

SOCIAL ORGANIZATION
FOR
IRRIGATED AGRICULTURE

PILOT PROJECT FOR FARMER-MANAGED IRRIGATED AGRICULTURE
UNDER THE LEFT BANK OUTFALL DRAIN STAGE I PROJECT, PAKISTAN

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INCEPTION REPORT
AND
IMPLEMENTATION PLAN

Presented to
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Department of Agriculture **and** Wildlife
Directorate of Agriculture Engineering and Water Management

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PILOT PROJECT FOR FARMER-MANAGED IRRIGATED AGRICULTURE UNDER THE LEFT BANK OUTFALL DRAIN STAGE I PROJECT, PAKISTAN

INCEPTION REPORT AND IMPLEMENTATION PLAN

INTRODUCTION

The Terms of Reference of the project specifies that there should be an Inception Report, and an Implementation Plan at the end of the Project's Phase I. This document serves both these purposes. The document is based on a literature review, the experience of past and on-going social organization attempts in Pakistan, and the inception activities already completed by the project since July 1995.

Part One of the document presents the Inception Report giving some details of background, concepts, objectives and methodologies underlying the planned pilot projects. Part One also refers to the project's locations and its linkages with other IIMI activities in Pakistan. These details are followed by an outline of overall project organization, including the arrangements made for project implementation.

In Part Two, the document gives the scope of activities for achieving the intended objectives, and an outline of the Implementation Plan as can be developed at this stage of the action research program.

The project documents refer to four phases of activities to be completed during a period of thirty months, Phase 1 from July to September 1995, Phase 2 from October 1995 to September 1996, Phase 3 from October 1996 to December 1997, with the twelve-month Phase 4 overlapping with Phase 3. The Phase 4 activities are basically for synthesizing the findings of activities of earlier phases and documenting the lessons of field experiences from the pilot projects that can be extended to other distributaries or minors within the LBOD area.

An attempt was made in the Implementation Plan to include the main requirements of all these four phases mentioned in the original project documents into a step-wise process, which was developed for the organization of water users in Pakistan. This step-wise process also proceeds through four phases progressively, from Phase I to Phase IV, as has been described in Part Two of this document. The project content included in the step-wise process is finally shown in the form of an Activity Chart at the end of Part Two.

The two-part document is supplemented by five Annexes. These Annexes serve to provide a summary of the literature review undertaken and the conceptual background to the pilot projects.

PART ONE: INCEPTION REPORT

BACKGROUND

Pakistan has a long history of irrigation. The country also has considerable experience in planning and implementing large irrigation development projects. The successful completion of these projects has made irrigated agriculture the country's engine of economic growth. However, both donor agencies, as well as government policy authorities in Pakistan, have recently started to feel some concern on the inadequate return on these investments. **Both of** these groups are actively considering some major institutional changes in the irrigated agriculture sector as an initial step towards achieving improvements in the sector's performance. Serious attention is being given to improving the productivity of irrigated agriculture by encouraging water users' involvement in jointly managing the irrigation systems.

These policy initiatives are also related to the country's **two** decades of experience in establishing water users associations (WUAs) at the watercourse level. However, in Pakistan, as elsewhere among developing countries, not much research has been done on the actual impact of these WUAs on the efficiency, as well as on the equity, in water resources management. More importantly, research on the processes that were used in watercourse level social organization attempts has also been minimal. Thus, very little organized information exists, which could be used for planning future interventions for a larger scope in participatory management.

With this policy and research background, the Sindh government authorities decided to try some interventions in social organization at the distributary/minor level in a pilot project mode. For this purpose, the Left Bank Outfall Drain (LBOD) Project Management in consultation with the World Bank and the Swiss Development Cooperation entered into a consultancy agreement with the International Irrigation Management Institute (IIMI) to implement three pilot projects in which Water Users Organizations (WUOs) would be established to operate and maintain irrigation and drainage facilities in distributary/minor canal command areas.

This initiative is also motivated by the fact that completion of the LBOD Project facilities would drastically increase the budget requirements for proper maintenance of the canal systems in Sindh, and that it is likely that the involvement of farmers in a participatory management approach could reduce the burden of these budgetary constraints. The Department of Agriculture and Wildlife, therefore, prepared a Supplementary PC-I which was approved by the GoS in September 1994, which includes the implementation strategy for the pilot projects. Based on this PC-I document, IIMI prepared a project proposal, giving the technical details and the methodology for project activities, and a financial proposal for a consultancy arrangement (IIMI, 1995). IIMI's consultancy agreement with the Agricultural Engineering and Water Management Directorate of the Government of Sindh was signed on 26 July 1995, and became retroactive to 1 July 1995.

PROJECT CONCEPTS

As with any other action research effort, these social organization pilot projects are based on a number of theoretical assumptions and principles, some of which are mentioned below¹:

- (1). **Benefits of Organized Behavior:** The assumption is that collective action is more effective than individual action in sorting out social issues related to equitable resource allocation and sustainable resource management. This is particularly true for water distribution in irrigated agriculture, as irrigation systems are inherently socio-technical systems. Conceptually, the underlying principle is that collective action is not only able to liberate individuals' actions, but also to restrain them. These twin actions are necessary to improve equitable water distribution. **For** instance, the strength of a Farmer Organization would depend on its ability to effect sanctions on members who commit irrigation offences, and prevent widespread anti-social conduct in water distribution.
- (2) **Benefits of Water Users Organizations:** In many instances in the past, WUOs have been promoted to take over part of the responsibility for managing irrigation and drainage systems with a view to reducing the government's share of O&M costs, improving equity in water distribution, managing groundwater levels, and improving system performance. **For** the present pilot projects, all these objectives remain, but in addition, they are taken as tentative propositions which will further be tested through the results of pilot efforts.
- (3) **Joint Responsibility:** Organizing farmers, who are part of the local community, is essentially a local responsibility, which should not be attempted alone by an international institute like IIMI. Organizing people for popular participation has a political implication, which can best be handled by a local group of people who have access to appropriate authority to engage in such work. IIMI should play a catalyst's role, and mobilize the interests and support of the operating agencies for this work. Suitable community-based opinion leaders can play a significant role in sharing responsibility for organizing farmers.

¹ Further details and references related to some of these assumptions and principles can be seen in Annex-1.

- (4) **Motivation for Sustainable Effort:** Improving existing physical conditions or providing new infrastructure cannot be considered a sufficient condition for effective social organization; nor is the device of cost-sharing for rehabilitation or capital works. Similarly, the delivery of an extension package is insufficient and also tends to make the farmers dependent on those who "deliver". All these interventions have a temporary influence on social organization. A continuous engagement in some productive activity by the water users as a group is more likely to provide a greater incentive to keep the organizations alive. Therefore, the work by the field teams is based on strategies for promoting collective action on effectively managing maintenance and operation of the irrigation distributary sub-system. An awareness on water-related technical and socio-economic issues in terms of quantity, quality, as well as economic and environmental impact of water used for irrigation, along with an opportunity to have some control over these issues would motivate the farmers on a long-term basis.
- (5) **Socio-Technical Linkage:** The social sub-system in an irrigation system, does not operate in isolation. It always works in association with the physical or technical sub-system (obviously, the converse is true, too). For this reason, social organization cannot be effectively accomplished independently, or without reference to the technical aspects of irrigation management. The water users in an irrigation system pay considerable attention to a discussion on problems and solutions related to their technical sub-system. Normally, rural people are not very much impressed by the outsiders who hasten to discuss their social issues. Therefore, as a strategy, the field teams should be well equipped with information on the technical sub-system, which the water users will be willing to discuss initially. This will also enable an initial rapport to be established between the field teams and the farmers.
- (6) **Mutual Trust:** Literature on irrigation management is rampant with references to lack of mutual trust between farmers and irrigation officials (Wade, 1987; Hart, 1978). The mistrust on the part of farmers extends to any group that tries to interact with them in the field. To clear this initial cultural barrier, the field teams would benefit by proceeding slowly, but steadily, in the process of trust-building, allowing sufficient time for farmers to air their views, understand the need for change, and identify the genuineness of outsiders interacting with them.
- (7) **Sense of Involvement:** The decisions related to social organization, including those regarding the form and structure of distributary or minor level organizations and their legitimate functions, should eventually be taken by the water users themselves. All other partners in this effort, including IIMI, should act as facilitators in the water users' decision-making process to assist them in taking progressive and implementable decisions.

- (8) **Upstream Abundance and Downstream Shortage:** Like in the case of famines which are not necessarily caused by a shortage of food alone, but also by mal-distribution², the problems of the end-users of any service or commodity, such as water, are attributable to defects in the distribution system. Acquisition of a large quantity of water by building dams does not necessarily mean that the user will have access to his water requirement (or his entitlement), **so** easily, or equitably as expected. Therefore, the equitable distribution of water is as important as the acquisition of water in overall irrigation performance. In an attitudinal re-orientation among the persons involved in managing water delivery services, the human interactions will be tested for their real value in bringing about increased productivity through more equitable water distribution.
- (9) **Improved Irrigation Practices:** Even if the equitable water distribution is effected, it does not ensure that the users will consume the water properly. Collective action by an organized group of farmers is expected to facilitate the needed transfer of technology for improved irrigated agriculture by improved management of the combined irrigation and drainage facilities. The field teams in the case of these pilot projects (and a similar institutional arrangement on a more permanent basis for subsequent replication of pilot project results, if they happen to be significantly positive), would serve as a group providing irrigation and agriculture advisory services to the WUOs. The sustainability of WUOs during the initial period would depend on the facilitating and motivating functions of this irrigated agriculture advisory services group. Conceptually, this advisory role of the government agencies is seen as a continuing need even after the establishment of WUOs.

The above items of assumptions and principles do not form an exhaustive list, but are mentioned as guidelines for a conceptual foundation for our work and the methodologies to be followed. However, all the partners in this effort will benefit by having a common understanding on the conceptual basis for pilot project activities.

² Work done by the renowned economist, Dr. A. K. Sen, on famines in Ethiopia and Bengal, explains that famines are not necessarily caused by a shortage of food alone. Problems of access to the available food resources through a lack purchasing power and uneven distribution make many poor people vulnerable. Sen's "entitlement" theory (Sen, 1981) could easily find relevance in the field of irrigation water management.

Some of the above mentioned project concepts were derived from a review of literature on Pakistan and international experience in water users organizations. The preliminary review work accomplished to date by the project's staff has generated the following review papers:

- (1) "IIMI's Proposed Research Activities on Water Users Associations in Pakistan", Concept Notes Prepared by D. J. Bandaragoda (3 April 1994);
- (2) "Research Inputs for an Action Program on Participatory Irrigation Management in Pakistan, Paper prepared by D. J. Bandaragoda and Gaylord V. Skogerboe for presentation at the EDI/Ministry of Water and Power Seminar on Participatory Irrigation Management held in Islamabad during 2-6 October 1994, [this paper is reproduced in Annex-I];
- (3) "Consultancy Inputs for the Preparation of Project Inception Report on Social Organization in Irrigation Management" by Piyasena Ganewatte and Prachanda Pradhan (January 1995), [summary of this report is given in Annex-21];
- (4) "Government's Participation in People's Programs: an Intermediary Role for NGOs in Developing Viable Institutions for Participatory Irrigation Management", Paper prepared by D. J. Bandaragoda, which was presented at the Third Annual South Asian NGO Summit 21-23 February 1995, Kathmandu, Nepal, [extract of this paper is in Annex-31];
- (5) "Institutional Conditions for Effective Water Delivery and Irrigation Scheduling in Large Gravity Systems: Evidence from Pakistan", Paper prepared by D. J. Bandaragoda for presentation at the FAO/ICID Workshop on Irrigation Scheduling: Theory and Practice, held in Rome, Italy, during 12-13 September 1995. (Abstract of the Paper is given in Annex-4); and
- (6) "IIMI's Initiatives on Participatory Irrigation Management in Pakistan", A Briefing Note prepared by D. J. Bandaragoda and Gaylord V. Skogerboe for the EDI/MWP Workshop at Burban, Pakistan, during 1-4 October 1995 [extract is in Annex-51.

The Concept Notes of 3 April 1994 [Item (1) above) traced the main features of Pakistan's irrigation and the rationale for establishing strong water users organizations to share its management responsibility. The present research efforts were seen as an essential pre-requisite for developing a general awareness regarding the needed policy initiatives. They were also seen as part of a strategy to create an interest among policy and implementation groups for undertaking more meaningful measures towards lasting institutional development among water users. Contextually appropriate action research efforts would be included in the initial "learning" phase, on the basis that external assistance can be effective only in playing a facilitating or a catalytic role.

The Conceptual Notes surfaced the following main research issues:

1. Inequity: It is conventional wisdom that rural people genuinely believe in cooperation. For failing to transform this belief into action, one of the possible reasons can be the inequity that exists among the rural people, be it an inequity in terms of their literacy, income and wealth, social status or political power. This reason seems to suggest why a greater degree of cooperation can be seen in more egalitarian societies. It can be hypothesized, therefore, that the skewed nature of the socio-economic structure of Pakistan's irrigated agriculture sector is a major impediment to the growth of cooperative behavior among the water users and the emergence of effective water users associations. This is an issue that needs to be explored more thoroughly with in-depth studies including both quantitative and qualitative assessments of the existing inequity, relating them with both the past experiences of social organization, as well as the potential for future interventions.
2. Incentives for Collective Action: Very much related to the inequity issue is the assumption that it is not logical to expect any individual to join collective action unless the individual **sees** a net personal benefit arising from it. Often, little value is attached to this seemingly simple, but practically important, theoretical concept. What is the potential, in this particular context, of generating a long term net benefit to the whole group, as well as to each individual who joins the group for collective action ?
3. Lessons from the Past: Pakistan has more than two decades of experience in establishing water users associations. Several evaluations on this effort have not been positive. What are the real reasons for these rather disappointing results of past interventions ? What are the water users' perceptions on this ? Among these reasons, or further to them, could there be any cultural, socio-economic or environmental factors that tend to foster or inhibit the development of organizations and institutions among water users ?
4. Farmer-Bureaucracy Interactions: The actual relationship between the official and the water user under the present conditions in Pakistan's canal systems has not been clearly explored. The obvious reason has been the difficulty of extracting accurate information on some of the sensitive aspects of this issue. Yet, it is worth trying, in any given opportunity, to find out more about this relationship. How do the "free riders" interact with the irrigation official relating to whatever they do against the law ? What is the nature and scope of these formal and informal interactions ?

5. Governance: Of the possible reasons for the success or failure of interventions promoting WUAs, governance is an important factor that deserves special attention. Governance refers to the allocation of power and authority in the society. The system in Pakistan can be described as a centralized form of governance for irrigation management, and therefore, can have a great influence on the establishment of WUAs as sustainable organizations. This proposition needs to be tested to consider possible policy changes in the present system.

PROJECT OBJECTIVES

The major objectives of the pilot projects are:

- (1) to test the viability of farmers' managing parts of the irrigation systems, more specifically, at the level of distributary/minor canals, so that more efficient and equitable allocation of water can be achieved; and
- (2) to make recommendations related to future extensions on the basis of results of the pilot projects.

In order to link these pilot projects with the overall LBOD Project objectives, the three pilot distributary/minor canals were to be selected from the LBOD Project area, one in each of the three districts: Nawabshah, Sanghar and Mirpurkhas. The cost recovery for drainage and irrigation improvements in the Left Bank Outfall Drain (LBOD) area has been a matter of great concern for donors as well as the government. One of the major reasons affecting cost recovery is an absence of mechanisms through which the farmers could be directly involved in the improvements offered under the project. This requires a re-orientation of Water Users Associations (WUAs) at the watercourse level and the further establishment of federated WUOs so that farmers get involved in better appraising their requirements and to decide how they could economically and effectively use the improvements offered under the project.

The specific objectives of these pilot projects would be to help organize farmers into Water Users Organizations (WUOs) in the three selected distributary/minor canal command areas, and ensure operation and maintenance of the distributary/minor canals by the WUOs without much intervention from the governmental agencies, but with their institutional support particularly in the early development stages of the pilot projects.

WUOs would eventually be accountable for water received at the head of distributary/minor canals, responsible for distribution of water among member watercourses under their own rules, and management of groundwater levels. Farmers would pay for the water and for operation and maintenance (O&M) of the irrigation and drainage facilities in their distributary/minor canal command areas. They will undertake the collection of water/drainage charges, improve water management practices, and other activities related to water. Also, an effort would be made to improve the maintenance practices for irrigation and drainage facilities.

This method of active involvement would help farmers in achieving benefits and project sustainability. Ultimately, the legislative requirements for effectively organizing and strengthening Water Users Organizations and Federations would be identified.

PROJECT METHODOLOGY

The Focus of Interventions³

As methodological issues, both the project's interpretation of the target group for interventions, as well as the main geographical location at which organizational efforts are focused, deserve some clarification. The project interventions are targeted at "water users" rather than "farmers", and the organizational unit is a "Water Users Organization" rather than a "Farmer Organization". As the project objectives are mainly based on operation and maintenance management associated with irrigation distributary systems, the focus of social organization activities is on the majority of persons (male and female) who are engaged in allocation, distribution and use of irrigation water in the secondary and tertiary levels of the canal irrigation system. An advantage of this methodology is that the organization is less likely to be dominated by the absentee landlords.

Initially, the main focus of attention will be at the secondary (distributary or minor), and the need to consider the watercourse level will be mainly for the purpose of ensuring a fair representation of all water users in the distributary or minor level WUO. Once the WUO becomes a stable entity and is capable of managing O&M of the distributary system, the WUO itself will be encouraged to strengthen the WUAs at the watercourse level so that they become strong links of the WUO for resource mobilization, water allocation and conflict resolution at the watercourse level. The nomenclature of WUO and WUA is only to be able to distinguish between the two levels of organizations.

³ The term "intervention" is given a very broad definition to mean mediation, negotiation, or intercession, rather than an aggressive or assertive action.

Field Approach

Basically, the project's intended approach involves the placing of field teams in selected communities to interact and slowly catalyze the farmers to identify their own problems, solutions, leaders, organization, financing, budgeting, and management. For each distributary or minor command area, a field team will be deployed, consisting of one Supervisory Social Organizer, two Social Organizers and ~~two~~ Field Research Assistants. The Field Research Assistants (new Engineering graduates) will provide the necessary technical support to the Social Organizers (MAs in Sociology).

Within this structure, however, the field teams' functions will have an emphasis on the social organization aspects. The decision to have a senior social organizer as the team leader reflects this designed project emphasis. Each of these field teams will recruit from among the opinion leaders in the community, a number of "contact farmers" who will assist the field teams with social organization activities.

Participatory Action Research⁴

A field approach as outlined above requires techniques of interactions, which will focus on catalyzing the water users to effectively participate in all field activities of the project. For all partners in the project, it is a participatory learning process. With a broad conceptual framework and a methodology, as given in this document, the project staff will have to interact with the water users and their groups, and meet the field situations as they arise, and evolve a detailed work plan as the project matures. No fixed ideas, nor blue prints for implementation, will be valid in such an approach. Instead of trying to coerce or manipulate water users' involvement in management, there should be a way of identifying, assessing and building on their intrinsic demand and their latent capacity. Emerging social science knowledge indicates that the most effective tools for this type of catalytic action are the Participatory Rural Appraisal (PRA) and Participatory Action Research (PAR) techniques which are currently being sharpened in the field of irrigated agriculture. A strategy that relies on self-reliance for sustainable management change and accompanying performance improvement would find these tools tailor made for field work in these pilot projects.

⁴ A strong theoretical framework for Participatory Action Research, which was given by Wignaraja in his leading article in a recent publication on development issues (Wignaraja and Hussain, 1989), provides a basis for this work. Also, suggestions made by some practitioners of these methods (Maloney, 1994; Lauraya et al, 1991) can be used in fine-tuning the detailed monthly work plans for the field teams.

Incentives

In previous donor-assisted projects in which social organization was a component, an incentive for organization was provided in terms of improvements in the physical system. However, their effect was generally found to be temporary, and the WUAs formed with such incentives lasted only until the short-term objectives were achieved. Considering this phenomenon, the pilot projects will adopt a different strategy. In place of monetary or physical infrastructure incentives, an attempt will be made to convince the water users of the need to have longer term objectives of achieving more equitable water distribution, increased reliability and timeliness of water delivery, and improved irrigation practices, all aimed at increased productivity of irrigation water.

The motivational effort will be to engage the water users in building awareness, confidence and mutual trust, with an emphasis on training and information sharing. There will be no monetary incentives and no promises of physical assets, except for some limited cost-sharing for maintenance activities. As will be discussed later in this document, the interventions will be in a slow process, monitoring the effect of each step and building on it. The strategy is to have frequent visits and meetings with groups of farmers in places which are considered as "neutral", such as schools, mosques, playgrounds and other community meeting places, and exchange ideas and information which will initially serve to build a rapport with the people. Another important motivating strategy to be tested is the introduction of self-evaluation by the group (and individuals) of the actions taken by them.

Contact Farmers

A major feature of the methodology adopted in this action research program is the deployment of "contact farmers". In an attempt to reach the water users community extensively, any member of the community, who is adequately informed and prepared to assist the field teams, would be a suitable contact person. The contact farmers will essentially serve as a link between field teams and the community, and will in effect form part of the team.

Some of the main criteria for selecting a contact farmer would be that:

- * The person is well informed about the area, its people, traditions, geographical details, water and land resources and generally about its irrigated agriculture;
- * The person is non-controversial, is not known to be a trouble maker or an exploiter, nor is an anti-social person in any way;

- * The person should be able and willing to communicate freely with all sections of the local community, and also with the outsiders who come to collaborate with the local people in community development activities;
- * The person should be motivated to help others and should see value in collective behavior for the common good;
- * The person should have the potential for acquiring some basic training to become a community-based social organizer, and be part of our extended field team; and
- * The person having an ability for public speaking would be an added advantage.

The contact farmer need not necessarily be a "farmer leader", a "big landowner", or even a person to "represent" the water users, or a potential office bearer of the proposed Water Users Organization.

The intention is not to have a set of passive "followers" of IIMI in these contact farmers. **As** against the more popularly known method of having a set of "yes men", these contact farmers should have their freedom to air their views as members of the larger community.

There will be no effort to select a specific number of contact farmers for each watercourse. What needs to be achieved is to find a sufficient number of friendly, helpful people willing to assist the field teams in reaching the whole water users community in the pilot area.

This methodology is derived from an IIMI field team's experience in some preliminary social organization activities conducted in the Hakra 6-R Distributary in the Punjab. The study in this distributary command area tested the use of key informants to obtain an understanding of the present organizational status in the area, and to collect basic socio-economic data from a sample of watercourses. The results, which are being analyzed for a forthcoming publication, suggest that the method can be adopted to use contact farmers for extension messages.

