Report No. 57

Managing Irrigation for Environmentally Sustainable Agriculture in Pakistan

Formalization of Water Users Associations by Farmer Leaders of Hakra 4-R Distributary

Waheed-uz-Zaman
Nasir Sultan
Bilal Asghar
Muhammad Amjad Kamran

July 1998
Pakistan National Program
International Irrigation Management Institute
Lahore

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES AND PLATES

LIST OF PLATES

FOREWORD

The process of social organization for irrigated agriculture in the Hakra 4-R Distributary command area was characterized by a strategy to focus on establishing a water users organization at the distributary level. In this strategy, the large Hakra 4-R Distributary command area was divided into five subsystems, and water user representatives from the watercourse level were first organized into five Sub-system Organizations. Through an elaborate selection process, the five Sub-system Organizations were then federated at the distributary level. The Hakra 4-R Distributary Water Users Federation was formed on 5 March 1997, at a meeting of the general assembly of twenty five persons, consisting of five representatives from each Sub-system Organization.

As part of the same organizational strategy, the new WUF was expected to take the initiative to form a water users association (WUA) for each of the 121 watercourses in the distributary command area. The process was documented by IIMI's field team, and an analysis of this process documentation data is provided in this report. The main purpose of this report is to highlight the advantages of using this particular methodology for organizing water users of large canal command areas. More specifically, the report refers to the utility of having organized water users at the watercourse level in the management of water resources within the distributary command area by a distributary level Water Users Federation (WUF), and describes the positive role that the identified farmer leaders could play in formally organizing the tertiary level WUAs. In effect, WUAs are to function as the agents of the WUF in its effort in mobilizing resources, as well as improving agricultural production.

The rather unusual term "formalization of WUAs" used in the strategy warrants an explanation. In some of watercourse command areas, WUAs had been formed and registered by the ON-Farm Water Management Programs. Although most of these WUAs had become defunct, some of their key office bearers were still known in the area. To avoid a confusion regarding the leadership issues in the given rural setting, the strategy was to go back to the watercourse level water users groups, which identified representatives for the formation of the WUF, and formally establish new WUAs. Hence the term "formalization".

The authors have had an intimate knowledge about the ground conditions of this pilot project area, and are all well-equipped to identify and analyze the issues related to social organization. Since they were associated with the project throughout its implementation, they show a remarkable success in comparing the features that tend to distinguish between the two phases of social organization, the formation of the WUF, and the formalization of WUAs. However, since there are other detailed reports describing and analyzing the first phase, this report rightly tends to emphasize on the details of the second phase.

The report itself presents two distinct aspects of the formalization. First, it describes legal documents prepared during the formalization process. Second, it analyzes the socio-cultural characteristics of over seven hundred office bearers related to 121 WUAs, depicting similarities and differences in their socio-cultural features. Among the many documents generated by the piliot project on social organization, this report serves a valuable purpose of providing some key community characteristics of the main actors that contributed to the social organization effort, the farmers.

D. J. Bandaragoda.
Senior Management Specialist
International Irrigation Management institute.

ACKNOWLEDGEMENTS

This research effort is the outcome of one year's documentation on formalization process of 121 Water Users Associations (WUAs) along the Hakra 4-R Distributary. Documentation was the result of collective effort by the Social Organization Field Team, of which the authors were also members. The efforts of the team are gratefully acknowledged. Specifically, the authors appreciate the efficient support provided by Abdul Hamid and Khalid Mehmood in processing the information for this report

Organizational development activities for these WUOs formed part of IIMI's research " Managing Irrigation for Environmentally Sustainable Agriculture in Pakistan", funded by the Royal Netherlands Government. The authors gratefully thank the donors for their support.

Inexpressible gratitude goes to the farmer leader of the Hakra 4-R Distributary, who were active facilitators in the WUA formalization process.

The authors would like to acknowledge the assistance provided Anwar Iqbal, Tipu Naveed and Muhammad Asghar, the Hakra 4-R Distributary WUO team members.

The authors also thank Mehmood-ul-Hassan and Mirza Zafar Iqbal for their cooperation during the formalization process.

Prof. G.V. Skogerboe, Director, International Irrigation management Institute (IIMI) Pakistan, for his valuable advice, moral support and appreciation for this work, and his invaluable editorial comments on the final draft, is thankfully acknowledged. His interest in finalizing this research report is abundantly appreciated.

We would like to thank Dr. Prathapar, Research Coordinator, IIMI-Pakistan, for his moral support and encouragement.

Verenia Duke's thorough work on the editorial aspects of the first draft contributed towards improving much in this report. The document was corrupted during the retrieval process. The extra effort she expended to restore this report, and for meticulously and accurately capturing minor errors, is gratefully acknowledged.

Special thanks go to Manzoor Hussain, Secretary, for his untiring patience in formatting and incorporating changes when this report took its final shape. To Muhammad Akram and Tebraiz Ahmad, go appreciation for making life easy by providing administrative support, and for their hearty friendship.

SUMMARY

Objectives

The formalization process (2nd phase) of 121 WUAs of the Hakra 4-R Distributary reached completion between April 1997 and March 1998. Earlier, between July and December 1996, these WUAs had been informally created in the 1st phase.

The main objectives of the formalization process were:

- to (s)elect formal office bearers for the WUAs;
- to prepare legal documents required for the registration; and, consequently;
- to elevate these WUAs to a level fit for registration under the WUAs Ordinance of 1982.

As the legal framework is absent for the distributary level water user federation in the Punjab, this registration is necessary. According to the WUAs Ordinance of 1982, the watercourse level associations are the only legal entities that can provide a basis for the distributary level Water Users Federation (WUF).

What this Report is about

This research report comprises of two main parts; the first covers the process of the formalization of 121 WUAs, and the second reveals the socio-cultural characteristics of 710 office bearers related to these WUAs.

As far as the formalization process of these 121 WUAs is concerned, this report first:

- argues the utility of the watercourse level Water User Associations (WUAs) under the management of the distributary level Water Users Federation (WUF);
- describes factors that make the WUA formalization process (2nd phase) different from the creation process (1st phase);
- delineates the role of farmer leaders in organizing the WUA formalization meetings;
- reports the extent of participation of ordinary farmers in the formalization meetings;
- uncovers the reasons why meetings were postponed;
- identifies the reasons for low, and high, participation in the meetings among the Sub-systems;
- discusses the types of changes among office bearers during the formalization process and examines the reasons for these changes; and
- reviews the problems and issues raised by the farmers in the meetings.

The 1st and 2nd phases have been compared in many instances. The first part of this report, finally, results in the detail of legal documents prepared during the formalization process.

The second part of this research report depicts the socio-cultural characteristics of 710 office bearers related to these 121 WUAs. This part portrays similarities, variations and differences in the socio-cultural features of the 710 office bearers. The socio-cultural parameters encompass:

- distribution of castes,
- tenancy status land relations;
- social status;
- extent of involvement in non-agricultural activities;
- political affiliation;
- range of office bearers selected from SOVs; and
- settlement patterns of these office bearers.

Each parameter related to socio-cultural features was analyzed separately for 121 presidents, as well as for the remaining 589 office bearers.

The need for WUAs under WUF Management

The research report consistently argues that the watercourse level WUAs can perform a variety of important functions under the management of the distributary level WUF. These include:

1) WUAs provide the basis for the distributary level WUF, and also provide a mechanism whereby equal opportunities for leadership is given to every water user for representation in the higher tiers.

2) WUAs can be effectively involved in the assessment of the *abiana* (water taxes). The crop survey conducted by *patwaris* may be cross checked by the presidents of the respective WUAs.

3) Under the management of the WUF, WUAs can formalize watercourse maintenance activities.

4) The WUAs created by IIMI can be helpful when implementing improvement work, if undertaken by the On-Farm Water Management Project (OFWM).

5) WUAs can help the WUF to mobilize funds from grass-roots levels.

6) Solving disputes locally along their respective watercourses will enable the WUAs to function more efficiently and cost effectively.

7) Cases of adjustment for *warabandi* (water turns) may be referred to the PID through the WUAs after a detailed survey of the watercourse command, in order to help maintain transparency.

8) The WUAs can also be a major means of technology transfer, as all interventions related to improving agricultural practices will be introduced at the watercourse level.

9) The WUAs can provide the leadership for WUF sub-committees created for the execution of different tasks.

10) WUAs can be an effective means with which to mobilize manpower, machinery and equipment for each Sub-system, in order to undertake maintenance activities in their respective reaches.

11) WUAs can play a role in monitoring water supplies to prevent breaches in their respective reaches, which comprise of a cluster of watercourses.

Differentiating Factors

Many factors made this process (2nd phase) different from the preceding process (1st phase), which culminated into the ***Formalization of Water Users Associations (WUAs)***, i.e.:

- number of farmer leaders engaged;
- nature of facilitation roles when organizing meetings;
- tone of farmer-criticisms;
- extent of the ease with which the process was undertaken;
- scale of postponed meetings;
- duration of process;
- changes in farmers' perceptions;
- shift in farmers' confidence;
- range of issues raised in the meetings;
- correctness of detail for documentation; and
- levels of efforts in maintaining information for the preparation of legal documents.

Participation of the Farmer Leaders

With regard to the participation of the farmer leaders in the formalization process, overall:

- 77 percent watercourse level presidents participated in the meetings.
- 50 percent of the Sub-system level WUO office bearers played active roles in organizing the formalization meetings.
- 60 percent of the WUF leaders played active roles in organizing formalization meetings.

- 27 percent of the SOVs were actively involved in organizing formalization meetings.

The participation of ordinary farmers in the formalization meetings encompasses:

- The percentage of participation among the Sub-systems ranges from 71% to 78%. On average, the overall participation was 74%.

The participation of ordinary water users within the Sub-systems looks like this:

- Sub-system 1: Participant percentages range from 58% to 88%. On average, the overall participation among the watercourses was 71%.
- Sub-system 2: Participant percentages range from 65% to 100%. On average, overall participation among the watercourses was 76%.
- Sub-system 3: Participant percentages range from 52% to 94%. On average, overall participation among the watercourses was 71%.
- Sub-system 4: Participant percentages range from 54% to 94%. On average, overall participation among the watercourses was 69.
- Sub-system 5: Participant percentages range from 59% to 93%. On average, overall participation among the watercourses was 78.

The overall participation was 74%, which is fairly high. Participation within the watercourses varies greatly. In Sub-system 4, for example, it ranged between 54% and 94%. The factors for this high and low participation among the watercourses were:

Factors Affecting High Participation among the Watercourses:

- influence of WUA and SOV presidents;
- their active facilitation roles in organizing meetings;
- their personal contact with water users;
- the active role of the WUF and WUO office bearers;
- homogeneity of water users;
- the cohesion among the water users;
- on-going contact of IIMI-SOs with the WUO members through periodic meetings; and
- with the common farmers, conducting afternoon meetings.

Factors Affecting the Overall Decline in the Participation Rate (2nd phase)

IIMI social organizers were the main facilitators during the 1st phase, whose ardent efforts resulted in high participation for the WUA election meetings. The 2nd phase experienced a shift in strategy; the farmers were given active facilitation roles in meetings. The scale of effort by the IIMI social organizers, therefore, affected the participation rate in the 2nd phase.

IIMI SOs were asked to ensure a minimum participation of 66% in the 1st phase. This target was not based on any legal requirement, but merely on the idea that ensuring a minimum participation of two-thirds would be more sound for critics. On the other hand, they were asked to ensure a minimum of 51% participation for the 2nd phase, which is the minimum

requirement for the formation of WUAs at the watercourse level as laid down in the Water Users Ordinance (WUAs), 1982. This resulted in an overall lower participation in the 2nd phase.

Other reasons for low participation included:

- sudden deaths; and
- court appearances by farmers on the days meetings were scheduled for.

Extent of Postponed Meetings

During the 1st phase, the incidence of meetings postponed vary between 1 and 5 among the watercourses for different reasons, thus, the process was difficult. During the 2nd phase, the number of postponed meetings varies from 1 to 3 among the watercourses. In comparison, the overall incidence of postponed meetings was approximately 60% less in the 2nd than the 1st phase.

The main reason for postponing meetings was low participation. Among others are:

- disinterest of the key share holders;
- negative propaganda against the project;
- effect of share holders being scattered across the command areas;
- absence of WUA presidents;
- failure of the WUO leaders to convey the time and venue to all water users;
- quarreling among the water users;
- conflict among the office bearers; and
- the death of some villagers.

Changes among Office Bearers

In the 1st phase, a total of 615 WUA office bearers were e(s)lected for 121 WUAs. These WUA members were not given titles. The 2nd phase shows an addition of 95 office bearers, in which titles were allotted. Common titles include presidents, vice presidents, general secretaries, treasurers, information secretaries and joint secretaries. In some instances, one or two advisors were also selected for WUA executive bodies. The existing number of office bearers is 710 in total.

Three types of changes were made during the 2nd phase. In most cases, new office bearers were an addition to the executive bodies; and in some watercourses, office bearers were subtracted. A significant number of office bearers also replaced some older office bearers. The reasons for these changes are discussed below.
Reasons for Changing Office Bearers

There were several reasons for these changes:

- illiteracy;
- disinterest in organizational affairs;
- migration of share holders from the area;
- changes in tenancy status;
- deaths of a actual share holders; and
- holding offices in more than one watercourse command.

Socio-cultural Characteristics of the Office Bearers

Distribution of Castes

Based on the selection of WUA office bearers, it is now clear that, overall, the dominant caste in the area is Arain. All the Sub-systems, however, are not dominated by this caste; different Sub-systems are dominated by different castes. Some Sub-systems can be regarded as double-caste, or multiple-caste, Sub-systems. Overall, Joia is the second major caste in the region. Among other prominent castes are the Jats and Rajputs, which are the third- and fourth-most dominant castes, respectively. Another two significant castes residing in the area are Sukheras and Wattoos.

Land Relations

The analysis displays four ranges of holding sizes among the office bearers. In the case of the 121 WUA presidents, results indicate that 13 percent are small farmers, 31 percent own medium holdings, 26 percent have large holdings, and that 29 percent have relatively large holdings.

Among other office bearers, 24 percent are small farmers, 42 percent have medium holdings, 28 percent fall in the category of large farmers, and only 6 percent have relatively large holdings.

Tenancy

Overall, an overwhelming majority of the WUA presidents (87 percent) are owner-cultivators, 8 percent non-cultivating owners, 3 percent owner-cum-tenants, and only 2 percent belong to the tenant community.

Generally, a dominant majority of the other WUA office bearers (85 percent) are owner-cultivators, 9 percent non-cultivating owners, 3 percent owner-cum-tenants, and only 3 percent belong to the tenant community.

Social Status

Overall, 43 percent of WUA presidents command a formal social status in the community. They hold positions like that of members of the *Usher* and *Zakat* Committees, members of

now defunct local bodies, *numberdari*, office bearers to political parties, and WUA office bearers as of those created by the OFWM. Overall, 53 percent of the presidents were selected from farmers with no formal social status in the community.

Only 18 percent of the other office bearers were having the formal social status in the community. Similar to the examples of WUA presidents, they also hold positions like that of members of the *Usher* and *Zakat* Committees, members of now defunct local bodies, *numberdari*, office bearers to political parties, and WUA office bearers as those created by the OFWM. Overall, 82 percent of the other office bearers were selected from the farmers with no formal social status.

Political Affiliation

Overall, 68 percent of WUA presidents have affiliations with the Pakistan Muslim League (PML), 26 percent with the Pakistan People's Party (PPP), 6 percent have no affiliations whatsoever. *Jamat-e-Islami* membership is tantamount to none. Other parties are non-existent in the area.

The pattern of political affiliation for the other office bearers is similar to that of the presidents. Overall, 66 percent of the other WUA office bearers have affiliations with the PML, 22 percent with the PPP, and 11 percent have no political affiliations whatsoever.

Non-agricultural Businesses

As discussed in Chapter 10 of this report, approximately 90 percent of WUA office bearers are actual cultivators. Only 10 percent of farmers own land, but do not cultivate land themselves. Some office bearers are also involved in non-agricultural activities. They generate income from different sources, such as:

- managing shops in the villages and towns;
- government service;
- private service;
- as commission agents; and
- from factories and others.

Overall, 23 percent of WUA presidents take advantage of access to other sources of income. Of this 23 percent, 12 percent manage the shops in the villages and towns, 6 percent are involved in government service, 3 percent work as commission agents, and 2 percent own factories. Overall, 67 percent of WUA presidents do not have any other sources of income.

When compared with that of presidents, the involvement of other office bearers in non-agricultural activities is significantly less. Overall, 14 percent of other WUA office bearers are involved in other sources of income. Of this 14 percent, 3 percent manage shops in the villages and towns, 2 percent are involved in government service, 2 percent work as commission agents, 1 percent own factories. Overall, 86 percent of them have no other source of income.

Selection of SOVs as Office Bearers

Overall, 35 percent of WUA presidents were selected from SOVs, which constitute 27 percent of all SOVs. The highest percentage (41%) of presidents selected from the SOVs was from Sub-system 3; the lowest (17%), from Sub-system 1. The percent of presidents selected from SOVs was 39, 33, and 39 in Sub-systems 2, 4, and 5, respectively.

Overall, 10 percent of other WUA office bearers were selected from SOVs, which constitutes 36 percent of all SOVs.

