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**MOBILIZING SOCIAL ORGANIZATION VOLUNTEERS:
AN INITIAL METHODOLOGICAL STEP TOWARDS ESTABLISHING
EFFECTIVE WATER USERS ORGANIZATIONS**



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SUMMARY

IIMI's action research pilot project on social organization in the Hakra 4-R Distributary in Haroonabad initiated a strategy of involving community-based volunteers. This strategy has helped in supplementing the small field team in reaching the water users scattered within a large area. In addition to this advantage of increasing the manpower resources for the project, the deployment of these Social Organization Volunteers (SOVs) selected from the community has greatly helped in improving the trust and cooperation among the water users, and more importantly in clarifying the project objectives to the people who started to be apprehensive at the beginning of the project. This paper presents some salient features of the process of selecting these volunteers, and the results of interactions between IIMI's field team, the SOVs, and small groups of water users, during a series of awareness-building meetings held recently.

Some perceptions among the water users, as identified during these meetings, suggest that they are very much interested in establishing water users organizations, but would like to ensure that the transfer of any management functions to the organizations would not adversely affect the present levels of costs and benefits to the average individual water user. They also show a great interest in improving the maintenance of the physical system and the equity in water distribution.

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1. INTRODUCTION

This paper is derived from a process documentation of some on-going field activities related to the action research project, "Managing Irrigation for Environmentally Sustainable Agriculture in Pakistan". The project has been launched in the southeast of Punjab Province (Figure 1) by the International Irrigation Management Institute (IIMI), and is funded by the Royal Netherlands Government. One of the main objectives of the project's institutional development component is to enhance the institutional capacity in the project area for adapting improved management strategies to alleviate trends in soil salinity and sodicity.

As a solution to some of the deep-rooted problems of irrigation management in Pakistan, the involvement of water users in managing the irrigation systems is seen as an imperative for the efficient water distribution, system operation and maintenance, and revenue assessment and collection. The considered opinion has been that if the water users are adequately organized, well trained, and provided with the necessary technical guidance, they can operate and maintain part of the irrigation system more efficiently than an outside agency. Another underlying assumption is that the water user's participation in management can be maximized through a well planned effort to organize them.

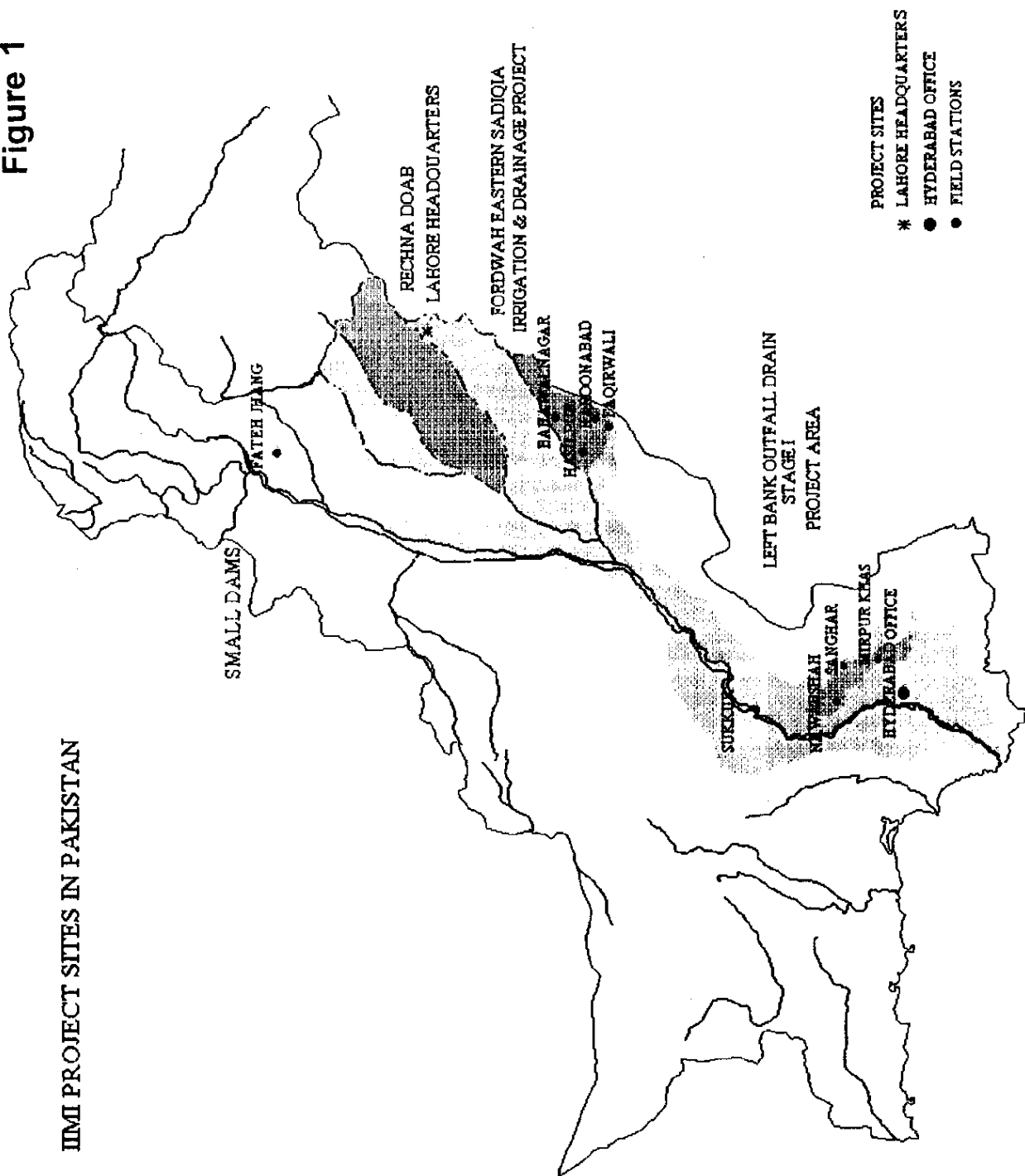
Based on these propositions, a pilot scale action research activity was started on the 4-R Distributary off the Hakra Branch Canal in the Fordwah Eastern Sadiqia (South) Irrigation and Drainage Project area (Figure 2) for establishing viable water users organizations at the distributary canal level. This paper focuses on the process of identifying and mobilizing some community-based volunteers selected from the pilot area for assisting in the project's field activities. The paper begins with an outline of the methodology adopted in organizing water users, followed by a brief description of the action research pilot site, and proceeds to describe how the volunteers were identified, their perceptions on participation and joint-management of irrigation systems, including their doubts, suggestions and recommendations for possible success.

2. ACTION RESEARCH METHODOLOGY

Maloney (1994) suggests that there are four basic ways in which the farmers organize themselves to manage irrigation water. These different ways can also be combined in tiers to form different organizational options. Among these, the most suitable combination will have to be selected for a particular context, taking into account the size, functions, social traditions, state policies and law, as well as the source and regularity of water, type of irrigation system, settlement pattern, crops. etc. The four basic organizational methods are:

Figure 1

IMI PROJECT SITES IN PAKISTAN



LOCATION MAP OF THE HAKRA 4-R DISTRIBUTARY



1. Associations: These are voluntary groups which have some formal structure, institutional momentum, and defined membership, providing the members with a sense of association;
2. Informal Groups: These have little formal structure, but may be held together by the common interest of members and the initiative of leaders, to meet a temporary exigency or satisfy the request of an officer;
3. Panchayats and committees: Panchayats usually claim to represent all the members, and make decisions and undertake actions for them, with or without their full knowledge; and
4. Single Leader: In some cases, farmers manage and contribute labor for irrigation under the orders of a single leader. They may also accept him as their legitimate spokesman and decision-maker.

