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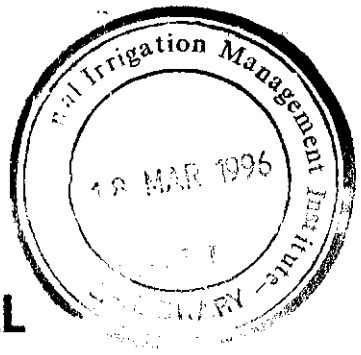

PARTICIPATORY RURAL APPRAISAL FOR IRRIGATION MANAGEMENT RESEARCH

Lessons from IIMI's Experience

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and
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IIMI

INTERNATIONAL IRRIGATION MANAGEMENT INSTITUTE

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Foreword

RESEARCH METHODOLOGIES ARE important instruments in the "toolkit" of research institutes such as the International Irrigation Management Institute (IIMI). In fact, research on research methodologies is an essential part of IIMI's generic research program, as it is recognized that irrigation management research is conducted in a difficult environment where off-the-shelf methods and procedures may not be automatically appropriate or cost-effective.

Ideally, IIMI's research should be interdisciplinary, collaborative, field-based and client- and action-oriented. Within this model, IIMI has been employing different research methodologies which reflect the numerous disciplines of the staff members of the institute (e.g., participant observation, process documentation, direct measurements, questionnaires, literature reviews, interviews with key informants, action research, etc.). IIMI publications on research approaches, tools and techniques are, however, relatively scarce.

Recently, new research approaches and techniques have been developed for application and fine-tuning in irrigation management research, e.g., Geographic Information Systems and Remote Sensing for assessing irrigation system performance, or participatory approaches that involve water users and use visualization techniques.

Although there are numerous other participatory methodologies, this paper focuses solely on Participatory Rural Appraisal (PRA). It attempts to review the pros and cons of PRA in the context of irrigation management research, and discuss the potential for institutionalization of PRA at IIMI. Closely related to the use of PRA (or any other participatory methodology) is the issue of the involvement of water users in the design, implementation and evaluation of research activities, which is also discussed.

As such, the present Working Paper should be interpreted as an avenue to stimulate the debate at IIMI on research methodologies in general, and participatory methodologies in particular, whether or not one concurs with the conclusions of the paper on the required involvement of water users at different stages of the research process.

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Executive Summary

THE INCREASING INTERNATIONAL awareness about the strengths of participatory approaches and methods for research and development has led international development banks, NGOs, donors and research and training institutes to adopt Participatory Rural Appraisal (PRA) and other participatory approaches to implement new projects and programs. At IIMI, PRA approaches and methods have also been incorporated in a number of research activities.

The present Working Paper explores the opportunities of PRA in irrigation management research through an analysis of selected case studies in which IIMI attempted to practice the PRA approach. Recent experiences have shed light on the potential and down-sides of the approach, and in what ways it could be applied for an irrigation management research strategy which strengthens water users' input into irrigation management research.

The paper starts with the presentation of a simplified framework for irrigation management research based on the identification of actors, functions and processes required for irrigation management, along with their links with the enabling environment and their impact on agricultural production and rural development. This framework is subsequently used for an analysis of irrigation management research, and it focuses on the shifts in emphasis on the actors, functions and processes herein, and the importance attached to the enabling environment. It shows that water users have become very important to research as a unit of analysis to measure the impact of irrigation management and as increasingly important partners in the management of irrigation systems. Despite their recognized importance, the water users' role has remained a passive one in irrigation management research.

The following section describes PRA as one of the most important participatory research and development approaches to increase farmers' input into the research processes. PRA enables local people to participate in joint-analysis leading to actions plans. As such, PRA has been developed as a reaction to the alleged shortcomings of conventional ways of working with local people and conducting development-related research. While there are many other participatory approaches, their underlying principles are common and contribute to a process of empowerment and enhance the quality and validity of the information.

PRA has been used in different types of processes and sectors, and shows a broad repertoire of methods for group and team dynamics, sampling methods, interview and dialogue, and visualization and diagraming methods. Literature on the constraints to the use of PRA in practical, cultural, institutional and conceptual terminology is relatively scarce, but critiques of PRA question the cultural appropriateness of the methodology and the creation of expectations (typically aid). In research terms, the level of rigor has received criticism that may be related to the absence of proper evaluation of the methodology itself.

A literature review of the use of participatory methodologies in irrigation does not reveal many examples with clearly documented PRA experiences. PRA has been used in participatory appraisal of irrigation systems, participatory implementation of watershed management programs, participatory implementation of the design of irrigation systems, and in participatory monitoring and evaluation of programs. Four examples of the application of PRA in irrigation management research (Nepal, Sri Lanka, Pakistan, and Kenya, the latter being a non-IIMI example) are discussed to illustrate how the PRA approach works out in practice. These cases show that the conditions required for a proper PRA are not always met, that team composition is an important variable for the outcome of the participatory research, that biases and rigidity still persist, and that facilitators play a leading role in some of the

activities. An important conclusion is that the adoption of the PRA approach at the outset of research does not necessarily lead to interactive participation.

The paper ends with an attempt to assess the advantages and disadvantages of PRA on the basis of the three selected (IIMI) case studies. Two generic issues on the application of the approach by irrigation researchers are investigated: first, how does PRA relate to more formal approaches in irrigation management research? second, how can insights derived at the watercourse level impact on system level management and provide a broader view of the whole system? The paper stresses the importance of the complementarity between methods and approaches, and challenges researchers working in the field of irrigation management to identify appropriate sets of methodologies for research on the actors, functions and processes in irrigation management.

At IIMI, PRA can play an important role in adaptive (context-specific) research, but it could also contribute to the identification of new research issues based on interactions with water users for strategic research. It is emphasized that water users should come in at an early stage of the research cycle, in which they could take on some of the research functions and responsibilities, and have a voice in the definition of IIMI's research agenda. Potential changes required to institutionalize the involvement of water users (and other stakeholders) in the research process (such as modification in the process of research design, new definition of clients, new professional attitudes and values, and increased accountability to the end users of irrigation systems) are recommended.

Introduction

THE GENERIC RESEARCH program of the International Irrigation Management Institute (IIMI) entails evaluating and comparing the findings and results emerging from field research across countries and regions, yielding results with multi-country applicability. An important element of this program is **undertaking research on research methodologies** in the special context that irrigation management provides, i.e., a socio-politically complex topic in an area of unreliable or nonexistent data (IIMI 1992a).

Notwithstanding this generic aim of IIMI, there are only very few research papers on data collection methodologies for irrigation management research published by IIMI (for examples, see Chambers and Carruthers 1985 and 1986; Merrey 1994 and Sakthivadivel and Merrey 1992). In a different field, for example, the recent effort of the International Food Policy Research Institute (IFPRI), a sister institute of the Consultative Group for International Agricultural Research (CGIAR), is to be recognized and congratulated for the publication of the book titled *Data Needs for Food Policy in Developing Countries* (von Braun and Puetz 1993).

IIMI's Performance Assessment Program[1] has included part of the generic research elements into its objectives with the identification of the most appropriate methodologies and data collection methods for assessing irrigation system performance. To do so, different data collection methods are designed and field-tested, and then compared in terms of quality of the information collected, the accuracy of data, the convenience of the data-collection process, costs and skill requirements of each method, etc. However, although the methodological concern has been explicitly specified in the research agenda of IIMI's Performance Assessment Program, very little has been written yet on data-collection methods and the program activities to date have concentrated more (at least until recently) on the development of a logical framework for the analysis of irrigation system performance and the calculation of performance indicators.

The present paper focuses on one appraisal methodology: **Participatory Rural Appraisal (PRA),** and on its use for **Irrigation Management Research (IMR).** As will be discussed in the following sections, to link these two topics requires two initial clarifications. The first clarification relates to the identification of the boundaries of irrigation management research (what do we call irrigation management?). The second clarification focuses on the definition of PRA and its specificities versus other types of participatory approaches and techniques that have been developed and implemented in development and research activities for the last 20 years. A very specific portion only of the long list of participatory approaches similar to PRA that have been used in the field of irrigation management will be discussed in the present paper.

The attempt to describe the principles of the PRA approach and the implementation of PRA activities, and to evaluate the potential use of this method for irrigation management research in the present paper can be seen as a follow-up to the earlier papers on Rapid Rural Appraisal (RRA) for irrigation management research written by Potten (1985), Chambers and Carruthers (1985 and 1986) and Groenfeldt (1989). However, the emphasis on the methodology itself is

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[1]The Performance Assessment Program of IIMI focuses on the introduction of performance assessment methodologies to define, monitor and evaluate improved operational procedures for existing irrigation systems. More specific objectives of this Program are provided under *Performance Indicators from Water Users' Perspective in Pakistan* (p. 37).

greater here, as the paper provides a clear description of the PRA approach and tools, and illustrates some of the basics of PRA with selected case studies. In fact, the paper has mainly been written for researchers, potential implementors of PRA and managers of PRA activities involved in irrigation management research.