Settlement Patterns

Based on the evaluation of the socio-cultural features of the office bearers, the leaders of the Hakra 4-R Distributary present a mixed settlement pattern. All three major communities, i.e., local, *mohajir* and settlers, are present in the area. Overall, however, locals in the region are in the majority. In addition, the settlement pattern in each Sub-system does not have a single community dominating. Furthermore, in certain Sub-systems, locals, ***mohajirs,*** and settlers dominate. In others yet, settlement patterns are dominated by more than two communities.

Legal Documents

Two ultimate objectives prevail for the formalization process; one, to select formal office bearers for each WUA, and the other, to prepare the legal documents required to register the WUAs with the OFWM under the Water Users Association Ordinance of 1982.

Documents required for the WUAs' registration with the OFWM under the Water Users Association Ordinance of 1982 are:

1) Proceedings of the election / selection meetings;
2) List of WUA members, with signatures;
3) Verified list of the watercourse share holders;
4) A copy of the by-laws; and
5) Bank account receipts.

In the WUA formalization process (2nd phase), documents listed from 1 to 3, were prepared by IIMI-Pakistan social organizers with the active help of farmer leaders. The provision of documents 4 and 5 will be the responsibility of the WUAs during the registration process.

Issues Raised

WUA formalization meetings provided an opportunity for farmers to discuss a variety of problems and issues. These cover water management, organization, improvement works, agricultural marketing, contacts with government agencies, agronomy, environmental and project-related issues.

Part I

The Process of Formalization of the WUAs.

Chapter 1

BEFORE YOU READ THIS REPORT

1.1 General

This chapter deals with some terminology and statements used in this research report. The necessity to comprehend these before reading this report is because some terms are not used in generic terms, but rather, are specific to the pilot project of the Hakra 4-R Distributary, and cover specific levels and categories of its organizational structure.

1.2 Water Users Associations (WUAs)

The Hakra 4-R Distributary comprises of 123 watercourses. The Water Users' Federation (WUF) here is a three-tier organization. Initially, 4500 water users residing in 41 villages were organized at watercourse level into 121 associations (as first tier). Associations could not be formed at two watercourses due to the unwillingness of water users influenced by anti-project propaganda. The number of office bearers usually comprised of 5 to 7 members, who were selected by the participating members of the meeting. Equal opportunities for association membership were provided to each water user. These watercourse level associations are called **WATER USERS ASSOCIATIONS**. In the text, these will be referred to as ***WUAs***.

1.3 Water Users Organizations (WUOs)

All the watercourse level WUAs nominated 121 watercourse representatives, who, in most cases, were nominated by WUA executive bodies. In other cases, however, the general water users selected them. The Hakra 4-R Distributary system was grouped into 5 Sub-systems based on social, and physical, divisions. The number of watercourses among the Sub-systems varies between 15 and 33, depending on the size of the hydrological unit. These water users associations were then organized (at second tier) into five associations. The electoral body of each association also comprises of 15 to 33 watercourse representatives. Each association has 7 to 10 executive body members, depending on social and hydrological units (villages, *baradaries* and watercourses). These Sub-system level associations are called **WATER USERS ORGANIZATIONS**. In the text, these will be referred to as ***WUOs***.

1.4 Water Users Federation (WUF)

Each Sub-system WUO nominated 5 general assembly members from the distributary level association (third tier). In most cases, the president and general secretary of the Sub-system level WUO were also co-opted for the federation's general assembly. The remaining three WUO members were nominated from the watercourse representatives. Thus, the general assembly of the distributary level association comprises of 25 members. These members then elected a five-member federation executive body from the entire distributary command on March 5, 1997. This distributary level association is called the **WATER USERS FEDERATION**. In the text, these will be referred to as the ***WUF***.

1.5 Creation of Informal WUAs (1st Phase)

The process of creating informal water users associations was completed from July to December 1996. During this process, the association office bearers were not given formal titles. These associations were created *informally,* and were called *Water Users Associations (WUAs),* or *khal* committees. This formation of informal water users associations at watercourse level will be referred to, for easy reference in the text, as ***1st phase,*** or sometimes, for purposes of comparison, as ***"before formalization process***". The 1st phase has been described in detail in Chapter 3.

1.6 Formalization Process (2nd Phase)

The formalization process (2nd phase) of these associations started in April 1997 and continued until March 1998. The main objective of formalizing these associations (2nd phase) was to elevate them to a level that would qualify for legal registration, according to the legal requirement. In this phase, each WUA executive body office bearer was given a title. This WUA formalization process will be referred to, for easy reference in the text, as ***2nd phase***, or sometimes, for purposes of comparison, "***after formalization process***". The 2nd phase has also been described in detail in Chapter 3.

1.7 121 Presidents

A total of 710 office bearers are related to the 121 WUAs. The associations have 121 presidents. The data related to characteristics of the office bearers that covers tenancy status, holding size, involvement in non-agricultural activities, castes, political affiliations and social status etc, has been analyzed separately for each of the 121 presidents. With reference to figures and tables, features for these presidents will be referred to as***"121 presidents"***; the reason being that their roles in the WUAs, compared to that of the other office bearers, are of much higher importance.

1.8 589 Other Office Bearers

When subtracting 121 presidents from the total amount of 710 office bearers, i.e., 710 - 121, 589 remain. The data related to characteristics of these office bearers will also be analyzed for all the parameters that have been described in the preceding section. With reference to figures and tables, features for these other office bearers, and comparative data with 121 presidents, will be referred to as ***"589 other office bearers".***

Chapter 2

THE PILOT PROJECT SITE

2.1 General

This chapter deals with the description of the Hakra 4-R Distributary's WUO pilot project site shown in Figure 1. In the first instance, it:

- describes the location of the pilot site;
- provides information about the physical features of the distributary;
- discusses the slopes in the pilot site;
- covers the extent of precipitation and the detail of available data at site;
- examines the water supply conditions in the region;
- evaluates the socio-economic conditions of the water users; and finally,
- delineates the WUOs' organizational structures and nomenclatures.

2.2 Location of the Pilot Site

The nexus of the irrigation system in relation to the study site starts with a diversion from the left bank of the river Sutlej at Sulemanki Headworks to the Eastern Sadiqia Canal. This canal is approximately 74 km in length and trifurcates into the Hakra and Malikwah Branch Canals, and the Sirajwah Distributary at RD 242. The Hakra Branch Canal originates from Head Jalwala and trifurcates into 1-L, 3-R and 4-R at RD 89750 (29th km) of Head Ghulab Ali of this branch canal. The Hakra 4-R Distributary off-takes at RD 89750 at the right side of Head Ghulab Ali of the Hakra Branch. The Hakra 4-R Distributary forms part of the Fordwah Eastern Sadiqia Canal (FESS). The FESS area falls in an expanse of 203 km, and is between 18 and 80 km wide along the left bank of the Sutlej River between Suleimanki and Islam Headworks. This stretch encompasses irrigable lands in the Eastern Sadiqia and Fordwah Canal commands. The location is between latitudes 29 and 6 25 N to 30 22 45 N, and longitudes 72 16 47 E to 73 58 30 E, comprising an area of 1.67 million acres in southeast Punjab.

Encompassing parts of *Tehsil* Haroonabad and Bahawalnagar, the study area is encircled by the Hakra 3-R Distributary in the northeast, the command areas of the Hakra 5-R and 6-R Distributaries in the north, and by the Hakra Branch to the east. The Hakra Branch canal runs almost parallel to the Indian border, which is only 2.5 km away from Head Ghulab Ali towards the east.

2.3 Description of the Pilot Site

The Hakra 4-R Distributary makes provision for direct water supplies to 75 watercourse commands located along a 35-kilometer length, and indirectly, to another 48 watercourses through its two minors, which is equal to approximately 23 kilometers. Thus, the total length of the system is 58 km. The Gross Command Area (GCA) and the Culturable Command

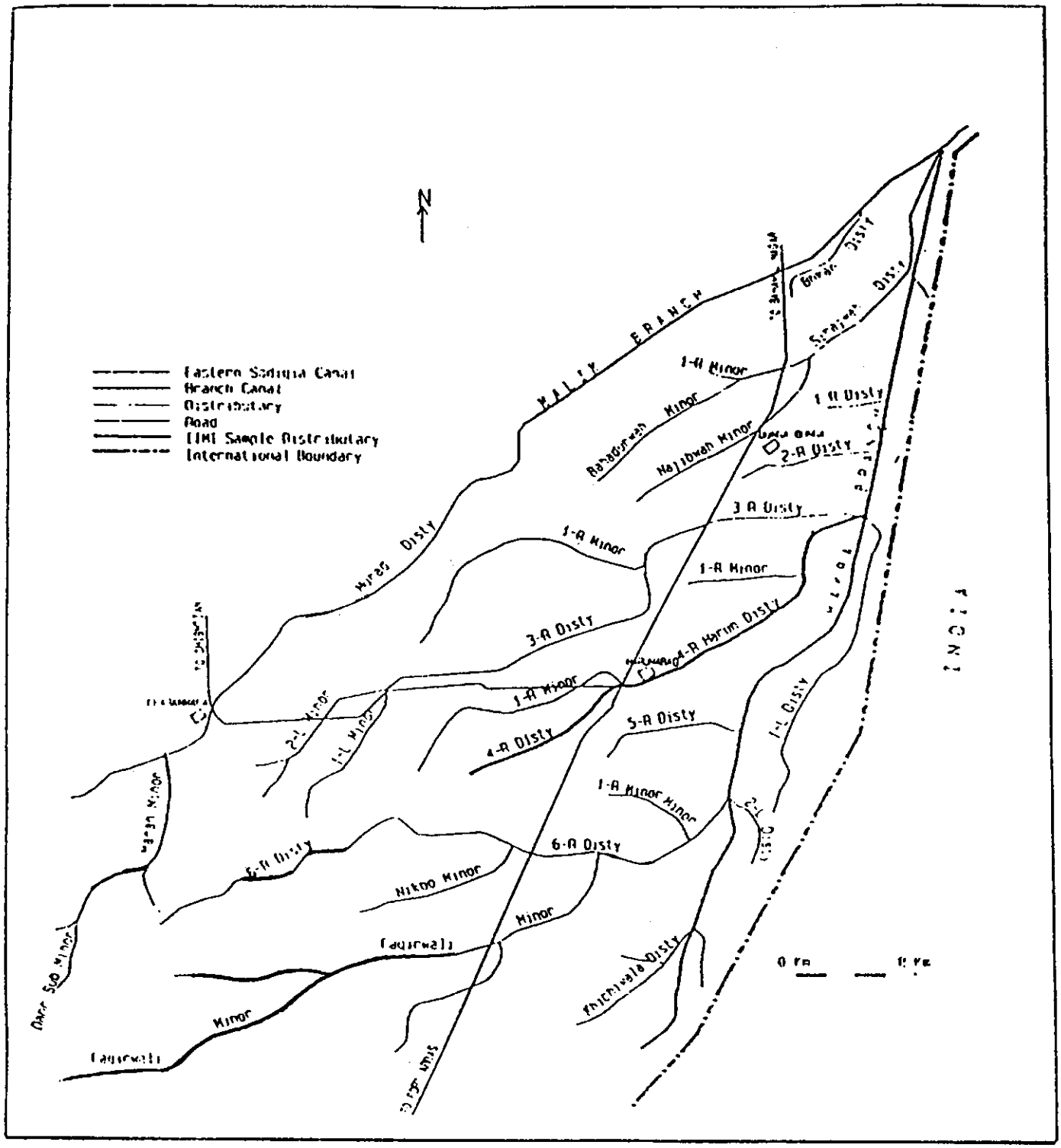


Figure 1. Location map of Hakra 4-R Distributary.

Area (CCA) of the distributary, including its two minors, is 48649 and 43801 acres, respectively. The Hakra 4-R Distributary has 5 drop structures, located along a 35-kilometer stretch. The distance between these drop structures varies between 6 and 8 kilometers. Each drop structure is located at RDs 25, 46, 72, 82 and 107, respectively. Each of two minors originates from RD 23+200 and 72+100, respectively. In this respect, the Hakra 4-R Distributary could easily be divided into 7 hydrological units for purposes of monitoring water supplies. However, for social organization work purposes, the system was divided into 5 convenient Sub-systems. The mean CCA, per Sub-system, is 8760 acres, the largest being 10621 acres. The mean CCA, per watercourse, is 356 acres, and the largest being 1003 acres (w/c No. 16290-R) (Waheed-uz-Zaman, 1998).

2.4 Slopes in the Pilot Site

The average natural slope available to the Hakra 4-R Distributary is 0.71 foot per km from north to south, with a greater elevation difference on each of four drop structures that varies between 2.50 feet and 7.50 feet. The crests of the off-take head and tail outlet cluster have elevations of 525.011 feet and 500.641 feet above sea level, respectively. The irrigated fields (Natural Surface Level, or NSL) are situated in a range from 526.606 feet to 498.666 feet above sea level, between the head and tail areas (Waheed-uz-Zaman, 1998).

2.5 Precipitation in the Area

The climate in the region is hot and arid. The average rainfall ranges between 125 and 250 mm. July and August are months of highest precipitation. October and November are dry months. The hot and dry climate, insufficient rainfall and brackish ground water demand reliable and adequate water supplies for both, irrigation and drinking purposes (Mirza and Hassan 1996).

2.6 Data Available

IIMI-Pakistan has already conducted a baseline survey in the area. This survey covers information about the characteristics of farm holdings, cropping patterns, cropping intensities, water supplies and its reliability, irrigation practices, water logging and salinity, use of agricultural inputs, farm machinery and yields of different crops (Cheema *et al.* 1997). These data will serve as benchmark information, and can be used to test different indicators and the impacts of irrigation supplies after the application of operation and maintenance activities. In addition, the Watercourse Monitoring and Evaluations Directorate (WMED) is monitoring five watercourses in the distributary command in order to assess the impact of water logging and salinity on crop production, especially in consideration of existing management practices. These data will also be helpful for project gestation, or monitoring and evaluation.

2.7 Socio-economic Characteristics of the Farmers of the Hakra 4-R Distributary

IIMI-Pakistan conducted a baseline survey along the Hakra 4-R Distributary during July 1995. The survey revealed (Asghar *et al.* 1995) that overall, the mean number of family members per household along the sample watercourses was 8.78. The mean age of

respondents along the Hakra 4-R Distribuatry was 48.69 years. Farmers have an irrigation experience of 28.2 years, on average. Local respondents were equivalent to about 20 percent, while the rest of the sample farmers were either settlers or migrants. The Jat, Rajput and Arain farmers form about 80 percent of inhabitants along the distributary. The majority of farmers were illiterate, about 61.6 percent. Sample farmers with education below matriculation constituted about 34 percent, whereas only 5 percent of farmers had post-matriculation education.

The mean number of males engaged in agriculture, full-time, was higher than that of females. The mean number of family members in full-time agriculture among respondent households, was 1.97 percent. Females of working age were involved in common agriculture on a part-time basis.

The majority of sample farmers (55%) owned up to 5 acres of land. About 83 percent of farmers have landholdings below the subsistence level, and about 12 percent of farmers had land from 12.6 to 25 acres, while 6 percent of the total sample farmers owned 25.1 acres and above. The mean operated area was about 13 acres in total. The mean area owned by the sample farmers was 8.34 acres. The mean operated area, in total, was higher at the head than at the tail reach. The number of farmers owning tractors was 17 percent, and the number of tubewell owners, 11.7 percent. The majority of cultivators (50.7%) were the actual landowners. Tenants constituted 16 percent, while owner-cum-tenants were 33 percent.

2.8 Irrigation Supply Conditions in the Region

The baseline survey of the Hakra 4-R Distributary (Asghar *et al.* 1995) also provides interesting background information on water supply conditions. The majority of farmers had access to canal water as a source of irrigation supplies. About 43 percent of the sample farmers used other water sources, like private tubewells or purchasing canal water from other farmers. Farmers of the view that canal water only fulfilled crop requirements to some extent was 80.1 percent, and 4 percent pointed out that canal water did not fulfill their crop requirements. About 15 percent of farmers reported that canal water fulfilled the water requirements to a larger extent.

In instances of short water supplies, 54 percent of farmers maintained fallow land. On average, about 26 minutes of water supply were allocated to farmers to irrigate one acre of land. About 132 minutes were required to irrigate one acre. During the 1994 *kharif* season, water was deficient at times of sowing and harvesting. About 30 percent of farmers said that water was in acute shortage during June, *kharif* 1994. About 22 percent of farmers were of the view that canal water was in acute shortage at the time of harvesting the *kharif* crop, i.e., September. Around 80 percent of farmers reported that canal water was in acute shortage during the 1995 *rabi* season. An insufficient water supply was also noticed by 13.1 of the farmers during December. About 24 percent of farmers were of the view that the present system of canal water distribution was unsatisfactory. The majority of sample farmers (68.8%) were of the opinion that government agencies had the ability to improve the present distribution of canal water. About 45 percent of the sample farmers were of the view that distributary water was not equally distributed, while about 52 percent of respondents held the

opposite view. About 80 percent of the sample farmers indicated inequity in water distribution within the Hakra 4-R Distributary command area. Overall, 42 of the sample farmers were of the view that PID officials were responsible for the inequitable distribution of water.

2.9 Organizational Structures and Nomenclatures

The formation of the Water Users Federation (WUF) at the Hakra 4-R Distributary is a three-tier system in which 4500 water users were organized (at first tier) into 121 WUAs (Figure 2). Each WUA comprises of all the farmers along a watercourse. The number of WUA members varies from 5 to 7, depending on the number of factions (*baradaries*, number of potential leaders) along a watercourse, with the exception of 1 or 2 watercourses where the WUA comprised of only one member who owned the entire watercourse command.