In providing consultancy inputs for the Project's Inception Report, Ganewatte and Pradhan (1995) suggested two alternative models of organization for the selected pilot sites. In the first model, the suggestion was to create new water users associations (WUAs) for watercourses, and once the WUAs become strong and viable and have demonstrated their ability to take over responsibility, to federate them to form a water users organization at the distributary canal level.

The other model is to start organization at the distributary canal and watercourse levels simultaneously. After a comprehensive farmer awareness program covering clusters of watercourse commands, the distributary organization is established with farmer representatives through an election or a selection process. The rationale is that a strong distributary organization can promote the establishment of strong social organization to take control of water distribution and maintenance work in the canal system in a short span of time. They also recommended the use of farmer volunteers and educated youth as catalysts in order to promote and facilitate the process of farmers organizations.

Considering past experiences from other countries, the consultants' recommendations, and the discussions held with water users during the socio-economic survey conducted at Hakra 4-R Distributary, IIMI developed a process in which some new strategies were included for establishing water users organizations. In one of these chosen strategies, the water users would choose their representatives on the basis of watercourses, who in turn would form organizations on the basis of subsystems² of the distributary. These subsystem level organizations would then be federated to form the distributary level water users organization.

² The subsystems were defined in such a way that the entire distributary system was divided into five portions depending on identifiable hydrological boundaries. For details of this definition, see Mirza and Hassan (1996).

This new approach contrasts with Pakistan's traditional method of initially forming water user associations at the watercourse level, one for each of the watercourses in the distributary, and then federating them at the distributary/minor canal level. This way, the formation of the distributary level organization could be achieved fairly quickly without first having to establish 120 WUAs for the 120 watercourses served by the Hakra 4-R Distributary. This approach also helps to avoid the perceived "WUA images" in reviving the previously established government sponsored water users associations.

Following this new approach, a preliminary step in the social organization process in the Hakra 4-R Distributary was to identify some suitable persons from the water users' community to be deployed as "contact farmers". This, in effect, was a starting point in developing a combination of different basic organizational methods. As the term "contact farmers" would tend to give a value-loaded connotation with reference to its popular use earlier in agricultural extension strategies, the project preferred to use a new term -- "social organization volunteers (SOVs)". These community based SOVs were selected on the basis of a pre-determined set of criteria. Basically, the SOVs should be able to work as members of the extended group of IIMI's Social Organization Field Team (**SOFT**ware), located at Haroonabad.

3. DESCRIPTION OF THE ACTION RESEARCH SITE

The Hakra 4-R Distributary offtakes at Gulab Ali Headworks off the Hakra Branch Canal. The designed discharge for the distributary is 193 cusecs with a total gross command area of 49493 acres. The canal network of the 4-R Distributary has 130 outlets, out of which 120 are irrigation outlets that serve a total command area of 44,307 acres³. The total length of the main distributary channel is about 37 km, its culturable command area is about 27,610 acres, which is being irrigated by 73 outlets supplying water to about 2,765 shareholders. Two minors, 1RA Labsingh and 1R Badruwala offtake from the main Hakra 4-R Distributary. The schematic diagram of the distributary is shown in Figure 3.

Minor 1RA Labsingh

Minor 1RA Labsingh consists of 15 irrigation outlets having a total design discharge of 22 cusecs, covering a culturable command area of 6077 acres. The total length of the minor is about 7 kms. Direct beneficiaries are about 565 shareholders.

Minor 1R Badruwala

Minor 1R Badruwala consists of 32 irrigation outlets with a total designed discharge of 43 cusecs. The covering culturable command area is 10,621 acres. The total length of the minor is 17 kms. Direct beneficiaries are about 1,393 shareholders.

³ A recent physical survey during the study accounted for a total of 146 outlets out of which 123 were supplying water for irrigation purposes (see Annex-2).

Figure 3

SCHEMATIC DIAGRAM OF 4-R DISTRIBUTARY SYSTEM

Design Data of 4-R Distributary

Authorized Discharge	=	193 Cusecs
Offtake RD.	=	89750-R (Head Ghulab Ali)
Tail RD.	=	112050
Minor	=	2 (1R/4R & 1RA/4R)
Outlets	=	84
GCA	=	30064 Acres
CCA	=	27609 Acres
Lined Reach	=	RD. 64000 to 72000
Watercourse Lined	=	47%