Step-wise Process

At the project planning stage, most of the WUAs formed during OFWM efforts in the LBOD area were assumed to be able to form a federation at the distributary/minor level, which will eventually be able to undertake the responsibility for operation and maintenance of distributaries/minors, interceptor drains and tubewells, as well as for cost recovery related to such functions. The current project was established to nurture this

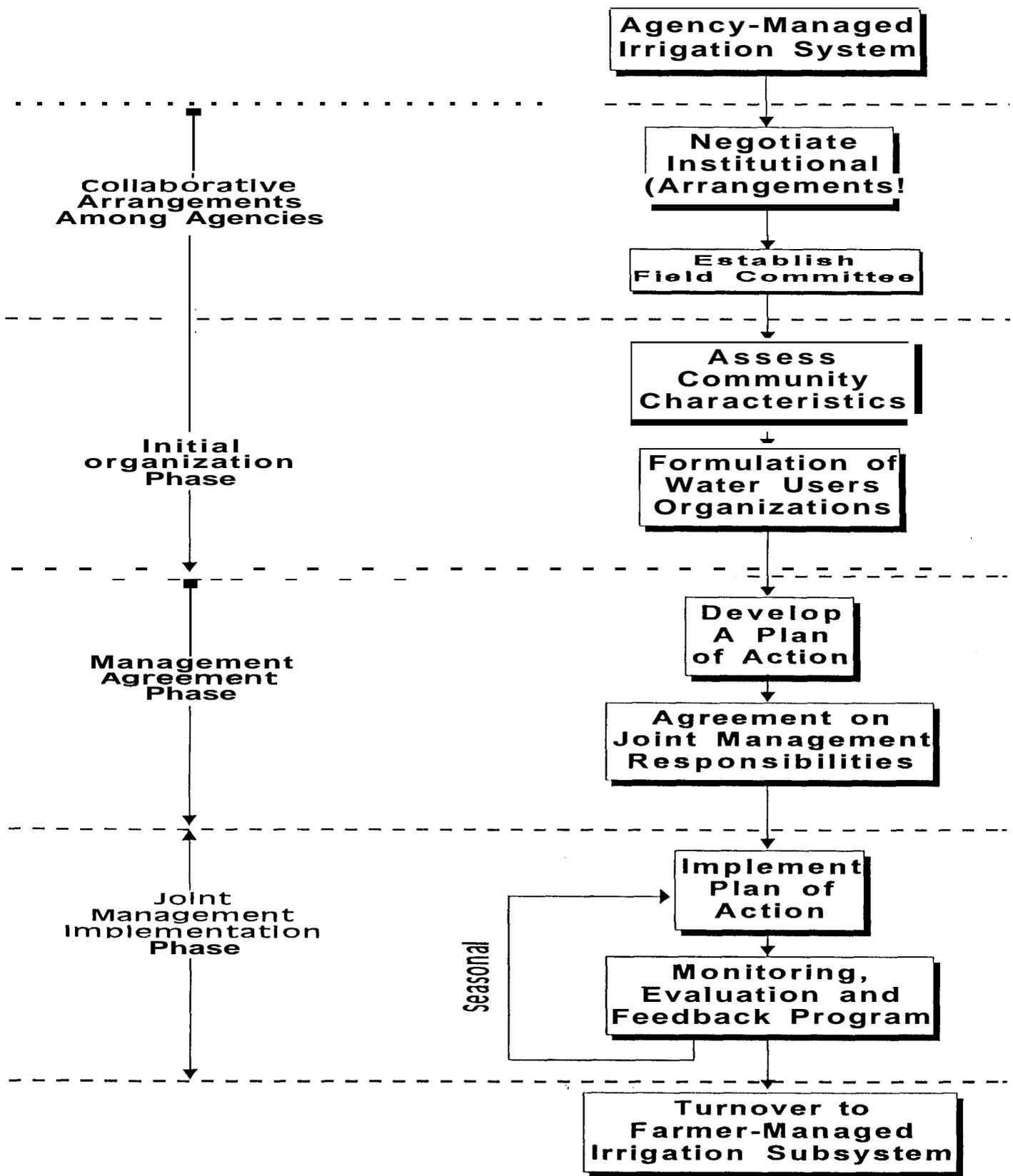
concept by supporting the formation of Water Users Organizations (WUOs) at three pilot distributary/minor command areas. Further, they were to undertake the collection of water/drainage charges, improve water management practices, and improve the maintenance practices for irrigation and drainage facilities.

However, preliminary field investigations indicate that the approach to organize water users at the distributary level will not be as easy as anticipated. Current expectations and demands of the water users exceed the government sponsored plans to develop institutional mechanisms such as WUOs. They appear to be overwhelmed by problems and their definitions rather than being patient in listening to possible long-term solutions. In this scenario, a prudent strategy would be to take certain preliminary steps to assess the potential for changes, identify their feasible scope and content, and determine the time frame for their successful introduction.

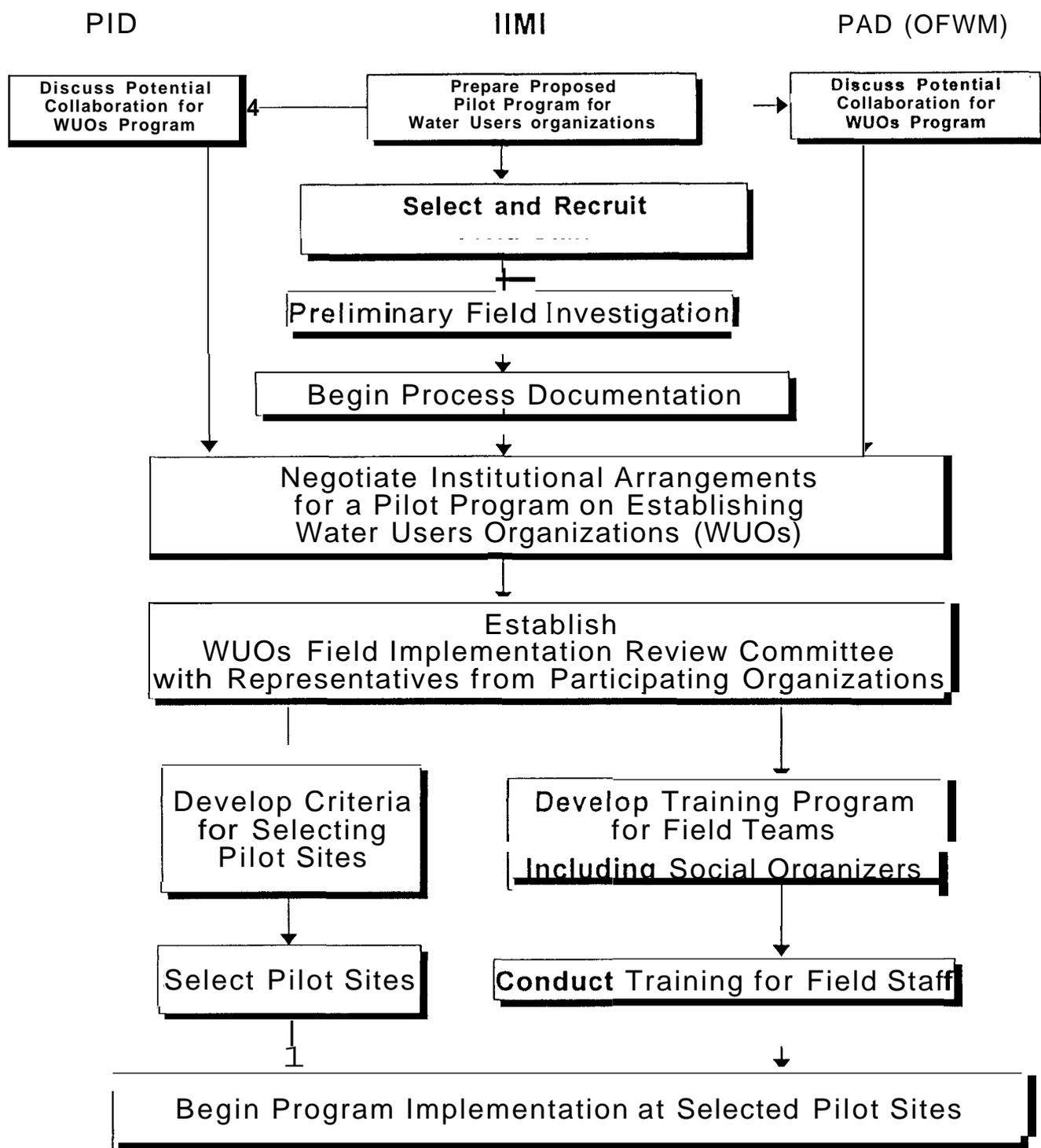
The project's chosen approach includes a step-wise process to be adopted for the activity of organizing water users. The process of organization of water users will be in four phases, each of which will concentrate, respectively, on mobilizing institutional support, initial activities aimed at social organization, consolidation of the organizational process and initiating some collective action. Some of the major activities in each of these phases are mentioned in Part Two of this document. A flow chart of this four-phase process' suggested for the pilot projects is given in Figure 1.

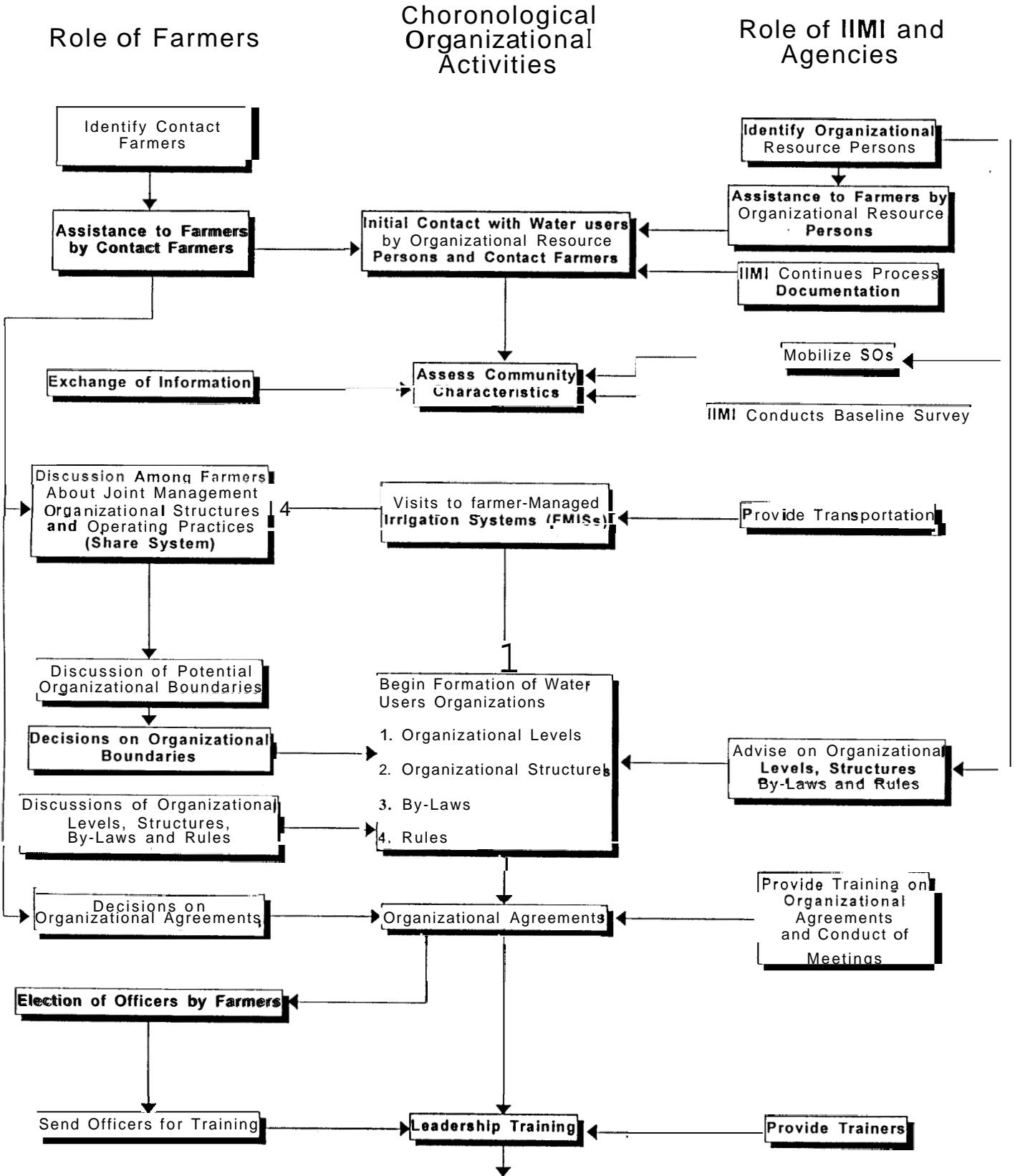
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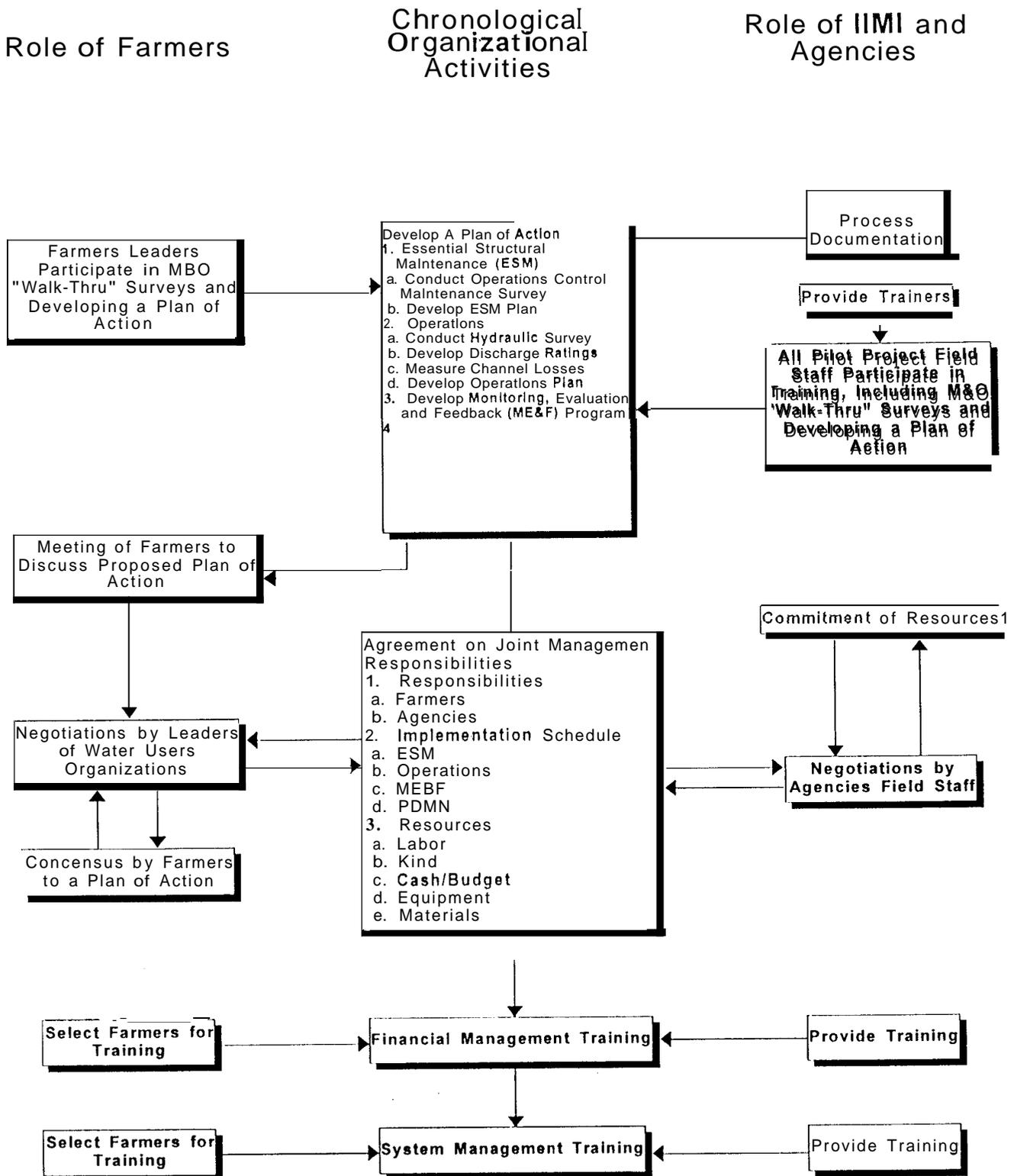
This four-phase process for water users organization activities in Pakistan was adapted from the M & O guidelines given in Skogerboe et al (1993).

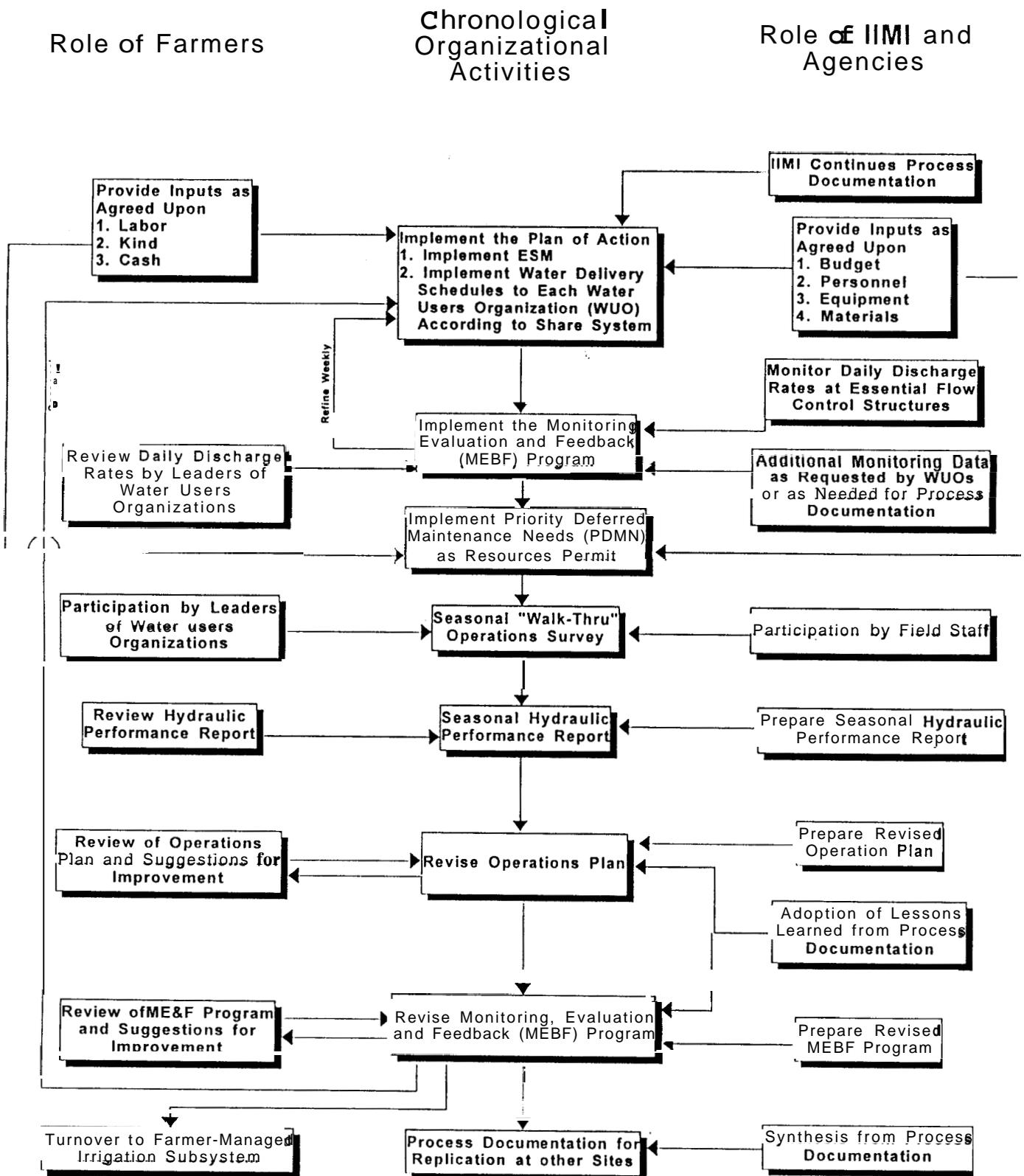


Phase I: COLLABORATIVE ARRANGEMENTS AMONG AGENCIES









A similar gradual approach is suggested for the organizational development among the water users and the WUOs.

Once the water users are organized at the distributary/minor level, their organizational action phase will be guided by the following, major needs:

- 1) identifying a set of continuing tasks for WUOs;
- 2) having a set of their own rules to guide collective action for task performance;
- 3) ensuring that the outputs of collective action are gainful;
- 4) ensuring that they are of common benefit to all the water users; and
- 5) developing a sense of, and mechanisms for, accountability.

These needs cannot be identified and fulfilled haphazardly, or in one attempt. Following the step-wise process for organizing water users, the methodology for the pilot projects includes an idea that the development of water users organizations should also be gradual. The past experience in forming WUAs at the watercourse level, where the process was relatively short in order to establish some quick responses from water users regarding watercourse improvement, suggests that a hasty approach to organize farmers would also quicken their deterioration. Learning a lesson from this experience, a prudent approach would be to allow sufficient time for the individual water user to assess the usefulness of collective behavior in managing irrigation water and the associated physical systems.

Following a step-wise approach in this organizational development, a progressive change is suggested in the existing institutional arrangements. Table 1 gives an illustrative pattern for this progressive change⁶.

Legal Basis

WUOs would become sustainable institutions only when they are commonly accepted as useful on a persistent basis. However, acceptability will be greatly helped initially by the WUOs gaining some recognition as a formal group by other institutions in the country on the basis of some form of legal framework including a mechanism for their registration. During pilot project implementation, the major areas of modification needed in the existing legal framework will be identified. A clear legal basis for the formation and functioning of water users organizations, including their participation in the management of irrigation and drainage systems, will be a pre-requisite for proceeding beyond the pilot project level.

⁶ This Figure is an adaptation from the ideas developed at a series of group meetings held at the initiative of NWFP's PATA Project staff to prepare a seminar paper on participatory irrigation management.

Table 1: PROGRESSIVE TRANSFER OF FUNCTIONS TO WUOS

Irrigation Department		OFWM	EXISTING STRUCTURE	Agriculture Extension	WUOs
Construction, remodelling, restoration and repairs to irrigation works	Regulation of canal supply	Assessment of abiana charges	Enforcement of Canal Act including Warabandi	Enforce equitable distribution of canal water and check against unauthorized	Formation of WUAs at watercourse level Improvement of watercourses on cost sharing basis (during construction period) Demonstration of improved practices of water management including precision land levelling
Continue to perform existing duties	In collaboration with OFWM formation of Distributory WUOs	Educate WUOs about existing activities and responsibilities of ID staff	Establishment of Institutional Development Unit (IDU)	Exchange ideas with farmers about existing irrigation practices and cooperative behaviors	STAG ONE
Share responsibility for O&M of pilot distributaries with WUOs	Provide on-the-job training to WUO members on O&M management	Continue to perform remaining duties			STAG TWO
Transfer O&M responsibility for pilot distributaries to WUOs	Oversee the performance/functioning of WUOs on O&M management	Continue to perform remaining duties			STAG THREE
Construction, remodelling, restoration and repairs to irrigation works	Regulation of canal supply	Assessment of abiana charges	Enforcement of Canal Act including Warabandi	Enforce equitable distribution of canal water and check against unauthorized	Formation of WUAs at watercourse level Improvement of watercourses on cost sharing basis (during construction period) Demonstration of improved practices of water management including precision land levelling
Continue to perform existing duties	In collaboration with OFWM formation of Distributory WUOs	Educate WUOs about existing activities and responsibilities of ID staff	Establishment of Institutional Development Unit (IDU)	Exchange ideas with farmers about existing irrigation practices and cooperative behaviors	STAG ONE
Share responsibility for O&M of pilot distributaries with WUOs	Provide on-the-job training to WUO members on O&M management	Continue to perform remaining duties			STAG TWO
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Construction, remodelling, restoration and repairs to irrigation works	Regulation of canal supply	Assessment of abiana charges	Enforcement of Canal Act including Warabandi	Enforce equitable distribution of canal water and check against unauthorized	Formation of WUAs at watercourse level Improvement of watercourses on cost sharing basis (during construction period) Demonstration of improved practices of water management including precision land levelling
Continue to perform existing duties	In collaboration with OFWM formation of Distributory WUOs	Educate WUOs about existing activities and responsibilities of ID staff	Establishment of Institutional Development Unit (IDU)	Exchange ideas with farmers about existing irrigation practices and cooperative behaviors	STAG ONE
Share responsibility for O&M of pilot distributaries with WUOs	Provide on-the-job training to WUO members on O&M management	Continue to perform remaining duties			STAG TWO
Transfer O&M responsibility for pilot distributaries to WUOs	Oversee the performance/functioning of WUOs on O&M management	Continue to perform remaining duties			STAG THREE

NOTE The role of WUOs in collecting O&M costs and abiana is not reflected in this chart
The issue of resource mobilization is to be resolved along with charges in the legal framework

Criteria for Selection of Pilot Sites

The selection of appropriate pilot sites will largely determine the success of the pilot projects. Essentially, this activity needs to be accomplished with the full involvement of the collaborating agencies according to an agreed set of selection criteria. Based on the preliminary information available at this stage, the following main criteria are suggested:

- * A distributary or minor which is not too large or too small;
- * Availability of water at an average level;
- * Proximity to drainage infrastructure provided by the LBOD Project;
- * A distributary or minor which is not dominated by a few big landowners; and
- * A satisfactory level of identified initial interest and cooperation among the water users.