Watercourse level meetings facilitated the nomination of WUA members by water users. These 121 WUAs nominated 121 watercourse representatives, who, in most cases, were nominated by the WUA executive bodies. In some other cases, however, the general water users elected the members.

The Hakra 4-R Distributary was grouped into 5 Sub-systems based on social and physical divisions. Each Sub-system comprises of 15 to 33 WUAs, depending on the size of the hydrological unit. These WUAs were, at the time, organized (second-tier) into five Water Users Organizations (WUOs). The electoral body for each WUO also comprises of 15 to 33 watercourse representatives. Each WUO comprises of 7 to 10 executive body members, depending on social and hydrological units (villages, *baradaries* and watercourses). Each Sub-system WUO nominated 5 members for the WUF general assembly. In most cases, Sub-system level WUO presidents and general secretaries were also chosen for the WUF general assembly. The remaining three WUO members were co-opted from among the watercourse representatives. Thus, the WUF general assembly comprises of 25 members. These members then selected a five-member executive body (third-tier) for the WUF for the entire distributary command on March 5, 1997.

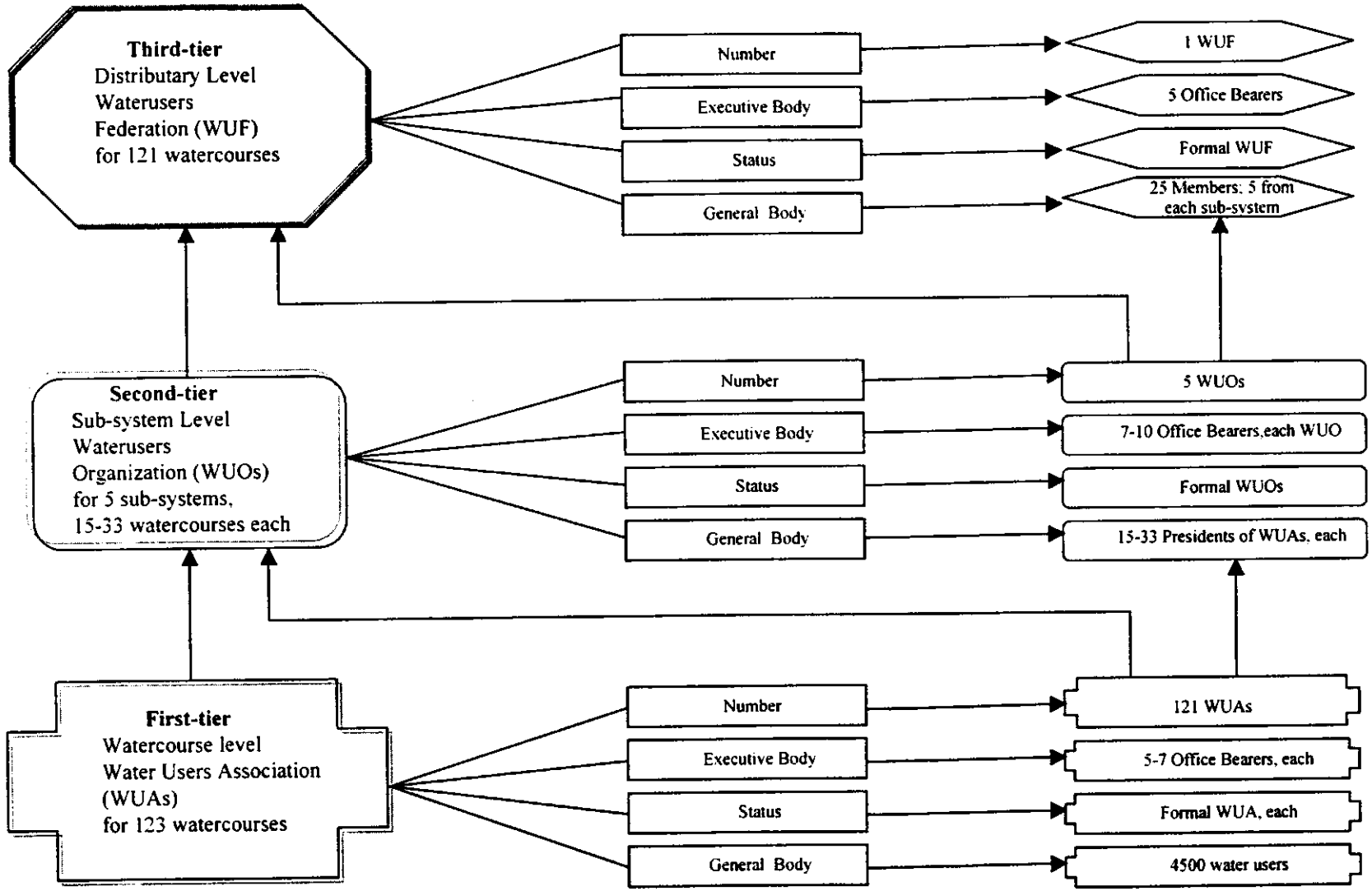


Figure 2. The organizational structure and nomenclature of the Hakra 4-R Distributary Water Users Federation (Waheed-uz-Zaman etc. al., 1998).

Chapter 3

WATERCOURSE LEVEL ASSOCIATIONS UNDER THE DISTRIBUTARY LEVEL WATER USERS FEDERATION

3.1 General

This chapter deals with the process of WUAs at watercourse level. Firstly, it:

- identifies WUA functioning areas under the management of the distributary level WUF;
- describes, in detail, the creation (1st phase) and formalization (2nd phase) processes of the WUAs.

3.2 The Need for Watercourse Level Associations (WUAs)

The main objective of the Hakra 4-R Distributary's WUO pilot project is to provide viable WUFs to manage the distributary. Creating a distributary level WUF, was, therefore, its ultimate target. The WUAs along the Hakra 4-R Distributary have also been created at Sub-system and watercourse levels. Some critics raised the objection that there was no need to create watercourse level associations functioning under the distributary level WUF. They opine that this organization is a mere wastage of resources (with reference to the visit of an Asian Development Bank Consultant to the IIMI Field Office, Haroonabad). The argument here is that WUAs are the main organizational elements of the WUF. The WUAs can perform a variety of important functions under the management of the distributay level WUF, which include:

1) WUAs provide the basis for the distributary level WUF. They also provide a mechanism for equal opportunity leadership to every water user for the higher tier organizations.

2) If responsibilities are transferred to the WUF, then the WUAs can effectively be involved in the assessment of *abiana* (water taxes). The WUF has already proposed the procedure for the involvement of WUAs in assessment procedures. They suggest that the current crop survey by *patwaris* should be continued. The survey, however, should be cross-checked by the WUA presidents of respective watercourses, in order to check under-assessment of crops.

3) Water users from every watercourse are already undertaking periodic cleaning and desilting operations at watercourse level. Earlier, these activities were not formalized. Under the WUF management, WUAs can formalize maintenance activities.

4) 44 percent of watercourses along the Hakra 4-R Distributary are already lined. There is still tremendous potential to undertake improvement works

at watercourse level. The WUAs created by IIMI can be more receptive for purposes of implementing improvement works under the On-Farm Water Management Project (OFWM).

5) Fund raising is an essential element for the viability of the WUF. WUAs can help the WUF to mobilize funds from the grass-roots level.

6) An important function of the WUA will be to solve land- and water-related disputes along their respective watercourses. Solving disputes locally in the their respective watercourses will prove to be very efficient and cost-effective.

7) After a detailed survey of the watercourse commands, the cases of *warabandi* adjustments may be referred to the PID through the WUAs. This will help to maintain transparency for cases related to *warabandi* adjustment.

8) WUAs can also be a major means of technology transfer, because all the interventions related to enhanced agricultural practices will be introduced at watercourse level.

9) WUAs can provide leadership for WUF sub-committees created for different tasks.

10) WUAs can be an effective means to mobilize manpower, machinery and equipment to undertake maintenance activities in their respective reaches for each Sub-system.

11) WUAs can play a role in monitoring water supplies to prevent breaches in their respective reaches, comprising of clusters of watercourses.

3.3 The Creation of 121 Informal Water Users Associations (*Khal* Committees, 1st Phase)

The process of creation of informal watercourse associations (1st phase) was completed between July and December 1996. In this phase, 5 to 7 members were elected; usually, they were 5 in number. In some cases, only one member formed the informal committee as the entire watercourse command belonged to only one farmer. They were called informal associations because the office bearers of these associations were not given different formal titles. Among the 5- to 7-member committees, one was allotted a title of watercourse representative, and the rest were referred to as members. These associations were created *informally,* and were called *khal* committees. The main reason for creating informal associations was because those responsible for implementation wanted to avoid adapting WUO size, structure, strategy and nomenclature as used in the government-sponsored OFWM project.

In the I[st] phase, organizational work was completed with the active facilitation role played by IIMI-Pakistan social organizers. This phase was a bit difficult, as there was less awareness among the common farmers. The process required hard efforts by the field team because of quarrelling among different factions and a high incidence of postponed meetings.

The creation of informal associations had two main repercussions. The first was that such associations could not be registered with the OFWM under the WUA Ordinance of 1982. The second was that *khal* committee members felt no sense of responsibility, as they were not allocated any offices, except for watercourse representatives.

3.4 Formalization of 121 Water Users Associations, 2[nd] Phase

As has been mentioned in the preceding section, the process of creation for 121 informal WUAs (1[st] phase) was completed between July and December 1996. The formalization process (2[nd] phase) of these associations was initiated in April 1997, and continued through to March 1998. The main objective for formalizing these associations (2[nd] phase) was to elevate them to a level that would gain their registration according to the legal requirement. In this process, the selected number of WUA office bearers also varied from 5 to 7, but each office bearer was given a title in the WUA body.

Chapter 4

COMPARISON BETWEEN BEFORE AND AFTER FORMALIZATION PROCESS

4.1 General

This chapter elaborates illustration of factors that make the 2nd phase different from the 1st.

4.2 Differentiating Factors Between 1st and 2nd Phases

Many factors made this process different to the preceding process, and evolved into the ***Formalization of Water Users Associations (WUAs)***, i.e.:

- number of farmers leaders engaged;
- nature of facilitation roles when organizing meetings;
- tone of farmers' criticisms;
- extent of ease with which the process was undertaken;
- scale of postponed meetings;
- duration of the process;
- change in farmers' perceptions;
- shift in farmers' confidence;
- range of issues raised in the meetings;
- correctness of detail for documentation; and
- levels of efforts in maintaining information for the preparation of legal documents.

These factors are elaborated in the following section.

4.2.1 Number of Farmer Leaders Engaged

In the 2nd phase, a range of parameters for farmer leadership was involved when organizing meetings. WUF office bearers at the distributary level, WUO office bearers at the Sub-system level, WUA office bearers of the watercourse level, and social organization volunteers performed active facilitation roles.

4.2.2 Nature of Facilitation Roles when Organizing Meetings

In the first phase, active facilitation roles were forthcoming from IIMI-Pakistan social organizers. The second phase was with the active involvement of the farmer leaders for organizing WUA formalization meetings.

4.2.3 Tone of the Farmers' Criticisms

During the 1st phase, criticisms from farmers were not as a result of a desire for information, but rather for the sake of creating objections. On the other hand, they raised

genuine questions that sought knowledge, information and concept clearances in the second phase.

4.2.4 Extent of Ease to Undertake the Process

In comparison, the 1st phase was completed with relatively more ease than that of the 2nd phase. In this phase, less quarreling and harsh debates among different factions of the water users took place.

4.2.5 Scale of Postponed Meetings

All of 82 instances of postponed meetings in the 1st phase were mainly because of low participation. Whereas, in the 2nd phase, there were only 45 such instances, which shows the farming community's increased interest.

4.2.6 Duration of the Process

The 2nd phase was, relatively, much easier than that of the 1st phase. Consequently, the duration of the formalization process should have been shorter. This duration, however, was longer than that of the 1st phase. The main reason was that the process was halted for a few months due to the organization of a series of flow measurement training courses for farmer leaders.

4.2.7 Change in Farmers' Perceptions

The farmers regarded the 1st phase with doubts, fears and apprehensions. The 2nd phase was regarded with hope, trust and confidence-building.

4.2.8 Shift in Farmers' Confidence

Farmers displayed less confidence during the 1st phase, especially when discussing agriculture-related issues. During the 2nd phase, however, they discussed issues with more confidence. Besides this, there was increased interest and awareness among the water users, particularly about the project, as was clear from the replacement of the WUA old office bearers.

4.2.9 Range of Issues Raised in the Meetings

During the first phase, discussion was focused on raising doubts on the role, motives and international character of IIMI-Pakistan. During the second phase farmers focused discussions on their problems. There was an interesting outcome of range, but mainly issues related to irrigated agriculture. These issues will be discussed in detail in Chapter 9.

4.2.10 Correctness of Detail for Documentation

The process of the 2nd phase was studied and documented with greater detail and accuracy. A proforma was developed, which covered about 20 items pertaining to the formalization process. After each meeting, these proformas were filled out in detail. The information contained in these proformas was later assiduously processed for the purpose of formal report writing.

4.2.11 Clear Guidance about the Number of Office Bearers

The facilitation of IIMI-Pakistan SOs for the number of office bearers was clear and strong during the 2nd phase. Whereas, during the 1st phase, guidance in this regard was relatively lower. The water users decided, in totality, the number of office bearers necessary.

4.2.12 Levels of Efforts for Preparing Legal Documents

The foremost objective of the 2nd phase was to prepare legal documents required to register the WUAs. Three main documents, i.e., proceedings, signed list of participants and verified list of agreed *warabandi,* were prepared for this purpose. For some reason, these documents were lacking during the 1st phase.

Chapter 5

FARMER LEADERS AS FACILITATORS

5.1 General

This chapter deals with the role of farmer leaders in organizing formalization meetings. This chapter will:

- describe the roles of watercourse representatives in organizing meetings;
- discuss the role of Sub-system level office bearers, through shedding light on the role of WUF office bearers at distributary level;
- cover the role of SOVs in organizing formalization meetings; and finally,
- examine the modes of effort when organizing meetings.

5.2 Shift in Facilitation Roles and Extent of Leadership

As described in Chapter 2, the 1st phase encompasses the active facilitation role performed by IIMI-Pakistan social organizers. The 2nd phase involved the active involvement of farmer leaders in organizing WUA formalization meetings. In the 2nd phase, a range of parameters for farmer leadership was involved in organizing meetings. WUA, WUO and WUF office bearers at watercourse, Sub-system and distributary levels, respectively, and social organization volunteers (SOVs), performed active facilitation roles in these meetings.

5.3 The Role of WUA Presidents

Overall, participation by presidents in the meetings was 100 percent. However, 77 percent of the presidents were actively involved in organizing meetings.

In organizing formalization meetings, there was a varying degree of involvement by WUA presidents. Sub-system 4 performed best in this regard, where 100 percent of the presidents were involved in organizing the meetings. In Sub-system 3, 82 percent of the presidents were actively involved in organizing meetings. Involvement from Sub-systems 1 and 5 was 91 each, respectively. In Sub-system 2, 87 percent of presidents were involved in organizing meetings. Table 1 gives the Sub-system-wise participation of presidents for these meetings. Figure 3 gives the percentage of involvement by presidents in organizing meetings.

Annexures 1 to 5 give the Sub-system-wise lists of presidents of WUAs and their status of participation.

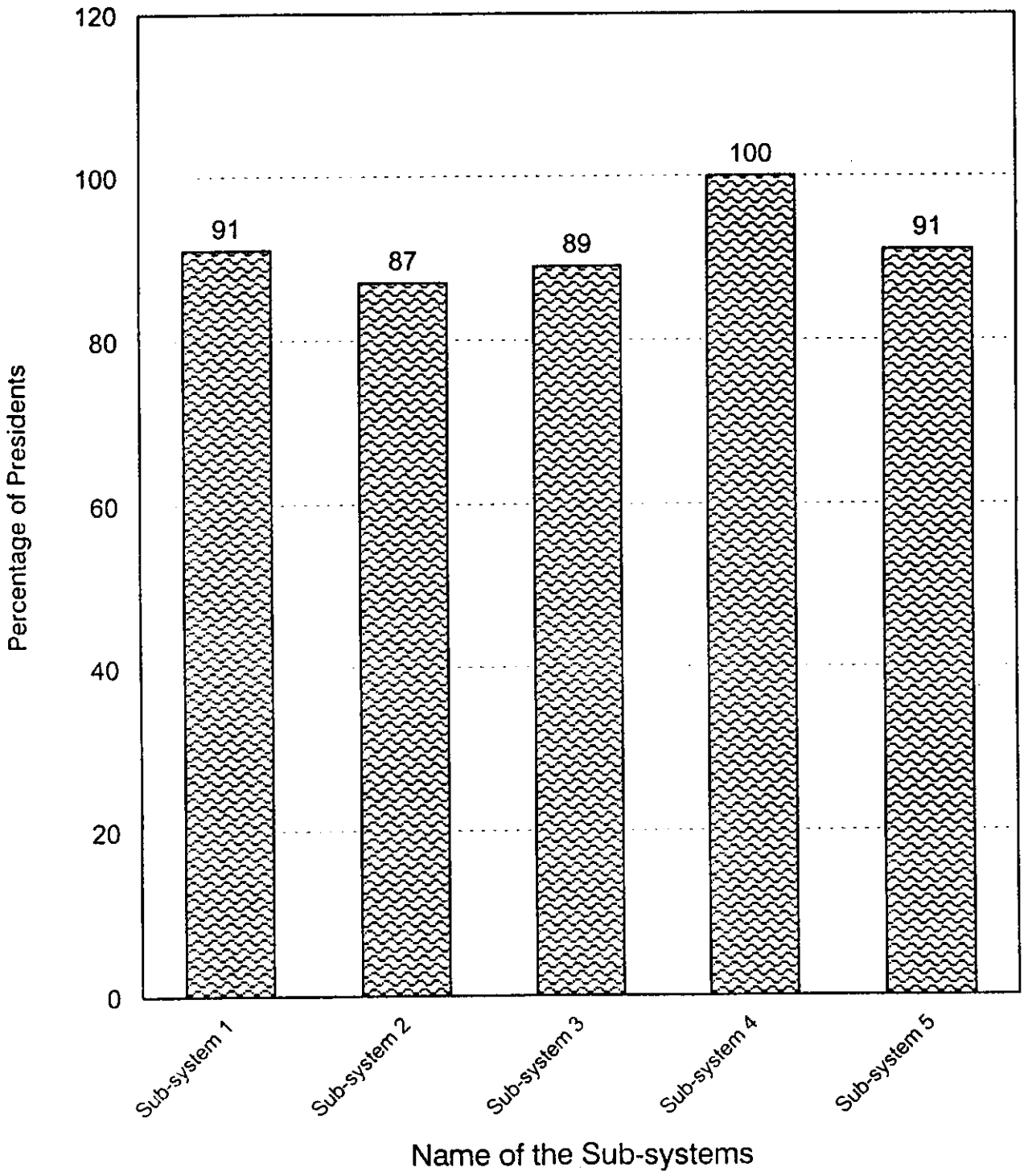


Figure 3. Percent of president involved in organizing formalizing meetings among 5 Sub-systems.

