This explains why they were not able to assist in both portions of the week's interviews.

Two-person teams interviewed approximately five farmers per day. Team members were reassigned each morning. Most interviews were conducted in farmer's homes. A few interviews were conducted in stores or along roads or paths. As all participants were too tired in the evenings, discussion of the results of the interviews was postponed until the following week.

3. *Analyzing the Formal Questionnaire*

Analysis of a portion of the questionnaires was carried out over the intervening weekend by two researchers. Only those variables were analyzed which would contribute to, or were necessary for, the design of farm trials. The majority of variables were not analyzed at this time. The formal, complete analysis of the questionnaires took place more than a year later.

Only means, ranges and some modes were calculated for each important design variable. For example, means and ranges were calculated for grain yield, while modes and ranges were calculated for such parameters as row spacings and average numbers of seed per hole for maize, rice, beans and sorghum.

While every attempt was made to reconstruct the actual farm *system*, the formal questionnaire was not the best instrument for such a task (Galt et al. 1982). Indeed, often information within a given questionnaire was inconsistent. Implied in the answers to some questionnaires might be a system (maize + beans), but the field map, useful for confirming and providing more details of such a system, might show only a field of sole-cropped maize and another of sole-cropped beans.

C. Farm Trial Design: Use of the Formal Questionnaire and RRA Information

Putting everything into proper perspective, socio-economic diagnostic information is only useful in the FSR/E process if it assists a team design (or analyze and redesign) farm trials better. During the process of design of on-farm trials for the first year in Comayagua, information from both the RRA and the formal survey was used. However, the marginal value of much of the information contained in the formal surveys was judged to be less than the marginal cost of obtaining it (Galt et al. 1982).

During the three-day process of farm trial design, often the "real" information needed was that which had been collected during the informal RRA interactions with farmers in their fields during January and February. The group generally felt better relying on this source of information – for providing details of how spacing, plant spacing within rows, number of seeds planted, depth of planting – than the group did relying on answers to the close-ended questions which made up the bulk of the formal survey questionnaire. When the information obtained by the two tools was different, the team most often accepted the answer provided by RRA.

D. Suggestions for Other Teams Facing the Need for Diagnostic Information

Based on the experience of the Comayagua interdisciplinary team during 1978, and the experience of ICTA researchers from Comayagua, by 1979 the team recommended a "formal" type of informal survey (i.e., *sondeo*) as the first step of interaction with farmers in a domain (Galt et al. 1982). Furthermore, the team supported the notion of developing an informal questionnaire for each unique agro-climatic domain being surveyed. Finally, the author recommends that the following steps be added to the RRA process detailed above:

(1) A team should be led through the process of a *sondeo* by an experienced practitioner. The setting can be either artificial (using researchers or extension agents as farmers to be interviewed) or real (selecting a few farmers to be interviewed). This role-playing exercise can be done in as little time as two hours.

(2) The team carrying out interviews should allow enough time in the afternoon for group meetings to discuss results and to get a better feeling for the predominant farm systems and related problems in the domain.

(3) The entire team should be involved in analysis of the RRA information and the subsequent design of trials for farms and the experiment station.

These statements add little to the state-of-the-art in FSR/E. Indeed, most of them have been repeated for years by other FSR/E practitioners (Hildebrand and Ruano 1982; Hildebrand and Poey 1985; Ruano and Calderon 1982). However, these statements do round out the historical progression from reliance on the formal survey process to the use of the *sondeo*, a specialized form of RRA, in Honduras in the late 1970's.

THE PROPER ROLE OF RRA AND OTHER DIAGNOSTIC TECHNIQUES IN THE FSR/E SEQUENCE

It is presumptuous for anyone to attempt to delineate *the* proper role of RRA and other diagnostic techniques in a general FSR/E process. However, there is little doubt that many approaches to FSR/E have spent too much time and human (and economic) resources on the "diagnostic" phase of FSR/E (Anonymous 1983; Everson et al. 1982; Galt 1985). Furthermore, too much effort has gone into defining and describing the sequence of discrete "phases" of FSR/E (Shaner et al. 1982), while, too little effort has gone into describing the actual realities of im-

plementing FSR/E approaches in the field.

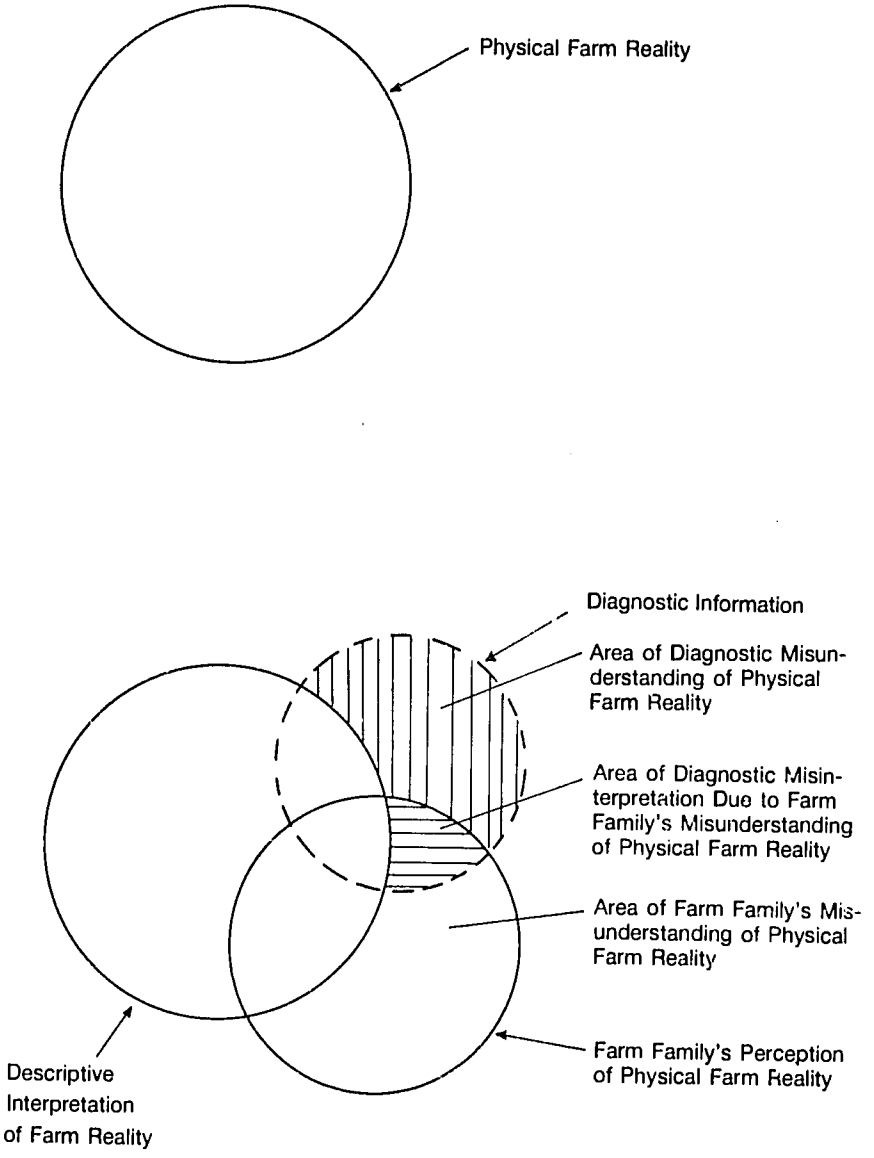
The FSSP is attempting to partially close this gap of descriptive realities of FSR/E projects and approaches. The project offers FSR practitioners two forms for publication: (1) the Networking Paper Series and (2) the FSR/E-Intrahousehold Case Studies (jointly sponsored by the Population Council and the Ford Foundation). Finally, while much has been written about RRA (Honadle 1972; Chambers 1980; Carruthers and Chambers 1981; Rhoades 1982; Lamug 1985; especially the summary paper by Beebe 1985), very little has been written about how RRA should be better integrated into the various phases of FSR/E (Galt 1985).

This section attempts to demonstrate how various socio-economic diagnostic tools may be used quite constructively *throughout* the FSR/E sequence, so long as they are based on felt needs of the interdisciplinary team. This section also reaffirms that the FSR/E sequence is a dynamic cycle, not a static linear progression or a circle arriving back at the point of origin.

The concept of FSR/E as a dynamic cyclical process is conceptually important, in that it allows incorporation of significant *progress* into this type of agricultural research. Judicious use of a variety of socio-economic tools during this cyclical process makes each phase more productive and gives any interdisciplinary team a better grasp of the farmers' household realities (see Figure 4). These household realities in turn complement the team's understanding of the farmers' field realities. The related issue of interdisciplinarity, the relative stress placed upon the diagnostic and the farm trial phases of FSR/E, and the justification for cyclic, or recurrent, diagnoses has been documented elsewhere (Galt 1985), and these topics will only be covered here as they apply to RRA and other diagnostic tools.

Since farm families, researchers, and extension personnel do *not* have all the answers required for improving the various components of farm systems better or more efficiently, these three groups all need to work together more closely. The process of FSR/E allows each of these groups to gain greater and greater understanding of farmers' field reality. More in-depth understanding of these systems allows researchers to identify, test, adapt and recommend research technologies which are available on the shelf. At the same time, this greater in-depth understanding leads farmers and researchers to realize where gaps exist in shelf technology. Then, researchers can quickly try to close these gaps by any of three non-exclusive methods: (1) applied and exploratory research at the experiment station level, (2) exploratory research in farmer's fields, and (3) importation of technology from a neighboring area within the country, from another country, or from an international agricultural research center. Often, some combination of all three of these methods will be used, depending on the severity of the problem to be overcome and the human resource capabilities of the particular agricultural research program.

Figure 4 Physical Farm Reality and its Descriptive Interpretation



A. Uses of Different Socio-Economic Diagnostic Techniques in FSR/E Phases

There are many types of socio-economic diagnostic tools. Several of them, such as mail and telephone response questionnaires, are of no importance in developing country situations. The five major types of socio-economic diagnostic techniques which may be of use to practitioners of FSR/E which will be discussed briefly in this section include (1) the baseline survey, (2) the formal survey, (3) RRA and the *sondeo*, (4) the tailored follow-up survey, and (5) farm enterprise records. Descriptive details of these diagnostic techniques may be found in a further review of the literature (see especially Beebe 1985, for an overview of diagnostic methods which focus on RRA in particular; also see Byerlee et al. 1980; CIMMYT 1981; Collinson 1981 and 1982; Hildebrand 1981 and 1982).

1. *The Baseline Survey.*

The baseline survey is a time-honored part of any project designed to *improve* anything. Such a survey helps policy-makers determine how things were at the beginning of a project, so that progress – or the lack thereof – can be measured. Baseline surveys were commonly a part of USAID bilateral agricultural projects during the 1970's. However, such surveys should be applied with great caution, if at all, to agricultural projects. This is because the year to year variability in agriculture is so much higher than is variability in normal, non-agricultural projects, that use of a baseline survey may often be more misleading than helpful.

"Normalcy" is the key concept to keep uppermost in mind when someone proposes that a baseline survey be conducted to establish base parameters against which project progress can be measured. However, normalcy cannot be predicted in advance in most agrarian settings. This is especially true for drier, rainfed areas of the world. In fact, in defining the "base period," one source states:

> "The main consideration in choosing a base period for any particular measurement is that it should be a fairly typical or normal period in respect of the forces which influence the numbers under consideration. If the base-period value is unusually low, subsequent growth rates will be exaggerated, and the converse will be true for an unusually high base-date value." (Bannock et al. 1972).

Thus, if the parameters one wishes to estimate via a baseline survey are average farm yields, average farm incomes and average labor devoted to predominant crops and/or livestock, selecting a normal year for rainfall average and distribution is a necessity for a baseline survey to have any meaning. However, baseline surveys are almost always conducted during the first year of a project, regardless of whether or not such a year is "average" or even close to average. This particular application of a baseline study is a gross misuse of an otherwise useful economic tool, as well as being a severe waste of project monies. Thus, for most African and Latin American rainfed situations in which variability of rainfall is also high, a baseline survey is an inappropriate diagnostic technique.

2. *The Formal Survey.*

The specific details of the formal survey, as applied in Honduras in 1978, were provided above. However, the formal survey described above represented compromises between several disciplines, and was severely limited in length by the FSR/E team. Average interview time per farm family was only about 40 minutes. Most formal surveys are between 10 and 30 pages, and farmer interviews take between one and two hours each.

The basic difference between any formal survey and an RRA exercise is *structure*. Formal surveys mainly contain close-ended questions of a specific nature, while RRA tends to be more loosely structured with more open-ended questions and more latitude for recording unofficial observations and/or interviewer impressions.

In the Honduras experience, the close-ended question format of the formal survey proved to be self-defeating in many instances. In putting down the proper response from each farmer, many interviewers forgot that an in-depth understanding of the process being surveyed was more important than the exact answer being recorded. A simple example is number of seeds planted. When the formal questionnaire asked, "number of seed planted per hill of crop 'X' is.....," the interviewers might have written down "2-3" (the average of which is 2 1/2 seed per hill). However, the process of farmer planting was actually two seeds in the first hill, three in the second, two in the third, and so on down the row. This latter information is easier to obtain during an informal RRA study, especially if the survey is conducted in the farmers fields.

During the diagnostic step of year one, a formal survey is unnecessary if a good, well-conceived *sondeo* or RRA has already been carried out (Beebe 1985; Galt et al. 1982). In addition, the marginal cost of a formal survey at the beginning of an FSR/E thrust may far outweigh any marginal benefits. The relative merits of neither the formal nor the RRA survey are being questioned here. Rather, the relevant question is one of place. The RRA activity should be the initial step of the FSR/E team in a given domain. Formal follow-up surveys should be conducted at a later time in the FSR/E process, in response to felt needs by the interdisciplinary team. Examples of such surveys, and their important place in the FSR/E process, are considered below in section 4.

3. *RRA and the Sondeo.*

For a summary of various types of RRA activities, the reader should refer to Beebe (1985). The attraction of the *sondeo*, and the mechanics of applying it, have been expounded elsewhere (Hildebrand 1979, 1981, and 1982; Hildebrand and Ruano 1982; Ruano and Calderon 1982; Beebe 1985).

As stated above, the RRA, or *sondeo*, represents the first step of an interdisciplinary team in a continuous, cyclic interaction with the farm families of a given domain. The activity should emphasize quick farmer interactions to determine the specifics of the important crop and livestock components of his or her farming system, and major problems or constraints in their production. More specifically,

the group needs to determine at least the following: (1) crop names or types, (2) color of seed (if important), (3) method and timing of land preparation, (4) method and timing of planting, (5) quantity of seed planted, (6) inputs used and timing of their application(s), (7) predominant insects, diseases or weeds and their controls, etc.

All of the information gathered using a *sondeo* has a specific purpose. That purpose is to allow the interdisciplinary team to work together with the farmers of the domain in laying out exploratory trials during the first year (see Figure 4). Collection of additional information is nice but not necessary. Other socio-economic tools can be used to collect additional information from farm households, or can be used to help refine the understanding the team has of the domain's farmers' systems, practices and problems, at later (hopefully slack) times in the FSR/E process.

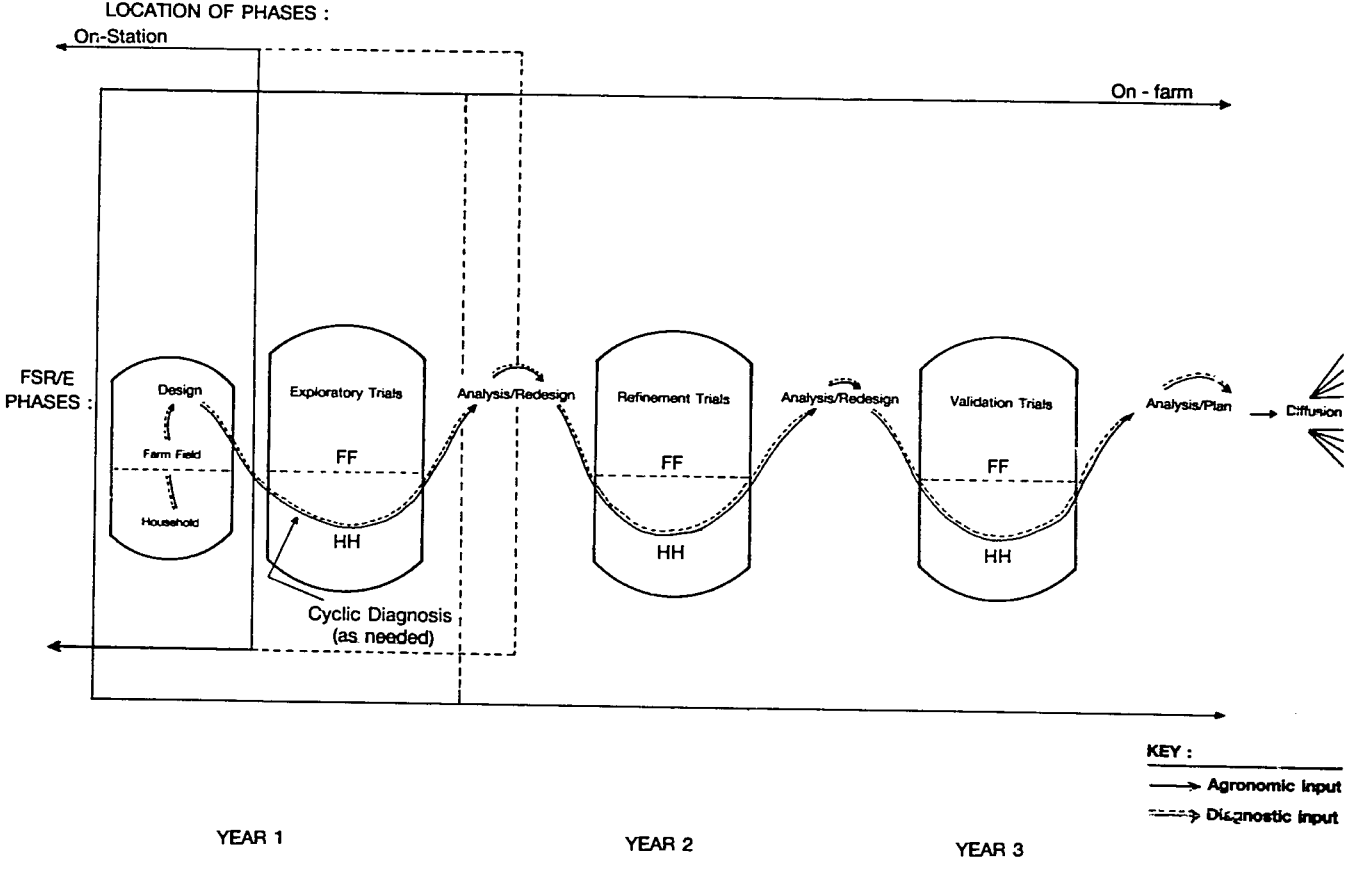
The RRA activity should take less than one week per domain. Interviews should be conducted quickly and informally. Interviews should focus on the family member(s) doing the actual farming. This may necessitate extensive interviewing of women, and the team should be aware of, and overcome, any language, cultural or religious barriers this might impose. Local extension personnel should be included in the process if at all possible. Two-person teams composed of extension and research personnel, or a social scientist with a biological scientist, should carry out the farmer interviews. Interchange of information should occur late each afternoon or during early evening hours, in the whole group setting. The specific members of each two-person team should be changed each day to minimize cumulative interviewer bias.

The overall team goal during RRA should be gradual convergence and agreement on (1) the most important component crops and livestock in the domain, and (2) the most important problems or constraints faced by the farmers of these most important crops and livestock species (Hildebrand 1981, and 1982; Hildebrand and Ruano 1982). This information is directly useful in allowing researchers to propose and design both station-based and farm-based trials for the first year of research (Galt 1985).

4. *The Tailored Follow-up Survey*

While the *sondeo* is the first step in the FSR/E process (Figure 5), the first year's station-based and farm-based trials will seldom, if ever, solve all the problems encountered in the predominant systems of the domain's farmers. For this reason, there is a cyclical sequence of FSR/E phases beginning with exploratory trials and progressing through refinement trials to validation trials (Figure 5). This cyclical sequence is more efficient if biological field trials are complemented with logical, focused diagnostic activities which the team agrees are vital to their overall success in research, and which can be carried out during lulls in field work. This timing is also critical for best farm family response, as lulls in team field work usually correspond to times during the cropping season when farm family members have more time to respond to additional socio-economic questioning.

Figure 5 Linear FSR/E Process Interwoven with Cyclic Diagnoses



These tailored, follow-up surveys are more formal than the RRA activity. After exploratory trials have been planted and seasonal crop and livestock observations and informal farmer contacts made, the field team will be much more familiar with basic farmer practices and potentials. This greater familiarity allows them to tailor a follow-up questionnaire to a specific subtopic of great importance to the continued progress and success of their farm level and station-based research. For this reason, the blanket statement that "there is no place in FSR/E for formal surveys" is completely erroneous. The fact remains that there is a place for both informal and formal surveys in the FSR/E process, and it is very important for practitioners to keep their respective places in the FSR/E cyclical sequence in mind. Some examples of tailored follow-up surveys follow.

In Honduras, the team designed spacial arrangement trials of (maize + sorghum) based on the interpretation of the formal survey and the RRA activity of early 1978. During the season, one planting arrangement was not found to be superior to the others. In addition to this field observation, farmers gradually explained to team members that they planted different arrangements of (maize + sorghum) because they were interested in their own particular labor situation at time of planting. If the family owned oxen, or had ready access to oxen, or was a large family with plenty of hand labor, it was likely that separate rows or hills of maize and sorghum would be planted. If the farmer did not own oxen and was low on the "rent priority" list for oxen, or if the farm family was small or the children were very young (or grown and not living at home), the farmer was more likely to physically mix the maize and sorghum seed together and plant them "cassado" (married) in the same hole during planting.

When the team began to see the *reason* for the variety of spacial arrangements in the domain, the agronomist proposed, and the team helped to design, a follow-up questionnaire. This follow-up questionnaire was designed to reveal more of the details of, and constraints on, land preparation in this domain. This formal, tailored follow-up survey was carried out at the beginning of the second year of the FSR/E cyclical process (Figure 5), prior to land preparation and planting (Galt et al. 1982).

Other examples of follow-up surveys include (1) those which gather further details about soil conservation attitudes and practices of farm families, (2) those which gather specific information to assist the researchers of a given crop (including unexpected intercropping patterns, such as the sesame + maize pattern uncovered in an initial survey in the southern region of Honduras in the fall of 1978), and (3) those which ascertain more important socio-economic characteristics of farm family decision-making.

The keys to the successful use of tailored follow-up surveys are insuring that (1) the topic(s) being investigated are extremely important to the biological success of the on-farm research, (2) each follow-up survey consists of concise questions focused on one, or at most a very few, of these extremely important issues, (3) the interdisciplinary team agrees that the survey is worth conducting, (4) the team designs and carries out each tailored follow-up survey, (5) the team jointly analyzes the results of each survey and agrees on how the additional information will assist their station-based and farm-based research, and (6) the follow-up survey information is incorporated into subsequent on-farm or on-station trials.

5. *Farm Enterprise Records.*

If a given FSR/E team has sufficient human resources, farm-level trials should be supplemented with simple enterprise records. Such records are a much more reliable source for crop or livestock costs and labor estimates (by sex and age) devoted to various practices within enterprises. The latter type of information can be extremely useful in determining labor peaks and valleys. Such labor information can assist research teams to determine when more rapidly-maturing varieties might or might not help solve labor bottle-necks.

Better (more reliable) cost and yield information may only be available through a system of farm enterprise records. This is because certain types of economic questions are sensitive and may not be asked during either an RRA or a formal survey. Once researchers have established contact with farm families and begun to build rapport with them, these cost questions may be asked in farm records.

Compiling proper farm records takes time and requires human resources and mobility. Developing simple forms also requires time. One system of farm records is based on weekly farmer recall, because farm decision-makers may or may not be literate. There may or may not be others in the household who can keep records. The FSR/E team may already be stretched too thin to consider designating persons from the team to keep enterprise records. If such is the case, and if the team still feels a need for them, enterprise records can be maintained by a third person. The team may contract, at a relatively low salary, a school teacher or the son or daughter of a farmer to manage farm enterprise records in their village on a part-time basis. Such a system requires some training, but it may be the only way to resolve a severe manpower or budgetary constraint.

B. Integrating Recurrent Diagnosis with Farm-level Trials in FSR/E

It was pointed out above how RRA is the beginning step of the diagnostic phase of FSR/E. It was also pointed out that many other types of socio-economic techniques may be used for recurrent diagnosis throughout the sequential process of FSR/E (Figure 5). Also, too much emphasis has gone into describing "discrete phases" of the FSR/E process. In practice, these phases are not so discrete.

Take the case of the exploratory stage of FSR/E. While an exploratory stage always marks the beginning of a farm-based research effort (Figure 5), exploratory trials may be conducted on-farm, on-station, or both, and may be called by different names in different nations or regions. Exploratory trials may have to be repeated in year two at the station of farm level. Finally, additional exploratory trials for year two may arise as a direct result of the first year's exploratory trials or tailored follow-up surveys.

Again, throughout the FSR/E process, additional diagnostic information will likely be needed. The keys to complementing farm trials with additional diagnostic information are: (1) selecting the correct diagnostic tool to collect the necessary information, (2) involving the entire team in legitimizing the additional diagnostic need, (3) tailoring the diagnostic tool to the specific needs of the interdisciplinary

team and the farmers of the domain, (4) keeping the tool as simple as possible, while making sure that it will gather the necessary information, and (5) designing another socio-economic data gathering survey tool *only* when the need is very high and felt by the whole team.

CONCLUSION

The first major section of this paper provided an historical evolution from dependence on formal survey to use of the *sondeo*, or RRA, in the FSR/E process. This evolutionary process was supported by a case study of Honduras during 1978 and 1979. From this initial section, it was concluded that very little was gained by moving from an informal RRA activity to a survey using a formal questionnaire in the initial step of FSR/E, and that such additional information may cost more than it is worth.

The second major section of this paper considered how RRA and other socio-economic diagnostic tools may be used more efficiently in the FSR/E sequence. While not all socio-economic techniques are useful in FSR/E, those which are in use by practitioners in various parts of the world were summarized. The techniques summarized were (1) the baseline survey, (2) the formal survey, (3) RRA and the *sondeo*, (4) the tailored follow-up survey, and (5) farm enterprise records.

While each of these techniques may be in use in some FSR/E approach in the world, the tools are not equally useful or cost-effective. The first tool, the baseline survey, can actually be less than useless in cases where agricultural variability from year to year is extremely high and unpredictable. This is the situation of much of the African Sahel and sub-Sahelian zones, including much of southern Africa.

Likewise, the second technique (formal surveys) has a place in the FSR/E process, but this place is during the traditional "diagnostic" phase which precedes farm trials (Figure 5). However, formal surveys are actually a sub-set of the tools considered most useful when they follow the third tool summarized in this paper, the RRA (or the *sondeo*). This fourth group of tools includes tailored follow-up surveys. These follow-up surveys may be informal but are usually formal. They may take place anywhere during the cyclic FSR/E sequence, and they may complement the exploratory, the refinement or the validation sub-stages of FSR/E experimentation, or all three (Figure 5).

A fifth and final technique, the farm enterprise record, may also complement farm-level trials, especially during the first year or two. However, potential FSR/E practitioners should be aware that there is a definite cost associated with the proper use of farm enterprise records. Local FSR/E teams need to determine if they themselves can manage and analyze these records, or if they need to consider hiring others to manage the daily or weekly data collection activities on a part-time basis.

Indeed, RRA activities should take place throughout the FSR/E sequence, but must be subservient to the basic objective of FSR/E: improving the most important farming system(s) of a set of farm families in a recommendation domain. As long as this objective is kept in mind, researchers are urged to consider the whole range of socio-economic diagnostic tools to complement their farm-level and station-level trials. The proper tool to use depends on the needs of their farmer-collaborators

and themselves, as well as the depth of information required.

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RAPID RURAL APPRAISAL AND AGROECOSYSTEM ANALYSIS: A CASE STUDY FROM NORTHERN PAKISTAN

Gordon R. Conway

INTRODUCTION

This paper describes an attempt to combine Rapid Rural Appraisal (RRA) and Agroecosystem Analysis in the context of a development project. The workshop technique of Agroecosystem Analysis was originally designed to aid the identification and formulation of key questions for research. Participants in the workshops were university or research institute workers, although often there were development specialists present. The outcomes of the workshops were agreed programmes of research, applied in orientation but not necessarily leading to immediately applicable results. In this paper I discuss the potential value of the techniques as an aid to determining agreed programmes of development, where the emphasis is on action. Such a goal requires a response that is both rapid and cost effective – hence the introduction of RRA as an integral component of Agroecosystem Analysis.