Initially, each field team will collect basic field information, based on a checklist, for about nine distributaries/minors within a reasonable distance from where the field station is located. This reconnaissance survey will be used to select three distributaries/minors for each district in consultation with relevant staff of the operating agencies. Further in-depth data collected for the three short-listed secondary canals will lead to the selection of the pilot distributary/minor for each of the three districts, based on an agreed set of criteria. The final selection of pilot sites will be effected in close consultation with operating agencies.

Scope of Pilot Projects

An important methodological imperative is the perceived role of pilot projects and the reasons for their establishment at the distributary level. Evaluations of watercourse level WUAs formed by the OFWM program have consistently pointed out their size and objective limitations. The temporary nature of their assigned functions; namely, resource mobilization and field implementation related to watercourse improvement work, was a factor that invariably led to the collapse of WUAs. For meaningful participation in operation of the physical system for water distribution, the organized behavior needs to shift upstream beyond the watercourse outlet. At the same time, the large size and the complexity of the integrated canal system in Pakistan tend to deter bold institutional innovations where water users could play a significant role in managing the main or branch canals. As an intermediate effort, the pilot trials may be more feasible at the distributary level, where most of these considerations are taken into account. In addition,

the day-to-day operation of the Irrigation Department extends to the distributary and minor head regulators, so this becomes an important interface between the Irrigation department and the water users. However, there is considerable flexibility built into the present focus on pilot trials at the level of distributary WUOs. It is conceivable that the distributary WUO becomes a step in a hierarchy of organizations, including WUAs at the watercourse level, as well as Federations for joint-management with the Irrigation Department at the main or branch canal level. This possibility is reflected in the organizational system for improved joint-management for irrigated agriculture depicted in Figure 2.

PROJECT SITES

At the planning stages of this project, the collaborating partners decided that the pilot distributaries or minors should be located in the three LBOD districts of Nawabshah, Sanghar and Mirpurkhas. During the Phase I inception stage of the project, IIMI in consultation with the client department decided to establish the project office in Hyderabad, and field stations in the cities of Nawabshah, Sanghar and Mirpurkhas. The pilot distributaries or minors will be selected, on the basis of one for each district, after a reconnaissance survey in each district, and after consultation with relevant staff of the operating agencies.

The decision to rent a house in Hyderabad to serve as the Project Office was principally based on the need to secure adequate space. As IIMI was planning to undertake a program of improved irrigation operations upstream from the three pilot areas in collaboration with the Sindh Department of Irrigation and Power, a suitable place in Hyderabad was considered necessary to coordinate field activities.

LINKAGE WITH OTHER IIMI PROJECTS

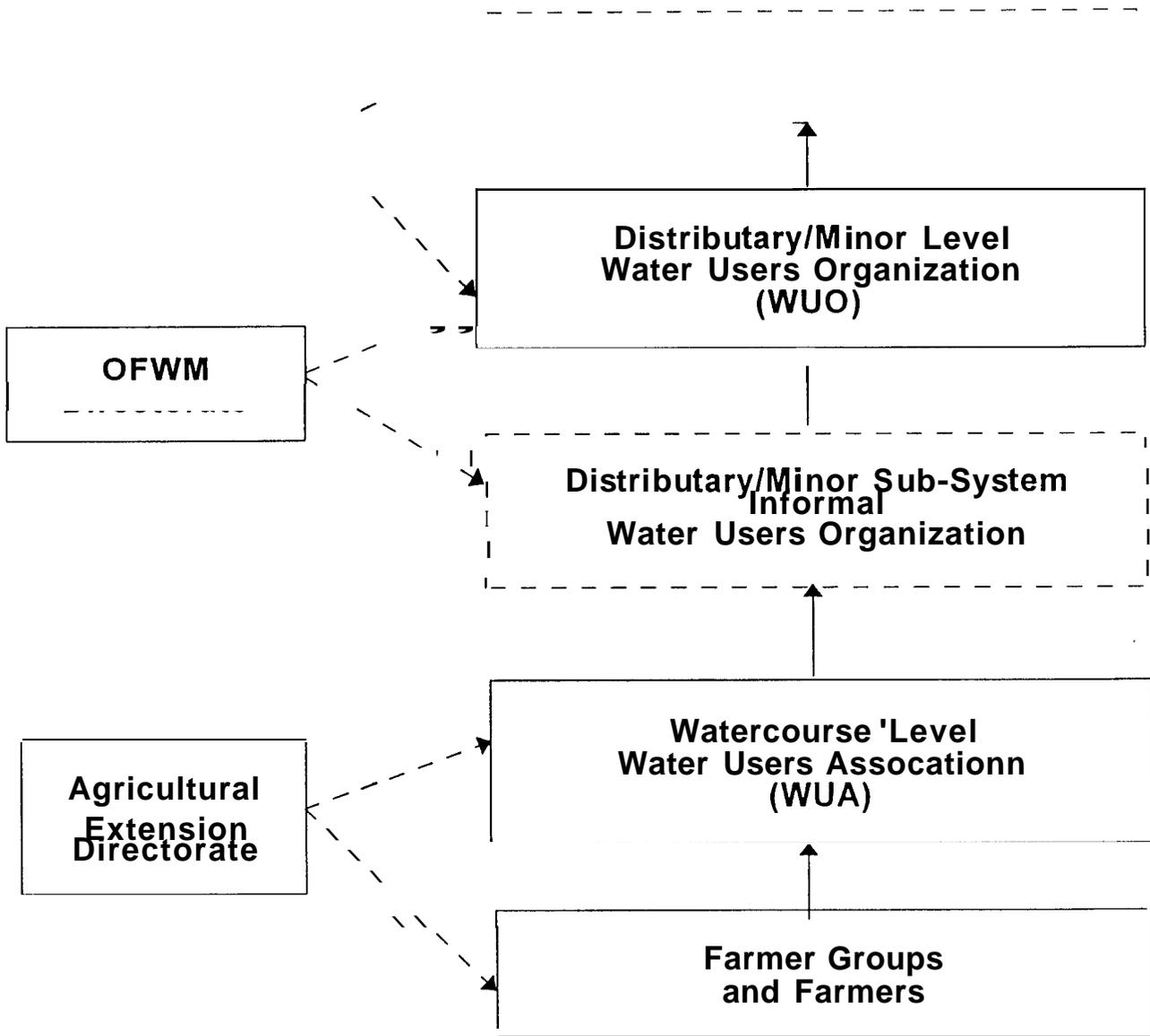
There are three major IIMI research activities underway in the Punjab province, that would conceptually support these pilot projects in the Sindh province. Two of these activities have a programmatic link with the pilot projects, through field research planned to be undertaken in close proximity to pilot project sites. An outline of these linkages is given below.

The Government of the Netherlands (GoN) is funding an IIMI project in the Punjab and Sindh under the title "Managing Irrigation for Environmentally Sustainable Agriculture in Pakistan". This work began in October 1994 and will terminate in December 1998. The project has three major components: (1) Operational Management; (2) Institutional Development; and (3) Salinity Management.

POTENTIAL FOR IMPROVED JOINT-MANAGEMENT

GOVERNMENT

WATER USERS



Component 1 involves research work on Decision Support Systems (DSS) for Main System Management and on water allocation, conjunctive use, water trading, and irrigation practices for Watercourse Management. The work on DSS is being undertaken at the Fordwah Eastern Sadiqia (FES) Irrigation and Drainage Project in the Province of Punjab, as well as the Left Bank Outfall Drain (LBOD) Stage I Project in the Province of Sindh. The work plan for the Sindh subcomponent is awaiting selection of the three pilot sites; this work plan will cover one or two canal command areas linked with the three pilot distributary/minor sites.

Component 3 of the GoN supported project, which is directed towards developing an understanding of the Indus Basin Irrigation System (14 million hectares) regarding environmentally sustainable agriculture, will also extend to sites in the Sindh province. For waterlogging and salinity management work in Sindh, a field station will be established in Sukkur. To obtain a macro picture on the salinity problem, the Rechna Doab in the Punjab province is presently being analyzed with the draft report planned for March 1996 and the final report three months later. The next large study area connected with this activity will be the Province of Sindh, with the work plan being developed during January-March 1996, based on the work done for the LBOD area during early 1994 using the GIS ILWIS (Dutch) software.

The research activities for Component 2 (Institutional Development) of the GoN supported project in the Punjab are undertaken in FES, and involve pilot efforts in organizing water users primarily in the south on distributaries receiving water from the Hakra Branch Canal. This Component has no direct involvement in the Sindh, but is very similar to the pilot projects in LBOD funded by SDC-IDA, and the two projects will largely have a common sub-set of activities on social organization. A report prepared by two overseas consultants (see summary of this report in Annex-2) has been helpful in formulating the conceptual framework for both these projects. At the EDI seminar held in Islamabad in October 1994, a briefing paper was presented to explain IIMI's own research experience in this area and to highlight the need to have research inputs into the present pilot projects (see extract in Annex-I).

The field stations in FES in the Punjab are at Bahawalnagar (DSS - Main System Management), Hasilpur (Watercourse Management) and Haroonabad (Water Users Organizations). Taken with the three field stations in LBOD (Nawabshah, Sanghar and Mirpurkhas) in the province of Sindh, the sites are at a fair distance from one another, as can be seen in Figure 3. The pilot project sites in the LBOD area are shown in Figure 4.

Figure 3: PROJECT SITES IN PAKISTAN

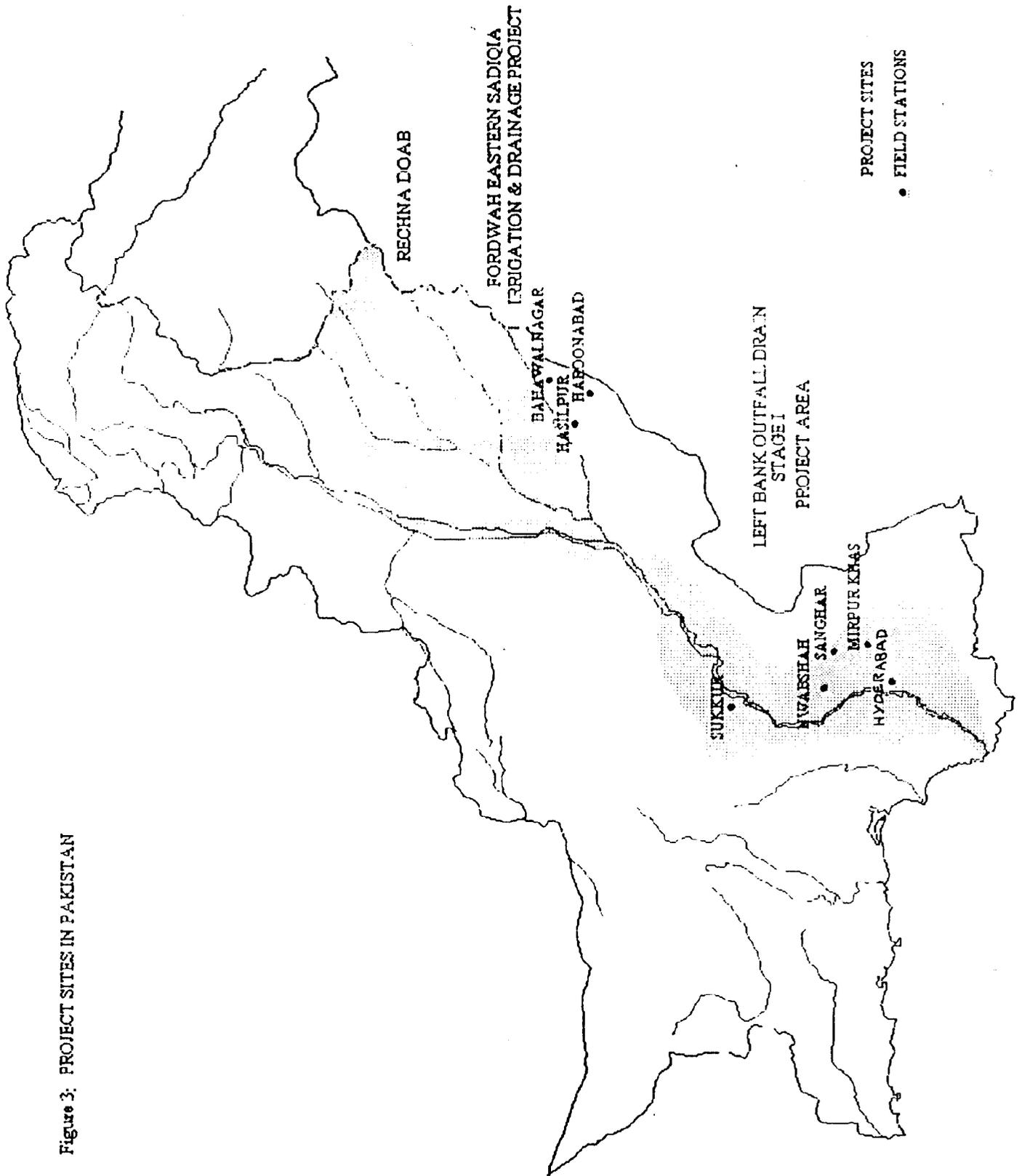
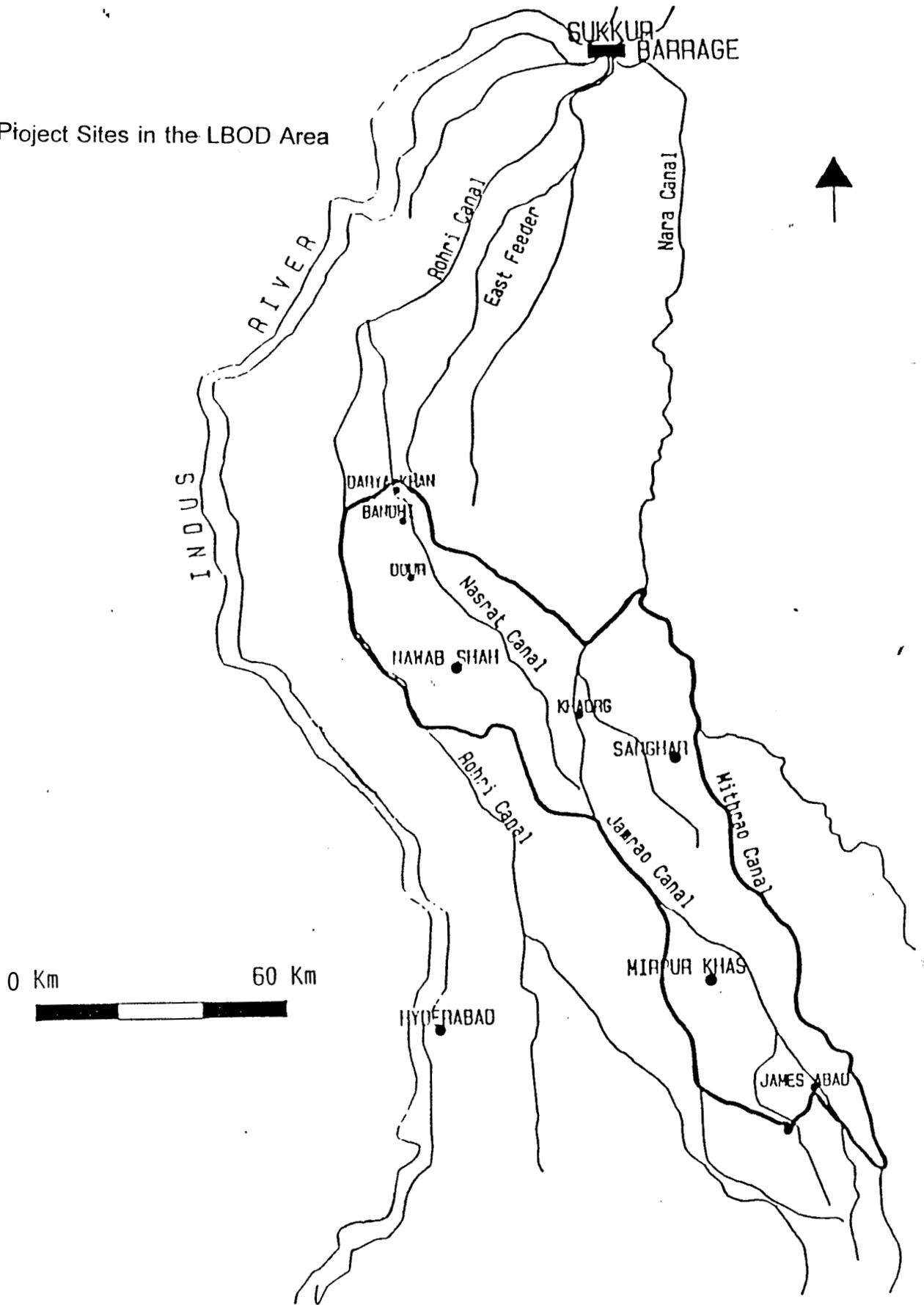


Figure 4: Pilot Project Sites in the LBOD Area



PROJECT ORGANIZATION

The organization is primarily dictated by the project design. The project has part time services of three senior members of IIMI's international professional staff based in Lahore, an Irrigation Institutional Specialist, a Water Management Specialist and a Monitoring and Evaluation Specialist. The Irrigation Institutional Specialist will serve as the Project Leader. These resources will be supplemented by short-term inputs from four overseas consultants, a Financial Specialist, two Irrigation Institutional Experts, and a Legal Specialist. The background details of the seven key personnel (international) for the Project are listed in Table 2.

The full-time locally recruited project staff include the Sociologist who also serves as the overall Team Leader, three Field Teams consisting of three Supervisory Social Organizers, six Social Organizers and six Field Research Assistants. This permanent cadre of professional staff will be supported by two more locally recruited professional staff, the O&M Specialist and Financial Specialist, both of whom will provide their services on a part time basis. As administrative support staff, the project office in Hyderabad will have on a full-time basis, a Secretary cum Book Keeper, a Purchaser, a Xeroxer, and two Drivers. Details of locally recruited project staff are listed in Table 3.

The composition of the field teams was discussed above in the section on Project Methodology. While IIMI's fifteen full-time field staff form the core group for this project, they are to be assisted by the staff of operating agencies deployed in the pilot project areas. The strategy for reaching a large section of the water users community is to establish a community based group of social organizers through a number of contact farmers who are specially selected and trained for this purpose. The concept of "contact farmer" was described in an earlier section of this document.

The project in its present design consists of four phases: Phase 1 of 3 months; Phase 2 of 12 months; Phase 3 of 15 months; and Phase 4 of 12 months. According to the project document, all project activities have to be completed within a period of 30 months, starting 1 July 1995. With this limitation in view, the activities categorized into four Phases of the project have been compressed with the 12-month Phase 4 overlapping with Phase 3, which is of a duration of 15 months. The deployment of human resources within the various phases throughout the project duration is given in Table 4.

TABLE 2: DETAILS OF KEY PROJECT PERSONNEL

NAME/TITLE	JOB DESCRIPTION	QUALIFICATIONS
D.J. Bandaragoda Irrigation Institutional Specialist	Management of activities relating to the implementation of the Pilot Projects, preparation of project reports and development of recommendations for future extension of project activities and coordination with the relevant agencies in implementing the pilot projects.	He has gained considerable experience in managing research activities and monitoring their progress during the past six years while he was associated with IIMI's Pakistan program. His experience as an agency staff person with the Mahaweli Development Authority for several years in Sri Lanka before joining IIMI in 1989 has greatly helped him to handle collaborative work in Pakistan. He is the Team Leader for the IIMI Research in Pakistan on Farmer's Organizations.
Gaylord V. Skogerboe Water Management Specialist	Carry out baseline surveys and assess allocation of water in the pilot project areas, propose measures to alleviate inequity in water distribution, and assist in the preparation of O&M plans.	His long experience both as a professional, as well as a trainer, in international irrigation, has been recognized with the Outstanding Educators of America Award in 1975, and the Colorado State University Environmental Interdisciplinary Research Award for On-farm Water Management Research in 1978. He has considerable field experience in the Operation and Maintenance of the Irrigation Systems, including the training of farmers for improved O&M.
Chris Perry Financial Specialist	Assist the project team to prepare O&M plans, specifically focusing on financial issues of farmer organizations, train FO staff regarding financial matters, and coordinate agencies regarding collection of water charges.	As Senior Economist in the World Bank he brings with him his vast experience in appraisal and evaluation of agricultural projects in developing countries. His interests in financial and economic aspects of irrigation sector management led him to join IIMI on secondment from the World Bank.
Parchanda Pradhan Irrigation Institutional Expert	Provide expert advice to project team and refine project implementation and social organization processes.	His strong background as an academic in public administration, and his association with IIMI in conducting research on farmer-managed irrigation systems in Nepal and on irrigation organizations and farmer participation in irrigation in Nigeria has drawn Prachanda to undertaking several consultancy assignments for IIMI.

NAME/TITLE	JOB DESCRIPTION	QUALIFICATIONS
Piyasena Ganewatte Irrigation Institutional Expert	Advise the project team on developing operational procedures and identifying maintenance deficiencies, and refining social organization processes.	His extensive field experience in working on farmer organizations in Sri Lanka in association with the Cornell University team at the Gal Oya Irrigation Project, as well as working on farmer organizations at four irrigation schemes in Polannarawa, and his own follow-up work thereafter ideally fit into the proposed pilot project work program.
M. S. Shafique M & E Specialist	Assist Government of Sindh to plan and design the proposed M&E, set out monitoring items and indicators, establish data collection and reporting systems.	His specialization and research interests are in hydraulics of surface irrigation, groundwater hydrology, drainage, salinity and water quality management and project planning. He also has work experience in irrigated agriculture in Pakistan, in the Mona Reclamation Experimental Project and the Punjab Agriculture Department. He has been the Head of IIMI's program in Sudan for the past six years, focusing on irrigation management turnover in Sudan, and irrigation performance issues, including the application of performance indicators in the Rahad Irrigation Scheme.
George Radosevich Legal Specialist	Analyse existing water laws in Sindh and develop, in consultation with Sindh authorities, appropriate water legislation for enabling effective users' participation in managing irrigation systems, and regulating and facilitating their membership in Farmer Organizations; Assist the Government of Sindh to plan and establish the developed legal system.	In association with Colorado State University, he has worked as teacher, researcher and extension service advisor since 1969. His experience goes beyond the University, and includes his service as Water Law Specialist in the United Nations during 1973, as co-organizer of the 1975 International Conference on Global Water Law Systems in Spain, as organizer of the 1985 Regional Symposium on Water Resources Policy in Dhaka, as Legal Advisor to the Interim Mekong Committee during 1987-1992, and as participant in numerous other international conferences and workshops on the subject. He was the primary resource person for developing the legislation regarding the water users ordinance passed by each of the Provincial Assemblies of Pakistan in the early 1980's.