Table 1. WUA Presidents Involved in Organizing Formalization Meetings.

Name of the Sub-systems	Total WUA Presidents	WUAs presidents actively involved in organizing meetings
Sub-system 1	23	21
Sub-system 2	23	20
Sub-system 3	27	24
Sub-system 4	15	15
Sub-system 5	33	32
Total	121	112

5.4 The Role of WUO Office Bearers

Overall, approximately 50 percent of the Sub-system level WUO office bearers played active roles in organizing formalization meetings. They were involved in organizing 40 percent of the meetings. The number of office bearers actively involved in the process varies among the Sub-systems. The performance of WUO office bearers of Sub-systems 3 and 5 was relatively better.

In Sub-system 3, out of 9 office bearers, 5 participated in organizing 19 meetings. In Sub-system 5, out of 6 office bearers, 5 participated in 16 meetings. In Sub-system 2, only one office bearer participated in organizing the meetings, but to a limited extent.

In Sub-systems 1 and 4, the number of office bearers who participated in organizing formalization meetings was 3 and 4, respectively. Their roles were also limited. In their respective Sub-systems, they organized 6 and 4 meetings, respectively. See Table 2.

Table 2. WUO Office Bearers Involved in Organizing Formalization Meetings.

Name of the Sub-systems	Total WUO OBs	Office bearers actively involved in organizing formalizing meetings	Meetings organized by WUO office bearers
Sub-system 1	8	3	6
Sub-system 2	8	1	2
Sub-system 3	9	5	19
Sub-system 4	7	4	4
Sub-system 5	6	5	16
	38	18	47

5.5 The Role of WUF Office Bearers

As has been described in Chapter 1, five WUF general assembly members were co-opted from each Sub-system. Thus, the WUF general assembly comprised of 25 members. Overall, 60 percent of the WUF leaders played active roles in organizing formalization meetings.

In Sub-system 3, the participation of the WUF leaders was highest, in which 6 office bearers participated in 25 meetings. Participation for Sub-systems 4 and 5 is in the middle, and Sub-system 1 and 2 remained at the lowest position, where only 2 office bearers participated in only a few meetings. See Table 3.

Table 3. WUF Office Bearers' Performance when Organizing Formalization Meetings.

Name of the Sub-systems	Total WUF OBs	OBs actively involved in organizing formalizing meetings	Total meetings organized	No of meetings, organized by WUF office bearers
Sub-system 1	5	2	23	2
Sub-system 2	5	2	23	4
Sub-system 3	5	6 (includes OB from other Sub-system)	27	25
Sub-system 4	5	3	15	5
Sub-system 5	5	3	33	11
	25	16	121	47

5.6 Role of Social Organization Volunteers

Overall, 27 percent of the SOVs were actively involved in organizing meetings.

Social Organization Volunteers (SOVs) were selected when the project was initiated. They were initial contact points between the Field Team and the farmers. They performed many important functions, such as constructing *warabandi* lists and organizing consultation meetings. They also played an important role in organizing formalization meetings. Table 4 shows the participation of the SOVs in the formalization meetings, merely to point out that those SOVs not included in the table have been selected as WUO and WUA office bearers. Out of 158, about 100 SOVs were selected as the WUO and WUA office bearers.

The involvement of SOVs from Sub-systems 1 and 5 in organizing formalization meetings was highest. In Sub-system 3, it was normal, and Sub-system 2 and 3 remained at the bottom. See Table 4.

Table 4. Performance of SOVs When Organizing Formalization Meetings.

S. NO	Name of the Sub-systems	Total SOVs	SOVs actively involved in organizing formalization meetings	No of meeting in which SOVs were involved.
1	1	29	11	8
2	2	30	2	2
3	3	32	6	7
4	4	13	3	3
5	5	54	20	10
	Total	158	42	30

Chapter 6

WUA PARTICIPATION IN FORMALIZATION MEETINGS

6.1 General

In this chapter, the participation of the ordinary water users in the formalization meetings has been presented. Here, the rate of participation among the Sub-systems, and then the comparison of participation between the 1st and 2nd phases are presented. The participation within the five Sub-systems among the watercourses is also detailed.

6.2 Participation in Each Sub-system

The number of water users varies from 318 to 951 among the Sub-systems. The percent of participants among the Sub-systems ranges from 71 to 78. On average, participation was 74 percent. Table 5 gives the comparison of this percent of participation. Also, see Figure 3, which gives a comparative overview of participation in the 1st and 2nd phases among the Sub-systems.

Table 5. Sub-system Participation in Formalization Meetings.

Serial No	Sub-system name	Total Water Users	Participated	Percentage
1	SS1	706	500	71%
2	SS2	318	241	76%
3	SS3	824	623	75%
4	SS4	610	423	69%
5	SS5	951	744	78%
	Total	3409	2511	74%

6.3 Participation in the Sub-systems

The following sections pertain to the percent detail of the participants within the Sub-systems among the watercourses. Each of five Sub-systems has been described in detail.

6.3.1 Participation among the Watercourses, Sub-system 1

The water users among the watercourses of Sub-system 1 vary from 9 to 51, except in one watercourse, where the entire command belongs to one farmer. The average percent of participants ranges from 58 to 88. Overall, the percent of participation among the watercourses of Sub-system 1 is 71. Table 6 shows the watercourse wise percent of participants within Sub-system 1.

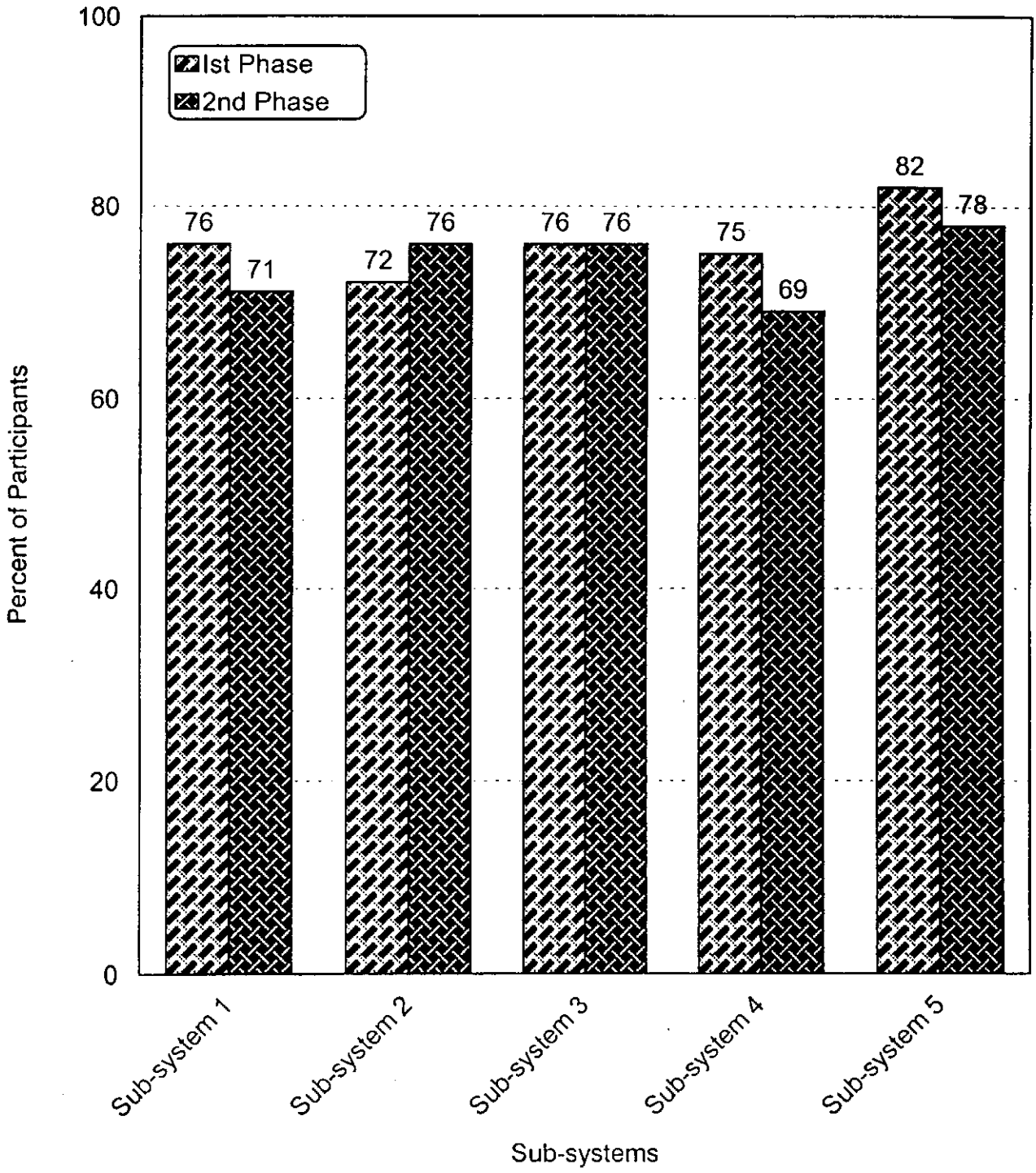


Figure 4. Comparative look at the participation in 1st and 2nd phases among the Sub-systems.

Table 6. Sub-system 1's Participation in Formalization Meetings.

Serial No	W/C No	Total Water Users	Participated	Percentage
1	1240-L	19	15	79%
2	4162-L	48	42	88%
3	6431-L	26	16	62%
4	14865-L	26	16	62%
5	14670-R	30	25	83%
6	16290-R	51	31	61%
7	21798-L	24	16	67%
8	22812-R	26	21	81%
9	24474-L	41	27	66%
10	24582-R	25	17	68%
11	28208-L	1	1	100%
12	31980-L	9	8	87%
13	33130-L	24	19	79%
14	34630-R	46	29	63%
15	35730-L	38	22	58%
16	39610-L	23	17	74%
17	40400-R	46	31	67%
18	43320-L	25	19	77%
19	44580-R	51	34	67%
20	45810-R	32	21	67%
21	45850-R	36	27	75%
22	46237-R	13	10	78%
23	46240-L	46	36	78%
	Total	706	500	71%

6.3.2 Reasons for High, and Low, Participation in Sub-system 1

The percentage of participants among the majority of the watercourses was generally above 70. The watercourse where presidents, as well as the SOVs, commanded a good influence, and where they played active facilitation roles in organizing meetings, enjoyed a relatively higher participation. Homogeneity of the water users was another factor for high participation among the watercourses of Sub-system 1.

In locations where the water users of a watercourse live in hamlets, or live in more than one village, coupled with the relatively lower active roles of WUA presidents and SOVs, the participation remained low. Relatively less awareness about the project was another reason for low participation in some watercourses. In one watercourse, the death of a villager on the day of the meeting was the reason for low participation.

6.3.3 Participation Among the Watercourses, Sub-system 2

The holding sizes within Sub-system 2 present a skewered pattern when compared to that of other Sub-systems. Therefore, the number of water users among the watercourses of Sub-system 2 varies from 1 to 31, with the water users of 6 watercourses ranging from 1 to 5. The average number of water users, however, per watercourse in Sub-system 2, is 14. The percent of participants ranges from 65 to 100. Overall, the percent of participants among the watercourses of Sub-system 2 is 76. Table 7 shows the percent of participants within Sub-system 2.

6.3.4 Reasons for High and Low Participation in Sub-system 2

In the watercourses where the number of water users was very small, i.e., 1-3 the participation in the formalization meetings was higher in term of percentage. The main reason for relatively low participation within the Sub-system 2 was disinterest of the leaders of the WUO executive body.

6.3.5 Participation among the Watercourses, Sub-system 3

The farmers in Sub-system 3 are relatively smaller when compared to that of Sub-system 2. The number of water users among the watercourses of Sub-system 3 varies from 14 to 72. The average number of water users, however, per watercourse in Sub-system 3, is 31. The percent of participants ranges from 52 to 94 among the watercourses. Overall, the percent of participants among the watercourses of Sub-system 1 is 71. Table 8 shows the percent of participants within Sub-system 3.

6.3.6 Reasons for High, and Low, Participation in Sub-system 3

The influence of WUA presidents, their personal contacts with water users, homogeneity (single-caste) of water users, roles of SOVs, cohesiveness among the water users, and holding afternoon meetings, were the contributing factors for high participation in Sub-system 3.

6.3.7 Participation among the Watercourses, Sub-system 4

There is a relatively smaller amount of farmers in Sub-system 4 when compared to that of all the other Sub-systems. The number of water users among the watercourses of Sub-system 4 extends from 29 to 65. The average number of water users, however, per watercourse in Sub-system 4, is 41. The percent of participants ranges from 54 to 94

among the watercourses. Overall, the percent of participants among the watercourses of Sub-system 4 is 69. Table 9 shows the percent of participants within Sub-system 4.

Table 7. Sub-system 2's Participation in Formalization Meetings.

Serial No	W/C No	Total Water Users	Participated	Percentage
1	50310-R	22	14	63%
2	50950-L	19	12	63%
3	52050-L	26	22	84%
4	52050-R	11	09	82%
5	54700-L	17	15	88%
6	55650-L	05	04	80%
7	56730-L	15	12	80%
8	57860-R	03	03	100%
9	57870-R	12	08	67%
10	57890-L	24	18	75%
11	60490-L	11	09	82%
12	59100-R	1	1	100%
13	59130-R	1	1	100%
14	62670-R	1	1	100%
15	63910-L	07	05	71%
16	65080-L	16	12	75%
17	66050-L	2	15	71%
18	69310-R	08	08	100%
19	69490-L	23	20	87%
20	70640-L	31	20	65%
21	71270-R	18	11	61%
22	71735-L	16	13	81%
23	71750-R	09	08	89%
Total	23	318	241	76

Next >>

Table 8. Sub-system 3's Participation in Formalization Meetings.

Serial No	W/C No	Total Water Users	Participated	Percentage
1	75366-R	44	23	52%
2	78400-R	33	20	61%
3	79924-L	21	20	95%
4	81350-R	33	29	88%
5	86376-L	52	32	62%
6	87640-R	51	35	69%
7	88920-L	28	21	75%
8	89179-L	38	24	63%
9	91706-R	14	08	57%
10	92631-L	16	12	75%
11	93870-L	33	25	75%
12	94300-L	39	32	82%
13	95102-L	16	12	75%
14	95920-R	21	18	86%
15	96362-L	32	20	62%
16	98729-L	19	18	94%
17	101069-L	19	17	89%
18	102214-R	25	20	80%
19	102237-	20	18	90%
20	104520-	52	39	75%
21	105634-L	14	13	93%
22	107020-R	17	15	88%
23	107022-	34	32	94%
24	107055-R	19	12	63%
25	109980-R	26	18	69%
26	112050-TL	36	34	94%

Table 9. Sub-system 4's Participation in Formalization Meetings.

Serial No	W/C No	Total Water Users	Participated	Percentage
1	674-L	29	26	90%
2	4000-L	37	23	62%
3	4700-R	44	29	66%
4	8565-L	43	27	63%
5	9661-L	42	26	62%
6	10291-R	49	31	63%
7	11785-L	47	30	77%
8	14080-L	36	34	94%
9	16280-R	34	27	79%
10	18480-L	32	30	94%
11	19580-R	24	17	71%
12	22000-TL1	37	32	86%
13	22000-TL2	65	39	60%
14	22000-TC	41	25	61%
15	22000-TR	50	27	54%
Total	15	610	423	69%

6.3.8 Reasons for High, and Low, Participation in Sub-system 4

The active roles of WUF and WUO office bearers, and the active roles of the presidents of the respective WUAs, their continuous contact with the WUO members and common farmers, through periodic meetings, were the main contributing factors for high participation in some watercourses. In other watercourses, the participation was relatively low. Reasons included sudden deaths in the village, and the need for some farmers to appear in court on the days meetings were held

6.3.9 Participation Among the Watercourses, Sub-system 5

Relatively speaking, the distribution of water users among the watercourses of Sub-system 5 is not very skewered. The farmer population is relatively small in this Sub-system when compared to that of some other Sub-systems. The number of water users among the watercourses of Sub-system 5 ranges from 15 to 58. The average number of water users, however, per watercourse in Sub-system 5, is 29. The percent of participants ranges from 59 to 93 among the watercourses. Overall, the percent of participants among the watercourses of Sub-system 5 is 78. Table 10 shows the percent of participants within Sub-system 5.