The first and second parts of the paper focus on the two primary elements included in the paper's title: **(i) Irrigation Management Research**, and **(ii) Participatory Rural Appraisal.** The section on Irrigation Management Research attempts to address the issue of the boundaries (rather than the definition) of what is named irrigation management research. The relatively recent history of irrigation management research is described, and complemented by current and future research issues in irrigation management as seen by the research and donor community. In itself, this summary remains incomplete as it does not include the views of the various stakeholders of irrigation systems (one of the points stressed by the present paper). In fact, so far, stakeholders have not been formally involved in the identification of research topics and/or the evaluation of research findings.

In order to increase the (indispensable?) involvement of end users in irrigation management research, participatory methods are required (not for the sake of participation in itself but to ensure a higher effectiveness of this research and to increase the chances of acceptance of innovations and ultimately their sustainability). The main approach developed during the past 10 years, **PRA**, seems to offer a great potential for increasing stakeholders' involvement in the design of the research agenda for irrigation management research. Thus, the core ideas of PRA will be presented and discussed, and tools and techniques of potential use for irrigation management research will be described.

The link between the first two parts of the paper is made in the third section that describes past (and current) experiences in the use of PRA for irrigation management research, based on a review of literature and a review of IIMI's experiences in this arena. The concluding part of the paper analyzes the potential for further utilization and development of PRA for major areas of research in irrigation management, and also explores the potential for PRA at different stages of the research process, including the institutional context required for the implementation of PRA.

Irrigation Management Research

BACKGROUND

IN THE MAJORITY of developing countries (especially in Asia), the required increases in agricultural production and productivity have been obtained in the past by the development of irrigation accompanied by the Green Revolution. With the best sites for new irrigation schemes already in use, leading to increasing investment costs for new irrigation infrastructure, with the recognized inadequacy of water deliveries of most of the irrigation schemes compared to design or requirements, and with the environmental degradation (waterlogging, salinity) that have accompanied the poor performance of irrigation systems, the improvement of the management of the current systems appears as the option with the highest payoff. In fact, the benefits that may be expected from improved irrigation management are seen as extremely high as the current levels of performance are substantially below their potential and far from their original design figures (Clarke 1993; Rosegrant and Svendsen 1993; Yudelman 1993; Gerards 1995).

Research in the domain of irrigation management is a rather recent phenomenon, and has probably arisen as an answer to the increasing demand for an integrated approach of the management of irrigation systems. This demand has mainly been led by the donor community, but it has also been driven by governments whose objectives are to increase the financial and economic returns of existing and new investments in the irrigation sector, to reach higher levels of self-sufficiency in the production of staple (irrigated) crops, and to reduce the budgetary burden imposed by most of the current irrigation schemes. One of the most positive aspects of irrigation management research has been to put different disciplines together leading towards a more holistic analysis of irrigation systems.

Rather surprisingly, irrigation management is not a clearly defined and confined subject as shown by the comparison between research papers that have analyzed the complexity of this topic and have described the history of irrigation management research (see, for example, Rao and Wickham 1986; Johnson 1989; Hoogendam and Slabbers 1992; Levine 1992 and 1993). Moreover, the focus of the different actors involved in research has evolved other time. The recent changes in the mandate of IIMI, from irrigation system management to irrigated agriculture and even watershed management (Wijayaratna 1995), comprise one of the examples that stresses the dynamic nature of the research process and research agenda and the evolving priorities as identified by researchers and other actors involved in the research process.

Changes in the research agenda occur because great success or failure of research programs follows changing financial, institutional and human constraints, and the agenda is also influenced by the requirements or policy objectives of the institutions financing irrigation management research. As contended by Chambers (1988:65), research agenda and research projects are generally developed by researchers in their content, *following the latest fashion and priorities of funding agencies*. This statement may be too strong as sometimes the format only of a project (and not its content) is modified to satisfy the requirements of the donors. Various environment-related projects provide such examples of repackaging of research ideas and activities for a better fit with donors' priorities. The inclusion of gender issues may be another area of such concern.

A FRAMEWORK FOR IRRIGATION MANAGEMENT [2]

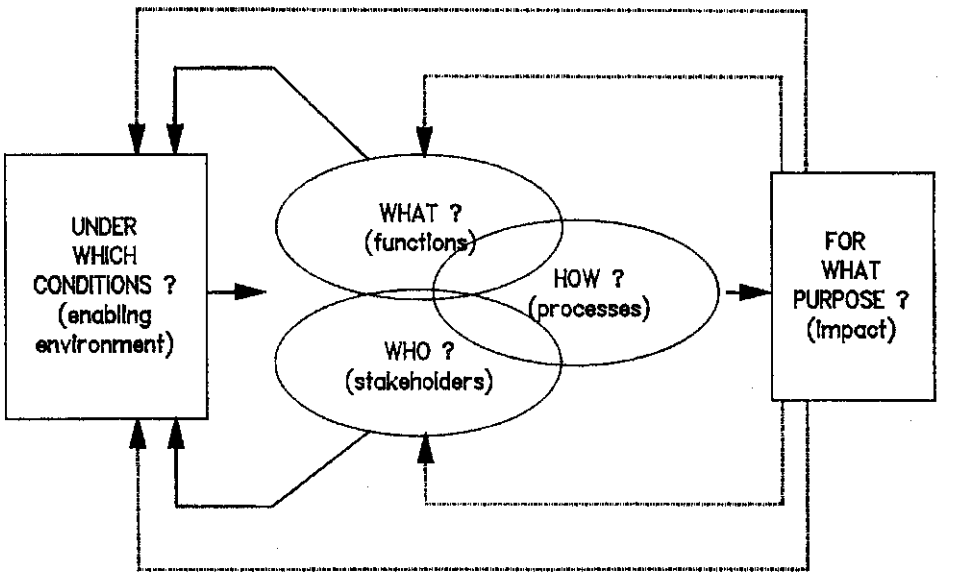
To ease the discussion on the use of PRA for irrigation management research, a simplified structure of irrigation management research is proposed and presented in Figure 1, based on three basic questions (focused on different axes of the irrigation management matrix), and on two major links. The three questions are:

Who? This relates to the different **actors or stakeholders** (from the individual to government agencies, via community groups and lobbies), their objectives and internal constraints and their position within the general network of actors.

What? This relates to the **functions** performed for irrigation management, i.e., acquisition, distribution, application and disposal of water.

How? This refers to **processes** such as planning, construction and rehabilitation, operation, maintenance and supply of support services.

Figure 1. A framework for irrigation management.



[2]The basic structure of this framework and the definition of the different categories included in the **what** and **how** questions are based on articles by Rao and Wickham (1986) and Small and Svendsen (1990).

The two major links refer to the **impact** of the so-called **enabling environment** (including social, economic, legal and physical aspects) on irrigation management; and the **impact of irrigation management** itself on agricultural production and productivity and their sustainability, and eventually on farm income and socioeconomic development of the area served by a given irrigation system. These major links are complemented by feedback loops stressing the fact that the impact of irrigation management may induce changes in the enabling environment, and also in the way the ***who/what/how*** trilogy interacts.

Some of the issues to be addressed for the application of the present (very simplified) framework are the source of irrigation water (groundwater versus surface water for example), the level of analysis and focus (whether at the level of the irrigation system, at the level of one distribution canal or at the level of the farm), the spatial diversity in terms of ***who*** does ***what*** and ***how***, and the temporal variability of the irrigation management processes. Moreover, social, economic and physical aspects are to be considered for the intersection between the different ***who***, ***what*** and ***how*** categories.

The junction between the ***who*** axis and the ***what*** axis (who does what?), for example, will address issues of responsibilities and accountability among the different actors, along with problems related to information and financial flows (support services). The link between actors and the enabling environment includes irrigation-sector policy, with the specification of the roles of different actors in the development and implementation of these policies.

Using this framework as a basis for analyzing irrigation management research (IMR), a look at the literature shows that research issues have changed over time (Fuchs Carsh et al. 1992; Hoogendam and Slabbers 1992; Levine 1992). While 30 years ago, irrigation was mainly a construction (a **how** question) and technical subject focused on main canals (acquisition and distribution categories of the **what** question) operated by large bureaucracies, it shifted to the management of the tertiary units in the sixties-seventies with the development of integrated technical, social and economic approaches and research programs. The eighties saw a shift to the main canal system again, but with a focus on operation and maintenance of large irrigation systems in the context of a complex social, economic and technical environment. Multidisciplinary approaches similar to the ones developed in the seventies for the tertiary-level research were applied for issues at higher levels of the irrigation system (Hoogendam and Slabbers 1992). However, and as a follow-up to the focus on tertiary units, the lower levels of irrigation systems were not abandoned, mainly because the increasing emphasis on farmers' role in irrigation management led by the relatively good performance of farmer-managed irrigation systems also became the object of comprehensive research program in the eighties. This was further reinforced by recent policies aimed at turning over large-scale publicly managed systems (or at least part of these systems) to the water users (or water user associations).

