

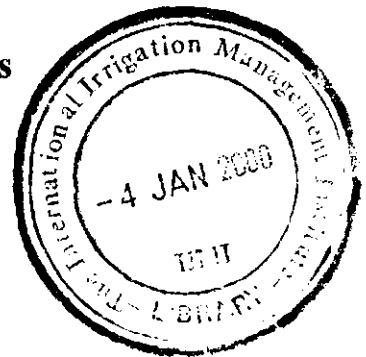
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Irrigation and Drainage Project

Institutional Measures for Improved Management

**Farmers' Participation, Empowerment and
the Institutional Reform of Pakistan's
Irrigation and Drainage Sector:
Key Concepts and Farmers' Perceptions**

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ABSTRACT

In this study the state of crisis in the irrigation sector of Pakistan and the need for institutional reform are reviewed. It discusses the implications of the key concepts of participation, empowerment, accountability, transparency, equity and capacity, and presents the results of a survey on farmers' perceptions of their experience with the reform process.

During the 1990s a deepening crisis became evident in the irrigation and drainage sector of Pakistan. Ineffective management of the irrigation system, financial non-sustainability and inequitable distribution of water resources increasingly threaten the viability of irrigated agriculture. To improve the performance of the system, the sector is undergoing a comprehensive institutional reform. The reformed legal framework envisions farmers' participation and empowerment to increase accountability, transparency and equity.

The Provincial Irrigation and Drainage Authority Acts of 1997 mandate the representation of farmers in Area Water Boards (AWB) managing irrigation at the primary system level and in the Provincial Irrigation and Drainage Authorities (PIDA) (Government of Punjab, 1997; Government of Sindh, 1997). Farmer representatives will, thus, participate in planning and decision making processes, and in the 'control and guidance' of the PIDA's Board of Management and the director and staff of AWBs. Farmers' participation will be most comprehensive at the distributaries and minors of the irrigation system. The PIDA Acts and their subsidiary regulatory framework stipulate irrigation management transfer to farmer organizations (FO) at the secondary system level.

The study argues that the effective empowerment of farmers requires adequate organizational and financial autonomy, commensurate with the tasks and responsibilities of a financially self-sufficient organization. Relations between FOs and service providers need to be based on contractual service agreements and transparent information flow to ensure mutual accountability. Democratic representation and an active interface between leaders and their grassroots constituency can achieve internal accountability among the FOs' membership. Equity in the distribution of irrigation supplies, mandated by the emerging legal framework for the reformed institutions, is a crucial objective of the reform and a key functional parameter of system operation. It requires both, the capacity of FOs to enforce user discipline and a normative commitment from farmers and irrigation managers. Farmers need to be trained and gain practical experience in the multiple and diverse tasks and responsibilities of irrigation management at the distributary level. Empowerment is an essential condition for effective capacity building. The failure to turn over management responsibilities at the distributary level to organized farmers within a reasonable period of time after FO establishment can frustrate farmers' expectations and confidence.

A survey, querying qualitative and quantitative information, was carried out among a quota sample of 143 water users at the grassroots and leadership levels of three farmer organizations at the Hakra 4-R, Sirajwah and Bhukan distributaries, located in the Fordwah Eastern Sadiqia (South) Project area of southeastern Punjab.

The survey results indicate that within the FOs a democratic governance structure with an active, informed, trained and educated, as well as self-confident and representative leadership has emerged. Although at the leadership level the organizational structures for farmers' participation have been firmly established, the leadership has become dependent on the social organizers and their logistic support, raising doubts about the FOs' sustainability.

Meanwhile, the grassroots membership at the watercourse level has remained inactive, uninformed and disinterested in participatory irrigation management. In particular, the information flow between the leadership and the community of irrigators is insufficiently organized, causing ignorance at the

grassroots level about the irrigation management transfer process. Inadequate grassroots mobilization by the FOs and their social organizers, apathy and insufficient information undermine internal transparency and accountability mechanisms.

The continued delay of management transfer from the Irrigation Department to the farmer organizations threatens the viability of the FOs. The capacities built in the social organization process cannot be practiced. The equitable distribution of irrigation water and control of irrigation offenses cannot be enforced. Distrust and suspicion mar the relationship between the farmers and irrigation personnel. These key stakeholders were unable to forge an agreement on the experimental transfer of irrigation management by means of a memorandum of understanding. Without substantive empowerment the pilot FOs and their facilitators are unable to test the viability of the reform strategies. Therefore, the ongoing process of formulation of a legal framework is not informed by practical experience. As empowerment remains uncertain, the farmer organizations are threatened by a lack of purpose.

The study makes the following recommendations to increase the functional capacity of the farmer organizations and to promote the process of reform implementation:

1. Motivate the leadership to organize regular joint meetings and capacity building activities at the grassroots level, as well as to produce FO newsletters, to activate the leadership / grassroots interface;
2. Design and implement a 'weaning process', to enable the FOs to manage their activities independently, without prolonged reliance on the initiative of social organizers;
3. Promote the participation of small farmers in the FO leadership to avoid the under-representation of this group;
4. Make provisions for experimental management transfer to FOs to enable the actual pilot-testing of the reform strategy;
5. Revise the strategy for financing irrigation system management to overcome the impasse in the current discussion about the distribution of *abiana*;
6. Revise the PIDA Acts, to generate an unambiguous legal basis for the empowerment of autonomous service providers;
7. Target farmers and irrigation personnel simultaneously in social organization projects to forge a viable partnership;
8. Carry out a detailed study of the causes for resistance to the implementation of the institutional reform among various stakeholders; and
9. Mobilize a public debate on the institutional reform of the irrigation sector to promote public understanding and acceptance.

1 INTRODUCTION

The irrigation and drainage sector in Pakistan is neither cost-effective, nor well managed. Therefore, it is undergoing a comprehensive institutional reform. Participatory irrigation management is an essential component. Several pilot-projects are underway to test the viability of farmers' organizations and their capacity to operate and maintain the secondary and tertiary levels of the irrigation system. During the past four years, the Pakistan Program of the International Water Management Institute (IWMI) has undertaken action research on the social organization of water users in the Punjab and Sindh Provinces. The objectives of the research are to facilitate organizational development and the transfer of powers and responsibilities in distributary management to organized farmers, and to assess their capacity for sustained collective action. The On-Farm Water Management Program (OFWM) of the Department of Agriculture has also organized water users at the distributary level of the irrigation system to promote irrigation management transfer (IMT)¹ to farmer organizations.

In Section 2 of this report we review some of the reasons for and objectives of the reform initiative, and several key concepts informing the farmers' participation strategy. Section 3 presents and discusses the results of a survey of farmers' perceptions of the process of experimental reform implementation through social organization of farmers at three distributaries located in the area of the Fordwah Eastern Sadiqia (South) (FESS) Irrigation and Drainage Project in southeastern Punjab. Finally, based on the research findings, we assess the current state of the reform process at the distributary level and provide recommendations.

¹ It is usually assumed that IMT refers to a complete turnover of the irrigation system to water users, while participatory irrigation management is considered to be some (to be specified) form of joined management between water users and Irrigation Department personnel. In Pakistan, the concept of participatory management has greater appeal to the latter, as they seek to retain control over the irrigation system. I use the term IMT for what may be expected to happen at the distributary level, where the emerging legal framework envisions the turnover of powers and responsibilities for irrigation management to organized farmers. At the higher system levels, i.e. the canal commands, management will be participatory, as farmers would be represented in Area Water Boards and Provincial Irrigation and Drainage Authorities, alongside irrigation personnel and government actors.

2 INSTITUTIONAL REFORM OF THE IRRIGATION AND DRAINAGE SECTOR

During the 1990s a deepening crisis became evident in the irrigation and drainage sector of Pakistan. Ineffective management of the irrigation system, financial non-sustainability and inequitable distribution of water resources increasingly threaten the viability of irrigated agriculture. To improve the performance of the system, the sector is undergoing a comprehensive institutional reform. The reformed legal framework envisions farmers' participation and empowerment to increase accountability, transparency and equity.

2.1 CRISIS

In its seminal 1994 report 'Pakistan Irrigation and Drainage: Issues and Options', the World Bank notes that the expenditure for operation and maintenance (O&M) (excluding public tubewells in fresh groundwater areas and surface drains) fell short of funding requirements by 29.1 and 24.2 percent in the financial years of 1991 and 1992, respectively. Recoveries of O&M expenditure fell short by 44.4 percent in the financial year of 1992. If SCARP tubewells in fresh water areas are included, the cost recovery rate of O&M expenditure was estimated to be less than 30 percent, and less than 20 percent in the drainage sector taken by itself. By 1994-95 the gap between O&M expenditures and recoveries in the Punjab Province was 62 percent and rose to 74 percent in 1995-96. In the Sindh Province, this gap was 89 percent in 1994-95 and 88 percent in 1995-96 (World Bank, 1994; 1997).

In addition to insufficient funding and the need for large subsidies, the report identifies the following interactive causes of the deterioration of the performance and infrastructure of Pakistan's irrigation systems (World Bank, 1994): low delivery efficiencies and the inequitable distribution of irrigation supplies, supply based water deliveries, waterlogging and salinity, overexploitation of groundwater, under-pricing of water and concomitant rent-seeking, as well as a declining performance by irrigation personnel.

The World Bank, the Asian Development Bank and the Government of Japan seek to promote institutional reforms that aim at transforming the present state-sector management organizations in Pakistan's four provinces into autonomous authorities and utilities. These autonomous bodies would act as service providers at the provincial and canal command levels, respectively, while farmer organizations (FO) would manage operations and maintenance at the distributary and watercourse levels. The reformers expect that, in the long run, the new institutional structure and farmers' participation at all system levels would increase the stakeholders' accountability and, thereby, reverse the adverse trends indicated above. To motivate the stakeholders, the disbursement of new loans for the physical rehabilitation of the system is tied to the establishment of a new institutional structure and the participation of farmers.

Consequently, the Provincial Irrigation and Drainage Authority (PIDA) Acts in 1997 were enacted in the four provinces. These mandate the transformation of Irrigation Departments into PIDAs, the establishment of Area Water Boards (AWBs) at pilot sites in selected canal commands, and the establishment of farmer organizations (FOs) at distributaries (Government of Punjab, 1997; Government of Sindh, 1997; Nakashima, 1998). The pilot testing of AWBs has recently been initiated. OFWM and IWMI facilitated the social organization of FOs at various canal commands since 1994.

2.2 FARMERS' PARTICIPATION

Farmers' participation is a central component of the reformed institutional structure in the irrigation sector of Pakistan. The PIDA Acts mandate the representation of farmers in AWBs and PIDAs

(Government of Punjab, 1997; Government of Sindh, 1997). Farmer representatives will, thus, participate in planning and decision making processes, and in the 'control and guidance' of the PIDA's Board of Management and the Director and staff of AWBs. Farmers' participation will be most comprehensive at the distributaries and minors of the irrigation system. The PIDA Acts and their subsidiary regulatory framework stipulate irrigation management transfer to FOs. Farmer management at the watercourse level has been a common practice for some time. The Canal and Drainage Act of 1873 provides for the management of the distribution of irrigation supplies at a watercourse by the users (irrigators) through the *warabandi* (rotation) system. The On-Farm Water Management and Water Users Association Ordinance of 1981 sanctions the operation and maintenance of watercourses by water user associations (WUA).

The donors and policy makers in Pakistan expect that by taking on responsibilities for the O&M of the distributaries, farmers would lower the cost of system management, improve cost recovery as well as the performance of the system, and achieve equity in the distribution of irrigation water. The World Bank views farmer organizations as 'an effective means of organizing farm labor', a 'counterbalance to the monopoly of public utilities', a mechanism to 'bring user discipline to water distribution' and a link in the institutional structure of irrigation and drainage which, would generate increased accountability among stakeholders (World Bank, 1994). Farmer-managed irrigation systems are globally recognized for their cost-effectiveness and perform better than government-controlled systems (World Bank, 1994; Merrey, 1996; Tang, 1992; Benjamin et al, 1994; FAO, 1982; Yoder, 1994). In Pakistan, farmers' participation will provide the end-users of irrigation delivery services with access to institutional representation, from which they have been excluded so far. It is hoped that their inclusion will achieve the objective of improved system performance.

Perry (1995) argues that under any form of irrigation management unambiguous water rights, a functional infrastructure to deliver services and clearly defined and assigned responsibilities are the essential determinants of successful system performance. Merrey (1996) contends that the definition of equitable water rights, effective operation and maintenance of infrastructures and the implementation of organizational arrangements need to be embedded in an appropriate institutional framework. In particular, in systems seeking to implement farmers' participation, the relations of autonomy and dependence between farmers, irrigation personnel and the government, i.e. their relations of power, must be designed in such a way, so as not to hinder the FOs' capacity to discharge the responsibilities assigned to them through participatory irrigation management. In other words, the powers assumed by farmers and the degree of autonomy of their organizations should match their responsibilities. Without changes in their power relations, "joint management as currently practiced is often business as usual with cosmetic changes" (Merrey, 1996:2). Merrey suggests that accountability is the pivotal issue, and institutions must be structured, in combination with the tasks assigned, so that government officials, irrigation personnel and farmers achieve mutual accountability.

Consequently, the stakeholders involved in the implementation of institutional reform need a clear understanding of several key concepts in participatory irrigation management. Farmers' participation inevitably confronts them with issues of empowerment, accountability, transparency, equity and capacity. Although used widely in the contemporary reform discourse, the meaning and implications of these concepts often remain vague. In the remainder of this section, we will discuss these key issues, with reference to the emerging legal framework for irrigation management in Pakistan.

2.3 EMPOWERMENT

Empowerment means an increase in the power which an actor or a group commands. Anthony Giddens (1979:6, 88-94) has defined 'power relations in social systems as regularized relations of autonomy and dependence'. This approach emphasizes that power is always about relationships

between social actors who routinely seek to motivate the other to comply with their wants. In any institutional setting, relationships between stakeholders are interdependent, with varying degrees of dependence. Some may be more autonomous or independent in their ability to decide and act. Differences in autonomy and dependence are the result of actors' stratified control over resources. Resources may be economic, legal, cultural, ideological and social. The more resources a group controls, the more dominant it is and the more it can use its resources to its strategic advantage.

The pre-reform institutional power relations in the irrigation and drainage sector of Pakistan favor irrigation personnel over farmers. The formal rules stipulated in the Irrigation and Drainage Act of 1873, as well as in operational manuals and procedures, vest extensive powers in irrigation officers to control the irrigation infrastructure, its management system and financial resources. For example, the act permits Divisional Canal Officers to investigate irrigation offenses, to arrest offenders and to negatively sanction offenses with punishments, including fines and imprisonment. Sanctions to reward or punish behavior are fundamental resources in power relations. In addition, their authority and expertise afford irrigation officers a high status position as compared to the majority of farmers. Farmers, on the other hand, seek to employ illicit resources such as bribes and political influence to counteract the powers of irrigation personnel. Farmers lacking such resources have to resort to appeals and complaints to irrigation officers. On balance, farmers experience a relatively higher degree of dependence on the providers of irrigation services and limited leverage to exert control over the behavior and performance of the former, as well as their fellow irrigators.

The institutional reform of the irrigation sector proposes to shift the relations of autonomy and dependence in favor of farmers, providing them some degree of control over the management of farmer organizations and the local irrigation infrastructure, as well as representation in higher level management organizations. The degree of autonomy to be granted to farmers is subject to considerable controversy and negotiation at this stage of the reform process. In the Sindh and Punjab Provinces it has matured to the point of drafting rules and regulations for AWBs and FOs, as well as bylaws for FOs. Before the enactment of a complete legal framework, a complex review process by several government departments, in particular law and finance, and the detailed operationalization of actual irrigation management transfer needs to be accomplished. The allocation of authority over the control of financial resources and the assessment and collection of irrigation service fees are among the most controversial issues.

The draft Rules for FOs in the Punjab and the Regulations for AWBs, FOs and WCAs in Sindh (PIDA, 1999; Government of Sindh, 1999) would empower FOs to manage, operate and maintain the irrigation infrastructure under their jurisdiction. They will be authorized to enter into contracts and to receive funds for this purpose, to assess and collect irrigation fees, to receive irrigation water from AWBs or PIDAs and distribute it among its members. The FOs will be entitled to employ personnel, own property and resolve disputes through FO-internal water courts or committees. The Sindh draft regulations would explicitly empower the FOs to collect and retain irrigation service and drainage fees in its funds. An agreed pro-rata share of O&M costs would be remitted periodically to the supplying utility or authority. This relatively high degree of financial autonomy forces FOs to become fully responsible for providing irrigation services to their members, while maintaining financial self-sufficiency. The Punjab draft rules omit the stipulation of authority over financial resources and have left this all-important issue open to be eventually regulated by the PIDA. This reflects continued disagreement among the stakeholders in the Punjab about the allocation and management of financial resources. In addition to the regulatory powers of the AWBs and the PIDAs over FOs, the Punjab FO Rules (Section 11(a)) specify that the PIDA 'may give such directions to the Farmer Organizations which it may deem appropriate in the public interest' (PIDA, 1999). Failure to follow these directions may result in suspension of the registration of a FO. On the other hand, the Punjab draft rules entitle the FOs to exercise the powers of a divisional and subordinate canal officers under the 1873 Canal and Drainage Act (Section 15 (2)).

The provisions in Sindh would create a higher level of financial autonomy relative to the AWBs and SIDA and place the relationship of the stakeholders on a firm contractual basis. The rules for the Punjab weaken the organizational and financial autonomy of the organized irrigators. Transactions of financial resources for irrigation supplies and other activities would continue to be regulated administratively, rather than through contracts. The transfer of the powers of canal officers strengthens the FOs' sanctioning powers and therefore emphasizes the interest in FO-internal enforcement of user discipline. If FOs lack clear financial or organizational autonomy, they will be treated as a replacement of the irrigation personnel at the distributary level and remain dependent on the hierarchical command structure of the AWBs and PIDAs.

Power and participation are closely linked, as the right or entitlement to participate in discussions and decision-making processes at the policy and management levels, as well as the entitlement to implement the decisions and enjoy the rewards of the actions implemented are a crucial aspect of power relations (Starkloff, 1996). At the FO level, participation in these processes is ensured through the internal representative structure. The draft rules in the Punjab stipulate that irrigators at each watercourse of a distributary delegate one representative to the general body of the FO, which in turn would elect its management committee of office bearers. In the Sindh, the regulations establish a direct link between watercourse associations (WCA) and FOs, as the former constitute the members of the latter, and are represented in the FOs' general body by WCA representatives elected according to the internal bylaws of the FO/WCAs. Annual general meetings and monthly management committee meetings ensure that those elected representatives and general members have access to discussions, decisions and implementation processes. Meetings and elections constitute prime means in the empowerment of farmers.

The extent of formal power and participation of farmers at the AWB and PIDA levels varies considerably between the provinces. The Punjab PIDA Act guarantees parity between farmer and non-farmer representatives on the PIDA Board and the AWBs, while on the SIDA Board and Sindh AWBs they remain a minority. It also makes a significant difference whether these representatives are elected by a constituency or selected by government administrators or politicians. As there are to date no registered and only few unregistered FOs in both provinces, the PIDA and AWB farmer representatives are currently appointed by the government upon recommendation of irrigation personnel.

2.4 ACCOUNTABILITY AND TRANSPARENCY

Accountability implies that an actor or group of actors must justify their decisions and courses of action before a legitimate authority or body. A right to examine and evaluate actions may be established by formal rules and regulations and/or through contracts, as well as through custom or informal agreements. Accountability involves control mechanisms by which actions are kept within agreed and socially approved boundaries. In Paul van Hofwegen's words:

It is the act of holding a person or organization liable for performing those activities for which he or she has been delegated the necessary authority and responsibility either by superiors, investors or clients. (Hofwegen, 1996:223)

Merrey (1996) notes that in centralized bureaucratic irrigation systems, accountability is typically oriented upwards towards superiors and the political level, but fails to be mutual. In an institutional arrangement of interlocking, but autonomous management organizations, mutual accountability between providers and clients / end-users of services needs to be designed within the structure of authority established between the stakeholders. According to Hofwegen, this involves service agreements, which determine the rights and responsibilities of the parties involved in transactions, as well as the procedures to be followed in the case of non-fulfillment of obligations. Abernethy (1998) points out the need for stipulating corrective actions for non-compliance or failure to deliver mutually agreed performance. These include compensation for damages, penalties and

modifications in operating rules and procedures. Importantly, he adds the need for positive sanctioning, i.e. rewards for good service.

Transparency is of fundamental importance for institutionalized accountability. Stakeholders need free access to relevant information, so that they can judge the appropriateness and legitimacy of decisions and actions. In Abernethy's words:

We say that an organization has transparency (sic) if it is easy for any stakeholder (that means any person who is affected by the organization's actions) to find out information about its activities and performance. (Abernethy, 1998:85)

Therefore, transparency involves a 'right to know'. For accountability mechanisms to function, planning, discussion and decision-making processes need to be recorded in minutes of meetings. Operational activities should be persistently recorded in ledgers, including the measurement of irrigation supplies distributed within a system, and the financial income and expenditure, i.e. the flow and distribution of money. To maintain transparency, foster equity and control free riders, the farmers need to know what level of financial and labor contributions the FO membership has made and what benefits are received in turn. Periodic reports are to be submitted to general assemblies, management committees or executive bodies, as well as a regulatory oversight agency, for their approval. Furthermore, routine and incidental monitoring, as well as scientific research play a significant role in ensuring transparency and enabling accountability in institutional relations and activities.

Accountability mechanisms need to ensure the monitoring and control of planning and decision making processes, and the operation of service systems. It requires the mutual approval of proposals and plans by clients' and agencies' representatives. Thus, an AWB or a PIDA may approve a proposed scheme for the establishment of a FO, the allocation of funds for rehabilitation works or a regulatory framework. The participation of farmers, irrigation personnel and government representatives and their dependence on joint decisions strengthen mutual accountability.

To promote mutual accountability, organizational and financial autonomy and contractual arrangements between stakeholders are essential. Yet, contractual arrangements continue to maintain uneven power relations between FOs and higher level bodies, even if they establish the fees-for-service principle. While FOs can withhold payment of the pro-rata share to an AWB in case of unsatisfactory services, they do not have the opportunity to enter into a different contract with an alternative service provider. The monopoly of the public utilities is only attenuated by farmers' representation. Therefore, dispute resolution mechanisms, such as the irrigation tribunal at the AWBs, and the appellate irrigation tribunals at the PIDA in the Punjab, provide other mechanisms for mutual accountability between farmers and service providers.