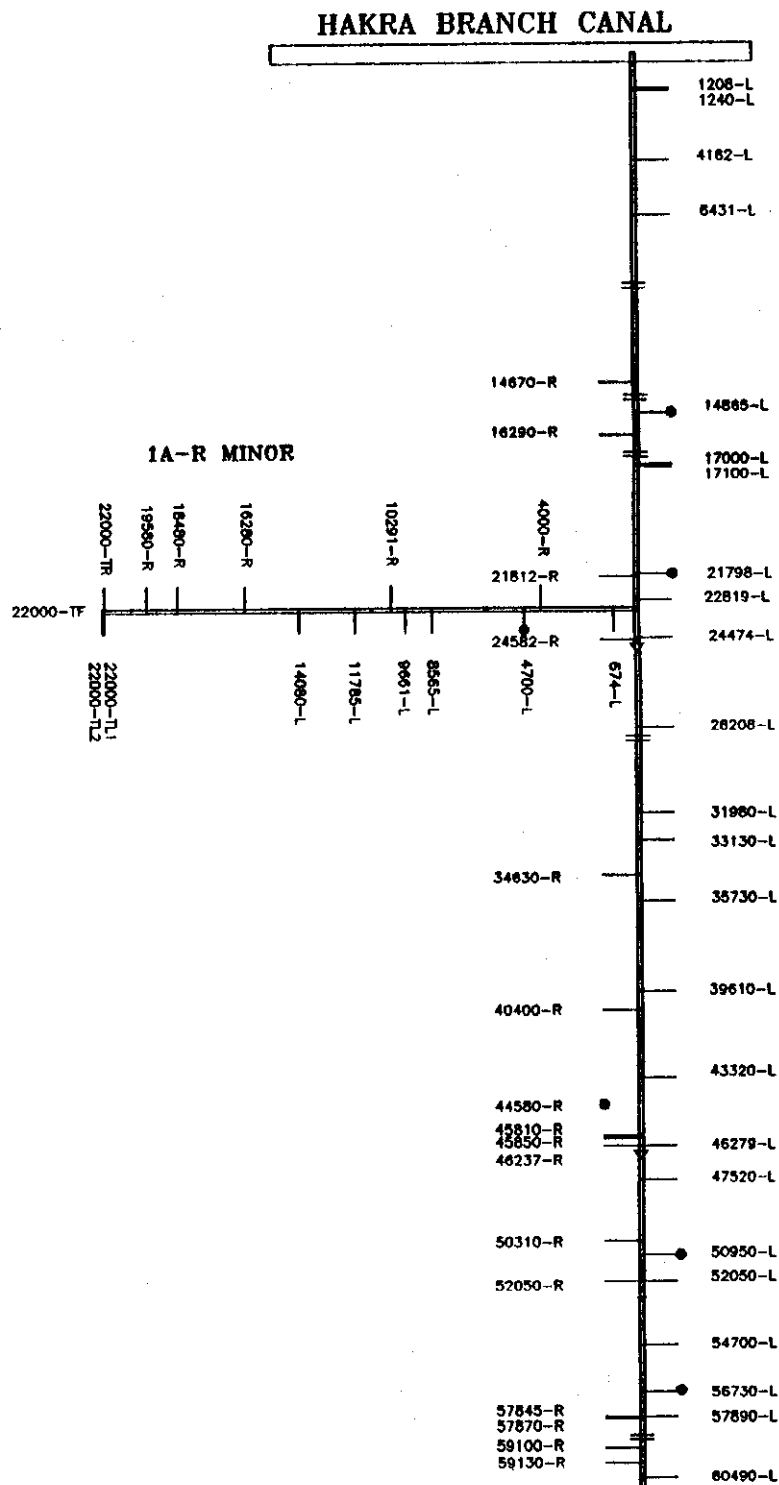
DETAIL OF MINORS

1- 1R/4R

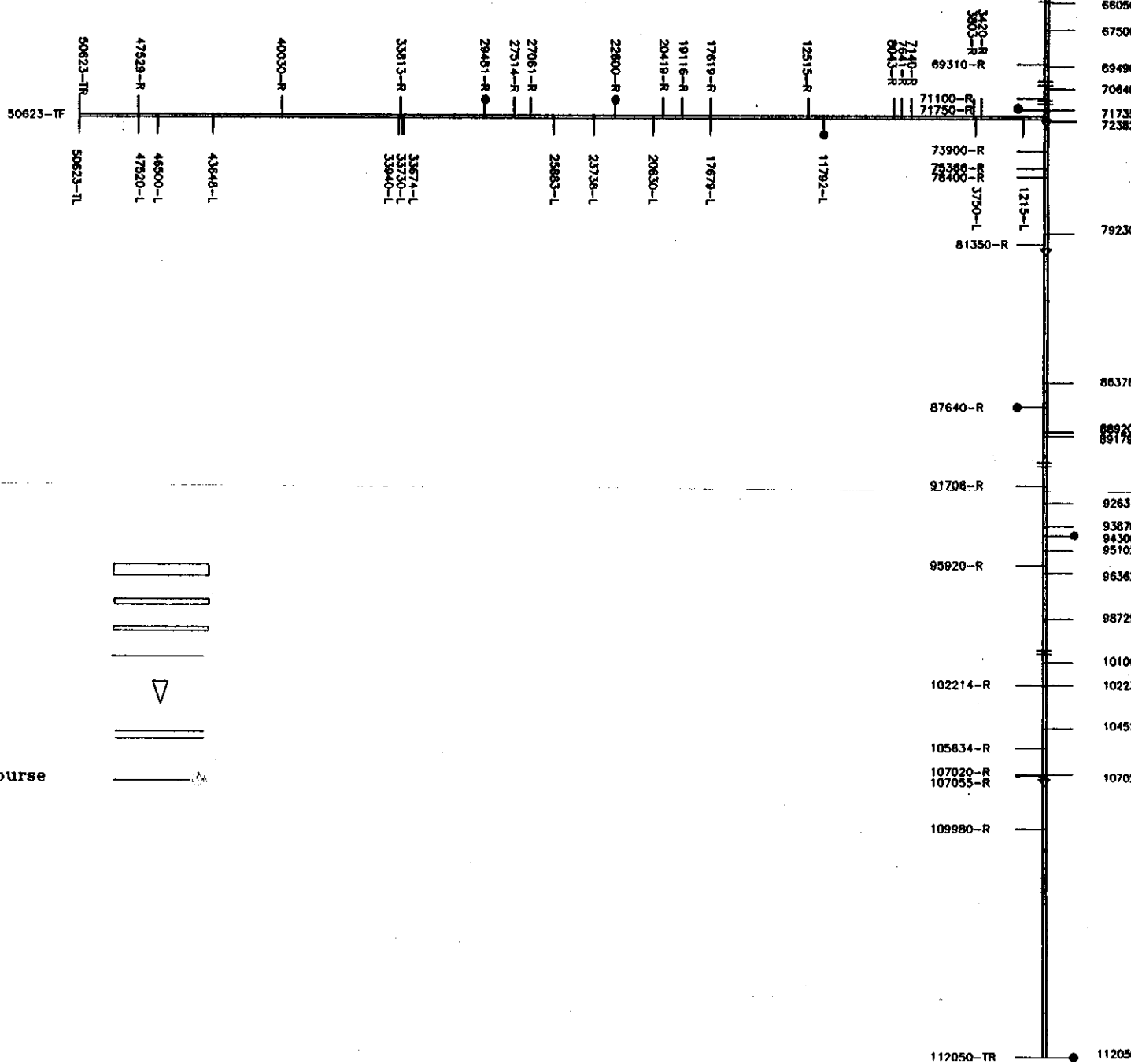
Authorized Discharge	=	43 Cusecs
Offtake RD.	=	72100/R
Tail RD.	=	50623
Outlets	=	32
GCA	=	12408 Acres
CCA	=	10621 Acres

2- 1RA/4R

Authorized Discharge	=	32 Cusecs
Offtake RD.	=	23200/R
Tail RD.	=	22000
Outlets	=	16
GCA	=	6967 Acres
CCA	=	6077 Acres



1-R MINOR



LEGEND

- Branch Canal
- Distributary
- Minor
- Watercourse
- Drop Structure
- Bridge
- Sample Watercourse



Villages and Population

The Hakra 4-R Distributary is supplying irrigation water to the lands belonging to 41 villages including small deras/hamlets. The total population according to the census of 1981 is about 53,814 (now more than 0.1 million). A list of the villages and related watercourses is shown in Annex-1.

Sub-Systems of the Pilot Distributary

The Hakra 4-R (also called Haroonabad) Distributary with 120 irrigation outlets can be described as a medium-to large-scale irrigation system. This size criterion has been one of the major considerations in selecting this distributary as a pilot research site. It contains a number of hydraulic structure that also define the logical boundaries of socio-technical sub-systems along the distributary (Mirza and Hassan, 1996). The two minors form two separate sub-systems, whereas the traditional head, middle and tail reaches form another three sub-systems. In order to accomplish initial organization fairly quickly, these units serve as appropriate entities for action research activities. Important physical and social characteristics of these sub-systems are given in Table 1.

Table 1: Important Physical and Social Characteristics of Various Sub-Systems on Hakra 4-R Distributary at Haroonabad.

Sub System	RD ⁴	No. of irrigation outlets	Culturable Command Area(acres)	No. of Share Holders
1	0 to 46 Main 4-R	23	8,888	683
2	46 to 72 Main 4-R	23	7,581	1053
3	72 to 112 Main 4-R	27	10,636	1029
4	1RA minor	15	6,088	565
5	1R minor	32	10,217	1393
Total		120	43,410	4,723

⁴. Reduced distance is the distance in measures of 1000 feet of any point on the center line of a canal from the head of the canal (RD 46=46,000 ft from the head of the canal).

The Minor 1R is the biggest sub-system in terms of number of outlets and share holders and the tail reach is the biggest in terms of culturable command area, while Minor 1RA is the smallest sub-system in all respects.

4. SOCIAL ORGANIZATION VOLUNTEERS (SOVs)

As indicated earlier, an important feature of the methodology adopted in the action research on social organizations in the pilot site is the use of "Social Organization Volunteers". Initially, they were called "Contact Farmers" because they had to play a pivotal role as a **contact** between the *SOFTWARE* group and the community. Later, it was found that the term "contact farmers" was associated popularly with the "influentials", big land owners and farmer leaders from the T & V system adopted by the Agricultural Extension Department. Since the use of these contact farmers has not resulted in the proper functioning of the T&V system, the term had an unfavorable connotation. In order to avoid farmers' mistrust from the start, the term "contact farmers" was replaced by the term "Social Organization Volunteers" (SOVs).

Rationale for Using Social Organization Volunteers (SOVs)

Organizing people is a socially sensitive and politically vulnerable activity. This is not a task to be solely undertaken by an international institute like IIMI; rather, it is the responsibility of local people (i.e. local agencies and the water users) themselves. Only an internally generated demand for social organization can make these organizations productive and sustainable. IIMI as an agent of change, or a catalyst, could only provide a facilitating role in this process, based on its international experience, by helping the organizers to proceed in both a professional and a systematic way.