I begin with a brief summary of Agroecosystem Analysis and then describe how it has been adapted to serve a development objective. Its first application in this form was conducted for the Aga Khan Rural Support Programme as an aid to planning the development of some 400 villages in Northern Pakistan. I present a brief introduction to this Programme and to the region and then describe the analysis of two of the villages, emphasizing the RRA techniques that were employed and the subsequent methods of dealing with the RRA data in the Agroecosystem Analysis workshop.

AGROECOSYSTEM ANALYSIS

The technique of Agroecosystem Analysis and its underlying concepts were first elaborated in 1978 (Gypmantasiri et al. 1980) and have subsequently evolved in a series of workshops held in Thailand and Indonesia (Conway 1985a, 1985c; KEPAS 1984, 1985a, 1985b, 1985c; KKU-Ford Cropping Systems Project 1982a, 1982b; Limpinuntana and Patanothai 1982). It is based upon a number of interlinked assumptions.

The first is that agricultural land use in any region can be represented as a set of more or less distinct agroecosystems, typically arranged in a hierarchic fashion. Each agroecosystem also has a characteristic behaviour that is summarised by four interconnected system properties (Conway 1982, 1983, 1984, 1985b), namely:

Productivity, which is the net increment of valued product per unit of resource (e.g., land, labour, energy or capital) and is commonly measured as annual yield or net income per hectare, or man hour or unit of energy or investment.

Stability, which is the degree to which productivity remains constant in spite of normal, small scale fluctuations in environmental variables, such as climate, or in the economic conditions of the market; it is most conveniently measured by the reciprocal of the coefficient of variation in productivity.

Sustainability, which can be defined as the ability of a system to maintain its productivity when subject to stress or perturbation. A stress is here defined as a regular, sometimes continuous, relatively small and predictable disturbance, for example the effect of growing soil salinity or indebtedness. A perturbation, by contrast, is an irregular, infrequent, relatively large and unpredictable disturbance, such as is caused by a rare drought or flood or a new pest. Unfortunately, measurement is difficult and can often only be done retrospectively. Lack of sustainability may be indicated by declining productivity but, equally as experience suggests, collapse may come suddenly and without warning.

Equitability, which is a measure of how evenly the productivity of the agroecosystem is distributed among its human beneficiaries. The more equitable the system the more evenly are the products, the food or the income, shared among the population of the farm, village, region or nation. It can be represented by a statistical distribution or by a measure such as the Gini coefficient.

A further assumption is that these system properties are determined, in turn, by a limited number of key functional relationships and management decisions. Thus to understand the essential behavior of an agroecosystem or to produce significant improvements in its performance requires that these relationships and decisions are identified and understood. In practical terms this means that the research worker or development specialist has to define and answer a limited number of key questions. These questions ask what are the key relationships or decisions and how do they function in determining the system properties and their interactions?

The next assumption is that the identification and definition of these key questions for one or more agroecosystems is best approached by bringing together a wide range of multidisciplinary experience, particularly spanning the natural and social sciences, to carry out a joint analysis. This is furthered by a workshop environment, by a structured but flexible procedure and by an analysis of the agroecosystem in terms of four basic patterns – space, time, flows and decisions – which are assumed to underlie the central system properties. This pattern analysis depends on the interactive use by the workshop participants of a large number of simple dioristic models, that is maps, transects, graphs, flow and bar diagrams, decision trees and Venn diagrams.

AGROECOSYSTEM ANALYSIS FOR DEVELOPMENT

The development version of the Agroecosystem Analysis procedure is modified by adding an extra phase after the identification of key questions in which

guidelines and working hypotheses for development are identified. Following this the proposed innovations contained in the hypotheses are then assessed and the final list of development priorities is produced (Figure 1).

To meet the time constraints of development programmes the workshop itself, normally lasting a week when the objective is research questions, is reduced to two days and follows a fairly strict timetable (Table 1).

Table 1 Timetable for an Agroecosystem Analysis for Development Workshop (Details of the organization of such a workshop are given in Conway 1985c)

Day 1

Introduction to the workshop
Overview of development area and project
Briefing on case study data
Case study teams:-
a. System definition
b. Pattern analysis
c. System properties
d. Key questions
e. Guidelines and working hypotheses for development

Day 2

Presentations by case study teams
Discussion of key questions, guidelines and working hypotheses
Innovation assessment
Agreed development priorities
Preliminary plans

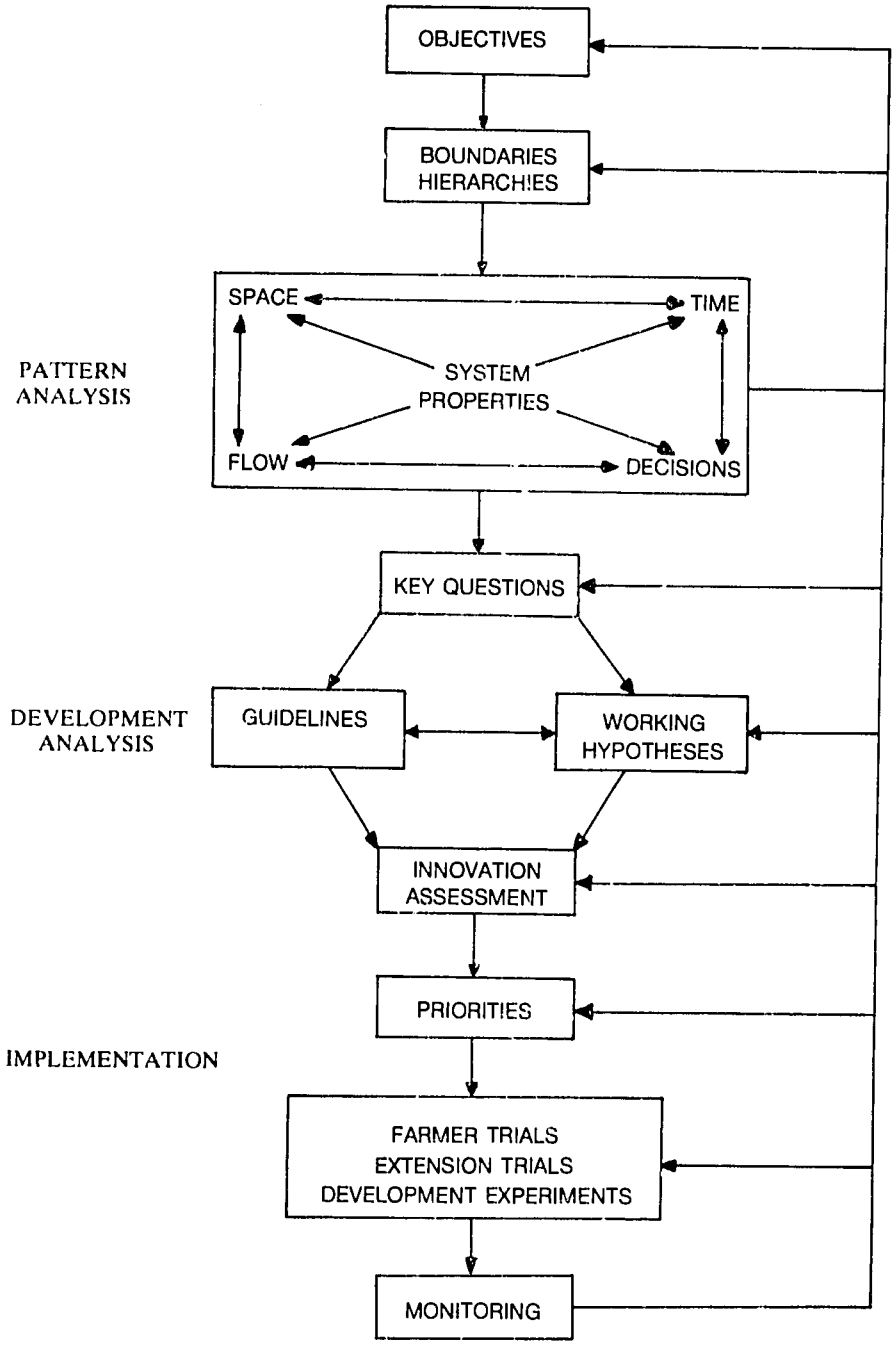


Figure 1 The Procedure of Agroecosystem Analysis for Development
Source : Conway et al. 1985.

THE AGA KHAN RURAL SUPPORT PROGRAMME

The Aga Khan Rural Support Programme (AKRSP) is a private, non-profit development company which began to work in Northern Pakistan in 1983. Its primary objectives are to reduce poverty in the area and to develop local capacity to identify and make use of productive opportunities. This is accomplished through the organisation of small farmers into broad-based economic coalitions, called Village Organisations, which then provide the vehicle for physical infrastructure projects, extension training, the provision of agricultural inputs and credits, and income generation activities for women.

A central principle of the programme is that development planning should be based in the villages and should thus be able to take account of significant socio-economic and ecological variations between and within villages. The first three phases of the project cycle – identification, preparation and appraisal – are thus accomplished through a series of interactive dialogues – termed the Diagnostic Survey – which takes place between the villagers and the AKRSP. The General Manager initiates the first dialogues with a village by explaining the objectives and methods of AKRSP and then inviting them to identify an income-generating project that would benefit most of the households in the village and that could be undertaken by the villagers themselves. Almost invariably, villagers are able to agree on a project of overriding importance. Typical such Productive Physical Infrastructure (PPI) projects include the construction of irrigation channels and siltation tanks, and of access roads and bridges. The second series of dialogues involves a feasibility survey of the proposed project and the preparation of blue-prints and cost estimates. In the third series the Village Organization is created and an agreement is reached as to how the projects will be planned, implemented, managed and maintained. The average cost of each PPI project is about 125 thousand rupees. The AKRSP provides grants for these initial projects but the villagers are also expected to make savings for which the Village Organisation takes collective responsibility. These form the security which enables the AKRSP to underwrite loans from the commercial banks for subsequent development activities in the villages.

To date the programme has reached 450 villages in the districts of Gilgit, Chitral and Baltistan. There are approximately 400 Village Organisations who have initiated some 230 PPI projects. By the end of 1984, 114 of these projects had been completed. The VO's had also accumulated an impressive total of 5.87 million rupees and established a record of over 99% repayment of their loans (AKRSP 1983, 1984).

The successful implementation of the PPI project phase of the programme has established the basis of a considerable potential for agricultural development. The newly irrigated land is ready for exploitation and the new access to markets provides an incentive for improvements in existing production and the introduction of new patterns of crop and livestock husbandry. At first sight the opportunities appear to be varied and considerable and the AKRSP is faced with the task of identifying, assessing and ranking them in order of priority for support through the loan programme. This task largely falls to the small team of development specialists and to the Social Organisers who are responsible for the continuing development

dialogue with the VO's. It is a highly complex task which nevertheless has to be accomplished speedily and at minimum cost. In eary 1985, discussions were held between the Aga Khan Foundation, the main funders of the AKRSP, and the author to explore the possibility of using Agroecosystem Analysis as an aid in setting priorities. The consequence was an exploratory workshop held in May of 1985 (Conway et al. 1985), the main results of which are reported here.

THE PROGRAMME AREA

The area covered by the AKRSP comprises the upper watershed of the Indus River lying in the Gilgit, Chitral and Balistan districts of Northern Pakistan. It contains a population of approximately 700,000, growing at 3.5% per annum, and with, on average, 0.08 ha of cultivated land per person. It also contains some of the highest mountains of the world, the Karakorams, with a large number of peaks over 20,000 ft. The valleys are very narrow and in some places only a few kilometers separate differences in elevation of over 15,000 feet. The other major characteristic of the region is the extremely low rainfall, between 2 and 6 inches per annum, which creates a mountain desert environment. In consequence agriculture is almost wholly dependent on irrigation tapping the snow melt at the base of the glaciers. In physical terms agriculture is thus constrained by the lack of water, by the lack of suitable level land and by the absence of soil. This explains the considerable productive potential of irrigation channels constructed over long distances and with great engineering skill to bring water and silt to suitable areas of land.

For the purpose of the workshop it was decided to concentrate on Gilgit district and to take two contrasting villages as case studies. These were Passu, which lies in the middle reaches of the Hunza river, and Oshikhandass, which is just south of Gilgit on the Gilgit river.

Passu is a small, high altitude (8,000 ft) village with cropland and summer pasture. It is also characterised by a very successful village organisation which, with AKRSP support, has nearly completed a new irrigation channel that will eventually quintuple the existing crop land. By contrast, Oshikhandass is a larger, relatively young village, established only 50 years ago at 4,700 feet near to Gilgit, and lacking summer pasture. The village organisation has been less successful than at Passu and the PPI project to construct a sediment tank failed.

THE METHOD OF RAPID APPRAISAL

A typical research oriented Agroecosystem Analysis workshop is preceded by a month or more of relatively intensive data gathering in the case study sites and the collection together of all relevant secondary data. Development teams such as those of the AKRSP, however, can rarely afford this amount of time. The solution tried here is to restrict the preliminary data collection to a single day's Rapid Rural Appraisal at each site.

As is apparent from this conference RRA covers a wide range of techniques

which have in common the objective of quickly acquiring critical information about or from an area during one or more brief visits. The techniques rely primarily on careful observation coupled with semi-structured interviewing of farmers and local leaders and officials. The objective may be to answer a specific question posed by research or development, the topical RRA, or, as in the case of RRA as applied to Agroecosystem Analysis, the task is primarily to acquire sufficient information to produce the essential diagrams for pattern analysis.

Experience gained in research oriented Agroecosystem Analysis workshops suggests that the following are the most useful basic set of diagrams:

1. A diagrammatic history of the area
2. Sketch map showing key features and agroecological zones
3. One or two transects with zones and problems
4. A seasonal calendar
5. Bar diagram of sources of income for selected farmers
6. Flow diagrams of production and market
7. Decision tree for major livelihood systems
8. Venn diagram of institutional responsibilities for decision making

Although even this restricted list represents a considerable amount of information, it was felt that an efficient field team of four to six people should be able to complete the task in a single day in the field.

The field team consisted of the author, an agricultural ecologist, M. Alim Mian, a soil scientist, Zahur Alam, an agriculturalist and Mehreen Hosein, a biologist, accompanied on the visit to Passu by A. Jami Sakhi, and to Oshikhandass by Essa Khan. The two latter gentlemen are members of the staff of AKRSP at Gilgit but are also inhabitants of the two respective villages. It was planned to include a social scientist but this proved not possible.

Simple maps had been prepared for the villages beforehand but otherwise all the information was acquired during the visit.

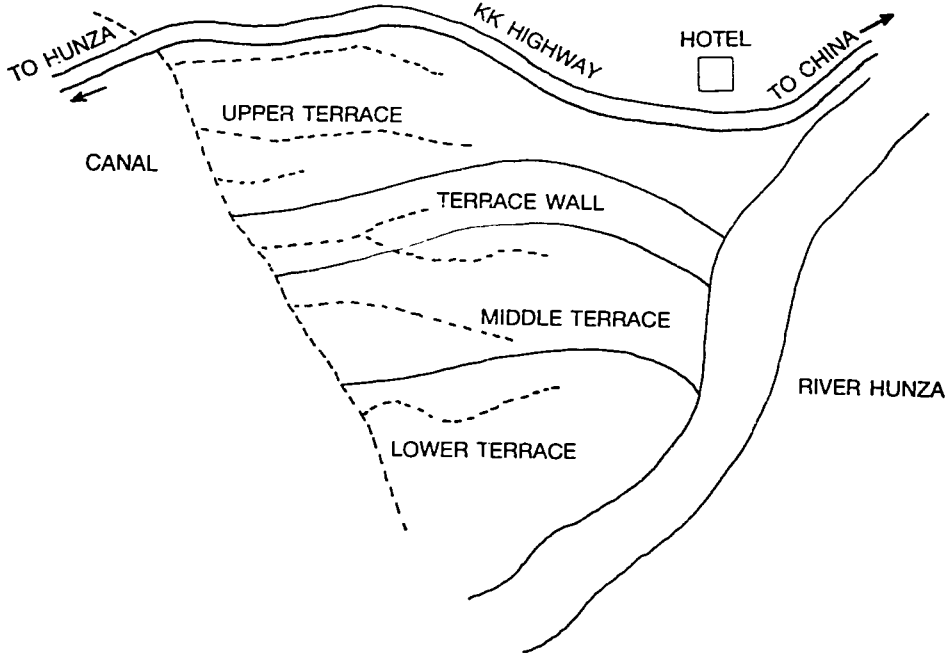
Maps and Transects

These were constructed by walking through the villages along two transects, chosen by eye to provide a good representation of the variation within the village. During the walks observations were made by eye and farmers who were encountered were questioned.

The primary purpose of the maps is to delimit the main agroecological zones within the village, again chosen subjectively as being distinct agroecosystems in terms of one or more ecological, agricultural, social or economic features. In the case of Passu the different terraces appeared to be the obvious basis of zonation (Figure 2).

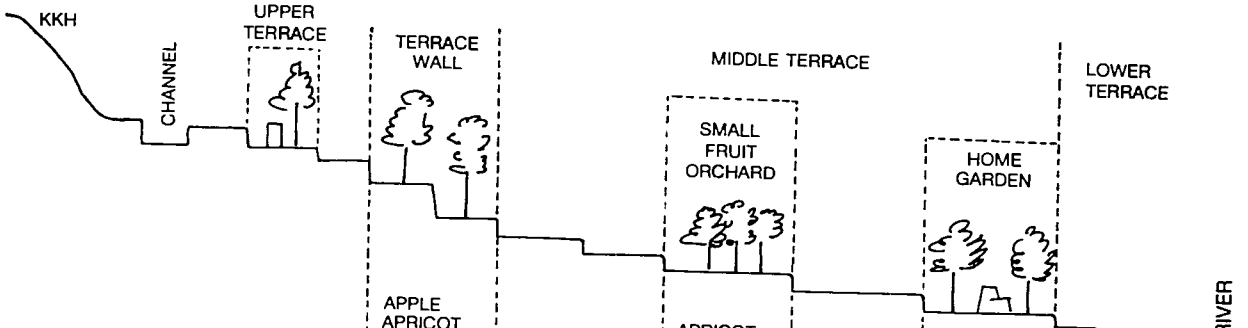
The transects also reflect the zones and provide an opportunity to characterise them in terms of the crops and livestock husbanded and the different problems encountered. An attempt was also made to record on the maps an assessment of the productivity and sustainability of each zone (Figure 3).

Figure 2 Agroecological Zones of Passu



Source : Conway et al. 1985.

Figure 3 Transect of Passu



CROPS	WHEAT BARLEY POTATOES	APPLE APRICOT PEACH WILLOW ONION SPINACH	WHEAT BARLEY POTATOES	APRICOT APPLE PEACH MULBERRY SPINACH	BROAD BEAN PEA	FRUIT TREES LIVE- STOCK	WHEAT BARLEY
COMMENTS	RECENT CULTIVATION MORE FERTILE	STEEP					
PROBLEMS	WHEAT SMUT WEEDS POTENTIAL VIRUS	COOLING MOTH	WHEAT SMUT WEEDS POTENTIAL- VIRUS	COOLING MOTH		FODDER LIVE - STOCK DISEASES	WHEAT SMUT WEEDS EROSION BY RIVER
PRODUCTIVITY	BARLEY 3-4 Mds. (H) WHEAT 60 Mds. (VH) POTATOES 25 Mds.(M)	FRUIT High VEG High	High High POTATOES (M)	FRUIT (M) VEG. (M)	Medium High	High Medium High	Low to Medium
SUSTAINABILITY	WHEAT High POTATOES Medium	Medium	High Medium	Medium	Medium	Medium	Low

Source : Conway et al. 1985.

The Seasonal Calendar

This was constructed partly during the transect walks, partly from the knowledge of the villager on the study team and later in interviews with a group of farmers and village leaders. The seasonal calendar is seen here as a development from the traditional crop calendar, being explicitly concerned not only with cropping and related activity patterns but with livestock and other sources of livelihood (Figure 4).

Because no quantitative information existed on climate and labour these were assessed qualitatively on the basis of farmer interviews. Farmers were asked which was the wettest month (August) and then asked in sequence how the neighbouring months compared (July "virtually none," June "a little," April and May "half of August," etc.). They also estimated the August rainfall as "about 5 inches." A similar approach was used to obtain the pattern of labour demand.

Bar Diagram

During the transect walks, individual farmers were chosen, subjectively, as representing "large, medium and small farmers" and were engaged in a more intensive, structured dialogue aimed at assessing their holdings by types of crop and livestock. Information was also obtained on the size of the family and the extent to which the subsistence demand was met (Figure 5).

In the case of Passu the diagrams indicate that the proportion of different sources remains remarkably consistent over the range of holdings.

Flow Diagrams

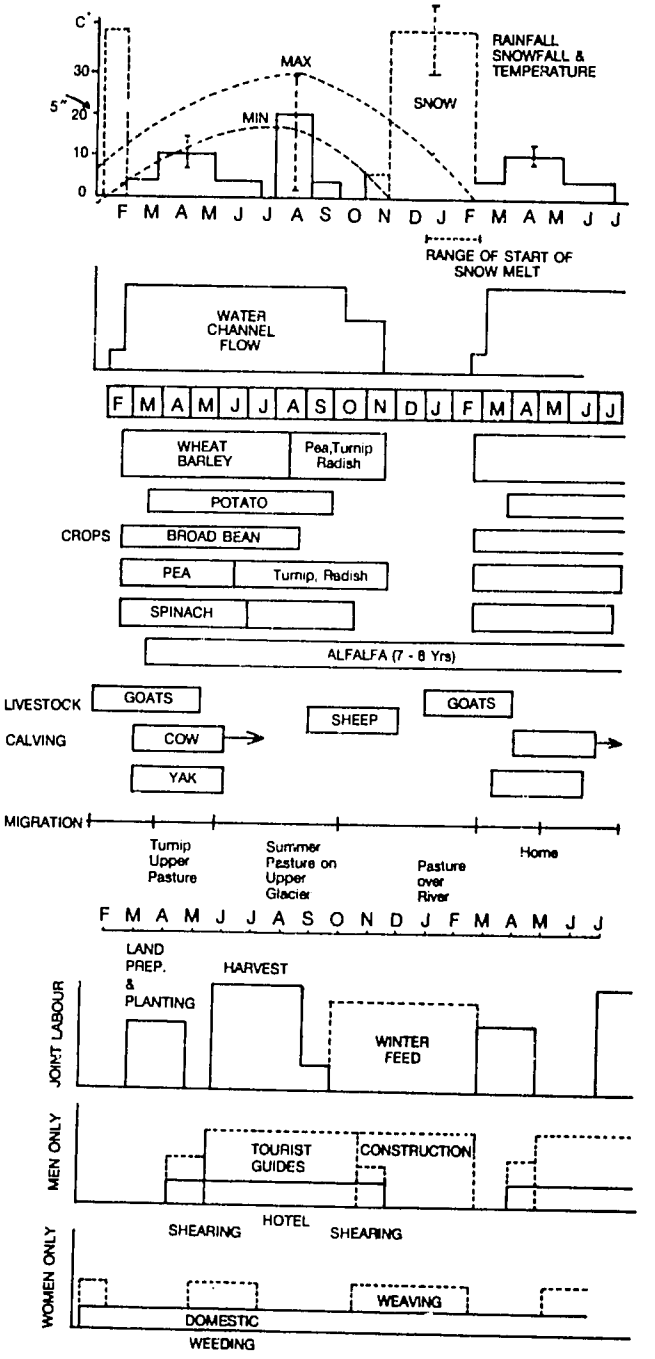
These were constructed largely from the group interview with a number of farmers and village leaders and assisted by the villager on the team. Only two or three diagrams were constructed for each village, the systems chosen subjectively in terms of their present or future potential in the village. The diagrams were designed to show the interrelationships between production and marketing and the costs and returns at different stages in the cycle (Figure 6).

Decision Trees

The decision trees were constructed after the transect walks. The distinctive livelihood systems were identified during the walks by observation and from farmer interviews. The factors determining choices were also obtained from these interviews and from the group discussion with the farmers and village leaders. Note that the categories of the decision trees are livelihood rather than farming systems, since the intention is to encompass all forms of livelihood and not just agriculture (Figures 7, 8).

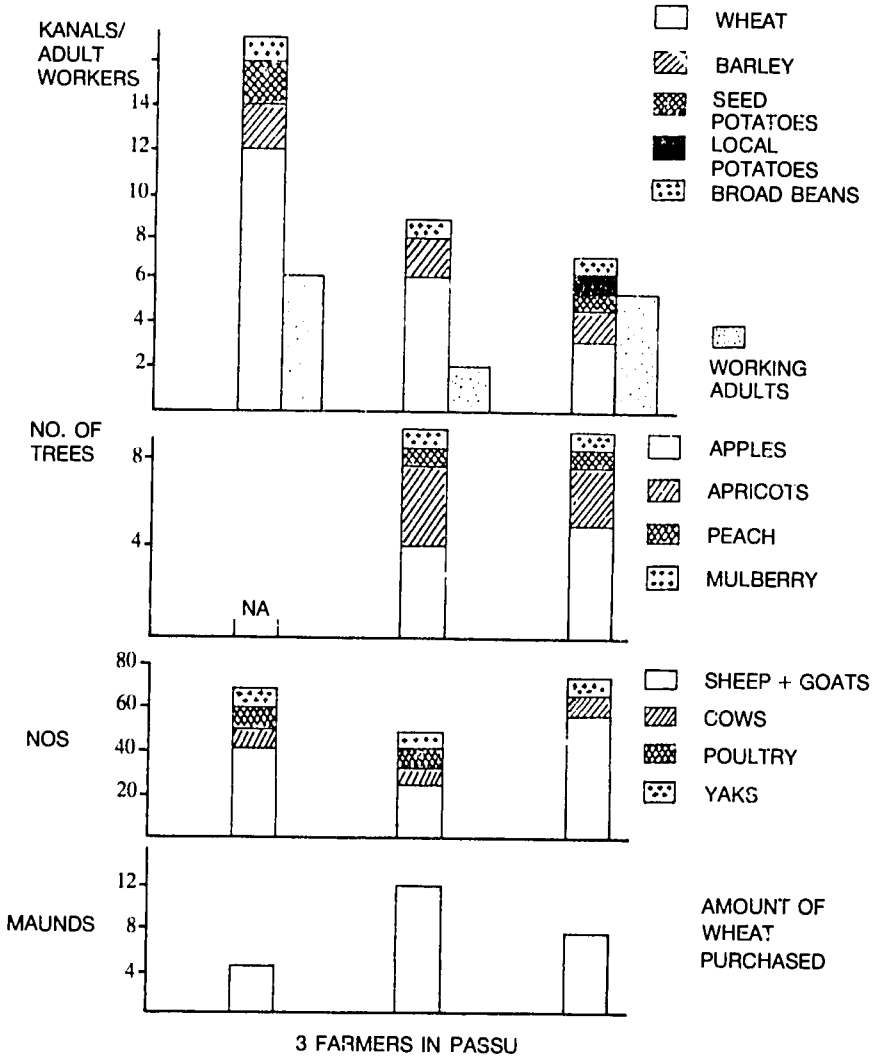
The decision trees for Passu are basically very simple because of the undifferentiated nature of the livelihood systems.

Figure 4 Seasonal Calendar for Passu



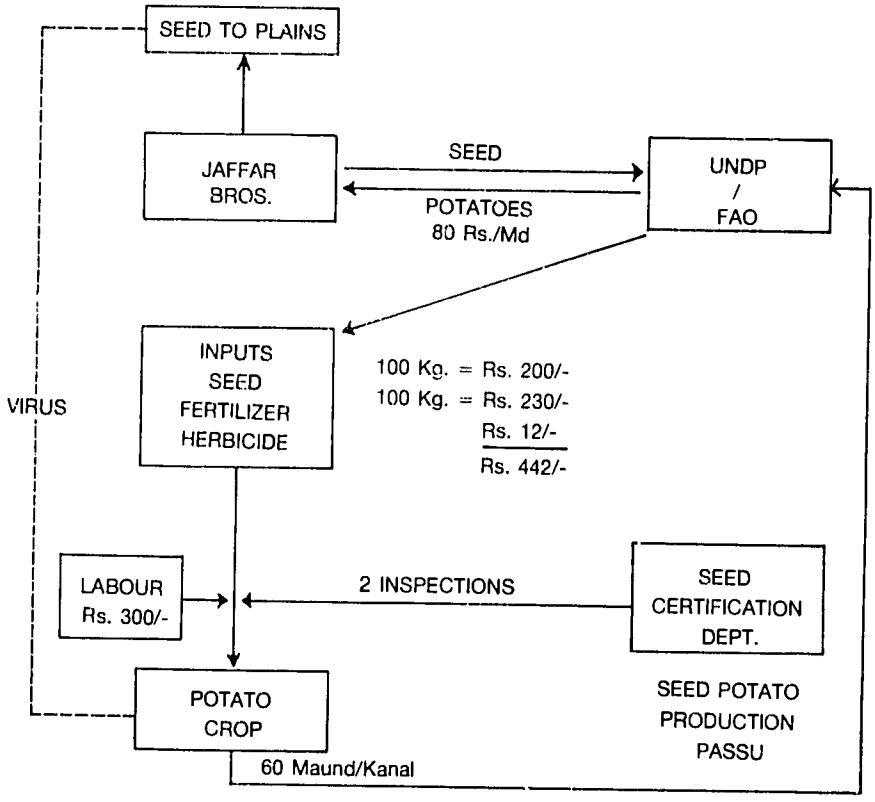
Source : Conway et al. 1985.