The shift in the emphasis of the ***who/what/how*** categories was also accompanied by an increasing importance of the enabling environment variables (and the recognition of the impact of macro-policies on irrigation system performance), and the concomitant recognition of the integration of the irrigation sector into the broader irrigated agriculture sector. IIMI itself has

been instrumental in recognizing this shift, as highlighted by the recent change in the Institute's mandate from irrigation system management to irrigated agriculture[3] (IIMI 1992b).

In terms of research emphasis, this shift leads to a greater need to fully understand technical, social and economic constraints at the farm and household level as other inputs may constrain irrigated agriculture and limit the scope for positive impacts (in terms of production, productivity, sustainability) of irrigation-management innovations. Thus, water users become central to the research agenda for two reasons: (i) as the appropriate unit of analysis to estimate the impact of water management on agricultural production, productivity and socioeconomic development (the final decision related to the allocation and use of irrigation water is taken by individual farmers within a given set of constraints which may be related to actions at higher levels of the irrigation system); and (ii) as increasingly important partners in the management of irrigation systems in the context of irrigation system turnover programs promoted by governments and funding agencies in a large number of countries.

IMR: FOR, BUT WITHOUT, WATER USERS?

However, even with water users at the core of IIMI's research agenda, the absence of water users and farmers in the identification of the research agenda is rather striking. In fact, water users appear only as the object of the research process and not as active participants in this process. The basic assumption is that researchers know what farmers need, which is their interpretation of the farmers' situation (Tripp 1992). In the basic research on agriculture, farming systems research provided the first attempt to shift from the "the researchers know" perspective (Thompson and Scoones 1994) towards a more user-oriented approach. However, this has not been directly transferred to IMR, partly due to weak links between farming system research and IMR (Merrey 1994).

From the donors' point of view, low-income water users whose livelihoods depend on irrigated agriculture should have the greatest benefits from research projects in irrigation management. However, no concerted attempts have been made to explore the major problems of these water users or to determine what their priorities would be in terms of improving the management of their irrigation system. Chambers (1988, 66) summarizes this opinion when discussing gaps in research:

> *Moreover, for gap and linkage subjects, these are often not clearly established methods of enquiry. How, for example, does one assess the knowledge and expectations of farmers regarding the water they will receive from the main system, and how this affects their behavior?*

[3]This shift may have been accelerated by the expansion of IIMI activities to more diverse environments and countries outside of the more traditional field of South Asian countries with their predominately large-scale publicly managed irrigation systems.

More generally, the lack of participation of stakeholders in the research process has also been very recently acknowledged by the consortium providing financial support to the CGIAR as testified by the Lucerne *Declaration and Action Program (renewal of the CGIAR)* output of the CGIAR ministerial-level meeting in February 1995 (CGIAR 1995). One of the recommendations related to the CGIAR research agenda urges the CGIAR to:

> ***Work in closer partnership and collaboration with*** *public and private research organizations in the South, including* ***farmer groups****, universities, NGOs, and international institutions* ***to design and conduct research programs****.*

As IIMI has moved from irrigation system management to irrigated agriculture with more impact analysis at the farm/household level, this recommendation would naturally apply to the Institute even more now than in the past.

The Performance Assessment Program of IIMI offers an appropriate example of how water users have been left out of the definition of the research agenda. Here, the point made is not to advocate a greater involvement of end users in the analysis of information and calculation of performance indicators, but to recognize the importance of incorporating their objectives and expectations, that have presently been defined for them but without them. The analysis of the performance of an irrigation system as described by the Performance Program documents (IIMI 1994b) stresses differences between policymakers, irrigation system managers and water users, but it does not make the appropriate steps to investigate objectives and performance-related issues from the water users' perspectives.

Another striking example is the push towards turnover or water users' participation in the management of irrigation systems mentioned in the introductory section. Although one may have very good reasons to believe that turnover or increased participation of water users in the management of their systems would increase the productivity and sustainability of these systems, it is never clear whether the proposed option is seen as the best option by the water users themselves; and their role in the identification of research issues under this program is negligible.

In sum, the present paper advocates an increasing involvement of stakeholders, especially water users, in the research process. Assessing the match between IMR and the perspectives of the end users and stakeholders is perceived as the minimum step required to increase IMR effectiveness and the potential for positive changes in irrigation management (with eventual impact on the sustainability of irrigated agriculture itself).[4]

However, to what extent water users should participate in the research process or research cycle, may depend on the type of research, the capability of the team of researchers, the type of farmers, the social environment, etc. This will be further discussed in the *Discussion and Conclusion* part of the present paper. What is clear is that the change in focus and perspective

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[4]Stakeholders other than water users are, and have been, involved in the identification of research issues and the implementation of specific research activities at IIMI up to a certain extent. For example, meetings involving representatives of national agricultural and irrigation ministries had been organized for the preparation of IIMI's Strategy. Consultative Committees are set up in countries where IIMI has ongoing research programs (Kijne 1995). However, the effectiveness of these committees and their role in the definition of the research agenda is not clear.

(i.e., to include the perspectives of the end users themselves), will require different approaches, techniques and behavioral attitudes of researchers.[5]

The following sections of the paper focus on the most commonly used method to increase farmers' input into the research process, to diversify research issues and to reduce the rigidity imposed by researchers themselves: i.e., PRA. The basics of the approach are described in some detail, and tools and techniques for addressing specific issues related to farmers' participatory research are described and discussed.

[5]As the role of stakeholders will be modified with their increasing involvement in irrigation management research, attitude changes may also be required for the end users/stakeholders themselves.

Participatory Rural Appraisal

A TYPOLOGY OF PARTICIPATION

IIMI's CONCERN ABOUT the concepts of "participation" and "participatory" is not a novelty in the development and research community. These notions already appeared in the development jargon as early as the 1950s (Rahnema 1992), and have since been present in the discussions on development. Recently, participation has been broadly defined as "a process by which people, especially disadvantaged people, influence decisions that affect them" (World Bank 1992).

The objectives of participation have gradually shifted over the years, and it is now a universal and accepted concept for policymakers, donors, banks, NGOs and development and research institutes as evidenced by the status of the participatory concept in organizations such as the World Bank. With a myriad of reasons for its widespread popularity, the inclusion of this slogan is to serve the objectives of empowerment, developing beneficiary capacity, effectiveness and efficiency of the activities, and cost sharing (World Bank 1992).

The use of the word participation in project and research proposals has become exceedingly favored, without however providing a proper definition of what participation means in different contexts. The cosmetic employment of the concept and its fashionable overuse without leading to truly different ways of working with local people did however not go unnoticed (e.g., Cernea 1991; Chambers 1992; Cornwall et al. 1994).

Approximately 30 methodologies including abbreviations are nowadays *en vogue* which reflects the faddism and potential rhetoric of the participatory movement. Some of the more well-known participatory approaches to agricultural research are Farmer Participatory Research (FPR - Farrington and Martin 1988), Participatory Action Research (PAR - Whyte 1991) and Participatory Analysis and Learning Methods (PALM - MYRADA 1990-). While one method may be more participatory than the other, they all manifest in one way or another the innovations and new directions in agricultural research and, as observed by Cornwall et al. (1994) *the challenge is to draw away from this array of innovation to create new syntheses.*

The intensity of how people participate in programs and projects has been described by Farrington and Martin (1988) and Biggs (1989). More recently, Pretty (1994, adapted from Adnan et al. 1992) has shown that participation ranges from passive participation, participation in information-giving and participation by consultation to participation for material incentives, functional participation, interactive participation and self-mobilization (Table 1). Passive participation means that people participate by being told what is going to happen or has already happened, while interactive participation means that people participate in joint-analysis, which leads to action plans and the formation of new local institutions or the strengthening of existing ones. Self-mobilization means that people participate by taking initiatives independent of external institutions to change systems. The participatory methodology, PRA, is alleged to liaise with local people in an intensive manner, where participation is interactive leading to self-mobilization if looked at in the context of the classification developed by Pretty and presented in Table 1.

Table 1. A typology of participation: How people participate in development programs and projects.