Table 10. Sub-system 5's Participation in Formalization Meetings.

Serial No.	W/C No	Total Water Users	Participated	Percentage
1	1215-L	26	20	77%
2	3750-L	23	18	78%
3	3420-R	35	22	63%
4	4803-R	27	25	93%
5	7140-R	32	25	78%
6	7641-R	41	36	88%
7	8043-R	38	26	68%
8	11792-L	22	18	82%
9	12515-R	32	25	78%
10	17679-L	15	13	87%
11	17619-R	24	19	79%
12	19116-R	34	24	79%
13	20419-R	41	32	78%
14	22600-R	58	34	59%
15	20630-L	37	33	89%
16	25883-L	28	24	86%
17	23738-L	34	29	85%
18	27061-R	34	26	76%
19	27514-R	39	33	85%
20	29418-L	28	23	82%
21	330-L	19	17	89%
22	33813-R	17	14	82%
23	33674-L	28	20	71%
24	33730-L	18	16	89%
25	33940-L	27	20	74%
26	40030-R	15	14	93%
27	43648-L	29	20	69%
28	47529	22	13	59%
29	46500-L	16	14	88%
30	45520-L	29	27	93%
31	50623-TL	20	19	95%
32	50623-TF	34	28	82%
33	50623-TR	29	17	59%
Total	33	951	744	78%

6.3.10 Reasons for High, and Low, Participation

The interest of leadership at all levels was the influencing factor of high participation. In this Sub-system planning meetings at watercourse level were organized to ensure maximum participation. Personality clashes among different factions of farming community were the main factor of relatively low participation within the Sub-system.

6.4 Comparison of Participation Before, and After, Formalization (between 1st 2nd phases)

The percent of participants among the Sub-systems before formalization (1st phase) ranged from 72 to 82. The percent of participants among the Sub-systems during the formalization process (2nd phase) varied from 69 to 78. The overall percent of participants in the 1st phase was 77, and 74 in the 2nd. Table 11 gives the comparison of participation between the 1st and 2nd phases.

Table 11. Comparison Between 1st and 2nd Phase Participation Among the Sub-systems.

Serial No	Sub-system Name	First Phase	Second Phase
1	SS1	76%	71%
2	SS2	72%	76%
3	SS3	76%	76%
4	SS4	75%	69%
5	SS5	82%	78%
		77%	74%

6.5 Reasons for Low Participation in 2nd Phase

The participation in the 2nd phase was lower than that of the 1st. However, this does not present a very significant difference. The participation in the 2nd phase was slightly reduced from 77 to 74 percent. Let us examine what the causes of this slight variation could be.

In the 1st phase, the IIMI-Pakistan social organizers were the main facilitators. Their hard efforts resulted in high participation in the WUA formation meetings. In the 2nd phase, there was a shift in this strategy. Farmers were given active roles in facilitating meetings in the 1st phase. Therefore, the scale of efforts by IIMI social organizers reduced, which affected the participation rate in formalization meetings.

In the 1st phase, IIMI SOs were asked to ensure a minimum participation of 66 percent. This condition was not based on any legal requirement, but just on the idea that a two-thirds participation would be considered a more sound participation by critics. On the other hand, they were asked to ensure a minimum of 51 percent participation in the 2nd phase. This is the minimum requirement for the formation of WUAs at watercourse level. This requirement has been laid down in the Water Users Association (WUA) Ordinance of 1982.

Chapter 7

EASE WITH WHICH FORMALIZATION MEETINGS WAS ACHIEVED

7.1 General

This chapter describes the extent of ease with which the formalization meetings occurred. The detail aims to:

- describe the ease of achievement by comparing the number of meetings postponed in the 1st and 2nd phases;
- narrate the reasons for postponed meetings in each phase; and
- provide the watercourse-wise instances of postponing meetings in each Sub-system.

7.2 Number of Meetings Postponed in the 1st and 2nd Phases among 5 Sub-systems

This section presents a comparative view of postponed meetings, of both, the 1st and 2nd phases, among the Sub-systems. The table indicates that out of 5 Sub-systems, the number of postponed meetings were reduced significantly in the 2nd phase. There was an enormous reduction in the number of meetings postponed in Sub-system 5 in the 2nd phase. This shows that the process was very easy in this phase. In Sub-systems 1 and 4, the number of meetings postponed in the 2nd phase was reduced to 50 percent, which shows the extent of ease with which the process in these Sub-systems was achieved. In Sub-system 3, relatively speaking, the number of meetings postponed in the 1st and 2nd phases was very low when compared to that of the other Sub-systems. This shows that the process of formalization of the meetings was very easy in both phases in this Sub-system, particularly in the 2nd phase. Overall, the number of postponed meetings was approximately 60 percent less in the 2nd phase than the 1st. See Table 12.

Table 12. Comparative View of Postponed Meetings in 1st and 2nd Phases in Organizational Process among 5 Sub-systems.

Sub-system name	Total postponed meetings (1st phase)	Total postponed meetings (2nd phase)
1	29	15
2	14	16
3	4	2
4	12	8
5	23	4

7.3 Postponed Meetings within Sub-system 1 (1st and 2nd phases)

The total number of instances of postponed meetings in Sub-system 1 was 29 in the 1st phase. In this phase, the number of instances per watercourse ranges from 1 to 5. On the other hand, the total number of instances of postponed meetings was 15 in the 2nd phase. In this phase, the number of instances per watercourse ranges from 1 to 2. This shows how the process became easy in the 2nd phase.

In the 1st phase, the main reason for postponed meetings was low participation in Sub-system 1. Among other reasons were:

- disinterest of key share holders;
- negative propaganda against the project by the PID local staff; and
- shareholders' scattered occupation along the command areas.

In the 2nd phase, there were only two main reasons for the postponement of meetings in Sub-system 1; one was low participation, and another was the absence of WUA presidents. See Table 13. Annex 6 shows the instances of postponed meetings corresponding to the number of outlets in Sub-system 1.

7.4 Postponed Meetings within Sub-system 2 (1st and 2nd phases)

The total number of instances of postponed meetings in Sub-system 2 amounted to 14 in the 1st phase. In this phase, the number of instances per watercourse ranges from 1 to 4. On the other hand, the total number of instances of postponed meetings was only 16 in the 2nd phase. In this phase, the number of instances per watercourse ranges from 1 to 3. This shows that the process became relatively more difficult in the 2nd phase.

In the 1st phase, the sole main reason for postponed meetings was low participation in Sub-system 2. There was no other reason for the postponement of meetings. Annex 7 shows the instances of postponed meetings corresponding to the number of outlets in Sub-system 2.

In the 2nd phase, there were two main reasons for postponed meetings; one was low participation, and the other was the failure of the WUO leaders to convey the time and venue to all water users. See Table 14.

Table 13. Comparative view of Postponed WUA Meetings during the 1st and 2nd Phases, Corresponding to Reasons from Sub-system 1.

S. No	W/C No	Postponed meetings (1st phase)	Reasons	No of postponed meetings (2nd phase)	Reasons
1	41-L	2	Low participation	1	Low participation
	64-L	1	Low participation	0	0
3	14-L	5	Disinterest of a main farmer	2	Absence of w/c Rep
4	16-R	2	Negative propaganda about IIMI	1	Absence of w/c rep,
5	21-L	4	Negative propaganda about IIMI	2	Absence of w/c rep, illness of w/c rep
6	22-R	1	Low participation	1	Low participation
7	24-L	3	Scattered locations of WU: and disinterest	1	Low participation
8	31-L	2	Low participation	1	Low participation; disinterest of w/c rep.
9	33-L	1	Low participation	1	Low participation
10	34-R	1	Low participation		0
11	35-L	2	Low participation		0
12	39-L	1	Low participation	1	Low participation
13	40-R	2	Low participation	0	NA
14	44-R	2	Low participation	0	0
15	45-R	0	0	2	Low participation
16	45-R	0	0	1	Low participation
17	46-R	0	0	1	Low participation
Total		29		15	

Table 14. Comparative View of Postponed WUA Meetings during the 1st and 2nd Phases, Corresponding to Reasons from Sub-system 2.

S. No	W/C No	Postponed meetings, 1st phase	Reasons	Postponed meetings, 2nd phase	Reasons
1	50-R	0	0	1	WUs were not informed
2	55-L	0	0	2	Bad weather
3	56-L	1	Low participation	0	0
4	57-L	4	Low participation	0	0
5	60-L	2	Low participation	2	Low participation
6	69-L	0	0	3	Low participation
7	70-L	3	Low participation	2	Low participation
8	71-R	3	Low participation	3	Low participation
9	71-L	0	0	1	WUs were not informed
10	71-R	1	Low participation	2	WUs were not informed
Total		14		16	

7.5 Postponed Meetings within Sub-system 3 (1st and 2nd phases)

The total number of instances of postponed meetings in Sub-system 3 was 4 in the 1st phase. In this phase, the number of instances in each watercourse does not exceed 1. In the 2nd phase, the total number of instances of postponed meetings was only 2. In this phase, the number of instances per watercourse also did not exceed 1. Annex 8 shows the instances of postponed meetings corresponding to the number of outlets in Sub-system 3. This shows that the process became relatively easier in the 2nd phase. In comparison with other Sub-systems, the process was very easy in both phases in Sub-system 3.

In the 1st phase, the sole chief reason for postponed meetings was low participation in Sub-system 3.

In the 2nd phase, quarreling among the water users of Sub-system 3 was the only reason for postponed meetings. See Table 15.

Table 15. Comparative view of Postponed WUA Meetings during the 1st and 2nd Phases, Corresponding to Reasons from Sub-system 3.

S. No	W/C No	Postponed meetings, 1st phase	Reasons	Postponed meetings, 2nd phase	Reasons
1	79924-L	1	Low participation	0	0
2	94300-L	0	0	1	Differences of opinion
3	96362-L	0	0	1	-do-
4	98729-L	1	Low participation	0	0
5	101069-L	1	Low participation	0	0
6	102237-	1	Low participation	0	0
	Total	4		2	

7.6 Postponed Meetings within Sub-system 4 (1st and 2nd phases)

The total number of instances of postponed meetings in Sub-system 4 was 12 in the 1st phase. In this phase, the number of instances in each watercourse ranges from 1 to 3. In the 2nd phase, the total number of instances of postponed meetings was only 8. In this phase, the number of instances per watercourse also varies from 1 to 2. This shows that the process became relatively easy in the 2nd phase. In comparison to other Sub-systems, the process was easy in both phases, but not as easy as in Sub-systems 1 and 3. Annex 9 shows the instances of postponed meetings corresponding to the number of outlets in Sub-system 4.

In the 1st phase, the main reason for postponed meetings in Sub-system 4 was low participation. In one watercourse, the reason was quarreling among the office bearers.

In the 2nd phase, low participation was the single main reason for postponed meetings in Sub-system 4. See Table 16.

7.7 Postponed Meetings within Sub-system 5 (1st and 2nd phases)

The total number of instances of postponed meetings in Sub-system 5 was 23 in the 1st phase. Similar to Sub-system 1, the number of instances of postponed meetings per watercourse ranges from 1 to 5 in this phase. On the other hand, the total number of instances of postponed meetings was only 4 in the 2nd phase. Here, the number of instances per watercourse ranges from 1 to 2. This shows how the process became easier in the 2nd phase. Annex 10 shows the instances of postponed meetings corresponding to the number of outlets in Sub-system 5.

Table 16. Comparative View of Postponed WUA Meetings During the 1st and 2nd Phases, Corresponding to Reasons from Sub-system 4.

S. No	W/C No	Postponed meetings, 1st phase	Reasons	Postponed meetings, 2nd phase	Reasons
1	674-L	1	Low participation	0	0
2	4000-L	1	-do-	0	0
3	4700-R	1	-do-	0	0
4	8565-L	0	0	0	0
5	9661-L	1	Low participation	0	0
6	10291-R	0	0	1	Low participation
7	11785-L	1	Low participation	0	0
8	14080-L	1	-do-	0	0
9	16280-R	0	0	1	Low participation
10	18480-L	0	0	1	-do-
11	19580-R	0	0	0	0
12	22000-TL1	0	0	0	0
13	22000-TL2	1	Conflict among OBs	1	-do-
14	22000-TC	2	Low participation	2	Low participation
15	22000-TR	3	-do-	2	-do-
Total	15	12		8	

In the 1st phase, the main reason for postponed meetings was low participation in Sub-system 5. Among other reasons were conflict among office bearers and the deaths of the some villagers.

In the 2nd phase, there were also two main reasons for the postponement of meetings in Sub-system 5; one was low participation and the other was the death of a villager. See Table 17.

Table 17. Comparative View of Postponed WUA Meetings during the 1st and 2nd Phases, Corresponding to Reasons from Sub-system 5.

S. No	WC. No	Postponed meeting, 1st phase	Reasons	Postponed meetings, 2nd phase	Reason
1	1215-L	2	Conflict selecting OB	0	0
2	3420-R	3	Low participation	0	0
3	4803-R	3	Low participation	0	0
4	7140-R	3	Low participation	0	0
5	17619-R	1	Conflict selecting OB	1	Death
6	22600-R	5	Low participation	2	Low participation
7	33813-R	1	Death	0	0
8	33730-L	2	Low participation	1	Low participation
9	40030-R	1	Death	0	0
10	47529-R	2	Low participation	0	0
Total	10	23		4	

Interesting to note is that in the Sub-system 5, in the 1st phase, there were two watercourses where the meetings were postponed due to conflicts among the water users. In the 2nd phase, however, there was not even a single instance of quarreling. See Table 17.

7.8 Instances Per Watercourse

With regard to the range of instances of postponed meetings per watercourse in the 1st and 2nd phases, the analysis shows a significant reduction in the 2nd phase. In the 1st phase, there were 80 outlets where instances of postponed meetings were zero. In the 2nd phase, there were 90 such outlets with zero instances. Similarly, in the 1st phase, there were 7 outlets where the meetings were postponed three times each; whereas, in the 2nd phase, there were 2 such outlets. There were even some outlets where the meetings were postponed for 4 to 5 times in the 1st phase. In the 2nd phase, there was not even a single outlet with this high incidence. This situation suggests that the 2nd phase was much easier than that of the 1st. See Figure 5.

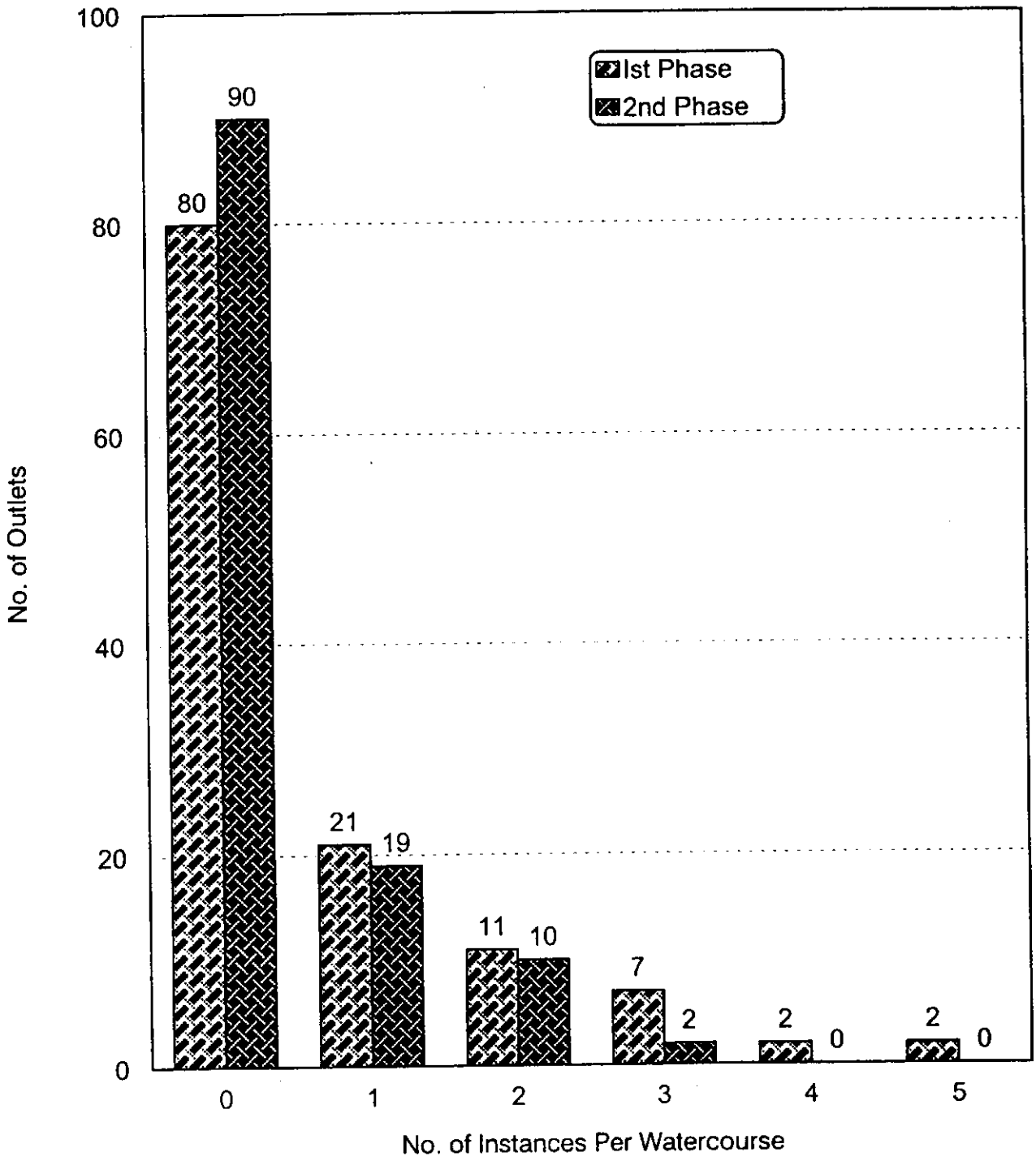


Figure 5. Instances of postponed meetings per watercourse.