Figure 5 Bar Diagram Showing Sources of Income, Amounts of Wheat Purchased, and Size of Working Population for Three Farmers in Passu



Source : Conway et al. 1985.

Figure 6. Flow Diagram of Seed Potato Production and Marketing in Passu

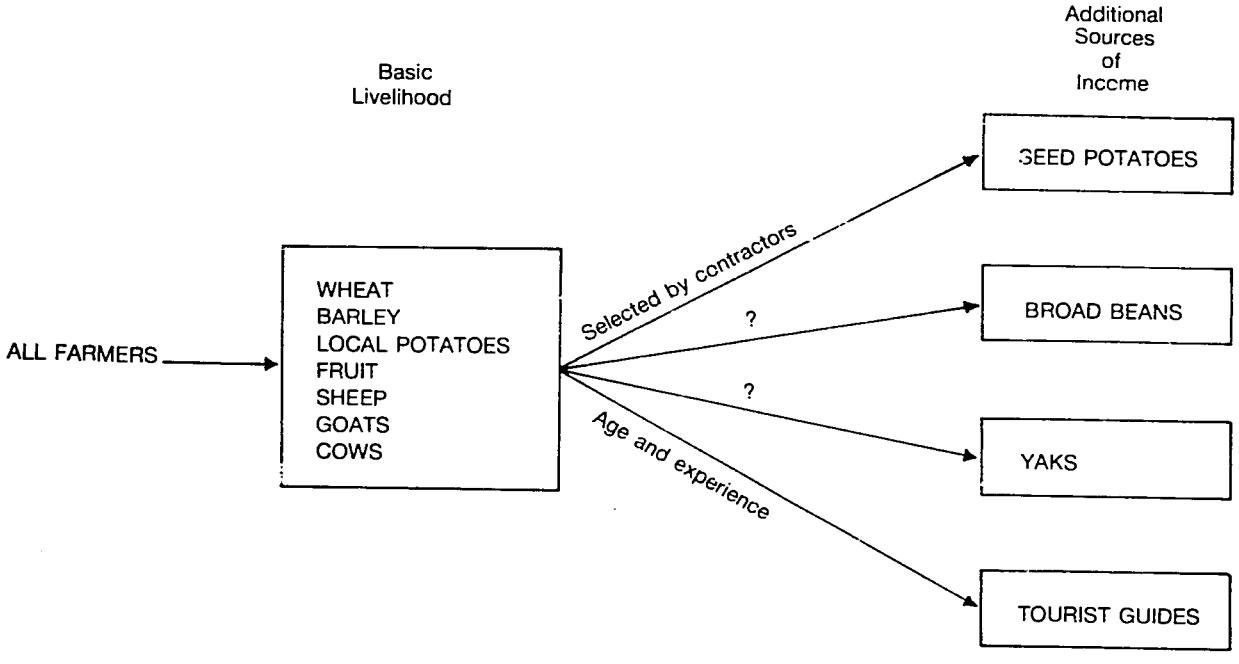


COSTS

Seed, Fertilizer, Herbicide =	442
Labour (planting & harvesting) =	300
	742
Sale =	4800
	4058 Rs/Kanal

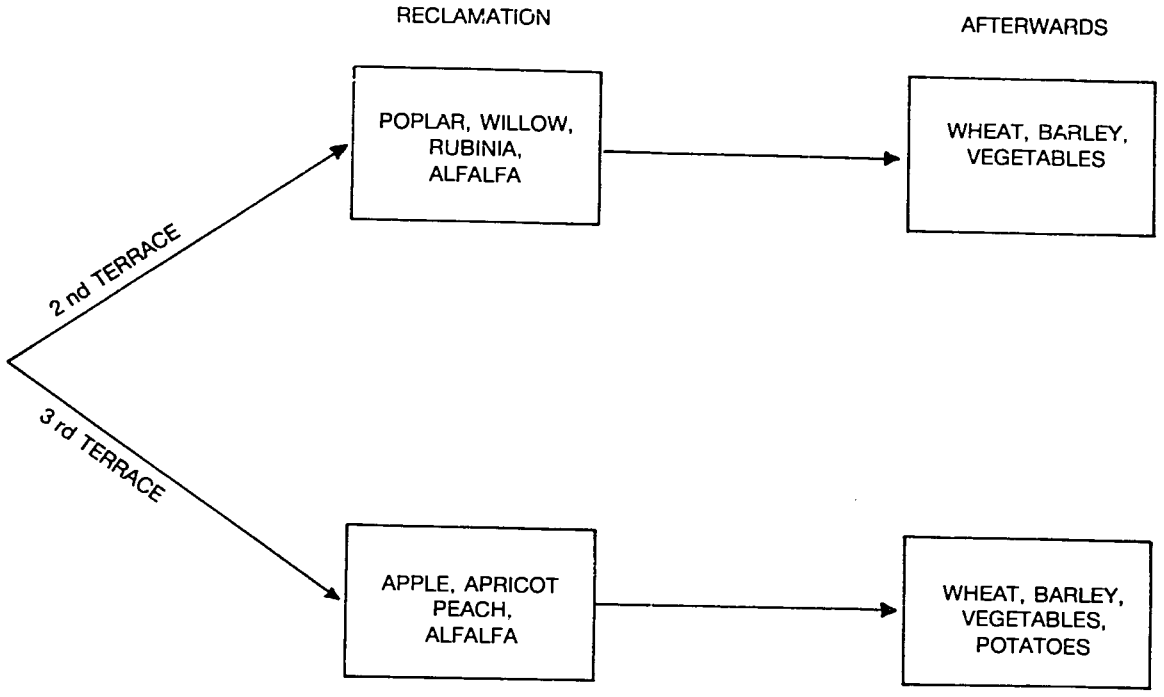
Source : Conway et al. 1985.

Figure 7 Decision Tree for Livelihood Systems in Passu



Source : Conway et al. 1985.

Figure 8 Decision Tree for Farming Systems on New Land in Passu

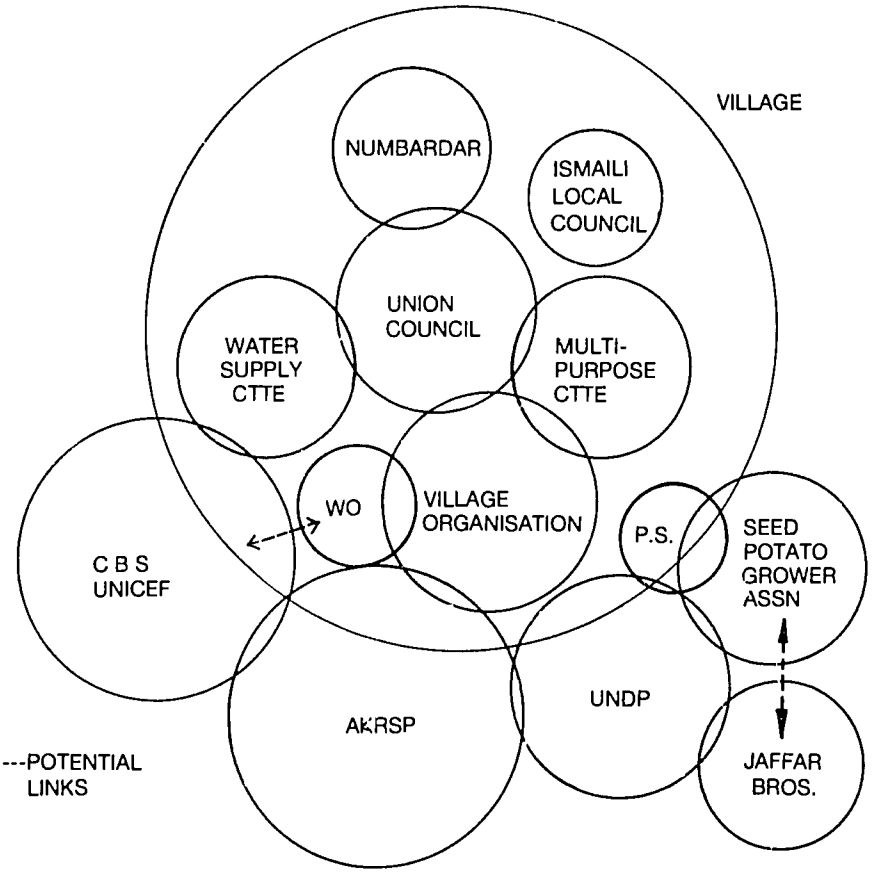


Source : Conway et al. 1985.

Venn Diagrams

The Venn Diagram, indicating the degree of interrelationship between the different decision makers in the village, was constructed during the group interview with the farmers and village leaders (Figure 9). Although revealing a complex pattern of overlap of decision making it also indicates where linkages could be made.

Figure 9 Venn Diagram of Institutional Overlap in Passu (WO = Womens Organisation)



Source : Conway et al. 1985.

The Historical Record

This record of major events in the life of the village was similarly constructed during the group interview (Figure 10).

THE ANALYTICAL WORKSHOP

Following the RRA a day was spent on the data from each village, primarily transferring it to overhead transparencies and making photocopies for the workshop participants.

The workshop was held three days later and was attended by about thirty people. Participants included the AKRSP staff from Gilgit, most of the Social Organisers, and representatives of other development agencies in the area and the Aga Khan Foundation. The timetable was as indicated in Table 1. After a short introductory session participants followed the procedure as described in Figure 1. Two case study teams were formed, one for each village.

Objectives

The workshop defined its objective as:

"to identify working hypotheses for development that will lead to improvements in the agricultural productivity on a stable, sustainable and equitable basis."

System Definition

The case study team members were asked to identify the principal systems and their interrelationships. Simple diagrams were produced in order to define the boundaries of the systems in their case study. In the case of Passu, for example, it is clear that although the village is tiny, consisting of only 60 households, the resource base extends over thousands of square miles (Figure 11).

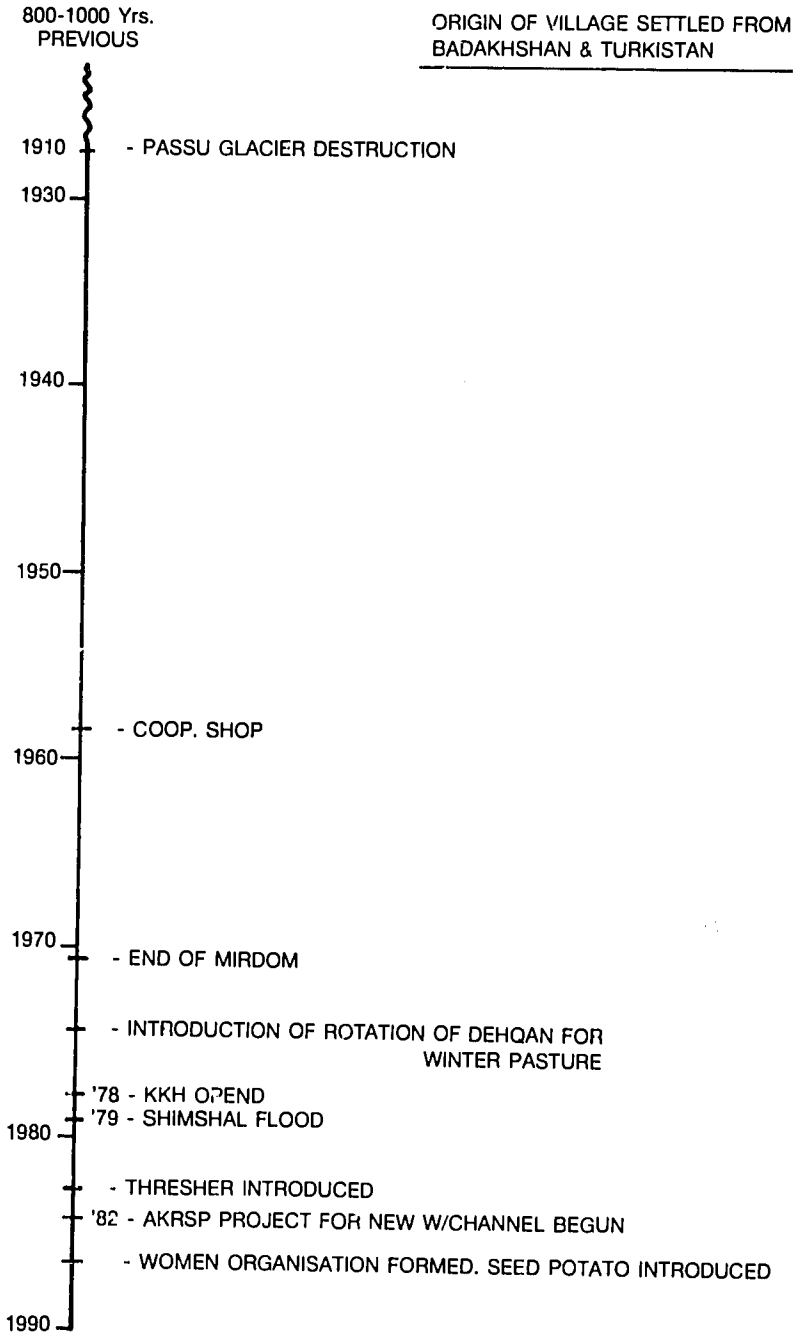
Following this definition the system hierarchies were constructed (Figure 12), using the agroecological zones described during the RRA as the basic systems.

Pattern Analysis

The case study team members were given the following tasks:

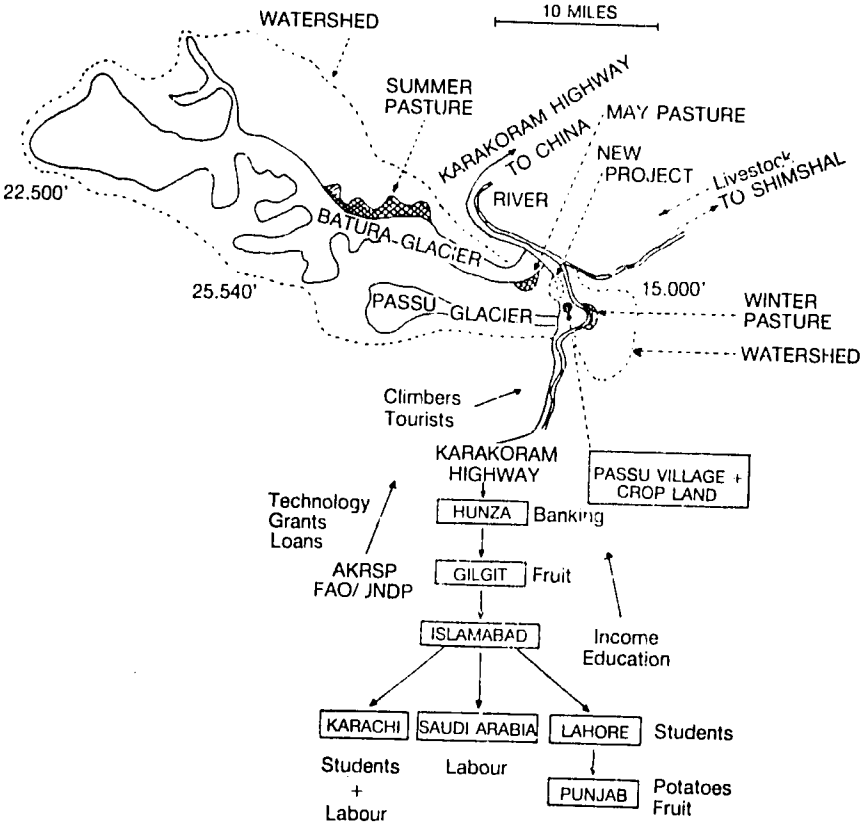
1. *Maps*
   a) discuss correlations and factors in land use
   b) identify new forms of land use
2. *Transects*
   a) discuss problems
   b) discuss system properties
   c) suggest potential solutions to problems

Figure 10. Historical Profile of Passu



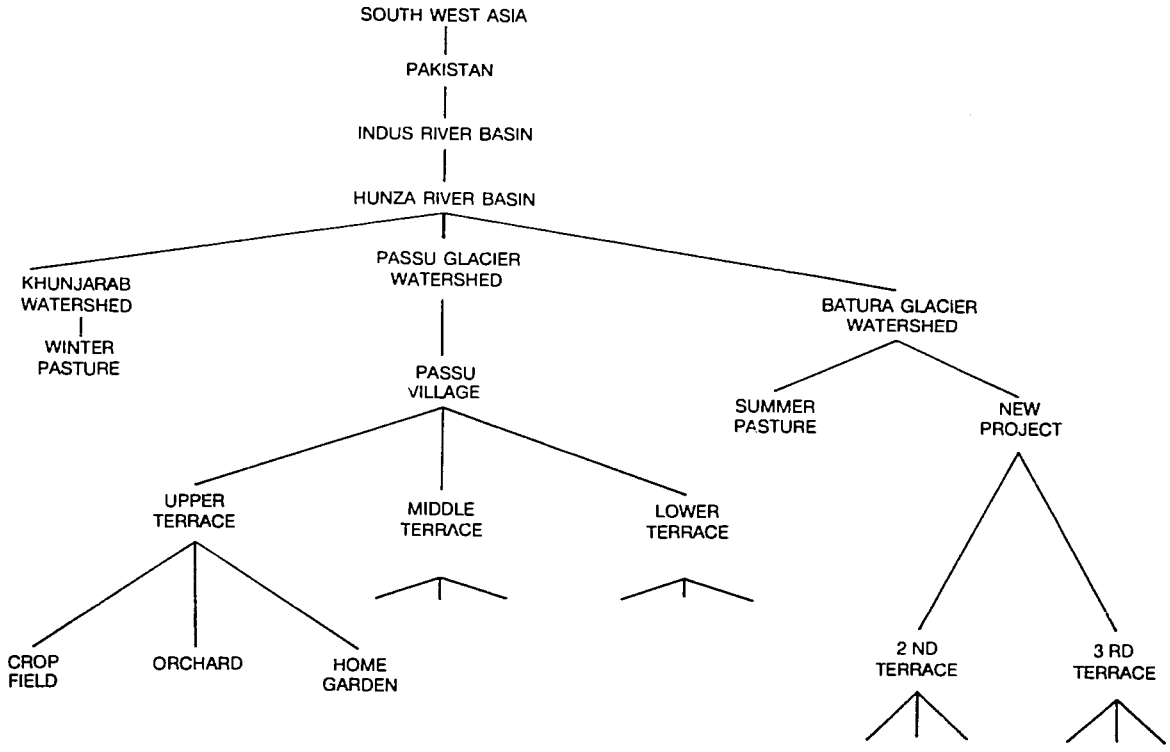
Source : Conway et al. 1985.

Figure 11 The Passu Village Agroecosystem



Source : Conway et al. 1985.

Figure 12. System Hierarchy for Passu



Source : Conway et al. 1985.

d) identify potential intensifications
3. *Seasonal calendar*
   a) discuss constraints
   b) discuss opportunities
4. *Long term trends*
   a) discuss past trends
   b) predict future trends
5. *Bar diagrams*
   a) discuss sources of production and income
   b) identify new potential sources of income
6. *Flow diagrams*
   a) discuss productivity, stability, sustainability and equitability of flows
   b) identify missing links
   c) identify potential intensification
7. *Decision trees*
   a) discuss key factors in decision making
   b) identify possible new farming and livelihood systems
8. *Venn diagrams*
   a) discuss missing links and gaps in organisation
   b) identify possible new organisational links

System Properties

Following pattern analysis the working group members were asked to summarise what they had learnt of the system properties and to tabulate the most important contributing factors and processes (Table 2). They were also asked to identify the trade offs between these properties and their implications for development.

Key Questions, Guidelines and Working Hypotheses

Key questions, guidelines and working hypotheses arise throughout the procedure, during system definition, pattern analysis and the discussion of system properties. Participants were asked to record these as they emerged and then collectively revise them in the light of all the information available.

Key questions for development may be of the form:

"*How can soil development be speeded up while at the same time providing a high return?*"

Such questions then generate a set of guidelines and working hypotheses. Guidelines are based on well established knowledge, derived from experience in the area or elsewhere, or reflecting fundamental principles of development. A guideline relating to the above key question might then be:

"*Use deep rooted, high quality fodder crops and manage them intensively.*"

Table 2 Key Variables and Processes Affecting the System Properties in Villages of the Northern Areas of Pakistan (Conway et al. 1985)

Positive	Negative
PRODUCTIVITY	
Factors increasing Productivity	Constraints, limiting factors
Karakoram Highway	Land shortage
Land development	Water shortage
Fertilisers	Weeds
New varieties	Seasonal labour shortage
Seed potatoes	
Credit	
Knowledge	
STABILITY	
Stabilising Factors	Destabilising factors
Integrated livestock/crops	Crop diseases
Co-operative marketing	Crop pests
	Livestock diseases
	Temperature fluctuations
SUSTAINABILITY	
Processes preventing collapse	Stresses and perturbations
Farmyard manure	Glacier movement
Crop rotation	Mudflows, avalanches
	Earthquakes
	Erosion
	Potato virus
	Pesticide use
EQUITABILITY	
Factors increasing equitability	Factors producing inequity
Traditional co-operation	Sale of land
Village organization	Education
Rotation of pasturing	Emigrant labour

The related working hypotheses reflect a greater uncertainty about development. They are based on knowledge and experience and on the previous steps of analysis but still need to be tested. A working hypothesis related to the key question might be:

"Soil development can be most profitably speeded up by planting alfalfa at a high density, cutting twice a year and resowing, after ploughing in, every three years."

The working group members were asked to:

a) identify and write down each key question
b) identify and write down guidelines
c) identify, clearly define and write down working hypotheses
d) justify hypotheses and describe underlying reasoning (three or four sentences)

Table 3 lists some of the key questions, guidelines and working hypotheses for development generated for the village of Passu.

Innovation Assessment

Contained within the guidelines and working hypotheses are a number of proposed innovations which may be technological or socio-economic in character. The next stage is for the whole workshop team to assess these on a number of criteria and assign priorities. One set of criteria is the system properties or indicators of performance and each innovation needs to be assessed for its impact (positive or negative) on productivity, stability, sustainability and equitability. Estimates also need to be made of the cost of the proposed innovation, the time horizon over which its benefits can be expected and its technical and operational feasibility. (Table 4). These assessments are made in terms of the village agroecosystem as a whole, e.g., in terms of village level productivity, or the cost to the village. Once this is done for all the innovations they can then be ranked by the workshop participants in terms of their priorities.

Research Design and Implementation

The remaining phase of the procedure is one of conventional development activity. The hypotheses are tested as appropriate: by farmer or extension trials, or by development experiments, and these trials carefully monitored.

Some of the hypotheses can be tested directly; others, however, may need further refinement because the information gathered in the pre-workshop RRA is inadequate. There is an important role here for post-workshop RRA's of the "topic" variety described elsewhere in this conference.

Table 3 Examples of Key Questions (KQ), Guidelines (G) and Working Hypotheses (WH) for Development for the Village of Passu (Conway et al. 1985)

1. KQ : How can soil development on the new land be speeded up while at the same time providing a high return?
   G : Choose crops that facilitate soil development; do not plant wheat, barley or potatoes for at least five years; start with high potential zone (3rd terrace); set up small experimental, observation area; plant windbreaks.
   WH : 3rd terrace should be planted with apples, peaches, apricots, cherries and alfalfa. 2nd terrace should be planted with willow, rubinia, alfalfa and perennial grasses.

2. KQ : How can the land be best used after reclamation?
   G : Conduct experiments before large scale planting.
   WH : After 7 years 25% of land for potatoes, the rest to wheat, barley and fruit trees. Alfalfa and forest trees most suitable for 2nd terrace.

3. KQ : How can health and quality of seed potatoes be maintained and improved?
   G : Priority on control of diseases, insect vectors and eel worms.
   WH : Isolate fields at over 200 feet apart and rotate 1 year in 4 for potatoes.

4. KQ : What is the potential for catch crops without incurring declining yields?
   G : Must fit from July/August to October; animals must be kept separate; organic manure as fertiliser must be added or legume grown.
   WH : Peas, radish, turnip, vetch may be suitable.

5. KQ : How can women and older children be more productively involved in development?
   G : Concentrate on skilled activities.
   WH : Train women and adult children for such tasks as alfalfa processing, seed potato production, milk production and processing of curds.

DISCUSSION

The RRA and following workshop were regarded by the participants as highly successful and as a consequence two training courses are planned, one in the techniques of RRA and the other in the techniques of Agroecosystem Analysis. These will be primarily attended by the Social Organisers. The aim is to provide them with sufficient confidence to undertake further exercises of this kind as part of the process of determining priorities for the villages for which they are responsible.

"Success" so far, of course, is largely a subjective judgement by the participants. They generally agreed that the approach enabled them to get a better understanding of the two villages and to produce what appeared to be a reasonable list of development priorities. This was also achieved quickly and at relatively low cost. However, the eventual test of success will be whether the development programme produced as a result of this approach has been effective in terms of the stated objectives of the AKRSP. This, of course, cannot be judged for another five years or so.

The RRA component clearly needs further refining. Only additional experience will show whether the tasks set for the RRA can be reasonably completed in a single day, particularly where villages are larger or more varied. The RRA team was fortunate in having members who came from the villages and were educated

Table 4 Innovation Assessment for the Village of Passu (+ positive, – negative, O neutral effects, H high, M medium, S short or small, L long)

	Product-ivity	Stability	Sustain-ability	Equit-ability	Cost	Time horizon	Feasibility	Priority
Development of 2nd terrace	+	+	++	++	H	M	H	3
Development of 3rd terrace	+++	+	+(?O)	+	H	L	H	1
Artificial insemination	++	+	?	–	M	M	M	2
Catch crops	+	+	+	O	S	S	L	3
River bunding	O	+	+	+	H	S	M	4
Potato intensification	+++	+	–	+	S	S	M	2
Involvement of women	++	+	+	+++	S	M	L	2

Source : Conway et al. 1985.

and articulate. This undoubtedly made the appraisal easier, although it may have introduced certain biases. The need for greater efficiency and speed in the RRA is likely to lead to a more codified approach in the future, but this will undoubtedly be at the expense of flexibility and informality which are valuable for uncovering the unexpected and for stimulating serendipiteus responses. This trade off will be constantly assessed as the approach is further developed.

ACKNOWLEDGEMENTS

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Finally, I would like to express my gratitude to the General Manager of the AKRSP, Mr. Shoaib Sultan Khan. Much of the success of the Programme is due to his wisdom, enthusiasm and energy. I feel priviledged to have been able to contribute to this programme and I am grateful for the encouragement and hospitality extended to me.

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SOCIOTECHNICAL PROFILE: A TOOL FOR RAPID RURAL APPRAISAL[1]

Romana P. de los Reyes

In rural development there are rarely sufficient time and resources to allow comprehensive analysis of village conditions. The usual situation is that a quick assessment of rural circumstances is undertaken and on the basis of such assessment decisions are made. In recognition of this, there has been increasing interest in methodologies for accomplishing rapid rural appraisal.[2]

The growing literature on rapid appraisal approaches identifies the different organizations that need short cut methods of information gathering and analysis for decision making. These include donor agencies (Ellman 1981), agricultural research institutions (Hildebrand 1981; Rhoades 1982), and implementing agencies (Honadle 1982). So far, however, the literature has dealt primarily with methods appropriate for donor agencies or agricultural research institutions for which the data are collected and analyzed by academicians or consultants. Very little has been done to address the needs of the implementing agencies that directly affect the lives of millions of rural poor.

This paper, in contrast, discusses a rapid appraisal methodology developed specifically for use by an implementing agency. Named the sociotechnical profiling approach, this methodology became a tool of a Philippine irrigation agency for deciding which small-scale irrigation projects it would assist in a given year and for planning the agency's initial technical and social interventions. While it served as a site selection and planning tool, the sociotechnical profile derived its methodologies from a sociological field study of small-scale irrigation in the Philippines. It thus illustrates the utilization of social science research to serve the decision-making needs of an action agency.