Mechanisms of accountability need not only to be established between groups of stakeholders, but also within each group. For FOs this implies that elected representatives are accountable to their constituencies, as they are controlled through elections and impeachment procedures. Office bearers of management committees are accountable to general bodies, and staff is accountable to management committees, often mediated by a chief executive officer. The charter of authority (rules and by-laws) usually stipulates these mechanisms, including sanctioning and dispute resolution. Intra-organizational accountability, coupled with means of sanctioning, must enforce rule-bound behavior among the FOs' membership. Given the differentiation of wealth, statuses, political influence and power among farmers, keeping a check on the capacity of so-called 'influentials' to abuse their resource endowments for unfair advantages is essential for the effective functioning of a service organization.

In addition to accountability based on representative democracy and internal sanctioning power, internal conflict resolution mechanisms are imperative. The Punjab and Sindh legal framework envision the establishment of FO water courts and conflict resolution committees, respectively.

Keeping conflict resolution at local levels would improve the efficiency of the system. In cases where decisions on conflicts cannot be reached, AWB and PIDA level tribunals and committees can be involved.

Mollinga (1998) argues that accountability is fundamentally dependent on stakeholders' adherence to a 'normative commitment to rationality'; i.e. they need to be reasonable. The parties involved in a service agreement would refrain from violence and force in the pursuit of their interests. Rather, they would interact constructively by listening to and taking seriously each other's arguments. They would seek to balance their interests on the basis of negotiations and compromise.

All of these institutional processes and arrangements are subject to the scrutiny of regulatory bodies which seek to ensure that activities are in conformity with the norms and rules designed to meet the service system's objectives. The new institutional arrangements in Pakistan's irrigation sector assign the task of regulating FOs to the AWBs, while the PIDAs regulate AWBs. Finally, all of these come under the regulatory authority of the government. These proposed arrangements confound regulatory functions and service relationships within the institutional hierarchy. The autonomy of the individual organizations is, therefore, limited. FOs will depend on higher level service providers, if they seek the resolution of conflicts over the provision of services. A clear organizational division between regulatory and service functions would be preferable, to avoid conflict and operational inefficiency.

Transparency and accountability not only depend on formalized accountability mechanisms, but also require persistent informal interactions and discourses by which information is circulated, opinions are formed, decisions are prepared and actions are judged. Stakeholders, who are mutually accountable to each other, need to recognize the value of dialogues and negotiations in which courses of action can be aligned and compromises found. Participation then means that such informal exchanges are sought and sustained by all relevant parties.

2.5 EQUITY

Equity in the distribution of irrigation supplies is one of the fundamental objectives of institutional action, as well as a prime functional parameter. The emerging legal framework for institutional reform mandates equity as a salient objective of the new management organizations. The SIDA Act commits the authority to 'equitable distribution of irrigation water ... through participation of beneficiaries' (Government of Sindh, 1997). The 'obligation to ensure equity' is reiterated in the draft regulations for AWBs (Government of Sindh, 1999). The PIDA Act, on the other hand, does not mention equity as one of the authority's duties or objectives. Its preamble stresses 'more responsive, efficient and transparent arrangements, to achieve economical and effective operation and maintenance...' (Government of Punjab, 1997). The draft rules for farmer organizations, however, clearly mandate that FOs 'supply the irrigation water equitably and efficiently to the farmers' (Government of Punjab, 1999).

The principle of equity establishes a normative, i.e. value-based, prescription in irrigation management in Pakistan. It seeks to achieve relative fairness in a system of otherwise unequal distribution of wealth. While it does not question the legitimacy of the given pattern of land distribution, it accords to each farmer the same quantity of water per acre of land owned. Svendsen and Small (1990) term 'per hectare equality of water deliveries' the simplest equity standard. Accordingly, each lower sub-system in the systemic hierarchy (watercourse, distributary, branch canal, canal, province) would receive from the higher level system a specific quantity of the total available water supply in proportion to its command area, based on the simple equity principle. Equity requires that water scarcity be shared within the entire Indus Basin Irrigation System.

The simple standard of equity is modified by various intervening variables, such as channel losses or the crop evaporation requirements of the crops typical for certain agro-climatic zones. The latter

is expressed in the concept of water allowance, which stipulates for each command a specific quantity per 1000 acres. Thus, water allowances in Pakistan typically range from 2.84 to 10.00 cusecs per 1000 acres for the major perennial canals in Pakistan (Bandaragoda and Rehman, 1995).

Nevertheless, conventionally equity at the secondary and tertiary level of the system is defined as a more or less fixed proportion between the discharge at the distributary head and the discharges to each watercourse. Fluctuations of +/-10 percent around a design value are considered adequate (Bhutta and Vander Velde, 1993).

At the watercourse and field levels the simple equity standard may, however, be difficult to attain, because of the specific conditions of flow in the channel and in fields. Despite regulation by a *warabandi*, which allocates turns for certain periods of time to individual irrigators, variant conditions of the soil and slope in a field may lead to deviations from the equity standard. Unequal power relations between water users at a watercourse may also skew the intended *warabandi* pattern. Bandaragoda and Rehman (1995) observe that 'influentials' may frequently impose an inequitable distribution of supplies, while adversely affected farmers often remain reluctant to complain to the authorities. Moreover, farmers seek to handle distribution patterns flexibly, in order to accommodate irrigation needs arising from individual cropping patterns and intensities. Therefore, the 'actual' *warabandi* can deviate considerably from the farmer-organized *kacha* or government-regulated *pakka warabandi*.

Furthermore, equity may be complicated by considerations of conjunctive water management, as quantitative and qualitative groundwater endowments affect the actual local water availability. The current and the reform institutions do not yet address this issue.

As a functional parameter, the principle of equity seeks to ensure a system close to steady flow. By focussing operations on monitoring of fluctuations in total water availability and coordinated responses to such fluctuations, equity contributes to raising the efficiency of system management. Under extreme scarcity conditions, rotation of irrigation supplies needs to be practiced to ensure reductions of water supplies within a reliable temporal pattern on all of the distributaries of a canal command. As Renault and Vehmeyer (1999) point out, reliability is of high value to farmers who need to make 'strategic and tactical choices for the cropping pattern, the quantity of inputs, etc.'. The authors define variability and predictability as key indicators for reliability. Thus, as long as variations in flow patterns remain predictable and are equitably passed on to or shared between users, a system remains reliable.

In addition, equity ensures that over- and under-irrigation in different reaches of subsystems, which may lead to waterlogging, salinization and diminished crop yields, are avoided. By motivating farmers to adopt more productive irrigation and agricultural practices, equity can promote efficient utilization of water, according to the 'more crop per drop' principle.

Achieving equity is fundamentally dependent on the availability of information about actual water distribution patterns within the entire system and the capacity of stakeholders to sanction deviation from approved and recognized patterns. It also requires that aggrieved parties have open access to mechanisms of complaint and redress, such as water courts and tribunals. The emerging legal framework does provide many important structural elements to make participation and empowerment, accountability and transparency, as well as equity a real possibility. Yet, structural opportunities for positive change do not guarantee its sincere implementation. For the legal framework to be applied in practice, a normative commitment among all stakeholders is essential. As Max Weber (1958) has pointed out, for laws to be effective, they need to be rooted in a shared belief in their validity. Legal stipulations are a necessary condition of successful implementation of accountable irrigation management, but not sufficient by themselves. The law may break down in

In a system, which practices protective irrigation to equitably share scarcity, several constraints on equity are experienced. The conditions of availability of surface water resources confine each irrigator to a design cropping intensity far below land potential, typically at 70-80 percent for two cropping cycles (e.g. 50% *khariif*, 30% *rabi*). Conditions such as population growth, the increasing cost of living and the rising expectations of landowners motivate them to achieve cropping intensities as close as possible to 200 percent. Consequently, farmers and irrigation personnel have an incentive to trade additional illegal water supplies through hidden water markets.

The illicit sale of additional water supplies to individual subsystems at the expense of others disorganizes the irrigation system and leads to inefficient use of water, environmental and systems degradation and deprivation of disadvantaged irrigators. It lowers productivity and diverts scarce financial resources from system maintenance and improvement to private consumption. Widespread irrigation offenses jeopardize the long-term technical, ecological and economic survival of Pakistan's irrigation system and, thereby, threaten the food security of its growing population.

2.6 CAPACITY

Farmers' participation and empowerment does not only entail the right to do things, it also incurs the responsibility to do things right. Empowerment involves both, a belief in the validity of rules and in the functional competence of those who apply them. Organized farmers need to have the capacity to engage in organized collective action; to participate in discussions, decisions and their implementation; to competently undertake all the essential tasks involved in irrigation management; and to assimilate the necessary value system and beliefs underpinning an equitable and efficient irrigation system. Thus, knowledge, skill and rule-acceptance are essential components of empowerment. Capacity empowers. Yet, the capacity to be a competent and rule-bound actor cannot be acquired ad hoc. It demands from all stakeholders a prolonged and patient process of learning and socialization, including the unlearning of habits, behaviors and dependencies of a culture of disorganized irrigation management.

The tasks of farmer organizations will be multiple and diverse. The following may be identified among the key tasks (based on Yoder, 1994; Bandaragoda and Memon, 1997; Zaman and Hamid, 1998; Zaman, Hamid et al., 1998; Starkloff, Upadhyay et al., 1999). Farmers need to establish and manage their organization, including its structures, roles and responsibilities. They need to select representatives who hold meetings, deliberate and make decisions. An internal system of rules needs to be established and enforced with sanctions. The FO needs to be formally registered to act as a corporate body. Organized farmers need to ensure adequate internal information flow through formal and informal channels of communication. They also need to monitor their activities, both through internal mechanisms and outside monitors. They need to hire and supervise staff. An annual business plan has to be designed, discussed and approved. Among the operation tasks are the capture of irrigation supplies at the head regulator of the distributary on the basis of a service agreement with an AWB; the allocation and distribution of those supplies among watercourses and individual irrigators; the measurement of the actual flow of irrigation water in the system; as well as the management of groundwater levels and drainage facilities. Maintenance tasks include the planning and execution of activities such as desilting, weeding and repairs of the irrigation and drainage infrastructure. The FOs will have to manage resource mobilization activities, including the assessment and collection of irrigation, drainage and other related service fees, and the mobilization of labor and equipment. Appropriate fee levels and O&M costs need to be negotiated and decided upon. A mechanism for the development of financial reserves needs to be put in place. A detailed and accurate procedure of accounting and record keeping needs to be followed. Mechanisms of conflict management need to be established and utilized. Training activities for improved irrigation management practices from the head regulator to the field level need to be organized. Support services from government agencies, public utilities and NGOs need to be mobilized by FO personnel and representatives. Persistent communication with other stakeholders in the irrigation

sector has to be ensured at local and higher levels. In addition, FOs may need to manage non-irrigation assets, should have an emergency plan for natural and other disasters, and need to develop a vision and strategy for future development. While some of these tasks may be delegated to hired personnel at the rank of beldar to sub-engineer or sub-divisional officer, many will remain with the farmer representatives and the grassroots membership. Effective control of staff will require a basic knowledge of all the management tasks. Effective organizational management can emerge only from adequate training and continuous experience.

The long and far from exhaustive list indicates the need for building the capacity of water users. The social organization process strives to develop these capabilities among irrigators with the long-term goal of establishing a self-sustaining irrigation and drainage management organization at the water users level. It is necessary to consider the fact that the assumption of responsibility for these tasks by farmers is an added burden. Therefore, it is not surprising that many farmers in IWMI's pilot sites are quite aware that they are now expected to directly finance and undertake tasks, which government personnel have failed to deal with (Starkloff, Bandaragoda et al., 1999). Nevertheless, the promise of improved irrigation services, thus far, sustains their interest in and preparedness for participatory irrigation management. However, they do expect that they will be empowered with sufficient rights to control the material and human resources needed to undertake their new tasks.

The organization building process developed by IWMI aims at inculcating the value of equity and generating organizational capacity. The capacity building process involves training in organizational and financial management, distributary operation and maintenance, and on-farm irrigation practices. To promote awareness of and commitment to equity in water distribution, persistent flow measurements at the distributary's head regulator and hydraulic subsections (head, middle and tail), as well as at the watercourses are taken, and outlets are measured and re-calibrated. Maintenance needs are assessed and campaigns carried out. Communication with government agencies, the Irrigation Departments in particular, is facilitated.

To sustain these capacities and a purpose for FO activities, farmers need to be empowered. Empowerment may accordingly be understood as the transfer of a combination of rights. The organized water users require a right to the use of the physical irrigation infrastructure within a recognized jurisdiction (distributary command area). They need the right to operate and maintain this infrastructure and employ their own labor force for this purpose. They require clearly defined water rights and the right to enforce these. They need the right to manage and control their financial transactions. They need the right to participate in internal decision-making processes, as well as in those external decision-making processes, which affect their subsystem. As we have shown, the emerging legal framework provides many of these rights to a certain degree, but may stop short of granting sufficient autonomy to enable farmers' organizational capacity.

Following Merrey (1996), the meaning of empowerment may be brought into focus through the concepts of organizational and financial autonomy. Within a broad regulatory framework, farmer organizations need a sufficient degree of autonomy in managing their organizations, assets, tasks and finances, so that they can enter into service agreements as described by Hofwegen. Only then can stakeholders hold each other accountable and ensure that mutual commitments are honored. If both, finances and internal governance are controlled too tightly by governmental and/or PIDA actors, farmers' dependency will be maintained. There is a clear danger that organized farmers will perceive themselves as a labor force, which is also made to pay. This would undermine their motivation and capacity to undertake the tasks of local irrigation management. Furthermore, the failure to turn over management responsibilities at the distributary level to organized farmers within a reasonable period of time after FO establishment can frustrate farmers' expectations and confidence.

3 FARMERS' PERCEPTIONS SURVEY

To assess the farmers' experience of the ongoing reform process, IWMI Pakistan carried out a survey in the FESS area among three FOs, organized by IWMI and OFWM. The survey probes, how farmers at the leadership and grassroots levels of the pilot FOs perceived their organizational capacity to realize participation, empowerment, accountability, transparency and equity. The survey intends to assess the viability of the social organization methods adopted and to identify FO-internal as well as external constraints to reform implementation at the distributary level. The results were expected to yield actionable recommendations and to promote a learning process among farmers, social organizers and other stakeholders, on whom the successful implementation of the institutional reform depends.

In this section, we will first introduce the study sites, outline IWMI's social organization methodology and describe the representative structures, which emerged with the establishment of farmer organizations. Thereafter, the research methods are introduced and the findings of the survey presented and discussed.

3.1 STUDY SITES

The Fordwah Eastern Sadiqia South (FESS) Irrigation and Drainage Project has implemented large-scale improvement works at the secondary and tertiary system levels since 1994, to ensure water supply to the tail reaches of irrigation channels and reduce channel losses of irrigation water. It has, furthermore, involved the construction of surface and interceptor drains to decrease waterlogging and salinity (WAPDA, 1994).

The project area is located in the southeastern Punjab within the Fordwah Eastern Sadiqia Canal System and the Tehsils of Bahawalnagar, Haroonabad and Chistian in the Bahawalnagar District. The project activities are carried out at ten distributaries and their minors and watercourses. The project area covers approximately 105,000 hectares.

Before the construction of the Fordwah Eastern Sadiqia Canal System a limited expanse of agricultural land was irrigated with the help of inundation canals off-taking from the Sutlej River. The irrigation system was developed during the 1920s by the Sutlej Valley Project, which increased the cultivable area and the reliability of water supplies during the *kharif* (summer) season (Kuper and Kijne, 1992). The Eastern Sadiqia and Fordwah Canals off-take from the Sutlej at the Sulemanke Headworks. Since the enactment of the Indus Water Treaty (1960) and the construction of Pakistan's link canals during the 1960s, the system has been supplied with irrigation water from the Jhelum and Chenab Rivers and the Mangala Reservoir. Currently, the gross command area (GCA) and culturable command area (CCA) of the Fordwah Eastern Sadiqia Canal System are 301,000 and 232,000 hectares, respectively.

The FESS project area is located in the cotton-wheat zone of the Punjab. The average annual rainfall of the region is 260 mm. Average temperatures range from 35°C to 46°C in June and from 0°C to 24°C in January. The designed cropping intensity for the area is 75 percent, while the actual cropping intensity is 129.3 percent (Government of Pakistan, 1992).

Farmers' perceptions were studied at the Hakra 4-R, Bhukan and Sirajwah Distributaries. All three canal systems are subsystems of the Eastern Sadiqia Main Canal. At its tail end (RD 242), the canal trifurcates into the Hakra and Malik Branch Canals, as well as the Sirajwah Distributary (see Figure 1).

The Hakra 4-R Distributary off-takes from the Hakra Branch Canal at the Head Ghulab Ali (RD89+750). Its design discharge is 193 cusecs, irrigating a CCA of 43,801 acres via 123 watercourses. The distributary and its two minors have a total length of 58 km. Approximately

4,500 water users live in the distributary's command area. The two minors and the tail section of the Hakra 4-R Distributary were lined by the FESS project.

The Sirajwah Distributary with its two minors, Bahadarwah and Najeebwah, provides water to a CCA of 44,419 acres via 110 watercourses. The design discharge at the head is 197 cusecs. The total channel length is 57 km. The system has 4,417 water users. 2207 of these cultivate a command area of 19,267 acres at the Bahadarwah Minor, the largest hydrological unit of the distributary. The two minors were lined by the FESS project.

Bhukan Distributary off-takes from the Malik Branch Canal (RD 22+100) and has a design discharge of 12 cusecs. Its total length is 5.4 km, its CCA 3,027 acres, and it supplies 322 water users through 8 watercourses. The entire distributary was lined by the FESS project.

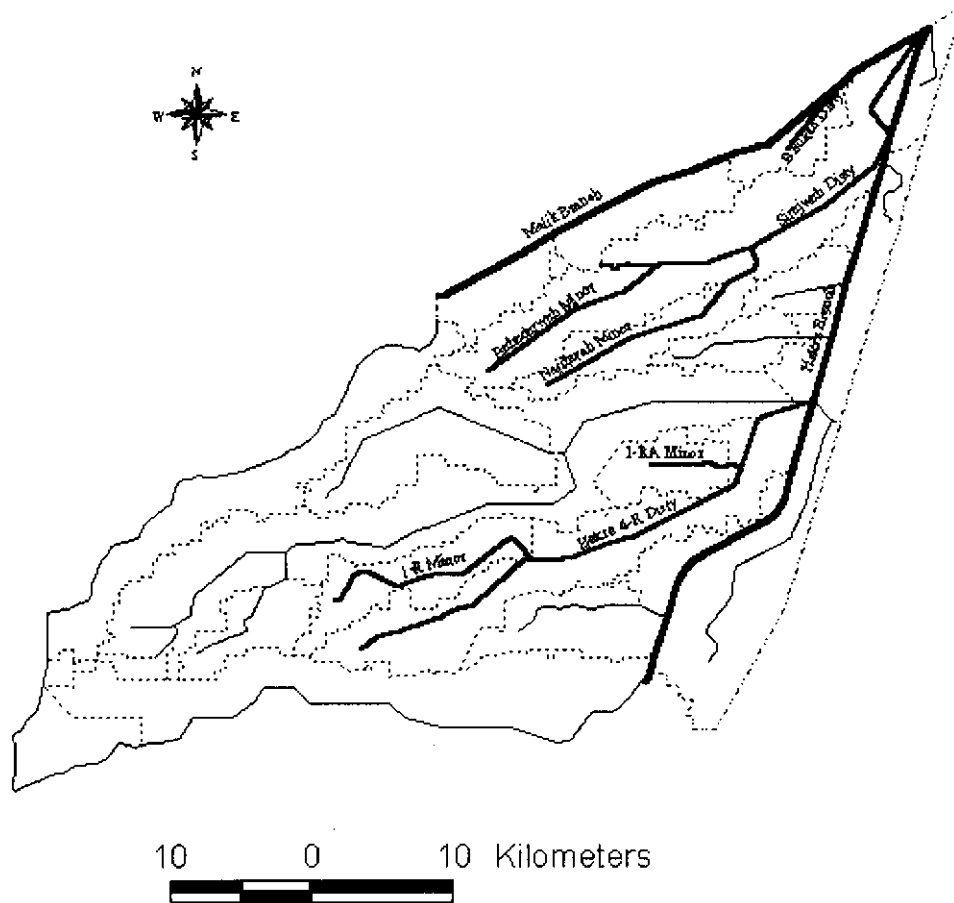


Figure 1. Location Map of the Research Sites

3.2 SOCIAL ORGANIZATION

At the Hakra 4-R, Sirajwah and Bhukan Distributaries, IWMI and OFWM project teams have mobilized water users to form farmer organizations (FO) since 1994. We discuss the social organization methodology developed by IWMI. OFWM has not formulated and published a systematic methodology for social organization. Its approach throughout the project cycle was influenced considerably by IWMI project staff in the course of joint activities and ongoing discussions among the project teams of the two organizations. The project teams aimed at establishing FOs, which represent their water user communities, are internally transparent and accountable, and have the capacity to assume responsibilities in the management of their distributaries. It was hoped that the empowerment of the pilot FOs through the transfer of rights and responsibilities would kick-start the institutional reform process at the distributary level.

Given the limited resources available for project implementation, IWMI sought to develop an efficient and cost-effective organizing strategy. It deployed a team of five social organizers and a field team leader, supported by a design team consisting of senior staff at IWMI's Lahore office, to organize more than 4,500 water users from 41 villages located along 123 watercourses.

Social organization was conceived as a gradual process of transformation of individualized water users, i.e. cultivators², into coordinated collective actors who are capable of jointly managing their common water resources. The organizing process was systematized into four distinct, but overlapping phases (Skogerboe and Bandaragoda, 1998; IIMI, 1995; Bandaragoda et al., 1997; Skogerboe et al., 1993; Zaman, 1998; Zaman, Sultan et al., 1998).

1. Support mobilization: Social organizers were recruited and trained in participatory organization methods, process documentation, flow measurement of channel discharges and the calibration of outlets. They secured institutional support from among governmental and non-governmental agencies operating in the project area and formed a Field Implementation Coordination Committee. An socio-economic baseline survey was conducted.
2. Initial organizing phase: The social organizers, supported by social organizing volunteers from the target communities, built rapport with the farmers at Hakra 4-R and involved increasing numbers of water users in the organizing process. The farmers identified key problems in irrigation management and established informal water user associations (WUA) at each watercourse.
3. Organizational consolidation phase: Five water user organizations (WUO) were formed at the subsystems of the distributary (head, middle, tail and two minors) and federated as a water user federation (WUF). Capacity building training in organizational and financial management, flow measurement and outlet calibration, as well as improved agricultural and irrigation techniques was provided. Negotiations about a joint management agreement between the FO and the Punjab Irrigation Department / PIDA were initiated, which continue to this date.³
4. Organizational action phase: The FOs and social organizers undertook technical walk-through surveys to identify maintenance needs of the local irrigation infrastructure and organized two maintenance campaigns during the annual canal closure periods. Agricultural extension services were mobilized and community development projects, such as rural credit and adult education

² The legal framework for the reform institutions fails to make provisions for multiple water uses and the representation of water users other than cultivators as defined in the Canal and Drainage Act of 1873. The three FOs, therefore, do not include women and the majority of tenant cultivators, as well as artisans, small industrial enterprises and urban or peri-urban settlements.