Chapter 8

CHANGE IN OFFICE BEARERS

8.1 General

The detail of changes that occurred during the 2nd phase among office bearers is discussed in this chapter. This chapter:

- discusses the Sub-system-wise changes in the number of office bearers;
- gives the detail of the changes within each Sub-system; and
- describes, in detail, the reasons for changes among office bearers in each of the 5 Sub-systems.

8.2 Change in Office Bearers among the 5 Sub-systems

In the 1st phase, a total of 615 office bearers comprising of the WUAs belonging to 121 watercourses existed. Here, the WUA members were not allotted titles in the executive body. The 2nd phase shows an addition of 95 office bearers. In this phase, they were given titles. Titles of positions were President, Vice President, General Secretary, Treasurer, Information Secretary and Joint Secretary. In some cases, one or two advisors were also selected into the WUA executive body. Currently, the selected number of office bearers amounts to 710 in total.

In the 2nd phase, three types of changes were made; in the majority of instances, the new office bearers were added into the executive bodies, in others, subtracted. A significant number of office bearers were also replaced. The reasons for these changes will be described in later sections. Table 18 gives the Sub-system-wise status of replaced office bearers.

Table 18. Status of Office Bearers before, and after, Formalization within the 5 Sub-systems.

S.No	Sub-system	No. of OBs, 1st phase	No. of OBs, 2nd phase	Change in No of Office Bearers		
				Addition	Subtraction	Replaced OBs
1	SS1	127	139	16	4	15
2	SS2	111	109	11	13	22
3	SS3	145	160	15	0	15
4	SS4	79	102	23	0	0
5	SS5	153	200	49	2	7
	Total	615	710	114	19	59

8.3 Change in Office Bearers in Sub-system 1

The number of office bearers in Sub-system 1, in the 1st phase, ranged from 5 to 7. This number was less than 5 in only a few exceptions. The number of office bearers in the 2nd phase generally ranged from 5 to 6 in Sub-system 1. There was not even a single watercourse in which the number of office bearers was less than five. In one watercourse, the number of office bearers amounted to 9.

Three types of changes were made in the selection of office bearers during the formalization process (1st phase): addition, subtraction and replacement. Approximately 50 percent of the WUAs added new office bearers to their executive bodies. The number of new additions varies from 1 to 3. Overall, there was an addition of 12 new office bearers in the executive bodies of Sub-system 1's WUA. Office bearers were subtracted from 15 percent of the Water Users Associations. Replacements occurred in 47 percent of the watercourses of Sub-system 1. The number of replaced office bearers ranged from 1 to 3 among the watercourses of Sub-system 1. See Table 19.

8.4 Change in Office Bearers in Sub-system 2

The number of office bearers in Sub-system 2 generally ranged from 5 to 7 in the 1st phase, with a significant number of watercourses where this figure was less than 5. In three watercourses particularly, WUA bodies comprised of only one member each because the entire watercourse command belongs to one farmer. The number of office bearers in the 2nd phase generally ranged above 5 in Sub-system 2. Contrary to Sub-system 1, there was not even a single watercourse in which the number of office bearers was more than seven.

Also, in Sub-system 2, three types of changes were made in the selection of office bearers during the formalization process (2nd phase); addition, subtraction and replacement. Approximately 26 percent of the WUAs added new office bearers to their executive bodies. In 57 percent of the outlets, the number of office bearers was reduced. Office bearers were replaced in 48 percent of the watercourses. Overall, there was a net addition of only 2 new office bearers in WUA executive bodies in Sub-system 2. The number of newly-added office bearers vary from 1 to 3. The number of office bearers subtracted, per watercourse, ranged from 1 to 2. The number of replaced office bearers also ranged from 1 to 3. See Table 20.

8.5 Change in Office Bearers in Sub-system 3

The number of office bearers in Sub-system 3 generally ranged from 5 to 7 in the 1st phase, with few watercourses where this number was less than 5. In three watercourses, WUA executive bodies comprised of only three members each. The number of office bearers in the 2nd phase also ranged from 5 to 7 in this Sub-system. Contrary to Sub-system 1, there was not even a single watercourse in which the number of office bearers was more than seven.

Table 19. Status of Office Bearers before, and after, WUA Formalization, Sub-system 1.

S. No	W/C No	No. of OBs, 1st Phase	No of OBs, 2nd phase	Change in Office Bearers, 2nd phase		
				Addition	Subtraction	Replacement
1	1240-L	4	6	2	0	1
2	4162-L	5	5	0	0	0
3	6431-L	6	6	0	0	0
4	14865-L	6	5	0	1	4
5	14670-R	7	7	0	0	1
6	16290-R	7	6	0	1	1
7	21798-L	7	7	0	0	0
8	22812-R	5	6	1	0	0
9	24474-L	7	7	0	0	0
10	24582-R	5	6	1	0	1
11	28208-L	3	6	3	0	1
12	31980-L	5	6	1	0	0
13	33130-L	5	5	0	0	0
14	34630-R	5	5	0	0	0
15	35730-L	5	6	1	0	0
16	39610-L	5	5	0	0	0
17	40400-R	7	6	0	1	3
18	43320-L	5	6	1	0	0
19	44580-R	7	6	0	1	1
20	45810-R	5	6	1	0	0
21	45850-R	5	6	1	0	0
22	46237-R	4	6	2	0	1
23	46240-L	7	9	2	0	1
Total		127	139	16	4	15

Table 20. Status of Office Bearers before, and after, WUA Formalization, Sub-system 2.

S. No.	W/C No	No. of OBs, 1st phase	No of OBs 2nd phase	Change in Office Bearers, 2nd phase		
				Addition	Subtraction	Replacement
1	50310-R	7	5	0	2	0
2	50950-L	3	5	2	0	1
3	52050-L	5	5	0	0	0
4	52050-R	5	6	1	0	2
5	54700-L	5	5	0	0	0
6	55650-L	4	5	1	0	0
7	56730-L	7	5	0	2	2
8	57860-R	5	5	0	0	0
9	57870-R	7	5	0	2	1
10	57890-L	7	6	0	1	1
11	60490-L	5	5	0	0	2
12	59100-R	1	1	0	0	0
13	59130-R	1	1	0	0	0
14	62670-R	1	1	0	0	0
15	63910-L	5	5	0	0	0
16	65080-L	4	7	3	0	0
17	66050-L	3	6	3	0	0
18	69310-R	7	5	0	2	2
19	69490-L	6	5	0	1	2
20	70640-L	7	5	0	2	2
21	71270-R	4	5	1	0	2
22	71735-L	7	6	0	1	2
23	71750-R	5	5	0	0	3
Total		111	109	11	13	22

Unlike Sub-systems 1 and 2, only two types of changes were made in the selection of office bearers during the formalization process (2nd phase) in Sub-system 3; addition and replacement. Approximately 30 percent of the WUAs added new office bearers to their executive bodies. There was not even a single instance of office bearers being subtracted from the executive bodies from this Sub-system. The office bearers were replaced in 41 percent of the watercourses. Overall, there was a net addition of 15 new office bearers in WUA executive bodies in Sub-system 3. The number of new additions varied from 1 to 3. The number of replaced office bearers ranged from 1 to 2. See Table 21.

Table 21. Status of Office Bearers before, and after, WUA Formalization, Sub-system 3.

S. No	W/C No	No of OBs, 1st Phase	No of OBs, 2nd Phase	Change in Office Bearers, 2nd Phase		
				Addition	Subtraction	Replacement
1	75366-R	5	7	2	0	0
2	78400-R	5	5	0	0	1
3	79924-L	5	5	0	0	1
4	81350-R	7	7	0	0	0
5	86376-L	6	6	0	0	0
6	87640-R	6	6	0	0	0
7	88920-L	5	5	0	0	1
8	89179-L	6	6	0	0	2
9	91706-R	3	5	2	0	0
10	92631-L	5	5	0	0	0
11	93870-L	5	5	0	0	0
12	94300-L	5	5	0	0	2
13	95102-L	5	5	0	0	0
14	95920-R	7	7	0	0	0
15	96362-L	5	5	0	0	2
16	98729-L	7	8	1	0	1
17	101069-L	6	6	0	0	1
18	102214-R	7	7	0	0	0
19	102237-L	5	6	1	0	1
20	104520-L	7	7	0	0	0
21	105634-L	7	7	0	0	0
22	107020-R	3	6	3	0	0
23	107022-L	7	7	0	0	2
24	107055-R	3	6	3	0	1
25	109980-R	5	6	1	0	0
26	112050-TL	5	5	0	0	0
27	112050-TR	3	5	2	0	0
Total		145	160	15	0	15

8.6 Change in Office Bearers in Sub-system 4

The number of office bearers in Sub-system 4 was generally 5 in the 1st phase. There were only three watercourses in which the number of office bearers was 3, 7 and 9, respectively. The number of office bearers in the 2nd phase generally ranged from 5 to 7 in Sub-system 4. There were two watercourses in which the number of office bearers were more than 7.

In Sub-system 4, only one change was made in the selection of office bearers during the formalization process (2nd phase); an addition. Subtraction and replacements, however, were not made in this Sub-system. Approximately 73 percent of the WUAs added new office bearers to their executive bodies. There was not even a single instance of subtraction, or replacement, of the office bearers from the executive bodies of this Sub-system. Overall, there was a net addition of 23 new office bearers in the WUA executive bodies of Sub-system 4. The number of newly-added office bearers vary from 1 to 4. See Table 22.

8.7 Change in Office Bearers in Sub-system 5

The number of office bearers in Sub-system 5 ranged from 2 to 7 in the 1st phase. The number of office bearers generally ranged from 5 to 7 in Sub-system 5 in the 2nd phase. In Sub-system 5 there was not even a single watercourse where the number of office bearers was more than 7.

In this Sub-system, three types of changes were made in the selection of office bearers during the formalization process (2nd phase); office bearers were added, subtracted and replaced. However, instances of subtraction were not very significant in the Sub-system. Approximately 77 percent of WUAs added new office bearers to their executive bodies. There was only a single instance of subtraction of office bearers. The replacement of office bearers from the executive bodies was made in 15 percent of the watercourses from this Sub-system. Overall, there was a net addition of 47 new office bearers in WUA executive bodies of Sub-system 5. The number of newly-added office bearers per watercourse vary from 1 to 4. The number of replaced office bearers, per watercourse, vary from 1 to 3 in Sub-system 5. See Table 23.

8.8 Reasons for Change in Office Bearers

As has been described in the preceding section, the types of changes in office bearers were effected in all 5 Sub-systems. There were several reasons for these changes:

- illiteracy;
- disinterest in organizational affairs;
- migration of share holders from the areas;
- changes in the tenancy status;
- death of an actual share holder; and
- holding offices in more than one watercourse command.

Table 22. Status of Office Bearers before, and after, WUA Formalization, Sub-system 4.

S. No.	W/C No	No. of OBs 1st phase	No. of OBs, 2nd Phase	Change in Office Bearers, 2nd phase		
				Addition	Subtraction	Replacement
1	674-L	3	7	4	0	0
2	4000-L	9	9	0	0	0
3	4700-R	5	7	2	0	0
4	8565-L	5	5	0	0	0
5	9661-L	5	6	1	0	0
6	10291-R	5	7	2	0	0
7	11785-L	5	7	2	0	0
8	14080-L	5	5	0	0	0
9	16280-R	5	5	0	0	0
10	18480-L	5	7	2	0	0
11	19580-R	5	7	2	0	0
12	22000-TL1	5	7	2	0	0
13	22000-TL2	7	9	2	0	0
14	22000-TC	5	7	2	0	0
15	22000-TR	5	7	2	0	0
Total		79	102	23	0	0

8.9 Addition of Office Bearers, per Watercourse

The analysis shows that in the 2nd phase, there was not even a single addition of office bearers in 50 percent of the outlets. In 18 percent of the outlets, at least 1 new office bearer was added to the executive body. Similarly, in 24 percent of the outlets, 2 office bearers were added to executive bodies. In the 2nd phase, there were some outlets where 3 to 4 new office bearers were added. See Figure 6.

8.10 Replaced Office Bearers

Overall, there was no instance of replaced office bearer in 69 percent of the outlets. In 17 percent of the outlets, one office bearer, per watercourse, was replaced with the previous one. In 11 percent of the outlets, the number of replaced office bearers was 2. There were a few outlets in which the number of replaced office bearers, per watercourse, was 3 to 4. Figure 7 represents the status of replaced office bearers during the formalization process.

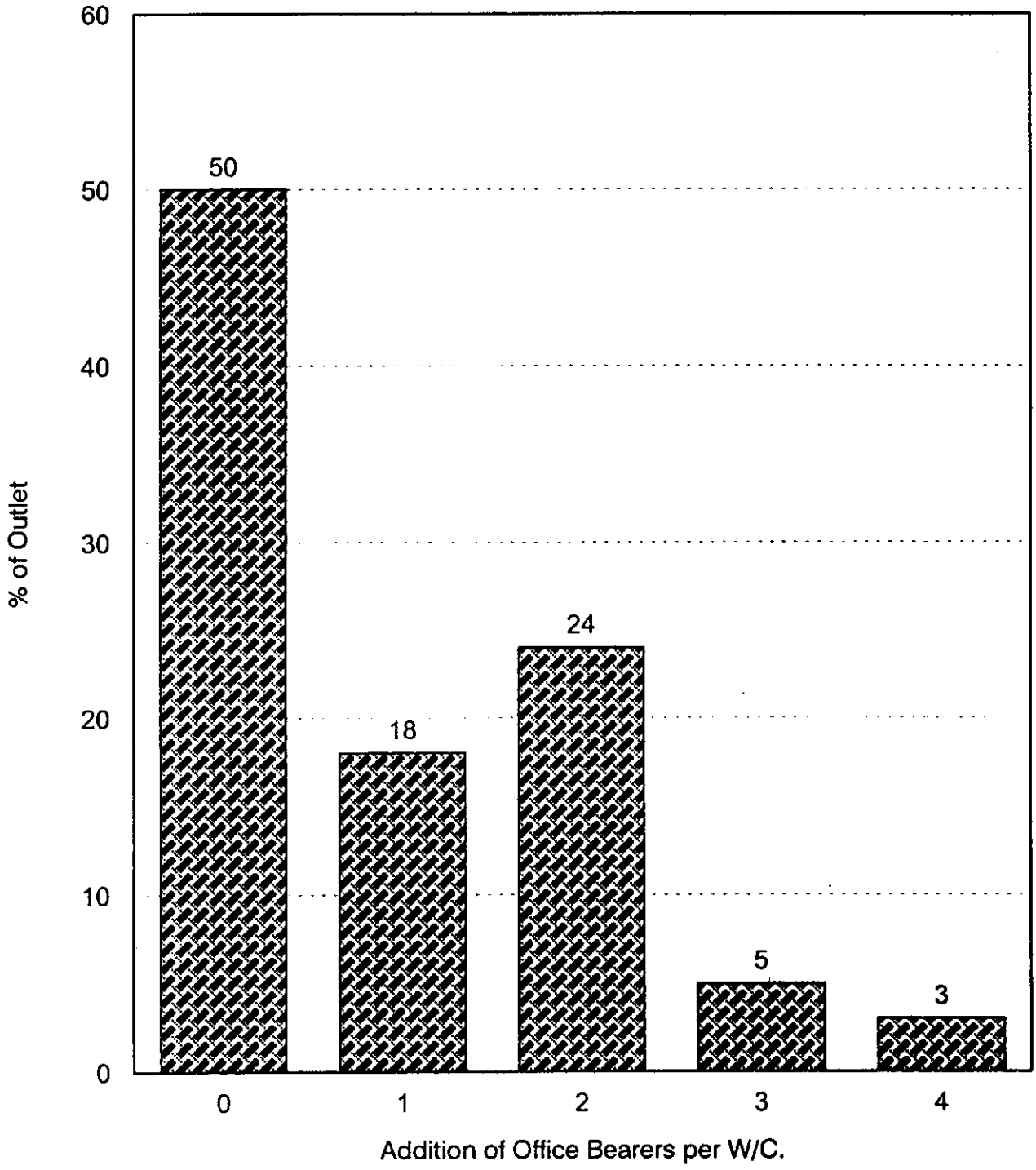


Figure 6. Addition of new WUA office bearers during the formalization phase.