PROGRAM CONTEXT OF THE SOCIOTECHNICAL PROFILE

In the Philippines, irrigation development is a responsibility primarily of the

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1. Preparation of this paper was supported by a grant from the Ford Foundation. Several individuals who were involved in developing the sociotechnical profiling approach provided critical comments and encouragement in the writing of this paper. The author particularly appreciates the helpful comments of Frances F. Korten, Benjamin U. Bagadion, and Salve B. Borlagdan, as well as the contributions of NIA staff from Regions 1, 2, 6, and 11 who shared their experiences in the use of the sociotechnical profile. Also critical to the development of the profiling approach were the contributions of NIA central office staff, particularly Nicasio T. San Miquel and Susan Evangelista-Leones whose creative ideas and leadership supported the development and adoption of the sociotechnical profile in the NIA.

2. For a concise discussion of the need for and potential uses of rapid rural appraisal, see Chambers 1983. He also discusses the variety of approaches and methodologies that have been devised and utilized to undertake rapid appraisal of rural situations.

National Irrigation Administration (NIA). This agency works mainly with two types of systems: the national systems which are owned, managed, and maintained by the government; and the communal systems which are owned, managed, and maintained by local groups of farmers. National systems are generally larger, covering more than 1,000 hectares while communal systems generally serve less than 1,000 hectares. As of 1983, communal systems served about half of the country's 1.3 million hectare irrigated lands.

Most communal systems in the Philippines were originally built by the farmers but NIA improves and expands these by constructing more permanent structures such as concrete diversion and canal structures as well as by improving the canal networks. NIA's assistance to communal systems was previously provided at no cost to the farmers. However, a government policy issued in 1975 changed this, requiring farmers to pay for the cost of materials, equipment use, and labor incurred by the government in building or improving communal systems. Moreover, farmers were to provide a minimum of 10 percent of the construction cost in the form of labor, materials, cash and rights of way. After construction assistance, the farmers would operate and maintain the irrigation system. Implementation of this policy required that farmers who would receive construction assistance become organized into an association strong enough to comply with the policy conditions. Consequently NIA, which previously focused only on the physical development of irrigation systems, became concerned also with the development of strong, viable communal associations.

However, because NIA had limited staff capacity for organizing irrigators' associations it contracted another government agency to undertake the organizing job. This resulted in a program in which the Farm Systems Development Corporation was responsible for organizing farmers while NIA handled the construction of irrigation facilities. The separation of the institutional and technical work between the two agencies created numerous difficulties in the field which eventually prompted NIA to experiment with a new approach for developing communal associations.

The approach that NIA adopted was to field its own community organizers to the project area prior to the expected schedule of construction work. The organizers utilized the lead time in preparing the association to work with the engineers in planning the design and layout of the irrigation system. The organizers also utilized the various activities in the physical development of the system to develop the skills of the association and to elicit farmers' commitment and involvement in the development of both their system and association.

NIA first experimented with the participatory approach in 1976 in a pilot project in Nueva Ecija, a province in Central Luzon. Although this project encountered numerous problems it convinced NIA top officials of the value of involving farmers in the physical development of the system and the potential positive impact of this involvement on the managerial capability of the association. Hence in 1979 NIA started two new participatory pilot projects in Camarines Sur, a province in Southern Luzon. As in the first pilot, these two projects were explicitly viewed as learning laboratories in which NIA could learn how to implement the participatory approach more widely and effectively. Thus the experiences in the Camarines Sur pilot projects were examined intensively to formulate the field methodologies of

the participatory approach as well as the changes needed in agency policies and procedures.

In 1980 NIA initiated the development of a nationwide capacity to implement the participatory approach by "seeding" one pilot project each in 10 of the country's 12 regions and 2 projects each in the other 2 regions, for a total of 14 projects. In early 1981, 25 additional projects were started. Then in 1982 a total of 108 participatory projects was added. By 1983 the participatory approach was being used in nearly all NIA communal projects.

The participatory approach brought about substantial changes in NIA's mode of working with its clients and required numerous changes in agency policies and operational procedures at the field level.[3] One of these was the adoption of the sociotechnical profile as a tool in the feasibility assessment of communal projects being considered for government assistance. First used in selecting the two participatory pilot projects in Camarines Sur in 1979, by 1983 the profile had become a standard procedure for site selection and planning in all of NIA's communal irrigation work.

INSTRUMENTS FOR THE SOCIOTECHNICAL PROFILE

The preparation, write up, and analysis of the sociotechnical profile were guided by five instruments. In the sequence in which they were used, these instruments included: (1) "Guide for Initial Technical-Economic Data," (2) "Guide for Socio-Organizational Data," (3) "Profile Write Up Guide," (4) "Profile Analysis Guide," and (5) "Summary Worksheet of Profile Analysis."[4] The purpose and contents of each instrument as of 1983 are discussed below.[5]

Instrument I: Guide for Initial Technical-Economic Data

This instrument guided the collection of basic technical and economic data on communal projects that were candidates for receiving NIA assistance. Collection of the data was accomplished by NIA technical staff at the provincial offices. The NIA provincial staff utilized the data to obtain an overview of the project area and to assess the general feasibility of intervening in the site. If the data revealed a candidate project to be potentially feasible, then fieldwork for collecting the socio-organizational data on the project was conducted and subsequently, the sociotechnical profile of the project was prepared. Thus the profiling methodology

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3. For a detailed discussion of these changes, see Bagadion and Korten 1983.

4. The names used in this paper for two of the five instruments were not the same names used in the NIA. Specifically, the "Guide for Initial Technical-Economic Data" was called in the NIA as "Investigation and Planning Data for Communal Irrigation Projects or CPID Form No. 2" while the "Guide for Socio-Organizational Data" was referred to in the NIA as "Interview Guide for Communal Profiles." Different names are used in this paper for purposes of indicating the content and purpose of the instruments.

5. An earlier version (October 1980) of the instruments is presented in de los Reyes and Borlagdan 1981.

was completed only for candidate projects which had been shown to be potentially feasible through an initial investigation. If, for instance, the initial investigation revealed that a candidate project had an inadequate water supply or its development costs would be too high, the project was classified as infeasible and the sociotechnical profile was not prepared.

The Guide for Initial Technical-Economic Data had long been used by NIA but when the profiling methodology was developed it was revised to include additional data and to make it fit with the sociotechnical profile. The new instrument was divided into four sections, each covering a specific set of data, as follows:

1. *Project Description*

This section covered basic information about the project such as its location, type (gravity, pump or a combination of gravity and pump), estimated coverage, indicating the area irrigated by the existing system and that which could be irrigated (or expansion area), and the number of farmers in the existing irrigated area and expansion area by crop season (wet and dry). Data on existing systems in the project's proposed area were obtained to highlight the presence of these systems to NIA staff who previously often disregarded the existing systems because of the need to meet targets for generating new irrigated hectarage.

2. *Water Availability*

This inquired into the rainfall pattern in the project area and the water discharge measurements at the proposed water source particularly at the proposed diversion site – data needed for estimating the available water supply for the project in the wet and dry season. Because water flow measurements were not regularly obtained on small streams tapped by communal projects, NIA had to make rough estimates of the available water at the proposed source. In the past the estimates were commonly based on one discharge flow reading for the wet season and another for the dry season. To encourage NIA staff to obtain several flow readings, the instrument was revised to provide spaces for several discharge flow measurements for each season.

3. *Potential Irrigation Area and Project Structures*

This covered preliminary engineering data, design data for the proposed diversion structure, topography and elevation of the potential irrigable area, length and terrain of the proposed main canal, soil types in the potential irrigable area and in the area to be traversed by the main canal before the canal reached the irrigable area, special structures needed, special problems expected, availability of an access road to the proposed diversion site, and project cost estimate.

The data included in this section which were not covered in the earlier versions of the instrument were the estimate of the main canal's length outside the potential irrigable area and the nature of the terrain to be traversed by this canal. These data

were added because beginning in the late 1970s NIA was developing more difficult communal projects, that is, projects which tapped water sources some distance away from the proposed service area, thus requiring considerably longer main canals to deliver the water from the source to the potential irrigable area. The data were intended to alert NIA staff to make an assessment of the proposed project's water requirement taking into consideration the distance the water had to travel before it reached the irrigable area and the soil types in that distance.

Together with the data from the section on water availability, the data in this section were intended to ensure that NIA staff made a reasonably accurate estimate of the project's potential service area. An accurate estimate was extremely important because this would determine the farmers who would be encouraged to join the association. NIA personnel were discouraged from overestimating the project's potential service area so that farmers would not be given false expectations. NIA's past experience had revealed that farmers became very angry if they were encouraged to put in time and effort in the development of the system and the association only to be informed later that their farms could not be irrigated by the system.

The data in the section were also intended to enable NIA staff to make a reasonably accurate estimate of the project cost. This allowed an early judgement on whether the project would entail too high construction costs for farmers to repay. If the project was estimated to be too expensive, NIA personnel were encouraged to develop alternative approaches for developing the project at more reasonable costs.

Moreover, the section called for data on the availability of an access road to the diversion site. This was intended to direct attention of the NIA staff to the need to find or construct access roads. Difficulties with inadequate access roads had caused delays in construction in many projects, including the initial participatory pilot projects.

4. *Agro-economic Data*

This covered the land use in the project area. The data included the areas currently cultivated and not cultivated, current yield per hectare per crop, the area expected to be converted to riceland once irrigation facilities were installed, the expected cropping intensity, the expected crop area and yield per hectare per crop after project completion. These data were intended for estimating the potential economic benefits of the project.

A key item in the section was the area not currently planted to rice which was expected to be converted to ricelands upon completion of the irrigation facilities. Past NIA experience indicated that the "new" areas of many systems were never actually irrigated because owners of coconut lands projected to be part of the system's irrigable area did not convert their lands to ricefields or plant them to other crops that would utilize irrigation.

In addition to these data, the Guide for Initial Technical Economic Data required a presentation of the project's proposed scheme of development, accompanied by appropriate maps.

Instrument 2 Guide for Socio-Organizational Data

Once the initial technical-economic data on a candidate communal project revealed the project to be potentially feasible, data on the socio-organizational aspects of the project were collected. This data collection was undertaken using the Guide for Socio-Organizational Data.

Collection of the socio-organizational data was accomplished by NIA profile writers, that is, NIA staff trained in the profiling methodology. The profile writers were also responsible for combining the technical-economic data with the socio-organizational data to produce the complete sociotechnical profile of a candidate project. So that the profile writers would integrate both technical and social data into one profile, the Guide for Socio-Organizational Data was sectioned to include topics covered by the Guide for Initial Technical-Economic Data. The Guide for Socio-Organizational Data was divided into eight sections. Outlined below are the contents of each section and the reasons for collecting the data.

1. *Project Description*

Data for this were taken from the Guide for Initial Technical-Economic Data.

2. *Water Availability and Water Rights*

Data from the section on water availability in the Guide for Initial Technical-Economic Data formed part of this section. In addition, the section inquired into the area currently irrigated by crop season and number of farmers served by each existing system in the project's proposed area, other users of the project's proposed water source and how the project would affect the current downstream users of the source, and projects that would draw water from the proposed source in the near future and how these would affect the planned communal project. These data were intended to alert NIA staff to assess the water available for the communal project not simply in terms of the project's water needs but rather in the context of the existing and future needs of other users of the water source to be tapped by the project. It was expected, for example, that low priority would be given to a candidate communal project which would deprive current downstream users of water who possessed water rights.

The section also looked into the water right status of existing systems in the project's potential irrigable area and those of other current users of the proposed water source. These data were intended to enable NIA to determine whether the project could obtain the needed water rights, communal associations needed to acquire water rights because under existing Philippine laws the water they used could be allocated to others unless they possessed water rights permits.

Moreover, the section sought farmers' opinions on potential water sources and diversion sites. This was intended to determine whether they agreed with NIA's initial plans and also to allow NIA to investigate the feasibility of farmer-suggested water sources and diversion sites.

3. *Characteristics of the Potential Irrigable Area*

Data for this were taken from the Guide for Initial Technical-Economic Data.

4. *Project Structures and Costs*

The preliminary engineering and design data from the Guide for Initial Technical-Economic Data formed part of this section. In addition, the section sought the farmers' assessment of NIA-proposed water source and diversion site such as the maximum height of floodwaters, whether or not the stream overflows during typhoon months, how shallow the stream gets during dry months, and whether or not the stream changed course in the past. Local people's knowledge of the characteristics of the proposed water source was elicited to enable NIA staff to include these in planning the project's scheme of development. NIA also needed to utilize this knowledge because it lacked longitudinal data on small streams tapped by communal projects.

Moreover, the section looked into whether the NIA-proposed diversion site and path of the main canal would result in new beneficiaries who might control water distribution in the system, or whether these would remove control of water distribution from those who currently control it. These data were intended to show NIA staff the potential implications of the project's physical layout on system operations.

5. *Rights of Way*

This section sought to identify landowners from whom rights of way were needed. It focused on landowners who might resist providing rights of way, including those whose property would not benefit from the proposed system, those whose holdings were less than 2.0 hectares, those who lived some distance away from the project area, and those who owned lands in which existing canals were situated. The likelihood of obtaining rights-of-way donations from these landowners was also determined.

These data were obtained to enable NIA staff to know the potential right-of-way problems well ahead of time and to assess whether these could be resolved. If the right-of-way difficulties were known early, NIA staff could identify alternative routes and avoid delays in the completion of construction.

6. *Integration of Existing Systems*

This section examined the relationship of existing systems to the proposed project. Thus it sought information on the ownership of the existing systems, whether these shared any of their canals and structures, whether the owners and users wanted to become part of the proposed project or they wanted to remain a separate group, whether owners and users were willing to accept farmers from the expansion area to join them, and what problems the various groups anticipated

should they integrate with one another as well as the problems they expected should they become a separate group.

These data were intended to provide NIA staff an understanding of the nature of relationships of farmer-groups to be covered by the project so that they could adjust the physical development of the irrigation system to the social relationships among farmer-groups. Prior to the introduction of the profiling approach, NIA staff commonly made an assumption that it was easy to simply combine and expand systems. Data in this section helped show the complexity of existing irrigation conditions and the need for careful evaluation of what should be combined or not be combined. The data were also intended to caution NIA staff in merging existing irrigators' groups with established leadership patterns and management traditions as this would require developing in the larger association new skills to handle more complicated management tasks.

7. *Farmers' Interest in the Project*

This inquired into the major farmer-groups within the potential irrigable area, their interest in the project, the type of assistance they needed, their awareness of the conditions of NIA's construction assistance, and their willingness to contribute labor in system construction and to pay back the construction costs. These data were obtained to enable NIA staff to determine whether many farmers welcomed NIA assistance or only specific interest groups wanted the assistance.

In addition, the section looked into the loans that farmer-groups had obtained for the improvement of their irrigation facilities and their repayment histories. This information helped NIA staff assess the likelihood of farmers repaying the construction costs of the system and more important, allowed NIA staff to design the project that would not overburden farmers with a heavy payback responsibility.

8. *Viability of the Association*

This looked into the leadership and organization of farmers in the potential irrigable area. Thus, if the proposed communal project covered an existing system, the section inquired into the leadership of the system, the farmers' practices with regard to fee collection, water distribution and system maintenance, the kinds of conflict experienced in the system, and instances of conflict and cooperation among farmer-groups in the existing system. If the project had no existing system, the section inquired into whether there was an attempt in the past to develop an irrigation system in the area and why it failed. It also inquired into the general leadership patterns in the project area and the possibility of current leaders becoming involved in the irrigators' association as well as the instances of cooperation and conflict among farmer-groups in the proposed project area.

Data on current irrigation arrangements in the project area were intended to enable NIA staff to understand the existing irrigation situation and identify the farmers' practices that could be strengthened and built on as well as those that needed to be avoided. Moreover, the data provided NIA staff background on key

individuals and groups in the project area. Thus, when NIA staff entered the project area they already had a good sense of the individuals and groups with whom they would interact.

The topics covered in the Guide for Socio-Organizational Data reveal the considerable amount of information that has to be obtained to prepare a communal project profile. If the needed data were gathered through the usual socioeconomic survey (that is, based on fixed questions, information was sought from a random sample of farmers in an area and then their responses were tallied numerically), the data-gathering and analysis process would be a very time-consuming task. However, the profiles had been prepared quite differently and the entire process from initial data gathering to a completed, written up, reviewed, and finalized profile had taken one person a total of 5 weeks (see subsequent section for a complete description of the profiling process). The profiling approach was a reasonably rapid assessment technique because it differed from the usual socioeconomic survey in a number of specific ways

1. It was issue focused. While many different topics were covered in the data collection, there was a focus on information relevant to decision making about the project. For example, the Guide for Socio-Organizational Data covered various aspects of the irrigators' group or association within the project area. The questions, however, centered on data relevant for deciding whether NIA should intervene in the area and for planning the initial organizing intervention. Thus, the Guide focused on whether farmers in the project area were divided into factions, whether these factions had been in conflict over the leadership and management of the association, and whether the association had experienced conflict over misuse of association funds. Data on these were intended to enable NIA staff to assess whether the project community was so conflict-ridden that it would be difficult to develop cooperation among the prospective project beneficiaries. In addition, the Guide focused on the leadership roles in the existing association, the specific individuals currently occupying these roles, and the systematic procedures that farmers had developed for accomplishing irrigation tasks. These data were relevant in helping NIA staff develop initial plans for building the association leadership and for making maximum use of the beneficial aspects of the farmers' current irrigation management practices.

2. It did not require the interviewer to repeatedly ask a set of fixed questions to each interviewee. Unlike the usual socioeconomic survey which utilized a questionnaire or structured interview schedule, the profiling approach employed an interview guide similar to that used in anthropological research. The Guide for Socio-Organizational Data was unlike a questionnaire which asked fixed questions in a prescribed sequence. Rather it presented a series of questions on particular topics but these topics could be covered in any sequence depending on the interview situation and the kind of person interviewed. Unlike the questionnaire which limited the interviewer to ask only the questions contained in it, the Guide required the interviewer during the process of an interview to develop and ask probe questions to obtain additional information or clarify the responses of the person interviewed. The Guide itself also provided probe questions for specific topics but the interviewer was expected to devise probe questions that fitted the responses of

the person interviewed. Moreover, while at the start of fieldwork in an area all topics in the Guide might be covered with each person interviewed, as the fieldwork progressed not all topics were asked of each interviewee. The interviews became more focused on specific topics because the data obtained were collated and synthesized daily to determine gaps and discrepancies as well as leads, and these structured the subsequent interviews. The objective was that at the end of the fieldwork the accumulated information would yield a composite picture covering all topics addressed in the Guide.

3. The persons interviewed were not randomly selected, but were selected because they could reveal particular types of information. In fact the people interviewed from place to place varied depending on the situation. Thus, if the project had an expansion or new irrigable area, farmers from that area were interviewed. If the project covered several existing irrigators' associations, then leaders of each of the associations were interviewed. The profile writer must analyze the situation on the spot to determine who would be interviewed. Specifically, the people to be interviewed included the following:

a. Association officials of the existing system or systems in the project area if farmer-users of the existing system were organized into a formal irrigators' association;
b. Recognized leaders of the existing system or systems in the project area if the farmer-users of the existing system were not organized into a formal association;
c. One or two large landowners of the area to be covered by the project or their representatives;
d. Three or four ordinary farmers (that is, people who were not leaders in the management of the existing system or systems) who cultivated fields in the upstream area of the system, three or four ordinary farmers from the midstream area, and three or four ordinary farmers from the downstream area;
e. A leader and member of each faction in the area to be covered by the project if interviews indicated the presence of factions;
f. Three or four farmers who owned or cultivated lands in the proposed expansion area of the project; and
g. Town mayor, one or two town officials, barangay (village) captain, and one or two barangay officials.

4. Quantitative precision was not sought. The intent of the profile was to obtain an overview of issues in a project area in order to plan NIA's initial technical and social interventions. It was not intended to gather precise measurements as needed, for example, in baseline studies that aimed to compare an initial state with a later state to determine the degree of change. Consequently, rough estimates of quantitative data such as currently irrigated areas, new irrigable areas, cropped areas, and yields were sufficient. Similarly a relatively small number of farmers were interviewed and there was no attempt to tally the number of farmers who responded in a certain way compared with those who responded in another way. (For the communal project profiles, the total number of farmers interviewed for a

profile usually ranged from 15 to 30, representing from 5 to 8 percent of farmers in projects covering between 100 and 300 hectares.) If there were differences among farmers' answers, the profile writer was expected to show how these differences related to the project instead of making quantitative tallies.

Instrument 3: Profile Write up Guide

This instrument was developed to assist NIA profile writers to present the data in ways that allowed NIA staff who analyzed the profiles to easily see the data relevant for decision making. Thus, the instrument provided a checklist of the major sections and subsections of a project profile, plus additional information such as the name of the person who prepared it, date when it was prepared, and the names and respective designations of the provincial and regional personnel who reviewed it. The guide also listed the materials to be appended to a profile, specifically, the list of informants interviewed and their respective positions in the irrigators' association or community as well as their farms' position in the potential irrigable area (that is, upstream, midstream, or downstream); the layout of the project's scheme of development showing both the existing and proposed canal routes and structure sites; and the project's accomplished Guide for Initial Technical-Economic Data.

Instrument 4: Profile Analysis Guide

This was devised to help NIA staff relate the data on a candidate project to specific decisions they needed to make. It was designed to be accomplished for each candidate project by actually filling in on the appropriate space the answers to the questions it contained.

Since it was intended to help NIA staff in decision making, the guide highlighted issues relevant to deciding whether to provide construction assistance to a candidate communal project and how to proceed with the assistance. Among these issues were:

- Was there enough water to meet the targeted irrigable area? Could the association obtain legal rights to the water it needed?
- Would the project deprive current downstream users of the water?
- Would construction of permanent irrigation facilities generate new irrigated lands? Would owners and cultivators of coconut lands included in the project coverage really convert their lands to crops that needed irrigation?
- Could new beneficiaries control the water distribution in the system considering the proposed diversion site and main canal route?
- Could rights of way for the planned structures and canals be obtained from the landowners concerned?
- Were farmers really interested in the project? Would farmers work in system construction to raise their equity contribution?

- Would owners and users of existing systems in the proposed project area be integrated with the project? Were there groups that did not want to be integrated?
- Was there conflict among farmers or among their leaders? Were the current leaders respected and trusted?

Instrument 5: Summary Worksheet for Profile Analysis

The topics covered by the Profile Analysis Guide showed that communal projects involved numerous issues. The Summary Worksheet was devised to help NIA staff focus attention on the most crucial issues in a candidate project. The instrument first outlined the key characteristics of the project such as the project's name, location, estimated cost, estimated existing and potential irrigable area, water readings, and estimated diversion requirement per hectare by crop season. The Summary Worksheet then focused on the key problems and recommendations for each of the topics addressed in the Profile Analysis Guide. With the key problems clearly identified, the candidate projects could then be prioritized on the basis of the degree of seriousness of these problems.

DEVELOPMENT AND METHODOLOGIES OF THE PROFILE

The process of embedding the use of the sociotechnical profile into the procedures of NIA was key to its becoming a useful tool in agency practice. To understand the value of this tool, it is necessary to look into the history of how the instruments were evolved and how NIA staff learned to use them.

Development of the Instruments

The ideas that prompted the development of the sociotechnical profile first emerged in a 1-day workshop that was convened in late September 1978. By then NIA had 2 years of experience in its first participatory pilot project in Nueva Ecija and agency key officials had decided to begin two new pilot projects in Camarines Sur. The workshop was held to enable key officials of NIA, representatives of the Asian Institute of Management and the Ford Foundation, and social scientists from the Institute of Philippine Culture (IPC) to define ways in which social science research on communal irrigation could better serve the decision-making needs of NIA. Among the studies discussed in the workshop was an ongoing IPC study on the organization and management of 51 communal irrigation systems in different parts of the Philippines. A question was raised as to whether that study could provide inputs into the development of a feasibility study tool for NIA. At that time NIA's feasibility studies for communal projects consisted only of basic technical and economic data. The workshop participants felt that NIA's planning might be greatly improved if the socio-organizational data collected in the IPC study were

also known for communal projects being considered for government assistance.[6]

The workshop initiated the transformation of the social science research instruments and methodologies employed in the IPC study into a planning tool for NIA.[7] Soon after this workshop, a number of the participants began discussing how to select the two new participatory pilot projects in Camarines Sur. They felt these projects should be selected on the basis of both social and technical considerations, but there was as yet no systematic means for collecting the social data. Thus, another workshop was called to focus specifically on developing a methodology for gathering socio-organizational data on candidate communal projects. The workshop participants identified the key data needs for assessing the social feasibility of a candidate project and requested the IPC social scientists to develop the data gathering instrument. In December 1978, a Guide for Socio-Organizational Data, which closely resembled the research instrument used in the IPC sociological study, was completed.

While useful in planning NIA's action interventions, the data gathered retained an academic perspective, lacking a sharp focus on the data most relevant to the decision-making needs of NIA. However, the social scientists who developed the initial guide became involved in the Communal Irrigation Committee, an interdisciplinary group that directed the development of NIA's participatory communal program.[8] As members of the committee, they joined and participated in repeated workshops in which profiles were analyzed by NIA personnel who then used the data both for prioritizing the projects for implementation and for initial planning of both technical and social interventions. Observations of this analysis process enabled the social scientists to work with NIA engineers to revise the guide to fit more closely the concrete decision-making needs of the agency. By end of 1983, the Guide for Socio-Organizational Data had been revised thrice. The revisions involved organizing and phrasing questions in ways that indicated their relevance to decision making, rewording of questions which experience had shown were confusing, and inclusion of additional issue-focused questions.

The other three instruments of the sociotechnical profile – the Profile Write-up Guide, Profile Analysis Guide and Summary Worksheet for Profile Analysis – were developed in late 1980, about 2 years after the Guide for Socio-Organizational Data was first devised. The need for these, particularly the data-analysis instruments, was revealed in the initial workshops in which NIA staff analyzed the

6. For details of the kinds of data gathered in the IPC study and a summary of the research results, see de los Reyes 1980.

7. The workshop also resulted in the development of a social science research which became known as "process documentation." This became an important tool in developing NIA's capacity to implement more effectively its participatory communal program at the village level. For a detailed discussion of the nature of this research and the ways in which it supported the development of NIA's participatory communal program, see de los Reyes 1983.

8. Chaired and managed by NIA Assistant Administrator Benjamin U. Bagadion, the Communal Irrigation Committee was composed of NIA staff concerned with the agency's communal program and individuals from several resource institutions including the Asian Institute of Management, International Rice Research Institute, Ford Foundation, and Institute of Philippine Culture. For a detailed discussion of the nature of this group and the ways it assisted the development of NIA's participatory communal program, see Bagadion and Korten 1983, and Korten 1982.

profiles. Experience in the earlier workshops showed that NIA staff found it difficult to relate the data to specific decisions they needed to make. Consequently, immediately after the analysis instruments were devised, these were used in workshops that were held in each region of the country. Members of the Communal Irrigation Committee attended these workshops to help NIA regional and provincial staff understand the problem-oriented approach that the analysis guides were intended to encourage.

Training of Profile Writers and Reviewers

The social scientists' goal was to assist NIA to build its own internal capacity to use the sociotechnical profile. Thus, while the social scientists helped develop the instruments for the profile, it was always NIA personnel who actually gathered the data. Similarly, while the social scientists conducted the initial training sessions for NIA profile writers, later it was NIA personnel who conducted the training with the social scientists serving only as resource persons.

At first NIA tapped its existing staff to prepare the profiles as an activity additional to their usual duties. However, having seen the usefulness of the profiles in the initial site selection and planning workshops, NIA key officials decided to gradually expand its use. Eventually, it was adopted in the feasibility assessment of all candidate communal projects. As a result, NIA started to hire full-time profile writers in late 1981.

Both the initial, part-time profile writers and the subsequent, full-time staff underwent a training course in the preparation of profiles. In all, around 142 NIA personnel participated in five training sessions held between 1979 and 1982 (see Table 1). The training course had two components: a 3-4 day classroom session and a practicum. The classroom session began with an orientation to communal irrigation systems and associations, the development of NIA's participatory communal program, and the rationale for the profiles. This was followed by a lecture and discussion of the profile instruments, their interrelationships, and the individual topics and questions in the Guide for Socio-Organizational Data. Subsequently, the lecture and discussion focused on fieldwork procedures. This session covered four key topics:

a. *Types of informants to interview.* This concerned the kinds of people from whom the socio-organizational data on the project would be obtained. As explained earlier, these data were to be obtained from a purposively selected sample which included farmer-leaders, ordinary farmers (or non-leaders) from the upstream, midstream, and downstream areas of the existing systems within the project coverage, as well as farmers from the planned expansion area.
b. *Interviewing techniques.* This included a thorough familiarization with the Guide for Socio-Organizational Data, techniques for probing or stimulating a respondent to provide more information, and methods for redirecting a respondent to the topic under discussion when he digressed.