Typology	Components of Each Type
Passive Participation	People participate by being told what is going to happen or has already happened. It is a unilateral announcement by an administration or project management without any listening to people's responses. The information being shared belongs only to external professionals.
Participation in Information Giving	People participate by answering questions posed by extractive researchers using questionnaire surveys or similar approaches. People do not have the opportunity to influence proceedings, as the findings of the research are neither shared nor checked for accuracy.
Participation by Consultation	People participate by being consulted, and external agents listen to views. These external agents define both problems and solutions, and may modify these in the light of people's responses. Such a consultative process does not concede any share in decision making, and professionals are under no obligation to accept people's views.
Participation for Material Incentives	People participate by providing resources, for example labor, in return for food, cash or other material incentives. Much on-farm research falls in this category, as farmers provide the fields but are not involved in the experimentation or the process of learning. It is very common to see this called participation, yet people have no stake in prolonging activities when the incentives end.
Functional Participation	People participate by forming groups to meet predetermined objectives related to the project, which can involve the development or promotion of externally initiated social organizations. Such involvement does not tend to be at the early stages of project cycles or planning, but rather after major decisions have been made. These institutions tend to be dependant on external initiators and facilitators, but may become self-dependant.
Interactive Participation	People participate in joint-analysis, which leads to action plans and the formation of new local institutions or the strengthening of existing ones. It tends to involve interdisciplinary methodologies that seek multiple perspectives and makes use of systematic and structured learning processes. These groups take control over local decisions, and so people have a stake in maintaining structures or practices.
Self-Mobilization	People participate by taking initiatives independent of external institutions to change systems. Such self-initiated mobilization and collective action may or may not challenge existing inequitable distribution of wealth and power.

Source: Pretty 1994, adapted from Adnan et al. 1992.

In this paper the term Participatory Rural **Appraisal** will be used mainly for the range of activities from the identification of a project (or a specific research issue) to the project's appraisal (or definition of a work plan for implementation of research activities) as presented in Table 2. Thus, appraisal is synonymous with diagnostic analysis or diagnosis and prescription (Chambers and Carruthers 1985). The appraisal phase in itself does not include the subsequent phase of action (research), which will be based on the participatory appraisals

but which will not be necessarily participatory. In practice, however (and also in most of the written material summarizing and analyzing PRA experiences), it is very difficult to separate the action phase from the purely appraisal phase as both become closely interrelated in the case of participatory approaches integrated in development activities.

Table 2. Appraisal: Overlaps of word meanings.

<table>
<tr><td colspan="3">SEQUENCE</td></tr>
<tr><td colspan="2">Project identification -------> Detailed design --------> Project appraisal</td><td rowspan="5">ACTION</td></tr>
<tr><td>Investigation</td><td>Analysis</td></tr>
<tr><td>Diagnosis</td><td>Prescription</td></tr>
<tr><td colspan="2">Diagnostic analysis</td></tr>
<tr><td colspan="2">Appraisal</td></tr>
</table>

Source: Chambers and Carruthers 1985.

In the next sections, PRA will be described with its main menu, and practical examples will be presented. This chapter ends with a critique of PRA from the literature.

WHY PRA?

Rapid Rural Appraisal as a predecessor to Participatory Rural Appraisal emerged and developed in the 1970s as a reaction to the alleged shortcomings of conventional ways of working with local people and conducting development-related research (McCracken et al. 1988). The weaknesses of the conventional approaches (e.g., rural development tourism, survey slavery, rural poverty unobserved) have been well documented by Chambers (1983). This gave rise to the maturation of a methodology which perceived the knowledge and views of villagers as basic determinants of the development path to be followed. In agricultural research, PRA attempts to challenge the assumptions of conventional ways of perceiving farmers, where knowledge is the exclusive area of the researcher and where the farmer is a passive recipient of information (Pretty and Chambers 1994).

This indicates that a combination of push and pull factors was involved in the spread of PRA. A significant pull factor in this process was the recognition that local people appear to have a greater capacity to analyze their own situations and conditions than the professionals normally imagined. Another pull factor is the cost-effectiveness of the approach and timely delivery of information which appeals to development workers and researchers. Thus, PRA is

supposed to have characteristics which should be able to overcome the weaknesses of more conventional approaches. According to Chambers (1992) these features are the following:

* A reversal of learning, to learn from rural people;

* Learning rapidly and progressively with flexible use of methods, improvisation and cross-checking;

* Offsetting biases, especially those of rural development tourism (spatial, project, person, dry season, diplomatic and professional);

* Optimizing trade-offs between quantity, relevance, accuracy and timeliness;

* Triangulation, using a range of methods, types of information, investigators and/or disciplines to cross-check information;

* Seeking diversity.

Through working with local people on this basis, the process of interactive participation leads to the strengthening of the capacities of local people (Richards 1994): notably it (i) enables local people to collect information, to assess its relevance, to cross-check its validity and document and present the findings; ii) enhances capabilities to prepare project proposals (planning, management); and iii) improves local skills for dealing with potential conflicts between different interest groups.

DEFINITION AND PRINCIPLES OF PRA[6]

PRA has been described as *a growing family of approaches and methods to enable local people to share, enhance and analyze their knowledge of life and conditions, to plan and act* (Chambers 1994a). The variety of participatory labels given to other members of this growing family is enormous, but they all share common principles. These are as follows (Guijt and Thompson 1994):

* ***A Defined Methodology and Systematic Learning Process.*** The focus is on cumulative learning by all the participants and, given the nature of these approaches as systems of inquiry, their use has to be participatory.

* ***Multiple Perspectives.*** A central objective is to seek diversity, rather than characterize complexity in terms of average values. The assumption is that different individuals and

[6]See also Scoones (1995) for a more detailed analysis of these principles and of their potential misuse.

groups make different evaluations of situations, which lead to different actions. All views of activity or purpose are heavy with interpretation, bias and prejudice, and this implies that there are multiple possible descriptions of any real-world activity.

* ***Group Inquiry Process.*** All involve the recognition that the complexity of the world will only be revealed through group inquiry. This implies three possible mixes of people, namely of disciplines, of sectors, and of outsiders (professionals) and insiders (local people).

* ***Context-Specific.*** The approaches are flexible enough to be adapted to suit each new set of conditions and actors, and so there are multiple variants.

* ***Facilitating Experts.*** The methodology is concerned with the transformation of existing activities to try to bring about changes which people in the situation regard as improvements. The role of the "expert" is best thought of as helping people in their situation to carry out their own study and so achieve something.

* ***Leading to Sustained Action.*** The inquiry process leads to debate about change, and debate changes the perceptions of the actors and their readiness to contemplate action. Action is agreed, and implementable changes will therefore represent an accommodation between the different conflicting views. The debate and/or analysis both define changes which would bring about improvement and seek to motivate people to take action to implement the defined changes.

These common principles of PRA are the basics of a well-defined and practical set of tools and techniques (see under *Practical Applications and Methods of PRA* [p.14]) which—if applied skillfully—contribute to the process of empowerment and enhance the quality and validity of the information. The participatory innovations have helped discover the hidden capacities of villagers to map, diagram, score and rank and that relaxed rapport which is crucial to facilitating participation (Chambers 1994b). Likewise, it was discovered that participatory diagramming and visual sharing are powerful and popular and that sequences of participatory methods create a flexible learning process which is open-ended and adaptable.

Accepting the PRA principles guides development workers and researchers into different behaviors and attitudes in their interactions with local people. A practical working principle of PRA therefore is accepting a different role[7] as facilitator where "they do it" (Chambers 1992). So, the role of villagers is to explore, analyze and experiment by themselves, while the researchers do not interfere and "hand over the stick." In addition, standards of self-critical awareness and responsibility where the behavior of the facilitators is continuously reviewed by other members of the team and sharing of information are leading principles in working with

[7]Changes in attitudes have been established through facilitators D.I.Y. (Do-It-Yourself), where the villagers are the teachers and the outsiders are the students (Chambers 1994c).

PRA. PRA has developed practical aids to assist facilitators in correcting the behavior of colleagues, such as team contracts and "shoulder tapping" (Shah 1991).

PRACTICAL APPLICATIONS AND METHODS OF PRA

The principles, tools and techniques of PRA have been applied in a broad field of subjects. Through training and field experiences in various workshops all over the world, these methods became accessible to a large number of interested development workers and researchers. Many of the field experiences have been carefully documented in PRA training reports in the English language (e.g., Girara and Abela 1991; Guijt and Pretty 1992; Tamil Nadu Agricultural University and IIED 1992; IIED and ActionAid 1992; IIED and MYRDA 1991; Theis and Grady 1991; Thompson and Nott 1992; IIMI 1995a) and in French (Gueye 1993abc and 1994). Handbooks and training manuals have been produced as field guides intended to assist those involved in all forms of participatory inquiry (World Resources Institute 1990; Pretty et al. 1995; Kamara and Denkabe 1993). Very recently the World Bank (Narayan and Srinivasan 1994) has developed a "participatory development tool kit" which contains training material for agencies and communities. Srinivasan (1993) has produced a manual and video package for training of trainers in participatory techniques. In addition, participatory approaches to monitoring and (self-)evaluation of programs have been developed (Aubel 1993; Aaker and Shumaker 1994; Narayan 1993; Rugh 1986). PRA has not only been used in developing countries, but in western contexts as well (Webber and Ison 1995; Scheuermeier and Ison 1992; Kievelitz and Forster 1991; Dunn 1993).