³ The negotiating parties were unable to agree on the terms of the MOUs. The farmers considered the extent of powers to be transferred insufficient and the conditions punitive. The irrigation officers sought to hold the FO representatives liable for failures and damages and to limit the farmers' control of financial resources. Agreement on the terms of *abiana* assessment and collection proved most difficult. Eventually, the parties agreed to wait for a transfer under the new legal framework, which has not been completed to date.

programs, were initiated. The FO debated, formulated and ratified its internal bylaws. The anticipated irrigation management transfer remains delayed until this date.

3.3 REPRESENTATIVE STRUCTURES

The local designations used for the farmer organizations at the three pilot distributaries (WUA, WUO and WUF) have been retained. The term farmer organization (FO) is used as a generic term to refer to the organizational structure as a whole.

The representative structures and bodies adopted by the Hakra 4-R FO involve three tiers at the watercourse, subsystem and distributary levels (Zaman and Hamid, 1998). At the grassroots level, water users along a watercourse are organized in a WUA. IWMI facilitated the establishment of 121 WUAs on the distributary. At two watercourses the farmers refused to be organized, as they expected the reform to lead to the privatization of the irrigation system and increased *abiana* rates. The irrigators at each of the 121 watercourses selected between five and seven WUA office bearers. They negotiated and eventually achieved consensus on the distribution of offices among the various kinship groups and other social alliances seeking representation. In two cases, the WUAs consist of a single landowner, who is the sole beneficiary of a watercourse.

The president of each WUA represents his constituency in one of five WUOs, mobilized at the subsystem level. As indicated in Figure 2, five irrigation subsystems were delineated at the head, middle and tail reaches, as well as the two minors. Depending on the number of watercourses within a subsystem, the electoral bodies of the WUOs comprise between 15 and 33 representatives who selected between seven and ten office bearers, in the same manner as described above.

Each WUO nominated five representatives for the general assembly of the WUF. These representatives selected five office bearers for its management committee.

Meetings of the management committees at the three levels are to be held at least once a month, and at least once a year among the general assemblies or the watercourse residents.

The three-tier structure allowed social organizers to focus their efforts on the six higher level representative bodies and their office bearers. It enabled a relatively rapid establishment of a trained and functional FO. Since grassroots representation is indirect, it does not ensure the accountability of the leadership to the general constituency and the WUAs' continuous functioning, as demonstrated below. The proposed FO regulations for the Punjab Province prescribe a simplified and more direct representative structure (PIDA 1999), as indicated in Section 2.3. The legal framework provides for the establishment of intermediate tiers and levels of federation above the distributary in exceptional cases. These would require negotiations with AWBs.

The social mobilization drive at the Sirajwah Distributary led to the gradual establishment of representative bodies at variant tiers (Government of Punjab, 1998; OFWM, 1997) (see Figure 3). In 1996, the OFWM field team started its mobilization efforts at the Bahadarwah Minor, the largest hydraulic sub-unit of the distributary. Here 52 WUAs were formed, which selected between five and seven office bearers. Of the latter, the presidents and general secretaries represent their constituencies in one of three sub water user organizations (SWUO), covering three sections of the minor. These again selected a nine-member body for each of the three SWUOs of which five are selected as office bearers. Three presidents from each SWUO formed the WUO of the minor and selected five office bearers.

In 1998, WUAs and WUOs were constituted simultaneously at the Sirajwah Main Distributary and the Najeerbwah Minor. At Sirajwah, 36 WUAs were established with seven to nine office bearers. One office bearer was designated as a representative of four consecutive watercourses to the WUO, which comprises nine members and of which five are selected as office bearers. Similarly, at Najeerbwah, 24 WUAs, with five to seven office bearers, were established. The executive bodies of

every three WUAs at consecutive watercourses designate one representative to the minor's WUO, which thus comprises eight members of which five are selected as office bearers.

The WUF of the Sirajwah Distributary was constituted by nine representatives of its three WUOs and selected six office bearers.

Here, a comparatively high degree of insulation of leaders from their grassroots constituencies is structured into the representative system. Two or three representative bodies separate the WUF from the WUAs, and only very few members at the WUO and WUF levels select and, thus, can directly hold accountable their office bearers.

At the Bhukan Distributary, the smallness of the system permits a simple and direct representative structure. At each of the eight watercourses, a WUA with five office bearers was established. Each WUA nominated one of their office bearers (usually its preident) as a WUF representative. Out of these, four office bearers were selected for the WUF.

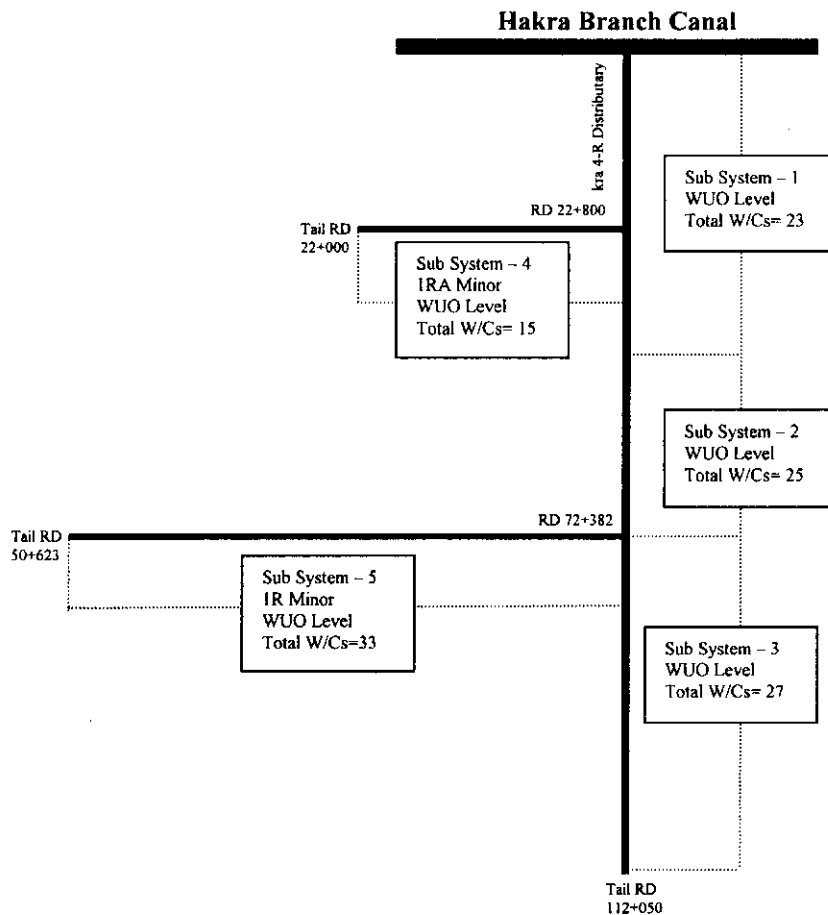


Figure 2. Subsystems of the Hakra 4-R Distributary

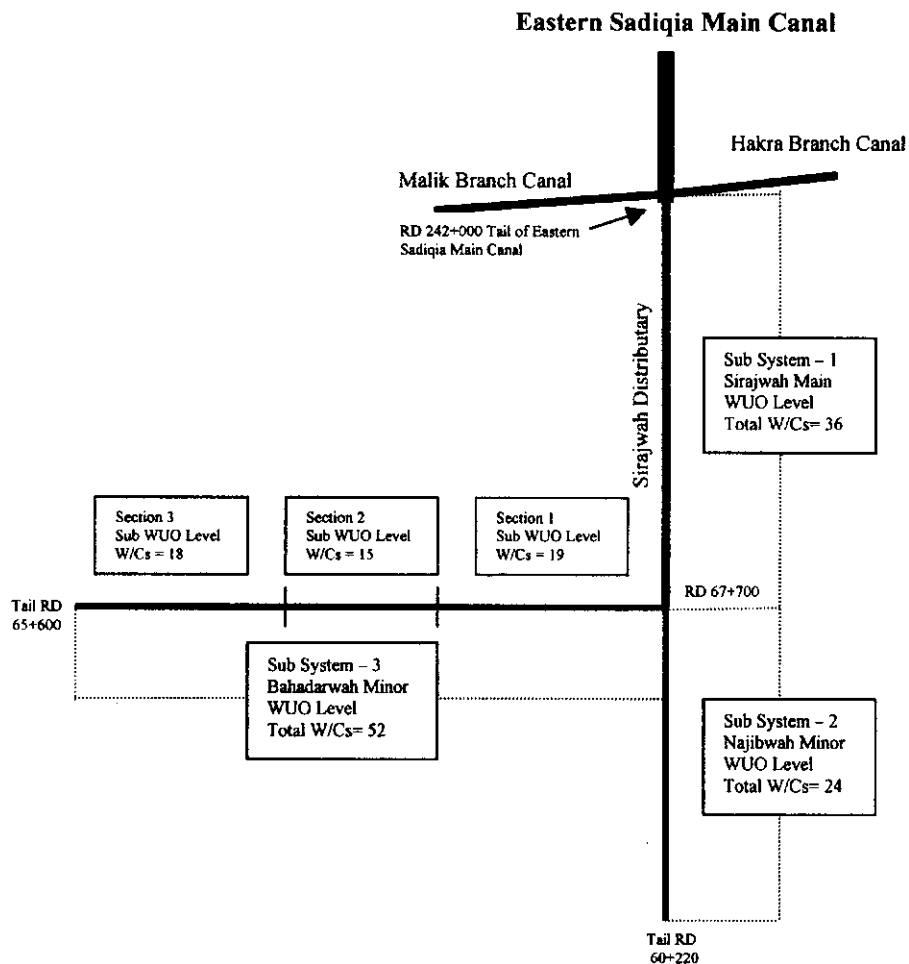


Figure 3. Subsystems of the Sirajwah Distributary

3.4 RESEARCH METHODS

IWMI Pakistan's Policy, Institutions and Management Group carried out a questionnaire survey among a sample of 143 water users⁴ at the Hakra 4-R, Sirajwah and Bhukan Distributaries (Table 1).⁵ The survey investigated the intra-organizational capacity and culture of the farmer organizations established, as well as the inter-organizational relations between the FOs and government agencies. Farmers' perceptions of the opportunities and constraints encountered while seeking to realize participatory irrigation management are a significant variable in generating motivation among water users to engage in sustained organizational activities. The study provides social organizers with

⁴ All of the respondents are male. At Hakra 4-R there are only 2 formally registered female irrigators. Women in Pakistan are not involved in the formal decision making processes for water management. The emerging legal framework does not mandate the representation of women. Male farmer organization members do not favor the participation of women, although women are primarily responsible for household water supply.

⁵ The tables giving a detailed breakdown of the survey results may be found in Annex 2.

important information about the strengths and weaknesses of their organizing strategies and methodologies, and an opportunity for improvement. The survey combined qualitative and quantitative information based on a structured, but open-ended interview schedule. Explanations of the meaning of standard replies were elicited from all respondents. The interviews were held from April to June of 1999.

The quota sampling technique was used to ensure the representation of particular social characteristics prevalent in the population researched. The key characteristics were respondents' location in the system and their level of membership in the governance structure of the farmer organizations. Accordingly, sub-populations were selected in predetermined proportions. While considering variations in the structure of representation among the three distributaries, the sample comprised office bearers and/or general body members at the WUF (distributary) and WUO (subsystem) levels⁶, as well as office bearers and irrigators at the WUA (watercourse) level in each of the distributaries. Each farmer was interviewed about activities at his highest level of participation only. Furthermore, wherever possible, respondents at all levels were selected from sample watercourses located in all of the distributaries' subsystems. This ensured representation of irrigators from the head, middle and tail reaches of the distributaries. In addition, WUA level respondents were selected from the head, middle and tail reaches of the sample watercourses. Of these about half must own 25 acres or less. Within each category, respondents were selected randomly from the FOs' registration lists. The detailed sampling keys for the three sites are provided in Annex 1.

The main purpose of this elaborate procedure was to capture an even representation of the grassroots members as well as of different layers of the representative bodies and office bearers within a relatively small sample. The considerable length of the in-depth interviews, as well as logistic and financial constraints required that we limit the sample population to around 150 respondents.

The initial analysis of the data revealed significant differences in the prevalence of organizational activity between the WUA level on one hand, and the WUO and WUF levels on the other. This motivated us to organize our presentation and discussion of the data around the grassroots / leadership comparison. We aggregated the WUO/WUF data to keep the tables and text manageable.⁷

The survey covers the topics of the practice of meetings, record keeping, rules, decision making, conflict management, training, maintenance activities, irrigation fees, distribution of irrigation water, experiences of constraints, and the relationship between farmers and Irrigation Department personnel, as well as IWMI. The degree to which the FOs were able to establish and sustain structures, roles and responsibilities which ensure broad membership participation and empowerment, as well as accountability and transparency may, thus, be ascertained. The achievement of equity remained a tenuous objective, given that the necessary powers to back up internal agreements on equity have not been devolved to farmer organizations. Nevertheless, questions probing the status of equity were posed.

⁶ The Bhukan Distributary does not have a WUO, as indicated above. At Sirajwah, the WUOs and SWUOs at Bahadarwah were aggregated.

⁷ Accordingly, the members of WUAs as well as their management committee office bearers were conceptualized as 'grassroots', with the exception of their presidents, all of whom are automatically members of the general bodies of WUOs and thus 'leadership'.

3.5 FARMERS' PERCEPTIONS

3.5.1 Meetings

Holding of regular meetings at all organizational levels is an essential activity in participatory irrigation management. It provides the leadership and the grassroots access to information, deliberation, planning and decision-making. Representatives and office bearers are selected and their activities are explained to and approved by general bodies. Routine issues and special problems are addressed and are communicated upwards and downwards in the organizational hierarchy. Meetings facilitate communication and the formation of opinions within and between organizational levels. Regular meetings are crucial for participation, accountability and transparency.

The regularity of meetings as reported by the respondents is indicated in Table 2. At the leadership level the majority at all three sites (72, 96 and 88 percent at Hakra 4-R, Sirajwah and Bhukan, respectively) stated that regular meetings were held. At Hakra 4-R a minority of 28 percent reported that no regular meetings were held. This is due to a lower level of activity of two WUOs.

The situation is significantly different at the grassroots level, where the overwhelming majority (60 to 70 percent at the three sites) reported that no regular meetings were held, while a considerable number of respondents (about 26 percent) did not know whether meetings were held or not.

At Bhukan and Hakra 4-R, farmers reported that a few watercourse level meetings had been held on the initiative of OFWM / IWMI social organizers and Irrigation Department engineers, mainly to discuss watercourse-lining activities. An initial meeting had taken place at the watercourses of all three distributaries to formally select the office bearers of the WUAs. Thereafter, meetings were sporadic or not held at all. The president of a WUA at Hakra 4-R stated that he only attended WUO meetings and saw no purpose in calling meetings at the grassroots level. At another Hakra 4-R WUA the president and general secretary complained that they had initially called several meetings but attendance and interest among water users had been minimal. One office bearer at the Sirajwah Distributary stated that OFWM social organizers and a local Member of the Provincial Assembly had appointed him, and no further organizational activity had occurred at his watercourse, thereafter.

The level of attendance in FO meetings was consistently high among the leadership, as indicated in Table 3. Between 75 and 91 percent of the WUO/WUF level respondents stated that they had attended all or most meetings. At the WUA level the vast majority had missed most or all meetings or was unable to answer.

As shown in Table 4, between 84 and 100 percent of the WUO/WUF representatives agreed that they were regularly notified about upcoming meetings. The majority of the WUA members at Hakra 4-R and Sirajwah were either not notified or unable to answer the question. At Bhukan about 52 percent of the grassroots respondents reported that for the sporadic meetings which were held, they had been notified, mainly by OFWM social organizers. 44 percent were not notified. As may be expected, most grassroots members at Hakra 4-R and Sirajwah had no information about who had convened the meetings. The Bhukan WUA meetings were initiated by OFWM according to 63 percent of the interviewees. At the leadership level the majority stated that meetings were convened jointly by the social organizers and the water users (Table 5).

Table 6 indicates that 80 and 74 percent of the leadership at Hakra 4-R and Sirajwah, respectively, confirmed that the minutes of meetings were kept regularly. At Bhukan there was no agreement among the leadership. At the WUA level the overwhelming majority at all sites stated that they were uninformed.

A general secretary of a Hakra 4-R WUO who is also a general body member of the WUF pointed out that IWMI field staff was recording, printing and distributing the minutes of these representative bodies. Several farmers stated that invitation letters for the meetings had been drafted and distributed by OFWM and IWMI staff. The FO at Hakra 4-R relied extensively on IWMI's logistical help. IWMI staff not only drafted, but also used its computers and copiers to produce the invitation letters, and the social organizers used their motorcycles for the distribution. The agenda of meetings was discussed with the social organizers as well and their presence at the meetings ensured that the farmers felt an obligation to attend. On the one hand, this joint organization and conduct of meetings between organizing staff and FO representatives builds capacity and ensures continuity. On the other hand, it generates and maintains dependency on the facilitators. As the social organization project eventually will have to withdraw from the site, the FOs may become non-sustainable.

The actual mode of decision-making in meetings was consensus-based according to the majority of the leaders at all sites (Table 7). The grassroots respondents again remained uninformed or had no opinion, with the exception of Bhukan, where 45 percent indicated consensus. Asked, which mode of decision-making they preferred, the majority of leaders and grassroots members assumed that reaching a consensus was desirable (Table 8).

However, at Hakra 4-R, a number of respondents questioned the consensus mode. One farmer leader argued that consensus decisions were actually decisions imposed by the most vocal and assertive, while the rest were reluctant to dissent in public. In this way, powerful kinship and/or political factions balanced their interests through negotiations between their leaders. He and four others, therefore, preferred a majority vote by a show of hands or, in the case of elections, secret ballot. In any case, decisions were usually preceded by an extensive discussion of the issues.

Another group, represented within the 'Other' category of Table 8, considered third-party decisions by the *panchayat* (council of elders and respected community members) preferable. The *panchayat* is a time-tested means of decision-making in cases of conflict (see Section 3.5.6.). The FOs have yet to establish the same legitimacy and recognition. Nevertheless, the majority felt, that consensus was needed, because the balancing of powerful interests was the only way of avoiding severe conflicts which would render the FO ineffective. Decisions by majority against a strong kin/caste group would cause deep resentment and their non-cooperation, at best, and retaliation, at worst.

The meetings of the FO leadership were therefore characterized by vigorous and often long debates, before decisions could be forged. Some representatives reported that there were tensions and at times anger, but in the end, they were able to resolve their differences and arrive at decisions. Asked about the overall atmosphere at the meetings, the overwhelming majority characterized them as generally friendly and cooperative. None indicated predominance of anger and confrontations (Table 9).

The farmers' replies demonstrate a consistent and significant discrepancy between the levels of organization and activity of the grassroots and leaderships. The WUFs and most WUOs are routinely holding meetings with a satisfactory level of attendance and maintenance of minutes. These FO representatives practice a mode of decision-making, which seeks the inclusion and support of all water users and their factions, in order to ensure the smooth functioning of the FO. As a result, the leadership respondents have characterized their experience of meetings as cooperative and friendly. The WUAs, by contrast, are generally apathetic and inactive. With the exception of initial meetings at which WUA office bearers were elected or appointed, few subsequent meetings were held.

The interviews show that the organization of meetings is highly dependent on the initiative and logistic support of social organizers from OFWM and IWMI. Once the selection of representatives and office bearers from the grassroots level was achieved, the social organizers ceased to mobilize

the water users at the watercourses and focussed on leadership development. Given the size of irrigation subsystems, such as Hakra 4-R and Sirajwah, and their large number of water users, the leadership oriented strategy promised a relatively rapid establishment of a functional organizational structure. This strategy was also followed at the small Bhukan Distributary, with the same effect.

These results raise a number of important questions: How sustainable will the FOs be once the social organization pilot projects are concluded? How well is the leadership anchored among the grassroots and how responsive are the latter to the implementation of the reforms by the leaders? What is the level of capacity and information among the general membership? How can the FO grassroots hold their leaders accountable?

3.5.2 Maintenance of Organizational Records

The maintenance of organizational records is essential for the achievement of internal and external transparency and accountability. The recognition and acceptance of the FOs will, to a considerable degree, depend on regular and accurate record keeping in conformance with the anticipated legal framework for farmer organizations.

The majority of leadership level respondents reported that financial, attendance and correspondence records were kept consistently. However, at Bhukan three-quarters of the WUF members stated that no financial records were kept due to the absence of financial transactions. The same holds for the WUA level at all three sites. Most grassroots members had no information about financial or other records, while between 14 and 26 percent stated that no records were kept at their WUA (Tables 10 to 12). This is not surprising given the paucity of meetings.

The regular practice of presenting the financial records during general body meetings was confirmed by most of the leadership at Hakra 4-R and Sirajwah (Table 13). However, one-third of the respondents dissented, because these records were not presented by some of the WUOs. At Bhukan, the majority claimed that financial records were presented, while two leaders disagreed. With only a few exceptions almost all WUA level respondents stated that no records were presented or they had no knowledge at all. Some declined to answer.

The leadership level demonstrates the emergence of routine organizational capacity and accountability, while the grassroots have not developed the ability to systematically handle, record and account for financial and other transactions.

3.5.3 Rules

The respondents were asked, whether they were aware of the existence of rules governing the behavior of members of the FOs. The existence and/or recognition of formal (bylaws) or informal (mutually recognized, but not codified) rules would indicate a shared set of assumptions about the purpose of a FO and the rights and responsibilities of its members. In fact, the WUOs and WUFs had developed and eventually adopted bylaws.

Since the WUAs had remained inactive, most respondents at this organizational level stated that there were no rules, they did not know or they declined to answer. About three-quarters of the leadership affirmed the existence of FO internal rules (Table 14). Asked about their perception of the general state of rule conformity, the majority at the grassroots was unable to answer. Many stated that as there were no rules, no one needed to follow any. The leadership at Hakra 4-R and Sirajwah perceived that most farmers respected the rules, but a minority disagreed. The Bhukan leaders were divided in their opinion and 50 percent reported a lack of rule conformity (Table 15). The most frequently reported rule violations were absenteeism at meetings and the failure to fine or expel notorious absentees in accordance with FO bylaws.