Experience elsewhere⁵ has shown that one of the essential elements of organizing people is that the social organizers should be based in the community itself. Ideally, this should have been the arrangement for this action research effort. However, this would mean that at least 120 social organizers had to be used for organizing water users of the Hakra 4-R Distributary in order to organize water users at the watercourse level. Placing one social organizer at each village level would still require at least 41 persons. In any event, for such intensive coverage, IIMI would have to plan for a substantial base of financial and human resources. Thus, the small *SOFTWARE* group of five locally hired persons that was possible within the project constraints was to act only as a core group. Selection of an adequate number of community based volunteers helped as a strategy to overcome this deficiency.

⁵ See Pradhan P and R. Sharples, "Overview of the Workshop" in "Role of Social Organizers in Assisting Farmer Managed Irrigation Systems", 1989.

Therefore, IIMI decided to look for assistance in its field work in reaching the community, not exclusively relying on the water users alone, but identifying members of the community in general, who were adequately informed about the community and its needs, and prepared to assist IIMI's field team. The members of this extended SOFTWARE group are based in the community, know the people fairly intimately, share their language, beliefs, traditions, rituals, needs and problems. The advantage of involving SOVs is that the water users do not regard them as *outsiders* who are usually treated with some mistrust. These SOVs serve as an essential link between IIMI's SOFTWARE core group and the water users community.

The methodology has the following advantages:

- * Interventions can be routed through local people causing little room for mistrust;
- * The pilot distributary is a fairly large irrigation system (120 irrigation outlets), the community of which can be reached fairly quickly through the SOVs, partially meeting the projects time constraint (the time set apart for all organizational activities is less than three years).
- * As SOVs are deployed on a voluntary basis, the method is cost-effective and can be easily applied on a wider scale; and
- * As indicated in the initial awareness-building meetings, the interactions with small groups of water users with these community-based SOVs playing a facilitating role are more effective than the attempts by external change agents alone.

5. CRITERIA FOR SELECTING SOVs

As the activity of organizing water users involves a complex social organization process, it was important to select the correct type of persons as SOVs. For this reason, a number of factors were considered. The main criteria for selecting SOVs were that an SOV should :

- be imbued with an initiative for working with the community, and should see the value in collective behavior for common good;
- be honest so that water users would believe him;
- possess communication skills, a willingness to engage in a two-way communication so that he can disseminate the SOFTWARE messages to the community, and also be able to communicate effectively with the outsiders who come to collaborate with the local people;
- be well informed about the area, local languages, castes, traditions, rituals, and other community characteristics, and details on water and land resources in the area, and generally about irrigated agriculture;
- be a non-controversial person and not anti-social in any way;
- be educated, having potential and ability to be trained to become a community based social organizer;

- have experience in speaking at a public gathering (an added advantage);
- not necessarily be a farmer, a big land owner or an influential; and
- not be an aspirant of any office of the WUO, nor should he expect any reward from SOFTWARE for his services.

6. PROCESS OF IDENTIFYING SOVs

Organizing a community is essentially a learning process; the work itself guides the organizers about the field methodology to be adopted, and subsequently refined as the work progresses, since each community is unique in content and character. Therefore, there can hardly be a rule-of-thumb or blue print that must dictate the process of community organization in all situations. As part of a "home-grown" process that is evolving in this action research effort, which is also an adaptation of many experiences elsewhere, the methodology included the need to deploy community-based volunteers, and the way they should be identified. This section of the paper refers to the process of identifying SOVs in the selected pilot project area.

The field work on identifying SOVs was started during the fourth week of September 1995. The first task was to train IIMI's field staff in conducting field interviews for this purpose. The staff was trained by conducting a series of *"walk through" interviews*⁶ along different watercourses. The Field Research Social Scientist and the Sociologist Associate Expert explained to them the purpose of this process, what was to be communicated to the water users and farmers, including preliminary information about the purpose of IIMI's pilot project. After each interview, the content, methodology, and the style of interviewing were evaluated by all the members of the field team. This training exercise was continued for two days.

Based on the initial field information, the field team members collectively decided that the number of SOVs to be identified could vary on each watercourse, but in general, there should be two to four selected SOVs depending on the characteristics of the water users' community, and based on farmer's opinions and a set of criteria as mentioned above. Field teams consisting of two persons would have informal individual meetings with the farmers. Along with the identification of SOVs, information on actual warabandi schedules were to be collected as a by-product of this field exercise.

⁶ The term "walk-through" is usually associated with surveys jointly conducted by an intervening group along with participating agency staff or user groups, walking along an irrigation channel or road for the purpose of assessing its physical characteristics. In this instance, the use of this term has been extended to mean a similar collective assessment of the social characteristics related to a physical system (watercourse).

The *SOFTware* group was sub-divided into two working teams and each team had to allocate two days for identifying SOVs on each watercourse. While one person was to conduct the interview, the other was to take notes. Each team was made responsible for one sub-system. The team members would start their 'walk-throughs' from the head of the watercourse and introduce themselves and the *SOFTware* program to the farmers. The team members would seek the opinion of the people about potential SOVs meeting the laid down criteria. The team would then arrange to meet with the identified potential SOVs.

As the work proceeded, the total time by following the watercourse approach for this activity was estimated at more than four working months per team. As this length of time was considered unaffordable, the method needed to be modified.

Meanwhile, this activity was temporarily suspended for one month due to a field training course on "Calibration of Irrigation Outlets" during October 1995. After the training course, the activities were again resumed with an analysis of the situation. After gaining some field experience, which disclosed that in certain cases even two days were not sufficient as the potential SOVs had gone out of the village, and in many cases, more than one visit became inevitable to actually meet them.

Also, selecting one SOV for each watercourse was seen to be insufficient, since the farming community on each watercourse was found quite heterogeneous in terms of caste, biradari and socio-political interests. Having a single SOV at each watercourse had an inherent danger of resulting in poor communication between the change agents and the community. Alternatively, the idea of identifying an SOV for each kinship group in the watercourse command area was considered, but it was quickly abandoned as there were numerous social groups, with quite diversified and conflicting interests, which would have claimed separate representation. This process could be time consuming for a team of four persons on a system having some 120 irrigating watercourse commands.

Eventually, a decision was reached to consider shifting from the watercourse to the village, as there were a number of watercourses corresponding to the lands belonging to the same village, and it was easier to identify a few SOVs in each village. Besides saving time, an additional advantage of this approach was that the content of the message communicated to various sub-groups in the community could remain uniform and stable.

Collecting information on warabandi practices consumed most of the available time. In order to give priority to the task of identifying SOVs, it was decided that the selected SOVs would be requested later to assist in the compiling of warabandi information and the teams should focus on identification of SOVs and recording their observations in their field notebooks and documenting the findings in the form of *village reports*.

The changed approach of SOV identification which was discussed and agreed among the field team was implemented by the start of December, 1995. A brief overview of the general method adopted by a field team member is given below:

1. Visit the village, obtain information from a number of people about the watercourses associated with that village;
2. Meet several people from different watercourses of the village, different castes and other social-groups, introduce yourself and the SOFTWARE program, and obtain information on major problems related to irrigated agriculture and the socio-political situation;
3. Obtain information on potential SOVs, their characteristics and links, as well as try to assess other groups' opinions about the suggested SOVs keeping in mind IIMI's criteria for SOVs, and obtain further information about alternate SOVs in case of disagreement;
4. Select the most appropriate SOVs that are referred by the community who fit into our criteria and pay a visit to each of them to confirm the farmers' opinion. Fill in the checklist keeping in view your discussion with the prospective SOV;
5. If found suitable, discuss in detail about the SOFTWARE program and seek the help of the prospective SOV in disseminating the message, but get assurance of his continuous help during the process;
6. Repeat Steps 4 and 5 until two or more suitable SOVs for that village have been identified; and
7. Consult the Field Team Leader and other team members to discuss those people identified for final selection.