TABLE 3: DETAILS OF LOCALLY RECRUITED PROJECT STAFF

S No.	Name	Designation	Qualifications	Location
1	M Naveed Khayal	Supervisory Social Organizer	MA Sociology	Sanghar
2	Mohammad Ali	Social Organizer	MSc Rural Dev	Sanghar
3	Ali Akbar Mangi	Social Organizer	MA Sociology	Sanghar
4	Niaz Hussain Sial	Field Research Assistant	BE Agri	Sanghar
5	Abdul Majeed	Field Research Assistant	BE Agri	Sanghar
6		Chowkidar		Sanghar
7	Muhammad Yousuf Memon	Supervisory Social Organizer	M Sc Rural Dev	Nawabshah
8	Abdul Ghafar Khoso	Social Organizer	MA Sociology	Nawabshah
9	Nizamuddin Bharchoond	Social Organizer	MSc Anthro	Nawabshah
10	Darshan Lal Oad	Field Research Assistant	BE Agri	Nawabshah
11	Abdul Rahman Soomro	Field Research Assistant	BE Agri	Nawabshah
12		Chowkidar		Nawabshah
13	Waryam Baloch	Supervisory Social Organizer	MSc Rural Dev	Mirpur Khas
14	Muhammad Nadeem	Social Organizer	MSc Rural Dev	Mirpur Khas
15	Ghulam Mustafa Talpur	Social Organizer	MA Jour & Eco	Mirpur Khas
16	Wali Muhammad Daud Poto	Field Research Assistant	BE Agri	Mirpur Khas
17	Munawar Hassan Mernon	Field Research Assistant	BE Agri	Mirpur Khas
18	Sardar Ali Junejo	Chowkidar		Mirpur Khas
19	Dr. Muhammad Yameen Memon	Sociologist	Ph D Ag Educ	Hyderabad
20	Dr. Bakhshal Khan Lashari	O&M Specialist	Ph D River Engg	Hyderabad
21		Financial Analvst		Hvderabad
22	Rubina Siddiqui	Agricultural Engineer Trainee	BE Agri	Hyderabad
23	Anbreen Naz	Secretary cum Book-Keeper	B Com	Hyderabad
24	Ayaz Anwer Solangi	Purchaser/Data Entry Spl	B Sc	Hyderabad
25	Muhammad Iqbal	Driver		Hyderabad
26	Qurban Ali	Driver		Hyderabad
27	Muhammad Ashraf	Xeroxer/Cleaner		Hyderabad
28		Security		Hyderabad

TABLE 4: WORK PROGRAMME AND TIME SCHEDULE FOR KEY PERSONNEL

NAME	POSITION	PHASE				MONTHS
		1	2	3	4	
Don Jayatissa Bandaragoda	Irr. Inst. Specialist	1-%	3	4-½	1	10
Prachanda Pradhan	Irr. Inst. Expert	0	½	½	0	1
Piyasena Ganewatte	Irr. Inst. Expert	0	½	½	0	1
Gaylord V. Skogerboe	Water Mgt. Specialist	1	2	2	1	6
M.S. Shafique	M & E Specialist	½	1	2	1	4-½
Chris Perry	Financial Specialist	½	1	1	0	2-½
George Radosevich	Legal Specialist	0	1	1	0	2
Sub-Total		3-½	9	11-½	3	27
M. Yarneen Memon	Sociologist	3	12	18		33
Bakhshal Khan Lashari	O & M Specialist	0	4-½	7-½		12
	Financial Analyst	0	6	6		12
(See Table 3)	Supervisory SOs	3	36	54		93
(See Table 3)	Social Organizers	6	72	108		186
(See Table 3)	Field Assistants	6	72	108		186
Sub-Total		18	202-½	301-%		522

PROJECT'S INCEPTION ACTIVITIES

The Consultancy Agreement between IIMI and the Sindh Government was signed on 26 July 1995 and was made retroactive to 1 July 1995. IIMI officially established an office in Hyderabad effective 16 August 1995 and staff were recruited in July and August to assume their work on 1 September 1995. The activities accomplished in the months of July, August and September 1995 were reported in Monthly Progress Reports sent to the client department of Agricultural Engineering and Water Management, Government of Sindh.' The major activities described in Part Two (Implementation Plan) of this document includes other inception activities already completed. Table 5 gives the information regarding the various project reports already prepared and distributed, and the reports to be prepared in the future.

TABLE 5: LIST OF PROJECT REPORTS

S.No.	Reports	Date of Preparation
1.	Monthly Progress Reports	Within 30 days of following month
2.	Phase Summary	Within 30 days after end of each phase
3.	Inception Report	31 October 1995
4.	Interim Report	31 January 1996
5.	Draft Final Report	15 November 1997
6.	Final Report	30 December 1997

PART TWO: IMPLEMENTATION PLAN

INTRODUCTION

As part of the Project's Methodology (see Part One), a step-wise process is adopted in the work plan for social organization, and the process consists of four phases:

- (I) Support Mobilization Phase;
- (II) Initial Organization Phase;
- (III) Organization Consolidation Phase; and
- (IV) Organizational Action Phase.

Each phase has a number of activities to be undertaken collaboratively by different actors, some of which, depending on the situational factors, will spill over to other phases. Figure 1 given in Part One of this document provides the flow chart of major activities in these four phases. **Also**, as inherent in an action research program, some of these activities and their sequence are likely to be changed, depending on the results of the consultation process during the project.

The process has been developed on the basis that each of the four phases prepares the participating water users in a progressive manner towards the goal of taking over management responsibility for the distributary or the minor. The initial focus is on the management of maintenance and operation **so** that other management functions are built around this core responsibility (Skogerboe et al, 1993). Throughout this document, the term "water users" is used in place of the traditional use of the term "farmers" in order to highlight this initial focus on water related irrigation and drainage issues. Notably, this main focus also reflects the project's emphasis associated with the LBOD project objectives.

While Figure 1 given in Part One of this document represents primarily the linkages among the various project activities of this four-phase process, as they are perceived at this planning stage, Table 6 given below presents these major activities and their distribution broadly within the project period, from July 1995 to December 1997.

Following Table 6, the major activities of the four-phase process will be further described in some detail. At the end of this section, an Activity Chart will be given in Figure 5, to indicate the proposed timing and the sequence of these activities.

TABLE 6: ACTIVITY SCHEDULE

		ACTIVITIES			
1995		1996		1997	
1. Select social organization field team	0.	Identify contract farmers	14. Conduct initial organization activities, identifying organizational levels and structures and potential leaders	19. Conduct training on O&M and irrigation practices and conduct "walk-thru" surveys	23. Implement plan of action for joint management of pilot distributary/minor
2. Train field teams	9.	Conduct preliminary analysis of baseline data	15. Initiate training on watercourse improvement and agricultural practices	20. Develop plan of action by WUOs and agencies for O&M and monitoring of pilot distributary/minor	24. Evaluate short-term effects of WUOs
3. Conduct planning meetings and negotiate institutional arrangements for pilot program	10.	Identify subsystems in the distributary	16. Review warabandi schedules in pilot area	21. Arrange for Agreement between WUO and agencies on O&M	25. Prepare final report on WUOs, and conduct seminar for dissemination
4. Identify persons for Field Implementation Committees	11.	Along with agency resource persons and selected contact farmers, conduct a series of initial meetings to build up rapport with water users and identify their critical needs	17. Consult WUOs on changes in the legal framework	22. Train WUO office bearers and selected farmers on financial and system management	
5. Develop the process for pilot program on water users organization	12.	Conduct a series of consultation meetings with water users to discuss feasibly options for organation	18. Indiate action to establish formal WUOs at distributary/minor level		
6. Select pilot project sites	13.	Conduct final analysis of baseline data			
7. Conduct baseline survey in selected pilot area					

I. SUPPORT MOBILIZATION PHASE

The main purpose of activities in this phase is to secure the institutional support necessary to initiate actions for the pilot projects. Support needs to be solicited not only from the concerned operating agencies, but also from some opinion leaders in the water users community.

Some activities planned for this phase have been completed; a few items are underway. However, it may be useful to reiterate these activities in order to provide a complete picture on the work plan. The following items form Phase I of the Implementation Plan:

Establishing Field Teams

This activity has been accomplished and field staff requirements identified in the project document have all been met. Through newspaper advertisements, applications were called from interested individuals with appropriate qualifications, and interviews held in Hyderabad by two panels, one for the technical field staff (Field Research Assistants) and the other for Social Organizers and Supervisory Social Organizers. The interview panels included a representative from the OFWM Directorate. Selections were finalized in August 1995. The research and support staff to be located in the Project Office in Hyderabad were selected during August and September 1995.

Considering the short project period and the complexity of the task of social organization, a considerable effort was taken to find appropriately suitable individuals for the three field teams. The recruitment interviews conducted by IIMI's senior staff members probed into the individual applicants' background and their demonstrated ability and aptitude to work in rural areas constantly interacting with the farmers with a view to assisting them. The candidates' potential for developing themselves as effective social organizers was an important criterion for selection. The selections were made solely on the basis of merit.

Training of Staff

As the field teams consisted of individuals of different background, a well planned training program was considered necessary before the teams were deployed in the field stations. Immediately on their induction into IIMI's staff, the fifteen field staff personnel were given a week's orientation program, starting on 3 September 1995. The orientation program was held in the new IIMI office in Hyderabad, and was conducted by senior IIMI staff from Lahore, with Mr. Azizullah Tunio, Director General of Agricultural Engineering and Water Management, Department of Agriculture and Wildlife, Government of Sindh, attending as the Chief Guest. Mr. Khalid Soomro, Director (Coordination) of Agriculture Engineering and Water Management Directorate participated as a resource person and provided an overview of the On-Farm Water Management Program of Sindh.

The week's program of orientation sessions is presented in Table 7. As part of the orientation program, the 15 members of the field staff and the Sociologist were given an opportunity to gain an initial appreciation of the current field situation. With assistance from the Deputy Director OFWM, Mirpurkhas, the group was taken to visit the Daulatpur Minor in Mirpurkhas district. Professor Gaylord Skogerboe led the group to a field discussion on "Maintenance and Operation Walk-Thru Surveys", which will be undertaken soon by the field teams.

Following the first week of orientation, the fifteen new field staff personnel, accompanied by the Sociologist, visited the Aga Khan Rural Support Program (AKRSP) in Gilgit for a ten-day training program on social organization (a copy of the program is given in Table 8).

The program included both class-room discussions, as well as field tours. Although the AKRSP model is not totally replicable in a canal irrigation context, the experience gained by AKRSP for several decades in the Gilgit area in establishing effective Village Organizations (VOs) as a vehicle for rural development has some direct relevance, to development interventions in rural Sindh. Particularly, the trainees were introduced to the process of forming VOs and the fine art of interacting with farmers in their own habitats. In the field areas where AKRSP has established Field Management Units (FMUs), the trainees were exposed to the functioning of **FMUs** and their interactions with water users in the mountainous irrigation systems.

This was followed by a two-day training program of the Water Resources Research Institute (WRRRI) of the National Agriculture Research Centre in Islamabad (copy of the program is shown in Table 9). This program concentrated on improved irrigated agriculture practices and the role of organized farmers in popularizing these methods.

As part of this training, after their deployment in field stations, the field staff will spend the first week of October 1995, to write individual and group reports giving their perceptions on the training program. These reports reflect a high degree of enthusiasm with which the new staff has responded to the training program, and also a very satisfactory absorptive capacity of the individual staff members.

This initial training effort will have to be supplemented by regular training inputs to staff development as the task of social organization requires special skills and attitudes. Interacting with the water users for a specific objective of assisting them to be organized for economic activities is a professional skill that has to be developed and acquired with some effort. This requirement was reflected in the exposure the new staff had in studying the AKRSP experience. The field teams encountered many staff members of AKRSP who had spent considerable time in specializing in these social skills.

**Table 7: ORIENTATION PROGRAM FOR NEWLY APPOINTED IIMI STAFF
"LBOD" PILOT PROJECT FOR FARMER-MANAGED IRRIGATED
AGRICULTURE**

Date/Time	Topic	Session Leaders
Sept 03, 1995	INTRODUCTION	
08:00 - 08:30	Registration	Mr. Kenneth R. Shams
08:30 - 09:00	Inauguration	Mr. Aziz ullah Tunio and Prof. Gaylord V. Skogerboe
09:30 - 10:00	Objectives of the Project and IIMI activities	Mr. Aziz ullah Tunio and Prof. Gaylord V. Skogerboe
10:00 - 10:30	Tea	
10:30 - 11:30	Sindh OWFM Program	Mr. Khalid Soomro
11:30 - 13:00	Why On-Farm Water Management ?	Dr. Mohammad Siddique Shafique
	Lunch	
13:00 - 14:00	Project Briefing and General Discussion to decide on staff deployment	Mr. Tissa Bandaragoda, Dr. Mohammad Siddique Shafique, Dr. Yamin Memon and Mr. Daniyal Haider
14:00 - 17:00		
Sept 04, 1995	BRIEFING ON IIMI PROCEDURES	
08:00 - 10:00	Vehicle and other equipment maintenance	Mr. Mohsin Hameed Dar and Mr. Zaheer Anwar
10:00 - 12:00	Leave procedures, Medical Expenses and Performance evaluation	Mr. Kenneth R. Shams
12:00 - 13:00	General discussion	
13:00 - 14:00	Lunch	
14:00 - 16:00	Accounting training Workshop	Mr. Daniyal.Haider
16:00 - 17:00	General discussion	

Date/Time	Topic	Session Leaders
<p>Sept 05, 1995</p> <p>07:30 - 09:00</p> <p>09:00 - 11:30</p> <p>11:30 - 12:00</p> <p>12:00 - 13:00</p> <p>13:30 - 15:00</p> <p>15:00 - 17:00</p>	<p>FIELD DAY</p> <p>Travel to Field location</p> <p>Introduction to M&O 'Walk Thru' Surveys</p> <p>Travel to lunch location</p> <p>Lunch</p> <p>Return to Hyderabad</p> <p>Participants write their field reports</p>	<p>Prof. Gaylord V. Skogerboe</p>
<p>Sept 06, 1995</p>	<p>Public Holiday</p>	
<p>Sept 07, 1995</p> <p>08:00 - 10:00</p> <p>10:00 - 10:30</p> <p>10:30 - 12:30</p>	<p>WRAP-UP</p> <p>Panel discussion WHY FARMERS NEED TO BE ORGANIZED ?</p> <p>Tea</p> <p>Conclusion</p>	<p>Dr. Yamin Mernon and 3 Supervisory Social Organizers</p> <p>Prof. Gaylord V. Skogerboe, Mr. Tissa Bandaragoda and Dr. Yamin Memon</p>

**TABLE 8: TRAINING PROGRAMME FOR IIMI-PAKISTAN FIELD STAFF
BY AGA KHAN RURAL SUPPORT PROGRAMME (AKRSP), GILGIT**

Duration: 10 days

Two days in classroom lecturing:

Day 1 Registration of the trainees
Mutual introduction
AKRSP working model of rural development, concept and practice/
organizational structures
Video : First Harvest
Questions and answers

Day 2 Village Organization (VO) - a vehicle of rural development
Process of VO formation (household coverage)
Organizational structure of VOs and its administration:

- VO President or Manager
- Selection criteria, rights and duties
- Membership criteria
- VO meetings: frequency of regular and calendar meetings
- VO decision making process

Eight days in the field:

Day 3 to Day 10 AKRSP has got field based staff units based on the geographical distribution of the programme area. Each unit is called Field Management Unit (FMU). We are planning to take the group to 5 FMUs i.e.

Astore	2 days
Hunza and Nagar	3 days
Punyal and Gupis	3 days

TABLE 9: SCHEDULE OF THE PARTICIPATORY IRRIGATION MANAGEMENT TRAINING AT WRII, NARC, ISLAMABAD

(24-26 September, 1995)

24-9-95	0830-1030	Participatory Irrigation Management: Participation - Dr. Shahid Ahmad
	1030-1100	Tea
	1100-1300	Participatory Irrigation Management: Development Process - Mr. M. Yasin
	1300-1400	Lunch & Prayers
	1400-1600	Participatory Irrigation Management: Institutional Constraints - Dr. Rakhshan Roohi
	1600-1630	Tea
25-9-95	0830-1030	Participatory Rural Appraisal and Planning - Dr. Shahid Ahmad
	1030-1100	Tea
	1100-1300	Participatory Irrigation Management: Monitoring and Evaluation - Mr. P.M. Moshabbir
	1300-1400	Lunch & Prayers
	1400-1600	Participatory Irrigation Management: Role of Audio-video - Mr. Anwar-ul-Hassan
	1600-1630	Tea & Video
26-9-95	0700-1900	Field visits and site seeing

Collaborative Relationships

The cooperation and involvement of operating agencies are critical elements in the project's implementation strategy. Some useful preliminary steps have been taken in securing the necessary institutional support for this purpose. Several joint visits to the project area by IIMI staff and OFWM personnel have achieved this task partly, but a major requirement is to obtain active participation by the Provincial Irrigation Department (PID) of Sindh. This need is being actively pursued by IIMI. The following items are included in this activity:

- i. Arrange for OFWM to deploy relevant field staff and other appropriately motivated persons from among their staff to be associated with the pilot projects. This deployment should be carefully planned so that the agency staff will form part of the field teams.
- ii. Obtain a serious involvement of the Provincial Irrigation Department (PID) and secure its formal official recognition of the arrangements for pilot projects at the distributary/minor level. Already, a formal request for cooperation has been made through the Director General, Agricultural Engineering and Water Management. The opportunity was also used at the EDI/MWP workshop held in Burban, Islamabad, to have preliminary discussions with the Secretary of Irrigation and the senior officials of the Planning and Development Department of Sindh regarding the project proposals. These efforts will be pursued at further discussions in Karachi during November 1995. Meanwhile, the field teams will expand their efforts to develop field level collaborative relationships.

Field Implementation Coordination Committee

While IIMI field teams play a catalyst's role, the responsibility for organizing water users lies with the operating agencies and the water users themselves. To give effect to this concept, the suggested mechanism is to have a number of field level agency staff to form a Field Implementation Coordination Committee (FICC). This will help both IIMI's staff, as well as field staff of operating agencies, to collaborate closely, and on a regular basis. Details of deployment of staff, scheduling of work, constraints encountered in the field such as objections from some water users, and possible solutions, assistance needed from elsewhere, are some of the issues that can be discussed by the FICC. Some individuals have already been identified, and action needs to be pursued to form this committee.

Selection of Pilot Sites

This is one of the most critical steps in the whole process. The client department has also advised IIMI to take cautious approach in selecting the appropriate pilot sites in the selected three districts. Considering the special contextual factors, such as the significant influence of the big landowners, and the criticisms already emerging in the field against government proposals for institutional reforms, IIMI decided to spend the period first two months in collecting field information on a number of possible secondary canals in each district before finalizing the selection. The field teams are now collecting data on a Checklist and will be short-listing three probable sites for each district in consultation with agency staff. Further in-depth data will be collected during the first two weeks of November 1995, and a final decision will be taken collectively by IIMI, OFWM and PID staff during the third week of November 1995.

Baseline Survey

The baseline survey serves two broad purposes. The survey can provide some general field information on physical, social and institutional conditions in the pilot area, which can be used in designing the action research program. The survey can also provide some bench mark information for developing indicators, which can be tested later during and after the interventions.

The baseline survey will be conducted using Participatory Rural Appraisal (PRA) methods in each of the three selected pilot areas. The survey will consist of two parts:

- (1) A short socio-economic questionnaire, will be administered in January 1996. The questionnaire will be developed during 7-15 November 1995, when the Sociologist will be in Lahore interacting with other IIMI staff who have conducted a survey in the pilot project area of the Punjab Province. As part of the work plan, this questionnaire and the PRA strategy will be discussed among all the relevant staff involved in the pilot projects in the Sindh.
- (2) Based on preparatory work already completed by the field team, the second part of the baseline survey will be started in December 1995, when Professor Skogerboe (Director IIMI Pakistan, and the Project's Water Management Specialist) will be initiating a field training program to calibrate the hydraulic structures in the selected pilot distributaries/minors. With the structures being calibrated, the initial set of flow measurements will be taken.

11. INITIAL ORGANIZATION PHASE

With the support forthcoming from both policy, as well as operating agencies, the field teams can start the process of trust-building, objective clarification, and interest creation in the community regarding the proposed social organization activities. Increased awareness on critical water related issues (irrigation and drainage) and their impact on agriculture production is an essential ingredient in organization initiatives. IIMI's research findings in Pakistan indicate that the water users are generally unclear about some important field issues such as, the degree of water supply variability in the whole canal system, and its impact on water allocation practices. Sharing of such useful information is considered to be of strategic importance to interventions on social organization among the water users. This initial organization phase is basically dedicated to creating a mutual understanding between the field teams and the water users. Outlined below are some of the major activities planned to be implemented during this Phase II of the process.

Identification of Contact Farmers

The social organization activities will start with the identification of contact farmers who are essentially the community-based opinion leaders. They will be deployed as social organizers in the field to transmit the field team's extension messages, as well as reach all the water users. The term chosen here to refer to these opinion leaders is "contact farmers", as the intention is to be able to select them from among all suitable persons in the community, irrespective of whether the person is a water user or not. As IIMI's field team members and agency field staff conduct their initial "walk-throughs" along the watercourses, the distributary, the hamlet roads, or whenever they meet the farmers or water users in the selected pilot command area, they can use the opportunity to identify an adequate number of contact farmers for each pilot area.

Initial Meetings for Awareness-Building

This is an important step in the process for organizing water users. The preferred methodology is to launch a cautious, **slow**, but steady approach towards building a rapport with the community, as many misconceptions can be caused by a rash entry into the villages. For many, even in the cities of Pakistan, IIMI is a new entity; many people are unsure about its motives, its activities and its alliances. With the pilot projects on social organization, IIMI is already entering into a socially sensitive and vulnerable area. Therefore, a progressive approach to meeting individuals and groups, with the effects of each step being carefully evaluated, while gradually building on the confidence which each step can generate, is more likely to be successful.

The purpose of the first series of these informal small group meetings is essentially limited to create an awareness among the people about IIMI and its international character, IIMI's field team, and the main objectives of the pilot project. People will be curious to know about these things, and that curiosity has to be met in the most positive manner possible. Extreme cordiality should be extended to the groups, and attempts must be made to make everybody feel comfortable. Room must be left for another series of meetings **to** discuss the water users' water related problems and possible solutions (while the initial series of meetings are ad-hoc, unstructured, and informal, the next series of meetings would be more formal).

Semi-Formal Consultation Meetings

The idea is to arrange for larger groups (relating **to** a cluster of watercourses), to assemble at pre-selected places appropriate for such gatherings. The purpose will be **to** conduct a semi-structured discussion on water-related irrigation and drainage issues of common interest **to** the group, possible solutions, the advantages and disadvantages of collective action for such solutions, and the potential for water users organizations. These meetings will be attended by representatives of the operating agencies. Preferably, a fairly informed person from among them will lead the discussions, but any one playing this role must necessarily promote participation by water users in the discussion and sincerely seek their views on the issues under consideration.

Instead of making water users passive listeners, the meetings will be used to share ideas and generally develop a consensus about establishing water users organizations. IIMI does not have any access to resources to be given to these groups as funds for construction or rehabilitation work, or any form of physical improvements, except for some limited cost-sharing maintenance funds. They are only available through other projects. The project has to, essentially, rely on a software approach. Some of the incentives we may try to use are:

- i. Providing information on the existing situation of the distributary, particularly water-related information (supplies, allocated and actual quantities, groundwater levels, salinity management, etc.);
- ii. Training on water measurement, water distribution, water application, drainage and groundwater management, improved agricultural practices including root zone salinity management, and organizational skills;
- iii. Encouraging water users to participate in planning and consultation meetings to have their views incorporated in the program of action;
- iv. Assisting them to conduct self-evaluations of their performance in water distribution, drainage, and agricultural production; and
- v. Arranging for close interaction between water users and agencies.