These responses demonstrate a striking ignorance of the rules, the absence of a shared code of conduct and an overall weak commitment to rule-bound behavior among the general membership. The social organizing activities were to some extent able to foster normative structures and commitments among the leadership. The grassroots members had not been included in the process of debate and decision-making about the rules for the FOs. The participatory process, once more, did not reach the wider community of irrigators.

3.5.4 Leadership Selection

The social organization process focussed on leadership development and organizational activity has occurred almost exclusively at that level. Therefore, the selection of leadership is the single most important link between the grassroots and their representatives. This subsection investigates the selection process and provides some basic socio-economic characteristics of the leaders in the survey sample, such as level of education, tenancy status and property sizes.

Between 83 and 100 percent of the leadership at the three sites perceived the process of selection of FO representatives and office bearers as consensus-based (Table 16). At Hakra 4-R the leadership respondents reported that an initial conflict between two factions was eventually resolved, once the distribution of offices between the contenders was negotiated. At Sirajwah, conflict between the three reaches (main canal and the two minors) and/or political alliances developed at various stages of the organization building process. The respondents stated that local politicians intervened in the selection process on behalf of their clients among the farmers, by pressuring the social organizing team. Eventually, conflict was resolved by distributing the key office bearer positions among the contending factions. At Bhukan, the leadership unanimously considered the process of selection of office bearer consensus-based. Offices were evenly distributed between the head and tail reaches of the distributary and political interference was not reported.

At the grassroots level the selection of representatives was also consensus-based according to about half of the respondents. However, the other half did not know how the selections were made or declined to answer.

Consensus was the outcome of a complex process of negotiation between opposing factions. These needed to balance their own interests, backed by the power resources at their disposal (political influence, close relations with social organizers, unity within faction, ability to sway opinions), against the need to achieve sufficient inclusion of opponents to maintain the viability and legitimacy of the organization. Considering the inclination of the local social setting to form multiple political and kinship-based factions, as well as its intense status orientation, consensus building is crucial for the success of organization establishment and leadership formation. The selection process reflects the power relations in the communities to a considerable degree. However, the influence of the social organizers tempered these dynamics. Throughout the social mobilization process, they stressed the importance of compromise and of representation of the various factions and reaches of the system. Moreover, the need for finding office bearers with leadership qualities was emphasized and did indeed influence the selections made.

Table 17 provides an overview of the criteria considered in the selection of office bearers by all respondents. These are ranked according to their frequency of indication. At Hakra 4-R, proven community leadership, honesty and level of education were considered most frequently, followed by 'wisdom and ability', the location of the candidates in the irrigation system (head, middle, tail), the ability to spend time, as well as the significance of kin-group membership and age. At Sirajwah, proven leadership ranked first, followed by honesty, level of education, ability to spend time and problem solving capacity. The Bhukan respondents indicated proven community leadership most frequently, followed by 'wisdom and ability', honesty and level of education, kin-group membership and age.

These results show that in selecting leaders, the respondents were mostly concerned about the candidates' honesty, educational levels and past performance as community leaders. Capacity and trustworthiness are, thus, salient characteristics of a good leader. Kin-group membership and age were important factors at two sites, which demonstrates the persistence of time-tested allegiances and leadership systems (e.g. the *panchayat* or council of elders). Of great interest is the importance accorded to 'wisdom', which was not mentioned in the questionnaire, but selected spontaneously by 31 respondents and ranked second at two sites. Wisdom is sought in an environment where leaders have to integrate know-how with considerations of justice and equity. They need to tackle difficult and to some extent entirely new organizational and technical tasks and they need to negotiate and balance the multiple and often opposing interests within the FO. Furthermore, they need to communicate and negotiate with government agencies, the Irrigation Department and its successors in particular.

The data on level of education demonstrate that the water users, at all three sites, selected a comparatively well-educated leadership. Table 18 indicates that only 2 individuals (3.6 percent of the total of leadership at the three sites) are illiterate. Meanwhile, 31 individuals (55 percent of all leaders) had completed the 10th grade (Matric) or attained a higher level of education (F. Sc., B. Sc. or M. Sc.). By contrast, 44 percent of the grassroots level respondents are illiterate.⁸

It is important to note that skepticism by opponents of participatory irrigation management in Pakistan about the ineptitude of 'illiterate farmers', is unfounded. The water users mobilized by IWMI and OFWM had a clear understanding of significant leadership qualities and accordingly selected educated people to head their organizations. The farmers primarily involved in negotiations and decisions about irrigation management are trusted community leaders, capable of learning new skills.

Almost all of the leaders selected fall into the owner-cultivator category, except for two lessees. At the grassroots level a few sharecropping tenants are FO members, among a majority of owner-cultivators (Table 19). The vast predominance of cultivating landowners in the FO leadership reflects the typical property relations in the communities concerned. The Canal and Drainage Act of 1873 confers the legal status of 'occupier' to landowners or to tenants, if they directly pay occupier's rates, i.e. water charges. The emerging legal framework for FOs in the Punjab recognizes only 'occupiers' as 'farmers' with a right to membership in FOs (PIDA, 1999). Women and the landless poor remain excluded from formal representation in the institutions of the water sector.

Within the owner-cultivator category the selected leadership is roughly representative of the range of property sizes found in the sampled communities. Table 20 shows that the leaders at Hakra 4-R are more or less evenly distributed among the four categories between 1 and 100 acres. Fifty-six percent are smaller landowners (1 to 20 acres). At Sirajwah, the mid-sized group (21 to 100 acres – 52 percent) and the large owners (above 100 acres – 26 percent) are better represented than the small landowners (17 percent). In Bhukan, the smallest category (1 to 10 acres) is not represented among the leaders. However, 75 percent of the leadership own between 11 to 50 acres. Overall, at all sites, the smallest land ownership category is clearly underrepresented in the leadership, considering that among the grassroots between 40 and 59 percent at the three sites own 10 acres or less.

Among the respondents from the WUF office bearers, property sizes range from 30 to 82 acres at Hakra 4-R, from 49 to 170 acres at Sirajwah (1 above 100 acres) and from 29 to 375 acres at Bhukan (2 above 100 acres). The majority of WUF general body representatives, by contrast, own below 50 acres, with one exception at Sirajwah (170 acres).

⁸ The overall level of literacy among the survey sample is 72 percent, which is well above the national average for males. The official literacy rate for Pakistan in 1998 was 45 percent (56.5 percent male and 32.6 percent female). In 1981 it was 26 percent (35 percent male and 16 percent female) (GOP 1999).

The majority of the leadership, at all three sites, owns between 11 and 100 acres. This is also the case for the top leadership, i.e. the WUF office bearers. There are no large landowners among the respondents in the Hakra 4-R leadership. At the other two sites, 25/26 percent of the leadership are large landowners. This group occupies altogether 3 (23 percent) of the 13 WUF office bearer positions sampled. The common fear that large landlords or 'feudals' would dominate the FOs' leadership is, therefore, not necessarily warranted. If the water users undergo the kind of mobilization and socialization process as in the pilot sites, the democratic and consensus-oriented representation mechanisms can successfully counter the dominance of large landowners. The three pilot-FOs surveyed demonstrate that mid-size farmers tend to become the main force among the leadership. However, the inclusion of large landowners is important to secure their compliance with the FO.⁹ The under-representation of the smallest landholding category is a cause for concern and requires further research.

3.5.5 Capacity Building Activities

At the three pilot sites formal capacity building activities were provided in the form of training on financial management, record keeping, flow measurement, walk-through maintenance surveys, as well as improved irrigation and agricultural practices. The level of participation among the FO members was queried. Table 21 indicates that at all sites mainly the leadership participated in the training and the level of participation was highest at Hakra 4-R.

The training in financial management and record keeping was targeted especially at the pertinent office bearers. Therefore, a rate of participation ranging from 17 to 50 percent among the leadership may be considered adequate.

Flow measurement training was given to almost all of the leaders, but did not reach the vast majority of respondents among the grassroots level respondents. Flow measurement training and the assessment of the level of equity in the distribution of irrigation supplies has two functions. It raises the awareness of the water users about the state of water distribution and equity and it builds the capacity among leaders to exercise control over the effective and rule-conforming operation of the system. However, the leader-focussed capacity building strategy emphasizes a reliance on sanctions, rather than the acceptance of equity by the membership at large.

The relatively low level of participation in training on improved irrigation and agricultural practices among all levels at Sirajwah and Bhukan and among the grassroots at Hakra 4-R is of concern. To achieve a sustainable impact of reformed irrigation management on increased crop yields and cropping intensities, the equitable distribution of water resources, as well as the widespread field level capacity for higher water application efficiency and commensurate agricultural practices are needed.

3.5.6 Water Resource Supply and Distribution

The respondents' perception of the present conditions of water resource supply and distribution in their distributories, as well as of changes in the incidence of irrigation offenses and the level of irrigation related conflict, was investigated. The analysis of responses on distribution and offenses was broken down by subsystems at Hakra 4-R and Sirajwah and by reaches (head, middle and tail) at Bhukan, because the respondents' perceptions would be closely linked to their experiences within their immediate environment.

By contrast to the responses to questions about organizational activities, all interviewees provided answers to the question whether they thought that the present situation of water resource distribution

⁹ The experience at another of IWMI's project sites in the Small Dams area shows that 'feudals' can be made to properly observe waranbandi and enter into joint decision-making processes with their fellow irrigators (Starkloff, Bandaragoda et al., 1999).

in their distributary should be continued (Table 22). The majority of water users at Hakra 4-R (69 percent) considered the current situation unsatisfactory. An exception is Subsystem 2, the mid-reach of the main distributary, where 58 percent answered with yes.

The main cause for complaint is the effect of the lining activities and outlet re-sizing carried out under the FESS project, which disorganized the previous water distribution pattern. The respondents argued that in the case of the 1-RA Minor (Subsystem 4) the contractors had failed to adjust the slope to the requirements of a lined channel and that, therefore, the velocity of flow had increased. Consequently, the watercourse outlets in the upstream portions of the lined section drew less water. This led to a flurry of uncoordinated outlet alterations. Irrigators in the head reach of the lined subsystem 3 voiced the same complaint. Farmers also reported that at the 1-R Minor (Subsystem 5) the channel-bed of the head reach of the minor had been raised by about 9 inches due to lining, which caused the channel to draw less water. To compensate for this problem, permanent obstructions were placed in the main distributary at RD 72 by the contractor firm with the concurrence of Irrigation Department officers. Although this resulted in increased discharges to the 1-R Minor, it diminished supplies to the tail of the distributary (Subsystem 3) and raised the water level in the distributary's mid-reach (Subsystem 2), thus leading to inordinate increases in the supplies to its watercourses. The affirmative response from 58 percent of farmers at subsystem 2 is, accordingly, not surprising.

The second significant cause for discontent with the current distribution system is the rotation regime among distributaries in the Eastern Sadiqia Canal system. Several respondents perceived the rotation system as an opportunity for rent seeking and a cause for irrigation offenses. Rotation has made supplies more variable and unpredictable. Consequently, farmers tend to seek to over-irrigate during their turn, with the hope that this would compensate for dry periods of unpredictable duration. Respondents who complained about the rotation system suggested that they preferred continuous supplies at design discharges to the current state of fluctuation.

At Sirajwah the opinions were split, with a slight majority of about 57 percent at all subsystems stating that the current situation was unsatisfactory. As at Hakra 4-R, these water users complained about the rotation system, the effects of lining, outlet tampering and irrigation offenses. With the lining activities, outlet sizes had been adjusted according to design discharges of 197 cusecs to the distributary. This had decreased supplies to the head reaches of the lined minors, while favoring the tails. Outlet re-sizing had diminished supplies to the many tampered structures in the head and mid reaches of the overall system. In addition, the rotation regime increased the variability of supplies during the system's turn. Farmers claimed that discharges peaked at 240 cusecs. However, the re-sized outlets are unable to receive these peak supplies proportionately. The irrigators, thus, have a strong incentive to start a new round of outlet tampering. As an uncoordinated and individualized response, this would inevitably lead to inequity. If, as suggested by some farmer leaders, the FO, as a planned and well-calibrated measure, carried out the outlet modifications, equity could be maintained. This would require the transfer of management authority to the FO. The farmers' statements suggest that they are presently engaging in uncoordinated outlet widening.

The 43 percent who considered the current distribution system satisfactory stated that the lined and re-calibrated system was providing them with their 'due share', based on the design discharge of 197 cusecs. The watercourse level warabandi were perceived as sufficiently operational and the level of conflict as reduced. Still, many argued that they received less water than before and were unable to maintain previous cropping intensities.

The majority of respondents at Bhukan were generally satisfied with the present distribution system. These farmers have accepted their present regime with lined channels and re-calibrated outlets, although they too are unable to cultivate the command area to the extent they used to. The dissenters complained for this very reason, as the actual discharges to watercourses were claimed to have

decreased. One WUF office bearer argued that the farmers were not adequately consulted before the lining activities were started and that the current regime did not serve their needs.

To further probe their perceptions about the current state of water supply, the respondents were asked whether they perceived an impact of the establishment of FOs on its quantity, reliability and equity. The answers need to be viewed with caution. The lining and outlet re-sizing measures were undertaken during the same time-period without significant FO inputs into the process. Furthermore, none of the FOs have been empowered to manage their distributaries and could, therefore, neither determine the management and distribution of supplies, nor punish irrigation offenders.

At Hakra 4-R (Table 23), 60 percent of the respondents in the system's tail (subsystem 3 and 5) and at 1 RA Minor, the lined sections, perceived a reduction in the quantity of supplies. A majority of these also considered the reliability of supplies to have increased, while equity was seen as declined. In the head reach of the main distributary (subsystems 1) opinions about the quantity and reliability of supply were split between more, less and the same, while equity was perceived as less by a clear majority. Subsystem 2 also demonstrates general disagreement among the respondents. Overall it may be observed that approximately 70 percent of the interviewees perceive no improvement or a decline of quantity and equity, while about 50 percent think that the reliability of supplies had actually improved.

At Sirajwah (Table 24), only a minority perceived an improvement in all three factors. Roughly 80 percent observed either a decline or no change. At Bhukan (Table 25), a slight majority of the tail end water users reported an increase in the quantity of supplies, but thought equity to have declined. Reliability was perceived as unchanged or declined by most respondents. Meanwhile, the head and mid-reaches claimed a decline in quantity and reliability, while there was no agreement among respondents on equity. Overall only a minority reported an improvement in the situation of water supply.

So far, the FOs have to exclusively rely on persuasion, symbolic social pressure and the good-will of the water users to promote equity and check irrigation offenses. They remain unable to affect the technical and institutional conditions of system management. Nevertheless, when asked whether they perceived changes in the incidence of irrigation offenses since the inception of FOs at their distributaries, the overall response indicates a perceived decline (Tables 26 to 28).

The majority of interviewees at Sirajwah and Bhukan reported an overall decrease of all types of irrigation offenses, although at the head reach of Bhukan, 50 percent claimed that the placement of obstacles to raise the head of flow had increased. At Hakra 4-R, a majority in subsystems 1 and 4 assumed that outlet tampering had increased. Otherwise, among all Hakra 4-R subsystems, about 55 percent of the respondents reported no improvement or an increase in the incidence of outlet tampering, while about 42 percent perceived an improvement. A clear majority saw a decrease in the other types of offenses.

The observations at Hakra 4-R are indicative of a trend observed by the authors in their field work, which was confirmed by irrigation officers working in the FESS area and by individual farmers, particularly those adversely affected by lining. The combination of declined supplies due to outlet re-sizing and lining and increased variability due to inter-distributary rotation in the Eastern Sadiqia Canal system serves as an incentive to commit individual irrigation offenses, outlet tampering and bribing of irrigation personnel in particular, to secure increased supplies. Individualized deviant responses continue to be more effective than collective action, as long as farmers are not empowered to manage their distributaries.

Difficult irrigation supply conditions and intensified competition for relatively scarce supplies can lead to conflict between farmers if internal regulatory arrangements are not available or not recognized. The respondents were asked whether they perceived a change in the level of conflict

since the inception of the FOs and which conflict-resolution mechanisms they used before and since FO establishment.

The WUA members reported about the state of conflict at the watercourse level. A clear majority at Hakra 4-R and Bhukan stated that they experienced no conflict since the establishment of their WUAs and the consolidation of their *warabandi*. Among the grassroots respondents at Sirajwah 57 percent reported no change or an increase in the level of conflict (Table 29). Table 30 shows that before the establishment of their WUAs, the farmers experienced a higher level of conflict and at Sirajwah and Bhukan relied predominantly on the *panchayat* (council of elders) as well as the government to resolve their conflicts. At Hakra 4-R, the farmers reported that the government (irrigation officers, police and the courts) was the main arbiter of conflict, besides the *panchayat*. This scenario has changed since the establishment of the FOs, as indicated by Table 31. At Hakra 4-R about 53 percent of the grassroots respondents stated that since they experienced no more irrigation related conflicts at the watercourse level, they did not seek any mediation or arbitration. One-third did not know whom to approach, and none recognized the FO as an authority for conflict resolution. At Bhukan, 37 percent also saw no need for conflict resolution and 18 percent were unsure. The remainder used the FO, the *panchayat* or the government as the appropriate authority. At Sirajwah, where a majority had reported the persistence of conflict, half of the respondents did not know whom to approach for its resolution. While their reliance on the government and *panchayat* had declined, only 10 percent had approached the FO to regulate their conflicts.

These responses indicate that among the grassroots, watercourse level conflict is perceived as relatively infrequent. It is, however, worrisome that the legitimacy of the *panchayat* and the government as agents of conflict resolution have declined, while the FOs have not yet been recognized by the grassroots as the appropriate body to play this role. Given the lack of grassroots mobilization by the FOs and their social organizers, on one hand, and the lack of empowerment of FOs, this is not surprising.

At the leadership level the situation is different (Tables 29 to 31). Only at Bhukan, a majority reported the absence of conflict at the distributary or inter-watercourse level and the remainder considered conflict to have decreased or remained the same. Here, the role of arbiter has clearly shifted from the government to the FO. At the other two sites, the absence of conflict was only perceived by about one-quarter of the leaders, while a majority reported no change or a decrease in its level. At Hakra 4-R, the FO is clearly recognized by the leaders as the key agent of conflict resolution. At Sirajwah, 44 percent provided the same answer, while about one-third continue to favor the government and *panchayat*.

The strengthening of the role of FOs in conflict resolution in the estimation of the leadership, even though it remains merely informal and non-binding, is of course to be expected. The leaders have developed symbolic ownership of their farmer organizations and wish to promote its significance. This will unfortunately remain inconsequential without the recognition by the grassroots of the FOs' actual capacity and legitimacy to resolve conflicts among the membership.

3.5.7 Maintenance

The mobilization of labor contributions by the water users is a key objective of participatory irrigation management. It is expected that self-help maintenance would improve the upkeep of the physical infrastructure and reduce the cost of system management. The survey inquired whether farmers had carried out maintenance activities at the watercourses and distributaries before and since the establishment of FOs.

The data in Tables 32 and 33 show that watercourse maintenance has remained an well-entrenched tradition. Between 90 and 100 percent of all respondents at all sites and levels of FO membership

reported that the farmers had carried out de-silting of their watercourses before FO formation and continue to do so.

The maintenance of distributaries will be one of the key responsibilities assumed by FOs after irrigation management transfer at the secondary level of the irrigation system. The majority of respondents at Hakra 4-R reported that before the formation of FOs the farmers had not undertaken distributary level maintenance. The tail-end farmers had organized occasional desilting efforts, as silt impeded the flow of their already disproportionately low supplies. Sixty-three percent of the grassroots members and 72 percent of the leaders reported distributary-desilting activities since the formation of the FO. The farmers who stated that they did not participate in these activities felt no need to maintain the recently lined sections of the distributary and minors (Tables 34 and 35).

At Sirajwah, a marked decline in distributary maintenance was indicated. While 53 percent reported farmer participation in desilting before FO establishment, 92 percent stated that self-help maintenance was no longer carried out. Again, no need for maintenance was perceived, as major portions of the system had been lined recently. Some respondents indicated their willingness to resume self-help maintenance if the need should arise in the future. Pre-FO farmer participation in distributary maintenance was the highest at Bhukan (reported by three-quarters of the respondents) and declined somewhat for the same reasons as at the other sites.

The vast majority of interviewees at all sites and levels reported that they had made labor contributions to these maintenance activities (Table 36). Contributions in cash and kind remained negligible, with the exception of the Hakra 4-R leadership of which 64 percent reported that they had contributed in kind, mainly tractors. Asked whether they were willing to make more contributions in the future, between 75 and 100 percent affirmed. Only 17 of 143 respondents declined, were unsure or gave no answer (Table 37).

The farmers' responses show that they are generally prepared to contribute to maintenance both, at the secondary and tertiary levels. At Sirajwah and Bhukan, the level of maintenance activity was highest before the establishment of FOs. As the FOs were formed at the same time as the FESS lining projects were undertaken, the farmers interest in desilting is temporarily suspended. The Hakra 4-R water users, on the other hand, had assumed that desilting at the secondary level was the responsibility of the Irrigation Department. Only because the department's maintenance performance was unsatisfactory and the water distribution pattern inequitable, were tail-end farmers forced to resort to self-help desilting in their reach. During the canal closure periods of 1997/98 and 1998/99 the Hakra 4-R FO organized two desilting campaigns in unlined portions of the distributary to demonstrate the organization's capacity to assess maintenance needs, mobilize labor power and tractors and carry out desilting on its own initiative. The campaigns mobilized 794 and 600 farmers, respectively, and were considered a huge success (Zaman, 1998). Accordingly, here FO mobilization had been the decisive factor.

3.5.8 Inter-organizational Relations

The FO pilot projects sought to develop supportive relationships with governmental and non-governmental agencies with a significant impact on irrigated agriculture in the FESS area. The most important of these were the Irrigation Department, OFWM (watercourse lining in particular), agricultural extension services and agri-businesses (input producers/suppliers). The farmers were asked how these relationships had fared during the course of the mobilization process. Table 38 indicates that overall, at all sites, most respondents did not perceive any improvement or deterioration in the relationship of farmers with these agencies. The exception is Bhukan, where the cooperation with OFWM was seen as a cause for improved relations by 51 percent of the farmers interviewed. At Hakra 4-R one-third perceived a better relationship with local agri-businesses, because a distribution arrangement had been organized with the farmers through the FO. At the same distributary, there was considerable disagreement about relations with the Irrigation

Department. While about 29 percent stated that relations had improved and another 29 percent found them unchanged, a slight majority judged them as worse. Some respondents stated that due to the formation of the FO 'the irrigation officers are now listening to us' and, as a result, information flow and communication had improved. Others argued that the opportunities for rent seeking had declined, as farmers became organized and a shift of power relations would occur, once IMT was implemented. Therefore, the irrigation personnel had become resentful, especially among the lower ranks at the distributary level.