Each of the identified SOVs was requested to discuss with other water users in their informal village meetings, social gatherings and discussions, about the possibilities and options for getting organized in order to play a greater role in irrigation management. A villager likened this suggested process to the phenomenon of spreading gradually expanding ripples when a pebble is thrown into still water in a tank.

Initially, the process of selecting SOVs became susceptible to many mistakes as the selection greatly depended on the vision and the perception of the SOFTWARE team members. Some of the mistakes were pointed out by the people as the news of particular selections spread around. On gaining some experience in being careful and patient, a checklist was developed for assessing the potential SOVs, which is presented in Annex 2.

7. PROGRESS IN IDENTIFICATION PROCESS

After the new methodology for identifying SOVs at the village level was introduced in December 1995, the process started to take off smoothly during the first twenty days of the month. This was interrupted by an unfortunate event, when the field team was involved in a road accident on December 20, 1995, and one of the staff members died on the spot while two others were seriously injured. The field work was suspended for almost one month and resumed by the end of January 96 with only one team (two persons) functioning. By mid-May 1996, the SOVs were identified in all of the 41 villages. The number of identified SOVs varied between 2 and 6 per village; 2 in cases where the village was small and homogenous, and more as the heterogeneity within the village increased. In most of the villages, the number of selected SOVs was between 4 and 5. In two villages, however, only one SOV was deemed sufficient because the land is owned by only one or two persons. However, no strict criteria were followed for deciding on the number of SOVs. The distribution of SOVs by subsystem is listed in Table 2.

Table 2: Number of Villages, Water Users Consulted, Persons Referred by Water Users as Potential SOVs, and SOVs Selected for the Hakra 4-R Distributary Command Area.

Sub-system	Number of Villages	Number of W/Courses	Number of Water Users Contacted	Number of Persons Refereed as SOVs	Number of Persons Selected as SOVs
1	9	23	146	159	29
2	9	23	132	120	30
3	8	27	63	108	32
4	4	15	83	28	13
5	9	32	61	140	54
Total	39 ⁷	120	486	555	158 ⁸

⁷ Apart from these big villages, there are many small additional settlements called azafi basti or tibba (farm houses and hamlets).

⁸ After the initial selection, adjustments were made including some additions and deletions to this number during the awareness building meetings.

In many villages, the SOVs referred by the people were those who were known to have been previously involved in solving problems of the community, local representative/leader, member/chairman of the previous WUA, member of the local panchayat, mir-aab of the watercourse (a person who is made responsible by the water users for informing and gathering people for desiltation of the watercourse and measuring the length of the watercourse to be desilted by each shareholder). Except for the mir-aab, all the above referred persons are somehow capable of winning the support of others, and are generally known to be able to get things done (legally or illegally!). Most of the selected SOVs are literate and have some formal schooling.

8. INITIAL APPREHENSIONS

The general attitude of the people towards cooperating with IIMI for organizing water users was negative initially, as the rumors about privatization of the irrigation system, installation of meters for water measurement, and increased water charges were quite common in the area. These rumors had raised doubts and confusion among the community.

The social sensitivity and political vulnerability of the action research effort was known as soon as the field work for awareness-building and identification of SOVs was started. Almost every water user interviewed referred to the story that people with motorcycles bearing (IIMI's) yellow number plates were part of a team from "distributary management" contractors from America or World Bank. They thought that the new management was going to install water meters on the outlets to record the amount of water passing through the structures, and that this information would be fed to the calculators (computers) and water bills would be prepared. Like WAPDA's electricity bills, these new bills would be enormously high (about Rs 500 to 1000 per hour).

On further investigation, it was found that the causes of such doubts, confusion and fears were many. As the informants described the background to their doubts, the story ran as follows. Firstly, they had seen IIMI field teams working with a foreign young man (a student from England) calibrating the outlet structures and the distributary with flumes and current meters, and conducting an inflow-outflow test for 36 hours in the tail reach. Secondly, they had also seen 50 people moving around the distributary with 3 foreigners (IIMI staff) during October 1995, when IIMI conducted a training course on "Calibration of Irrigation Outlets" on Hakra 4-R Distributary. Thirdly, they had also seen a foreign lady (Dutch Associate Expert) going about with local people, along the distributary and in surrounding villages, on a motorcycle or in an expensive car (Pajero) with local people, meeting rural notables (the work involved was for collecting information for assessing the community characteristics). Fourthly, staff from local research institutes (IWASRI, WAPDA's WMED and Irrigation Research Institute) conducted ponding tests and outlet calibration in different reaches of the distributary during the closure period in 1995. They also heard that some foreigners (possibly referring to several expatriate missions) visited the Haroonabad area, and

stayed at WAPDA or PID rest houses. These stories were talked about in every village, in the agro-supply shops, and in the grain market at Haroonabad. That the Hakra 4-R Distributary had been identified for privatization, or for sale to a foreign company, was a common belief among the people. One villager remarked, "the country is being sold to foreigners step-by-step as the mughal emperors sold the subcontinent to the East India Company".

These rumors which spread like wild fires were further fuelled by statements of groups with vested interest, who were generally opposing the social organization among water users. Such rumors had an extremely damaging effect on the field work. The field teams had to spend considerable time to clarify these misunderstandings.

9. SOCIO-ECONOMIC CHARACTERISTICS OF THE SELECTED SOVs

Some socio-economic characteristics of the identified Social Organization Volunteers are presented in Table 3. The table clearly shows that the average operational holding size of SOVs declines when proceeding from head to tail. The SOVs at Minor 1RA and the tail reach sub-systems are relatively small farmers. The land concentration is more in the head reach as some big land owners are there. The lands in this part of the system are owned by locals who have been residing here since long and the land had been gifted to them for some service rendered for the government during the colonial era. In the middle and tail reaches, and Minor 1R, most of the people are those who migrated from India or settled later.

Table 3 also reveals that almost all of the SOVs own some land. This does not mean that all of them are the owner cultivators. Some of them have their own land and also cultivate land on rent or share-cropping. Only two SOVs belonging to the middle reach did not own any land. Understandably, in general, the people have preferred to select those who own some land as they believe that the persons who do not own land cannot understand the problems related to irrigated agriculture, and their interests might be different.

Table 3: Important Socio-Economic Characteristics of the Social Organization Volunteers by Identified Subsystem.

Characteristics	SUBSYS1 Head Reach	SUBSYS2 Middle Reach	SUBSYS3 Tail Reach	SUBSYS4 1RA Minor	SUBSYS5 1R Minor	Total for Hakra 4-R
SOVs (Number)	29	30	32	13	54	158
Average Size of Operational Holding (Acres)	47.22	39.23	20.42	23.46	35.70	34.38
Owner-Cultivators (Percent)	100	93	100	100	100	99
Educated (Percent)	66	80	75	77	80	76
Matric & Above (Percent)	31	53	41	38	52	55
Resident within Village or at Farm (Percent)	100	97	100	100	98	99
Political Affiliation with Ruling Party (Percent)	21	23	3	8	33	21
Political Affiliation with Opposition Party (Percent)	52	40	16	23	56	41
Politically Neutral (Percent)	27	33	81	69	11	37
Community/ Collective Workers (Percent)	86	47	75	69	74	71
Local Leaders (UC/DC/Zakat etc.) (Percent)	10	20	19	8	7	13
Caste Jat (Percent)	3	17	34	0	13	15
Caste Arain (Percent)	3	30	38	0	53	32
Caste Rajput (Percent)	66	23	6	0	4	19
Others Castes (Percent)	28	30	22	100	30	34

The caste structure indicates that the water users from each of the subsystems preferred SOVs predominantly from one or two castes. At the head reach, Rajputs were referred and selected mostly as SOVs; at the middle and Minor 1R, Arains; at the tail reach a mixture of Arains and Jats, and at Minor 1RA wattoos were in the majority. It appears that each village has to some extent one caste as the major caste and most of the farmers tend to prefer people from that major caste as SOVs.