Process Documentation

This activity is of critical importance in terms of our research objectives. It involves recording the way in which the interventions are carried out: planned, coordinated and implemented, so that the research implications of this work can be better understood and analyzed. Details of how this activity should be implemented needs to be discussed further with the field staff and an accepted procedure will be decided. In the preliminary study conducted on the Hakra 6-R Distributary in the Punjab, each field team member generated written material related to field interviews and observations, and finally compiled this information into watercourse reports. In this instance, as an alternative way of documenting the processes, daily events and observations can be recorded by field staff in their field note books, and a monthly report can be compiled collectively by the team. All important items of observations and the essence of all field interviews are included in these monthly reports. Guidelines will be issued to field staff on the methods to be used in this process documentation.

Analysis of Baseline Data

The socio-economic part of the baseline survey will be primarily based on a structured questionnaire administered to water users in a random sample of watercourses. While this survey will provide considerable field-based information, additional information on the characteristics of the pilot area community is to be collected through a less formal investigation using PRA methods. This is basically to gain some insights into the main features of the community, which will relate to our pilot project interventions on social organization. Similarly, the maintenance and operation (M&O) walk-through surveys followed by an initial field measurement training program will provide the necessary basic information on the physical characteristics of the pilot distributary or minor. Soon after this activity, preliminary analysis of both socio-economic and physical data will be conducted by the field teams supervised by the Sociologist and the O&M Specialist. In order to proceed with the organization phase, at least some preliminary results need to be documented regarding the main features of the pilot area. The project staff will continue to analyze the collected data to prepare a comprehensive baseline report.

Identification of Sub-Systems in the Pilot Distributary

If the selected pilot site is a large distributary canal system, consisting of a number of minors, the size of the pilot distributary and its command area becomes a major consideration in planning the action research program. For example, the traditional way of organizing Water Users Associations (WUAs), one for each watercourse, and then federating them to form a Water Users Organization (WUO) at the distributary level is likely to delay the process of accomplishing project objectives. The time set apart for organizational activities is only a little over two years, and to optimally use this time, an alternative method of reaching the distributary level fairly quickly will be useful. This alternative would be to identify appropriate sub-systems in the distributary system and consider them as an intermediate level for organization. Once the preliminary field information is collected, it will be possible to define these sub-systems for pilot distributary. If the selected pilot area consists of only a minor, the sub-system organization may not become necessary, and such a minor command area would be expected to have only two tiers of social organization.

Designing Organizational Structure

With the information of identifiable sub-systems, the field team and the Lahore-based staff will consult the water user groups and the key agency staff to decide on a suitable organizational design for each pilot area. The method of representation, levels of organizational units, whether all such levels should have formalized structures, identification of functions for various organizational units, and the mechanisms for decision-making and implementing programs of action are the issues that have to be clarified in this consultation process. This activity requires close collaboration with operating agencies. The challenge for IIMI's team will be to assimilate the views from water users, agencies and IIMI's own methodological ideas.

III. ORGANIZATION CONSOLIDATION PHASE

Most of the activities in Phase II (Initial Organization) are designed to generate some interest among the water users for mutually beneficial collective action. Instead of the traditional approach of trying to coerce or manipulate water users' involvement in management, the initial attempts are to assist the water users to identify, assess and build on their latent capacity. With a self-realization by the water users of the potential and the value of organized action, they would start designing the organization they need. Phase III consists of a series of activities aimed at consolidating this process by entering into stronger collaborative relationships with the operating agencies and gaining some recognition in the process. In this new phase, the water users will be encouraged to realize that the water delivery is not a government responsibility or a service to be provided free of charge, and that they are partners of this economic activity and are no longer mere "beneficiaries", nor the government a mere "provider". Some of the major activities in Phase III are mentioned below.

M & O "Walk-Thru" Surveys

The training of staff in structural calibration and flow measurement activities can be used to train water user groups in assessing maintenance requirements. This is done basically through a series of "walk-thru" exercises, with groups of water users and Field Research Assistants mapping out the existing physical conditions of the pilot distributary or minor. The FRAs will assist in the preparation of maintenance priorities and related work estimates and include them in a plan of action for the season. A similar effort will be made to identify operational requirements.

Developing a Plan of Action

The Plan of Action will consist of four components: (1) Essential Structural Maintenance (ESM); (2) Deferred Maintenance; (3) Operations; and (4) Monitoring and Evaluation Feedback. The major impact of WUO's functioning will depend on their ability to identify and attend to the essential maintenance needs to operate the system according, or as close as possible, to design parameters. If the existing water distribution pattern is inequitable and unreliable, the reasons for this unsatisfactory canal performance are partly due to the deterioration of physical conditions of the system. If the WUO collectively can identify urgent maintenance needs and attend to them as quickly as possible, the results are most likely to impact positively on performance. There will be yet another set of maintenance requirements which have been accumulated due to long neglect, but which can be attended to in a more systematic manner. These deferred maintenance needs will also be included in the Plan. The most important component in the Plan would be the regular canal system operations and the organizational arrangements for implementing them. The Plan will not be complete without the mechanisms for monitoring and evaluation.

The main purpose of the distributary/minor level WUO is to take over from the operating agencies the management responsibility for operation and maintenance of the secondary canal system. For this to be successful, there should be a well planned transfer process. Initially, both parties will collaborate very closely to identify their changing roles and map out a strategy to define the scope of their respective responsibilities for operation and management of the distributary/minor canal system. At the outset, the two parties will collaborate to develop a plan of joint action, specifying each other's component, the set of activities to be accomplished by each party, their priorities, and the time frame for the various activities.

Implementation Meetings

In Phase II, two sets of meetings were mentioned. One was for the purpose of initial rapport building, and the other for consultation on organizational design. In Phase III, a third set of meetings among the water users is suggested to collectively discuss the implementation of the Plan of Action. The leaders of the WUO (eg. executive committee) would use these meetings to obtain a consensus among the general membership regarding the Plan of Action.

Joint Management Agreement

Reaching an agreement between the WUO and the operating agency regarding the implementation of the Plan of Action is the central activity in Phase III. The agreement will relate to the division of responsibilities between WUO and the agency, the implementation schedule indicating the priorities for action, and mobilization of resources.

Training for WUOs

Participation by the WUOs in joint-management activities at the distributary/minor level would be substantially improved with some training inputs to selected water users. Financial management of the Organization and the management of operation and maintenance activities are two areas in which training will be most valuable. IIMI and collaborating partners will collectively undertake the responsibility for this training.

IV. ORGANIZATIONAL ACTION PHASE

Phase IV is dedicated to action. The WUO and the operating agency together implement the first Plan of Action. While the Plan's **ESM** component will be implemented as an initial priority in order to improve the physical conditions of the system, a reviewed water distribution schedule will be field tested during the first season. Depending on the results of the first trial, the operational plan will be revised. At the same time action will be taken to start the priority deferred maintenance activities.

The monitoring and evaluation system will be tested and modified. A set of indicators will be developed for evaluation purposes.

The WUOs and the Operating agency together will finally consider the possible future action for an effective turn over of further management responsibilities to the **WUOs**.

PLANNED OUTPUT

The following items can be considered as the immediate project outputs to be generated during the project period:

- (1) Briefing Paper for presentation at EDI Seminar on Participatory Irrigation Management in Burban, Islamabad (October 1995). See extract of this paper in Annex-4.
- (2) Inception Report and Implementation Plan (October 1995).
- (3) Report on Selection of Pilot Sites based on the November 1995 workshop to be held in Hyderabad to consult key agency staff and invited professionals (January 1995).
- (4) Preliminary Report on Baseline Investigation on Pilot Distributaries/Minors (February 1996).
- (5) Final Report on Baseline Investigation (April 1996).
- (6) Interim Report on the Project (July 1996).
- (7) Report for the National Conference on Sustainable Irrigated Agriculture regarding initial project-related results and recommendations (November 1996).

- (8) Proposal for legal framework for the functions of Water Users Organizations in Pakistan (February **1997**).
- (9) An Action Plan for Joint Management in Pilot Distributaries or Minors (July **1997**).
- (10) Final Report of the Project (December **1997**).

The final output from this project, preferably after the extension requested for, is a set of recommendations on the policy and implementation issues related to farmer-managed irrigated agriculture in the Sindh Province as can be extracted from the three pilot projects. The outcome of this report is expected to be reflected in future irrigation management strategies in the province and in the country.

In addition to the reports mentioned above, there will be a series of reports, on a monthly basis to report on the project's progress, and on a Phase basis to give a summary of findings at the end of each Phase. Particularly in view of Pakistan's current policy initiatives and proposals for institutional reforms in the irrigated agriculture sector, the project will provide useful insights on the organizational arrangements for farmers to interact with government agencies and effectively manage their resources.

INFORMATION DISSEMINATION

A number of workshops and seminars were planned for conceptualizing the project activities, developing work plans and for information dissemination. Yet another set of field seminars are planned to be held in the project area for interactions with the water users. Some details of the workshops to be held are given below, but the dates mentioned for these events have to be considered as tentative.

1995

November Workshop on the Project Implementation Plan and Pilot Sites to be held in Hyderabad to consult key agency staff and invited professionals (November 1995).

1996

April Workshop on the Pilot Projects' Objectives, Work Plans and Progress, primarily to discuss the process of water users organization with key government officials and academics associated with irrigated agriculture in the Sindh Province.

November National Conference on Sustainable Irrigated Agriculture in Pakistan, to present tentative results of project activities and to discuss future activities required to achieve sustainability (this is an activity in the GoN supported project, but this project will also contribute to the workshop content).

1997

October Workshop to be held in Karachi or Hyderabad to discuss Water Management Alternatives for Environmentally Sustainable Irrigated Agriculture in Sindh (linked with the GoN supported project).

November Workshop on the Future Role of PIDs and PADs (linked with GoN supported project).

In addition to the above, there will be a number of research reports based on the findings of this project to cover the methodological issues and short-term effects of the interventions.

MONITORING AND EVALUATION

The project activities will be monitored on a regular basis at **two** levels. At the project level, there will be a Field Implementation Coordination Committee (FICC), which will coordinate the activities by different actors in the field (PID, OFWM, IIMI, Water Users), and also monitor the progress. The FICC is to be finalized by 15 December (see Part Two: Implementation Plan). They will make suggestions to another group, Project Advisory Committee at Hyderabad, which will meet at least quarterly to discuss the progress of work. In addition to the project outputs and outcomes referred to above, there are some other indicators that would be useful to members for evaluation purposes:

- o The progress being made by the provincial agencies involved in irrigated agriculture in the Sindh in achieving a coordinated approach to promote a farmer-managed system at the distributary/minor level, that could later be incorporated into government policy;
- o The level of interest demonstrated by farmers in being organized as a Water Users Organization at the distributary level;

- o The improvement in equitable water distribution among outlets along a distributary after becoming organized;
- o The ability to manage the combined irrigation and drainage facilities for mutual benefit of all water users; and
- o The capability of the Water Users Organizations to settle water disputes.

IMPLEMENTATION ENVIRONMENT

So far, the project activities have proceeded smoothly. Except for the few problems of mobility caused by intermittent strikes in the cities, which delayed the procurement of motorcycles for the field teams, the work environment has been relatively calm. The bulk of the more difficult field work is yet to be started. However, the composition of field teams with mature individuals from the local area augurs well for future project work. This implementation plan will not be realistic if it does not recognize the important collaborative role that the operating agencies have to play in institutional development activities. Institutional development is essentially a collaborative process. **All** of the activities need the unstinted cooperation of respective collaborating partners in order to be successful. **A** special effort is being made to develop these collaborative relationships, both during the planning stage, as well as in the implementation process. Table 10 provides the composite schedule of all major activities to be implemented during the 30-month period. This forms the basis for detailed monthly work plans developed for the field teams. Flexibility is retained to adjust the activity items within the phases, and if necessary to add or modify them, depending on the progressive development of the collaborative action research program in the field.

Figure 5: Activity Chart

TASK		MONTHS											
		J	F	M	A	M	J	J	A	S	O	N	D
1995													
1	Select field teams							■	■				
2	Train field teams								■				
3	Negotiate institutional arrangements							■	■	■			
4	Identify process for field coordination								■	■	■	■	
5	Develop the process for pilot projects							■	■				
6	Select pilot project sites									■	■		
7	Conduct baseline surveys												■
1996													
8	Identify contact farmers	■											
9	Preliminary analysis of baseline data	■	■										
10	Identify distributary/ minor sub-system	■											
11	Initial set of meetings of water users		■	■									
12	Consultation meetings with water users			■	■								
13	Final analysis of baseline data					■							
14	Initial organization activities						■	■	■				
15	Training on watercourse improvement & agriculture practices						■	■	■				
16	Review warabandi in pilot areas							■	■				
17	Consult WUOs on changes in legal framework									■			
18	Establish WUOs at disty/ minor									■	■	■	
1997													
19	Training on O&M & irrigation practices	■	■	■	■	■	■	■	■				
20	Develop plan of action for O&M	■	■	■									
21	Arrange Joint-Management Agreement				■								
22	Training on financial and Management aspects					■	■	■	■	■			
23	Implement plant of action on O&M					■	■	■	■	■	■		
24	Evaluate short-term effects of WUOs											■	
25	Final Report and Seminar												■

ANNEXES

RESEARCH INPUTS FOR AN ACTION PROGRAM ON PARTICIPATORY IRRIGATION MANAGEMENT IN PAKISTAN

D.J. Bandaragoda and Gaylord V. Skogerboe¹

Paper prepared for the Seminar on "Participatory Irrigation Management", co-sponsored by the Ministry of Water and Power of the Islamic Republic of Pakistan and the Economic Development Institute of the World Bank.

October 2 - 6, 1994
Islamabad

This paper is meant to serve as background material for the discussion proposed by the Seminar organizers, on "IIMI's past, present and future research activities relating to participatory irrigation management". The paper is structured into three sections. First, it presents a brief review of lessons learned that have been identified by IIMI's past and on-going research activities focusing on social organization for irrigation and participatory irrigation management. This review relates to experiences in a few selected countries, such as Philippines, Nigeria, Sri Lanka, Nepal, Indonesia, Columbia and India. Second, the paper outlines IIMI's general findings arising from its work in Pakistan, and gives a brief commentary on the major research and policy issues related to participatory irrigation management with special reference to possible action research work in Pakistan. In the third section, the paper outlines IIMI's proposed program of activities related to social organization aspects of irrigated agriculture in Pakistan.

1. EXPERIENCE IN OTHER COUNTRIES

1.1 Philippines

A widely documented social organization effort is the farmer organization program of the National Irrigation Administration (NIA) in the Philippines. Beginning with small communal systems in the early 1970s, and through a continuous learning process since then, the **NIA** has stepped up its effort to achieve higher productivity and increased willingness of farmers to pay irrigation fees. By 1995, the NIA will be having active irrigator associations to cover all of its 700,000 ha of communal systems and part of its 600,000 ha of national systems.

¹ Senior Management Specialist and Director respectively of IIMI Pakistan, Lahore.

Not unfamiliar in terms of experience elsewhere, the story is that this program began as a donor requirement for project funding, products of the first phase being just "paper associations". The success in the Philippines case is that the program has been able to, though slowly, grow out of this donor-driven mode. By the late 1970s, the two initial pilot sites had expanded to a program to cover all 12 regions, and started to gain root with the introduction of young college graduates from outside the project staff as "communal organizers". Later, NIA started its own institutional development department and introduced "farmer irrigator organizers". IIMI entered into a partnership with the **NIA** to identify research issues, monitor the program, and provide feedback while managing the program's research component.

1.2 Nigeria

IIMI's field research work in Nigeria confirmed the commonly believed set of conditions for the establishment of water users associations: a guarantee of water rights, legal status, secure land tenure, and the use of tenure as the basis for membership in an association. **At** three pilot sites in the Kano River Irrigation Project (KRIP), IIMI and Project staff acted as facilitators, rather than organizers, in a process of allowing the associations to evolve. Within a year, the associations were mature enough to organize and carry out about 50% of the distributary canal cleaning work, and about 75% of the work in the field channels. The project was notorious for weed growth in the waterways, and as a result of the cleaning exercise, the flow increased by 12% in the middle and tail portions of the canals. The associations **took** over the collection of water charges, and one pilot site achieved a 90% recovery rate in the very first season of this change, which led to a policy decision to permit the WUAs to retain 15% of the collections if the rate were to exceed 90%. The Project has now assigned 12 **staff** members for WUA activities, and KRIP's parent Hadejia Jama'ara River Basin Development Authority has established a separate WUA Wing in its administration.

IIMI's study findings included the following three conditions for the establishment of water users associations:

- 1) **A** well defined national policy must be established to guide the process of social organization and to see that participatory management becomes institutionalized;
- 2) The agencies should have separate institutional arrangements specifically for the purpose of promoting social organization; and
- 3) There should be a formalized legal basis for the organizations, since legal recognition is necessary for them to gain credibility.

1.3 Sri Lanka

IIMI's experience in Sri Lanka on farmer organization is characterized by its early involvement at the policy level. It started with an initial issues and needs assessment exercise, which matured into a long collaborative policy development phase. With policy support, IIMI then embarked upon a collaborative field-level action research program.

This was a case of IIMI's joining hands with a government program which had already begun on policy reforms aimed at participatory irrigation management. The old Irrigation Department established in 1900, based on mid-nineteenth century legislation (Ordinance No. 9 of 1856 and amended by Ordinance No. 21 of 1867), was restructured in the 1980s to have a strong Irrigation Management Division, with emphasis on water management and social organization. The concept of integrated management of major schemes (INMAS) had been introduced along with these reforms, adding an essential component of farmer participation.

The government's motivation was primarily based on resource mobilization to combat increasing maintenance costs. The official presentation at a May 1986 Workshop organized by IIMI echoed, "any government would be interested in participatory management if it could be demonstrated that such measures would help reduce government commitments for maintenance and rehabilitation, and more importantly, if it would reduce grievances within the farming community, leave alone the government's desire to see a prosperous community". However, this initial incentive on budgetary reasons, later developed into a firm commitment on sharing authority and responsibility with the farmers.

IIMI's involvement in the Irrigation Management Policy Support Activity (IMPSA), guided by a high level Irrigation Management Policy Advisory Committee (IMPAC), helped Sri Lankan authorities to elaborate and refine the government's participatory management approach and to develop a wide national consensus on a set of strategies for institutional reforms. Its Policy Paper No. 2 was dedicated to an "institutional framework for management of irrigation systems and building farmers' organizations". The main recommendations included strategies for turnover of small systems, joint-management of the others, formation of institutional development units within agencies, institutional adaptations for irrigation research, building farmer organizations, and legal reforms. Some of these recommendations have been taken up for implementation. The formation of distributary-level farmer organization is a major step.

IIMI carried out field research in the Kirindi Oya new settlement project to understand how settlement activities could affect settlers' irrigation management behavior and their participation in system management. There was unprecedented enthusiasm for the development of farmer organizations. The findings in this instance included the following:

- 1) The existence of a well defined and commonly appreciated purpose, or a set of purposes is a major determinant for achieving success in social organization. Early settler organizations became inactive when the project made the transition to an operational phase. The subsequent farmer organizations specifically set up for irrigation management purposes began to take shape fairly quickly. As there was no village level mechanism to attend to increasing community development issues in the settlements, the farmer organizations gradually assumed additional responsibilities, and gained greater acceptance and credibility.
- 2) The collective strength through the organization was more effective than individual action to interact with agencies. The project had many construction-related problems hampering the progress of project objectives. The farmer organizations were able to obtain regress fairly quickly and on a more equitable basis.

- 3) "Institutional Organizers" played a vital role in assisting the new farmer community to identify their leadership and get organized on their own initiative. They also played an active role in facilitating the transactions with agencies.
- 4) With the agency staff interacting closely with the farmer groups in a less authoritative way, despite the enormous irrigation problems in the project, there was unprecedented cooperation between irrigators and operational staff.
- 5) There was a quick realization that the new enthusiastic organizations could be easily overloaded with a variety of community development problems; thus, it was considered better for the farmer organizations to concentrate on irrigation-related issues.

1.4 Nepal

The experience in Nepal is mostly on farmer-managed irrigation systems. An innovative idea that has been tested and found very productive is "farmer-to-farmer training". The visits by groups of farmers from a poorly managed system to a well managed system have been very useful. These strategies have helped in the consolidation of farmer organizations in either situation.

Two-thirds of all the irrigation systems in Nepal are farmer-managed. In these systems, farmers perceive the water resources as community property, whereas, in agency-managed systems, water is perceived as a government-owned resource, and its distribution, which is a government responsibility, is not seen as a task serving the best interest of the community. IIMI's research in Nepal has identified the following as the "organizing forces":

- 1) Perception of water as community property;
- 2) Protection of water rights;
- 3) Achieving water distribution in proportion to water share; and
- 4) Mobilization of manpower for common tasks.

1.5 Indonesia

In early 1987, a national level working group was formed in Indonesia, consisting of representatives from the Directorate of Irrigation, Ford Foundation, a national NGO, and IIMI. Within a year, the Working Group was to develop a viable process and a workplan for implementing turnover of irrigation systems to farmers throughout the country. By early 1980, the turnover program started in two provinces, and by 1990; it had expanded to seven provinces. It has been estimated that, over 15 years of implementation, the turnover program could save the government about Rp. 22.5 billion (**US \$13.5 million**) in O&M **costs** for small scale irrigation.

Research during early stages of implementation showed no negative impact on system performance arising from the turnover process, and that considerable local investments were being stimulated. However, pressures for achieving ambitious targets appeared to have hampered strategic principles in promoting participatory management.

1.6 Columbia

Columbia's experience in management turnover is more mature than that in any other developing country. O&M responsibility in some districts were handed over to water users associations as early as 1976. IIMI is assessing performance before and after turnover and reviewing the transfer process. Initial results indicate the following:

- 1) After a temporary downturn immediately after the turnover in 1976, the area irrigated has continued to expand, indicating that farmers have confidence in being able to obtain water.
- 2) Both farmers and agency staff agree that paper work and delays have been reduced considerably after the transfer.
- 3) Emphasis on cost cutting has led to a decline in real terms in the irrigation fees levied by the WUAs.

1.7 India

Recognizing that there were already several irrigation-related social organization experiments in India (e.g. the CASED work in the Mula System in Maharashtra), IIMI opted to avoid competition or duplication, and to work in places where experiments did not exist, or to strengthen existing experiments by lending its international experience. Given IIMI's limited scope for large scale work, the decision was to work in one or two states where there was strong government interest in pursuing farmer organization activities. The work was essentially to be in collaboration with the local Water and Land Management Institutes (WALMIs).

The case of the Paliganj Distributary (12,000 ha) in the Sone System in Bihar presents a success story in farmer management attempts above the outlet. In a rather hostile environment due to years of neglect by irrigation officers, the WALMI Action Research Program (ARP) study team found many obstacles at the beginning. Social tensions related to caste and tenure were pronounced in this "socially disturbed" area, and the upper-end farmers had the habit of breaching the canal. The ARP team spent months in developing a rapport with the aggrieved majority in the farming community, and finally the breakthrough came. This is an isolated case of a local initiative, maintained by a dedicated group of local researchers, which has no larger strategic framework. Being one of the poorest states in India, Bihar is chronically short of funds, and has declared a policy of transferring management responsibilities to farmers. The experience suggests that it is more valuable, if it can be achieved, to organize farmers to deal with problems above the outlet rather than below the outlet.