According to Chambers (1994a) the applications of PRA can be found in four types of processes and in four major sectors. The most important types of processes are:

* Participatory appraisal and planning;
* Participatory implementation, monitoring and evaluation of programs;
* Topic investigations; and
* Training and orientation for outsiders and villagers.

The four sectors in which PRA has been applied are:

* Natural resources management (which includes watershed management and soil and water conservation);
* Agriculture (including irrigation);

* Poverty and social programs; and

* Health and food security.

The major innovators and users of PRA were NGOs and government field organizations (Chambers 1994a), operative in the fields of initiating, implementing and monitoring and evaluating development projects and programs. This may explain why the known applications of PRA in international agricultural research are relatively scarce. In fact, the international agricultural research centers have been criticized for *their lack of commitment to develop and disseminate methods for analysis conducted by farmers* on the one hand, and for *their gaps in approaches and methods to change the behavior, attitudes and beliefs of scientists* on the other (Pretty and Chambers 1994). It is argued that while many individual efforts have been made to integrate participatory methods into mainstream research, it is not the norm (see also Fujisaka 1994).

Table 3 shows the broad menu of PRA methods of group and team dynamics, sampling, interviewing and dialogue and visualization and diagramming. Visualization is considered as one of the principal innovations of the methodology (Chambers 1994b; Cornwall et al. 1994), where villagers and participants take over from the researchers and development workers who do not interfere with the villagers, observe from a distance or simply go away in order not to disturb the process.

PRA, however, should not be interpreted as a simple "tool box" which can be easily taken off the shelf and applied instantaneously. It entails a reversal of normal professional practices[8] (Chambers 1994b), where the organization of the activities and the use of tools may be of assistance, but not necessarily sufficient for working in an interactive manner with farmers. Going to the field and interacting with a handful of farmers is not equivalent to conducting a PRA (Drinkwater 1994). Or, as put by Gupta (quoted by Jiggins 1994):

> *... the methodologies cannot be expected to instil participatory values in the hands of individuals unable or unwilling to go through the necessary reversals...*

Appendix I provides a short description of the PRA tools. In Table 4 an overview is given of use of PRA methods for Farmer Participatory Research indicating possible applications of PRA methods in the context of IMR with and by water users. In addition, selected examples are given here as graphic presentations which portray some of the applications in the irrigation and nonirrigation fields. These examples are: participatory mapping, impact diagram, activity calendar, benefit analysis flow chart, and a monitoring tool.

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[8]Chambers (1994b) refers to four clusters of reversal: i) from outsiders' to insiders' perspectives (reversals of **frames**); ii) from individual to group, from verbal to visual, from measuring to comparing (reversals of **modes**); iii) from reserve to rapport, from frustration to fun (reversals of **relations**); and iv) from extracting information to convening, facilitating and initiating a process of empowering (reversals of **power**).

Table 3. PRA and its methods.

Group and Team Dynamics Methods	*Sampling Methods*	*Interviewing and Dialogue*	*Visualization and Diagramming Methods*
■ Team contracts ■ Team reviews and discussions ■ Interview guides and checklists ■ Rapid report writing ■ Energizers (motivators) ■ Work sharing (taking part in local activities) ■ Villagers and shared presentations ■ Process notes and personal diaries	■ Transect walks ■ Wealth ranking and well-being ranking ■ Social maps ■ Interview maps	■ Semi-structured interviewing ■ Direct observation ■ Focus groups ■ Key informants ■ Ethnohistories and biographies ■ Oral histories ■ Local histories, portraits and case studies ■ Transects and group walks ■ Traditional practices and beliefs	■ Participatory mapping and modeling ■ Social maps and wealth ranking ■ Aerial photograph analyses ■ Mobility maps ■ Seasonal calendars ■ Daily routines and activity profiles ■ Historical profiles ■ Trend analysis and time lines ■ Matrix scoring ■ Preference or pair-wise ranking ■ Venn Diagrams ■ Network diagrams ■ System diagrams ■ Flow diagrams ■ Pie Diagrams

Sources: Pretty 1994; Thompson and Pretty 1995.

Table 4. Applications of PRA methods for farmer participatory research.

Methods	Applications
Social maps	■ Location of changes and adoption of new technologies ■ Household listings for stratification and sampling ■ Inventory of vital social resources, local groups, etc. ■ Spread of technologies in neighboring communities
Farm sketches and resource maps: before and after	■ Inventory of vital natural resources, infrastructure, etc. ■ Changes in productivity of fields, intensity of resource use, resource degradation, etc. ■ Changes in rates of adoption, adaptation and rejection of agricultural technologies or practices
Transects	■ Field observations of natural resources, topography, land use patterns, farming practices, indigenous technologies, etc.
Mobility maps and network diagrams	■ Migration patterns ■ Labor opportunities before and after impact ■ Key individuals (e.g., suppliers of information, advice, technologies, services, etc.) and their locations
Trend analysis Time lines Crop biographies	■ Major trends and key events in the lives of local people ■ Influence of external interventions and agencies on community ■ History of introduction of major crop varieties
Seasonal calendars	■ Timing and amount of labor demand ■ Seasonal patterns of production and consumption, income and expenditure, debt and credit, employment ■ Seasonal patterns of rainfall, pests and diseases, etc.
Daily activity profiles	■ Daily work patterns and responsibilities of women and men

(Continued)

Matrix scoring	■ Systematic comparison of technologies, resources, land use, etc., according to locally generated criteria ■ Quantification of benefits according to local criteria ■ Classification and use of local land types
Systems, flow and impact diagrams	■ Impact of interventions or adoptions of new technologies ■ Changes in diversity and resilience of livelihoods ■ Flow of resources and information in and out of village and farm ■ Changes in sources of information and resources
Wealth ranking	■ Changes in welfare—who has benefited, who has not ■ Identification of potential focus groups ■ Distribution of impacts on various households
Village meetings and exhibitions	■ Sharing, analysis and triangulation of findings ■ Farmer-to-farmer exchanges ■ Role reversals (farmers present and analyze; researchers listen and learn) ■ Preparation and planning of research activities
Semi-structured interviews of key informants and focus groups	■ Description and analysis of local criteria, perceptions and priorities ■ Changes in input costs, wage labor rates, land use, etc. ■ Investment in new technologies
Venn diagrams	■ Frequency and strength of interactions between the various farmers' groups and other grass-roots organizations, and between local and external organizations ■ Perceived importance of external support organizations to local people
Pie diagrams	■ Resource and land use patterns and changes
Team contracts, reviews and discussions	■ Multidisciplinary teamwork and effective group dynamics

Source: Thompson and Pretty 1995.

These tools can readily be applied in the context of IMR, as will be observed from the case studies presented in the next chapter. Through a continued process of using these methods in irrigation, some of these tools will be fine-tuned for the distinct characteristics of irrigation. Wealth ranking, for example, would become water ranking, where water users of a particular

water course command area rank their water supply and determine who has benefited from certain management improvements. Maps would be topical, depicting the location of tubewells and environmentally degraded parts of the command area and provide a sample of water users. Seasonal calendars provide the patterns of water supply throughout the year, and pie diagram chart shares of groundwater versus canal water. Venn diagrams will produce insight into the relative importance of the various actors involved in irrigation for a given group of water users. The challenge is to provide an inventory of PRA applications for IMR in the near future.

Participatory Mapping

In the participatory process villagers use the floor, ground and paper to produce maps (village, resources, social, topical, impact and monitoring, etc.) or models (Chambers 1994a). People use local materials (such as sticks, stones, leaves) and outside materials. Mapping however is not a one-off process (Shah, quoted by Mascarenhas et al. 1991) but it leads to further discussion, a transect walk or planning. An example of a village/watershed resource map is shown in Figure 2 (p.20) (Mascarenhas and Prem Kumar 1991), which may form an important tool in the planning of watershed management. In combination with transects and other PRA tools it generates a good understanding of problems and opportunities, and may thus lead to better and more detailed planning.

Participatory Diagramming

In participatory linkage diagramming local people express their ideas of how a certain intervention may impact on their lives in terms of linkages, flows, connections and causality (Chambers 1994a). The example presented in Figure 3 (p.21) illustrates an analysis by a group of men on how they perceive the potential impacts of an irrigation system on their lives (Guijt and Thompson 1994). The same exercise for women (not reproduced here) led to important insights into the social and economic issues that could arise from this introduction not taking into account existing internal problems.