The survey queried a number of key difficulties, which affected the relationship between the FOs and various agencies. The responses clearly show that the farmers consider the Irrigation Department the most difficult agency affecting the work of the FO (Table 39). About half of all respondents at all sites agreed that the agency's power and status was an obstacle to good relations. In the words of two farmers:

The PID representatives treat us with a certain distance.

They don't like to see us in their office.

Corruption by influential farmers was perceived as significant by about one-third of all respondents at Hakra 4-R and Sirajwah, and corruption by irrigation agency staff by 54 and 51 percent, respectively, at the same sites. Conflicts with irrigation officers were viewed as a key difficulty by 43 and 24 percent, respectively. At Bhukan, fewer farmers pointed at corruption and conflict as a problem with the Irrigation Department. At Hakra 4-R especially, a minority of farmers stated that corruption and power/status issues adversely affected relations with the police and the revenue department.

The FOs will require continued support services and cooperative relations with agencies after irrigation management transfer at the distributary. We asked the respondents, which agency they would seek the provision of such services from. The results show that the Irrigation Department continues to be recognized as the most significant partner of farmer organizations (Table 40). At all sites, the Irrigation Department was identified by a majority of all respondents as the partner in operations activities. The same applies for maintenance activities, except at Hakra 4-R, where only one-third looked at the PID for support. The successful self-help maintenance experience at this distributary has made this FO more self-reliant in this respect. Continued support for the management of the FOs themselves is expected from the social organizing agencies, IWMI and OFWM, by many farmers. Banks, in particular the Agricultural Development Bank of Pakistan, and NGOs are seen as the key sources of financial support. For conflict resolution/mediation support was expected mainly from the legal system and the social organizing agencies, however, by only a small number of respondents.

It is significant, that despite the difficulties in their relationship with the Irrigation Department perceived by farmers, they expect to cooperate with irrigation personnel in the future and would seek their support services after the transfer of powers and responsibilities to the FOs. This result signals a precious opportunity for the development of a trust-based partnership. The farmers' responses also suggest that, to establish such a sustainable partnership, a change in relations of power and status and the cessation of rent seeking would be conducive. Farmers appreciate when they are treated with respect, as partners and equals, who are listened to and given an opportunity for participation in planning and problem solving.

Finally, we asked farmers to assess whether their relationship with the social organizers of OFWM and IWMI were useful and satisfactory. Table 41 suggests that the leadership clearly appreciated the services provided by the two agencies. At the grassroots level more respondents were unsure, especially at Sirajwah, but at each site only a small minority thought the work of OFWM and IWMI to have been not useful.

In the words of some farmers:

It is due to OFWM's efforts that our federation is at this stage. They motivated us and organized us. We water users have been here for 70 years, but OFWM gave us a sense of unity.

OFWM struggled much to form the FOs and arranged many meetings for which we were called, but also the authorities of the Irrigation Department. In this way the relations between us improved.

IWMI has worked very hard. They treated us very politely. They removed unnecessary fears from our minds and motivated us to form FOs.

IWMI taught us how to resolve conflict through mutual agreement.

If IWMI had not organized us we would not have done anything.

These responses and remarks clearly demonstrate the need for a well-coordinated organizing effort for FO establishment. Much depends on the organizers' ability to motivate and educate the water users. It may be observed that farmers not only seek organization and capacity building support, but place considerable emphasis on the quality of relationships. Concern for their fears, learning how to resolve conflict amicably, improving relationships with outside agencies and a polite way of communication are greatly appreciated and generate resonance.

3.5.9 Farmers' Self-assessment

We wanted to know how the water users assessed themselves and the experience of undergoing social mobilization for participatory irrigation management. Their perception of the value of their efforts so far and of the problems encountered would give important clues about their motivation and the sustainability of the process set in motion.

Asked whether it had been worthwhile to make an effort for the FO, the leadership gave a clearly affirmative answer (Table 42). Only at Bhukan, two respondents dissented, and at Sirajwah, two were unsure. The replies at the grassroots level were highly mixed. Forty-three percent at Hakra 4-R thought that efforts for the FO were not worthwhile, but 47 percent considered FO activities useful. At the other two sites, half of the respondents answered affirmatively and a large minority did not know.

The leadership also assessed the willingness of other farmers to cooperate more optimistically (Table 43). About three-quarters of the leaders perceived an improvement in the level of cooperation by others. Still, between 20 and 35 percent saw no change. The majority of the grassroots members reported no change as well, particularly at Sirajwah (93 percent).

These replies reflect the effects of the leadership-centered mobilization strategy. Little organizing effort and participation at the grassroots caused a lack of activity and experience and, thus, apathy and doubt. Among those who did not consider the FOs a worthwhile cause, many complained about the absence of activity without considering the need to make an effort themselves, some did not like to be involved in organizations and others were too busy with their farms and other income generating activities. A few remarked that they were prepared to be active but lacked leadership and perceived that the elected leaders were not interested to mobilize grassroots involvement.

Nevertheless, a great majority stated that the efforts of the FO should be increased (Table 44). Suggestions for activities abounded. These included collective problem solving and fostering greater amity among water users through frequent meetings, cooperative outlets for agri-products, training in collective action, self-help development of the local infrastructure (roads, culverts and other facilities), credit associations and, perhaps most importantly, the transfer of actual irrigation management responsibilities.

We asked the respondents about the main difficulties experienced during their involvement with the FO. The general level of response was comparatively low among the grassroots, as they had too

little experience with FO work. Below 30 percent replied to most queries in Table 45. At Hakra 4-R, 50 percent reported that rumors spread by irrigation personnel and farmers, adverse to the reform, to discredit the social mobilization effort had been a major obstacle, particularly in the beginning of the process. Among the Hakra 4-R leadership, this was the most frequently mentioned difficulty as well. Of less frequency and significance appeared to be the need to spend too much time and effort, the lack of familiarity with the relevant issues among members, the need to spend too much money, as well as corruption by some members. The Sirajwah and Bhukan leadership complained about time, money and effort most frequently. Rumors were of concern at Bhukan as well. Corruption, as well as political and kin-group conflicts were of lesser concern.

It is noteworthy, that at Hakra 4-R constraints to organizing capacity, such as rumors to discredit FO formation, were of greater concern than the need to spend time and money. The latter were perceived as more pronounced difficulties at the other sites. This circumstance may be taken as an indicator of a comparatively high level of commitment among the Hakra 4-R leadership.

A rather remarkable finding of the study is the significance accorded by farmer leaders to changes in their level of self-respect and confidence and, consequently, their perceived level of status. At all three sites between 78 and 100 percent (see Table 46) reported that they experienced an increased sense of confidence, self-respect and honor.

Earlier it was difficult for me to talk in gatherings. Now I can speak in meetings and with the higher ups in government agencies.

Because people have given me this office, I feel that I get more respect.

Now we can talk with agency staff with courage. Earlier they considered us just sheep.

Now the officers of the different departments give me full respect.

At Hakra 4-R, 37 percent of the grassroots members shared this sense of increased confidence, but the remainder felt no difference or declined to answer. At the other two sites, the majority reported no difference in their level of self-worth.

The responses show that there was a significant status imbalance between 'agency people' and farmers. The organizing effort, the great attention showered on farmer leaders, the advocacy provided by the social organizers in farmers' dealings with government actors, the anticipation of management responsibilities and simply the holding of an office, all afforded the leadership a much sought after commodity in the local social setting, *izzat*. This is a significant reward for the effort required from the leadership. The recognition of the 'other's' *izzat* is also a necessary foundation for the development of partnership with irrigation personnel. If status relations can be balanced and the dominance of one party is replaced with recognition and indeed respect, then there is a chance for negotiated agreement on a division of tasks and roles in the new irrigation institutions.¹⁰

Organizational sustainability, without continual support by social organizers, is the ultimate goal of the mobilization drives. It was originally anticipated that IWMI or OFWM would facilitate organization and capacity building, and eventually IMT at the distributaries. After a (not clearly defined) period of support during farmer management, the facilitators would withdraw and the farmers would be able to run the system by themselves and seek necessary support services on their own. As the data show, the farmers expect that irrigation personnel would continue to play a significant rôle in supporting FOs. While organization and capacity building were successfully

¹⁰ *Izzat* may be translated as honor, esteem or status. Merrey (1979) has characterized the pervasive pursuit of *izzat* in Punjabi society as a 'zero-sum game', in which one player gains at the expense of another, and a major cause for competition and jealousy. If he is correct, there may be little hope that a mutual recognition of honor and respect and, thus, a capacity for irrigation partnership can be achieved. Viewed from yet another perspective, irrigation reform is not only about institutional-structural, but also about cultural change, which encourages the valuation of mutuality over dominance.

accomplished among a group of leaders at each of the pilot distributaries, IMT has so far failed. The reasons are multiple, but it is clear that the reluctance of the irrigation authorities and provincial governments to enter into agreements with the FOs and the persistent delay of a comprehensive legal framework have prevented IMT so far. Meanwhile, the project cycles of both facilitating organizations have been completed and, in the case of IWMI, over-extended, without seeing the FOs through the whole process. Therefore, sustainability has become a precarious issue and the testing of the organizations' viability non-feasible.

Nevertheless, we wanted to know whether the farmers felt confident enough to carry on their activities without IWMI or OFWM. The level of confidence was highest among the Hakra 4-R leadership among which 80 percent answered with yes (Table 47). Only 40 percent of the grassroots members shared this opinion, while 37 percent answered no, 20 percent did not know and 1 person declined to answer. At Sirajwah, only 27 percent of the grassroots respondents and 61 percent of the leaders answered affirmatively. Thirty-five percent of the leaders did not consider their organization self-sustainable. Among the grassroots about half did not know whether their FO could carry on and 24 percent were sure it couldn't. The situation at Bhukan is similar, with 75 percent of the leaders and 26 percent of the grassroots expecting sustainability, while the great majority of the grassroots either expects a demise of the organization or can't tell.

The results and discussion in this subsection show that the leadership members at all sites almost unanimously agree that their efforts had been worthwhile. Confidence about their own abilities and status, as well as about the sustainability of the organizations is lowest among the Sirajwah leaders. Sirajwah and Bhukan also look at demands on their time, money and energies as the key obstacles. The Hakra 4-R leaders mind external interference most. The grassroots at all sites demonstrate a comparatively lower degree of confidence about themselves, their fellow farmers and the FO, and consequently show less interest in their organizations. They appear ill informed in many instances and are unable to express an informed opinion. This situation indicates a motivational crisis, which would have serious implications for the capability of the leaders to implement IMT, once the institutional context is ready. We, therefore, queried the respondents about their preparedness to support IMT.

3.5.10 Irrigation Management Transfer

Once the organizational structures was consolidated and capacity building activities were underway, the FO leadership together with the social organizers sought to promote IMT at the distributary level. A good deal of reluctance to empower farmers was experienced in negotiations with irrigation personnel and the FOs sought to initiate the transfer process by compromising on a joint management model. A memorandum of understanding (MOU) was debated among the leaders and with PIDA representatives for some time, without even achieving a partial transfer of responsibilities. The respondents gave their opinions about the prospect of taking responsibility for the assessment and collection of irrigation service fees and the process of negotiation of a joint management agreement between the Irrigation Department and the FOs.

Abiana is an issue of heated debate, as the control of financial resources is insufficiently regulated by the PIDA Acts and susceptible to competition among many stakeholders, including the Board of Revenue, the current authority in charge of fee assessment and collection. Furthermore, trust in people's capacity to handle money has been seriously eroded, because, in the past, the handling of *abiana* had been highly irregular. Underassessment of *abiana* and default on payments has been chronic in irrigation management.

Approximately two-thirds of all respondents agree that the FO should assume the responsibility of assessing and collecting *abiana* (Table 48). A considerable minority dissents or is unsure. The opponents were concerned about the FOs capacity, as they considered the membership uneducated. Some feared that dishonesty and favoritism would lead to a lack of cooperation and inequity. Some

worried about the timeliness of payments. Potential conflict with the current collectors (*lambardars*) was a concern among several respondents.

If this responsibility is transferred to the FO, they will eat up this money. They will fight, like the monkey over a *bali* (sugar cake) and kill each other while not allowing anyone to eat. The farmers will not cooperate with the FO.

Proponents stated that if honest and just people were in charge of *abiana*, the farmer organization would improve the accuracy of assessment and the rate of recovery. They emphasized that it was desirable to be no longer subjected to the *patwaris'* requests for bribes. They preferred that all farmers should be assessed and charged accurately without opportunities for evasion. Many stated that this responsibility should only be taken on, if the FO would either retain an appropriate share of the fees collected, or be granted full financial autonomy. In the latter case they would pay the government for the delivery of water.

I do not think that the FOs can do this without powers.

The FO should take this responsibility only if it gets full powers to spend the *abiana*. In this case it will be able to reduce the leakage in *abiana* assessment.

The introduction of a flat fee was preferred by some, as this would simplify the procedure and make it more transparent. However, it was argued that this would only be equitable if waterlogged fields were drained properly and fit for cultivation.

An intermediate position was proposed by several respondents who suggested that the current system of assessment and collection could be retained, perhaps with a smaller staff, but that the FOs should have the power to cross-check the assessment and charges calculated by the *patwaris*.

When it comes to money, trust is at its lowest among the community of irrigators. Therefore, the opponents wish to stay clear of this responsibility. The proponents understand that they need sufficient powers of enforcement and control over the irrigation service fees to ensure collection. If the FO was financially autonomous, it would inescapably be dependent on the correct assessment and collection of fees, in order to finance system O&M and purchase water from AWBs. This, in turn, requires the ability to punish non-compliance and deviance, as well as functioning mechanisms of accountability. Honesty and trust in financial matters may not be expected to emerge with new institutional arrangements alone, but need to grow within a new culture of collective action based on an experience of improved system performance and viability.

IMT at the distributaries is the goal of the social organization process and a key strategy of the institutional reform. The discussion of the survey results indicates that the capacity of farmers to take on responsibilities requires the transfer of powers. Farmers' willingness to accept IMT is crucial. Their willingness is, in turn, affected by their level of understanding of and participation in the process of negotiation of service agreements, which determine the rights and responsibilities of the stakeholders.

The respondents' level of involvement in and understanding as well as acceptance of the MOU process is highly uneven and blatantly reflects the differences in organizational activity between the leadership and grassroots (Table 49). At Hakra 4-R, 60 percent of the leaders clearly seek to take responsibility and assume powers for distributary management. One representative is opposed, four have no opinion and five have no knowledge about the negotiation process. At the grassroots level, only one-third support the transfer of power and responsibilities, while 57 percent are unable to comment, due to their lack of information about the process. If the leadership data are disaggregated into WUO and WUF, the respondents without knowledge or an opinion are mainly among the WUO leaders.

At Sirajwah, 96.7 percent of the grassroots members are strikingly uninformed about the transfer negotiations. About half of the leaders stated that they are prepared for the assumption of

responsibilities. Again, it is among the WUO leaders that a lack of knowledge or an opinion is most pronounced (10 out of 17). At Bhukan, the picture is similar as three-quarters of the grassroots are uninformed. However, 87.5 of the leaders support the MOU process.

Altogether 83 of all respondents, or 58 percent, at all sites had remained oblivious to the MOU negotiation process and were, therefore, unable to make an informed judgement about IMT. Of those claiming to be informed, only 5 out of the total sample are opposed to the transfer of powers. Unequivocal support of some form of irrigation management transfer was stated by 46 percent of all respondents at Hakra 4-R, by only 23 percent at Sirajwah and by 32 percent at Bhukan.

The results show that the lack of grassroots activity has caused a widespread state of ignorance about one of the most crucial aspects of the social organization effort. The fact that even among the WUO level this is the case among a significant minority, demonstrates a lack of interest and participation. The MOU negotiations have remained a top leadership activity, which was insufficiently reviewed and supported by the general membership. FO involvement in the negotiations was restricted to the Hakra 4-R and Sirajwah top-leaders as well. At Hakra 4-R this process was participatory, as the WUF office bearers reviewed drafts received from the Irrigation Department and provided their own proposals, after intensive discussions (Zaman, 1999). The Bhukan WUF respondents stated that they were merely briefed by OFWM staff about their progress. Given these limitations, the MOUs fail to be widely understood or legitimized.

The sustainability of participatory or farmer management may consequently be considered questionable. There is a danger, that the leader-focussed approach places the representative bodies, the FO management committee in particular, in the same position as the executive engineer and the sub-divisional officer in relation to the community of irrigators. If the grassroots remain insufficiently integrated and fail to absorb the new organizational culture of participatory irrigation management, their lack of commitment would jeopardize the leaders' capacity to achieve a transparent, effective, financially self-sufficient and rule-conforming farmers' organization.

However, doubts about the commitment of the grassroots are matched by doubts among the grassroots members about the leaders' commitment as well. Trust is again the key issue.

If the FO leaders want to accept these management responsibilities, they need to make sure that they can maintain justice in irrigation management. I fear that after taking on the responsibilities and powers, the FO leaders will become greedy like some sub-engineers of the Irrigation Department. If they cannot accept the burdens of honesty, they should not accept these responsibilities, because they will fail.

Many FO members clearly understand that the power to punish rule violations is one of the necessary conditions for building trust within their organizations.

The MOU will be effective, once the FO assumes the power to apply sanctions against irrigation offenders.

The enforcement of rule-bound behavior by organized farmers, in turn, requires the transfer of powers. The continued delay of experimental IMT to the pilot FOs in the FESS area is bound to destabilize the achievements made by these projects so far and is not conducive to strengthening grassroots involvement and commitment. Capacities, in the end, need to be developed and tested by practicing the tasks and responsibilities of participatory irrigation management.

4 CONCLUSION

In concluding this study, we seek to ascertain how far the farmer organization pilot projects have been able to realize the organizational structures, activities and values implied in our discussion of key concepts in the participatory reform discourse (section 2).

Participation: The organization building process at the three pilot sites has established an internal democratic governance structure, which provides a mechanism for irrigators to participate in debates, decision-making and implementation activities through a system of representation. After the election of representatives an active, educated, informed and trained, as well as self-confident and representative leadership has emerged. The social organization strategy concentrated mainly on leadership development, in order to accelerate organization establishment and to maximize the limited resources of the social organization teams. The mobilization of water users on large distributaries, such as Hakra 4-R or Sirajwah is difficult and time consuming. Organizing a representative structure, which can lead and speak for 4500 water user households, is, therefore, essential.

Given the results, it may be judged that the strategy has paid off. The respondents from among the leadership level organizations, i.e. WUO and WUF, report that they hold regular meetings with a reasonably high level of attendance. A reliable business routine is emerging and decisions are based on consensus. However, the intensive coaching of the FOs by social organizers has caused considerable dependency on their initiative and logistical support, which may lead to problems, once the social organization projects come to a close. The selected leadership is comparatively well educated, considering the rural setting. Fifty-five percent of the leaders have a grade 10 education or higher. The leadership appears generally well informed about the key issues in irrigation management and the reform process. Formal training in organizational and O&M activities was provided to and widely utilized by the leadership. The majority of leaders reported an increased sense of self-confidence and status, as a result of their participation in the FO formation process. Finally, all size classes of landholdings are represented among the office bearers, although the smallest category (10 acres and less) is proportionately underrepresented.

With the support of the social organization teams, this leadership is involved in commenting on the emerging legal framework with the irrigation authorities, has mobilized support services from governmental and non-governmental agencies and seeks to promote a culture of rule-bound irrigation management. The widespread fear that the FOs would be dominated by large landowners and handicapped by insufficient education has been proven unfounded. If the organizations are established through a well-prepared and skilled organizing team, a competent and representative leadership can be mobilized.

Participation of the wider community of irrigators, after the initial election of a WUA management committee, was, by contrast, minimal. IWMI's and OFWM's leadership-focussed mobilization strategy has accepted apathy at the grassroots level. The community of irrigators at the WUA level has remained inactive, uninformed and disinterested in farmers' participation. This lack of involvement is, in part, self-imposed, in so far as it results from the unwillingness of the grassroots to contribute to organizational activities. However, disinterest, apathy and reluctance are a typical initial condition of social organization among the target communities. These are largely inexperienced in solving common problems through collective action in resource user associations. The conventional mechanisms of coping in a competitive and relatively water scarce environment rely among others on irrigation offenses, political influence and the solidarity of kinship groups.

The social organizers were able to establish an alternative collective mechanism through representative leaders, despite the farmers' initial reluctance. Unfortunately, the links to the grassroots were not maintained, as the organizing process evolved. The WUAs and the community of water users were not part of the new network of interactions between farmer leaders, social

organizers, agency personnel and donor representatives. They missed out on most of the information circulated in these networks, did not gain from capacity building activities and were unable to provide inputs to, for example, the review of the draft rules and regulations for farmer organizations or the MOUs. Therefore, the grassroots will be ill prepared for those tasks, which require watercourse level participation under the new institutional setup. Without active and disciplined grassroots involvement, the achievement of equity, adequate fee assessment and collection, local conflict resolution and accountability of the leadership are not feasible.

Farmers' participation in maintenance activities up to the distributary level is becoming an increasingly accepted component of irrigation culture, as our data indicate. Cost-efficiency through farmer participation appears a feasible objective. However, the maintenance campaigns carried out by the FO members remained exceptional exercises designed to demonstrate capacity. Again, routinization of farmer managed maintenance is the long-term goal and requires the transfer of responsibilities.

Participation in processes involving other stakeholders was achieved to some limited extent. Most significant is the negotiation of management transfer by means of MOUs. Although this process was difficult and at times adversarial, it involved irrigation personnel and farmer representatives in an important learning experience, through which they gauged each other's interests and attempts were made to seek compromises. The farmers did negotiate on behalf of their communities as elected representatives of organizations legitimized by their constituencies. Despite their failure, these negotiations introduced the FOs as a new power factor in the irrigation scenario. The participation by farmer leaders in the review of the draft rules and regulations for farmer organizations by Hakra 4-R farmers constitutes another small achievement. The FO formed a review committee and after some initial reluctance to tackle legal texts, provided PIDA with comments. This participation was, nevertheless, not ensured by a legal or customary right, but granted by the authorities, who in the end passed a set of rules over which the farmer representatives had no power of decision-making.