A majority of the SOVs are educated. Almost half of the selected SOVs have reached the educational standard of matric and above; in no subsystem did this proportion drop below one-third. Perhaps the farmers believe that the educated persons have a better understanding of the common problems and communicate these better. The *SOFTware* also preferred educated persons as they were found to be broad minded, open and critical, easy to communicate with, and have an ability to accommodate training.

Almost all of the identified SOVs reside either within the village, hamlets around the village, or at the farmhouse called 'dera'. This may help in organizing water users as they are available and easily accessible compared with those who reside in the town or elsewhere. Some of the persons referred as SOVs by the community were those owning land in the village, but resident in the town. After some discussion, there was agreement not to select them as SOVs.

Except for subsystems 3 and 4, a majority of the SOVs were known to have some political affiliation either with the ruling party or with the opposition. Irrespective of their political leanings, the selected SOVs showed willingness to work with *SOFTware* on this program, and appeared to be unconcerned by the general belief that the government was going to "sell" or privatize the system.

The majority of the selected SOVs were not opposed by other water users, indicating their neutral status and their potential of being apolitical and commonly acceptable. This is further supported by the fact that most of the referred and selected SOVs have already played some role in community/collective work previously.

The proportion of local level leaders, such as members of Union/ District Councils, Ushar and Zakat Committees, as well as members of the old Basic Democracy system, is very low ranging from 7 percent in Subsystem 5 (Minor 1R) to 20 per cent in Subsystem 2. This indicates a preference by the water users to avoid such representatives. When questioned, some people have openly described such persons as those who usually tend to use their powers and status to maximize their own personal gain rather than work for a common benefit.

10. SOME PERCEPTIONS AMONG WATER USERS

The initial series of informal meetings conducted by the field team basically helped the process of selecting SOVs. These meetings were followed by another set of rapport-building meetings in which the SOVs also played a role by way of selecting the venue and inviting a few other water users to attend. These meetings were held in the form of semi-structured small group discussions during which a number of topics related to irrigated agriculture and its institutional implications were discussed. The first few interviews provided a number of issues that seemed to interest the SOVs and the water users in general, and this set of issues were discussed during the interviews that

followed. In this process, the SOVs could identify a varied set of perceptions prevalent among the water users. Careful note keeping by the field team provided a good database on some of the perceptions of the water users, and the following section of the paper gives a summary of these perceptions.

a) About Water Related Problems

The main problems regarding irrigation as indicated by the water users of the area are:

- There is a high incidence of waterlogging and salinity in the head reach due to persistent seepage and over-irrigation, breaches, and poor maintenance; and there is a general shortage of water at the tail reach;
- The distributary is silted up and draws less water than design under normal flow conditions;
- The inclusion of more area (as CCA and allowance for additional water for orchards) than sanctioned in many outlets without changing the design of their structures has caused a decline in the average amount of irrigation water available per unit area;
- The authorization of reclamation shoots for rice cultivation is not done at the proper time, which further aggravates waterlogging; for areas other than in the head reach, it disturbs equity as the sanctioned discharge for these shoots is not accompanied with a corresponding increase in the sanctioned discharge for the distributary;
- High water supplies are available when demand is low and low water supplies when demand for water is high;
- Unreliability of water supply as the rotation among distributaries is not properly implemented; influentials at other distributaries manipulate the rotation schedules;
- Persistent seepage from the unlined portions of the watercourses, loss of already scarce water, breaches and overflows in the watercourses;
- The time of annual closure is not proper as during this period water is badly needed for the wheat crop, the maintenance tasks that should be carried out during this period are not attended to, the duration of the closure is also much more than stated in the documents or announced by the Irrigation Department, and the water users are not informed about the dates of closure start and end;
- Corruption among irrigation officials invariably helps the "free rider" behavior, in which some individuals try to get more than their due share at the expense of the others, which disturbs the adequacy, equity and reliability of water supplies;

- The gauges installed for indicating the amount of water are installed deeper so that these can show more water in the canals and distributaries than they actually carry;
- The bed level of the distributary is lower than the lands in some sections of the distributary, and the outlets in these sections draw less water than what they are entitled to;
- The water users are ready even to pay more water charges, if adequacy and reliability of water supplies are ensured; and
- The canal banks are weak and can not bear the authorized discharge, and full- or over-supply may cause a breach.

b) About Agriculture Related Problems

Apart from water related problems, the water users of the area indicated several other general problems regarding agricultural production:

- Agricultural inputs such as fertilizer, seed, pesticides etc. are not available at the needed time and in the needed quantity. The intermediaries charge generally 20 to 50 rupees higher per bag for spot selling and even higher for supplies on credit;
- So far as the pesticides are concerned, the general complaint is about their quality as they are ineffective in killing insects;
- For the seeds, less farmers are interested as the prices charged are very high. Some progressive farmers, however, complain that they do not get what they pay for. The seed bag claims something different from what it contains;
- Agricultural knowledge is readily not available. The extension staff only visit the influentials and big landowners and the demonstration effect does not take place;
- Several farmers want to cultivate crops other than the traditional cropping pattern but are constrained due to the lack of proper information; and
- Agricultural credit is difficult to obtain. Whatever credit is disbursed by the ADBP is not utilized in raising crops but it is used for paying for social obligations such as marriages and other social events.

c) About Users' Participation in Irrigation Management

Most of the water users do see a value in getting organized for solving problems related to irrigated agriculture. They believe that the main reason that their problems are not solved is that **they do not have a "union"**. However, they have several questions and fears about it. Some of their perceptions are indicated below:

- * A pilot project will not cause a loss or damage to anyone; in case of failure, the water users have a chance to go back to their traditional system;
- * If water users stand united, nobody can harm them; the system discriminates against powerless individuals, but when they behave collectively, the chances are greater in securing their due rights;
- * The water users have to be courageous in overcoming their fears associated with the actions of influential and corrupt people;
- * Water users can operate the distributary like they do in the case of the watercourses; as they manage the watercourse successfully, they can also do it at the distributary (i.e. collective desiltation, consultation, pooled resources etc.) and when farmers own the distributary, they will care for their own property;
- * The idea of a Water Users Organization can work if the Organization has powers for implementing its decisions, economic and social sanctions against "free riders", and if the Administration helps in this process;
- * Water stealers and free riders will be punished; influentials and tenants should be equal before the law;
- * WUOs should be established under supervision of the government so that the government recognizes them and should not see it as groups of individuals, but as a corporate body and should trust them in assisting the government in irrigation management;
- * Each watercourse and village should have its own grass root level organization, two people from each watercourse are enough; educated and honest people should be chosen democratically as members of the organizations;
- * There should be a complete check and balance system, or a monitoring system, for proper functioning of the WUOs;
- * WUO should also solve other farming problems; and
- * There should also be powerful persons participating in the WUOs as the poor and powerless cannot do much against relatively strong free riders.

d) About Problems in Organizing Water Users

The most important community responses, from the perspective of the project's immediate objectives, were those related to social organization. The following items reflect a range of perceptions regarding the process of organizing water users:

- * The majority of the farmers are poor and illiterate, and tend to rely on others who are more resourceful. Often, they are reluctant to give a good hearing to outsiders, including IIMI. Even if they are able to understand what IIMI tries to discuss with them, they do not readily believe that an effort can be launched for the benefit of common people. They have their doubts and suspicions that such an effort may further cause inequity and injustice, as the big landlords and influentials will invariably capture the new opportunities. The poorer people believe that they do not have a role in decision-making merely because they are poor. IIMI's field team has found this social barrier as a major impediment against efforts to convince them to participate in an organization.
- * At the beginning, almost all the farmers were confused about the introduction of a pilot project in their area; they were scared that meters were being installed, that outsiders had bought the distributary on contract and would install meters and manage water strictly with the help of local people. This attitude is slowly changing after the SOVs were selected.
- * The powerful and influential agriculturists still seem to dislike such changes as these organizations are seen as a threat to their power status. Their future actions for inhibiting the process through illegal means is not improbable.
- * The absentee landlords have no interest in agricultural productivity or better water management, because they receive rent for the land and such changes will only cause more outlays in the short run; owner cultivators seem to be reluctant to join an organization that contains non-owners (tenants) as they do not regard them socially equal.
- * Some people see a greater value of maximizing their personal gains relative to what they can expect in collective action.
- * The new office bearers, once they get elected, may become equally corrupt as the existing influentials, since power of any sort is known to corrupt people. They would discriminate against ordinary members.
- * Farmers think that for successful organizations, ideal conditions are needed such as honest people at office, for ID to favor participation, the administration being supportive, and justice is maintained.
- * An occasional question is whether the office bearers will have enough spare time for the organizations as they have also to earn a living. They may lose interest when they see that it is taking too much of their time.
- * Farmers cannot get organized by themselves, they need some outside support to sort out some of these constraints and bring everybody together.

* The following are some of the specific negative statements encountered in the field:

"New responsibilities of water users are unclear";

"Your vehicles bear American number plates; who is behind IIMI, America, World Bank, or CIA?";

"We suspect this canal is on a management contract";

"Since 'goras and goris' were working on the distributary, people thought that meters are being installed by a foreign company";

"Patwaris are telling us not to listen to IIMI, as there is nothing in it for farmers";

"Can you eliminate corruption? Then we will be fully with you";

"Our hearts accept this, but what is true in reality we do not know";

"If the irrigation system is going to the farmers, there will be a massacre"; and

"If drastically increased water rates are going to be introduced like the electricity charges by WAPDA, or if abiana will be increased, you will then see farmers' funerals; if participation means paying more money, water users cannot afford to cooperate".

e) About Problems of Water Availability

One critical issue is the limitation imposed by water availability. Many respondents raised this issue as an inevitable question during discussions on proposed WUOs. Their concern can be summarized by the following statements:

- * For everyone to get his right according to equity and justice, there should be more (additional) water at the distributary head.
- * If water will be short at the head, people will say that the system (joint irrigation management) is not a valid improvement.
- * The outlets should be installed in such a manner that water stealing is not possible through tampering.
- * There should not be any scheme on reclamation shoots in the future.

11. CONCLUSIONS

Although this paper is not a final output from the whole process documentation effort on the activity of mobilizing SOVs, some tentative conclusions can yet be drawn from the above analysis. While these conclusions are helpful for the project's on-going activities, they may also provide to the reader some understanding about the context in which this social organization action research program is being conducted.

1. The water users do recognize the need for getting organized, but they cannot do it alone; they need a catalyst that should prepare the ground well before actual organizational activities are undertaken. Confirming the validity of the selected approach is better in terms of time, cost and human resources, the importance of frequent contact between the catalyst and the community through SOVs cannot be over-emphasized.
2. The farmers of the area invariably want their irrigation systems rehabilitated and improved, and will participate in any attempt towards achieving that goal. But, they are also looking for a multi-task organization that could help them out of all kinds of exploitation from middlemen, "free-riders", rent-seekers, and other anti-social elements. A water user's organization can serve as a starting point for achieving that objective.
3. They will organize readily, but only if joint irrigation management or participation ensures more income and productivity through better and efficient operation and management (O & M). If this means more work for the same return, or more outlays on O&M, they are unlikely to cooperate.
4. If WUOs do not have adequate control, authority, legal and administrative support, and protection, they can hardly become sustainable as the members will lose interest and start doubting the usefulness of the organizations to achieve the perceived benefits.
5. WUOs will only be ready to undertake objectives they define and choose in their own way, and for their own gain. Any excessive pressure from outside will harm the organizational efforts and the sustainability of such organizations.
6. The rumors have been rampant about the installation of water meters, management contracts for irrigation systems, and selling the system to outside companies. During the initial stages of the pilot studies, the involvement of outsiders in the field should be kept at a minimum possible level, as the people in this area are extremely sensitive to outside influence.

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**VILLAGES AND RESPECTIVE WATERCOURSES
IN HAKRA 4-R DISTRIBUTARY COMMAND AREA**

SUB SYSTEM 1 (RD 00 TO 46300 OF HAKRA 4-R)

Mogha #	RD	Village(s)
1A(W)	1208/L	GULAB ALI HEAD WORKS
1	1240/L	BAJIK, RATIRAM PURA
2	4162/L	BAJIK, RATIRAM PURA
3	6431/L	BAJIK, RATIRAM PURA, GULAB ALI
S	6440/L	SEASONAL RECLAMATION SHOOT
4	14865/L	GULAB ALI
5	15670/R(14670)	GULAB ALI
5A	16290/R	RODA SINGH, TEKURAM PURA, GULAB ALI
W	17000/L	WATER SUPPLY GULAB ALI
6	17100/L	TEKU RAM PURA
S	18100/L	SEASONAL RECLAMATION SHOOT
8	21798/L	TEKURAMPURA, RATIRAM PURA
10	21812/R	RODA SINGH, TEKURAM PURA
9	22818/L	TEKURAM PURA, RATIRAM PURA, RODA SINGH
12	24474/L	TEKURAM PURA, RODA SINGH
14A	24582/R	RODA SINGH, LABH SINGH
16	28208/L	LABH SINGH
17	31980/L	BARA SAJWAR KHAN, LABH SINGH
S	31982/L	SEASONAL RECLAMATION SHOOT
18	33130/L	MEHMOOD PURA, BARA SAJWAR KHAN, LABH SINGH
18A	34630/R	GURMUKH SINGH, LABH SINGH
19	35730/L	MEHMOOD PURA, LABH SINGH
20	39610/L	MEHMOOD PURA
21	40400/R	GURMUKH SINGH, MEHMOOD PURA
22	43320/L	GURMUKH SINGH, MEHMOOD PURA, CHAK 76
23	44580/R	GURMUKH SINGH
25	45850/R	GURMUKH SINGH, ALI MUHAMMAD CHISHTI
26	45810/R	GURMUKH SINGH

SUB SYSTEM 2 (RD 46300 TO 72300 OF HAKRA 4-R)

Mogha #	RD	Village(s)
27	46240/L	GURMUKH SINGH, CHAK 76
28A	46237/R	CHAK 50
28	50310/R	CHAK 50
S	50460/R	SEASONAL SHOOT
29	50950/L	CHAK 76
30	52050/L	CHAK 75
31	52050/R	CHAK 50
32	54700/L	CHAK 75
S	54720/R	SEASONAL SHOOT
S	55650/L	SEASONAL SHOOT
S	56720/L	SEASONAL SHOOT
33	56730/L	CHAK 74, 75
34A	57860/R	CHAK 50
34	57870/R	CHAK 50
35	57890/L	CHAK 74
36	60490/L	CHAK 74
37	59100/R	CHAK 49/3-R
37A	59130/R	CHAK 51
S	61500/R	SEASONAL SHOOT
37B(W)	61900/L	ID RESTHOUSE WATER SUPPLY / CHAK 74
38	62670/R	CHAK 51
38A(W)	62700/R	CHAK 51/ FACTORY WATER SUPPLY
38B(W)	63910/R	MUNICIPAL COMMITTEE HAROONABAD WATER SUPPLY
40/B(W)	65080/R	WATER SUPPLY MUNICIPALITY
39	63910/L	CHAK 73
38C(W)	63915/R	WATER SUPPLY HOSPITAL/HIGH SCOOOL
40	65080/L	CHAK 73
40A	66050/L	CHAK 73
41	71270/R	CHAK 52
W	69000/R	WATER SUPPLY
41A	69310/R	CHAK 52
42	69490/L	CHAK 72
43	70640/L	CHAK 72
44	71750/R	CHAK 52
45	71735/L	CHAK 71