Table 1 Number of Participants in the Profile Writing Training Course, 1979-82[a]

Year	Total Numbers of Participants	Average Number of Participants per Region
1979	4	b
1979[c]	19	1.6
1980	39	3.2
1981	40	3.3
1982	40	3.3

a. Figures for 1981 and 1982 are estimates.
b. The first profile writers were community organizers who were based at the central offices.
c. Since the second training session, all 12 regions had participants in the training.

c. *Procedures for recording and collating interviews.* This included the importance of writing out the results of an interview soon after it was completed to ensure that relevant and important information would not be lost and also to be able to follow up leads or to clarify contradictory information in subsequent interviews.
d. *Data collection through onsite inspection.* This included explanation of the need to visit major existing irrigation facilities and sites for proposed facilities as well as other key locations to validate the layout map of the proposed project.

The final phase of the classroom session consisted of a practice session with mock interviewing and role playing. For this portion, the participants first observed one trainee interviewing another trainee who acted as an informant, while the training staff interrupted the interview process at certain times to explain to the group specific interviewing techniques that they should observe or avoid. Afterwards, the participants divided into small groups to continue with mock interviewing and role playing, under the supervision of a member of the training staff.

After the formal session, the trainees returned to their respective regions to begin preparing profiles. The first two profiles they completed constituted the practicum component of their training. In the first three courses this component, as well as the formal training session, was handled by the social scientists from IPC. They reviewed each profile and provided the trainees feedback on what additional data or clarifications were needed, as well as how to improve the syntax and organization of the profile report. As the use of profiles expanded, however, it became evident that capability for reviewing the profiles had to be developed within NIA. The review process could be designed not only to improve the quality

of the profiles, but also as a key part of NIA's planning process. Such a review could provide key NIA technical and institutional staff an early acquaintance with the characteristics of candidate sites. Consequently, in 1981 each region appointed a two-person review team composed of the regional planning engineer and the regional supervisor of the community organizers.

To develop common procedures for reviewing the profiles, the review teams from each of the 12 regions were called to two separate 2-day workshops conducted by the IPC social scientists. In this workshop, the review teams learned the nature and importance of the profiles and practiced reviewing some actual profiles. Their reviews focused on whether there was insufficient, repetitive, unclear, or contradictory information and whether the write-up needed improved organization. The ways in which each profile needed to be improved were listed and reviewed towards the end of the workshop. In this way the participants developed an understanding of the common problems encountered in profile writing.

After the workshops, the teams began regularly reviewing all communal profiles in their respective regions. In some regions the construction chief later joined in reviewing the profiles. Beginning in late 1982, the provincial irrigation engineer or his assistant also reviewed the profiles of candidate projects in his province.

Procedures in Preparing and Analyzing Profiles

To implement its communal assistance program, NIA had developed decentralized systems which placed important responsibility at 12 regional offices that supervised 67 provincial offices. These regional units were utilized from the beginning of the adoption of the sociotechnical profile. While at first only one region was involved in experimenting with the new methodology, starting in 1980 all regions began to adopt the profiling approach. Table 2 shows the growth in the use of the profiling methodology. As the table also indicates, the average cost for preparing a profile decreased as NIA staff became experienced in the methodology. By end of 1983, all provincial and regional offices were observing the following procedures in preparing and analyzing profiles.

Profile Preparation

Primary responsibility for communal projects rested on the provincial irrigation engineers who headed NIA's provincial offices. Each provincial engineer maintained a list of potential communal projects. Drawing from this list, every year a provincial engineer submitted to his regional office, through the regional planning engineer, a list of communal projects he proposed to undertake 2 years thereafter. The projects in this list were expected to have undergone an investigation survey, the results of which were recorded on the Guide for Initial Technical-Economic Data. The regional planning engineer was expected to review these results and identify the potentially feasible candidate projects that would be profiled.

Table 2 Growth in the Use of the Sociotechnical Profiling Methodology, 1979-1983

	1979	1980	1981	1982	1983
Number of regions involved		12	12	12	12
Estimated total number of profiles prepared	6	36	79	310	256
Total number of profile writers	4	19	33	41	34
Average number of profiles per region[a]	-	-	6.6	25.8	21.3
Average number of profile writers per region	-	-	2.8	3.7	2.8
Average number of profiles per profile writers[b]	-	-	2.4	7.1	7.5
Average cost per profile[c]	-	-	P2485 $310	P1402 $140	P1278 $127

Notes :

a. Data for 1981 on the average number of profiles per region, average number of profile writers per region, average number of profiles per profile writer, and average cost per profile are based on information from 5 regions; those for 1982 and 1983, from 6 regions.

b. The average number of profiles prepared by a profile writer increased by 1982 because the profile writers had began working on a fulltime basis.

c. Includes the salaries and travel expenses of the profile writers, and the costs of production of profiles. Dollar figure for 1981 is based on an exchange rate of P8: US$1; that for 1982 and 1983, P10: US$1.

Preparation of a project profile, which involved collecting socio-organizational data and integrating these with the technical-economic data, was the task of the profile writer. As of the end of 1983, NIA had a total of 34 profile writers, or an average of 2.8 per region. Seven were working part-time while the other 27 were employed full-time. The profile writers were mostly female college graduates with majors in the social sciences, agriculture, or engineering. They were required to be able to speak the dialects of the region where they worked, be interested and willing to work in rural areas, have experience in working with rural communities, be able to write a descriptive report in English (because all profiles were written in English), and be able to type (because local NIA offices lacked clerical staff that could attend to the typing and production of profiles).

Most profile writers were based at the regional offices and received their assignments from the regional planning engineer. In regions covering widely dispersed provinces, however, they were assigned to the provincial offices. These provincial-based profile writers received their work assignments from the provin-

cial irrigation engineer but the regional planning engineer also continued to supervise them.

Once she received an assignment, the profile writer prepared for fieldwork by conferring with the provincial technical staff to find out the project's location, proposed coverage, and suggested layout for its development. She generally also obtained a copy of the layout map of the project and the accomplished Guide for Initial Technical-Economic Data if these documents were not already available at the regional office. She used this information to locate the particular types of persons she should interview.

The profile writer began fieldwork in a project site by paying courtesy calls on local government officials particularly at the village level, to explain the purpose of her visit and to obtain additional information for identifying and locating the types of persons she needed to interview. She conducted interviews with these persons individually although on occasion she might hold group interviews. Between interviews, the profile writer undertook onsite inspections of NIA-proposed and farmer-suggested canal and structure locations, usually in the company of farmers or NIA technical staff.

The fieldwork for one project was expected to be completed within 2 weeks although it might be extended if the project covered more than 500 hectares. Throughout the fieldwork period, the profile writer generally resided in a village in the project area. Within a week after the fieldwork, she was expected to have prepared a draft of the profile and have it submitted for review to the provincial office as well as to the regional planning engineer.

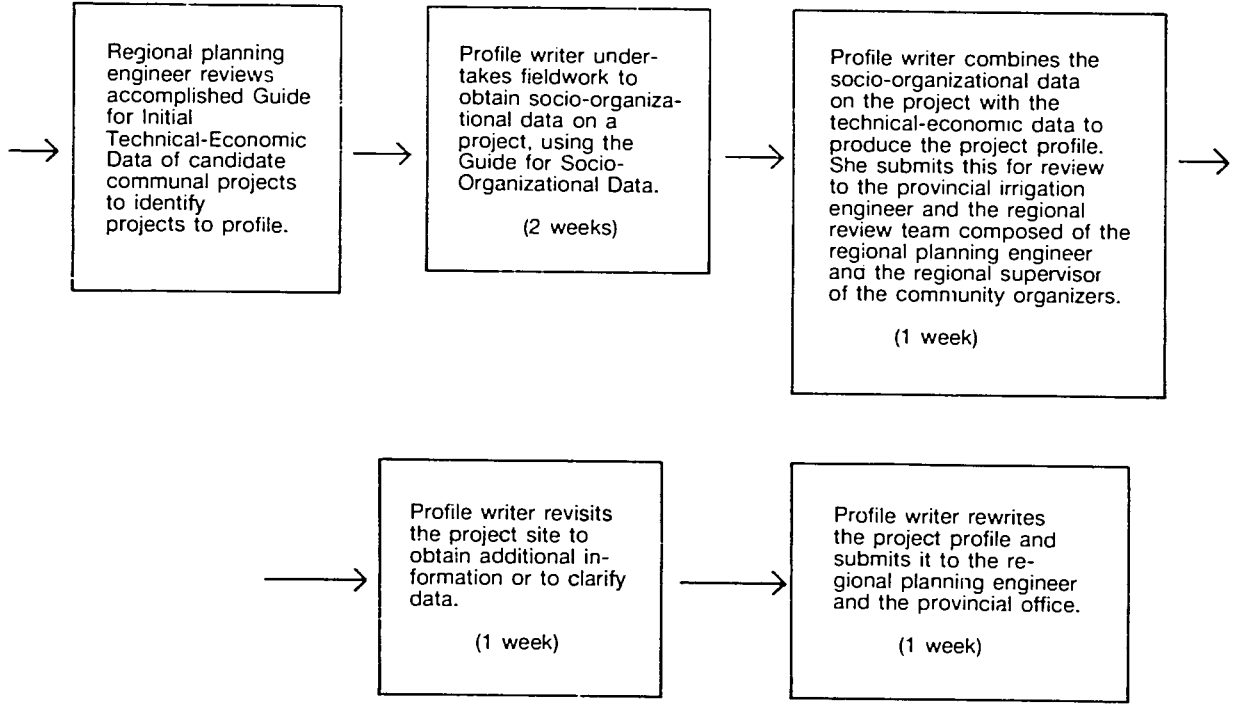
At the regional level, the profile was to be jointly reviewed by the regional planning engineer and the regional supervisor of the community organizers in the presence of the profile writer. During this review, the profile writer was usually asked to return to the site to collect additional information on specific items which the review team felt to be important for decision making. This call back had to be completed in a week's time. After this, another week was allowed for the profile writer to prepare the final write up and submit it to the regional planning engineer and the provincial office. Thus, the profile preparation was programmed to take a total of 5 weeks. Figure 1 summarizes the procedures followed in preparing the profiles.

Profile Analysis

Profiles of candidate communal projects were analyzed during site selection and planning workshops in which NIA staff prioritized candidate projects and planned the initial technical and social interventions in the most feasible candidates. The first of these workshops was convened in 1979 during which the two pilot participatory projects in the province of Camarines Sur were selected. In 1980 when it was decided to carry out one participatory project in each region, three workshops were held, each attended by NIA staff from three or four regions who analyzed three profiles from each region to select their pilot sites. By 1981 each region was holding its own profile analysis workshop each year.

The regional workshop was chaired by the regional irrigation director and

Figure 1 Procedures in Preparing and Reviewing Sociotechnical Profiles



attended by both regional and provincial satff. The participants from the region included the planning engineer, design chief, construction chief, supervisor of the community organizers and profile writers. Those from the province consisted of the provincial irrigation engineers and their respective assistants and the community organizers. Often the workshop was also attended by personnel from the technical and institutional group of the communal unit at NIA central office. Moreover, until 1982 at least one member of the Communal Irrigation Committee participated in each regional workshop.

Between 1980 and 1982 the workshops proceeded in the following manner. After a brief discussion of the purpose and goals of the workshop, the participants divided into provincial groups to analyze the profiles of candidate projects in their province. A group was composed of the provincial irrigation engineer, his assistant, community organizers in the province, a participant from the regional office, and one or more Manila-based participants. Each group began with all members reading the profile of a particular candidate project. They then discussed how each question in the Analysis Guide would be answered, and agreed on the key problems under each topic. After each profile had been analyzed in this manner, the group prioritized the candidate projects as to which were the most viable candidates for construction assistance. They then also wrote on large pieces of paper the Summary Worksheet of the two most feasible candidates. These were presented to all participants, followed by an open discussion as to whether NIA should assist the project and how it should proceed with the assistance.

By 1983 the workshops followed different procedures. The initial analysis of the profiles was done at the provincial level. Since NIA personnel had become sufficiently familiar with the issues and questions covered in the Analysis Guide, they found it unnecessary to fill it in. Instead they simply used the Summary Worksheet in structuring their discussion of candidate projects, identifying the key problems and issues, and prioritizing the candidate projects.

The results of the provincial-level profile analysis were then discussed in the regional workshop which convened the provincial staff with key regional staff. Prior to the first workshop day, the participants were provided copies of the profiles of candidate projects which the provincial staff had prioritized as most feasible. They were expected to read the profiles so they could participate in the workshop discussion. Then at the workshop, the provincial irrigation engineers individually presented their most viable candidate projects. They made this presentation with the use of the Summary Worksheet on each project written out on large pieces of paper. The issues were then openly discussed by all participants.

IMPACT OF THE SOCIOTECHNICAL PROFILE

NIA's experience showed that the cost of preparing sociotechnical profiles of candidate communal projects averaged 2,485 Pesos (US$310.62) per profile in 1981 but this decreased to 1,278 Pesos (US$127.80) in 1983 (see Table 2 above).[9] For

9. Dollar figure for 1981 is based on an exchange rate of 8 Pesos to US$1; that for 1983, 10 Pesos to US$1.

this cost, several beneficial effects of the sociotechnical profile were observed in NIA by end of 1983. While the obvious benefit was the incorporation of social data into the decision-making process, the actual benefits appeared to be broader.

Improved Project Feasibility Analysis and Planning

The sociotechnical profile broadened NIA's feasibility studies for communal projects to include socio-organizational issues as well as technical issues. More importantly, the profile brought a new element into NIA's analysis of candidate projects. NIA staff discussed not only *whether* to intervene in a site but also *how* to intervene and what issues would have to be confronted.

A common characteristic of candidate communal projects was that they covered long-existing irrigated areas whose cultivators and/or owners belonged to one or more irrigators' groups. But in the past NIA generally ignored the existence of these groups. NIA's project classification of "new" or "rehabilitation" were used to distinguish whether the system had been assisted by NIA or not. Thus an area could have been irrigated for many years but if it had not received NIA assistance, the project would be classified as "new." The question of existing irrigators' groups and how they might view the project or be integrated with each other, thus would never even come up.

The sociotechnical profile, however, highlighted the presence of existing irrigators' groups, the nature of their relationship with one another as well as with groups not currently served with irrigation who would be covered by the project, their reaction to a merger with another group and their interest in NIA assistance. These data then provided a basis for NIA staff to analyze *how* to develop both the physical irrigation system and the farmers' association. The following cases illustrate these issues.

The profile of one candidate project indicated that the project would cover an existing system whose farmer-users were organized into two associations. When this profile was analyzed in a workshop there was much discussion about whether or not to merge the two associations. Proponents for the merger argued the need for only one association since farmers drew water from only one source and one diversion structure. Other workshop participants, however, pointed out the existing leadership roles and traditions of the two associations and the potential difficulty of merging them owing to their long established independent operations. The project profile in fact indicated that while the leaders of the two associations had no objection to their sharing of the irrigation facilities that NIA would develop, they wished to continue the independent management of their respective service areas. Eventually NIA rehabilitated the existing system without changing any major aspects of its physical layout. The two associations retained their independent status but they developed arrangements for shared participation in generating their equity contribution to project construction and they agreed on their respective shares for repaying the construction costs.

The profile of another project, on the other hand, revealed that the project would cover two existing systems which drew water from separate sources. This information also prompted discussion on how to develop the physical system and

the irrigators' association. In this case, however, the farmers wanted a single organization because almost all who farmed the 35 hectare area served by one system also cultivated fields in the other system which covered 83 hectares. As it turned out, NIA replaced the brush dam of one system with a new concrete one and rehabilitated the damaged permanent dam of the other system, with this being done under the auspices of only one association.

In many other projects, a common problem encountered was the need to obtain rights of way from these individuals: absentee landowners, landowners whose properties would not be served with irrigation, and landowners who built the existing systems in the area. The project profiles identified these individuals. Consequently, NIA staff encouraged the farmers to begin negotiating with these persons at the earliest opportunity. At the start of the project, NIA staff also discussed with farmers alternative routes for canals with potential right-of-way problems and advised farmers to ascertain the right-of-way conditions for these routes as early as possible. The early attention given to potential right-of-way problems generally allowed farmers to work out agreements with problematic landowners in time for the start of construction.

One profile which exemplified the right-of-way problem revealed that part of the project's proposed irrigable area was currently irrigated by a privately-owned system. The system owner was opposed to NIA's plan to develop a communal irrigation system in the area, apparently because he would lose substantial income from the high irrigation fee payments that he was collecting from farmers served by his system. NIA's initial plan for the project, however, called for the proposed system's main canal to traverse the land of the private system owner. At the profile analysis workshop, a key problem identified for this project was the potential difficulty of obtaining right of way for the main canal from the system owner. It was also pointed out that should the system owner grant the needed right of way his land would be placed at the upstream section of the proposed system which would enable him to control the water distribution in a major portion of the system. Consequently, workshop participants pointed out that NIA needed early discussions with farmers about possible alternative routes that would best serve the needs of the majority of the farmers. In the system that NIA eventually developed the main canal did not traverse the lands of the owner of the existing private system. In consultation with farmers NIA identified a new route which allowed the system to operate independently of the existing private system. The new route, however, encountered technical difficulties which delayed the completion of construction. When the system began full operations in 1983, it continued to suffer these technical difficulties. By end of 1983 the system had irrigated only half of its planned service area.

Interdisciplinary and Inter-level Project Planning

NIA's adoption of the participatory approach in developing communal projects required the agency to hire personnel oriented toward people and trained in building the problem-solving capacities of rural groups. While previously NIA's field staff for its communal assistance program consisted primarily of engineers who

were concerned with the physical development of communal irrigation systems, under the participatory approach NIA began to have another group of personnel – the community organizers who were responsible for assisting farmers develop their irrigators' association. The initial participatory pilot projects revealed the differing perspectives of these two groups of personnel on how to develop a project, resulting in a variety of difficulties in the field. To help resolve these difficulties, mechanisms were devised to help both technical and institutional staff develop a common perspective on irrigation development.

The sociotechnical profile presented one opportunity for developing the needed common perspective. Since the profile addressed both technical and social issues in a project, analysis of the profiles helped to develop understanding of both dimensions right from the beginning. The workshops in which both technical and institutional staff analyzed the profiles fostered the development of an interdisciplinary approach to project analysis and planning. Beginning in 1982, NIA technical field staff had become sufficiently familiar with the socio-organizational issues in developing communal systems that they themselves often raised these issues in site selection and planning workshops as well as in sessions that reviewed the implementation of communal projects. The organizing staff in turn had learned about the technical issues and could point out their implications for the development of the irrigators' association.

Another important dimension of the profile analysis workshops was that these facilitated substantive discussions among the provincial technical staff and between the provincial and regional technical staff. The provincial irrigation engineers in particular indicated that they had benefited from the ideas presented in the workshops on how to develop their projects. They also reported that the workshops helped them obtain responsive support from the regional office. Because potential problems in implementing projects were discussed in the workshops, the regional staff became aware of these and readily responded to the provincial engineers' request for assistance when these problems later surfaced in the field.

Improved Collection of Initial Technical Data

For purposes of funding appropriations, each year NIA had to submit to the national legislative assembly a list of candidate projects to be assisted the following year. Prior to the introduction of the profiling approach, the provincial offices had generally hastily gathered the needed data on water, land, and crops shortly before the list was due. One outcome was that a number of proposed communal irrigation projects were found infeasible just before their scheduled start of construction. Since funds had been allocated, the provincial office had to identify quickly substitute projects resulting in somewhat chaotic technical feasibility studies.

The profiling and analysis processes underscored the need for greater attention to the technical feasibility work. The initial profile analysis workshops revealed that many candidate projects had not been surveyed at the time the profile writers visited the project site to collect the socio-organizational data. In others there was inadequate information on important issues, such as the potential water supply from the proposed source, terrain and nature of soil along the proposed main canal

route, and types of soil within the potential irrigable area.

The problems revealed in the initial workshops led to discussions with the regional and provincial staff which, in turn, led to a substantial rescheduling and rationalization of each of the steps involved in selecting a candidate site. The investigation and assessment of candidate projects was advanced about one and a half years, thus occurring 3 years before the planned start of system construction. Figure 2 shows a flow chart for all the steps involved in carrying out a communal irrigation project under the participatory approach, including the feasibility work, the planning, the design, the construction, and the operation and maintenance assistance. Under this 6-year scheme, the sociotechnical feasibility surveys were to be accomplished over the 3 years prior to the fielding of community organizers in the project area.

By end of 1983 substantial improvement in the completion of the initial technical and economic data gathering was observed, with most projects conforming to the new planning schedule. The existence of the profile writers greatly contributed to this improvement. Because they needed to have the initial technical and economic data before they could prepare the profiles, their repeated requests for these data created a pressure on the technical staff which encouraged the timely gathering of these data.

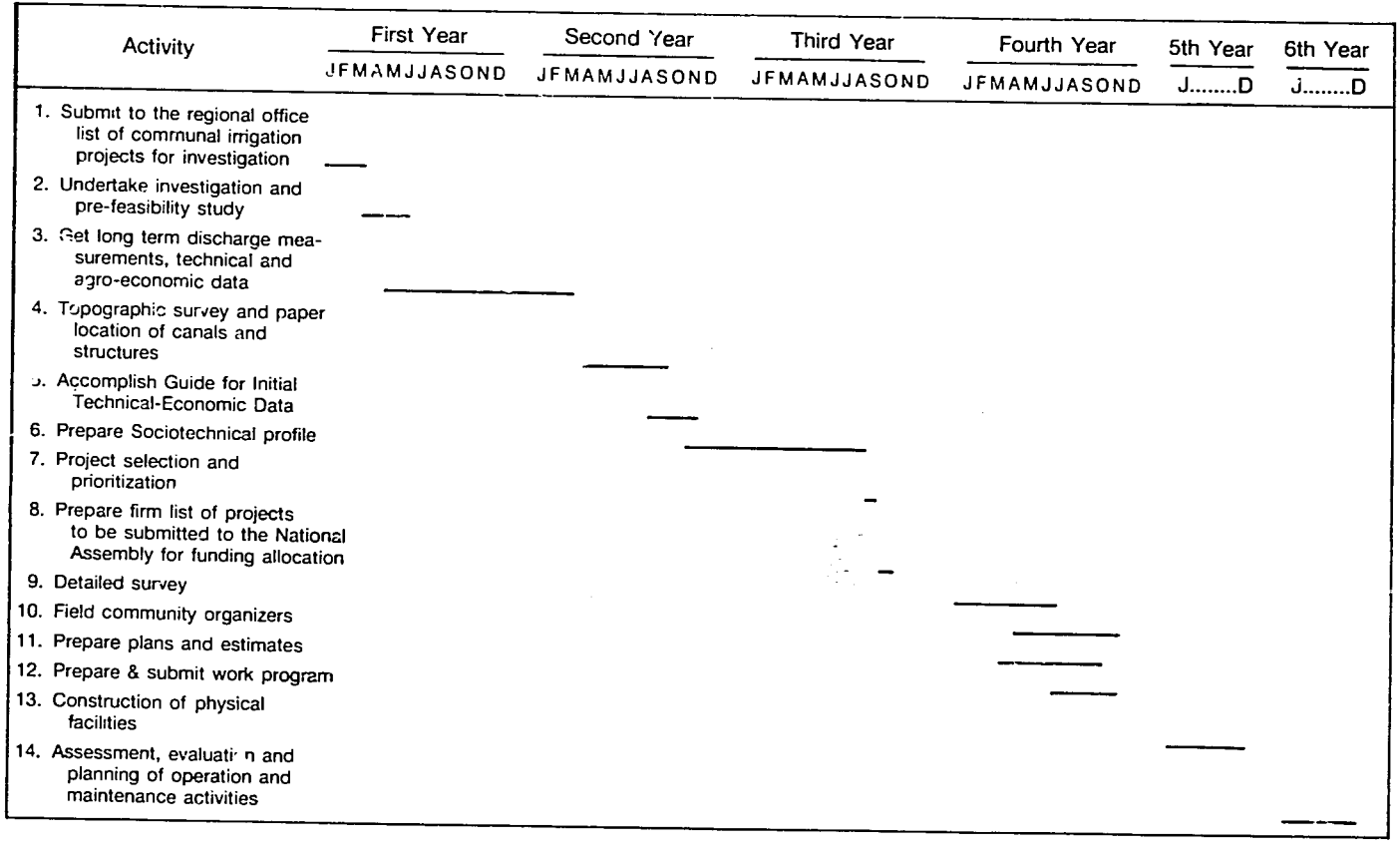
Increased Systematic Knowledge of Communal Systems in the Agency

Except for basic technical and agro-economic data on candidate projects, NIA previously did not maintain a data base on communal systems. This meant that while the provincial staff working directly with communal systems had some knowledge of specific systems, at the regional level there was very little understanding of communal systems and the farmers' organizations that operated and maintained them.

The sociotechnical profiling process brought about increased knowledge of communal organizations within NIA as well as improved understanding of the irrigation management traditions that these organizations had developed from years of experience. At the regional level, where staff members were mainly acquainted with the agency's work on the larger, national systems, the profiles helped them see the complexity of what they had often assumed were "simple" systems. They reported that they relied on project profiles to obtain a briefing on a project prior to a field inspection or in preparation for sessions in which the project would be discussed.

At the provincial level, the profiles helped the technical staff become aware of the social organizations of communal systems. They also helped the community organizers gain an overview of the system they were assisting, helping them avoid losing sight of the entire system area as they became embroiled in working with specific villagers. The provincial staff also reported that they reread a project profile in preparation for sessions in which they reviewed the ongoing implementation of the project. This helped them raise key issues that otherwise might have been overlooked. They also reported utilizing the profiles as a basis in explaining to local politicians the reasons for the priorities given to a communal project. One

Figure 2 Planning Schedule for Communal Irrigation Projects



problem commonly encountered by local NIA staff was a local politician's insistence on the implementation of his sponsored communal project although this was found infeasible.

Better Farmer-Agency Relationship

Beginning in 1975, Philippine government policy required that construction assistance to communal systems be provided to farmers on a loan basis and that farmers must provide equity contribution in the form of rights of way, labor, materials, or cash. These policy conditions accounted for the inclusion in the socio-technical guide questions regarding the likelihood of obtaining rights of way for proposed irrigation facilities, willingness and likelihood of farmers contributing equity through voluntary labor in system construction, and willingness and likelihood of farmers repaying the construction costs of system facilities.

Experience revealed that in most instances when the profile writer inquired into these matters, farmers indicated that they did not understand the conditions of NIA assistance. While the profile writer responded to the farmers' queries, often she would also facilitate a meeting in the project area between the farmers and NIA staff which helped the farmers become acquainted with the conditions of NIA assistance. It also helped NIA staff gain an early understanding of the farmers' specific concerns with regard to the development of the proposed project.

Many NIA engineers indicated that these early meetings allowed them to respond better to farmers' concerns in developing the system. But equally important, the meetings allowed NIA personnel to discuss with farmers potential problems in developing the project like, for example, the need to obtain rights of way from an absentee landowner or from a landowner who indicated he would provide rights of way but would ask for cash payment, the probability of excluding from the project coverage areas that had high elevations although farmers in these areas were interested in the project, or the refusal of specific landowners in currently irrigated areas to be part of the project. Since farmers were made to be aware of the potential difficulties before the start of the project, NIA staff expected them to be less prone to blaming NIA over problems encountered during the implementation of the project. Moreover, since in these meetings NIA staff also warned farmers that while the project was being considered for construction its implementation would depend on many factors including the cost of the project, extent of its benefits, and availability of funds, farmers were expected to develop more realistic expectations of the project. All these were contributing to the growth of a better relationship between NIA and the farmers.

In summary, while initially the goal in adopting the profiling approach was to develop among NIA staff a greater understanding of the social characteristics of a given communal project and to bring this understanding into the project decision making, the effects turned out to be much broader. The most important effect appeared to be in helping develop a stronger orientation toward problem analysis in all levels of NIA's communal program implementation process. The content of the profiles, the focus of the analysis guides, and the structure of the analysis workshops all signalled to NIA personnel that problems were to be expected in

each project and these problems should be faced and analyzed. While previously the review of projects focused primarily on matching the amount of money available with the needs of the project, the profile analysis process dealt with the inner-workings of the project – the people it was meant to serve, their conditions and interest, and the technical alternatives that could help them. Through the entire set of profiling activities the message that was consistently transmitted was that problems were not to be covered up, but rather were interesting, and analyzing them allowed potentially much smoother actual implementation of the project.