Power: The discussion throughout this study has clearly emphasized that, in the end, the crux of the matter is power. The failure of management transfer up to date has prevented the empowerment of farmer organizations. Not even on an experimental basis have the existing pilot FOs been permitted to assume powers and to practice their newly acquired skills and responsibilities. The farmer leaders are keenly aware of this circumstance.

Hakra 4-R is an experiment. It would have been good if the Irrigation Department had transferred all powers unconditionally, in order to make the FO a real experiment.

Thus far, the irrigation authorities have retained all legal powers and, as we pointed out above, the emerging legal framework for the Punjab limits the financial and organizational autonomy of FOs. Grassroots demand for empowerment is reluctant as well, as our data show, and the leadership seeking empowerment is dependent on the advocacy of their facilitators and the pressure of donors and high level policy-makers to push ahead the process of reform implementation. Empowerment, consequently, remains a promise, which is hard to fulfil. Increasingly, the FOs experience a lack of purpose and their confidence in social mobilization may be eroded, if real powers and responsibilities are not transferred soon. Even if the leadership seeks to motivate more grassroots involvement and to overcome the remaining skepticism about its honesty and capacity to run distributary level O&M, it cannot sustain its legitimacy and the grassroots' interest with promises alone.

Accountability: With the failure of the MOUs, an important accountability mechanism stipulating mutual rights and responsibilities between the stakeholders was not achieved. The establishment of a system of representation through elections has set up FO-internal accountability mechanisms. Grassroots apathy, however, renders this mechanism less effective. It risks the detachment of the leadership from its constituency and undermines the democratic control of the leadership and its decision-making activities by the electorate. It also limits the emergence of alternative leaders with

sufficient skills to take over office bearer positions as necessary. Furthermore, it undermines the exercise of collective control at the watercourse level, which is essential for the establishment of rule-bound behavior and financial sustainability.

Nevertheless, at Hakra 4-R, general body representatives to the WUF, supported by the subsystem WUO members from the tail-reach and the two minors, successfully threatened their management committee. They would give their 46 percent of the vote to alternative candidates in the next committee elections, if the office bearers failed to address the problems caused by the defective lining works and outlet tampering in the distributary's mid-reach. Unfortunately, at this point the FO leadership can only seek to appeal to the PID and donors' evaluation committees. Without IMT, it lacks control over the system's physical infrastructure.

Transparency: The absence of regular information flow between the leadership and the general members betrays a significant lack of internal transparency within the FOs. The grassroots have remained ignorant of fundamental changes in the conditions of production of their livelihoods. To mobilize support and legitimacy for this transformation, the leaderships need to involve their constituencies in a widespread debate. Without such support, the objectives of the reform will not be 'owned' by the mass of farmers. Without transparent information flow and persistent mobilization at the grassroots level, the general membership can be expected to remain apathetic and the leadership detached.

As we pointed out, transparency implies a right to know. The leadership at the three sites has maintained records with varying degrees of persistence and completeness. In the course of the flow measurement training and subsequent routine measurement activities, data about the distribution conditions at the distributaries were collected. Unfortunately, the apathy of the grassroots, the detachment of the leadership and the absence of a means of intra-organizational communication, all prevented the dissemination of information and the realization of the right to know.

Transparency between stakeholder groups also remained limited. The actual negotiation and formulation of the details of the draft rules and regulations was not accessible to farmers. They were able to comment on one of the drafts, while PIDA and the Chief Minister controlled the process and final decision.

Equity: Due to the delay of IMT at the distributary level, the equitable distribution of irrigation water and the control of irrigation offenses cannot be achieved and enforced by the organized farmers. With the support of their social organizers, the FOs sought to put in place mechanisms to promote equity. The measurement of water distribution patterns in their systems was to provide data for monitoring of the flow regime and, thereby, grounds for a rational resolution of irrigation conflict. However, without power to enforce rule-bound behavior and control the physical state of the channel system, the flow measurement exercises remain mere capacity building activities without consequences.

The discussion in section 3.5.6 shows that the formation of farmer organizations occurred under rather difficult circumstances. The FESS project's rehabilitation works and the inter-distributary rotation regime affected major and often disorganizing physical and operational changes. The FOs had little influence over these measures. They lack the power and authority to establish an internal system of management of water supply and distribution, which is accepted by the farmers and can be enforced. The capacity of FOs to adequately manage the quantity, reliability and equity of water supplies can only be tested with the implementation of participatory irrigation management and the transfer of powers at the distributary level.

Capacity: The survey results indicate that the farmer leaders were exposed to key capacity building measures through formal training as well as ongoing interaction with their social organizers and with other stakeholders. Due to their lack of training and involvement, the grassroots members have yet to acquire the skills needed to ensure that watercourse level tasks, such as the assessment and

collection of *abiana* and local level conflict resolution, can be accomplished. Furthermore, it is important that capacities built through training are practiced, consolidated and routinized. Otherwise they will eventually be forgotten. The turnover of management responsibilities would have been crucial in this regard.

As the Hakra 4-R farmer leader quoted above observed, the real experiment in farmer management of distributaries is yet to come. It is tragic that all the good efforts of the three pilot-FOs and their organizers have not been rewarded with an unconditional transfer of powers on an experimental basis. Now, the farmers have to wait for the enactment of a regulatory framework, the formulation of which is not first informed by concrete experiences with what may or may not work. The experiments were designed to test the viability of the new institutions. The emerging legal framework is, instead, the outcome of an insufficiently transparent process dominated by irrigation personnel within PIDA. The balancing of relations of autonomy and dependence has so far failed. As PIDA assumes the control of the regulatory framework it treats the FOs as a subordinate unit of an administrative command structure, rather than an autonomous partner with whom to negotiate contracts and service agreements, which aim at mutual accountability. It is questionable whether the emerging relationships are conducive to the achievement of the objectives of the institutional reform.

Given the difficult circumstances observed, the fact that an active leadership has emerged at all may be judged a success against all odds. It may also be considered among the reasons for grassroots apathy, that so far individualized responses to uncertain water supplies, by means of irrigation offenses, continue to be more likely to provide short-term relief to relative water scarcity than collective action. In an environment of chronic water scarcity and low cropping intensities, competition may induce persistent conflict among water users and strain the integrative capacity of FOs, AWBs and PIDAs, as long as water users are unable to regulate this competition through their autonomous organizational structures.

5 RECOMMENDATIONS

Based on the findings of this study we make the following recommendations. They seek to address the two key problems indicated by our research: first, the improvement of the FOs' functional capacity, especially at the grassroots level; and second, the promotion of irrigation management transfer at the distributaries.

1. Activate the leadership / grassroots interface:

The social organizers need to view grassroots mobilization as an essential task in its own right, and not only as an initial stepping-stone for leadership development. Without an involved, informed, disciplined and responsible grassroots membership, the goals of distributary management are difficult to achieve. The organization will lack legitimacy, support, accountability and alternative leaders. The FOs need to become a socio-cultural institution, rather than a necessary burden.

The FO leaders in collaboration with the social organizers need to maintain regular contacts with their grassroots. It would be useful to designate responsibilities for liaison work with the grassroots to each FO leader in the general body. A division of labor can be organized according to tasks or geographical areas. Some may take on general information dissemination functions, while others care for a number of watercourses and WUAs. Each social organizer would be assigned a defined number of tasks for these activities.

Information flow, to generate transparency and understanding of the relevant issues and problems among the grassroots, is paramount. The dormancy of most WUA activity, reported by the survey's respondents, prevents the flow of information between the constituency and the leadership. As the leadership frequently interacts with various stakeholders in the irrigation sector, they are participants in debates and negotiations, about which the grassroots of the FO structure need to be informed. Conversely, information about events and discourses at the field and watercourse levels in the various reaches of the system need to travel upwards in the institutional structure. The frequent lack of knowledge and involvement among WUA members is not conducive to ownership and transparency.

The practice of regular meetings at the watercourse, to foster debate, information and knowledge, as well as problem solving, is indispensable. The WUA members, as well as designated FO leaders and social organizers should prepare an annual schedule of fixed monthly meetings. These meetings need to be well prepared and will require inputs from leaders and organizers, especially in the beginning of the organizing process.

These meetings can also be used, to provide capacity building measures on tasks and issues of relevance to watercourse level management. Local level conflict resolution, basic organizational management (procedures of meetings and keeping of records), *abiana* assessment and collection (rules, procedures and verification), watercourse maintenance and the like, would be useful topics. Farmer leaders with previous training and sufficient experience or representatives from local agencies and NGOs can provide this training. Regular debates with speakers and discussions on topics of interest, such as equity, relations with the Irrigation Department, or the progress of the institutional reform can be organized.

To provide transparent information flow on institutional and technical issues, a convenient means of communication, accessible to all members of the FO structure, as well as other stakeholders, needs to be developed. The social systems involved in irrigated agriculture in Pakistan usually comprise comparatively large populations, among whom the predominance of face to face communication limits access to information. The newsletter has been a typical means of communication and debate within and among all types of modern organizations. A newsletter can inform members about events, issues, problems and opinions as they are exchanged. For example, summary tables of monthly discharges at the watercourse, distributary and canal levels can be published for users'

reference. A newsletter would be a forum not only for FO members, but other stakeholders as well, including irrigation personnel, NGOs, businesses, local public servants and anyone concerned with managing local water resources and related issues.

Regular dissemination of information through a newsletter complements regular meetings and prepares as well as motivates water users' participation. If they are informed about issues in need of deliberation and decision-making, they are more likely to perceive a purpose for attending. Meetings at all levels are indispensable for a well functioning network of water user associations. As a network, which links its parts through frequent exchanges, organized water users and their representative bodies can effectively and equitably manage an irrigation system. Based on transparent information on technical and social conditions and objectives within their subsystems, water resource allocation and distribution can be negotiated, designed and implemented.

The establishment of a FO newsletter requires training to farmer editors by professionals experienced in newsletter production. This training may be organized simultaneously for designated farmers at several FOs. The newsletter also requires financing which may be organized by offering sponsorships and space for advertisement or information dissemination to NGOs or private businesses, such as agri-input producers and suppliers.

Other community development activities in collaboration with NGOs, such as NRSP and ActionAid, and locally active businesses need to reach the grassroots level and can be facilitated by the FO leaders and the social organizers. Among the options are local infrastructure development of roads, culverts and other facilities, agri-input distribution, health and hygiene campaigns and literacy programs.

The FO at Hakra 4-R and IWMI staff are currently engaged in several such initiatives, to increase the functional capacity of the FO. Therefore, the FO has become more multi sector oriented. This is by necessity, since the farmers continue to wait for the transfer of powers and responsibilities for distributary management.

2. Design and implement a 'weaning process':

At the beginning of the organization building phase, the farmers are usually highly dependent on their facilitators to organize meetings, set agendas, keep minutes, disseminate information and come to decisions. Social organizers are trained in managing logistics and have some important tools at their disposal, such as motorcycles, computers and photocopy machines. The farmers experience facilitation as a useful service and find the reliance on the skills and tools of social organizers convenient. Therefore, they tend to expect this service even after three years of mobilization efforts. Social organizers tend to continuously play the role of the initiator of activities, because then they can 'get things done' and show progress and success of their projects, which legitimizes their activities. The danger is, of course, that these relationships have to be terminated at the point of project closure, after which the FO leaders/members are insufficiently experienced in doing things on their own. Consequently, the FOs may not be sustainable and abandon their activities.

Awareness of the dependency problem is fundamental. The social organizers need to plan the entire mobilization strategy with an eye to weaning and the FO's independence. They need to be aware of the problems of dependency and discuss these among themselves. They need to analyze their own needs for dependency and accept that their eventual goal is to make themselves dispensable. The social organizers need to train and persistently encourage farmer leaders to mobilize activities on their own. While at the beginning they are coached and accompanied by their facilitators, they need to increasingly take responsibility and initiative on their own. The social organizers need to discuss the pitfalls of dependency with the FO representatives to build their awareness.

Training for organizational capacity needs to involve logistics skills. Systematic procedures in organizing and carrying out tasks need to be provided and practiced, first through skilled trainers and eventually through farmer to farmer training.

The social organizers also need to encourage the FOs to acquire their own equipment. Motorcycles ease their movement, allow them to spread messages fast and call meetings on a short notice. They allow farmer leaders to quickly attend to local problems on the spot. Obviously, the use of motorcycles needs to be guided by clear rules and monitoring by a reliable person (secretary), in order to avoid abuse. Computers and copy machines allow the leadership to quickly compose messages and invitations, as well as all sorts of information material and necessary correspondence. The FO members can collect money for this equipment and make a useful long-term investment in necessary tools. The financing of the social mobilization projects can also be designed in such a way that they leave some of their equipment with the FOs after their closure. Obviously, the FO leaders and other interested members need to be trained in the use of the office tools and in composing written materials. Learning how to use a computer in your FO may be a good incentive for keeping members active and involved. Eventually FO members can teach each other these skills.

However, even after project-closure the FO will need a partner or ally and advocate within the local community. Therefore, it is advisable that already during the support mobilization phase at project inception the social organizers seek to identify a local agency and/or NGO, which may be capable of taking on such a role.¹¹ The local partner needs to be mindful of encouraging the independence of the FO.

3. Promote the participation of small farmers in the FO leadership:

The survey results show that small farmers with ten acres or less of landholdings are proportionately underrepresented. It is recommended that, during the diagnostic analysis phase of social mobilization, the social organizing teams pay particular attention to the socio-economic status and problems of this group and study the causes for their potential under-representation. Among the hypothetical reasons may be their limited capacity to spend time on FO matters, as they engage in multiple income generation activities, or their lack of status and acceptance among the community of irrigators. As the causes are identified, measures to compensate for their relative disadvantage may be designed. Generally, awareness about the importance of selecting a representative leadership needs to be generated during the organization building phase. The process of selection should never be left to chance, as it will tend to reproduce entrenched power structures, unless the social organizers encourage the farmers during rapport building and consultation meetings, to develop a set of rational criteria for leadership selection.

4. Make provisions for experimental management transfer to FOs:

The current framing of rules and regulations as well as bylaws for FOs, without first making practical experiences through pilot-projects, such as those carried out by IWMI and OFWM in the FESS area, is potentially counter-productive. It serves the power interests of irrigation personnel more, than the objectives of the reform. What works and what doesn't must be experienced under realistic conditions, rather than non-transparent conjecture. Therefore, the pilot FOs should be given considerable room to experiment with various modes of management, without being locked into a preconceived legal framework. These experiences can be closely monitored by irrigation personnel, social organizers and independent observers.

The key problem will be to convince uncooperative stakeholders in various government departments to relinquish their claims to resources under their jurisdiction, for the purpose and extent of the experiment. This can be clearly defined in the MOUs, which govern agreements on the

¹¹ In the case of IWMI's small dams project, the Agency for Barani Area Development agreed to play such a role after IWMI closed down its local office and ceased project activities.

experiments. Most likely, these stakeholders will need to be compelled to accept non-interference with the experiments by a decision at the highest level of government.

If experimental transfer to existing FOs is further delayed, valuable lessons to be learned will be forgone and considerable investments of financial and human resources will be lost. In addition, the legitimacy of the reform effort, as well as of the government authorities and the development agencies responsible, will suffer. Without immediate empowerment, these FOs will have lost their purpose.

The formulation and review of binding legal provisions for FOs needs to be suspended, until the results of real experiments come in. The various reform institutions may internally agree on provisional rules and guidelines, which are flexible enough to be revised, as experiences are made. This process should be organized internal to the FOs, AWBs and PIDAs and requires sanctioning at the highest level of decision-making, i.e. FO general bodies, the board and the authority, to ensure maximum participation in decisions. Two additional measures are recommended, which should be implemented before the process of formulating binding long-term rules and regulations is resumed (recommendations 5 and 6).

5. Revise the strategy for financing irrigation system management:

To settle ongoing disputes about the allocation of funds at various system levels, a number of steps may be taken. The funding of primary level (under the AWBs and PIDA) and secondary level (under the FOs) financing of O&M should be split.

The funding-needs of distributary level management may vary from system to system and also depend on the quality of service the FO members seek and can agree on. Therefore, financial autonomy should be granted to the FOs, in order to internally set an adequate and agreed level of fees for distributary level management. This may be regulated by governmental guidelines.

The cost of funding for the primary level irrigation system requires a detailed study of the necessary tasks and staffing levels and their cost. Thereafter, a pro-rata share will need to be calculated for each distributary or minor subsystem under FO management. The FO will then collect this fee from its membership in proportion to the shares in water rights held by individual irrigators. The delivery of water to the FO will depend on the prompt payment of this fee.

In this way, financing can be shifted from administrative directives to contractual relations, which commits the service partners to implement the fees-for-service principle and generates financial responsibility. This strategy will overcome a major obstacle threatening the acceptance of the reform process among stakeholders. So far, they have been unable to find a rational basis for sharing *abiana*. The split fees structure, particularly if it was to be based on a flat fee, would simplify procedures and avoid conflict over funds.

6. Revise the PIDA Acts:

The current PIDA laws fail to stipulate clear entitlements of PIDAs, AWBs and FOs to take over powers and responsibilities from the various government departments involved in irrigation. For example, the Board of Revenue continues to be legally entitled to collect irrigation service fees. Such ambiguities and incomplete provisions lead to legal conflict and provide an opportunity to delay or undermine the institutional reform. The PIDA Acts need to be revised to express an unassailable commitment to autonomous service provision between contractually bound providers and users of services.

7. Target farmers and irrigation personnel simultaneously:

The future irrigation sector in Pakistan needs to operate through a partnership of legally and organizationally autonomous entities. Therefore, social organization, from the outset, needs to target both, farmers and irrigation personnel in its organization and capacity building measures. The

changes to be fostered will be organizational and technical, as well as socio-cultural. The lack of trust and social barriers demonstrated by our findings require real changes in the mode of operation of the irrigation system, as well as changes in the way the stakeholders communicate with and treat each other. Status barriers and distancing behavior need to be overcome, as much as new institutions and skills need to be promoted. The assumption that farmers need to do all the learning, while irrigation personnel are simply transferred from their government department to PIDA, would be erroneous. The current change strategies are fragmented and partial. They need to become more holistic, inclusive of all stakeholders and interactive. The farmers and irrigation personnel will remain interdependent and need to be supported in finding new and more productive modes of cooperation.

8. Carry out a detailed study of the causes for resistance to the implementation of the institutional reform among various stakeholders:

The reform implementation process has been slow and fraught with obstacles and setbacks. Valuable resources and time are wasted, if progress is delayed continuously. However, simply pushing reform by compelling compliance will not do. The legal provisions emerging from PIDA-internal deliberations and designs are too restrictive and IMT at the distributary level remains deferred. The stakeholders need to 'own' the process as the participatory wisdom goes. To generate this ownership, they need to be convinced of the benefits and prospects of change and they need to be able to voice their concerns and interests. Otherwise, key stakeholders may continue to delay the process or sabotage it.

To better understand the resistance to reform and to identify real opportunities for change and partnership, a detailed study of the obstacles needs to be undertaken with recommendations to re-invigorate the faltering process.

9. Mobilize a public debate on the institutional reform of the irrigation sector:

The institutional reform process has, so far, not been a subject of public debate, but rather the specialized concern of donors, policy makers, high-level government officials and a few NGOs and FOs. Such a fundamental transformation in Pakistan's primary production sector deserves a much wider public debate. There is a blatant lack of knowledge, not only among the wider public, but also among farmers and most ranks of irrigation personnel, about the reasons for and objectives of the reform, as well as the provisions made to promote these objectives. A public debate would provide policy makers, donors and other supporters of the reform with an opportunity to generate understanding and acceptance on a broader popular basis. To date, public opinion has been more susceptible to rumors and suspicion, than facts and informed opinions.

Dissemination of information is required in the mass media in all local languages. Debates among stakeholders and specialists on television and radio, and public meetings in the target areas for pilot implementation of AWBs give access to information to affected groups and the general public and give them an opportunity for questioning and discussion. Meetings for the discussion and design of the legal framework need to be open to competent stakeholder representatives, rather than being held behind the closed doors with a few irrigation managers and specialists. The outcome of these meetings needs to be widely publicized.

The changes produced by the reform will affect the lives of millions of people. They have a right to know and to participate in the process, rather than being ignorant bystanders. All stakeholders, at all levels of the social and organizational hierarchies, deserve an opportunity to contribute to the process of shaping the reforms. The organization of a public debate is a basic requirement to facilitate this process. The success of the reform will in the end depend on its acceptance. Avoiding transparency and public involvement can be expected to backfire and seriously threaten the crucial objectives of the reform.

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ANNEXURES

ANNEX 1. SAMPLING KEY

Hakra 4-R

Total interviews: 55

WUF

Management committee office bearers: 5 (all)

General body members: 5 (1 per subsystem, selected randomly)

WUO

Management committee office bearers: 5 (1 per subsystem, selected randomly)

General body members: 10 (2 per subsystem, selected randomly)

(Exclude WUF representatives from this sub-sample)

WUA

WUAs: 5 (1 per subsystem, selected randomly)

From each selected WUA, select 6 members, 2 from the head, 2 from the middle and 2 from the tail of the watercourse, 2 of which are office bearers (excluding presidents) and 4 general members (selected randomly within each category).

Select WUAs with a minimum of 5 office bearers only.

Select at least 1 respondent with holdings of 25 acres or less per head, middle and tail section.

Sirajwah

Total interviews: 54¹²

WUF

Management committee office bearers: 6 (2 from Sirajwah Main, 2 from Najeebwah Minor, 2 from Bahaderwah Minor; i.e. all)

WUO

Office bearers and general body members: 18 (6 from Sirajwah Main, 6 from Najeebwah Minor, 6 from Bahaderwah Minor; 2 from the head, middle and tail sections of each subsystem, selected randomly within each category)

WUA

WUAs: 5 (1 from Sirajwah Main, 1 from Najeebwah Minor, 3 from Bahaderwah Minor [1 each from the head, middle and tail section], selected randomly within each category)

From each selected WUA, select 6 members, 2 from the head, 2 from the middle and 2 from the tail of the watercourse, 2 of which are office bearers (excluding presidents) and 4 general members (selected randomly within each category).

Select WUAs with a minimum of 5 office bearers only.

¹² One office bearer at a Sirajwah WUO was not available for the interview: thus, the actual total is 53.

Select at least 1 respondent with holdings of 25 acres or less per head, middle and tail section.

Bhukan

Total interviews: 35

WUF

Management committee office bearers and general body members: 8 (all)

WUA

WUAs: 3 (1 from the head, 1 from the middle and 1 from the tail of the distributary, selected randomly within each category)

From each selected WUA, select 9 members, 3 from the head, 3 from the middle and 3 from the tail of the watercourse, 3 of which are office bearers (excluding presidents) and 4 general members (selected randomly within each category).