1.8 Lessons Learned²

The following can be mentioned as "the main lessons learned from research experience on farmer organizations around the world, with particular reference to Asian countries:

- 1) Experience in many countries suggests that farmers are willing to become organized in order to improve irrigation system management; it is commonly appreciated that organizing farmers can lead not only to better production and more equitable water distribution, but also to better relations between farmers and agency officials. Farmers' participation in irrigation management through farmer organizations can contribute positively to planning, design and construction, water management, resource mobilization and conflict resolution.
- 2) Advisably, water users organizations should be built upon small hydrologically defined groups as the primary organizational units, so that all farmers have a chance to participate, without limiting it to subgroups such as landowners.
- 3) There is no maximum size limit for a farmers' organization. There are effective farmer organizations managing small command areas of 20-25 hectares and large command areas ranging from 3000 ha to 15000 ha. In a large system, a farmer organization may need several tiers, each with specific responsibilities, or smaller groups can form a federation. The 15,000 hectare Karnali system in Nepal, the 458,000 hectare King's River Water Association in Fresno, California, and the 150,000 hectare Chia-nan Irrigators' Association in Taiwan are examples of federated farmer organizations.
- 4) Farmer organizations must have real power and control over resources. Sri Lanka, India, Indonesia and Philippines all have many examples where farmer organizations have failed because actual decision-making power was kept by government agencies; these countries also have many examples where farmer organizations have functioned very well when given real power and legal clarity about rights and responsibilities and the authority to settle conflicts locally and apply sanctions.
- 5) A farmer organization whose primary felt need is water, should reach a level of managerial sophistication that ensures a reliable water supply before it undertakes other agriculture related activities which can augment the productivity of water. A tendency for farmer organizations to undertake additional activities on their own, once they can manage irrigation water, has been observed in the Philippines and Sri Lanka.
- 6) In system rehabilitation or modernization, efforts to organize farmers or strengthen existing farmer organizations should begin well before the physical works are initiated. An event requiring group decision-making and local investment can be a good foundation for an effective organization. The experience of an action research project in Sindhupalchowk (Nepal) shows that once farmers are organized, physical construction

² This section giving a synthesis of lessons learned from experiences around the world, has benefited considerably from a note, "FARMER ORGANIZATION IN IRRIGATION MANAGEMENT IN INDIA: HOW CAN IIMI CONTRIBUTE?". by R. Sakthivadivel, Jeff Brewer, Douglas Merrey and Douglas Vermillion of IIMI (1992).

does not take long. Many examples in Sri Lanka, India, and the Philippines show that if organizational development does not precede or occur together with design and construction, the work is slower, **less** effective, and often faces opposition, or even sabotage, from the farmers.

- 7) Farmers' willingness to contribute labor, cash and other resources to operations and maintenance, and to collectively bargain with agencies, is directly related to their power to make real decisions. This is a good index of the potential for organization.
- 8) Many national and state irrigation acts do not provide for farmers' participation in irrigation management. Even where legal provision exists, they generally need to be strengthened and modified.
- 9) Experience in the Philippines, Indonesia and Sri Lanka shows that, as farmer organizations become more effective, they are capable of taking increasing responsibility for irrigation system operations and maintenance, thus relieving the government of these burdens, both managerial and financial.
- 10) Because of the complexity of the process in shifting from reliance on government agencies to reliance on farmer organizations, requiring changes in both parties, no detailed blueprint for achieving this shift is possible. Instead, the process requires experimentation, negotiation, adaptation to local circumstances, and time. It should be emphasized that planners must be prepared to take a long time period to achieve sustainable changes needed at all levels. Sri Lanka, for example, has made significant progress during the last 14 years but will need several more years to consolidate the required changes.
- 11) In some countries (Sri Lanka, Philippines) government units have proven effective in assisting farmers to establish and strengthen their organizations. There are also a number of important cases where non-government organizations (NGOs), working closely with the government, have proven very effective (Indonesia, Sri Lanka, Thailand, India).
- 12) There is no single model for farmer organizations. Each farmer organization must respond to its peculiar environmental and system requirements including agro-climatic and crop requirements, the local cultural system, and the legal and organizational environment.
- 13) Experience in several countries, including India, has shown that using catalyst agents or institutional organizers (IOs) can be an effective way to proceed. Catalysts provide the initial energy needed to get the farmers to work together while at the same time providing the initial contacts and communication between the incipient farmers organization and the irrigation agency. These contacts must eventually lead to negotiation of rights and responsibilities of the farmer organization. IOs can be recruited from NGOs, universities, trained agency field operations staff (a **low** cost approach in Indonesia), from local villages (Sri Lanka) or from among progressive farmers themselves (another low cost approach in the Philippines).

- 14). In many countries, the concern on having to share management responsibility with water users has been based on a common realization that the actual system performance is deviating from design standards in terms of equity and variability. For instance substantial inequity was observed in field studies in Philippines **Table-1**), Sri Lanka (**Table-2**) and India (**Figure-1**), as reported by **Wijayaratra** (1991). Similar, or more grave problems of inequity in water distribution have been identified in Pakistan. Some of them will be discussed in the following section of the paper.

2. PARTICIPATORY IRRIGATION MANAGEMENT IN PAKISTAN:

The Context and Prospects for Action Research

2.1 The Context

The management of Pakistan's integrated canal irrigation network is a very complex task. Its vast size, its dependence on run-of-the-river flows, fertile but environmentally fragile soils and their location in different ecological zones, large numbers of water users and a huge bureaucracy to administer, are just a few features of the world's largest contiguous irrigation system, which have made its management indeed a highly complex responsibility. That it has been run for such a long period, exceeding one hundred years, is in itself a commendable effort. But not many good efforts, carried out in their original design and style, can last that long and still be very productive.

A number of second generation problems started to surface, when the old systems were rehabilitated, remodelled and modernized, yet over-used or misused, and improperly operated under fast changing socio-economic conditions. These problems are too well known to need elaboration here. The constraints encountered in the present operation of the system can be summarized as:

- (1) a general shortage of canal water, which becomes more pronounced during peak periods of crop water requirement³;
- (2) The implications of the new-found supply of groundwater⁴ in the continued operation of traditional allocation methods based on equitable distribution;
- (3) a deterioration in physical conditions of the canal system, which continues to reduce the water delivery efficiency while aggravating the water shortage situation; and
- (4) the increasing difficulties of a centralized administrative system to fully cope with the growing problems of both operation and maintenance of the physical system.

³ See Tables 1 and 2.

⁴ See Figure 1 for the growth of groundwater development.

These main constraints are further compounded by environmental problems associated with waterlogging and soil salinity and sodicity.

The combined effect of these problems can be seen in an increasing inequity in the distribution and use of canal water, a decreasing concern for rules and regulations of canal operations, and consequently, a growing mistrust between water users and agency staff.

The present inequity can be seen as the cumulative effect of two interacting factors: 1) the deficiencies in maintaining physical conditions of the canal system; and 2) persistent deviations from the designed operational procedure. Maintenance is basically a support activity to facilitate operating the irrigation system; the two activities need to go hand-in-hand for the system to perform according to its design parameters.

To the theoretical understandings of irrigation management in Pakistan, as outlined above, IIMI's past and on-going research activities have added some empirical results in an effort to isolate a few important issues that relate to this situation. They are mainly in the following subject areas:

- 1) Performance of canal systems and equity in water distribution;
- 2) Implications of groundwater development;
- 3) Institutional factors affecting irrigation performance;
- 4) Environmental implications of irrigation; and
- 5) Potential for crop-based irrigation operation.

The first three items are selected for further elaboration, as they directly related to the subject under consideration.

2.1.1 Canal performance

With the gradual decline in the quality of physical and management conditions, the design objective of equity steadily eroded. When design assumptions for distributary outlets, such as continuous full supply water level in the canal and outlet modular conditions, were no longer valid, the distribution of water among the outlets was found to be substantially inequitable (Bhutta and Vander Velde, 1992).

The following comments relate to some *of* the main aspects of inequity as found in IIMI's field research (Kijne and Vander Velde, 1991 and 1992; Vander Velde and Murray-Rust, 1992):

- 1) Monitoring activities in Farooqabad and Bhagat Sub-Divisions have shown that the long standing system performance objective of equity in surface-water distribution is now rarely achieved. On average, the farmers in tail-end watercourses have less than **one-fifth** the access to surface water enjoyed by farmers in the head-end watercourses. The

pattern observed for the Pir Mahal Distributary, having a design discharge of 4.67 cubic meters/second for a CCA of 14,891 ha, can be seen in Figure 2 and Figure 3.

- 2) When the discharge at the distributary head falls below 70% of design, an occurrence observed in some distributaries of the Lower Chenab Canal (LCC) for as much as one-third of the annually available operational days, supplies to tail outlets simply collapse.
- 3) As the Lower Gugera Branch delivers insufficient surface water supplies to the tail of the system, an inter-distributary rotation is operated for much of the year at Bhagat Head. Yet, significant inconsistencies in the equitable implementation of scheduled rotational operations were observed in the Pir Mahal Distributary. For several months in 1990, this distributary operated about 40% of the time period below 70% of full supply level, contrasting with nearby Khikhi and Dabanwala distributaries which operated nearly continuously at 90% or more of full supply level (Figure 4). Heavy silt accumulation, embankment erosion, unauthorized or informal withdrawals of canal water upstream, and variability in distributary flows upstream were identified as causes of severe tail-end deprivation.
- 4) Laxity in canal operations has promoted anarchy in the field. There are many instances of breaching of canal bunds, installing of unauthorized outlets, pumping and siphoning of canal water, and tampering with outlets and other canal structures. These acts in turn exacerbate the maintenance problems. Both under normal supply and shortage conditions, generally the upstream water users receive more water than their due share, while those in the tail reaches of the canal command receive less⁵.

2.1.2 Groundwater

Public and private groundwater development added a new dimension to equitable use of water resources. It tended to help the richer farmers and also to adversely affect the tail-end farmers as the groundwater quality decreased towards the tail areas of the distributary commands.

A substantial increase in water supplies at the watercourse level due to public tubewells in some areas (eg. Rechna Doab) meant that the low design cropping intensities (50-75%) could now be exceeded. Annual cropping intensities in many LCC distributary commands increased to well over 100%. Simultaneously, some farmers started to grow higher priced, water-intensive crops

⁵ Surprisingly, there are also instances where the tail-end watercourses in some canals have been reported as receiving more water than their due share. This unusual inequitable situation observed in Puran and Nari distributaries in the Punjab is attributed to an overall over-supply of water to the canals (Gleason et al, 1993). A similar anomaly was seen in an IIMI study in the Lower Swat Canal in the North West Frontier Province, where its downstream Sheik Yousaf Minor was drawing more excess water relative to the design discharge than its upstream Distributary No. 3, and downstream watercourses receiving a greater allowance than watercourses upstream in the Minor, and the same reason was identified for explaining the unusual reversed inequity (Bandaragoda et al, 1993).

like rice and sugarcane. This was accompanied by a rapid development of private tubewells in the 1980s (Figure 8.13). A tubewell census of 35 watercourse commands of Mananwala, Karkan (Minor) and Largar distributaries revealed that the average density of private tubewells in the area was over 5 per 100 ha. IIMI studies showed that total groundwater supplies, on average, contributed about 70% of water used in the Farooqabad Sub-Division. Therefore, to exclude this high percentage of total water supply from the norm of equitable distribution is a major factor relating to consideration of equity.

2.1.3 Institutional Factors

A study on the institutional framework for irrigation management in Pakistan concluded the following (Bandaragoda and Firdousi, 1992):

- 1) A major institutional factor that affects Pakistan's irrigation performance is the continuation of complex and outdated formal rules and procedures while they are consistently over-ridden by several socially evolved informal institutions. The original intentions of ensuring strict discipline for codified behavior in water distribution, as well as in water use, can no longer be achieved due to changed circumstances in the social and physical environment. A review of formal irrigation rules, measures to arrest the dysfunctional effect of some informal rules, and an overall assessment of the whole structure of irrigation organization are the urgently needed research and policy initiatives.
- 2) With the changes in the socio-political systems after the demise of colonialism, the modern democratic values and the old cultural values appear to be running parallel to each other, often resulting in conflicting manifestations in the field. The challenge is to find an appropriate congruence between these two streams and convert the present institutional barriers to useful institutional support for irrigation management.
- 3) A centralized administration designed to control a large supply-oriented canal irrigation system has lost its effectiveness, if not largely its relevance, in an emerging demand-oriented system. The regional and location specific management requirements arise from the presence of additional tubewell water on the one hand, and different cropping patterns and intensities on the other. Centralization needs to be replaced by appropriate decentralized mechanisms, remote control by more intimate performance monitoring, and narrow departmentalism by greater coordination.
- 4) Any form of institutional change in any context requires positive support from policy. A deep-rooted administrative culture in this region would necessarily require carefully considered strategies and the support from the highest levels of policy to make any change in the existing irrigation-related institutions. Attempts can be fruitful when they are strongly based on local initiatives and a full understanding of the prevailing constraints, and when they are correctly placed in the country's socio-economic context.

Generally, a fairly common picture emerges in many canal systems. When the canal is silted, its upstream outlets tend to draw more water than their design discharges. This is simply a hydraulic phenomenon, which however has an impact on social behavior; it discourages upstream farmers from promoting maintenance activities in the canal⁶, it encourages "free-rider" behavior (in which some individuals try to get more than their due share at the expense of the others), and increases social conflict.

Conditions of scarcity and poor reliability of supply normally encourage the individual water user to engage in various malpractices for maximizing personal gain. A long period of this behavior results in a "syndrome of anarchy", which is a product of mutual mistrust between the water users and the operating staff. The users lack the confidence that if they refrain from stealing water, or breaking the structures, they will get their entitled water on time, while the officials lack the confidence that if they apply themselves properly to somehow get water on time, the users will refrain from breaking the rules. The problem is, where and how to break this vicious circle. As long as the offenders are the majority in either group, enforcement is not possible as any law can be effective only when a small minority of the population tends to break it.

2.1.4 Rationale for Organization of Water Users in Pakistan

A strategy that seems most congruous with this situation is to approach the problem from the demand side of the irrigation management equation. This strategy has not been fully explored so far in Pakistan, where a supply-sided bureaucracy has consistently been playing a dominant role.

The proposition is that growing inequity and declining productivity can be resolved by an institutional change initiated at the level of water users, which would help to adjust their own behavior, and would help to generate corresponding institutional (and behavioral) changes in the delivery organizations as well. There is evidence to suggest that, given the opportunity, Pakistan's water users are willing to take decisions on their own.

In the absence of pressure from rigid administrative behavior, Pakistan's farmers have demonstrated their willingness and ability to manage their own irrigation affairs amicably and productively. In the newly established Chashma Right Bank Canal Stage I system, any form of warabandi or official water distribution methods have not been established yet. Taking this opportunity, farmers resorted to close and open outlets according to their collective needs within the watercourse commands. IIMI's research results show that the pattern of this outlet closure almost coincide with the actual crop water requirements for the season (Figure . and Figure 7 and Figure 8). Field research in Fordwah Distributary has reported very prudent behavior by the farmers in water trading and sharing (Strosser and Kuper, 1993), and in coping with salinity (Kuper and van Waijjen, 1993).

⁶ In a seminar held in Karachi, mention was made that some influential farmers in such advantageous locations in a canal command had brought tractor loads of removed silt back into the canal, immediately after a major desilting effort by the government.

The current problems of irrigation management in Pakistan typically call for new thinking. Hitherto, the country's irrigation development has been mainly technology-oriented, and pursued with a pre-occupation in expanding the resource base. The commendable work done so far in technology application and resource base expansion is now clearly facing a decline in its productive value.

Yields of main crops under irrigated agriculture in Pakistan are either stagnant, or declining. The Pakistan National Conservation Strategy, a recently published government document, points out that Pakistan's average yields of all main crops are considerably less than the average yields achieved by other countries; wheat yield is 44% of that in Mexico, rice yield is 43% of that in Egypt, maize yield is 33% of that in Turkey, cotton yield is 75% of that in Mexico, and sugarcane is 66% of that in India. The 1990 *Water Sector Investment Plan* of Pakistan predicts a food shortfall of about 10% by the year 2000 and 25% by 2013, even if the Plan's proposed targets of resource base and performance improvements are met. This represents an increase in the food deficit from 24% to 36% during this period. Thus, the low productivity of irrigated agriculture in Pakistan represents a major threat to the country's food security.

2.2 Prospects for Action Research on Social Organization

The rationale for social organization in irrigation management in Pakistan was seen to be based on the country's context. However, generally for any country, the idea of organizing water users should raise a number fundamental questions, answers to which are usually assumed to be common sense. But these questions need to be raised, and clear answers sought and clarified so that there is a common platform of appreciation of the strategies to be undertaken.

For instance, who gains by farmer organization, and who loses? If it is for common benefit, how can the benefit be clearly identified to make it easily convincing? Can this goal be achieved in a skewed social system? What makes an organized users group function effectively under these conditions? And so on and so forth.

A few issues that relate to these questions are mentioned below.

2.2.1 Empowering Water Users : A Basic Issue

The following excerpt from a recent article by John S. Ambler (1993) aptly raises the issue of empowerment:

In practice, the implicit meaning of the phrase "farmer participation" frequently means "we need farmer participation in the government's program". With this unsaid attitude, the government acts as the prime mover, making the key decisions about investment priorities, the design of improvements, the system of management, and the rules of operation. Water user's associations become an appendage of the state, rather than autonomous bodies with real decision-making powers. The concept of farmer management (or alternatively, "government participation in peoples' programs") requires a reorientation of the irrigation bureaucracy from a position of implementing agency to one of service agency. This would be one step towards conditioning ourselves to think about placing meaningful authority in the farmers' hands.

The validity of this view rests on a number of observable facts and related interpretations. One dominant feature of irrigation management in South Asian countries is the exercise of power and authority in day-to-day management affairs. Therefore, a basic issue in social organization for irrigation management is whether, and to what extent, the power and authority can be shared among the relevant partners.

Ambler's views quoted above represent a common concern among many from outside the irrigation bureaucracies, and the concern has been increasingly emphasized in recent times. However, not much has been articulated on this issue by those within the bureaucracies who, in fact, possess the power and authority, which they are being encouraged to share with their "beneficiaries". A forum of this nature provides a good opportunity to clarify the insiders' view.

The downside of this issue is an apparent lack of both interest and its articulation at the grass root level. Do water users really want to get organized, or be empowered?

This question has to be answered with empirically tested results. That the people in one place have wanted users organization, or even benefited from it, is no reason for one to assume that the people in another place would do the same. Even if the common realization among those who are interested in their welfare is that any group of people would need it, there is a need to engage in some social engineering field work to ensure that people in fact are convinced that they want to be organized. Individuals will readily agree to join a group only when they see the personal gain in doing so.

In summary, the sharing of power and authority is a basic requirement for shifting to participatory management through the involvement of organized users. This presupposes the existence of a commonly accepted set of useful functions to be performed by the organizations. Without these, there will be only "paper organizations".

The desirability of power transfer may be widely accepted, but the issue needs to be further analyzed in terms of mainly three aspects:

- 1) Viability (is it really possible?);
- 2) Extent (how far is it possible?); and
- 3) Mechanisms (the strategies for transferring power).

2.2.2 What Can the Organized Water Users Do ?

Past experience in state-sponsored interventions in organizing water users shows that their emphasis was for more tangible, target-oriented and engineering-related activities by the water users. Once the limited involvement in lining and improving watercourses was accomplished, the "WUA" that was formed for this purpose collapsed. In fact, the activity itself was a doubtful incentive for the farmers to organize themselves for collective action, as the task could be undertaken with minimum organized behavior by the individuals. Studies on Swabi Irrigated Agriculture Project (SIAP) activities in the North West Frontier Province concluded that lining of watercourses is hardly seen by the farmers as a strong incentive for collective action. However, further research on this aspect is necessary to arrive at firm conclusions.

An organization of water users implies that the “water use” itself is an important task to be gainfully accomplished through collective action by the organization. This assumption has not been tested yet in Pakistan, but underlies the conceptual framework outlined in this paper. One of the important objectives of any future interventions in organizing water users in Pakistan should be to test the validity of this proposition. Can organized water users manage water more productively and more equitably, if they were to be given the responsibility, not only at the watercourse level, but also at the distributary canal level ?

2.2.3 Who Should Organize Water Users ?

The political nature of participation requires that the policy on social organization should essentially be indigenous. It should finally be determined by the local people alone, and not by any donor or foreign expert. However, external assistance can be a very useful catalyst in the process of policy formulation, situation analysis and developing implementation strategies.

That the content of participation is usually determined by the political ideology of each country is an added reason why there should be a fairly cautious approach to any type of intervention relating to the organization of people. Particularly, the rural people are generally believed to be the more vulnerable section of the society, and should be approached with greater care.

In Pakistan, this policy interest has already been expressed. Two extensive state sponsored programs, On Farm Water Management and Command Water Management, represent a clear expression of policy interest in social organization, which is further supported by the laws established for water users associations and their federations. What is lacking however, is a firm commitment on the part of both policy and management to pursue this effort beyond the program-based obligations to the donors. Once a favorable policy environment has been firmly established, ideally, the need for WUAs should be felt by the water users themselves, and the organization and development of WUAs should be based on their own expressed interest. These propositions can be tested in an action research program.

3. IIMI'S PROPOSED ACTIVITIES IN PAKISTAN

With the experience gained in different contexts, IIMI would like to collaborate with Pakistani agencies and research groups to provide the necessary research inputs for developing and implementing a strategy for participatory management. The above mentioned questions, and several others, will form the basis for a collaborative research and development program.

IIMI's proposed research effort aims to:

- 1) develop a general awareness regarding the field response to the past policy initiatives;
- 2) rekindle the interest among policy and implementation levels for undertaking more meaningful measures towards lasting institutional development among water users; and
- 3) identify the conditions for effective social organization.

Contextually appropriate action research efforts will follow the initial "learning" phase, on the basis that any external assistance can be effective only in playing a facilitating or a catalytic role. Methodologies used elsewhere with a fair degree of success (Skogerboe et al 1993) will be used with appropriate amendments to suit the local conditions.

Action research on this theme has to be essentially collaborative. With this requirement in view, the proposed research effort will also explore the development of appropriate extension mechanisms and training strategies for collaboration. In the next phase of the Netherlands funded project, "Managing Irrigation for Environmentally Sustainable Irrigated Agriculture in Pakistan", IIMI is planning to emphasize on the social organization aspects. The project document indicates this emphasis in the following preamble:

In line with present thinking within the Pakistan Government, and supported by similar World Bank initiatives in the irrigation and drainage sector, the project will embark upon a program of studies related to required institutional changes in irrigation delivery and drainage. Water Users Associations (WUAs), that are still insufficiently developed after many years of Government support, and institutional changes in provincial government agencies, will form a new thrust of the project. IIMI's involvement in many disciplines and sectors as Pakistan changes its approach and strategy, together with its experiences in other countries, would enable possibilities for success in these activities.

The activities will be built around four main areas:

- 1) Establishing viable water users organizations;
- 2) Farmer-agency interactions;
- 3) Coordinated irrigation services; and
- 4) Role of provincial institutions.

3.1 In the Puniab Province

These activities will be carried out in the Fordwah Eastern Sadiquia (South) area, where a World Bank funded irrigation and drainage project is being implemented at a total cost of about Rs.2300 million over a period of six years from 1992-93 to 1998-99. The infrastructure development and related research work is jointly executed by the Water and Power Development Authority (WAPDA), Punjab Irrigation Department (PID) and Punjab Agriculture Department (PAD). The proximity to this project work provides an opportunity for IIMI to closely collaborate with these agencies. For IIMI's activities related to social organization, the PAD (particularly its Water Management Directorate), will be the main partner. This partnership will be able to draw on the long experience of the Command Water Management Project (CWMP) and the On-Farm Water Management (OFWM) program, in which attempts had been made in the past to strengthen the irrigated agriculture management through improved infrastructure, institutions, agricultural inputs and services. The work will be carried out in the watercourse commands of two distributaries, the Sirajwah Distributary and the Bhukan Distributary.