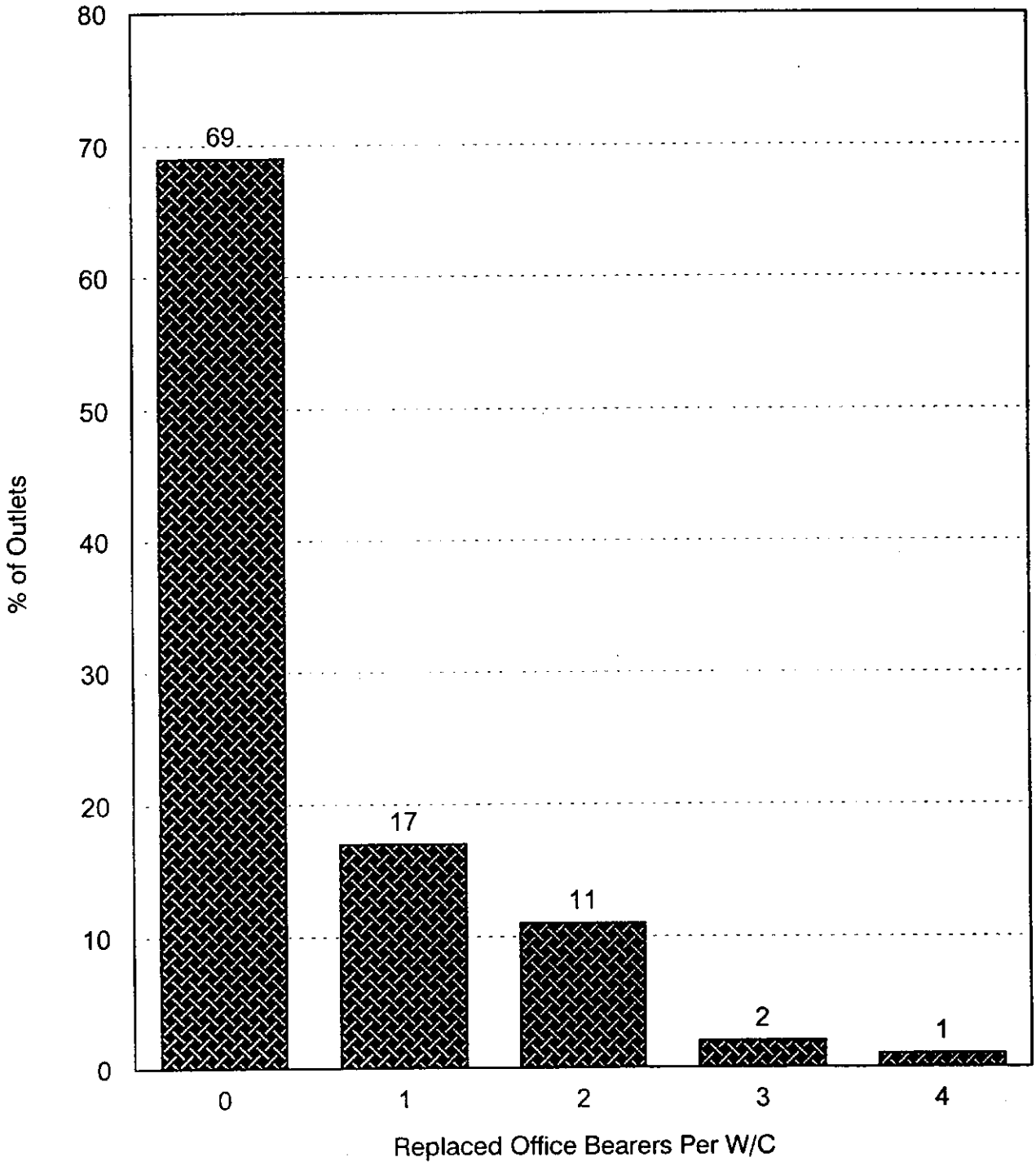


Figure 7. Replacement of office bearers in the formalization phase.

Table 23. Status of Office Bearers before, and after, WUA Formalization, Sub-system 5.

S. No	W/C No	No of OBs, 1st Phase	No of OB 2nd Phase	Change in Office Bearers, 2nd Phase		
				Addition	Subtraction	Replacement
1	1215-L	5	7	2	0	0
2	3420-R	3	5	2	0	0
3	3750-L	3	5	2	0	0
4	4803-R	3	5	2	0	0
5	7140-R	3	5	2	0	0
6	7641-R	4	6	2	0	1
7	8043-R	5	5	0	0	0
8	11792-L	3	5	2	0	3
9	12515-R	5	5	0	0	0
10	17619-R	6	6	0	0	0
11	17679-L	5	6	1	0	0
12	19116-R	2	6	4	0	0
13	20419-R	3	6	3	0	0
14	20630-L	5	7	2	0	0
15	22600-R	5	6	1	0	0
16	23738-L	5	7	2	0	0
17	25883-L	5	7	2	0	0
18	27061-L	6	6	0	0	1
19	27514-R	7	5	0	2	0
20	29418-L	5	7	2	0	0
21	33-L	5	6	1	0	2
22	33674-L	5	7	2	0	0
23	33730-L	7	7	0	0	0
24	33813-R	6	7	1	0	0
25	33940-L	6	6	0	0	0
26	40030-R	7	7	0	0	0
27	43648-L	5	6	1	0	0
28	45520-L	2	6	4	0	0
29	46500-L	5	6	1	0	0
30	47529-R	2	6	4	0	0
31	50623-TL	5	6	1	0	0
32	50623-TR	5	7	2	0	0
33	50623-TM	5	6	1	0	0
Total		153	200	49	2	7

Chapter 9

SOVs SELECTED AS WUA OFFICE BEARERS

9.1 General

An overwhelming majority of the social organization volunteers (SOVs) were selected as WUA office bearers. This chapter:

- describes the number of presidents selected from among the SOVs;
- covers the detail of other office bearers who were selected from among the SOVs; and
- compares the Sub-systems with regard to leadership selected from among the SOVs.

9.2 What are SOVs?

One of the main methodological steps in the social organization process . Social Organization Volunteers (SOVs) were suggested by the Ganewatte and Pradhan (1995) in the project inception report. The suggested use of farmer volunteers and educated youth as facilitator in the social organization process. following their suggestions, the SOVs were identified, selected, trained and used in the process. they were selected on the basis of village boundaries. the experience, however, has shown that they should be selected on the basis of village boundaries. The experience, however, has shown that they should be selected on the basis of hydrological boundaries (W/C level). The reason being the community takes all irrigation related decisions on the watercourse basis. In the start they were called as "contact farmers". But this term was abandoned to avoid its link with the government-funded project. The term was replaced with SOVs.

9.3 Why SOVs are Necessary?

The SOVs played an important role to expedite the social organization process. They served as a bridge between the social organization Field Team and the farmers. They were required because field team was small.

They were volunteers, therefore, cost-effective way of approaching large communities:

- For effective and quick approach to farmers because they were based on the community.
- After being trained they acted as "project representatives" for concept clearance among the ordinary farmers.
- For creating more trust among the users, as they were village based.

9.4 Characteristics of SOVs

SOVs were selected based on nine criteria

- initiative
- honest

- communication skill
- knowledgeable about the area
- acceptable to community
- potential to be trained
- speaking ability
- not necessary the operator of land
- not be desirous of any office

9.5 Number of SOVs

During the interview, 486 water users referred 555 SOVs, belonging to 123 watercourses, that live in 41 villages of the Hakra 4-R Distributary. Out of 555 referred SOVs, 158 were selected that fit into the nine-point criteria.

9.6 SOVs Per Village / Watercourse

The selection of SOVs was village-based. The number of SOVs usually ranged from 2 to 5 per village. SOVs were selected from each village. With respect to the watercourses, their proportion varies from 0.85 to 1.65 per watercourse among the Sub-systems. See Table 25.

9.7 SOVs Selected as WUA Presidents

Overall, 35 percent of the WUA presidents were selected from among the SOVs, which are 27 percent of the total amount of SOVs. Figure 8 shows the status of SOVs selected as presidents. The highest percentage (41%) of presidents selected from among the SVOs was from Sub-system 3; the lowest (17%) from Sub-system 1. The percent of presidents selected from SOVs was 39, 33, and 39 in Sub-systems 2, 4, and 5, respectively. Figure 9 shows the status of SOVs selected as WUA presidents among the five Sub-systems.

Overall, 10 percent of the other WUA office bearers were selected from among the SOVs, which are 36 percent of the total number of SOVs Figure 10.

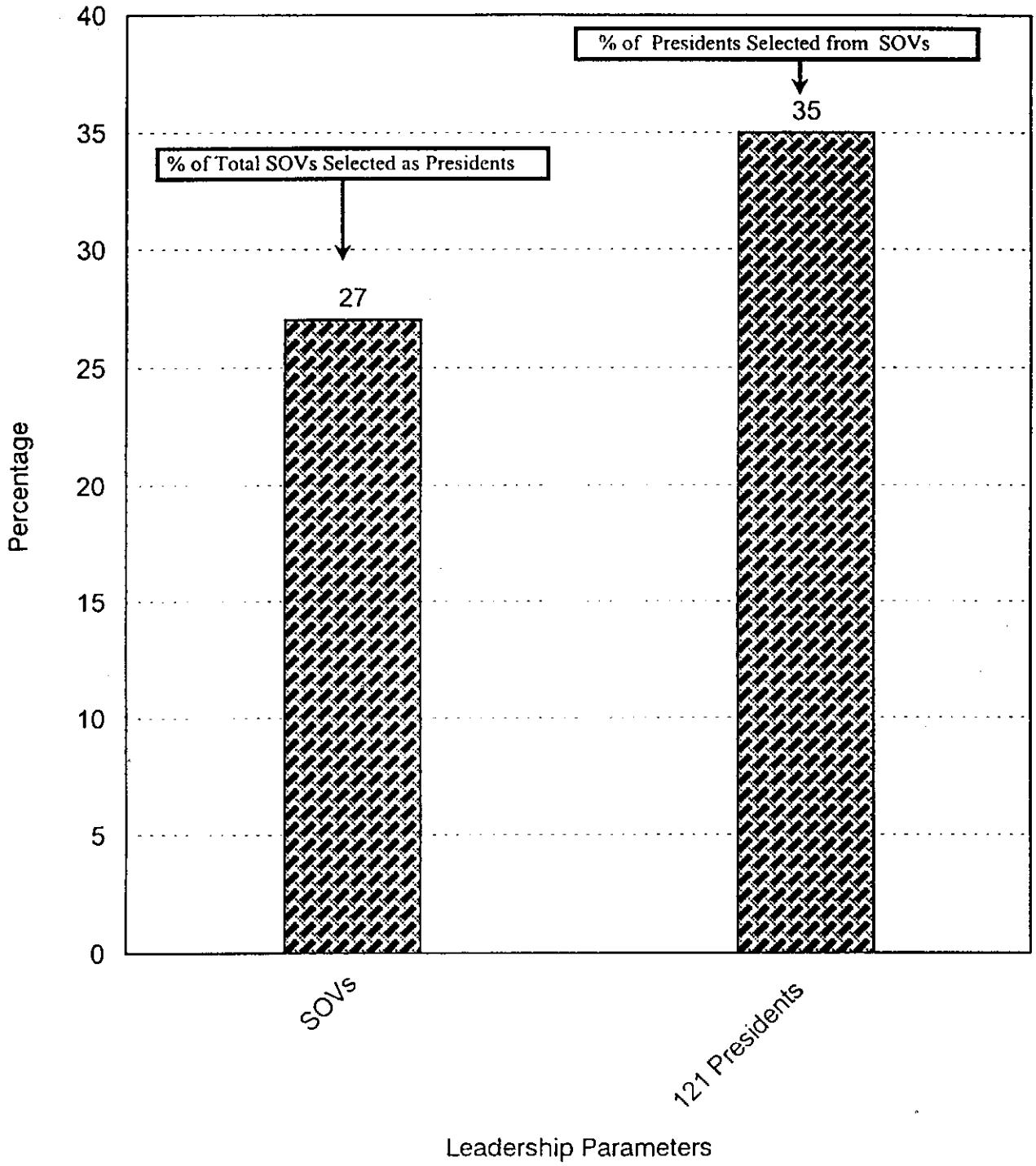


Figure 8. Percentage of 121 WUA presidents selected from among SOVs.

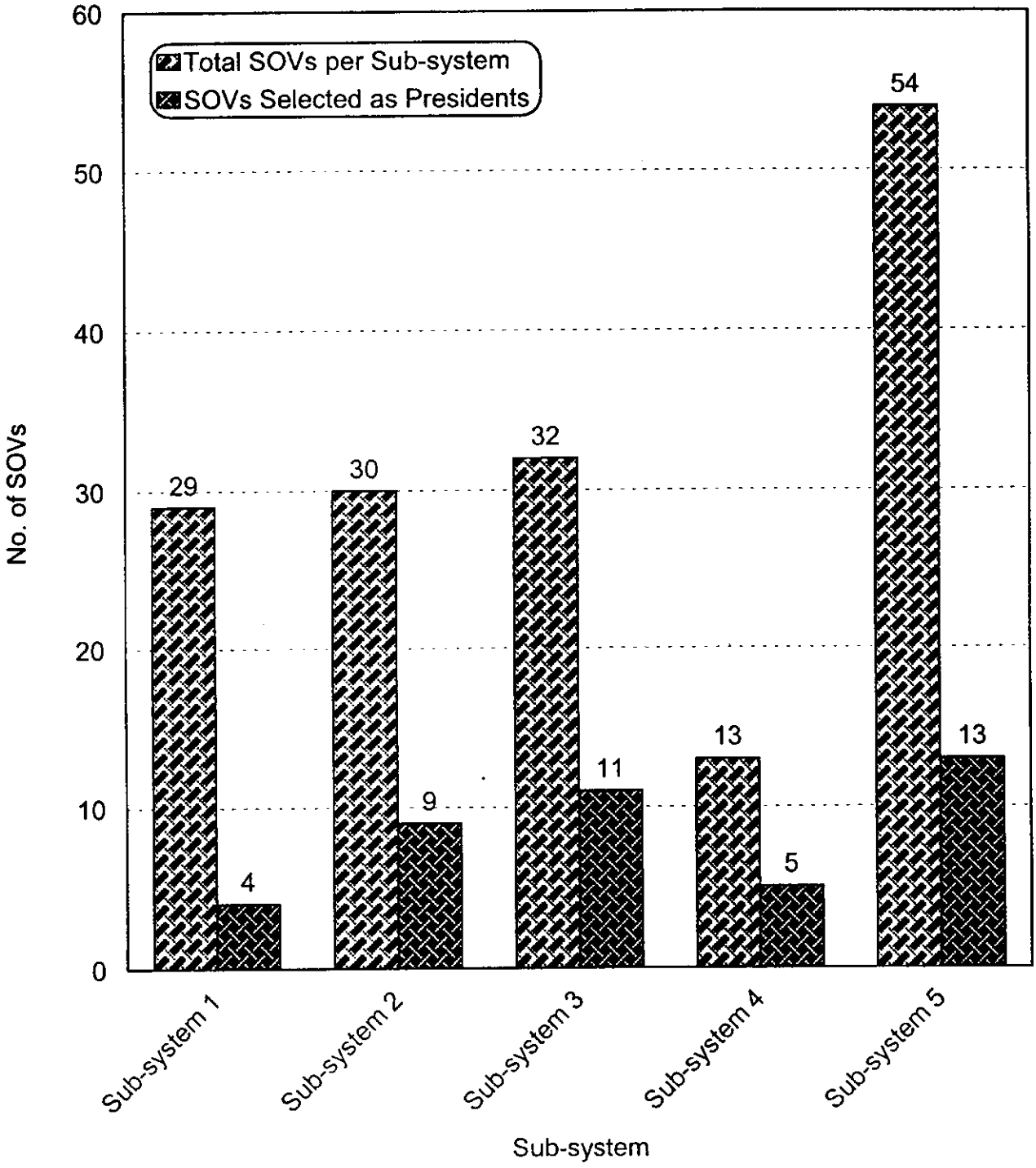


Figure 9. Percentage of 121 WUA presidents selected from among SOVs.