Don't select very small WUAs.

Select at least 1 respondent with holdings of 25 acres or less per head, middle and tail section.

ANNEX 2. TABLES

Distributary	WUA	WUO	WUF	Total
Hakra 4-R	30	15	10	55
Sirajwah	30	17	6	53
Bhukan	27	-	8	35
Total	87	32	24	143

Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	4	13.33	18	72.00
No	18	60.00	7	28.00
Don't know	8	26.67	0	0.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	1	3.33	22	95.65
No	21	70.00	0	0.00
Don't know	8	26.67	1	4.35
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Yes	4	14.81	7	87.50
No	16	59.26	1	12.50
Don't know	7	25.93	0	0.00

Table 3: Participation in FO Meetings				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Attended all	3	10.00	9	36.00
Attended most	3	10.00	11	44.00
Missed most	1	3.33	0	0.00
Missed all	11	36.67	0	0.00
No answer	12	40.00	5	20.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Attended all	2	6.67	11	47.83
Attended most	0	0.00	10	43.48
Missed most	0	0.00	2	8.70
Missed all	2	6.67	0	0.00
No answer	26	86.67	0	0.00
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Attended all	5	18.52	1	12.50
Attended most	5	18.52	5	62.50
Missed most	2	7.41	1	12.50
Missed all	11	40.74	0	0.00
No answer	4	14.81	1	12.50

Table 4: Notification about FO Meetings						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	7	23.33	21	84.00	28	50.91
No	14	46.67	3	12.00	17	30.91
No answer	9	30.00	1	4.00	10	18.18
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	3	10.00	22	95.65	25	47.17
No	24	80.00	0	0.00	24	45.28
No answer	3	10.00	1	4.35	4	7.55
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Yes	14	51.58	8	100.00	23	65.71
No	12	44.44	0	0.00	10	28.57
No answer	1	3.70	0	0.00	2	5.71

Table 5: Who Convened FO Meetings?				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
FOs	5	16.67	7	28.00
IWMI	6	20.00	3	12.00
FOs & IWMI	0	0.00	13	52.00
Don't know	3	10.00	0	0.00
No answer	16	53.33	2	8.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
FOs	1	3.33	9	39.13
OFWM	2	6.67	2	8.70
FOs & OFWM	0	0.00	12	52.17
Don't know	1	3.33	0	0.00
No answer	26	86.67	0	0.00
Bhukan				
	WUA		WUF	
	No.	%	No.	%
FOs	0	0.00	0	0.00
OFWM	17	62.96	2	25.00
FOs & OFWM	4	14.81	6	75.00
Don't know	4	14.81	0	0.00
No answer	2	7.41	0	0.00

Table 6: Keeping of Minutes of FO Meetings				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	1	3.33	20	80.00
No	7	23.33	4	16.00
Don't know	22	73.33	1	4.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	0	0.00	17	73.91
No	5	16.67	1	4.35
Don't know	25	83.33	5	21.74
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Yes	3	11.11	4	50.00
No	7	25.93	4	50.00
Don't know	17	62.96	0	0.00

Table 7: Actual Modus of Decision-Making				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Consensus	4	13.33	13	52.00
Majority Vote	0	0.00	1	4.00
Other	2	6.67	3	12.00
Don't know	6	20.00	0	0.00
No answer	18	60.00	8	32.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Consensus	6	20.00	16	69.57
Majority Vote	0	0.00	1	4.35
Other	1	3.33	3	13.04
Don't know	19	63.33	1	4.35
No answer	4	13.33	2	8.70
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Consensus	12	44.44	6	75.00
Majority Vote	0	0.00	0	0.00
Other	3	11.11	0	0.00
Don't know	6	22.22	0	0.00
No answer	6	22.22	2	25.00

Table 8: Preferred Modus of Decision-Making				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Consensus	10	33.33	12	48.00
Leaders decide	2	6.67	0	0.00
Majority vote	0	0.00	5	20.00
Other	11	36.67	7	28.00
No answer	0	0.00	1	4.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Consensus	20	66.67	17	73.91
Leaders decide	5	16.67	2	8.70
Majority vote	3	10.00	1	4.35
Other	2	6.67	3	13.04
No answer	0	0.00	0	0.00
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Consensus	14	51.85	6	75.00
Leaders decide	6	22.22	0	0.00
Majority vote	0	0.00	0	0.00
Other	6	22.22	2	25.00
No answer	1	3.70	0	0.00

Table 9: Overall Atmosphere during FO Meetings				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Angry confrontations	0	0.00	0	0.00
Friendly cooperation	11	36.67	20	80.00
Neutral	0	0.00	0	0.00
Other	5	16.67	3	12.00
No answer	14	46.67	2	8.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Angry confrontations	0	0.00	0	0.00
Friendly cooperation	23	76.67	22	95.65
Neutral	1	3.33	0	0.00
Other	4	13.33	1	4.35
No answer	2	6.67	0	0.00
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Angry confrontations	0	0.00	0	0.00
Friendly cooperation	17	62.96	8	100.00
Neutral	0	0.00	0	0.00
Other	10	37.04	0	0.00
No answer	0	0.00	0	0.00

Table 10: Maintenance of Financial Records				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	2	6.67	21	84.00
No	7	23.33	3	12.00
Don't know	21	70.00	1	4.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	1	3.33	16	69.57
No	4	13.33	2	8.70
Don't know	25	83.33	5	21.74
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Yes	4	14.81	2	25.00
No	7	25.93	6	75.00
Don't know	16	59.26	0	0.00

Table 11: Maintenance of Attendance Records				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	4	13.33	20	80.00
No	5	16.67	4	16.00
Don't know	21	70.00	1	4.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	0	0.00	17	73.91
No	5	16.67	1	4.35
Don't know	25	83.33	5	21.74
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Yes	3	11.11	6	75.00
No	7	25.93	2	25.00
Don't know	17	62.96	0	0.00

Table 12: Maintenance of Correspondence Records				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	4	13.33	19	76.00
No	4	13.33	3	12.00
Don't know	22	73.33	3	12.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	0	0.00	15	65.22
No	5	16.67	2	8.70
Don't know	25	83.33	6	26.09
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Yes	2	7.41	5	62.50
No	6	22.22	3	37.50
Don't know	19	70.37	0	0.00

Table 13: Presentation of the Financial Records by Finance Secretary				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	2	6.67	16	64.00
No	6	20.00	8	32.00
Don't know	11	36.67	0	0.00
No answer	11	36.67	1	4.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	1	3.33	14	60.87
No	11	36.67	7	30.43
Don't know	17	56.67	2	8.70
No answer	1	3.33	0	0.00
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Yes	2	7.41	2	25.00
No	10	37.04	6	75.00
Don't know	14	51.85	0	0.00
No answer	1	3.70	0	0.00

Table 14: Existence of FO-Internal Rules				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	2	6.67	19	76.00
No	9	30.00	4	16.00
Don't know	10	33.33	0	0.00
No answer	9	30.00	2	8.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	1	3.33	16	69.57
No	7	23.33	4	17.39
Don't know	20	66.67	3	13.04
No answer	2	6.67	0	0.00
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Yes	2	7.41	6	75.00
No	9	33.33	2	25.00
Don't know	15	55.56	0	0.00
No answer	1	3.70	0	0.00

Table 15: Observance of FO-Internal Rules				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	2	6.67	16	64.00
No	3	10.00	3	12.00
Don't know	22	73.33	5	20.00
No answer	3	10.00	1	4.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Yes	2	6.67	13	56.52
No	0	0.00	5	21.74
Don't know	0	0.00	0	0.00
No answer	28	93.33	5	21.74
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Yes	1	3.70	2	25.00
No	3	11.11	4	50.00
Don't know	1	3.70	0	0.00
No answer	22	81.48	2	25.00

Table 16: Modus of Selection of Representatives and Office Bearers				
Hakra 4-R				
	WUA		WUO/WUF	
	No.	%	No.	%
Consensus	16	53.33	21	84.00
Majority Vote	0	0.00	3	12.00
Other	1	3.33	0	0.00
Don't know	5	16.67	0	0.00
No answer	8	26.67	1	4.00
Sirajwah				
	WUA		WUO/WUF	
	No.	%	No.	%
Consensus	14	46.67	19	82.61
Majority Vote	0	0.00	4	17.39
Other	0	0.00	0	0.00
Don't know	16	53.33	0	0.00
No answer	0	0.00	0	0.00
Bhukan				
	WUA		WUF	
	No.	%	No.	%
Consensus	20	74.07	8	100.00
Majority Vote	0	0.00	0	0.00
Other	0	0.00	0	0.00
Don't know	6	22.22	0	0.00
No answer	1	3.70	0	0.00

	Hakra 4-R		Sirajwah		Bhukan	
	No.	Rank	No.	Rank	No.	Rank
Location in irrigation system	14	3	7	6	2	6
Honesty	19	1	20	2	7	3
Level of Education	19	1	17	3	7	3
Ability to spend time	13	4	12	4	2	6
Community leadership	19	1	25	1	20	1
Problem solving capacity	2	8	8	5	1	7
Closeness to community	4	7	1	10	-	-
Biraderi/kin-group membership	7	5	3	9	4	4
Size of land	4	7	5	8	2	6
Wisdom & Ability	15	2	6	7	11	2
Age	7	5	1	10	3	5
Financial Condition	5	6	5	8	-	-

Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Illiterate	11	36.67	0	0.00	11	20.00
Primary	6	20.00	2	8.00	8	14.55
Middle	6	20.00	6	24.00	12	21.82
Matric	4	13.33	4	16.00	8	14.55
F.A./F.Sc.	1	3.33	7	28.00	8	14.55
B.A./B.Sc.	1	3.33	2	8.00	3	5.45
M.A./M.Sc.	0	0.00	0	0.00	0	0.00
Other	1	3.33	4	16.00	5	9.09
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Illiterate	13	43.33	1	4.35	14	26.42
Primary	7	23.33	3	13.04	10	18.87
Middle	4	13.33	4	17.39	8	8.00
Matric	3	10.00	6	26.09	9	16.98
F.A./F.Sc.	1	3.33	5	21.74	6	11.32
B.A./B.Sc.	1	3.33	3	13.04	4	7.55
M.A./M.Sc.	1	3.33	1	4.35	2	3.77
Other	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Illiterate	14	51.85	1	12.50	15	42.86
Primary	8	29.63	3	37.50	11	31.43
Middle	2	7.41	1	12.50	3	8.57
Matric	2	7.41	1	12.50	3	8.57
F.A./F.Sc.	0	0.00	1	12.50	1	2.86
B.A./B.Sc.	1	3.70	0	0.00	1	2.86
M.A./M.Sc.	0	0.00	1	12.50	1	2.86
Other	0	0.00	0	0.00	0	0.00

Table 19: Tenancy Status						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Landowner	0	0.00	0	0.00	0	0.00
Lessee	2	6.67	0	0.00	2	3.64
Tenant	3	10.00	0	0.00	3	5.45
Owner Cultivator	22	73.33	24	96.00	46	83.64
Manager	2	6.67	1	4.00	3	5.45
Other	1	3.33	0	0.00	1	1.82
No answer	0	0.00	0	0.00	0	0.00
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Landowner	1	3.33	0	0.00	1	1.89
Lessee	1	3.33	1	4.35	2	3.77
Tenant	1	3.33	0	0.00	1	1.89
Owner Cultivator	25	83.33	21	91.30	46	86.79
Manager	0	0.00	0	0.00	0	0.00
Other	2	6.67	1	4.35	3	5.66
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Landowner	0	0.00	0	0.00	0	0.00
Lessee	2	7.41	1	12.50	3	8.57
Tenant	1	3.70	0	0.00	1	2.86
Owner Cultivator	24	88.89	7	87.50	31	88.57
Manager	0	0.00	0	0.00	0	0.00
Other	0	0.00	0	0.00	0	0.00
No answer	0	0.00	0	0.00	0	0.00

Table 20: Size of Landholdings						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
10 acres & below	12	40.00	7	28.00	19	34.55
11 to 20 acres	6	20.00	7	28.00	13	23.64
21 to 50 acres	7	23.33	5	20.00	12	21.82
51 to 100 acres	2	6.67	6	24.00	8	14.55
101 to 200 acres	2	6.67	0	0.00	2	3.64
201 to 500 acres	0	0.00	0	0.00	0	0.00
Above 500 acres	0	0.00	0	0.00	0	0.00
No answer	1	3.33	0	0.00	0	0.00
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
10 acres & below	16	53.33	1	4.35	17	32.08
11 to 20 acres	7	23.33	3	13.04	10	18.87
21 to 50 acres	6	20.00	8	34.78	14	26.42
51 to 100 acres	1	3.33	4	17.39	5	9.43
101 to 200 acres	0	0.00	5	21.74	5	9.43
201 to 500 acres	0	0.00	1	4.35	1	1.89
Above 500 acres	0	0.00	0	0.00	0	0.00
No answer	0	0.00	1	4.35	1	1.89
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
10 acres & below	16	59.26	0	0.00	16	45.71
11 to 20 acres	5	18.52	3	37.50	8	22.86
21 to 50 acres	2	7.41	3	37.50	5	14.29
51 to 100 acres	1	3.70	0	0.00	1	2.86
101 to 200 acres	0	0.00	1	12.50	1	2.86
201 to 500 acres	0	0.00	1	12.50	1	2.86
Above 500 acres	0	0.00	0	0.00	0	0.00
No answer	3	11.11	0	0.00	3	8.57

Table 21: Participation in Training						
Hakra 4-R						
	WUA (n=30)		WUO/WUF(n=25)		Total (n=55)	
	No	(%)	No	(%)	No	(%)
Financial management	0	0.00	10	40.00	10	18.18
Record keeping	0	0.00	7	28.00	7	12.73
Flow measurement	2	6.67	24	96.00	26	47.27
Walk thru maintenance survey	0	0.00	7	28.00	7	12.73
Improved irrigation practices	2	6.67	15	60.00	17	30.91
Improved agricultural practices	2	6.67	14	56.00	16	29.09
Sirajwah						
	WUA (n=30)		WUO/WUF(n=23)		Total (n=53)	
	No	(%)	No	(%)	No	(%)
Financial management	1	3.33	6	26.09	7	13.21
Record keeping	1	3.33	4	17.39	5	9.43
Flow measurement	1	3.33	21	91.30	22	41.51
Walk thru maintenance survey	1	3.33	3	13.04	4	7.55
Improved irrigation practices	1	3.33	4	17.39	5	9.43
Improved agricultural practices	1	3.33	2	8.70	3	5.66
Bhukan						
	WUA (n=27)		WUF (n=8)		Total (n=35)	
	No	(%)	No	(%)	No	(%)
Financial management	0	0.00	2	25.00	2	5.71
Record keeping	0	0.00	4	50.00	4	11.43
Flow measurement	2	7.41	6	75.00	8	22.86
Walk thru maintenance survey	0	0.00	2	25.00	2	5.71
Improved irrigation practices	0	0.00	1	12.50	1	2.86
Improved agricultural practices	3	11.11	3	37.50	6	17.14

Table 22: Satisfaction with the Current Water Distribution System												
Hakra 4-R												
	SS1		SS2		SS3		SS4		SS5		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	2	20.00	7	58.33	3	30.00	2	20.00	3	23.08	17	30.91
No	8	80.00	5	41.67	7	70.00	8	80.00	10	76.92	38	69.09
No answer	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Sirajwah												
	SS1		SS2		SS3		Total					
	No.	%	No.	%	No.	%	No.	%				
Yes	7	43.75	6	42.86	10	43.48	23	43.40				
No	9	56.25	8	57.14	13	56.52	30	56.60				
No answer	0	0.00	0	0.00	0	0.00	0	0.00				
Bhukan												
	Head		Middle		Tail		Total					
	No.	%	No.	%	No.	%	No.	%				
Yes	5	62.50	11	73.33	7	58.33	23	65.71				
No	3	37.50	4	26.67	5	41.67	12	34.29				
No answer	0	0.00	0	0.00	0	0.00	0	0.00				

Table 23: Supply of Irrigation Water since FO Establishment												
Hakra 4-R												
Quantity												
	SS1		SS2		SS3		SS4		SS5		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
More	2	20.00	4	33.33	3	30.00	2	20.00	4	30.77	15	27.27
Less	3	30.00	4	33.33	6	60.00	6	60.00	8	61.54	27	49.09
Same	5	50.00	3	25.00	1	10.00	2	20.00	1	7.69	12	21.82
No answer	0	0.00	1	8.33	0	0.00	0	0.00	0	0.00	1	1.82
Reliability												
	SS1		SS2		SS3		SS4		SS5		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
More	3	30.00	5	41.67	5	50.00	5	50.00	10	76.92	28	50.91
Less	4	40.00	2	16.67	4	40.00	4	40.00	1	7.69	15	27.27
Same	3	30.00	4	33.33	1	10.00	1	10.00	2	15.38	11	20.00
No answer	0	0.00	1	8.33	0	0.00	0	0.00	0	0.00	1	1.82
Equity												
	SS1		SS2		SS3		SS4		SS5		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
More	1	10.00	4	33.33	3	30.00	1	10.00	5	38.46	14	25.45
Less	8	80.00	3	25.00	5	50.00	5	50.00	7	53.85	28	50.91
Same	1	10.00	4	33.33	2	20.00	4	40.00	1	7.69	12	21.82
No answer	0	0.00	1	8.33	0	0.00	0	0.00	0	0.00	1	1.82

Table 24: Supply of Irrigation Water since FO Establishment									
Sirajwah									
Quantity									
	SS1		SS2		SS3		Total		
	No.	%	No.	%	No.	%	No.	%	
More	4	25.00	2	14.29	6	26.09	12	22.64	
Less	4	25.00	5	35.71	11	47.83	20	37.74	
Same	8	50.00	7	50.00	6	26.09	21	39.62	
No answer	0	0.00	0	0.00	0	0.00	0	0.00	
Reliability									
	SS1		SS2		SS3		Total		
	No.	%	No.	%	No.	%	No.	%	
More	3	18.75	1	13.00	6	26.09	10	18.87	
Less	3	18.75	13	92.86	3	13.04	19	35.85	
Same	10	62.50	0	0.00	14	60.87	24	45.28	
No answer	0	0.00	0	0.00	0	0.00	0	0.00	
Equity									
	SS1		SS2		SS3		Total		
	No.	%	No.	%	No.	%	No.	%	
More	3	18.75	2	14.29	5	21.74	10	18.87	
Less	3	18.75	3	21.43	6	26.09	12	22.64	
Same	10	62.50	9	64.29	11	47.83	30	56.60	
No answer	0	0.00	0	0.00	1	4.35	1	1.89	

Table 25: Supply of Irrigation Water since FO Establishment								
Bhukan								
Quantity								
	Head		Middle		Tail		Total	
	No.	%	No.	%	No.	%	No.	%
More	3	37.50	3	20.00	5	41.67	11	31.43
Less	4	50.00	7	46.67	2	16.67	13	37.14
Same	1	12.50	2	13.33	4	33.33	7	20.00
No answer	0	0.00	3	20.00	1	8.33	4	11.43
Reliability								
	Head		Middle		Tail		Total	
	No.	%	No.	%	No.	%	No.	%
More	3	37.50	3	20.00	1	8.33	7	20.00
Less	2	25.00	4	26.67	4	33.33	10	28.57
Same	3	37.50	6	40.00	6	50.00	15	42.86
No answer	0	0.00	2	13.33	1	8.33	3	8.57
Equity								
	Head		Middle		Tail		Total	
	No.	%	No.	%	No.	%	No.	%
More	2	25.00	4	26.67	2	16.67	8	22.86
Less	3	37.50	4	26.67	5	41.67	12	34.29
Same	3	37.50	4	26.67	4	33.33	11	31.43
No answer	0	0.00	3	20.00	1	8.33	4	11.43

Table 26: Incidence of Irrigation Offences since FO Establishment: Outlet Tampering												
Hakra 4-R												
	SS1		SS2		SS3		SS4		SS5		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
More	4	40.00	1	8.33	1	10.00	8	80.00	4	30.77	18	32.73
Less	2	20.00	5	41.67	6	60.00	1	10.00	9	69.23	23	41.82
Same	3	30.00	5	41.67	3	30.00	1	10.00	0	0.00	12	21.82
No answer	1	10.00	1	8.33	0	0.00	0	0.00	0	0.00	2	3.64
Sirajwah												
	SS1		SS2		SS3		Total					
	No.	%	No.	%	No.	%	No.	%				
More	2	12.50	0	0.00	3	13.04	5	9.43				
Less	9	56.25	14	100.00	17	73.91	40	75.47				
Same	5	31.25	0	0.00	3	13.04	8	15.09				
No answer	0	0.00	0	0.00	0	0.00	0	0.00				
Bhukan												
	Head		Middle		Tail		Total					
	No.	%	No.	%	No.	%	No.	%				
More	1	12.50	1	6.67	2	16.67	4	11.43				
Less	7	87.50	9	60.00	9	75.00	25	71.43				
Same	0	0.00	2	13.33	1	8.33	3	8.57				
No answer	0	0.00	3	20.00	0	0.00	3	8.57				

Table 27: Incidence of Irrigation Offences since FO Establishment: Illegal Pipes												
Hakra 4-R												
	SS1		SS2		SS3		SS4		SS5		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
More	1	10.00	0	0.00	3	30.00	1	10.00	2	15.38	7	12.73
Less	4	40.00	7	58.33	6	60.00	7	70.00	11	84.62	35	63.64
Same	3	30.00	4	33.33	1	10.00	2	20.00	0	0.00	10	18.18
No answer	2	20.00	1	8.33	0	0.00	0	0.00	0	0.00	3	5.45
Sirajwah												
	SS1		SS2		SS3		SS4		SS5		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
More	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Less	11	68.75	13	92.86	20	86.96	20	86.96	44	86.96	44	83.02
Same	5	31.25	1	7.14	3	13.04	3	13.04	9	13.04	9	16.98
No answer	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bhukan												
	Head		Middle		Tail		SS4		SS5		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
More	1	12.50	2	13.33	2	16.67	2	16.67	5	16.67	5	14.29
Less	6	75.00	9	60.00	9	75.00	9	75.00	24	75.00	24	68.57
Same	1	12.50	1	6.67	1	8.33	1	8.33	3	8.33	3	8.57
No answer	0	0.00	3	20.00	0	0.00	0	0.00	3	0.00	3	8.57