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RAPID RURAL APPRAISAL: EXPERIENCE AT KHON KAEN UNIVERSITY

Mantana Samart

INTRODUCTION

Beginning in early 1981, a group of researchers at Khon Kaen University (KKU) from the biological, physical, and social sciences gathered to formulate a research project on farming systems in Northeast Thailand. This led to the design of the Farming Systems Research (FSR) Project, which received funding from USAID and began research activities in 1983. Research activities at KKU during the first phase of this project (1983-1984) included the selection of a project village as well as the design of the appropriate agricultural activities trial programs. Because the term of the grant imposed certain time constraints that made many conventional research methods unsuitable, the interdisciplinary group looked at new methodologies that would allow it to understand the local conditions well enough to conduct effective experimentation in a shorter period of time.

As part of this effort, Rapid Rural Appraisal (RRA) was introduced to the project, and was demonstrated to be an effective means for assisting personnel in conducting interdisciplinary research. RRA methodology has allowed researchers from various disciplines to work closely, to learn together, and to share experiences from different points of view. It has led to the design of more specific research topics and has also enabled researchers to increase their understanding of farmers, particularly with respect to their ideology, indigenous knowledge, and decision-making. RRA techniques have been adopted, experimented with and refined at KKU since 1983.

RRA methodology has been employed extensively in many research projects throughout KKU within the last two and a half years. A total of at least 19 RRA studies have been carried out: fifteen under the FSR Project, three under the Socio-economic Studies of Farmers in Rainfed Areas of Northeast Thailand (KKU-FORD) Project, and one series under activities of the KKU Water Resources and Environment Institute. Many of these were done as a part or a first step of a larger research activity. Many of these also were carried out in combination with other research methods, such as short questionnaires and daily household record-keeping.

This paper will discuss experience in using RRA at KKU. It is based on information from a series of meetings held at KKU during June-August, 1985. Additional information came from a survey of KKU practitioners of RRA, covering nineteen topics of interest.

RRA, as employed by KKU, is a systematic approach to obtain information and conduct problem analysis that requires a highly effective use of time. RRA as employed at KKU emphasizes the systems aspect of the research and therefore the

utilization of personnel resources from various disciplines depending on the issue of interest. Semi-structured interviewing has invariably been the principal research method used by the interdisciplinary team of researchers. Other methods, such as observation, measurement, and the use of indicators, were also used whenever appropriate. The subject of semi-structured interviewing is treated in detail elsewhere in this volume and will not be elaborated here. The method is a middle way between unstructured interviewing and highly structured interviewing by the formal survey method.

Two broad types of RRA have been used by KKU personnel: (1) General RRA, and (2) Specific or Topical RRA.

General RRA studies whole villages, with emphasis on agroecological systems. The purpose of the study is to learn the general characteristics of a research area or site, which will serve as a basis for planning subsequent experimental activities or specific studies. Examples include the Ban Hin Lad RRA, which provided village system analysis for the FSR Project, and an agroecosystems analysis of conditions which support or discourage growing peanuts after rice.

Topical RRA focuses on specific subjects of interest. Studies may pursue topics raised by a general RRA study of a village system, as when the Ban Hin Lad RRA led to subsequent RRA studies on cooperative labor and on exploitation of fuelwood sources in that village. Both of these topical RRA's were aimed at extending the understanding of the sociological characteristics of farmers under study by the KKU-FSR Project. Topical RRA can also be used to study aspects of village and farming systems, and the indigenous technologies they employ, either in a single village or in a number of villages throughout an area. Examples at KKU include studies on raising native swine, on raising meat and dairy cattle, and on growing peanuts after rice.

ANALYSIS OF RRA EXPERIENCE AT KKU

The following discussion will analyze KKU experience with RRA in terms of four functions: site selection, duration, organization, and activity. We will seek to relate these factors to the types and purposes of RRA.

I. Site Selection

In conducting RRA, researchers are usually faced with two questions in selecting villages: how many villages are to be selected, and what selection criteria are to be applied? Both depend on the type and purpose of the study.

In general village system RRA, one village is usually selected for study. This is due to various limitations resulting from a large number of participants, including transportation logistics. It is also possible to study village systems in several villages, however, when study goals require an understanding of several specific villages. For example, ten villages were studied in developing a plan for growing peanuts after rice.

In topical RRA, the number of villages selected depends on the specific

requirements of each study. Topical RRA is often used to study relevant topics in villages participating in a particular project. In such cases, the villages involved are defined by the project, as with studies in Ban Hin Lad (FSR village) on cooperative labor, food habits, and fuelwood; two studies have also been conducted at Ban Don Po Daeng for the purpose of designing a specific experiment. When many villages are included under a project, the RRA may be conducted in more than one village, as we have done in villages of Northeast Rainfed Agricultural Development (NERAD) Project, and in villages involved with the Water Resource and Environment Institute.

When a study involves more than one village, criteria for selection are required. Geographical areas covered by projects and studies usually contain more than ten villages, often many more, so studies conducted in every village become neither necessary nor possible. Usually, a minimum of three villages are selected according to set criteria. For example, an RRA on small-scale irrigation systems selected villages according to the level which villages benefited from a project; a fuelwood study chose villages using forest density as a criterion; and a study of native swine raising selected villages on the basis of swine raising management systems.

2. Duration

The duration of an RRA includes both the time spent in the field and the time spent in analyzing field data and preparing reports. The number of days spent in the field relates to the type of RRA, the number of subtopics, the number of participating researchers, and the location and number of villages involved in the study. A general village system RRA usually takes a relatively short period of time (approximately three days), since it often includes relatively few subtopics (normally about five) and is constrained by the difficulty in scheduling the participation of many researchers. We often conduct RRA's in single villages in Khon Kaen Province to reduce researcher commuting time requirements, but field study time has been extended when study of multiple villages is required. With topical RRA, the number of days spent in the field varies considerably, depending on the number of subtopics and the number of villages under study.

Studies at KKU have established reporting norms. Field notes must be completed on the same day as the interview, and are usually written in the study village. Field notes are discussed and analyzed by the team as the study proceeds, and afterwards team member reports are prepared summarizing team member findings. This process usually takes about one month, and results in a preliminary report to be used as a basis for further discussion and analysis. Since information from preliminary reports is often used in planning activities for projects such as the FSR Project, researchers must use their time effectively if the benefits of RRA are to be realized. The time required for preparation of a final report varies according to the needs of the working units and the time available to researchers.

Appendix I classifies RRA's at KKU by the number of days required for field activities, preliminary summary preparation, and final report writing.

3. Organization

Study organization is an important factor in facilitating the attainment of RRA objectives. Organizational activities include decisions regarding the number of researchers, the amount of preliminary information to be collected from surveys or other secondary sources, the subtopics to be studied, the conceptual tools to be used, and the schedule for field work and summary preparation. Organizational models are associated with the type and objectives of the RRA, which will be discussed further in this report. Of particular importance here is team composition and scheduling.

Characteristics of RRA Workers

Participants in an interdisciplinary research team should be willing to work with researchers from various disciplines. They should be cooperative, ready to expand their realm of interest, and open to the lines of reasoning followed in disciplines other than their own. Acceptance and willingness to cooperate, even when discussions are not on one of their primary areas of interest, are very important in interdisciplinary research.

Prior training in RRA methods is usually given to RRA team members. Researchers participating in more than two studies all went through a training session, where they were given an introduction to RRA methods. This has allowed diverse RRA research teams to reach a common understanding of research methods and procedures. Of the nineteen RRA studies surveyed, the following disciplinary breakdown of team members was reported: 113 in biological and physical sciences (60 percent of all researchers), 54 in social sciences (29 percent), and 19 in other areas of study (11 percent). Social scientists have been participating in most research teams, as a result of the interdisciplinary approach emphasized at KKU.

Team Size

Team size varied a great deal in RRA's at KKU, but for discussion purposes we call 2-3 members a "small team," more than 20 a "very big team" and any thing in between a "big team," since with more than 3 team members the team usually splits up to do interviewing. The nineteen RRA studies surveyed at KKU included teams of all sizes, with size varying according to the type and purpose of the RRA and the sites where it was conducted (see Appendices 4 and 5).

Very big teams (over 20 members) usually go through a training session together. They are usually used for general studies which require the knowledge and experience of researchers from many disciplines. Usually only one site is covered, and the fieldwork takes less than 3 days.

Small teams (2-3 members) are commonly used in topical RRA studies, with two to three disciplines (one usually from the social sciences) cooperating in the investigation. Small teams are usually most appropriate in studies covering many

sites, or in studies requiring long-term participation or maximum researcher interaction.

Teams of intermediate size (4-20 members) have been used for both general village RRA and topical RRA studies, usually of a particular site, rather than covering many locations. The field time for most of these studies is relatively short. For convenience, sites are not too distant and interviews are rather short, so that not more than 3 days are usually spent in the field.

Large teams have the advantage of many researchers from many disciplines simultaneously exploring problems and opportunities at the same time. They also offer more opportunity for using a range of data collection techniques and for collecting a larger quantity of information because of the greater number of contacts with village sources. Since a large team can gather data more quickly, it usually requires less time, commonly only one to two days.

Disadvantages of large teams primarily involve organizational difficulties and more elaborate preparations for field work. Accommodations for a large number of researchers can also be a problem. Researchers in large groups must wait for their turn in interviewing at a given session, or smaller groups must wait their turn for interviewing various types of farmers. Consequently, data collection by a given team member may lack continuity. Since large teams increase problems of communication and adaptation to various disciplinary lines of inquiry, work schedules tend to be less flexible. Meetings among members of large teams tend to be more formal than meetings of small teams, which can meet more frequently and casually. Separate meetings must usually be scheduled for large teams to compare field notes, to discuss findings, and to formulate summaries, whereas small teams can incorporate more tasks into a single meeting.

Scheduling

Scheduling of study activities is essential, especially during fieldwork, but scheduling requirements vary with team size. A large team usually requires explicit scheduling to meet the needs of all researchers, and to provide opportunities for exchange of field notes and ideas among researchers. Scheduling should allocate time to allow sufficient opportunities for researchers to learn from farmers, to discuss their findings and exchange ideas, and to prepare study summaries.

4. Activity

RRA study activities usually include advance preparation of information from existing sources, selection of subtopics, determination of appropriate levels of investigation (such as household or village levels), and selection of respondents and interview techniques.

Information from Existing Sources

If relevant information about the village to be studied is available from

previous studies or research, it should be collected as an essential part of the study. Secondary information from sources such as general, topographic, or soils maps can be useful in providing information on local conditions, and can be used in discussion with farmers about their land resources. Other secondary sources are often available to provide information on demographic trends, climate and rainfall, and crop production, prices and markets.

If the research site has no previous studies and little or no secondary information is available, a group of researchers may be sent to the study area to gather important district or village level information. At KKU, such preliminary information has become an important part of RRA, and has sometimes been supplemented by a brief preliminary survey, especially when the research team is large and little secondary information is available. Such preliminary surveys have been used, for example, prior to the general village study at Ban Hin Lad and for topical RRA studies of native swine production, dairy villages, and small-scale irrigation systems.

The type and amount of preliminary data collection depends on the purpose and context of the study. In a general village system RRA, when secondary sources are limited, a preliminary survey may be necessary to prevent the research team from spending a great deal of time trying to collect such background information. Whenever adequate records or previous studies exist, however, less time and effort is required for preliminary data collection. In Ban Hin Lad, for example, a general village RRA study, a subsequent survey, and a household record-keeping study have all provided valuable preliminary information for topical RRA studies of cooperative labor, fuelwood utilization, and food habits. Other RRA studies have utilized data from the NERAD Project and from studies of the Farming Systems Research Institute's Crop-Livestock Integrated Farming Systems Project.

Selection of Subtopics

The establishment of study subtopics keeps inquiries focused on appropriate subjects. Subtopics are agreed upon at a formal or informal meeting of participating researchers, depending on the size of the group. Various questions or subtopics may be raised in advance when researchers have sufficient background knowledge or hypotheses they wish to test, but subtopics usually remain rather flexible. An important advantage of RRA is its provision for adapting and revising subtopics as the study proceeds.

There are no firm rules about the number of subtopics to be used in an RRA, since the number usually relates to the particular topic under study or the hypotheses which are to be tested. But many RRA's start with relatively few subtopics, which are subsequently adjusted and developed. The "iterative" and cumulative nature of the RRA process allows questions and new subtopics to emerge during the course of the study. This flexibility makes RRA particularly useful in exploring sites or topics with which researchers have limited familiarity. All RRA studies at KKU have used this feature of RRA to adapt and modify questions and subtopics during the study. After the first morning of interviews in the RRA study of native swine production, for example, the original subtopics of environmental conditions,

ethnicity, and village accessibility were supplemented with an additional subtopic on marketing.

Examples of subtopic questions for a general village RRA include the following: (1) What are the patterns of land utilization in the village? What types of soils occur in village lands? (2) What are the original crops grown? When are crops grown? What types of cropping patterns are used by local farmers? (3) What livestock raising systems are present in the village? What types of animals do farmers find useful and how do they use them? How important are various animals? (4) What types of labor activities are conducted on village farms? When are the periods of peak labor demand? (5) What are the most significant constraints on crop production?

Subtopics for topical RRA studies depend on the topic and research framework. An RRA on the fuelwood situation and farmer adjustment, for example, contained, at various stages, subtopics such as: (1) What is the amount and condition of the forest in and around the village? (2) What is the composition of the fuelwood collected, who collects it, and when and how is it collected? (3) What types of fuelwood are used for cooking? (4) How much of what type of fuelwood is used in activities other than cooking, such as silk thread extraction, salt making, and smoke fires to protect livestock from insects? (5) What is the extent of charcoal use?

Levels of Investigation

RRA usually collects information at both community and household levels. Community level information includes general information on farm households collectively, their general activities and practices, and relationships among them, such as social organization and exchanges of knowledge, goods and services within the community and outside the community. It also includes village history and traditions. Individual household investigations usually seek a more detailed level of information about household labor allocation and utilization, the type of technology employed, and relationships between farm activities and factors beyond the control of the household.

RRA studies most often seek information on both the community and the household at the same time. Studies do not concentrate on understanding the characteristics and practices of each individual farmer. Rather, they rely on information from individual farmers and the general patterns of the entire village to develop a composite picture of the whole community. Since interviews are the primary source of information in RRA, they must be conducted to gather information on both the community and the household. Key informants are usually interviewed to gather information at the community level, and often include official leaders, leaders in various types of production, or village elders who know their village well. Individual household interviews, on the other hand, supply detailed information about that individual household, although questions may also cover practices of other members of the same community. Reliable information depends on good interviewers using good interviewing procedures.

Selection of Respondents

Since interview respondents are a primary source of information for RRA, respondent selection is a very important factor. Techniques vary according to the type of RRA used. In a general village RRA, data collection is based largely on key informants. Good key informants are often the most efficient means for gathering accurate data on a community's physical and biological characteristics, its general economic patterns and production activities, and its history and social structure. Villagers and preliminary surveys are helpful in identifying potential key informants.

Topical RRA studies, however, usually require detailed interviews of a sample of households regarding their own activities, although key informants may also be useful for answering particular types of questions. The criteria used for selecting a sample of househhold respondents vary according to the purposes of the study, but may include factors such as size of land holding, amount of family labor, number of livestock, the level of benefits from water resources, etc. These variables can be used to classify potential respondent households into categories from which respondents are chosen. Categories should cover the range of variation present in the population under study, and often may be as few as three in number. For example, a topical RRA on small-scale irrigation classified households into 3 categories, with respondents selected from each: those receiving benefits from a new water resource, those who received no benefits, and those who lost benefits from development of the water resource. This method of classification and selection of respondents is referred to as "triangulation."

The number of households or respondents interviewed depends on the clarity and variation of responses received. Further interviews are not necessary when several interviews provide clear, consistent responses. But the number of interviews also depends on the time constraints imposed on the RRA study, on the number of researchers conducting interviews, and on the size, complexity, and variation of the village under study. Generally, a research team can interview at least 2 households per day, allowing sufficient time to write and discuss field notes.

Individual vs Group Interviews

Both individual and group interviews have been used in RRA studies at KKU. Individual interviews have been found to be most suitable for exploring relationships among household resource utilization activities and external factors, and for understanding household adaptations to changing circumstances. Information obtained from individual interviews is more personal than from group interviews, and is more likely to reveal conflict within the community since respondents may feel they can speak more freely without their neighbors being present. Usually, individual interviews can be easily conducted without advance appointments.

Group interviews are often useful in obtaining village-level information, since villagers can assist each other in supplying information about the community. Group interview respondents also frequently provide an immediate cross-check on information as it is received from others in the group. When groups become too

large, however, management becomes more difficult as the group tends to break into smaller groups. When one respondent assumes too much of a leadership role, or when a locally powerful or influential person is present, the opinions of that individual may falsely appear to be the opinion of the group, reducing the effectiveness of the group interview.

Although most RRA studies at KKU have employed individual household and key informant interviews, a total of six studies have used a combination of individual household and group interviews. Sometimes individual interviews are converted to group interviews when a number of neighbors come to listen to the interview.

Interview Techniques

Interviewing techniques become very important in RRA, since effective techniques result in clearer and more relevant responses. The following techniques are good examples of those covered in RRA training sessions organized for KKU researchers.

a. *Questioning*. Interviewers are required to use questions beginning with who, what, where, when, why or how (known as the "six helpers"), and to avoid questions which can be answered by yes or no. Leading questions are also not allowed, since farmers sometimes tend to tell the interviewer what they think he or she wants to hear.

b. *Probing*. Probing is a kind of continuous questioning. Farmers' responses are, in turn, used to pose new questions. This helps the questioning go more smoothly and makes the farmers feel more a part of the interview process. Probing can often help reveal unexpected information and new subtopics.

c. *Protocols*. To add coherence to interviews and to prevent respondents from becoming confused by them, the research team should follow interview protocols. Protocols should determine who is to lead the interview, who is to conclude it, how and when people can interrupt the questioning of another team member, and how interviews will be terminated if it becomes necessary. They should also specify who will question on various subtopics and the order in which subtopics will be pursued, as well as when it is necessary for all team members to ask particular questions to ensure completeness. The team must also reach a prior agreement on what language to use, when multiple options exist, and how to make the questioning as natural as possible. All RRA studies at KKU have used protocols, but the number and specificity of protocols depends on the size of the research team. When interview teams are small, the team can reach agreement more easily on how they should proceed; fewer protocols are therefore required.

Since Northeastern Thais have their own regional dialect, it is preferable to conduct interviews in this dialect, in order to help the respondents feel more comfortable in answering questions. Thus, every RRA study at KKU usually has at least one researcher who can speak Northeastern Thai. Various other minority languages are also spoken in the region, and when no researchers who can speak a particular language are available, it is sometimes necessary to use interpreters. While an interpreter can be either an adult or a youngster, it is important that he or

she have sufficient education and interest in the topics discussed to fully interpret the respondents' answers.

Every researcher is required to take notes on each interview in the RRA to ensure completeness in questioning and data collection. Notes are also used to record additional information obtained through observation. Interview notes usually include the question, the answer, and the respondent's reactions. Respondents should be told before the interview that notes will be taken, and a small, unimposing notebook is desirable. If tape recording is necessary, permission should be obtained before the recording begins.

The location of an interview is also important, since it can greatly influence the atmosphere of the interview. A private location, free from outside disturbance, is desirable, but it should also be convenient so that respondents do not feel the interview is causing them to waste a lot of time. For example, respondents may be watching livestock or doing some other form of work during the interview. It is also very helpful if the interview is conducted at a location where the research team can visually observe aspects of the topics under discussion. This helps team members in formulating questions and in understanding respondent answers. Interviews are often first conducted at a farmer's residence, since this is often most convenient. But later, the interviews may move to a farmer's field, animal shed, water resource, or other sites where specific activities are performed. On-site interviews may not be used if responses are sufficient at the farmer's residence, or when research time is limited or sites are very distant (e.g., 6-7 kilometers by foot).

"Fine Notes," Discussion, and Report Preparation

After a fieldwork session is completed, RRA research team at KKU usually prepare a set of "fine notes" – detailed, more clearly written, *consolidated* field notes to be used by the whole team as a basis for further discussion, analysis, and report preparation. These notes are often completed the same day the interviews were conducted, to avoid confusion or memory loss.

The consolidated field notes can be structured either in the chronological order in which interviews occurred, or according to the topics, subtopics, and questions established prior to and during the fieldwork. Both formats have their advantages and disadvantages. Chronological order usually captures more detail from a given interview, but makes it more difficult to determine if each subtopic or question has been adequately covered. Subtopic and question order helps determine the relevance and completeness of the data collected. The choice of format may depend on the topics under study or RRA time constraints: chronological order may be more appropriate when the study requires a great deal of detail, whereas subtopic and question order is recommended when data needs are more general or when time constraints require rapid discussion and conclusion of the RRA.

The assignment of note preparation tasks has usually followed one of three basic patterns. The first pattern requires the joint participation of all team members in note preparation. Although only one person actually writes the notes, all are present to discuss each point. While this pattern provides extensive opportunities for team consultation and discussion, it can be very time-consuming. The second

pattern occurs when one person, usually the person with the most complete set of field notes, prepares an initial draft of the notes. Other team members then edit the draft, adding missing information and detail from their own notes. This pattern manages to capture most of the detail while requiring less researcher time. The third pattern has all team members submit their field notes to one researcher, who combines them into a single set of notes. This method is most feasible when the team size is small. Researchers find this method very convenient, unless they are the one who must combine the notes. RRA studies at KKU usually use the first pattern while in the field, but shift to the second pattern to prepare the final set of notes.

After a set of notes has been prepared, they are used as the basis for a discussion session, during which all study findings are discussed, and conclusions are articulated and agreed upon by team members. An overhead projector, transparencies, and a tape recorder are helpful during this session, to facilitate the discussion and record findings and conclusions for use in final report preparation. A summary of the conclusions of this session will be circulated to verify research team consensus. The designated report writer will then prepare a draft final report from the results of the discussion session, the consolidated notes, secondary sources, and field aids such as maps, data tables, etc. The draft is then circulated and refined until it is ready for final publication. This final step has often been found to be rather time-consuming, so that some RRA studies have yet to publish their final reports. Thus, preliminary summary findings are often provided to activities requiring more immediate input from particular RRA studies.

CONCLUSION

Experience at Khon Kaen University has shown the value of using rapid appraisal techniques for many types of research needs and has also begun to reveal some of the lessons of doing RRA in different ways – with different criteria for site and respondent selection, different forms of organization, various combinations of activities centering around semi-structured interviewing, interviewing of both individuals and groups, increasing experience in interviewing techniques, information sharing, recording and analyzing, and reporting. The present report has aimed to assemble some of this experience in order to share it among RRA practitioners at KKU and among those practicing or beginning to practice RRA elsewhere in the world. We also hope that other RRA practitioners will undertake similar efforts to share their experience so that we all may make further improvements in doing RRA.

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Appendix 1

Number of Projects Classified by Duration of Field Days, Summary Report Days and Report Preparation Days

Period	Field Days	Summary	Report
3 days	11	-	-
4-5 days	4	-	-
6-10 days	2	2	-
11-20 days	2	-	-
21-30 days	-	10	8
2 months	-	2	1
3 months	-	-	1
Over 3 months	-	-	1
Uncompleted	-	4	8
No data available	-	4	-

Appendix 2

RRA Projects in KKU

Title	Type	Members	Location	Duration
Ban Don Chang RRA	VS	26	Khon Kaen	2d/na/3m
Hin Laad Fuelwood Consumption	T	2	KKU/FSR	3d/1m/2m
Natural Food Resources	T	3	NERAD	10d/1m/2m
Cooperative Labor	T	3	KKU/FSR	4d/1m/2m
Ban Hin Laad Village RRA	VS	28	KKU/FSR	2d/na/i
Dairy Production	T	10	Khon Kaen, Chaiyaphum	3d/3m/i
Crop and Dairy Calf	T	4	FSRI	1d/2d/1m
Traditional Pig Raising	T	12	Surin, Nakonphanom	10d/1m/i
Plant and Animal Relationship	T	5	FSRI	2d/1m/1m
Farmer Conditions: Peanut after Rice	VS	6	Surin	5d/7d/1m
Farmer Adjustment to Flood Stress	VS	5	Srisaket	3d/1m/i
Small Scale Irrigation System	T	3-5	Khon Kaen	18d/na/1m
Animal Science Training RRA	T	29	Khon Kaen	2d/1m/i
Agroecosystem Analysis in Villages Related to Peanut after Rice Activities	VS	18	Khon Kaen	10d/na/na
Food Habits	T	2	KKU/FSR	3d/45d/i
Conditions for Cattle Raising	T	5	Srisaket	3d/1m/i
Study of Urea Treated Straw For Cattle Raising	T	6	Chiangmai	2d/21d/i
Fuelwood Situation & Adjustment	T	7	NERAD	4d/45d/3m
Trees in Paddy Fields	T	5	NERAD	4d/21d/2m

Notes:

Duration : days in field/report preparation time/final report writing
- na : not available
- d : day
- m : month
- i : incomplete

KKU/FSR: KKU/FSR project village
FSRI : Farming System Research Institute Village
NERAD : Northeast Rainfed Agriculture Development Project

Appendix 3

RRA Training Participants by Discipline

Discipline	Number
Biological & Physical Sciences	51
Agronomy	13
Animal Sciences	14
Biology	2
Entomology	4
Fishery	2
Food Sciences	1
Forest Soil	3
Horticulture	1
Plant Breeding	4
Seed Technology	1
Soil Sciences	4
Veterinary Medicine	2
Social Sciences	16
Agricultural Economics	4
Agricultural Education	2
Anthropology	2
Economics	3
Education	2
Social Work	2
Sociology	2
Sociological Linguistics	1
Others	15
Accounting	4
Physical Geography	1
Law	1
Library Sciences	2
Nutrition	6
Public Health	1
Total	84

Appendix 4

Summary of RRA Activities

Activity	Number
Type of RRA	
Village system	5 (26)
Topical	14 (74)
Purpose	
Training	5 (26)
Study existing systems	14 (74)
Duration	
Field day	
3 days	11 (58)
> 3 days	8 (42)
Summary Report/discussion	
1 month	12 (63)
> 1 month	3 (16)
no data	4 (21)
First Draft	
1 month	8 (42)
> 1 month	3 (16)
no data	8 (42)
Number of Subtopics	
5 subtopics	11 (58)
> 5 subtopics	5 (26)
no data	3 (16)
Information Sources	
2 types	11 (58)
> 2 types	8 (42)
Type of Interview	
Individual	13 (68)
Individual & group	6 (32)
Present Report Status	
Summary report finished	4 21)
First draft finished	5 (26)
Final report finished	10 (53)

Activity	Number
Study Location	
One village	11 (58)
Multiple villages	8 (42)
Type of Village	
Project village	11 (58)
Non Project village	8 (42)
Conceptual Tools Used	
5 types	7 (37)
> 5 types	12 (63)
Report Writing	
By 1 person	14 (74)
By many	5 (26)
Team Size	
Small	6 (32)
Big (4-20)	9 (47)
Very Big (exceeds 20)	4 (21)
Information in Advance/ Preliminary Survey	
Yes	11 (58)
No	8 (42)
Number of Interviewees	
10 households	9 (47)
> 10 households	10 (53)
Interview Place	
Farmer's home	8 (42)
Home and field	11 (58)

Appendix 5

The Relation Between RRA Activities and Team Size

	Total	Very Big	Big	Small
Purpose				
Training	5	4	1	-
Research	14	-	8	6
Type of RRA				
Village Systems	5	3	2	-
Topical	14	1	9	4
Number of Subtopics				
1-5	11	2	7	2
6-10	2	-	-	2
11-20	2	-	-	1
Unknown	4	2	1	1

Study Location

	One village	More than one
Field days		
Up to three days	9	2
More than three days	2	6
Number of Respondents		
Up to ten respondents	7	2
More than ten respondents	4	6

Type of Village and Information in Advance

	Project Village	Non-Project Village
Type of Advance Information		
Two types	8	3
More than two types	3	5

Number of Subtopics and Conceptual Tools

	Five Subtopics	More than 5 Subtopics
Number of Conceptual Tools		
Four types	2	5
More than four types	9	3

FUELWOOD SITUATION AND FARMERS' ADJUSTMENT IN NORTHEASTERN THAI VILLAGES[1]

Sukaesinee Subhadhira, Nongluk Suphanchaimat, Suriya Smutkupt, Suchint Simaraks, Weera Pakuthai, Kalaya Suphanpesat, and Panada Petchsingha[2]

INTRODUCTION

Rapid deforestation has occurred over the past twenty years in most of the world's tropical and subtropical areas. Fuelwood needs are not the principal cause of this deforestation, but once forests become scarce in rural areas, fuelwood and charcoal become more difficult to obtain. This can have negative effects on both the remaining trees and the lives of rural inhabitants, depending on how rural society adjusts to the changes. This article discusses the adjustments being made at the village and household levels in Northeast Thailand. In many areas fuelwood shortage is already very serious and villagers have had to adjust their usage of fuelwood and have been looking for solutions to this ever increasing problem.