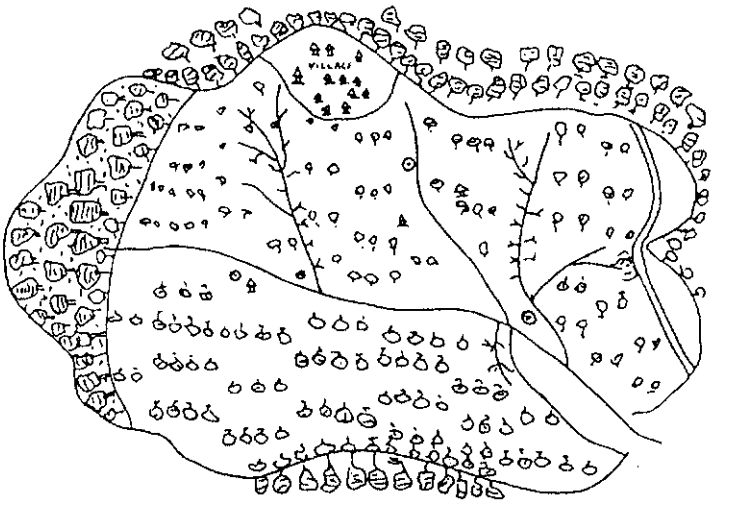
Seasonal Calendar

This tool will explore seasonal constraints and opportunities by diagramming changes month by month throughout the year. It may represent patterns of rainfall, crops, food consumption, illnesses, debts, etc. (Mascarenhas et al. 1991). The example given in Figure 4 (p.22) is a gender-disaggregated activity calendar (Feldstein and Poats 1994), and reveals the periods of labor demand for men and women, which in turn determines the availability of labor for projects and programs.

Benefit Analysis Flow Chart

This technique as shown in Figure 5 (p.23) will describe who in a household or community uses a product, how it is used, and who controls the money if sold. This is repeated for the various livelihood activities (Thomas-Slayter et al. 1993).

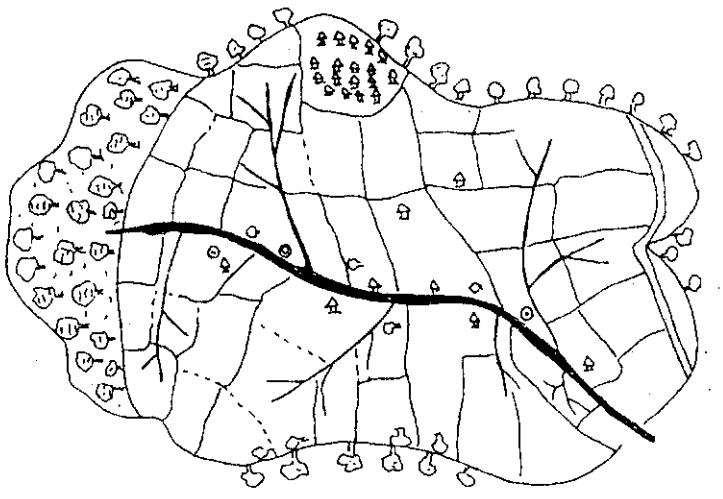
Figure 2. Two watershed models, 50 years ago and today.



50 years ago

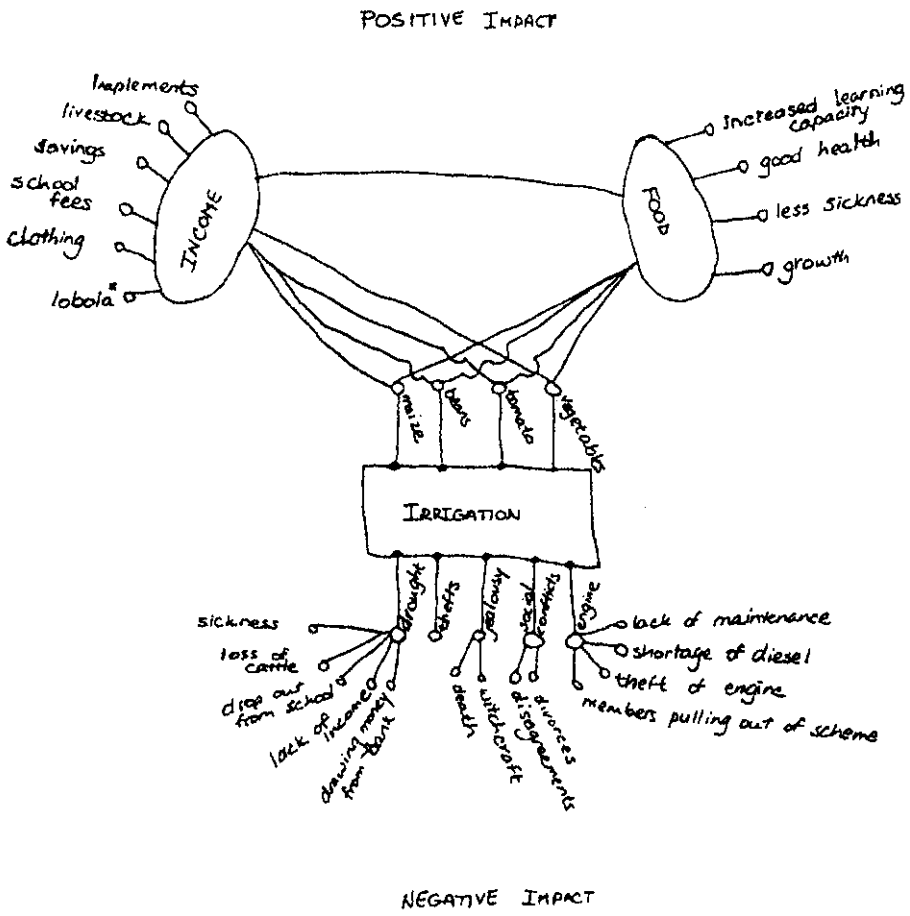
Housing
Nullah
Road
Well
Spring

Today



Source: Mascarenhas and Prem Kumar 1991.

Figure 3. Expected impacts of irrigation as perceived by young men in Zimbabwe.



Source: Guijt and Thompson 1994.

Monitoring Form

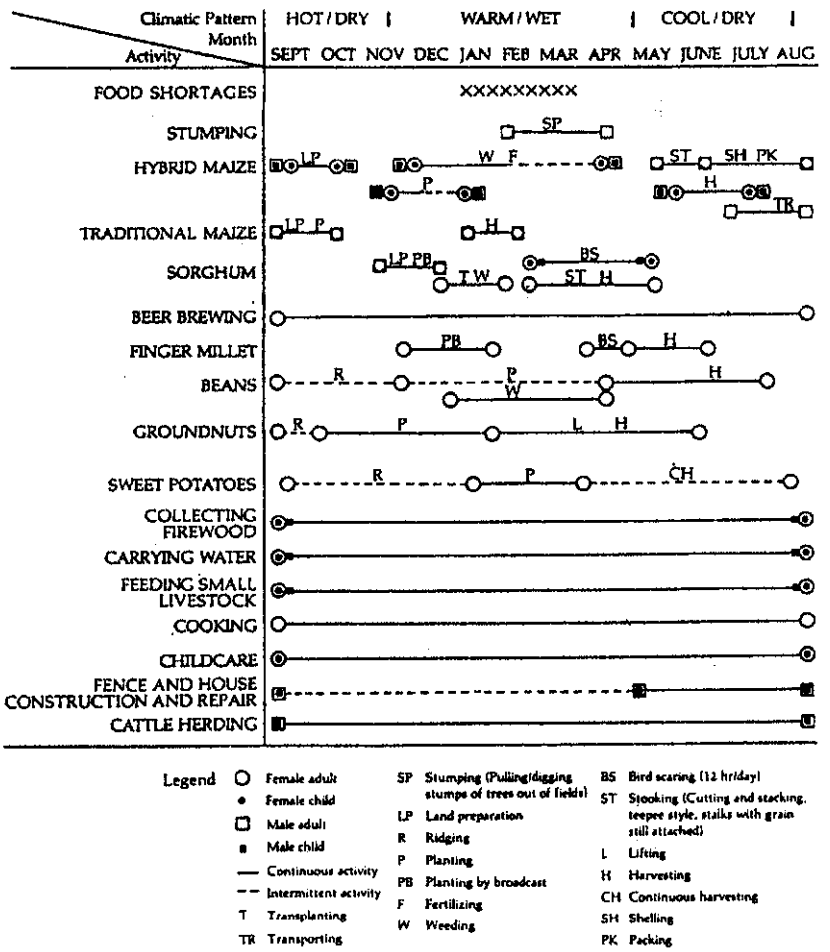
To assess the impact of a project participatory monitoring and evaluation can be implemented by using monitoring forms accessible for local people. The example in Figure 6 (p.24) monitors the time the water is being supplied, the flow of the water (fast, medium, slow, if at all), the standpipe platform (clean, not clean) and whether meetings are organized as a feedback to discuss felt problems (Bolt 1994).