SUB SYSTEM 3 (RD 72300 TO TAIL RD 112050 OF HAKRA 4-R)

Mogha #	RD	Village(s)
45A	72383/L	CHAK 71, ITTEHAD COTTON FACTORY
W	73900/R	FOREST NURSERY
46	75366/R	CHAK 55
48	78400/R	CHAK 56
47	79224/L	CHAK 71
W	79230/L	WATER SUPPLY
48A	81350/R	CHAK 56
49	86376/L	CHAK 70
50	87640/R	CHAK 56
51A	88920/L	CHAK 70
51	89179/L	CHAK 70
52	91706/R	CHAK 56
53A	92631/L	CHAK 69
53	93870/L	CHAK 69
54	94300/L	CHAK 69
54A	95102/L	CHAK 69
55	95920/R	CHAK 61
56	96362/L	CHAK 69
57	98729/L	CHAK 68
58	101069/L	CHAK 68
59	102214/R	CHAK 61
60	102237/L	CHAK 68
61	104520/L	CHAK 67
62	105634/R	CHAK 61
63	107020/R	CHAK 62
64	107022/L	CHAK 67
65	107055/R	CHAK 62
65A	109980/R	CHAK 62/ 64
66	112050/TL	CHAK 66/ 67
67	112050/TR	CHAK 66/ 62

SUB SYSTEM 4 (MINOR 1RA OF HAKRA 4-R)

Mogha #	RD	Village(s)
1	674/L	RODA SINGH
1A	4000/L	RODA SINGH, LABH SINGH
2	4700/R	RODA SINGH
WS	5800/R	WATER SUPPLY FOR HEALTH CENTER
3	8565/L	LABH SINGH
4	9661/L	LABH SINGH
5	10291/R	LABH SINGH, RODA SINGH, AUDHAYPUR
6	11785/L	AUDHAYPUR, GUR MUKH SINGH
8	14080/L	AUDHAYPUR
7	16280/R	AUDHAYPUR
8A	17785/L	AUDHAYPUR
9	19580/R	AUDHAYPUR, KHATAN
10	22000/TL1	AUDHAYPUR, ALI MUHAMMAD CHISHTI, GURMUKH SINGH
13	22000/TL2	AUDHAYPUR, ALI MUHAMMAD CHISHTI
12	22000/TC	ALI MUHAMMAD CHISHTI
11	22000/TR	KHATAN

SUB SYSTEM 5 (MINOR 1R OF HAKRA 4-R)

Mogha #	RD	Village(s)
1	1215/L	CHAK 55
1A	3750/L	CHAK 55
2	3420/R	CHAK 52/ 53
2A	4803/R	CHAK 53
3	7140/R	CHAK 53/ 54
4	7641/R	CHAK 54
S	8000/L	SEASONAL SHOOT
5	8043/R	CHAK 54
S	11000/L	SEASONAL SHOOT
6	11792/L	CHAK 55
S	12500/R	SEASONAL SHOOT
7	12515/R	CHAK 54
S	13000/R	SEASONAL SHOOT
8	17679/L	CHAK 57
9	17619/R	CHAK 58
9A	19116/R	CHAK 58
10	20419/R	CHAK 58
12	20630/L	CHAK 57
11	22600/R	CHAK 59
12A	25883/L	CHAK 57
12B	23738/L	CHAK 57
13	27061/R	CHAK 59
14	27514/R	CHAK 59
15	29418/L	CHAK 57
	32+??	CHAK 61, 57 (NEW MOGHA 1996)
17	33674/L	CHAK 62
17A	33730/L	CHAK 62
16	33813/R	CHAK 59, 60
17B	33940/L	CHAK 62
18	40030/R	CHAK 60
19	43648/L	CHAK 64
21	46500/L	CHAK 64
21A	47520/L	CHAK 63
20	47529/R	CHAK 64
22	50623/TL	CHAK 64/ 65
23	50623/TF	CHAK 65
23A	50623/TR	CHAK 65/ 39/3-R

List of irrigation outlets, water supplies and seasonal outlets on various subsystems of Hakra 4-R Distributary system

Sub system	Number of Irrigation Outlets ¹	Number of Water Supplies	Number of Seasonal Reclamation Shoots ²	Total Outlets
1	23	2	3	28
2	24	6	5	35
3	28	2	0	30
4	15	1	0	16
5	33	0	4	37
4-R Disty	123	11	12	146

¹ A new outlet was installed in 1996 at RD 32+ of minor 1R in Subsystem 5.

² Reclamation Shoots are special outlets authorized for cultivation of rice in saline areas. Each shoot is sanctioned for three months i.e. mid July to mid October, and may be allowed for a period less than three years. The number of shoots may keep changing from year to year.

CHECKLIST FOR IDENTIFYING SOCIAL ORGANIZATION VOLUNTEERS AT HAKRA 4-R DISTRIBUTARY

WATERCOURSE _____ CHAK NO. _____

NAME OF THE CONTACT FARMER _____

FATHER'S NAME _____

SIZE OF HOLDING _____ CULTIVATION STATUS _____

CAST _____

EDUCATION _____

ADDRESS _____

- 1 Do you think the person is well motivated and has initiative for working for the community ? YES/NO
If yes, Explain how ? _____

- 2 Did he participate in some social/ community work in the past ? YES/NO
If yes, give details: _____

1 _____

2 _____

3 _____

3 Is he well informed ?

YES/NO

If yes, does he:

Know more about the area ?

Know more about the community, casts, traditions etc ?

Know more about crops, problems of irrigated agriculture etc?

Know about who can solve their water related problems ?

Any other ?

4 Is he believed to be honest ?

YES/NO

If yes, did someone disbelieve his honesty ?

YES/NO

5 Is he believed to be anti-social element

YES/NO

If yes, what did he do ?

6 Is he able to communicate well with you ?

YES/NO

7 Can he talk to farming community ?

YES/NO

Has he some experience ?

YES/NO

8 Does he seem reasonable and intelligent to you ?

YES/NO

Explain how ?

9 Does he have some experience in public speaking ?

YES/NO

10 Is he affiliated to some political party ?

YES/NO

If yes, by whom

11 Is there a political conflict in the area ?

YES/NO

If yes, is it SEVERE MODERATE MILD

12 Is there a strong commitment on his side for improvement in the situation ?

YES/NO

Explain how ?

Total persons met _____ favored _____ opposed _____

OTHER OBSERVATIONS _____

DECISION: _____

NAME(S) OF THE TEAM MEMBERS

1 _____ 2 _____

SIGNATURES:

DATE: / /

IIMI-PAKISTAN PUBLICATIONS

RESEARCH REPORTS

Report #	Title	Author	Year
R-1	Crop-Based Irrigation Operations Study in the North West Frontier Province of Pakistan (Volume I: Synthesis of Findings and Recommendations)	Carlos Garces-R D.J. Bandaragoda Pierre Strosser	June 1994
	Crop-Based Irrigation Operations Study in the North West Frontier Province of Pakistan (Volume II: Research Approach and Interpretation)	Carlos Garces-R Ms. Zaigham Habib Pierre Strosser Tissa Bandaragoda Rana M. Afaq Saeed ur Rehman Abdul Hakim Khan	June 1994
	Crop-Based Irrigation Operations Study in the North West Frontier Province of Pakistan (Volume III: Data Collection Procedures and Data Sets)	Rana M. Afaq Pierre Strosser Saeed ur Rehman Abdul Hakim Khan Carlos Garces-R	June 1994
R-2	Salinity and Sodicty Research in Pakistan - Proceedings of a one-day Workshop	IIMI-Pakistan	Mar 1995
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