Table 28: Incidence of Irrigation Offences since FO Establishment: Placement of Obstacles												
Hakra 4-R												
	SS1		SS2		SS3		SS4		SS5		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
More	0	0.00	1	8.33	3	30.00	0	0.00	4	30.77	8	14.55
Less	8	80.00	6	50.00	5	50.00	6	60.00	8	61.54	33	60.00
Same	1	10.00	4	33.33	2	20.00	3	30.00	0	0.00	10	18.18
No answer	1	10.00	1	8.33	0	0.00	1	10.00	1	7.69	4	7.27
Sirajwah												
	SS1		SS2		SS3		SS4		SS5		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
More	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Less	10	62.50	14	100.00	20	86.96	20	86.96	44	86.96	44	83.02
Same	6	37.50	0	0.00	3	13.04	3	13.04	9	13.04	9	16.98
No answer	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bhukan												
	Head		Middle		Tail		SS4		SS5		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
More	4	50.00	4	26.67	3	25.00	3	25.00	11	25.00	11	31.43
Less	2	25.00	7	46.67	7	58.33	7	58.33	16	46.67	16	45.71
Same	2	25.00	1	6.67	2	16.67	2	16.67	5	16.67	5	14.29
No answer	0	0.00	3	20.00	0	0.00	0	0.00	3	0.00	3	8.57

Table 29: Level of Conflict since FO Establishment						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Increased	3	10.00	1	4.00	4	7.27
Decreased	3	10.00	14	56.00	17	30.91
Same	2	6.67	2	8.00	4	7.27
No conflict	19	63.33	7	28.00	26	47.27
Don't know	3	10.00	1	4.00	4	7.27
No answer	0	0.00	0	0.00	0	0.00
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Increased	1	3.33	2	8.70	3	5.66
Decreased	3	10.00	8	34.78	11	20.75
Same	16	53.33	6	26.09	22	41.51
No conflict	5	16.67	5	21.74	10	18.87
Don't know	5	16.67	2	8.70	7	13.21
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Increased	2	7.41	0	0.00	2	5.71
Decreased	2	7.41	2	25.00	4	11.43
Same	2	7.41	1	12.50	3	8.57
No conflict	18	66.67	5	62.50	23	65.71
Don't know	3	11.11	0	0.00	3	8.57
No answer	0	0.00	0	0.00	0	0.00

Table 30: Preferred Conflict Resolution Agency before FO Establishment						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Panchayat	11	36.67	5	20.00	16	29.09
Govt.	15	50.00	20	80.00	35	63.64
No conflict	2	6.67	0	0.00	2	3.64
Don't know	0	0.00	0	0.00	0	0.00
No answer	2	6.67	0	0.00	2	3.64
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Panchayat	17	56.67	8	34.78	25	47.17
Govt.	12	40.00	14	60.87	26	49.06
No conflict	1	3.33	0	0.00	1	1.89
Don't know	0	0.00	1	4.35	1	1.89
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Panchayat	17	62.96	2	25.00	19	54.29
Govt.	4	14.81	6	75.00	10	28.57
No conflict	6	22.22	0	0.00	6	17.14
Don't know	0	0.00	0	0.00	0	0.00
No answer	0	0.00	0	0.00	0	0.00

Table 31: Preferred Conflict Resolution Agency since FO Establishment						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
FO	0	0.00	14	56.00	14	25.45
Panchayat	2	6.67	1	4.00	3	5.45
Govt.	0	0.00	0	0.00	0	0.00
No conflict	16	53.33	8	32.00	24	43.64
Don't know	10	33.33	0	0.00	10	18.18
No answer	2	6.67	2	8.00	4	7.27
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
FO	3	10.00	10	43.48	13	24.53
Panchayat	2	6.67	2	8.70	4	7.55
Govt.	1	3.33	6	26.09	7	13.21
No conflict	3	10.00	3	13.04	6	11.32
Don't know	15	50.00	1	4.35	16	30.19
No answer	6	20.00	1	4.35	7	13.21
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
FO	5	18.52	5	62.50	10	28.57
Panchayat	4	14.81	0	0.00	4	11.43
Govt.	3	11.11	1	12.50	4	11.43
No conflict	10	37.04	0	0.00	10	28.57
Don't know	5	18.52	0	0.00	5	14.29
No answer	0	0.00	1	12.50	1	2.86

Table 32: Participation in Maintenance of Watercourses before FO Establishment						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	28	93.33	25	100.00	53	96.36
No	1	3.33	0	0.00	1	1.82
No answer	1	3.33	0	0.00	1	1.82
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	29	96.67	23	100.00	52	98.11
No	1	3.33	0	0.00	1	1.89
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Yes	24	88.89	8	100.00	32	91.43
No	3	11.11	0	0.00	3	8.57
No answer	0	0.00	0	0.00	0	0.00

Table 33: Participation in Maintenance of Watercourses since FO Establishment						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	29	96.67	25	100.00	54	98.18
No	0	0.00	0	0.00	0	0.00
No answer	1	3.33	0	0.00	1	1.82
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	28	93.33	21	91.30	49	92.45
No	0	0.00	2	8.70	2	3.77
No answer	2	6.67	0	0.00	2	3.77
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Yes	27	100.00	8	100.00	35	100.00
No	0	0.00	0	0.00	0	0.00
No answer	0	0.00	0	0.00	0	0.00

Table 34: Participation in Maintenance of Distributaries before FO Establishment						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	7	23.33	7	28.00	14	25.45
No	23	76.67	18	72.00	41	74.55
No answer	0	0.00	0	0.00	0	0.00
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	13	43.33	15	65.22	28	52.83
No	17	56.67	8	34.78	25	47.17
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Yes	19	70.37	7	87.50	26	74.29
No	8	29.63	1	12.50	9	25.71
No answer	0	0.00	0	0.00	0	0.00

Table 35: Participation in Maintenance of Distributaries since FO Establishment						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	19	63.33	18	72.00	37	67.27
No	11	36.67	7	28.00	18	32.73
No answer	0	0.00	0	0.00	0	0.00
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	1	3.33	3	13.04	4	7.55
No	29	96.67	20	86.96	49	92.45
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Yes	13	48.15	7	87.50	20	57.14
No	14	51.85	1	12.50	15	42.86
No answer	0	0.00	0	0.00	0	0.00

Table 36: Contributions to Maintenance						
Hakra 4-R						
	WUA (n=30)		WUO/WUF (n=25)		Total (n=55)	
	No.	%	No.	%	No.	%
Labor	27	90.00	25	100.00	52	94.55
Cash	0	0.00	0	0.00	0	0.00
Kind	7	23.33	16	64.00	23	41.82
None	0	0.00	0	0.00	0	0.00
No answer	3	10.00	0	0.00	3	5.45
Sirajwah						
	WUA (n=30)		WUO/WUF (n=23)		Total (n=53)	
	No.	%	No.	%	No.	%
Labor	26	86.67	23	100.00	49	92.45
Cash	0	0.00	0	0.00	0	0.00
Kind	1	3.33	3	13.04	4	7.55
None	4	13.33	0	0.00	4	7.55
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA (n=27)		WUF (n=8)		Total (n=35)	
	No.	%	No.	%	No.	%
Labor	24	88.89	7	87.50	31	88.57
Cash	6	22.22	0	0.00	6	17.14
Kind	0	0.00	2	25.00	2	5.71
None	1	3.70	0	0.00	1	2.86
No answer	0	0.00	1	12.50	1	2.86

Table 37: Willingness to Contribute to Maintenance in the Future						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	25	83.33	22	88.00	47	85.45
No	5	16.67	1	4.00	6	10.91
Don't know	0	0.00	0	0.00	0	0.00
No answer	0	0.00	2	8.00	2	3.64
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	26	86.67	23	100.00	49	92.45
No	0	0.00	0	0.00	0	0.00
Don't know	0	0.00	0	0.00	0	0.00
No answer	4	13.33	0	0.00	4	7.55
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Yes	24	88.89	6	75.00	30	85.71
No	1	3.70	2	25.00	3	8.57
Don't know	2	7.41	0	0.00	2	5.71
No answer	0	0.00	0	0.00	0	0.00

Table 38: Relationship between Farmers and Government / Other Agencies since FO Establishment								
Hakra 4-R (n=55)								
	Improved		Worse		Same		No answer	
	No.	%	No.	%	No.	%	No.	%
Irrigation Dept.	16	29.09	21	38.18	16	29.09	53	96.36
OFWM	8	14.55	2	3.64	35	63.64	45	81.82
Agricultural Extension	9	16.36	4	7.27	32	58.18	45	81.82
Private Business	17	30.91	3	5.45	26	47.27	46	83.64
Sirajwah (n=53)								
	Improved		Worse		Same		No answer	
	No.	%	No.	%	No.	%	No.	%
Irrigation Dept.	8	15.09	7	13.21	36	67.92	51	96.23
OFWM	17	32.08	0	0.00	34	64.15	51	96.23
Agricultural Extension	3	5.66	1	1.89	46	86.79	50	94.34
Private Business	12	22.64	1	1.89	38	71.70	51	96.23
Bhukan (n=35)								
	Improved		Worse		Same		No answer	
	No.	%	No.	%	No.	%	No.	%
Irrigation Dept.	2	5.71	6	17.14	23	65.71	31	88.57
OFWM	18	51.43	0	0.00	13	37.14	31	88.57
Agricultural Extension	2	5.71	0	0.00	29	82.86	31	88.57
Private Business	3	8.57	0	0.00	29	82.86	32	91.43

Table 39: Difficulties affecting the relationship between the FO and Government / Other Agencies								
Hakra 4-R (n=55)								
	Agency people's power & status		Corruption by influential farmers		Corruption by agency staff		Conflicts between FOs & agency staff	
	No.	%	No.	%	No.	%	No.	%
PID	27	49.09	19	34.55	30	54.55	24	43.64
Police	6	10.91	5	9.09	8	14.55	0	0.00
Govt.	2	3.64	0	0.00	0	0.00	0	0.00
Legal System	1	1.82	0	0.00	1	1.82	0	0.00
WAPDA	1	1.82	1	1.82	0	0.00	0	0.00
Revenue Dept.	3	5.45	2	3.64	6	10.91	0	0.00
Banks/NGOs	0	0.00	0	0.00	0	0.00	0	0.00
ADBP	1	1.82	0	0.00	0	0.00	0	0.00
OFWM	0	0.00	0	0.00	0	0.00	0	0.00
IWMI	0	0.00	0	0.00	0	0.00	0	0.00
Sirajwah (n=53)								
	Agency people's power & status		Corruption by influential farmers		Corruption by agency staff		Conflicts between FOs & agency staff	
	No.	%	No.	%	No.	%	No.	%
PID	26	49.06	16	30.19	27	50.94	13	24.53
Police	0	0.00	1	1.89	3	5.66	0	0.00
Govt.	1	1.89	0	0.00	0	0.00	0	0.00
Legal System	0	0.00	0	0.00	0	0.00	0	0.00
WAPDA	0	0.00	0	0.00	0	0.00	0	0.00
Revenue Dept.	1	1.89	1	1.89	3	5.66	0	0.00
Banks/NGOs	0	0.00	0	0.00	0	0.00	0	0.00
ADBP	0	0.00	0	0.00	0	0.00	0	0.00
OFWM	0	0.00	0	0.00	0	0.00	0	0.00
IWMI	0	0.00	0	0.00	0	0.00	0	0.00
Bhukan (n=35)								
	Agency people's power & status		Corruption by influential farmers		Corruption by agency staff		Conflicts between FOs & agency staff	
	No.	%	No.	%	No.	%	No.	%
PID	18	51.43	3	8.57	11	31.43	2	5.71
Police	1	2.86	0	0.00	1	2.86	1	2.86
Govt.	0	0.00	0	0.00	0	0.00	0	0.00
Legal System	0	0.00	0	0.00	0	0.00	0	0.00
WAPDA	0	0.00	0	0.00	0	0.00	0	0.00
Revenue Dept.	1	2.86	0	0.00	0	0.00	1	2.86
Banks/NGOs	0	0.00	0	0.00	0	0.00	0	0.00
ADBP	0	0.00	0	0.00	0	0.00	0	0.00
OFWM	0	0.00	0	0.00	0	0.00	0	0.00
IWMI	0	0.00	0	0.00	0	0.00	0	0.00

Table 40: Agencies Expected to Provide Support Services to the FO in the Future										
Hakra 4-R (n=55)										
	Operation		Maintenance		FO Management		Finance/ Credit		Conflict Mediation	
	No.	%	No.	%	No.	%	No.	%	No.	%
PID	30	54.55	16	29.09	3	5.45	1	1.82	3	5.45
Police	2	3.64	0	0.00	0	0.00	0	0.00	1	1.82
Govt.	0	0.00	0	0.00	1	1.82	3	5.45	3	5.45
Legal System	0	0.00	0	0.00	0	0.00	1	1.82	13	23.64
WAPDA	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Revenue Dept.	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Banks/NGOs	1	1.82	0	0.00	0	0.00	18	32.73	0	0.00
ADBP	0	0.00	0	0.00	0	0.00	24	43.64	0	0.00
OFWM	0	0.00	0	0.00	1	1.82	0	0.00	0	0.00
IWMI	8	14.55	6	10.91	17	30.91	3	5.45	10	18.18
Sirajwah (n=53)										
	Operation		Maintenance		FO Management		Finance/ Credit		Conflict Mediation	
	No.	%	No.	%	No.	%	No.	%	No.	%
PID	32	60.38	26	49.06	13	24.53	10	18.87	6	11.32
Police	2	3.77	0	0.00	0	0.00	2	3.77	1	1.89
Govt.	0	0.00	0	0.00	0	0.00	6	11.32	6	11.32
Legal System	0	0.00	0	0.00	0	0.00	0	0.00	9	16.98
WAPDA	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Revenue Dept.	0	0.00	1	1.89	0	0.00	12	22.64	0	0.00
Banks/NGOs	0	0.00	0	0.00	0	0.00	5	9.43	0	0.00
ADBP	0	0.00	0	0.00	0	0.00	1	1.89	0	0.00
OFWM	0	0.00	2	3.77	15	28.30	1	1.89	2	3.77
IWMI	0	0.00	0	0.00	1	1.89	0	0.00	0	0.00
Bhukan (n=35)										
	Operation		Maintenance		FO Management		Finance/ Credit		Conflict Mediation	
	No.	%	No.	%	No.	%	No.	%	No.	%
PID	20	57.14	20	57.14	2	5.71	4	11.43	2	5.71
Police	4	11.43	0	0.00	0	0.00	0	0.00	0	0.00
Govt.	0	0.00	0	0.00	0	0.00	3	8.57	0	0.00
Legal System	0	0.00	0	0.00	0	0.00	0	0.00	3	8.57
WAPDA	1	2.86	0	0.00	0	0.00	0	0.00	0	0.00
Revenue Dept.	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Banks/NGOs	0	0.00	0	0.00	0	0.00	10	28.57	0	0.00
ADBP	0	0.00	0	0.00	0	0.00	8	22.86	0	0.00
OFWM	1	2.86	1	2.86	15	42.86	2	5.71	1	2.86
IWMI	0	0.00	0	0.00	0	0.00	0	0.00	1	2.86

Table 41: Usefulness of Social Organization Activities by OFWM / IWMI						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	20	66.67	25	100.00	45	81.82
No	3	10.00	0	0.00	3	5.45
Don't know	6	20.00	0	0.00	6	10.91
No answer	1	3.33	0	0.00	1	1.82
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	11	36.67	22	95.65	33	62.26
No	1	3.33	1	4.35	2	3.77
Don't know	17	56.67	0	0.00	17	32.08
No answer	1	3.33	0	0.00	1	1.89
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Yes	13	48.15	7	87.50	20	57.14
No	2	7.41	1	12.50	3	8.57
Don't know	12	44.44	0	0.00	12	34.29
No answer	0	0.00	0	0.00	0	0.00

Table 42: Usefulness of Farmers' Efforts for the FO						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	14	46.67	25	100.00	39	70.91
No	13	43.33	0	0.00	13	23.64
Don't know	3	10.00	0	0.00	3	5.45
No answer	0	0.00	0	0.00	0	0.00
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	15	50.00	21	91.30	36	67.92
No	2	6.67	0	0.00	2	3.77
Don't know	13	43.33	2	8.70	15	28.30
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Yes	14	51.85	6	75.00	20	57.14
No	3	11.11	2	25.00	5	14.29
Don't know	9	33.33	0	0.00	9	25.71
No answer	1	3.70	0	0.00	1	2.86

Table 43: Willingness of Other Farmers to Cooperate						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Improved	11	36.67	19	76.00	30	54.55
Decreased	2	6.67	0	0.00	2	3.64
No change	12	40.00	5	20.00	17	30.91
No answer	5	16.67	1	4.00	6	10.91
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Improved	2	6.67	15	65.22	17	32.08
Decreased	0	0.00	0	0.00	0	0.00
No change	28	93.33	8	34.78	36	67.92
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Improved	9	33.33	6	75.00	15	42.86
Decreased	0	0.00	0	0.00	0	0.00
No change	15	55.56	2	25.00	17	48.57
No answer	3	11.11	0	0.00	3	8.57

Table 44: The Efforts of FO should be Increased						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	24	80.00	24	96.00	48	87.27
No	0	0.00	1	4.00	1	1.82
Don't know	6	20.00	0	0.00	6	10.91
No answer	0	0.00	0	0.00	0	0.00
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	22	73.33	22	95.65	44	83.02
No	0	0.00	1	4.35	1	1.89
Don't know	8	26.67	0	0.00	8	15.09
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Yes	15	55.56	8	100.00	23	65.71
No	0	0.00	0	0.00	0	0.00
Don't know	12	44.44	0	0.00	12	34.29
No answer	0	0.00	0	0.00	0	0.00

Table 45: Main Difficulties Experienced while Participating in the FO						
Hakra 4-R						
	WUA (n=30)		WUO/WUF(n=25)		Total (n=55)	
	No	(%)	No	(%)	No	(%)
Too much time & effort spent	7	23.33	8	32.00	15	27.27
Members are unfamiliar	4	13.33	8	32.00	12	21.82
Too much money needed	6	20.00	6	24.00	12	21.82
Rumors spread to discredit	14	46.67	19	76.00	33	60.00
Members engaged in corruption	7	23.33	6	24.00	13	23.64
Political conflict	8	26.67	3	12.00	11	20.00
Conflict between kinship-groups	6	20.00	4	16.00	10	18.18
Corruption by influential farmer	8	26.67	3	12.00	11	20.00
Sirajwah						
	WUA (n=30)		WUO/WUF(n=53)		Total (n=53)	
	No	(%)	No	(%)	No	(%)
Too much time & effort spent	7	23.33	14	60.87	21	39.62
Members are unfamiliar	6	20.00	13	56.52	19	35.85
Too much money needed	5	16.67	17	73.91	22	41.51
Rumors spread to discredit	2	6.67	8	34.78	10	18.87
Members engaged in corruption	4	13.33	3	13.04	7	13.21
Political conflict	2	6.67	4	17.39	6	11.32
Conflict between kinship-groups	2	6.67	2	8.70	4	7.55
Corruption by influential farmer	3	10.00	4	17.39	7	13.21
Bhukan						
	WUA (n=27)		WUF (n=8)		Total (n=35)	
	No	(%)	No	(%)	No	(%)
Too much time & effort spent	4	14.81	6	75.00	10	28.57
Members are unfamiliar	9	33.33	6	75.00	15	42.86
Too much money needed	3	11.11	5	62.50	8	22.86
Rumors spread to discredit	7	25.93	6	75.00	13	37.14
Members engaged in corruption	3	11.11	2	25.00	5	14.29
Political conflict	1	3.70	0	0.00	1	2.86
Conflict between kinship-groups	1	3.70	0	0.00	1	2.86
Corruption by influential farmer	2	7.41	0	0.00	2	5.71

Table 46: Level of Self-respect and Confidence since FO Establishment						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Increased	11	36.67	24	96.00	35	63.64
No difference	13	43.33	1	4.00	14	25.45
No answer	6	20.00	0	0.00	6	10.91
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Increased	1	3.33	18	78.26	19	35.85
No difference	29	96.67	5	21.74	34	64.15
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Increased	4	14.81	8	100.00	12	34.29
No difference	21	77.78	0	0.00	21	60.00
No answer	2	7.41	0	0.00	2	5.71

Table 47: Ability to Continue FO Activities after Closure of Social Organization Project						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	12	40.00	20	80.00	32	58.18
No	11	36.67	5	20.00	16	29.09
Don't know	6	20.00	0	0.00	6	10.91
No answer	1	3.33	0	0.00	1	1.82
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	8	26.67	14	60.87	22	41.51
No	7	23.33	8	34.78	15	28.30
Don't know	14	46.67	1	4.35	15	28.30
No answer	1	3.33	0	0.00	1	1.89
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Yes	7	25.93	6	75.00	13	37.14
No	11	40.74	2	25.00	13	37.14
Don't know	8	29.63	0	0.00	8	22.86
No answer	1	3.70	0	0.00	1	2.86

Table 48: Assumption of Responsibility for Assessment and Collection of <i>Abiana</i> by FO						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	20	66.67	17	68.00	37	67.27
No	9	30.00	7	28.00	16	29.09
Don't know	0	0.00	0	0.00	0	0.00
No answer	1	3.33	1	4.00	2	3.64
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Yes	20	66.67	14	60.87	34	64.15
No	4	13.33	9	39.13	13	24.53
Don't know	6	20.00	0	0.00	6	11.32
No answer	0	0.00	0	0.00	0	0.00
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Yes	16	59.26	5	62.50	21	60.00
No	9	33.33	3	37.50	12	34.29
Don't know	2	7.41	0	0.00	2	5.71
No answer	0	0.00	0	0.00	0	0.00

Table 49: Acceptance of Irrigation Management Transfer (IMT) at the Distributary Level						
Hakra 4-R						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Accept	10	33.33	15	60.00	25	45.45
Don't accept	2	6.67	1	4.00	3	5.45
No opinion	1	3.33	4	16.00	5	9.09
No knowledge of IMT process	17	56.67	5	20.00	22	40.00
Sirajwah						
	WUA		WUO/WUF		Total	
	No.	%	No.	%	No.	%
Accept	1	3.33	11	47.83	12	22.64
Don't accept	0	0.00	0	0.00	0	0.00
No opinion	0	0.00	2	8.70	2	3.77
No knowledge of IMT process	29	96.67	10	43.48	39	73.58
Bhukan						
	WUA		WUF		Total	
	No.	%	No.	%	No.	%
Accept	4	14.81	7	87.50	11	31.43
Don't accept	2	7.41	0	0.00	2	5.71
No opinion	0	0.00	0	0.00	0	0.00
No knowledge of IMT process	21	77.78	1	12.50	22	62.86