CRITIQUES OF PRA

PRA has spread rapidly and the merits of PRA have been documented extensively. An immense domain of knowledge of applications of PRA tools and techniques is readily available for potential practitioners and researchers (e.g., PLA Notes 1988-1995. Even the dangers of

the swift adoption and expansion of PRA have been given appropriate attention[9] (Chambers 1994c). However, literature on constraints to the use of PRA in, for instance, practical, cultural, institutional or conceptual terminology, is scarce; and well-documented evaluation of PRA methodologies (including comprehensive comparisons with other more traditional approaches) is most of the time neglected and still too rare.[10] In many cases, the evaluation of PRA approaches is limited to the participatory issues (the assumption made is that what is participatory is good by principle), and does not include any analysis of impacts and their sustainability.

Figure 4. Gender-disaggregated activity calendar, Zambia.



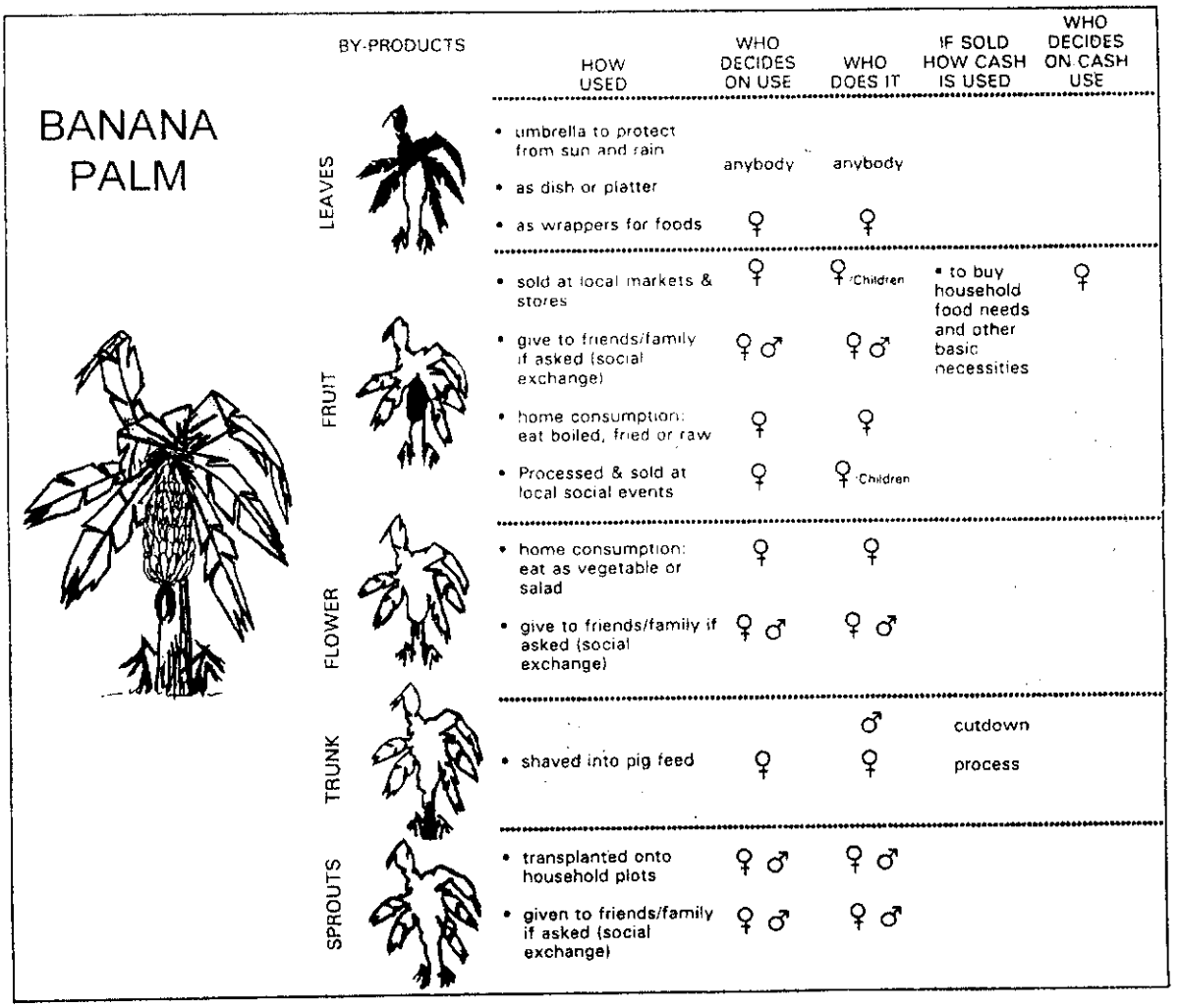
Source: Feldstein and Poats 1994.

[9]Chambers (1994c) perceives four dangers which together threaten the quality of PRA: i) instant fashion; ii) rushing; iii) formalism; and iv) routinization and ruts.

[10]For a recent review and evaluation of PRA practices, see IIED (1995).

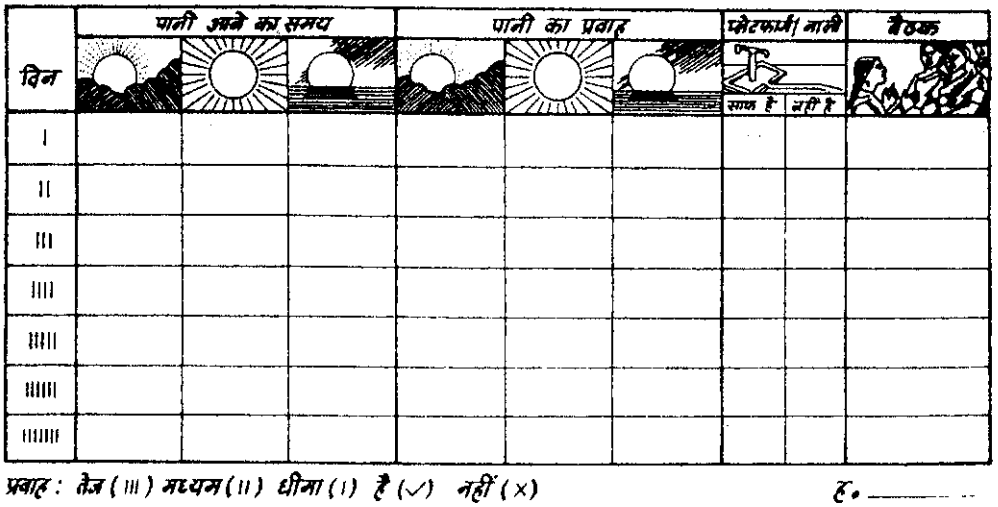
The critiques of PRA expressed so far are difficult to categorize at this stage, but one of these involves the consideration whether PRA is able to generate qualitative data only (Buchanan-Smith 1993). The roots of this criticism lie in the fact that policymakers and decision makers have a normal inclination towards "hard" data which are relatively more easy to interpret. The majority of the irrigation researchers and system managers will presumably display the same tendency. There are several domains where PRA did produce numerical data commensurable to questionnaire surveys (Gill 1993; Chambers 1994b). These areas are: farm and household surveys, wealth and well-being ranking; and village censuses and rainfall data. In all of these examples PRA produced validated and cross-checked figures, which revealed more detail and precision than a questionnaire could have presented.

Figure 5. Benefit analysis flow chart (the Philippines).



Source: Thomas-Slayter et al. 1993.

Figure 6. Monitoring water-collecting patterns and women's participation in a project in India.



Source: Bolt 1994.

During interactions with participants the cultural appropriateness (or neutrality) of PRA is a matter of importance. How commensurate are our perspectives with those of local people? Jones and Townson (1993) discuss what they call the "sophistication" of Sri Lankan villagers which might embarrass illiterate people who were encouraged to use symbols instead of words which precisely had the effect of emphasizing their illiteracy. Thus, they state that *it cannot be assumed that the people being interviewed are equally comfortable with every technique.* Further, the suitability of wealth ranking is challenged:

> *... The reason for the caution with using wealth ranking is that wealth differences and peoples' perceptions of such differences can be very subtle and rarely (and with difficulty) verbalized. To bring up such perceptions, especially at a group meeting, may disrupt the social structure of a village creating problems of jealousy, resentment and animosity that last much longer than the RRA visit we would be undertaking*[11] (Jones and Townson 1993).

[11]Empirical evidence of PRAs in Sri Lanka (including one of the authors' personal experiences) however does not support this observation (Thompson and Nott 1992).

However, Fussel (1990) provides the opposite conclusion when he states that the PRA *seems to be well suited for maximizing possibilities and placing intervention activities in step with the community value system.* And in addition *...that the PRA methodology can be especially effective in addressing the goals of cross-cultural understanding....*

Another criticism of PRA refers to the specific concentration on tools, techniques and attitudes to data collection at local level while neglecting the analyses of how this information is used at higher levels (Buchanan-Smith 1993). For PRA to have an impact at a wider scale will to a large extent depend on the acceptance and adoption of the methodology and its outputs by policymakers.