3.2 In the Sind Province

At the request of the Government of Sind, a similar program is planned to be incorporated in the World Bank and Swiss funded "Supplementary Project for Strengthening of LBOD Stage I, Water Management Component". Pilot projects will be undertaken to induce genuine farmer management of irrigation. One minor or distributary command area will be selected as a Pilot Distributary Turnover Command area in each of the three LBOD districts (Nawabshah, Sanghar and Mirpukhas). The Directorate of the LBOD Water Management Cell in particular, and the Provincial Agriculture Department in general will be the collaborating partners of IIMI in this activity.

Dutch funding for IIMI's work for water management interventions will reinforce this LBOD activities to fine-tune the delicate balance between conjunctive irrigation and drainage practices that are required for the waterlogged situation in the Sindh. This combined support will further help IIMI to involve strong collaboration with existing research organizations and government agencies in the Province of Sindh.

IIMI places a strong emphasis on the collaborative nature of these activities. IIMI would work as a partner with the implementing agency and other collaborating institutes. In the long run, a successful farmer organization effort aimed at participatory irrigation management approaches will necessarily be accompanied by policy and organizational changes within irrigation agencies, which they must be prepared to plan and implement. IIMI would like to participate in launching this institutional development program, by providing it the relevant research inputs and international experience.

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Table-1

Water Availability - Ratio between the highest and lowest:
1983-87, Upper Pampanga Project, Philippines

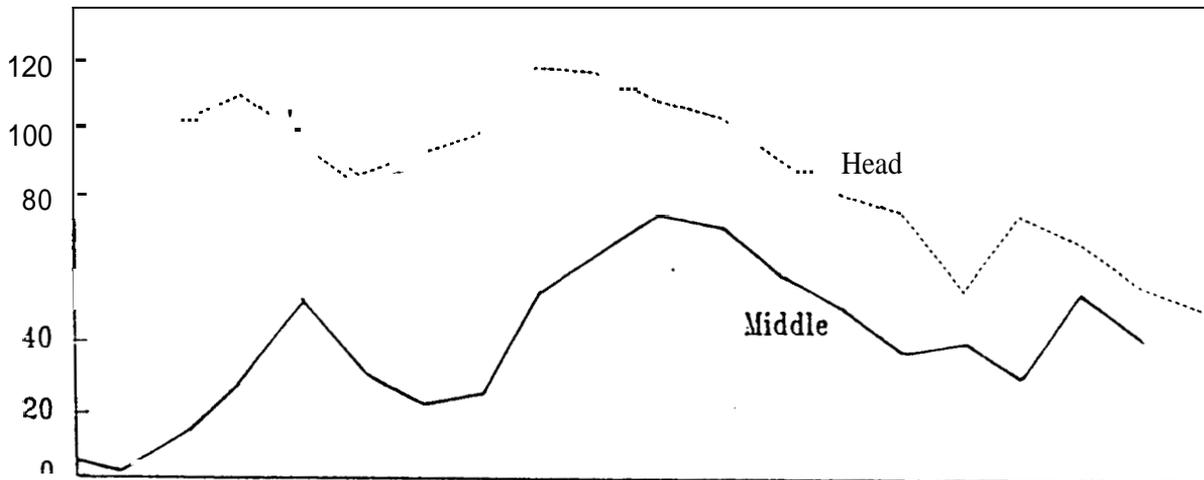
1993	Dry	2.03
	Wet	3.23
1984	Dry	1.46
	Wet	1.69
1985	Dry	1.52
	Wet	2.05
1986	Dry	1.68
	Wet	1.40
1987	Dry	1.61
	Wet	1.23
Average	Dry	1.50
	Wet	1.58

Table-2

Summary of the Analysis of Variance in the Distribution of
Water Availability - Gal Oya Project, Sri Lanka

	1980/181 (Wet)	1981 (Dry)	1981/82 (Wet)	1982 (Dry)
Main system	53	24	55	48
Field channel	9	14	18	22
Among farmers	29	38	11	21
Within farm	9	24	16	9
Total	100	100	100	100

Figure-1



b) Rabi 1987-88

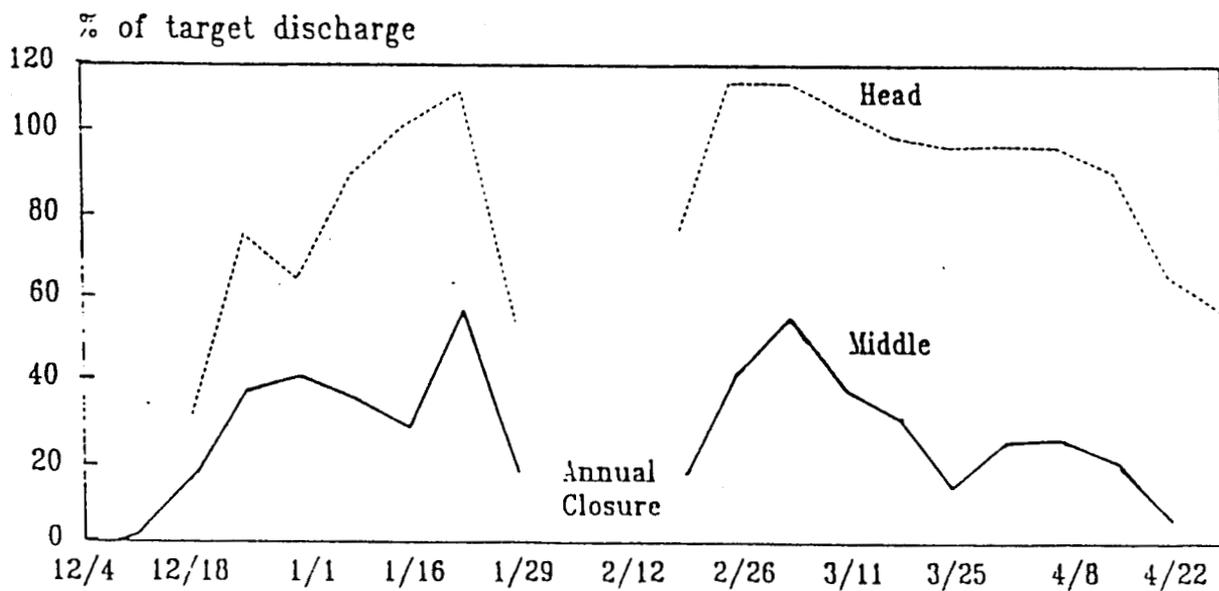


Table-3 Water Allowance in Major Perennial Canals in Pakistan.

Canal system	Year operations started	Canal capacity		Water allowance	
		M ³ /sec	(Cusecs)	L/s/ha	(Cusecs per 1,000 acres)
1 Central Ban Doab	1859	73.58	(2,600)	0.23	(3.22)
2 Sidhnai	1887	127.35	(4,500)	0.21	(3.00)
3 Lower Swat	1890	22.64	(800)	0.44	(6.15)
4 Lower Chenab	1892	325.45	(11,500)	0.22	(3.17)
5 Lower Jhelum	1901	150.00	(5,300)	0.20	(2.84)
6 Upper Jhelum	1915	53.77	(1,900)	0.21	(3.03)
7 Panjnad	1929	254.7	(9,000)	0.30	(4.20)
8 Rohri	1932	316.96	(11,200)	0.20	(2.84)
9 Thal	1947	283.00	(10,000)	0.23	(3.18)
10 CRBC	1987	130.1	(4,879)	0.53	(7.53)
11 Lower Swat (Remodeled)	-	55.0	(1,940)	0.78	(11.00)

Sources: Revised Action Programme for Irrigated Agriculture, Vol.I, WAPDA 1979.Item 10 from PC-I (Revised) for CRBC Project, WAPDA May 1981.Item 11 from Final Project Plan, Mardan **SCARP**, June 1981 (Draft Report) Harza/Nespak Consultants.

Table-4 The Ratio of Water Supply to Crop Consumptive Use for Typical Canal Systems in Pakistan

Canal	Rabi						Kharif						Annual		
	Oct	Nov	Dec	Jan	Feb	Mar	Sea- son	Apr	May	Jun	Jul	Aug		Sep	Sea- son
1 Lower Swat P, IG	0.42	0.76	2.54	1.10	0.86	1.29	0.80	0.93	0.39	0.24	0.37	0.47	0.23	0.36	0.47
2 Upper Jhelum PP, GW	1.63	1.25	1.21	2.07	0.93	0.56	1.13	1.29	1.75	0.86	1.82	2.52	1.14	1.40	1.28
3 Sidhnai NP, LG	0.72	1.02	1.11	0.99	0.48	0.38	0.69	0.90	0.99	0.63	0.70	0.61	0.43	0.66	0.67
4 Muzaffargarh NP, GW	1.81	0.81	1.51	1.63	0.78	0.49	0.98	1.09	1.24	1.17	1.62	1.38	1.04	1.27	1.14
5 D.G. Khan NP, LG	1.21	0.51	0.43	0.85	0.21	0.08	0.46	0.38	0.58	0.77	1.10	1.06	0.65	0.83	0.68
6 Rohri P, IG	0.82	0.81	1.56	0.35	0.47	0.49	0.67	0.82	0.71	0.59	0.38	0.50	0.69	0.57	0.61
7 Rice NP, LG	1.02	0.01	0.02	0.00	0.00	0.02	0.18	0.50	1.36	0.81	1.04	0.85	0.77	0.89	0.70
8 Beghari	0.54	0.03	0.04	0.09	0.04	0.09	0.13	0.36	0.05	0.55	1.30	1.51	2.82	0.91	0.68

Source: Revised Action Programme for Irrigated Agriculture, Vol.I, WAPDA, 1979.

Notes: P=Perennial, PP=Partly perennial, NP=Non-perennial,

LG=Limited groundwater, GW=Groundwater supplement available.

Figure-2
**Private Tubewell development in Pakistan
 and Punjab**

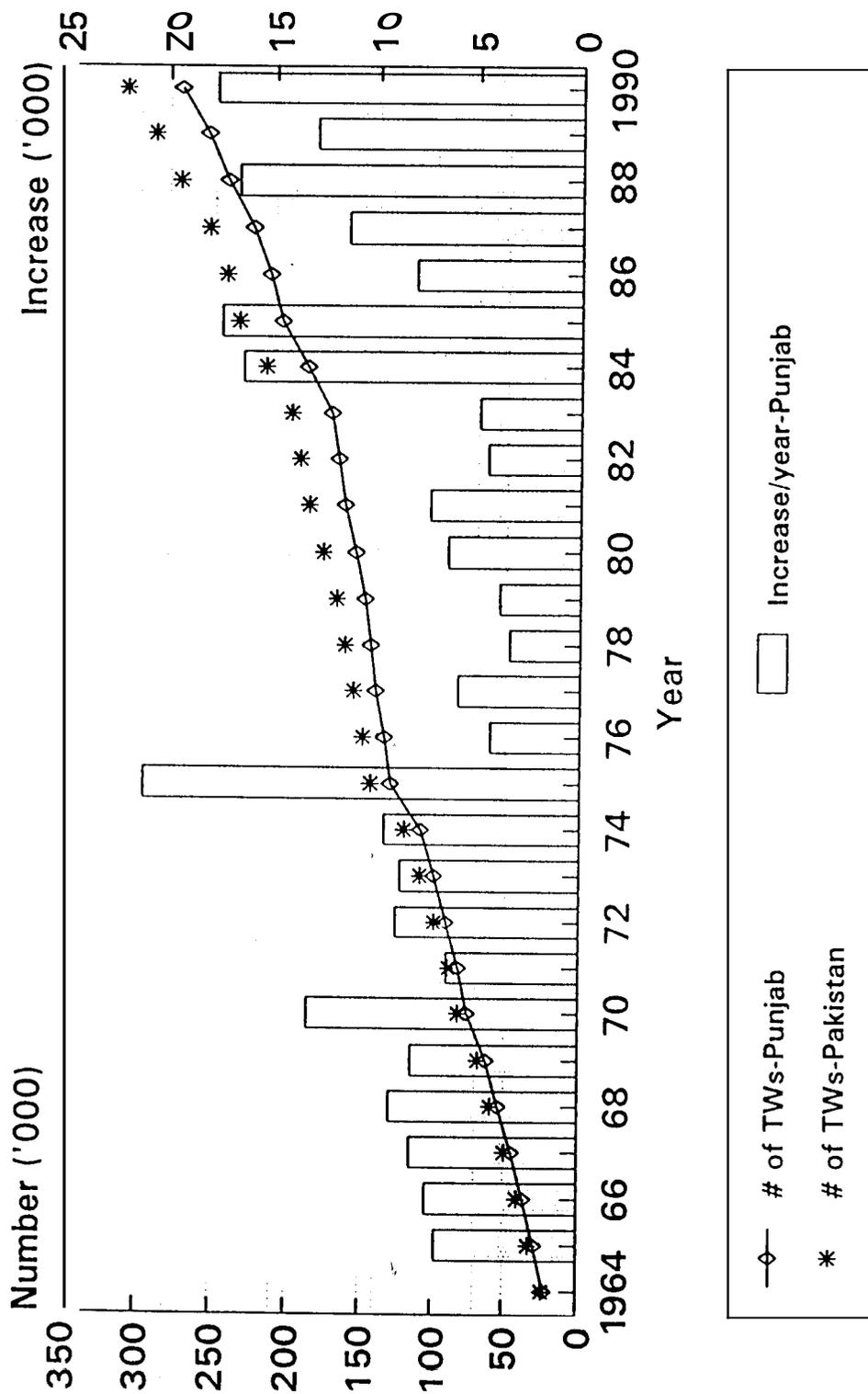
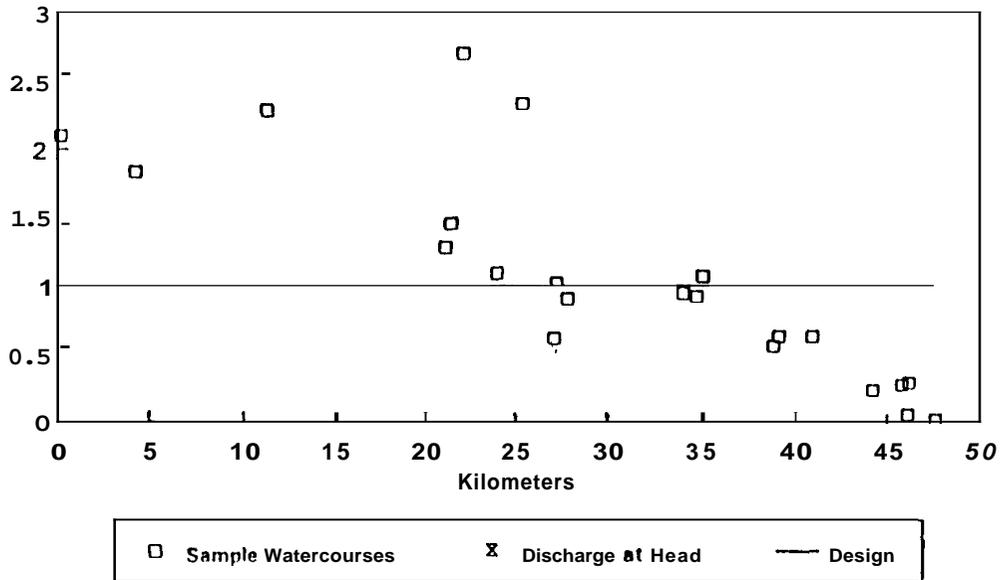
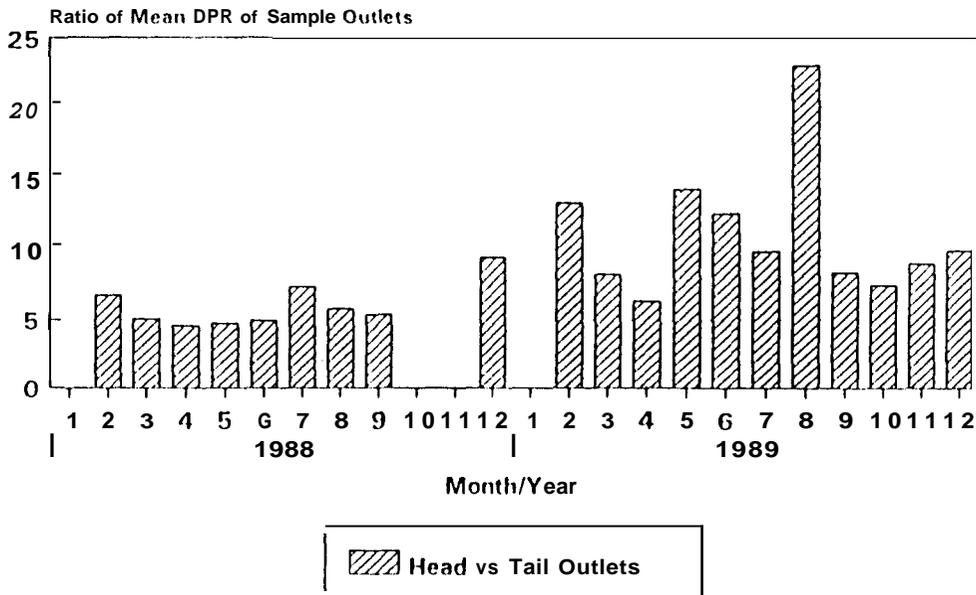


Figure-3
Pir Mahal Distributary
Water Distribution Equity



Bhagat Sub-Division

Figure-4
Pir Mahal Distributary
Water Distribution Equity



No Ratio October-November, 1988
 Flood Closed Tail Outlets

Figure-5
 Bhagat Head Rotational Operations
 Distributary Head Discharge

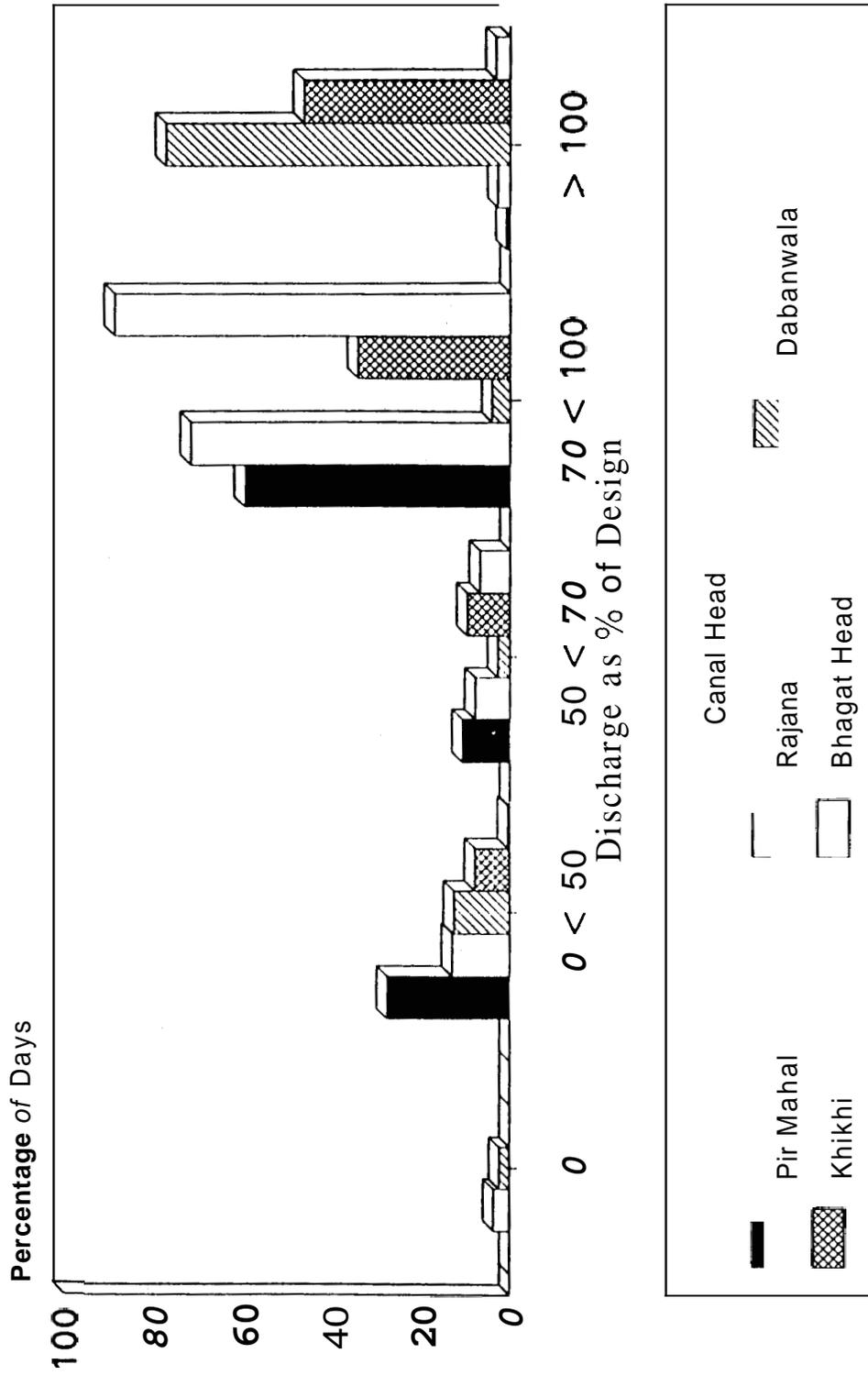
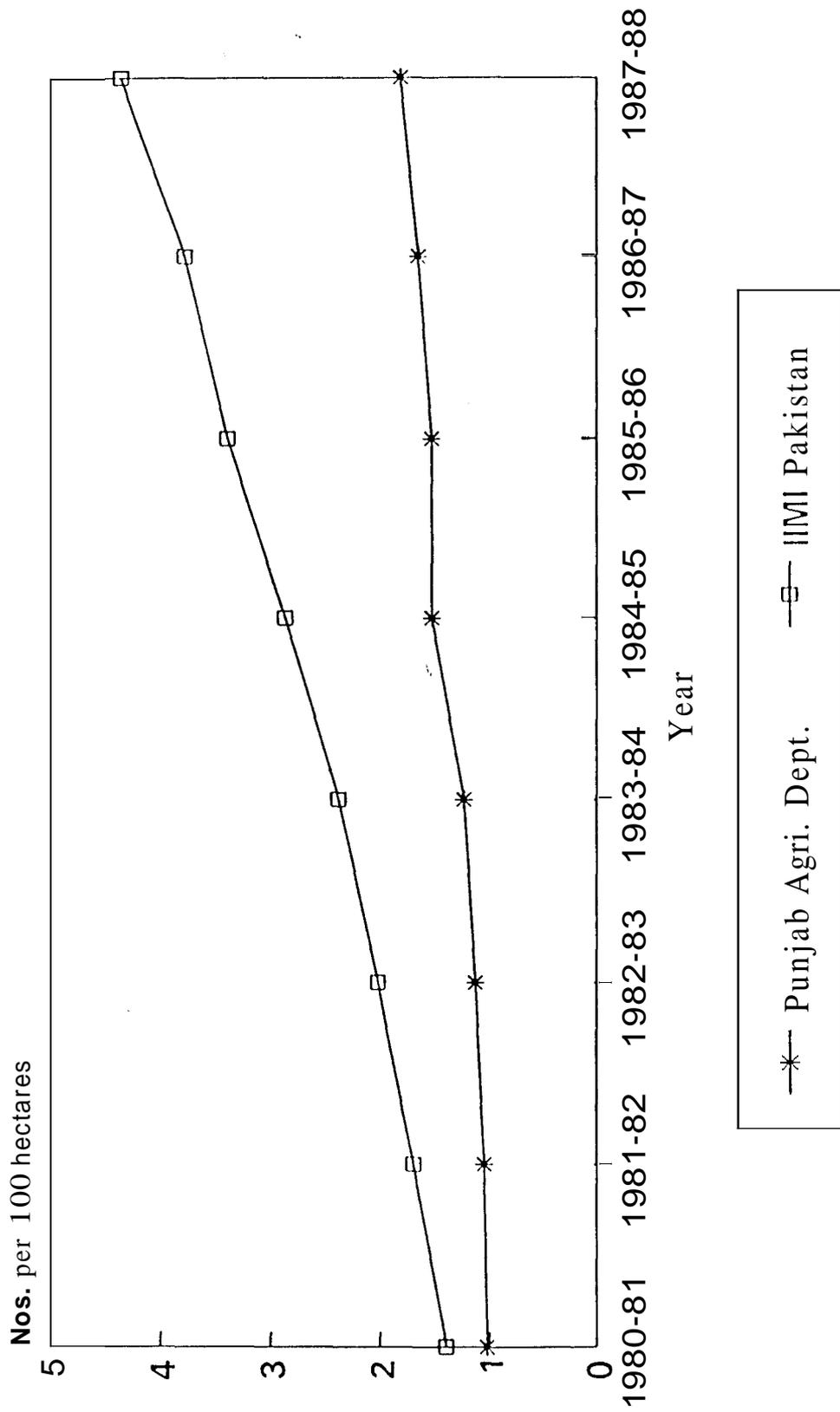