This topic was investigated using a combination of various rapid rural appraisal (RRA) methods in eight villages of four provinces (Khon Kaen, Nakhon Phanom, Roi Et and Srisaket – see Figure 1). Sites were chosen to represent a range of fuelwood availability and can be grouped into four stages of fuelwood situation as fuelwood availability changes. Inferences on the stages relate to factors such as proximity to forests, methods of acquisition, usage of fuel and future plans for fuelwood supply.

METHODOLOGY AND CONCEPTUALIZATION

The major research methods employed in this study belong in a group known as rapid rural appraisal as practiced by interdisciplinary teams. Semi-structured interviewing with key informants and individual farmers and farm families was used throughout the study. Other rapid appraisal techniques used were observation (including use of sketches and photography), the use of indicators, and direct but simple measurement techniques for the weight, volume and size of fuelwood.

Initial conceptualization was done and preliminary interviewing carried out in three villages near Khon Kaen University in Northeast Thailand in order to firm up the first set of "subtopics" (issue areas, hypotheses and general questions), con-

1. The article is based on field study conducted in 1984 in Northeast Thailand.
2. All authors are members of teaching staff at Khon Kaen University, Khon Kaen, Thailand.

Figure 1 Map of Northeast Thailand Marked to Show Approximate Locations of the Eight Villages Studied by the RRA Reported in this Article.

cerning adjustments to fuelwood availability. The initial set of subtopics involved the following:[3]

1. The size and condition of forests and trees in the village, near the village and far away from the village from which fuelwood is obtained. It was reasoned that these affect the availability of fuelwood.

2. Acquisition of fuelwood in terms of where, when and how fuelwood is obtained and by whom. These would reflect both availability and adjustment to it.

3. The use of fuelwood, especially in cooking, which is a major activity of any household, but also other usages, such as in silk thread extraction, and fire for livestock to ward off chill and dampness and keep away insects with smoke. We were interested to see what change had taken place in these activities, and how much of it related to changes in fuelwood availability. Charcoal usage was another subtopic, especially the extent to which it may have been purchased as a substitute for fuelwood.

During the conduct of the RRA, this list of subtopics was continuously refined or revised. The team also learned some lessons about subtopic revision, especially that it was important not to drop any subtopic too soon. When the team found out from initial interviews (in a fuel-scarce village) that fires were not built for livestock, they almost decided to drop this subject, only to find out as the RRA proceeded that in some villages fires for animals consumed a larger volume of fuelwood than cooking, and also underwent important changes as fuelwood scarcity increased.

Additional subtopics that arose during the RRA included (a) the types of stoves and their change over time, (b) the habit of putting fire out after an activity, (c) the local units of fuelwood referred to by villagers (the size of an arm, leg, finger, etc.) and the uses of various sizes, (d) sources and organization in fuelwood acquisition, (e) the species of fuelwood used for various purposes, (f) fuelwood price, (g) "social" fires at morning and evening and (h) several items used as indicators from observation such as types of fences, wood used to shore up paddy dikes, etc.

SITE SELECTION AND THE CONDUCT OF THE STUDY

The initial interviewing took place in three villages near Khon Kaen University (Village 3A, 3B and 2A in Figure 1). The main study trip was then conducted with seven staff members from Khon Kaen University and two resource persons. Five villages in three provinces were studied on the main trip. The selection of villages followed the "triangulation approach," where variability of major factors influencing decision-making in terms of fuelwood was taken into account. For example,

3. What appears in this list is not what interviewers directly asked, nor is the information in the report what villagers directly replied. For example, the "forest 10 kilometers from the village" had a name, a direction, a description of who went there, when they went, etc. Semi-structured interviewing was used, starting with general discussion on a subtopic, then probing in greater and greater detail. This wealth of detail was then gone over repeatedly by the team, in order to analyze, understand, to revise questions, and finally, to synthesize, and summarize for the final report.

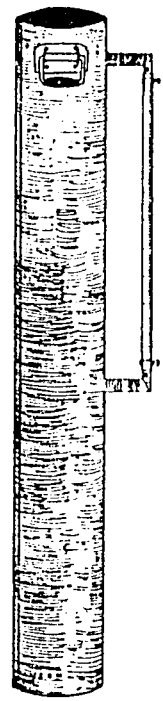
provinces were chosen for variation on amount and type of natural forest. Villages were selected for distance from the forest as well as access to the closest market town. Households interviewed were intentionally varied to cover large, medium and small land holdings. Very extreme situations, however, were generally avoided or treated as being in a different class, in order to get as representative situations as possible on a short study.

The triangulation technique was also applied to the research methods employed, i.e. methods as well as sources of information were intentionally varied to improve reliability of findings. Secondary sources were consulted as well as pre-existing survey information from the Northeast Rainfed Agriculture Development Project. These provided information for comparison and were also used in initial selection of the villages. Key informants were interviewed upon arrival to assess the situation at the village level and to identify households to be interviewed. More villages and households were intentionally identified than could be visited or interviewed. In case a village could not be reached or an interview did not go well there would be others on the list. For households, selecting from a larger group helps to offset any bias in the households recommended by key informants. Bias is also reduced by not making advanced announcement about the visit or the subject of study, especially important on a sensitive issue such as fuelwood where some types of acquisition may be illegal.

Direct measurement of volume and weight of fuelwood was done by asking villagers to set aside the amounts of fuelwood typically used for each activity. This provided some quantitative information and served as a crosscheck on what interviewees said about the adjustment in relation to fuelwood scarcity. A simple locally made cylindrical aluminum gauge (Figure 2) allowed for fuelwood volume measurement by submerging the wood in water and reading the increased volume off a scale (adjusted after each reading for water absorbed by the wood). This task was usually carried out by the resource persons while interviews were being conducted by the rest of the team. A research assistant and a driver were sent back to the first three villages to repeat this exercise after the trip.

The main field trip lasted four days. The team was divided into two sub-teams interviewing different households but on the same subjects agreed upon each day. Each sub-team also pursued leads of its own that occurred during interviewing. Sub-teams reviewed interview notes after each interview and the whole team met at the end of each day to exchange findings and to revise questions for the following day. Sub-team composition generally remained the same, in order to increase sub-team efficiency, although some changes were made to improve team composition. The last afternoon was spent working on writing up the field notes. Upon return to Khon Kaen field notes were further refined, circulated and corrections made. The RRA team members then decided to divide up the task of writing up the report based on a jointly-decided outline. Due to the format taken, however, there was much repetition among sections and the sections were far too long, thus severe editing was needed before the present report could emerge. In retrospect, it is felt that a smaller team would probably have made the report writing easier and would have been more productive per person-hour.

Figure 2 Aluminum Gauge for Measuring Volume of Objects by Submergence



Note : Gauge is about 1 meter tall and 18 centimeters in diameter, filled with water to above the bottom of the scale. Scale is clear plastic tubing, calibrated to 1/10 liter.

THE STAGES OF FUELWOOD SITUATION

Situations indicating different degrees of fuelwood shortage can be grouped to represent four stages: (1) fuelwood abundance; (2) early stage of awareness of fuelwood scarcity; (3) presently facing serious fuelwood problem; and (4) potential recovery after a long period of serious fuelwood scarcity. However, this approach has limitations. These stages are devised in order to group the studied villages for comparison purposes, but a larger study might have revealed a better way to classify the overall fuelwood situation. More importantly, fuelwood problems in villages which have been grouped together are not identical nor do they represent the exact same degree of scarcity. They are as close as possible in terms of their shared problems within the villages studied. The stages are useful, nonetheless, for comparison, for inferring time process, and for defining target groups/areas for possible policy recommendations. We will first describe the general stages and introduce the studied villages assigned to each stage, then discuss the particular adjustments.

Stage One: Abundance

Villages in this stage have no fuelwood shortage primarily because there are nearby natural sources of fuelwood such as public forests or village common forest areas. Some crop fields are in fact still inside the forest areas. Villages falling within this category are Villages 1A and 1B in Nakhon Phanom province (see Figure 1). The abundance of fuelwood is to the extent that villagers say they don't have to economize. The most striking indicator that wood is still plentiful in these areas is the use of whole hardwood tree trunks to support paddy dikes.[4] Fences around the house compounds in both villages are also made of sizable logs (6-7 inches in diameter). Species and size preferences are strong for fuelwood usages. Hardwood of good size is chosen over smaller branches. Softwood is considered very inferior – it burns too fast and produces too much smoke. People do not feel very possessive about trees or wood in these areas. It is not uncommon for villagers to ask for relatively large logs from their neighbors. Villagers not only make charcoal for sale but also sell fuelwood to outsiders who often come around from places where fuelwood is scarce.

Due to the proximity to fuelwood sources, fuelwood collection is not a major activity nor is it a time-consuming task. It is usually combined with other activities by household members who go out to work in the fields. If time permits, logs may be stored under the house for convenience, but there is no need to plan ahead – adequate amounts can easily be gathered with minimal effort. Since fuelwood is easy to obtain villagers do not feel the need to plan for the future, although they have heard of problems in other villages and realize that their village may eventually have to face such problems. However, they do not foresee fuelwood shortage

4. In Northeast Thailand soil is usually quite crumbly, making paddy dikes difficult to keep in shape. Shoring them up in places most likely to wash out saves labor and reduces risk to the rice crop.

occurring in their lifetime nor even in their children's generation. (This is not to say that they are correct in their assessment of how soon they may face such problems.)

Stage Two: Beginning Scarcity

In this stage, villagers already feel the pressure of fuelwood shortage and begin to adopt fuelwood-saving measures. Most forest areas have been converted into other forms of land use or are no longer freely open to villagers. Major sources of fuelwood are presently limited to village common woody area (*khok satarana*) or villagers' own land. Village 2A, in Khon Kaen, and Village 2B, in Roi Et, are in this category (Figure 1). Fuelwood saving is consciously practiced. No longer are logs used to shore up paddy dikes. In general, the size of fuelwood used is smaller compared with that in villages in stage one. Villagers also use many types of wood regardless of species including some which were previously considered taboo. Sense of ownership over wood becomes stronger in villages in the second stage of fuelwood problem, although dry branches in privately owned fields not yet gathered in piles by the field owners can be collected freely by anyone. To chop sizeable branches from trees, however, permission must usually be obtained.

As far as fuelwood collection is concerned, the pattern is still "collect when needed," and still usually done along with other activities. No one family member is responsible for the task, and no elaborate planning is involved. Charcoal is made mostly for domestic use, especially for use during the rainy season, but not for commercial purposes. Trading for charcoal exists, however, especially among friends and relatives.

Villagers also begin to think about solutions to future problems by looking for new sources of fuelwood farther away than the present ones. Some have even thought about substitutes and have considered options to fuelwood (one family mentioned commercial gas).

Stage Three: Serious Scarcity

This is the stage when fuelwood scarcity becomes acute. All nearby forests have been converted into agricultural land, and fewer trees are left in the fields. Villagers have to hire a truck to get fuelwood from faraway sources, or make long trips with pushcarts, facing the risk of being arrested since tree cutting on public land is considered illegal. (In Thai law, some species are also defined as "valuable" and legal permission must be obtained from government offices to cut them even when they naturally occur on private land.)

Villagers facing this stage of fuelwood scarcity are those in Villages 3A and 3B, in Khon Kaen, and Village 3C, in Srisaket (Figure 1). Although the degrees of shortage in these villages are not the same nor the types of problems identical, they are all fuel-short and they all have adopted fuelwood-saving measures. Fuelwood availability became a problem in Village 3C long before the other two villages. At Village 3A, where the main occupation is non-farm employment in town (Khon Kaen), about half of the households use electric rice cookers when non-glutinous

rice is made (not very often since glutinous rice remains the main staple). Electric burners are sometime used in cooking dishes to go with rice. Fuelwood is still the main fuel for steaming glutinous rice. Some better-off households have adopted gas stoves instead of using fuelwood and charcoal. Fuelwood shortage has forced villagers in this stage to abandon some activities requiring fuelwood (discussed below, under Fuelwood Usage).

Fuelwood collection for villages in stage three is a major activity involving careful planning and organization. It is a group activity. It is time-consuming and expensive in terms of labor requirements and cash costs. These villages are highly dependent on fuel sources outside or far away from their own villages. Fuelwood collection in large quantity is usually done during the dry season when agricultural activities are low. Risk of being arrested significantly affects planning. The use of pushcarts, for example, is very time-consuming, but is less risky than hiring a truck. Villages in this stage usually have little or no choice in terms of size and species of fuelwood used. People use whatever shapes, sizes and species of fuelwood they can find. One very strong indicator of wood shortage is the forms of fire starters used by the villagers. In the first two stages, large dipterocarps still exist nearby and villagers carve a hole at the base of the tree near the root and simmer it with low heat to obtain resin which is used as a fire starter. But in the stage three villages large trees are scarce and fire starters take the form of old rubber slippers, pieces of old tyres or kerosene.

Villages in this stage of fuelwood shortage have highly developed concepts of property rights over wood. Rules are strictly observed and fines are imposed in cases of violation. For example, in Village 3A, permission must be obtained to use any fresh or dry branches on the trees, although small dry branches found on the ground can be picked up without asking permission. In Village 3C in Srisaket, however, permission must be obtained regardless of the size, type or location for any wood one wishes to collect from other people's fields.

Awareness of the need to plan for the future is strong in these villages. Villagers interviewed have described their plans which include planting fairly fast growing trees such as *Phyllanthus polythyllus*, *Samanea samans*, *Euginia cumini*, and *Leucaena glauca*. Some families have adopted substitutes such as gas and electricity. Their planning reflects a more self-reliant approach, beyond looking for fuelwood sources farther away from the villages, the solution foreseen by villagers in stage two.

Stage Four: Recovery

This is the recovery stage, but we do not know whether other villages with fuelwood problems will do as well as this in the future. In Village 4A (Figure 1) the various degrees of fuelwood scarcity described above were experienced a long time ago. Present sources of fuelwood are primarily trees in villagers' own fields. Villagers told of their experience of buying fuelwood as far back as thirty years ago. *Phyllanthus polythyllus* is planted on paddy dikes everywhere but not on all dikes in any one paddy. Some of the paddy dikes are left for grass which is an important feed for buffalo and cattle, especially during the rice growing period when animals

are not allowed in rice fields. In villages where there are forests nearby, animals are taken there to graze, but in stage four villages there are no such forest areas. Almost all trees in the fields are reportedly planted and managed, and the concept of property rights over trees is the strongest among all the villages covered in this study.

FUELWOOD ACQUISITION

Methods of fuelwood acquisition have changed through time as a result of the increasing scarcity of fuelwood. A major finding of this study is that the higher the local scarcity of fuelwood, the more *organized* (and costly) fuelwood acquisition has become. In villages under stage one of fuelwood situation as classified above, trees are everywhere. Many of the paddy fields are still inside the forest areas. For household usage, fuelwood collection is done whenever the need arises, mostly combined with other activities. One village household interviewed uses an ox-cart to transport fuelwood from their fields, about a kilometer away. One ox-cart load of wood takes approximately two hours to collect. Whole trees may be felled and large logs stored under the house. Closer to the village, trees are scarcer but still relatively plentiful. A single person can collect several days' supply of fuelwood in only an hour or so. Fuelwood in stage one is so plentiful that, in villages with access to transportation routes, people perceived fuelwood selling and charcoal making as a means to increase their income – view long gone in other villages in later stages of fuelwood problems. Only larger live branches of hardwood are used in charcoal making. (Such branches will generally not be cut in fuelwood-short villages because they support the smaller branches which can be more frequently harvested).

In the stage two villages studied, forests in or near the villages were depleted relatively recently. Fuelwood acquisition became more difficult but high organization of the activity is still not needed. New paddy lands all have rather high tree density. Responsibility for fuelwood collection is not assigned to any one particular family member. It is usually combined with other tasks in the field. In Village 2A, the dwindling of forests has forced villagers to use fuelwood from trees on their own land and the situation has become worse since a nearby forest, the major fuelwood source for the village, became established as a "forest village settlement" under a program run by the Royal Forestry Department about five year ago. When charcoal is used, it is because of preference, not because of fuelwood scarcity.

Village 2B shares many characteristics although it is in a slightly better position. In general, this village has more standing trees in paddy fields and the concepts of rights over trees are not as strong as in Village 2A. Forested areas were significantly thinned about 20 years ago and villagers have had to travel longer distances for fuelwood, although most is still from their own land. In both villages, thus, the major source of fuelwood is no longer public or natural forests but trees in one's own paddy lands which are still undergoing a transitional process. Most villagers carry fuelwood back on their shoulders but pushcarts are also used in transporting fuelwood, an indication of the longer distance for fuelwood collection. Although fuelwood can still be obtained by those other than the field owner, even

by those from other villages, permission is required and only small branches can be asked for. A clear indicator that people in these two villages are facing a less plentiful situation compared to those in stage one is the fact that villagers are more aware of and worried about future problems. They see acquisition as becoming increasingly difficult, involving longer distances, more time-consuming, as well as more risk of being arrested. One farmer in Village 2B even speculates that he foresees fuelwood purchasing as a possibility within the near future.

Acquisition of fuelwood for villages in the third stage of scarcity becomes highly organized. For Village 3A in Khon Kaen villagers have to travel as far as 45 kilometers to another district for fuelwood, although some of it can be obtained from closer places 3-30 kilometers away. People in Village 3B began to face problems over 40 years ago when upland crops arrived in the area and new lands were opened at the expense of nearby forest. Fuelwood had to be collected from farther distance. About 14 years ago villagers began to collect fuelwood from other village areas, all about 8 kilometers away. Present sources of fuelwood are as far as 50-80 kilometers away. Village 3C in Srisaket is another village in this stage having to rely on faraway sources of fuelwood – in this case, about 10 kilometers away, reachable by pushcart. Pushcarts have to be used and people usually have to travel at night, since government officials in this area have been very strict and it is too risky to hire a truck or use the roads. Pushcarts are less conspicuous and easier to use off the road between home and the forest.

The long distances between the village and the forests make fuelwood acquisition a time-consuming and expensive activity. A whole day must be set aside for the purpose. People travel in small groups, composed of representatives of whichever households need to get fuelwood at the time. For pushcart trips, it is usually women who assume the burden. Most fuelwood, however, must be obtained from places too far to reach by pushcart, and both men and women go on such trips. A pick-up truck is usually hired by a group of villagers who will spend a whole day helping each other to bring back as much wood as possible to make the trip worthwhile. The group shares whatever is brought back from each trip. The group also shares whatever costs are incurred including sharing of the fine if arrested. Village 3B at the time of the interviews had just had an arrest and villagers had not since used a truck to go for fuelwood, for fear of being arrested. The local truck owner has also refused to go since the arrest, when his truck was confiscated. The same thing happened to villagers in Village 3A five years earlier and the truck was also confiscated. In both cases, group members contributed toward the payment to get the truck back.

Fuelwood scarcity leading to acquisition from faraway locations not only forces villagers to be more organized when obtaining fuelwood but also to develop rather accurate estimates for the amount of wood needed per period of time. In Village 3A, for example, villagers said a pushcart load of fuelwood lasts about a month whereas 2-3 trips by truck will be needed for basic fuel needs for a year. This estimate is based on an average household size of 4-5 members. The ability to calculate the rate of fuelwood used allows villagers to schedule their fuelwood collecting trips in light of other activities. Unlike in stage one and two where children are sometimes sent out to collect fuelwood near the house, adults are

always responsible for the task in villages in stage three. The longer distance implies less safety and the larger amount of wood means stronger persons are needed.

Scarcity also means that preferences are no longer asserted over wood size, type and species used in various activities. Roots and stumps previously left in the fields are now brought home as fuelwood. Even taboo trees are used. Fresh branches from trees in one's own fields are also cut. (These must be dried out first which is why already dry or dead branches are usually preferred.) In earlier stages, charcoal is used as a social status indicator or simply because of preference, or for convenience in the wet season, and it is mostly home-made. In stage three villages, however, charcoal is purchased from outside and used out of necessity, at times when enough fuelwood cannot be obtained. Purchase of fuelwood pieces or whole trees also takes place in these villages and villagers have rather accurate estimates for the value of a given tree. They also have more explicit plans of what they want to use their trees for and when they plan to use them. In Village 3A a whole dead tree can be bought and the buyer has a pretty good idea how long it will last and how much charcoal he will have to supplement it with.

Villagers in stage three are acutely aware of the increased scarcity of fuelwood and fear that they will not be able to obtain fuelwood from outside sources much longer. Many interviewed not only have thought of planting trees but have in fact begun to do so. Most of the trees planted are of multiple purpose type. They usually have parts (e.g., leaves, flowers, or fruits) which can be used as food or for medicinal purposes. But the need for fuelwood is clearly a main reason influencing the timing and number of trees planted.

Village 4A in the recovery stage acquires fuelwood primarily from villagers' own lands. Almost all trees in the fields have been planted and managed to ensure fuelwood availability. Fewer types and species of trees are planted but with a larger percentage highly useful for fuelwood such as *Phyllanthus polythyllus*, *Samanea samans* and *Leucaena leucocephala*. The concept of property rights over trees is the strongest among all villages studied. Since severe fuelwood shortage started approximately 30 years ago, villagers have been experimenting with various solutions for a long time. The main conclusion reached by some over two decades ago is that trees must be planted unless other forms of fuel can be obtained. Most also reached the conclusion that their own trees would finally become their only source for fuelwood. One household head even claims he is presently self-sufficient in fuelwood, from trees on his own land even though his holding is rather small.

FUELWOOD USAGE

Fuelwood in Production

The most common usage of fuelwood in terms of frequency is in cooking (usually twice a day). Although both fuelwood and charcoal are used, fuelwood is the preferred fuel for its lower monetary cost where it is available, and the ability to change or maintain temperatures quickly and easily by adjusting the pieces of wood. Sizeable hardwood is preferred, although any species and size will do where

wood is scarce. The best quality fuelwood used (such as *Cratoxylon formosum* and *Shorea obtusa*) is found in the two stage one villages. In stage two, villagers still have access to hardwoods such as *Erythrophleum succirubrum* and *Dipterocarpus obtusifolius*. People in stage three villages, however, have used *Samanea samans* and *Eugenia cumini* or even cassava stems, coconut shells and dry kapok pods as fuel for cooking. Village 4A which represents the recovery stage uses *Phyllanthus polyphyllus* and other planted trees to meet fuelwood needs.

During the study, some of the households interviewed at each village were asked to set aside piles of fuelwood required for cooking their meals in one day. (Whatever person actually did this regularly was asked to do it for us.) The piles were measured for weight and volume and number of family members recorded for each household. The results are shown in Tables 1 and 2. The sample size is small thus the overall average figures are at best indicative and when broken down into 4 stages are even less meaningful. Nevertheless, by combining information from these tables with information from observation and interviewing (the "triangulation" method) it is possible to draw some fairly confident conclusions about use of fuelwood for cooking under conditions of increasing scarcity.

Most important, the RRA found that there is no reason to believe the amount of fuelwood used for cooking is very much reduced with increasing fuelwood scarcity, at least under the various conditions of fuelwood availability now present in Northeast Thailand (see Table 2). Other factors better explain the variation found (and there is no reason to believe these array themselves in such a way in the sample as to hide a major relationship between increasing scarcity and decreased usage for cooking). Principal among the causes of variation are sociocultural factors.[5] In Village 1B, for example, even though fuelwood is plentiful, usage for cooking is fairly low. For sociocultural reasons cooking is done at most times in a kitchen up on the raised house, where danger of the house catching fire is high. For this reason, villagers here carefully tend all cooking fires, putting the fires out whenever not needed. This results in fuelwood usage rates for cooking that are much lower than expected, but not for reasons of conserving fuel. In fact, fuelwood uses for purposes other than cooking are very high indeed (discussed below). As Table 3 shows, household size is another factor having some effect on usage. The larger households tend to use less fuel per person. Household size is also affected by cultural considerations. Cultural factors also affect the kind of food cooked and the way it is cooked, accounting for further variation.

By combining the information in Tables 1 to 4 (especially Tables 2 and 4) with other information from interviewing, one can conclude that the weight of fuelwood used for cooking does not seem to decrease much with increasing difficulty of getting fuelwood, but wood density does tend to decrease on average (and volume increase) in fuel-scarce situations, as the variety of fuelwood species and materials increases. Although certain hardwoods may be preferred in abundant areas, in-

5. Part of the variation found among households is because of measurig only one day's fuel – the sizes and shapes of the fuelwood pieces are highly varied. Nevertheless, it was clear to the team that this could not account for the majority of the variation found. The majority of the variation occurs for other reasons, discussed in the text.

Table 1 Fuelwood Usage for Cooking (Measured from Samples Set Aside by Household Cooks as Representing One Day's Needs)

(Stage, Village, Household)	Pers/HH	Weight/ Day (kg)	Wt/Pers/ Day (kg)	Volume/ Day(10^3cc)	Volume/Pers/ Day(10^3cc)	Density (kg/10^3cc)
STAGE 1	7.5	4.5	.60	5.4	.72	.84
Village 1A	8.5	5.2	.61	5.6	.65	.93
HH No 18	7.0	5.3	.76	6.7	.95	.79
HH No 19	10.0	5.0	.50	4.4	.44	1.13
Village 1B	6.5	3.9	.60	5.2	.80	.75
HH No 20	7.0	4.4	.63	5.5	.79	.80
HH No 21	6.0	3.4	.57	4.9	.82	.69
STAGE 2	6.4	5.8	.91	6.9	1.08	.85
Village 2A	6.0	5.4	.90	6.2	1.03	.88
HH No 6	6.0	7.3	1.22	7.7	1.28	.95
HH No 7	4.0	5.8	1.45	5.2	1.30	1.12
HH No 8	6.0	7.0	1.17	8.7	1.45	.80
HH No 9	4.0	1.6	.40	2.9	.73	.55
HH No 10	6.0	2.9	.48	3.9	.65	.74
HH No 11	10.0	7.9	.79	8.6	.86	.92
Village 2B						
HH No 26	9.0	8.4	.93	11.4	1.27	.74

(Stage, Village, Household)	Pers/HH	Weight/ Day (kg)	Wt/Pers/ Day (kg)	Volume/ Day(10^3cc)	Volume/Pers/ Day(10^3cc)	Density (kg/10^3cc)
STAGE 3	6.7	5.4	.81	7.1	1.07	.76
Village 3A	4.6	3.7	.81	5.3	1.12	.71
HH No 1	6.0	3.6	.60	5.1	.85	.72
HH No 2	6.0	4.9	.82	6.6	1.10	.74
HH No 3	4.0	2.7	.68	3.5	.88	.77
HH No 4	3.0	2.2	.73	3.4	1.13	.65
HH No 5	4.0	5.3	1.33	7.9	1.98	.67
Village 3B	9.2	7.0	.76	8.4	.91	.83
HH No 12	13.0	5.5	.42	7.6	.58	.72
HH No 13	7.0	7.8	1.11	10.1	1.44	.78
HH No 14	8.0	6.7	.84	8.4	1.05	.80
HH No 15	12.0	11.0	.92	11.9	.99	.93
HH No 16	5.0	5.9	1.18	6.2	1.24	.95
HH No 17	10.0	5.1	.51	6.1	.61	.84
Village 3C	4.5	5.0	1.10	8.0	1.77	.62
HH No 22	4.0	4.1	1.03	5.9	1.48	.69
HH No 23	5.0	5.8	1.16	10.0	2.00	.58
STAGE 4	6.0	5.0	.86	6.7	1.14	.74
Village 4A						
HH No 24	7.0	5.0	.71	7.5	1.08	.67
HH No 25	5.0	5.0	1.00	6.0	1.20	.83

Table 2 Average Daily Fuelwood Usage for Cooking : Stages 1 and 2 (Combined) vs Stage 3 *

(Stage, Village, Household)	Pers/HH	Weight/ Day (kg)	Wt/Pers/ Day (kg)	Volume/ Day(10^3cc)	Volume/Pers/ Day(10^3cc)	Density (kg/10^3cc)
STAGES 1 & 2 (11 HH in 4 villages)	6.8	5.4	.79	6.4	.93	.84
STAGE 3 (13 HH in 3 villages)	6.7	5.4	.81	7.1	1.07	.76
STAGE 4 (2 HH in 1 village)	(6.0)	(5.0)	(.86)	(6.7)	(1.14)	(.74)

*(computed from Table 1)

Table 3 The Effect of Household Size on Amount of Fuelwood Used for Cooking per Person

Persons in Household	Fuelwood for Cooking (kgs/person/day)
13	.42
12	.92
10	.51
10	.79
10	.50
9	.93
8	.84
7	.76
7	.71
7	.63
7	1.11
6	.60
6	.82
6	1.22
6	1.17
6	.48
6	.57
5	1.18
5	1.00
5	1.16
4	.68
4	1.33
4	.40
4	1.45
4	1.03
3	.73

$r = -.37114$

($\alpha = 5\%$; $df = 24$; $r^2 = 14\%$)

creasingly almost anything that will get the job done may be used. The increasing use of smaller branches, twigs and odd-shape pieces also contributes to decreased wood density and increased overall volume needed.