That PRA creates high expectations is often expressed by practitioners of this methodology (Edwards 1995). The expectation is typically aid, especially when a foreigner is part of the PRA team. How can PRA for **research** be participatory in the true sense (perhaps only if it leads to a certain type of Participatory Action Research)? *We are farmers. What use are these games to us?* (Jones and Townson 1993).[12]

Mosse (1993) argues that the information PRA generates is strongly influenced by the fact that PRAs involve public social happenings which develop local knowledge which in turn reflects existing social relationships (power, gender). Information would, to a great extent, be determined by what the team thinks is important and relevant (if accessible at all for outsiders).[13] Thus, the issue is addressed as to who participates in and who decides and benefits from the participatory process (see also Thrupp et al. 1994).

Bell (1994) takes Mosse's article as the basis for understanding the "tyranny of methodology" and claims that the application of PRA is *far from being uncontentious*, and continues that *it seems evident that RRA and PRA are only as untyrannical, educative and locally sympathetic as the context and the scientist are prepared to be or, perhaps more meaningfully, are able to be given the limitations of their own culturally based view of their own methods.*

A final reservation towards PRA which could be mentioned is the reluctance of protagonists to come up with standard guidelines and recommendations for using PRA in a given context. As has been argued earlier, the strength of a PRA lies in its flexibility and spontaneity. This does not mean that PRA as a methodology does not attempt to accomplish a certain level of rigor. It does this by combining three methods: i) through active intervention; ii) through management and observation of process; and iii) through the exercise of critical judgement (Chambers 1994b). A framework for judging trustworthiness has been developed and distinguishes elements of the participatory process which enhance trustworthiness (Pretty 1994).

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[12]For example, this problem has been encountered in two of the case studies (Nepal and Pakistan) presented in the following section of this paper.

[13]This issue is stressed by the Nepal case study presented in the following section. In this case, the composition of the PRA team (the inclusion of women team members for example) is recognized as an important factor explaining the directions taken by the appraisal.

Examples of the Use of PRA for IMR

LITERATURE REVIEW ON PRA FOR IMR

THE CONCEPT OF greater farmer participation in irrigation management has followed the general evolution of thoughts on greater stakeholder participation in development projects. The specific motives to promote greater farmer participation in irrigation management stem from several objectives, with the desire to reduce the operation and maintenance costs for irrigation agencies and improved maintenance of irrigation systems being examples of these. Participation could mean something like a process by which water users influence irrigation management decisions that have an impact on the performance of their irrigation system.

Whatever the reasons to foster larger farmer participation in irrigation management may be and, similarly, to the changes that have occurred in other fields and development activities, new methodologies in IMR have emerged from this development. These methodologies attempt to avoid the biases of conventional assessment procedures (Chambers 1988) as it is realized that incorporation of water users' views is essential as they will benefit from the findings of high quality research (Healy 1994). Participation of water users in IMR would mean that water users are accepted as stakeholders in setting the research agenda, designing research procedures and judging the relevance of research findings. In addition, water users would be recognized partners in assessing performance of a technology or management strategy and partners in training and institutional development (Vermillion 1994). And one could also imagine farmers taking responsibility for part of the data collection and directly participating in the implementation of research activities. Therefore, PRA would qualify as an instrument which could guide irrigation management researchers to explore water users' problems and needs, where farmers are joint partners in identifying research priorities and analyze research outcomes.

In the 1980s, rapid appraisal methods have also been widely applied in the field of irrigation management and related research. In a bibliographical review of RRA and its application to irrigation, Potten (1985) discusses irrigation RRA principles and techniques, in which good organization, to escape spatial and project bias, to escape person bias, to take time and keep a low profile, and to appreciate local knowledge and season bias are of particular importance. Guidelines emerged to assist irrigation system managers and researchers to apply these principles in their day-to-day practices (Yoder and Martin 1985; Chambers and Carruthers 1985; Pradhan et al. 1987; Groenfeld 1989).

A more recent review of the use of participatory methodologies in irrigation reflects the absence of documentation specifically dedicated to PRA (Healy 1994). Rapid and participatory research methodologies have been applied for various purposes and contexts. However, PRA and irrigation information seem to be unpublished and meant for internal use of research institutes, development agencies and NGOs only. Most of the time, PRA is mentioned in more general documents focusing on the topic (irrigation management) rather than describing and evaluating the approach, thus making difficult a comprehensive and detailed literature review on PRA and IMR.

The review undertaken for the present paper was restricted to two sectors of PRA applications which were identified by Chambers (1994a, and see the previous chapter), namely natural resources management and irrigated agriculture. The types of processes in which applications of PRA were found were mostly participatory appraisal and planning and participatory implementation, monitoring and evaluation of programs.

Participatory Appraisal in Irrigation Systems. A large number of RRAs have been implemented by irrigation system managers and irrigation management researchers all over the world. This category of RRAs attempts in a "quick-and-dirty" manner to determine major problems in a system and opportunities to improve the system performance. The approach is not necessarily interactive and participatory nor is it always followed by planning and action in collaboration with the water users (Chambers and Carruthers 1986). As an example, an irrigation resource inventory as the basis for planning sustainable development strategies in Nepal (IIMI 1994a) will be described and discussed.

Participatory Implementation of Watershed Management and Soil and Water Conservation Programs. Although watershed management is broader than irrigation management, there are close links between the two. Watershed management as a coordinated approach to soil and water conservation is a common practice and by its very nature offers a high potential for stakeholder participation. In a selected catchment in Kenya, evidence suggests that the use of participatory approaches and community mobilization may lead to a high rate of adoption of soil and water conservation measures (Pretty et al. 1993). Using participatory and informal approaches to elicit farmers' perceptions to and practices of soil and water resources, farmers' practices can be contrasted with recommended practices evolved by scientists through formal research (Sanghi et al. 1994), with significant differences in practices of soil conservation, water harvesting and moisture conservation. IIMI's experience in watershed management and participatory approaches in Sri Lanka is described under *Stakeholder Participation in Watershed Management in Sri Lanka* (pp. 35-37) (Wijayaratna 1995).

Participatory Implementation of the Design of Irrigation Systems. In the conventional design process, the role of water users is relatively limited. As shown by Vermillion (1990), there is a great potential for farmers to contribute to the design process if they are allowed to express their alternative sets of design criteria which take into account their local knowledge and experience. Thus, participatory approaches are adopted in (rehabilitation of) irrigation projects which attempt to incorporate the multiple perspectives of water users. In a series of meetings, water users plan the design of their shallow well irrigation scheme (PATA 1994). Povel (1990) reports on the participatory development of an irrigation scheme in Kenya, where women, landowners and agency staff work together at the various stages of design and implementation.

Participatory Monitoring and Evaluation of Programs. Participatory procedures of monitoring and evaluation of irrigation system performance or self-assessment and self-

correcting processes of water user organizations have been explored and implemented by IIMI and others and reveal evidence of success (Lauraya et al. 1993). Uphoff (1988) has developed a methodology for participatory evaluation of small group capacities and performance for water user associations in Sri Lanka. Criteria for evaluation are selected and agreed upon by participants, the irrigation system stakeholders themselves, and maps, symbols and simple records are used to assess performance. As Uphoff (1988) observes that most of the approaches to evaluation are top-down, the challenge is to design the process in a really participatory manner. Participatory gender impact assessments of irrigation interventions have been documented by van Walsum (1993ab) and Gianotten et al. (1994).

The following sections of this chapter discuss examples of studies in which participation of stakeholders has been part and parcel of the research design, and where water users are invited to be the researchers themselves.

An Example of the Use of PRA for Problem Analysis in Irrigation Systems in Kenya

Although not describing activities undertaken under IIMI's research program nor focused on IMR *per se*, the present example is summarized below as it is one of the rare applications of PRA focused on irrigation systems that has been reported in a rather comprehensive manner in the literature (Thompson 1990). The PRA methodology and its different phases are clearly described, including very practical details regarding the implementation and field-testing activities. The main objective of presenting this paper is to give a practical flavor to the reader on PRA activities implemented in a very specific context.

Thompson (1990) describes the experience of researchers from the National Environment Secretariat (NES) of Kenya who applied PRA in a very specific context of water resources planning and management. PRA methods and approaches are used by the NES for local-level studies that are part of a global program on environment resources management titled *From the Ground Up*. The main objectives of this program are:

i. To identify institutional and managerial elements that contribute to effective environmental resource management at the local level;

ii. To determine the potential for community-level institutions to act as effective agents of resource management; and,

iii. To ascertain means for communities to identify long-term needs and opportunities for sustainable resource use.

The PRA approach that is used by the National Environmental Secretariat staff comprises 8 consecutive steps, from the selection of sites to the monitoring and evaluation of specific activities implemented as a result of the PRA activities. These steps are:

i. Site selection (at the request of local communities or the government department);