Figure-6
Densities of Private Tubewells
Punjab Agriculture Dept. vs IIMI Data



IIMI = Farooqabad SD Canal Watercourses
 PAD = Sheikhpura District

Figure-7
WATERCOURSES CLOSURE RECORDS: DISTY # 3
DISTY AVERAGE (1/92 TO 6/93)

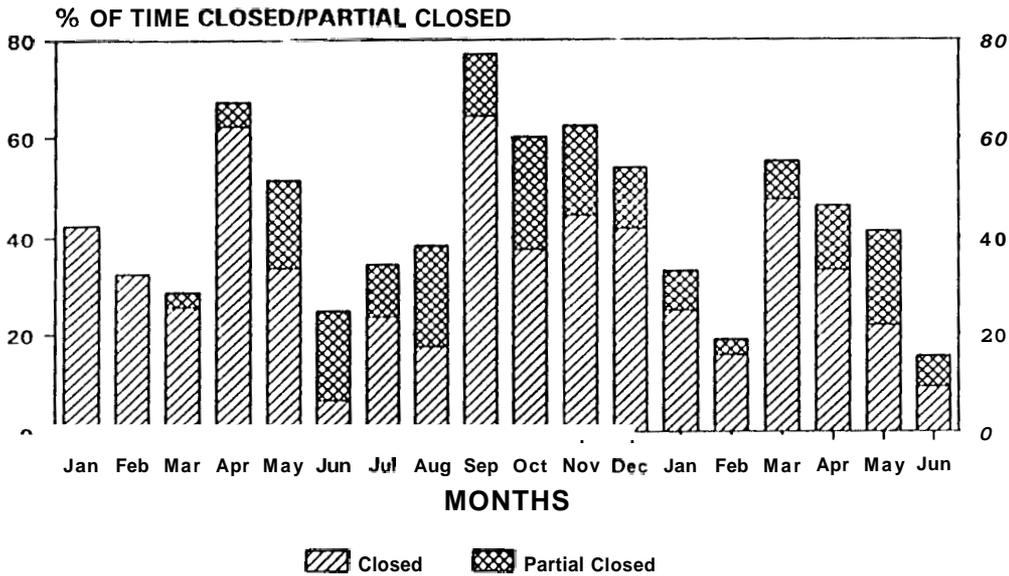
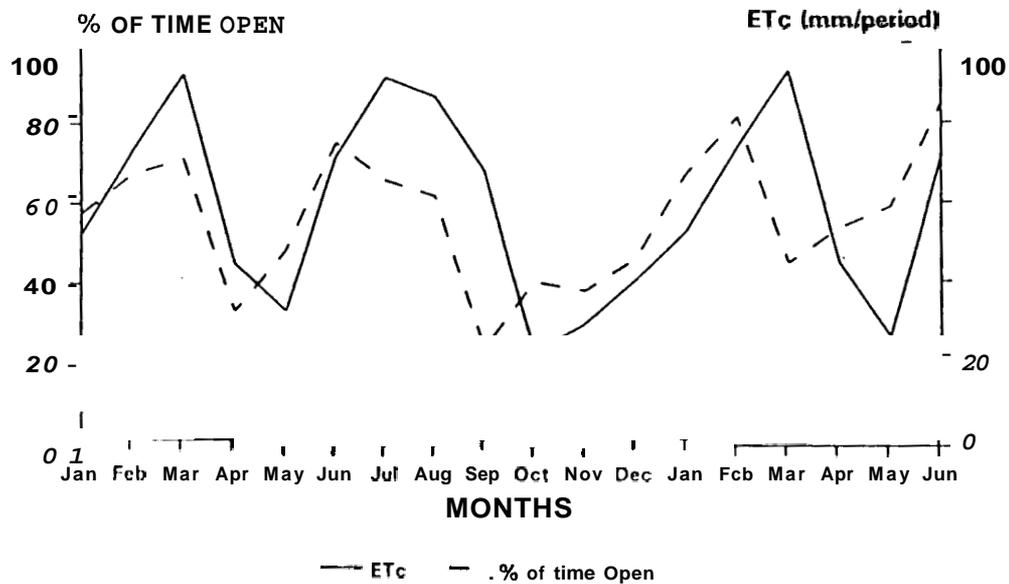


Figure-8
WATERCOURSES OPEN RECORDS : DISTY # 3
COMPARISON OF ET_c WITH FARMERS BEHAVIOR



CONSULTANCY INPUTS FOR THE PREPARATION OF PROJECT INCEPTION REPORT ON SOCIAL ORGANIZATION IN IRRIGATION MANAGEMENT

Piyasena Ganewatte and Prachanda Pradhan

JANUARY, 1995

EXECUTIVE SUMMARY

The Punjab irrigation system is an intricate and enormous network of dams, barrages, link canals, main canal systems, distributaries and minor canals stretching nearly 25,000 kilometers in length. The responsibility for the management of the system, its operation and maintenance devolves on the Provincial Irrigation Department (PID) while operation and maintenance of about 100,000 watercourses at the tertiary level is the responsibility of the farmers with assistance from the On Farm Water Management (OFWM) program of the Provincial Agriculture Department (PAD).

Research studies undertaken by Water and Power Development Authority (WAPDA) from 1973/1974 indicated that water course conveyance losses ranged between 31 % to 57 %. It was also revealed that efficiencies could be attained through watercourse improvements. These, and other findings led to the creation of the On Farm Water Management Pilot Project (1976-80). An important strategy of the OFWM pilot project was to involve farmers in the improvement and lining of the watercourses by providing labour. Although construction activities at the tertiary level were considered a legitimate responsibility of the Provincial Irrigation Department (PID), yet the authorities at the time were reluctant to assume responsibility for this task. Consequently, the On Farm Water Management program became the responsibility of the PADs.

A turning point in the history of the farmer organization in Pakistan was the promulgation of the Water Users Association Ordinance of 1981. Its aim was to clearly define the role, duties, rights and responsibilities of the association. The authority to assist in the formation of Water Users Associations (WUAs) legally rested with the OFWM Directorates of PADs. By the end of 1994, there were 20,000 WUAs in the Punjab. Once the watercourse improvement was completed, most WUAs disintegrated.

The proposed IIMI pilot project, as envisaged in its plan, should necessarily endeavor to develop a new strategy for the promotion of WUAs to make them more viable and sustainable rural organizations. The rationale suggested for the WUAs in this new strategy is strongly based on their ability to undertake equitable distribution of water and proper maintenance of the watercourses and the distributary canals; resolving of conflicts; promoting better support and cooperation between farmers and officials, and among farmers; and bringing about greater agricultural productivity.

In the review of concepts and strategy of the new WUAs, the consultants advocate the development of a democratic, bottom-up, grass root organizations based on hydrological boundaries with efficient water management initially as the major activity.

The consultants recommend that two alternative models of organization be tried out in the pilot project sites. In the first model, it is suggested that the new WUAs be federated at the distributary canal level once the WUAs at the watercourse level are strong and viable and have demonstrated their ability to take over responsibility. The representatives of the developed organizations at the watercourse level, will form the distributary/minor canal farmer organization. This is basically a learning process approach without a rigid organization structure, but with the flexibility to modify and amend the strategies as necessary. The main goal of this strategy is to establish strong participatory management of the distribution system including both the watercourses and the distributaries, with irrigation engineers and farmers working as partners.

The other model is to start at the distributary canal and watercourse levels simultaneously. After a comprehensive farmer awareness program covering clusters of watercourse commands, the distributary organization is set up with farmer representatives through an election or a selection process. This strategy is suggested taking into consideration the socio-cultural milieu of the Punjab. The rationale is that a strong distributary canal organization can promote the establishment of strong social organization to take control of water distribution and maintenance work in the canal system in a short span of time.

The consultants recommend the setting up of an Institutional Development Unit in an appropriate agency, preferably in the PID, and sub units at district/sub district and project levels with responsibility for the administration, planning, monitoring and evaluation of the new WUAs in the pilot project.

An important component of the strategy is the training and deployment of catalysts, designated as Social Organizers, to promote and facilitate the process of farmer organizations. The pilot project will experiment with different approaches (a) the deployment of farmer volunteers as catalysts and (b) the deployment of educated youth as catalysts.

Emphasis is given in the Report to well planned programs for the training of farmers, representatives of the new WUAs, community leaders, field officers, and middle & senior level officials. If the participatory management approach is to be a meaningful reality both farmers and officials need to be properly trained.

Monitoring and evaluation are other important components of the consultants' recommendations. Process documentation, analysis and feed back are recommended to be introduced in the pilot project area. Project Review Committees need to be organized at the Department, sub district and project levels, to review progress, resolve problems, and to effect better liaison and coordination among the participating agencies.

**GOVERNMENT'S PARTICIPATION IN PEOPLE'S PROGRAMS:
AN INTERMEDIARY ROLE FOR NGOS IN DEVELOPING
VIALE INSTITUTIONS FOR WATER RESOURCES MANAGEMENT**

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**Paper Presented at the Third Annual South Asian NGO Summit,
21-23 February 1995, Kathmandu, Nepal.**

(An Extract)

CONCLUSIONS AND POLICY RECOMMENDATIONS

The water users' ability and willingness (their expressed demand) to share responsibility and power with the government for managing irrigation systems would largely determine the viability of a participatory irrigation management approach. These two attributes are normally fashioned by the extent to which the water users are convinced on the desirability of their entering into a participatory management mode. Thus, as a prerequisite to any change towards participatory management in any given context, its social and economic viability needs to be assessed. A neutral intermediary group, such as an NGO, can be more effective than a government bureaucracy in working with the water users to make these assessments, and if the assessments are positive, to develop appropriate institutional mechanisms and to help internalize the process of participatory management. The requirement of an initial viability assessment implies that no pre-conceived notion or pre-determined model will be imposed on the water users.

This is basically a demand-driven approach, in which the local culture, values, latent capacity and the need for change will be comprehensively articulated. Irrigation management at some appropriate level of the irrigation system will essentially be part of a people's program. The government's main role in this approach will be to primarily facilitate this process.

A government of a developing country will have its unalienable social responsibility for ensuring equitable distribution of resources, poverty alleviation and rural development, regulatory mechanisms, rule adjudication and such other matters involved in strategies towards a balanced

growth. This overall social responsibility forms the basis for a government's facilitating role in the development of viable people's programs. For such efforts to be sustainable, the NGOs can play a valuable catalytic role to secure the government's committed participation in programs essentially planned and implemented on the initiative of the users and their organized groups.

The following main issues are recommended for further discussion and policy attention:

1. In view of less than optimum results from the government-sponsored (and often donor-driven) participatory irrigation management approaches attempted so far, a more effective role can be identified for the NGOs as an intermediary between the government officials and the water users. The effort can be supported by a restructuring of funding portfolios of the governments and the donors.
2. This intermediary role should necessarily include the need to assist the parties concerned, particularly the water users, to initially assess the viability of participatory management on a case by case (or a system by system) basis. The decision to change, the level of management transfer, the structure of participatory mechanisms and other details should depend on the results of this initial viability assessment.
3. The governments' decisions and initiatives to participate in this process should accompany an appropriate agrarian reform package to provide the necessary conditions for nurturing unfettered people-oriented development in the irrigated agriculture sector. This step is essential to reduce the existing dominance-dependence syndrome and other social impediments against genuine people's programs.
4. The peculiar administrative culture in South Asia, which is a derivative of the colonial and pre-colonial bureaucratic dominance, is another impediment to people's initiative in development. Some form of administrative reform will help both the government and the water users in furthering their participatory irrigation management objectives.
5. As the development of viable water users organizations require a long gestation period, participatory irrigation management should not be limited to hasty, and sometimes half-hearted, efforts associated with donor-financed physical infrastructure projects, but should form part of clearly articulated and fully committed national policy linked with an overall social and economic development process.

**INSTITUTIONAL CONDITIONS FOR EFFECTIVE WATER DELIVERY
AND IRRIGATION SCHEDULING IN LARGE GRAVITY SYSTEMS:
EVIDENCE FROM PAKISTAN**

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Abstract

In Pakistan's large canal irrigation systems, the scheduling of water delivery is normally limited to the main system. When this limited operation is not performed well, water flow fluctuations occur in the main system, which are readily transferred to the secondary and tertiary systems. In the older canal commands of the Indus Irrigation System, largely as a consequence of the increasing flow variability, the rigid warabandi water distribution method is no longer functional in apportioning the scarcity of water equally among all the users. The magnitude of this linkage, however, is not yet fully appreciated. The practice of warabandi is becoming increasingly flexible, with the time schedules frequently modified by farmers, apparently on their mutual agreement. This flexibility seems an outcome of complex social dynamics that represent "survival of the influential", with some farmers satisfying their full water requirements at the expense of others, disregarding the equity objective of warabandi. A low institutional accountability in water management often accentuates the inequity in distribution.

In the recently established irrigation systems in northern Pakistan, the farmers respond differently to the lack of institutional accountability. They enjoy the advantage of new design features aimed at increased water allowances, by increasing cropping intensities and changing cropping patterns, or otherwise, over-irrigating crops. This behavior has undermined the design intentions for introducing water delivery scheduling in these systems.

Thus, with both traditional as well as modern system design, there are institutional impediments to the realization of design objectives. Successfully introducing effective water delivery and irrigation scheduling in this context requires a strengthening of accountability, motivation and awareness regarding water use efficiency, and organized collective behavior as a strategy to improve equity.

IIMI'S INITIATIVES ON PARTICIPATORY IRRIGATION MANAGEMENT IN PAKISTAN

A Briefing Note Prepared by
D. J. Bandaragoda and Gaylord V. Skogerboe⁷
for the EDI/MWP Workshop at Burban, Pakistan
1-4 October 1995

INTRODUCTION

In Pakistan, both donor agencies, as well as government policy authorities, are actively considering major institutional changes to achieve performance improvements in the country's irrigated agriculture sector. Serious attention is being given to commercializing irrigated agriculture and encouraging water users' involvement in managing the country's irrigation systems. These policy initiatives are based on Pakistan's considerable experience in planning and implementation of irrigation development projects and some attempts at establishing water users associations at the watercourse level.

However, in Pakistan, as elsewhere among developing countries, not much research has been done on the actual impact of attempted institutional changes on the efficiency, as well as on the equity, in water resources management. More importantly, very little research has been done on the processes that were used in these attempts so that future interventions could be planned for more effective results. With this background, IIMI has responded to recent initiatives by national authorities and the donors regarding participatory irrigation management in Pakistan.

In developing interventions on social organization, IIMI brings the experience it has gained in other countries such as Sri Lanka, Nepal, Philippines and Nigeria, and also the knowledge distilled from others' experiences in countries such as Mexico and Colombia. However, the emphasis of IIMI's approach to establishing pilot projects on participatory irrigation management in Pakistan has been to learn more about the processes involved in establishing effective social organization for managing irrigation systems. IIMI expects that the intensive process documentation that accompanies this effort would benefit the country's policy initiatives in this area. Apart from this emphasis on "learning how to establish effective water users organizations", IIMI also plans to study the impact of pilot projects in terms of their contribution to performance improvement in the irrigated agriculture sector.

This note is meant to provide some information regarding IIMI's recent social organization initiatives and a few proposed activities which are under consideration by the government of Pakistan and the donors.

⁷ Senior Management Specialist and Director, respectively, of the International Irrigation Management Institute (IIMI), 12 KM, Multan Road, Thokar Niaz Baig, Lahore, Pakistan.

ON-GOING ACTIVITIES

1. Three Pilot Projects on Distributary Level Water Users Organizations in the Fordwah Easter Sadiqia Area of the Punjab Province (Financial Support from the Royal Netherlands Government)

This activity is a part of IIMI's study project, "Managing Irrigation for Environmentally Sustainable Agriculture in Pakistan", which was approved on 19 May 1955, but for funding purposes became effective on 1 October 1994. Under this activity, IIMI is associated with three pilot distributary commands in which participatory irrigation management will be attempted.

- (i) As the first site for this pilot trial, IIMI selected Distributary No. 4-R in the Hakra Branch canal system within the Fordwah Eastern Sadiqia (South) - FES(S) irrigation system. One of the reasons for selecting this site is the fact that a number of national research institutes and agencies are working in the same area under the World Bank-funded FES(S) Irrigation and Drainage Project.
- (ii) Prior to starting work in Hakra 4-R Distributary, IIMI undertook a rapid appraisal of the present organizational status in the Hakra 6-R Distributary command area, which was one of Punjab's several sub-projects under the Command Water Management Project (CWMP). The main purpose of this exercise was to train the team of field staff selected for social organization work, and to gain some understanding on the CWMP interventions on forming water users associations. With the background knowledge gained through this work, IIMI intends to use Hakra 6-R Distributary as a second pilot project site for participatory irrigation management. The effort, however, will be with an emphasis on encouraging the operating agencies to take the initiative in organizing water users, and will be launched after reaching some degree of maturity in the interventions at Hakra 4-R Distributary.
- (iii) The third is the Sirajwah Distributary pilot effort in the (World Bank-funded) Fordwah Eastern Sadiqia (South) Irrigation and Drainage Project, Punjab, for which IIMI gives only advisory assistance to the Punjab's On-Farm Water Management Directorate (OFWMD). The "Integrated Irrigated Agriculture Management" component of the FES(S) Project is executed by the OFWMD of Punjab, and as part of this component, the OFWMD is to introduce participatory irrigation management in two pilot distributary commands. For this purpose, OFWMD selected Bhukan and Sirajwah distributaries. The Bhukan distributary has only 8 watercourses, whereas the Sirajwah distributary is typically a large sub-system with over 100 watercourses. IIMI has provided an advisory service to the OFWMD in its planning effort for these pilot trials, but intends to be closely associated with the implementation of this work at the Sirajwah site.

2. Three Pilot Projects on Farmer-Managed Irrigated Agriculture at the Distributary/Minor Level in the LBOD Project Area of the Sindh Province (Financial Support from the Swiss Development Cooperation and the World Bank IDA)

PROPOSED ACTIVITIES

1. An Action Research Program on Social Organization for Improved System Management and Sustainable Irrigated Agriculture in Pakistan's Small Dam Irrigation Systems (Proposal to ODA, UK)

IIMI's National Consultative Committee in Pakistan had strongly recommended that some experimentation of users' involvement in management should first be carried out in the country's small dams, before major policy decisions are taken towards the transfer of management responsibility of large irrigation systems to water users. The opportunity for a proposal for this work came when the Overseas Development Agency, UK, announced its holdback facility for collaborative studies. The proposal under consideration by ODA is an activity to be undertaken in collaboration with the Water Resources Research Institute (WRRI) of Pakistan's National Agricultural Research Centre (NARC) in Islamabad.

The action research program will address the following three inter-related problems: (1) the problems of system management under small dams in Pakistan, which have resulted from a lack of post-construction attention by the provincial agencies, and the related need for active water users organizations to take over the management responsibility; (2) the weakness of the present government-dominated approaches in management transfers to the water users; and (3) the lack of information on impact evaluations related to such management transfers.

The proposed action research will initially explore the usefulness of generating a local interest and demand for taking over the management responsibility for these medium-scale irrigation systems, preferably deploying the services of selected local youth trained as social organizers for this purpose. For the pilot trials, three suitable small dams will be selected in consultation with the Irrigation Department and WRRI.

2. Pilot Project on Social Organization for Crop-Based Irrigation in the Chashma Right Bank Canal (CRBC) Area of the NWFP Province (Proposal to WAPDA and ADB)

This proposal is designed as a follow up of IIMI's initial study on crop-based irrigation operations in the CRBC Stage I, to field test some of the study's main recommendations with the help of operating agencies. The experience gained during the earlier study, which was conducted in two selected distributaries (Distributary No. 3 and Distributary No. 4) in Stage I, suggests that while those responsible for operating different portions of the system have come to appreciate most of the issues related to flexible irrigation operations in the context of CRBC, there is still a long way to go in institutionalizing this learning process into daily operations.

As the geographical and managerial scope of the project enlarges, it requires continued interest in understanding all the water related constraints of a fully developed CRBC system in order to achieve the project's design objectives. The main purpose of IIMI's proposed activities in a second phase is to attempt a consolidation of this process, essentially in collaboration with the water users and all the implementing agencies associated with the CRBC irrigation system.

Expectations for a substantial change from present patterns of behavior within the limited project period was grossly overestimated in the previous study design. A dedicated effort in social organization, persistent over an adequate period of time, seems essential to overcome this constraint. The proposal for a Phase II activity involving the establishment of water users organizations in the two distributaries for improved joint management relationships is under consideration by the NWFP Government and the Asian Development Bank.

3. IIMI-IFPRI Collaborative Research on Institutional Framework for Improved Sustainability and Productivity of Irrigated Agriculture in Pakistan (Proposal to the World Bank)

This activity has been proposed to the World Bank as part of the research to be undertaken under Pakistan's National Drainage Transition Program. The proposed research is basically to explore the appropriateness and feasibility of alternative institutional arrangements to improve the sustainability and productivity of irrigated agriculture in Pakistan, by identifying the physical and social parameters which affect the functioning of key institutions involved in irrigation and drainage management, and the impact of those institutions on the performance of irrigated agriculture.

The proposed research will coincide with the current interest in institutional experimentation and reform in Pakistan. The study will be jointly undertaken by the International Irrigation Management Institute (IIMI), the International Food Research Policy Institute (IFPRI) and national collaborators. The proposed national collaborators will include staff of government agencies [On-Farm Water Management Directorate, Irrigation Departments, and WAPDA Watercourse Monitoring and Evaluation Directorate (WMED)] and some research organizations [Punjab Economics Research Institute (PERI), and University of Agriculture, Faisalabad (UAF)]. The study will be an integral part of IIMI's overall research program and will build on IIMI's project titled *Managing Irrigation for Environmentally Sustainable Agriculture in Pakistan* (components on Water user's Association and Water Allocation within Watercourses), IIMI's on-going research on Water Markets in Pakistan, IFPRI's study of Groundwater Markets in Pakistan, and a review of international experiences on Water Users Organizations.