Fuelwood is also used in silk production in most sites visited. Charcoal, which is sometimes used in cooking where fuelwood acquisition has become a problem, cannot be used in some stages of silk production. Heat can be better controlled in silk thread extraction with fuelwood than with charcoal because the sticks of fuelwood can be withdrawn and re-inserted to keep the heat at a constant level. The use of charcoal results in thick and uneven thread. Fairly sizeable pieces of fuelwood are used (3-6 inches in diameter) to maintain the heat needed. Where silk fabric is made for commercial purpose such as in some households in Srisaket, the amount used in this activity, although not measured by the team, seemed more per year than that used in cooking. It would be worthwhile to find out the percentage of households in the Northeast having such high fuelwood usage in silk production.

A third production use of fuelwood is in charcoal making. In all villages visited, charcoal is often used in the rainy season when any wood not under cover is usually wet. Charcoal is easier to store in a dry place than bulky fuelwood. Farmers have to work in the fields and often cook in field huts. Charcoal is easier to carry out to field huts and is easier to keep dry there. In earlier stages of fuelwood availability, villagers make charcoal for sale as well as for their own use. But extensive use of charcoal is also considered an indicator of social status, a luxury, and some households will use it more often for this reason. In later stages, particularly in stage three, however, charcoal purchase, to varying degrees, becomes a necessity as a substitute or supplemental fuel.

Salt production is another, although much scarcer, activity found in some areas where fuelwood is still abundant. The process involves hours of boiling and simmering of salt water extracted from high salinity soil and requires large amounts of fuelwood. With increased scarcity of fuelwood the activity becomes less and less profitable and most villages have stopped the practice for quite some time. Village blacksmithing also requires a high use of fuelwood but could not be investigated in detail during the limited time of the RRA.

Other Major Uses of Fuelwood

As the study advanced in the field, it became clear to the RRA team that although cooking is the most regular and common activity in household daily life, cooking is not the most fuelwood-demanding activity. In areas where fuelwood is not seriously scarce, fires under the house for animals, and in the house compound for human usage, consume far greater amounts of fuelwood. As fuelwood becomes scarcer, the RRA found clear patterns of change in these activities.

Night fires are made for buffalo by every household in stage one villages where forests are close by. Insects abound, especially in the rainy season, and fires are kept smoldering so that the smoke will keep insects off the animals, both in the fields during transplanting and also when the animals are kept at home. The fire also keeps off dampness and chill. In Village 1B villager estimates came to about 13 x 10^3 cc for enough wood to last all night, vs. 5.4 x 10^3 cc for cooking in stage one

(see Table 1). Villagers claim that the fire also helps provide security around the house compound, especially in the cool season when risk of buffalo theft is higher. The warmth keeps dogs nearby and their reaction to unusual disturbances in the night will alert humans to intruders. This cool season usage may be more important in villages without electricity. (If the compound is well lighted at night it tends to discourage thieves.)

Fires for animals, especially in the rainy season, are still quite a common practice, even for villages with electricity. Many households in stage two villages keep the fire going throughout the night. Lesser quality wood including old fence material is used for this purpose. The addition of banana leaves and other debris helps to conserve wood and increase the smoke. Village 2A in Khon Kaen which has been grouped in this category is less fortunate. Many households have had to stop building fires for animals due to fuelwood scarcity. Those who still do it do so only in the rainy season and for shorter hours.

Fires for animals are virtually non-existent in stage three villages. In Villages 3A and 3B, the few households making an attempt at such activity use very small pieces of scrap wood and leaves and only for a few hours a night. The practice has been stopped totally in Village 3C for over 30 years. With the fuelwood recovery in Village 4A, however, fires for animals have been revived by some households using rather good size logs, about 4 inches in diameter and about 50 inches long (about 10 x 10^3 cc vs. 6.7 x 10^3 cc used for cooking by these households – see Table 1).

When fuelwood is plentiful, fires for humans are built in the household compound, in addition to the animal fires, often near the edge of the compound where neighbors can visit, since this is considered a socializing activity, especially in Nakhon Phanom sites. Two fires are made daily, around 5-9 in the morning and 7-10 in the evening. The fires are made to fend off chill and dampness and in the evening also for light. Fires are usually left to die out rather than be put out when people move on to other activities. In some households, the coals are still hot enough in the morning to start a new fire by simply adding pieces of wood. In Village 1B villager estimates of daily wood consumption in this type of fire came to about 40 x 10^3 cc, far greater than any other usage, including animal fires. With increased scarcity of fuelwood in stage two villages, fires are usually made only in the morning to help people to start working, but by fewer households. For those who still make a fire in the evening, it is always shared with neighbors. In stage three, fires are made only during the cool season where needed for the old and very young, but even this is practiced by very few households. Warm clothing is used as substitute. This is also true for the recovery village, Village 4A.

Hot water is boiled for bathing in the cool season only for the old and the very young in most villages except in stage one villages where hot water is boiled whenever it is needed by any member of the family. When questioned closely, however, villagers indicated that hot water bathing is primarily a matter of personal preference rather than in consideration of fuelwood availability.

Less Frequent Fuelwood Usages

There are three less frequent fuelwood usages, in post-partum resting, crema-

tion, and merit making, that are not as fuelwood-demanding (per household per year) as many of the usages discussed above. Nevertheless, they place high demands at the time when they do occur, and changes have taken place, over time, in the amount of fuelwood used and in how the burden is shared among households.

Yu Fai, or post-partum resting, literally translated means "to lie by the fire." This traditional rite is observed by women right after giving birth. A fire is kept going continuously for a number of days near the mother's bed where she stays until the observed period is over. It is believed that the heat quickens the post-partum recovery as well as protects the mother from certain illnesses in her old age. Water brewed with medicinal herbs is also kept hot and given to the mother to drink and bathe with. Several hot water baths are usually taken each day. Most women in their forties said they used to observe this rite for 15 days or longer twenty years ago but notice that the younger generation seems to observe it for a much shorter period, 5-7 days. Some have stopped the practice altogether. The reasons for the shorter period of post-partum resting are not conclusive in relation to the fuelwood situation, although some said the time has been cut because fuelwood is hard to obtain. Other reasons given were that some now give birth at the hospital where such a practice cannot be carried out, while for others the availability of modern medicine assures them that the traditional rite is no longer necessary. In places such as Village 1B where fuelwood is plentiful additional rites requiring fuelwood consumption are also practiced. For example, the placenta is buried, usually under the stairway to the house, and a fire is kept on the ground above it for a number of days, usually fewer days than the *yu fai* itself.

Cremation is another traditional practice with high fuelwood demands. In Buddhist practice in Thailand, the dead are normally cremated. In rural villages, this is carried out in a forested area designated by villagers as the village funeral ground. In Nakhon Phanom, wood is cut from trees in the funeral ground itself. It is believed that fuelwood stored at the house must not be taken to use at a funeral. In Village 2B, in Roi Et, cremation takes place at the cremation ground, but with fewer trees left there the host has to provide most of the fuelwood, from his own fields, for the ceremony. In cases where the host has problems obtaining enough fuelwood, the guests help provide the rest. When the fuelwood problem worsens, as in Village 3B and 3C, the host pushes a cart around the village requesting donations from neighbors. The host may have to go round the village more than once to obtain enough wood, but people will try their best to help out as this is considered a merit making act. At Village 3A, a special permit can be obtained from the district authority to acquire fuelwood from reserved forests for this purpose. In Village 4A where the fuelwood situation has begun to recover, when a family member dies, the family will also push a cart around for fuelwood donation to supplement whatever the host can provide. In all villages except those in the first stage, the species of fuelwood used at funerals are no longer a concern. In fact, kerosene and old tyres have been used as supplement in Village 2B for the past two years.

A third less frequent demand for fuelwood usage involves merit-making (*bon*). At least twelve major religious rites in a year are observed by villagers in Northeast Thailand. At such occasions, villagers make merits by cooking food to offer to the

monks as well as to share with friends and relatives. Large amounts of food are needed. This is the time when the small stove usually used in daily cooking is no longer adequate and the old traditional stone stove is used (discussed in next section). With increased fuelwood scarcity, however, many villagers have to resort to buying some of the food, from the market, especially those types of food required a large amount of fuelwood in the cooking (such as the traditional Thai rice noodle).

ASSOCIATED PRACTICES

Stove Type

As discussed above, this study found that sociocultural factors are more influential than the stage of fuelwood scarcity on the variation found in amount of fuelwood used for cooking. Within particular villages and households, however, changes in stove types have taken place over the past thirty years, and increased fuelwood scarcity seems to have been one of the motivating factors, although convenience, safety and durability are probably the more important causes.

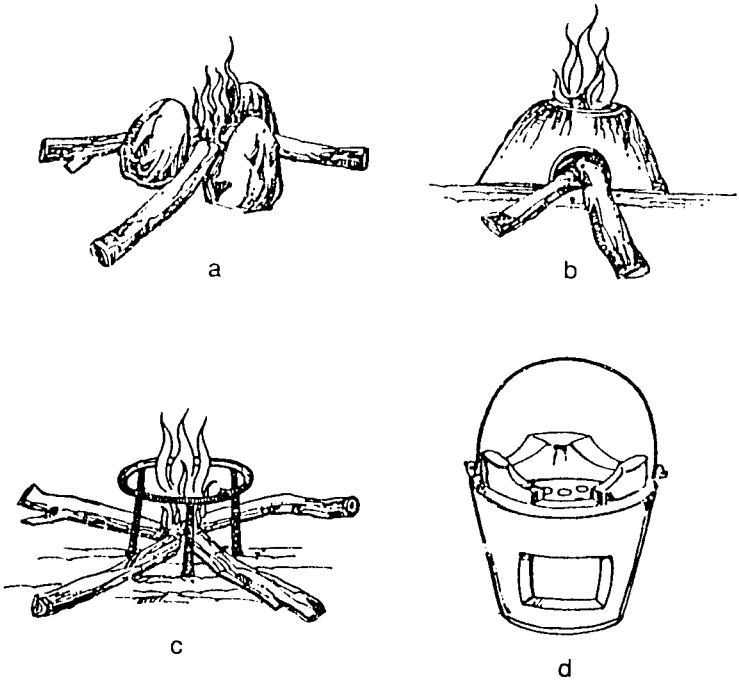
The oldest type of stove found is called *tao sam sao* or *tao kon sao* – the three-stone stove (Figure 3a). The origins of this stove are undoubtedly prehistoric but it is still found in almost all of the households visited. However, it is usually used only when a large quantity of food is being prepared, such as during religious festivals or for special purposes such as in silk production. It is the least fuel-efficient of all the stove types found. Another type of very old stove, *tao hang* (Figure 3b) was found in Village 3C. It is inexpensive (self-made) but not very convenient and not widely used.

Another type of stove found is called *tao khiang*, a metal ring on three legs (Figure 3c) still used in Village 1B, and used until quite recently in Village 3C. In Village 1B, where cooking is done on the raised house, the stove is set inside a square wooden box filled with dirt, but in Village 3C it is placed on the ground. In Village 1B, it was adopted more than 25 years ago and is locally made. It appears easier to cook with than the three-stone stove but is probably not much more fuel-efficient.

Among the more modern, commercially produced stoves is *tao ung lo* (Figure 3d), also called *tao ta-lad* (*ta-lad* means market). It has been adapted from a Chinese-style stove. *Tao ung lo* is presently the most commonly used type of stove and has been in use in most rural households for daily cooking for 5 to 10 years. It can be used with either wood or charcoal, is cheap, easy to get and durable, can be easily moved (even when lit), and all interviewees agreed it causes less danger of fire (does not have to be watched all the time) and provide more concentrated heat yet consumes less fuel than other stove types. Recently, other fuel-efficient stoves have been promoted on the market and some villagers had tried them, but none of these stoves have as yet been able to compete with the *tao ung lo*.

Figure 3 Sketches of Major Stove Types Used by Villagers in the Study

(a) tao sam sao; (b) tao hang;
(c) tao khiang; (d) tao ung lo.



Forbidden Species (Taboos)

Certain species are considered taboo by villagers apparently because of the negative connotation of the sound of the names, other characteristics such as smell, or the belief that they will cause illness to human or animal when burned as fuelwood. Some are taboo because of association with the Buddhist religion. *Mai bok* (*Irvingia malayana*) is a forbidden wood, because its name has a negative connotation – falling or disappearance of one's fortune, *mai waa* (*Eugenia cumini*) supposedly causes epidemics; the smoke from *mai nam thaeng* (*Randia tomentosa*) – is thought to cause eye disease in chickens; *mai makham pom* (*Emblica officinalis*) is believed to shorten thoughts. Superstitious or religious taboo trees are such as *takhian* (*Hopea odorata*), a big tree which a spirit inhabits, and *mai pho* (*Ficus religiosa*), the sacred tree associated with many events in the Buddha's life.

In fuel-scarce villages, taboos on many of these species are no longer observed, except for the *pho* trees. At least one villager, however, indicated that he might be forced to use even the *pho* tree in the future if the fuelwood situation does not get better. The degree of disregard for taboo species increases with the degree of fuelwood scarcity. Villages in the stage one situation are more strict in avoiding the use of taboo wood compared to villagers in stage three areas who have already experienced enough pressure from fuelwood scarcity that they have to use "any wood we can find."

Species Preference

In reviewing the species of trees used as fuelwood in villages visited by the RRA team, it is obvious that just as some villages have had to resort to using taboo species, they also increasingly have little or no chance to assert preferences for the species used. In fact, preferred species of hardwoods are often the first to become scarce. Villagers in the stage one sites in Nakhon Phanom still exercise very strong species preferences for different activities: cooking, hot water for bathing, animal fires, post-partum resting, and funerals. In stage two, lesser quality wood is accepted for the same type of activities listed in stage one. By stage three, villagers no longer assert preference over the species used in any activity – they say they count themselves lucky to find any wood at all. By stage four, almost all trees in the area have been planted. The number of species is reduced (and fuelwood preference thoroughly changed), because almost all the trees are planted and the planted species are carefully chosen to meet various needs.

CONCLUSION

The process described in this report illustrates the adjustments by villagers in relation to fuelwood need and fuelwood availability as population expands and more forest lands are converted into other forms of land use. For as long as other forms of fuel, such as gas or electricity, for daily activities remain too costly or unobtainable by most villagers, fuelwood will remain an important fuel in rural

areas. The study found that many villagers are increasingly worried, even in fuelwood-plentiful areas, that this resource is becoming too expensive to obtain, in terms of time, and money, and risk. There is also evidence that villagers, with enough incentive, will plant trees, with fuelwood usage being one of the main purposes – an activity which many have already carried out on their own.

Despite the increasing seriousness of the fuelwood situation in Northeast Thailand, this study found that it is generally not to the extent that it has had *major* effects on cooking habits, in either stove type or other measures to conserve fuel. Indeed, the study found that people are willing to invest a great deal of effort and cash to *avoid* having to change their cooking habits. Cooking habits, it seems, are highly affected by cultural factors not easily changed. It may also be possible that there are physical, nutritionally significant reasons why Northeasterners cook local food the way they do, further mitigating against changing such habits. In any case, the implication is that the promotion of stoves that are more fuel efficient than those presently in use will have to take very careful account of factors like convenience, portability, versatility (for wood and charcoal), safety and other effects on cooking habits if such efforts are to succeed.

Another important conclusion of the study is that there are several other fuelwood-consuming activities in Northeastern villages – mostly non-production activities – that, in many areas, together consume a great deal more fuelwood than does cooking. It is these activities that indeed do change in response to increasing scarcity. The goods and services of modern society have helped provide substitutes (electricity for light and security, medicine instead of heated post-partum resting, clothing for warmth, etc.). In the case of animal fires, however, further investigation should be undertaken to determine if discontinuing this practice has any major effect on the health of livestock.[6] If insect-borne diseases increase, for example, perhaps the Livestock Department could provide innoculations that could assist villagers who have had to give up this practice, and perhaps also encourage others to give up the practice (thereby conserving fuelwood), if they can be confident no deleterious effects on livestock will result.

Another implication from the study has to do with future effects of increasing fuelwood scarcity. The relatively small but significant inverse correlation between household size and fuelwood consumption per person may indicate that we should not expect the trend in decreasing household size in the Northeast to have a correspondingly beneficial effect on fuelwood consumption. Similarly, the decreasing trend in density of wood used for cooking, larger volume needed to get the same weight, and the decreasing sizes of fuelwood used, can be expected to have deleterious effects on remaining forests, particularly in terms of forest regeneration. Little trees will have less chance to grow into big trees. This is already apparent in the condition of remaining trees near villages.

The study found an important implication for government policy toward the

6. Animal fires *might* also have an effect on the health of human beings. The RRA did not investigate the extent to which smoky fires under the house at night might reduce incidence of mosquitoes and other insects up in the house itself. In the *fields*, villagers in stage one sites mentioned keeping mosquitoes away from humans as one of the main purposes of night fires.

promotion of fuelwood trees. The "recovery village" passed through a fuel-scarcity crisis more than twenty years ago and devised their own solutions, showing that, while such a recovery is by no means assured for every village, there is at least a good possibility that many other villages might undertake similar solutions and might benefit from assistance in doing this. But villager attitudes vary considerably depending on the stage of fuelwood scarcity, thus it will be important to target the needy villages. There is a great deal of variation in fuelwood scarcity, even *locally*. Villages only ten to twenty kilometers apart may have quite different situations. Variation among households within villages was not systematically assessed, but it was clear it is not as great as might be expected. Perhaps by the time fuelwood from one's own land becomes strictly a matter of private property, other factors (such as previous communal access to fuelwood or the use of trees for other purposes, such as lumber) have tended to reduce some of the variation.

Villages can be classed in terms of fuelwood scarcity by using such measures as the indicators listed in Table 4. The government could use such indicators to target particular villages and to assess the percentage of Northeastern population falling into each stage of fuelwood situation in order to plan resource allocations. The RRA team lacked the manpower to do this, but it can be estimated that the distribution would resemble a curve, skewed to the left, with a very small percentage in stage 4 (probably less than 5 percent) and the modal population in stage 2. More important than the present distribution, however, is the fact that the situation is changing rapidly, a majority or very large minority of the population will probably be in stage 3 in just a few years if villages presently in stage 2 do not take active steps to avoid it.

If villages in stages two and three of fuelwood scarcity can be targetted, the present study found several factors that should be taken into account in planning assistance. First, very few if any villagers have (on their own) planted trees *solely* for fuelwood usage. Perhaps if a tree were sufficiently fast-growing and productive for this purpose more would do so, but certainly consideration should be given to multipurpose trees, especially those that can also provide appropriate human food, local medicines, cash crops, or fodder, all of which are attractive to villagers and are some of the main reasons trees are presently being planted by villagers.

Second, more attention should be given to the promotion of tree growing on private land. Fuelwood scarcity is often accompanied by other changes in local resource situation, such as less remaining public land, more highly developed property rights, and more intensive labor both on and off-farm. In such situations, people don't have time to put into organizations and duties required to establish, protect, maintain, and harvest community woodlots. The delay before harvest also makes it impractical to *hire* people to do these tasks. On one's own land, however, the costs are much reduced and the "recovery village" example shows it can be done.

Third, trees grown on private land are mostly in houseplots and especially on paddy dikes. This RRA found that trees promoted for growth on paddy dikes should have certain additional characteristics: they should not cause heavy shading or have expansive root systems if they are to be acceptable to farmers. If their root structure can help hold crumbly dikes together, as *Phyllanthus polythyllus* does,

Table 4 Indicators of Stage of Fuelwood Situation (Village Level)*

Location/ Category	Stage 1 Abundance	Stage 2 Early Scarcity	Stage 3 Severe Shortage	Stage 4 Recovery
Fences	Sizeable wood (> 5" diameter)	(Transitional)	Bamboo/barbed wire	Bamboo/barbed wire
Field Areas	Logs lying around or used to shore up paddy dikes Lots of naturally occurring trees (e.g. dipterocarps)	(Transitional) Lots of naturally occurring trees (e.g. dipterocarps)	Very few if any logs or branches lying around Least tree density in fields of all stages	Very few if any logs or branches lying around High density of trees on dikes/ high ground, few on paddy floors
Forests	Forest nearby	(Forest access restricted)	(No nearby forests)	(No nearby forests)
Fuelwood Source	(Undistinguished)	(Fuelwood from naturally occurring trees on village lands)	(Majority of fuelwood acquired from outside)	(Majority of fuelwood from planted trees)
Woodstacks	Marked preference in a few hardwood species and usually not more than 2-3 species in any one woodstack Sizeable, fairly uniform pieces (> 3" diameter) No "taboo" species	More variety in size and species than stage one but still fairly sizeable wood One or two taboo species may be present, but not many	Larger woodstacks in dry season Highly varied species, sizes and/or lots of small branches (less than 2" diameter) Many taboos present (see text) Rubber sandals, old tires or kerosene used as firestarters	Small variation in species (usually 1-3, similar to stage 1) but almost all from planted trees (e.g. same trees as on dikes) More variation in size than stage 1 and fewer sizeable pieces
Charcoal	Charcoal (or charcoal and fuelwood) sold to outside	Charcoal production but little or no sale to outside	Charcoal bought from outside (very little if any produced)	Some charcoal made for own use (a little bought from outside)
Funerals	Wood from funeral ground	Host supplements wood gotten from funeral ground & guests	Host collects fuelwood donated by households in village	Host collects fuelwood donated by households in village

* Indicators in the first two rows may be noted from observation alone if the distinctions are clear in any particular village. In the last five rows observation should be supplemented by brief questioning of key informants. Indicators must be used together to determine the stage, since no one indicators is infallible. For example, "development villages" usually have bamboo fences regardless of stage, and recently electrified villages usually have lots of logs lying around since many trees are felled to clear right-of-way for overhead lines.

they will be even more acceptable. The study of villagers's conditions for acceptance should be carried out alongside laboratory or nursery experimentation, in order for trees to be appropriate to local conditions, biologically, socioculturally and economically.

Finally, this study has shown that it is possible to use RRA methods to study rural resource issues and produce a great deal of important qualitative (but also some quantitative) information at low cost, in a short period of time. Not everything can be learned by such methods, nor are all the findings "certain" and RRA sometimes raises more questions than it answers. But even if RRA *only* raised better questions, the investment would be very worthwhile. Serious efforts should thus be made toward increased awareness, further methodological development, training and institutionalization, so that more widespread usage can take place in rural development processes.

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APPENDIX 1

AGENDA

INTERNATIONAL CONFERENCE ON RAPID RURAL APPRAISAL

September 2-5, 1985

Monday September 2

0800-0815	Welcoming Remarks	Dr. Nopadol Tongsopit Rector, KKU
0815-0845	Introductory Address	Dr. Terd Charoenwatana

THE NEED FOR RRA, ITS EVOLUTION AND UNDERLYING CONCEPTS :

Chairman:	Neil Jamieson	
0845-0930	Shortcut Methods in Social Information Gathering for Rural Development Projects	Robert Chambers
0930-1015	Rapid Appraisal: The Evolution of the Concept and the Definition of Issues	James Beebe
1015-1030	Break	
1030-1100	Discussion of Chambers' and Beebe's Presentations	
1100-1130	A Conceptual Basis for Methodological Development in Rapid Rural Appraisal	Terry Grandstaff
1130-1200	Discussion	

THE RANGE OF RRA METHODOLOGY - IMPORTANT METHODS, TOOLS AND TECHNIQUES

Chairman:	Terry Grandstaff	
1330-1400	Semi-structured Interviewing	Pongcharn Na Lampang
1400-1430	Conceptual Tools for RRA in Agrarian Society	Viriya Limpinuntana
Chairman:	Robert Chambers	
1430-1500	Triangulation; Indicators; Observation; Direct Measurement	Panel: Michael Calavan Viriya Limpinuntana David Thomas James Beebe
1500-1515	Break	
1515-1545	Discussion	
1545-1615	Appraisal of Rural Resources Using Aerial Photography: An Example from a Remote Hill Region in Nepal	Brian Carson

1615-1645	Discussion	

Tuesday September 3

CONTEXTS, ISSUES AND TYPES OF RRA APPLICATION

0830-0930	Rapid Rural Appraisal: An Overview of Concepts and Applications	Christopher Gibbs
0930-1030	Panel Discussion: Contexts, Issues and Applications	Panel: Robert Chambers James Beebe Terry Grandstaff Christopher Gibbs Suriya Smutkupt Michael Calavan Somluckrat Grandstaff
1030-1045	Break	
Chairman:	Romana de los Reyes	
1045-1130	Basic Field Techniques for Rapid Rural Appraisal	Robert Rhoades
1130-1200	Rapid Rural Appraisal and Agroecosystem Analysis: A Case Study from Northern Pakistan	Gordon Conway
Chairman:	David King	
1330-1400	Plenary: Questions from the Floor to Resource Persons	
1400-1430	How Rapid Rural Appraisal and Other Socio-economic Diagnostic Techniques Fit into the Cyclic FSR/E Process	Daniel Galt
1430-1500	The Use of RRA in Cross-sectional and Longitudinal Studies	David Thomas
1500-1530	Sociotechnical Profile - A Tool for Rapid Rural Appraisal	Romana de los Reyes
1530-1545	Break	
1545-1615	Panel Discussion: RRA in Agroforestry/ Landuse in Forest Areas	Panel: Mark Poffenberger James Hafner Michael Calavan Brian Carson
1615-1715	Discussion	
Chairman:	Frances Korten	
1900-1930	Rapid Rural Appraisal: Experience at Khon Kaen University	Mantana Samart
1930-2000	Slide Presentation on Fuelwood RRA, Northeast Thailand	Suriya Smutkupt

2000-2045	Mini Panel on KKU Experience with RRA	Mantana Samart Suriya Smutkupt

Wednesday September 4

Chairman:	Christopher Gibbs	
0830-0900	The Paradigmatic Significance of Rapid Rural Appraisal	Neil Jamieson
0900-0930	Discussion	

ASSESSMENT OF METHODS AND CONTEXTS TO SET OUT GUIDELINES FOR RRA METHODOLOGICAL DEVELOPMENT AND TRAINING NEEDS

0930-1015	Guidelines for Working Groups	(Team)
1015-1145	Working Group Discussions	
1300-1700	Fieldtrips (RRA lecture tour)	
	Trip	Field Guide
	1: Rice Transplanting on the Undulating Paddy Fields of Ban Hin Lad	Viriya Limpinuntana
	2: Trees Planting and Management	Pagarat Rathakette
	3: Fuelwood RRA Revisit	Suriya Smutkupt
	4: Small Dairy Farming: A Place for RRA	Suchint Simaraks
	5: Small Scale Irrigation Systems	Nalinee Tanthuvanich

Thursday September 5

0830-0915	Review of Preliminary Group Documents and Feedback to Working Groups	
0915-1130	Continuation of Working Group Session and Preparation of Documents and Presentations	
Chairman:	Michael Calavan	
1300-1430	Working Group Presentations	
1430-1445	Break	
1445-1615	Concluding Remarks: Reflections, Realities and Frontiers	Robert Rhoades Romana de los Reyes Robert Chambers
1615-1630	Closing Address	Dr. Kavi Chutikul, Dean, Faculty of Agriculture

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APPENDIX 2

List of Participants at the International Conference on Rapid Rural Appraisal

held in
Khon Kaen, Thailand
September 2-5, 1985

Australia

Mr. Blair Bartholomew
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Dr. Ian Valentine
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Palembang

Ir. Soekarso
Tertiary and Village Irrigation
Development Section
Directorate of Irrigation I
Directorate General of Water Resource Development
Ministry of Public Work
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Jakarta Selatan

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Ms. Krisnawati Suryanata
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Bogor 16152

Mr. Herman Tiluata
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Lecturer
School of Forestry
Faculty of Agriculture
Hasanuddin University
Ujung Pandang

Pakistan

Dr. Sye Mutahir Shah
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