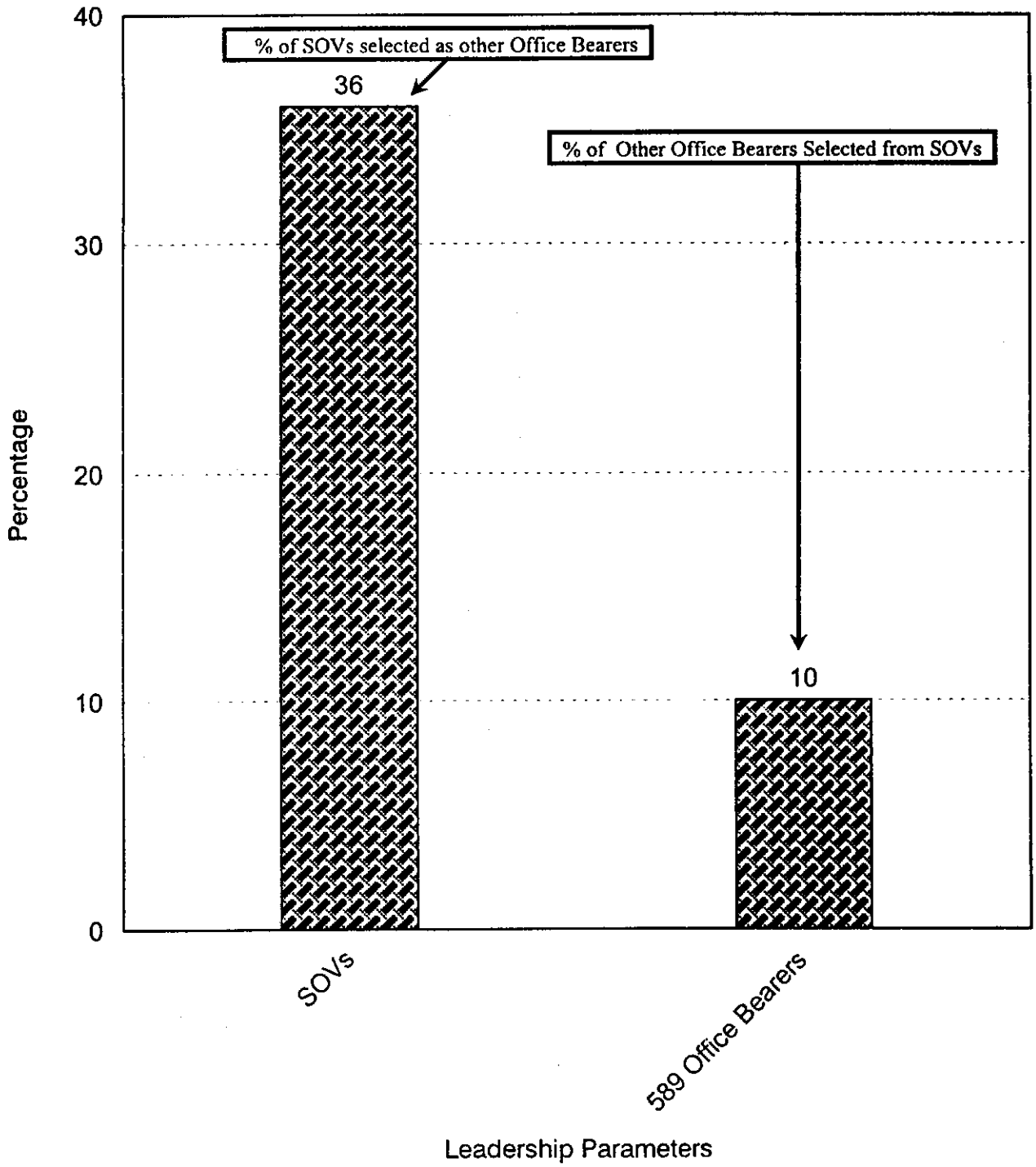


Figure 10. Percentage of office bearers selected from among SOVs.

Table 24. Number of SOVs Selected as WUA Presidents Among 5 Sub-systems.

Name of the SS	Total WUA presidents	Total SOVs	SOVs per watercourse	SOVs Selected as WUA Presidents
SS1	23	29	1.26	4
SS2	23	30	1.30	9
SS3	27	32	1.18	11
SS4	15	13	0.86	5
SS5	33	54	1.63	13
Total	121	158	1.30	42

In comparison, from among the Sub-systems, unlike the case of president, the highest percentage (16%) of other office bearers selected from among the SVOs was from Sub-system 1, which are 62 percent of the total number of SOVs of that Sub-system. The lowest (5%) were from Sub-system 4, which are still 30 percent of the total number of SOVs of that Sub-system. The percent of other office bearers selected from among the SOVs was 11, 6, and 11 in Sub-systems 2, 3, and 5, respectively. See Table 26.

Table 25. Number of Other SOVs Selected as WUA Office Bearers Among 5 Sub-systems.

Name of the SS	Total WUA office bearers	Total SOVs	SOVs Selected as WUA office bearers
SS1	116	29	18
SS2	86	30	9
SS3	133	32	8
SS4	87	13	4
SS5	167	54	18
Total	589	158	57

Chapter 10

PROBLEMS AND ISSUES RAISED IN FORMALIZATION MEETINGS

10.1 General

The WUA formalization meetings provided an opportunity for farmers to discuss a variety of problems and issues. These cover:

- water management;
- organization;
- improvement works;
- marketing of agriculture;
- contacts with government agencies;
- agronomic;
- environmental; and
- project-related issues.

This chapter covers detailed discussion for all these issues.

10.2 Water-related Issues

a) The Irrigation Department reduced the sizes of 22 outlets during the annual canal closure 1997-98. Farmers complained that this modification was the result of relationships between the WUF and the PID.

b) Short water supplies delayed sowing the wheat crop.

c) There were more water supplies in the period of less demand.

d) Frequent breaches in the diversion channels and distributary.

e) Erratic water supplies due to disorganized rational irrigation.

f) The crest of a outlet that irrigates *Chak* # 62/4-R has been raised to a height of 0.75 ft. Consequently, it is drawing less water.

10.3 Organizational Issues

a) The distributary-level executive body is not involving lower tier members in decision-making.

b) After obtaining powers, politics enter into the organization.

c) There is a communication gap between the higher and lower tier organizations.

d) WUA presidents are less involved in meetings.

e) Most of the office bearers are from the Arain caste.

f) Selection procedures for office bearers were not good.

g) The selection of Hafize Sanaullah, as a president, was not good.

h) Influential members control the WUF.

Besides the above organizational issues, many farmers made inquiries about the WUF's and WUOs' current performance. They were also curious about the status of the WUF's legal authority.

10.4 Improvement Works-related Issues

a) Poor and faulty construction of diversion channels.

b) The sizes of the outlets reduce after lining takes place. Consequently, they are drawing less water.

Besides the above, farmers also suggested that major improvement works should have been completed during the annual closure in order to avoid the construction of diversion channels.

10.5 Agriculture Marketing-related Issues

Participants also raised issues related to the marketing of agriculture products.

a) Farmers are not getting appropriate prices for their agriculture products.

b) Sugarcane mills are not accepting sugarcane from the farmers.

10.6 Issues Related to Contacts with Agency Staff

Farmers complained about the behavior of agency staff with regard to recovery and informal payments.

a) The PID receives charges for the modification of the outlets.

b) Serious complaints about a PID field staff member, about getting special charges for modifying outlets.

Besides the above, farmers complained about the style in which the cost of watercourse lining was being recovered. They objected to paying the recovery cost in one installment for watercourses that were lined many years ago.

10.7 Agriculture Inputs and Waterlogging and Salinity Issues

a) Adulterated agriculture chemicals and the delayed availability of the fertilizers.

b) Continuous deterioration of land due to waterlogging and salinity.

10.8 Environmental and Health Issues

a) Mixing sewerage water into the watercourses that also feed the drinking water pond.

b) Poorly maintained drinking water pond, causing serious health problems.

10.9 Perception about IIMI

In the majority of the meetings, IIMI-Pakistan's role in organizing farmers was highly commended. A few farmers, however, raised certain objections to IIMI. These were:

a) IIMI is not playing an active role in materializing the joint management agreement.

b) IIMI has a hidden agenda behind this effort.

c) Why IIMI receives Rs 100 from the watercourse presidents (this is money for the WUO common funds). This objection shows the extent of farmers' awareness about IIMI and WUOs.

Chapter 11

LEGAL DOCUMENTS AND REGISTRATION

11.1 General

There were two ultimate objectives of the formalization process; one was to select formal office bearers for each WUA, and the other was to prepare the legal documents required to register the WUAs with the OFWM under the Water Users Association Ordinance of 1982. This chapter:

- gives the list of legal documents prepared during the formalization process; and
- provides the details contained in each document, as well as the original samples of these documents.

11.2 Legal Documents

Documents required to register the WUAs with the OFWM under the Water Users Association Ordinance of 1982 are:

1) Proceedings of the election / selection meetings;

2) List of WUA members, with signatures;

3) Verified lists of watercourse share holders;

4) A copy of the by-laws; and

5) Receipt of the bank account.

During the WUAs formalization process (2nd phase), documents listed from 1 to 3 were prepared by IIMI social organizers with the active participation of farmer leaders. The WUAs will be responsible for the provision of document numbers 4 and 5 during the registration process.

In the following sections, information contained in each document prepared during the 2nd phase has been described.

11.2.1 Proceedings of the election / selection meetings

A proforma on which to record the proceedings was maintained. This document contained information about the meetings, such as:

Date;

Time;

Place;

Outlet number;

Chak number;

Duration of the meeting;

Name of the proposer;

Names of elected office bearers;

Name of the seconder;

List of the participants, with signatures; and

Witnesses' signatures, verifying the meeting date and venue (Plate 1).

11.2.2 List of WUA members, with signatures

This document contains information such as the names of the participants, their fathers' names, and their signatures. This was effected when the participation exceeded 51 percent. Farmers wanting to become WUA members, but could not attend meetings were contacted individually to obtain their signatures (Plate 2).

11.2.3 Verified list of watercourse share holders

This document contains a detailed list of all the water users, including their fathers' names. The lists are verified by the village *numberdars* (headmen), usually with an official stamp and a signature (Plate 3).

11.2.4 By-laws and receipts of the bank accounts

The Hakra 4-R Distributary Water Users Federation is in the process of developing by-laws. Similarly, its lower tier organizations also expected to develop by-laws sooner. The process of opening bank accounts has already been initiated (Plate 4).

آج مورخہ 9-12-96 کو پتی داران موگہ نمبر 17 چک نمبر 62/6R کا اجلاس بمقام رہائش گاہ چوہدری نذیر احمد بزدار بوقت 1800 hrs بجے منعقد ہوا۔ اجلاس میں شرکت کے لیئے تمام پتی داران کو بذریعہ لاؤڈ سپیکر اعلان طور پر مطلع کیا گیا۔ اجلاس کی کاروائی 2 گھنٹے تک جاری رہی۔ اجلاس میں محمد یوسف ولد رمضان 20/20 افراد نے مندرجہ ذیل افراد کو کھال کمیٹی (واٹر یوزرز ایسوسی ایشن) کے لیئے تجویز کیا

نام عہدیداران

(1) ارشاد احمد ولد غلام نبی = صدر

(2) مظفر محمد ولد نور محمد = نائب صدر

(3) اعجاز احمد ولد عبدالستار = جنرل سیکرٹری

(4) شمس اکرام ولد اکرام الحق = جوائنٹ سیکرٹری

(5) محمد وقار عظیم ولد نذیر احمد بزدار = سیکرٹری اطلاعات

(6) عبدالغفار ولد عصمت اللہ = خزانچی

(7) نصیر احمد ولد حشمت علی = "وادا"

اس کے بعد محمد حامد ولد غلام نبی نے عہدیداران کی تائید کی۔ بعدازاں تمام شرکاء / اکثریت نے اس تجویز کی حمایت کی۔

Plate 1. Sample of the election / selection proceedings, Sub-system 5.

اجلاس میں موضع کے کل پتی داران میں سے مندرجہ ذیل نے شرکت کی اور
عہدیداران کا انتخاب کیا

نام ممبران بمعہ ولدیت	دستخط	نام ممبران بمعہ ولدیت	دستخط
1) محمد یوسف ولد نظام دین		11) عبدالغنی ولد غلام نبی	
2) علم دین ولد نظام دین		12) محمد جاوید ولد غلام نبی	
3) نذیر احمد ولد نور محمد		13) ارشاد احمد ولد غلام نبی	
4) شمس الدین ولد کرم الحق		14) سردار علی ولد غلام نبی	
5) ابراہیم ولد پیر بخش		15) اصغر علی ولد فتح محمد	
6) محمد اسماعیل ولد پیر بخش		16) بشیر احمد ولد	
7) محمد علی ولد پیر بخش		17) فضل محمد ولد کریم اللہ	
8) [illegible]		18) [illegible]	
9) عصمت اللہ ولد		19) غلام رسول ولد کھلا	
10) غلام نبی ولد علی بخش		20) [illegible]	

تصدیق کی جاتی ہے کہ آج مورخہ 9-10-91 کا اجلاس منعقد ہوا جس میں کھال کے ممبران نے اپنی کھال کمیٹی (واٹر یوزر ایسوسی ایشن) کے لیے عہدیداران کا انتخاب کیا

نام تصدیق کنندگان	دستخط
(1) ارشاد احمد	
(2) [illegible]	
(3) [illegible]	

Plate 2. Sample list of WUA members' signatures, Sub-system 5.

لسٹ حصہ داران آب موگہ نمبر 3 [illegible] چک 53/12L ہارون آباد 8-12-97

نمبر شمار	نام مع ولدیت
1	صداقت علی ولد ریاض احمد
2	حاجی ریاض احمد ولد مراد علی
3	محمد جاوید ولد تاج محمد
4	عبدالرزاق ولد ولی محمد
5	محمد صادق ولد نور حسن
6	ولی محمد ولد علی محمد
7	عبدالستار ولد اللہ بخش
8	میرزا احمد ولد کریم اللہ
9	جوایا ولد نور دین
10	مشتاق احمد ولد غلام محمد
11	عبدالحق ولد فقیر اللہ
12	خلیل الرحمان ولد عبدالکریم
13	محمد [illegible] ولد نور دین
14	محمد شریف ولد دین محمد
15	عبدالستار ولد غلام محمد
16	محمد انوار ولد حاجی نذیر احمد
17	زاہد بشیر ولد بشیر احمد
18	عبداللطیف ولد رحمت اللہ
19	یاسر ولد عبدالحمید
20	محمد اسلم ولد فتح دین ([illegible])
21	اعجاز احمد ولد کریم احمد
22	ریاض احمد ولد نذیر احمد

	نام مع ولدیت
23	محمد مشتاق ولد ریاض احمد
24	محمد عابد ولد حاجی عبدالمجید
25	مشتاق احمد ولد ولی محمد
26	محمد اقبال ولد غلام حیدر
27	محمد خالد ولد غلام رسول
28	حاجی محمد دین ولد لال دین
29	محمد دین ولد نور دین
30	عبدالرشید ولد رحمت اللہ
31	کرم دین ولد نور دین
32	نواب علی ولد غلام حیدر

[illegible] 5

Plate 3. Sample of verified list of watercourse share holders, Sub-system 5.

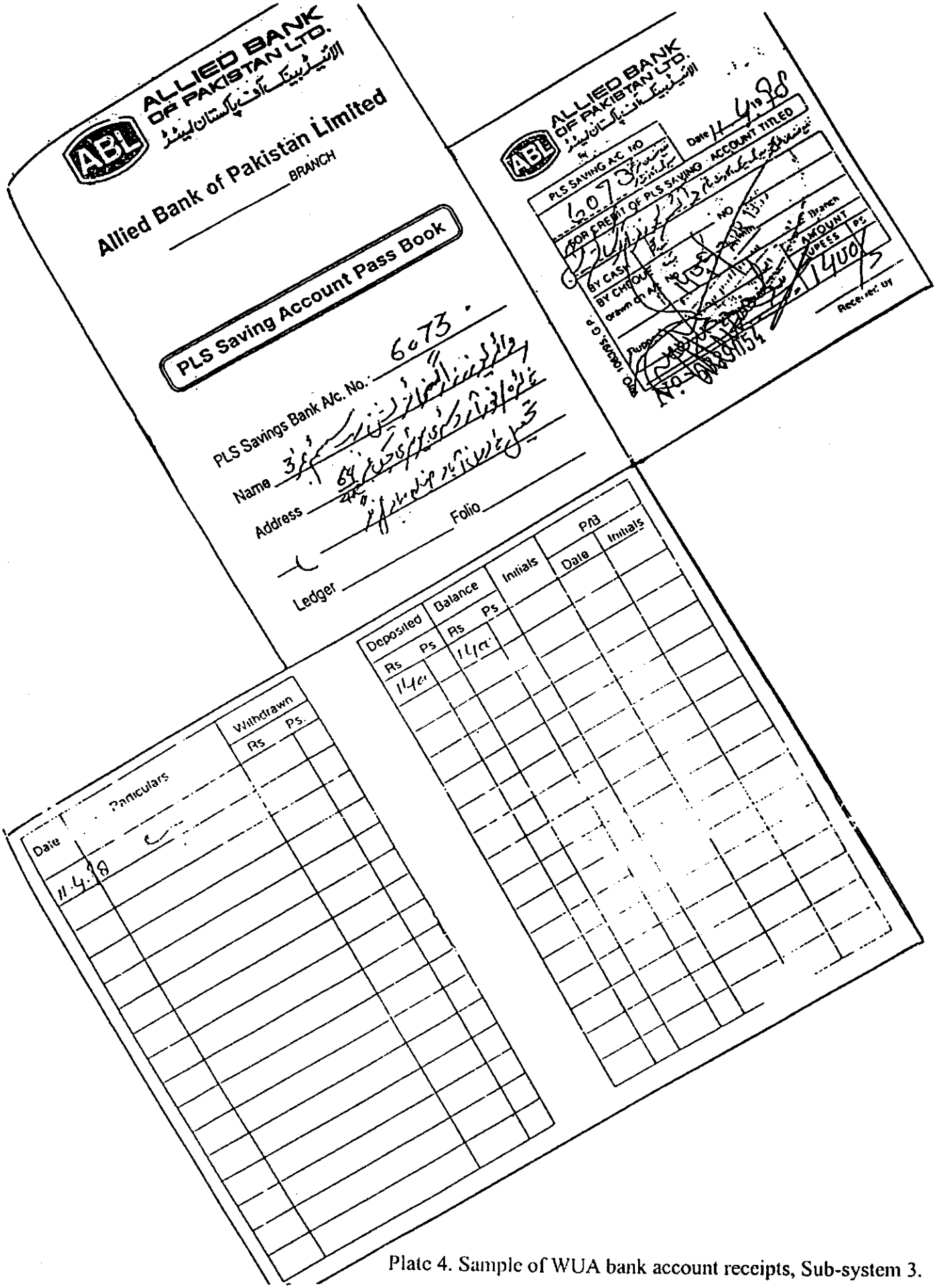


Plate 4. Sample of WUA bank account receipts, Sub-system 3.

Part II

Socio-cultural Characteristics of WUA Office Bearers

Chapter 12

CASTES AND SETTLEMENT PATTERNS OF WUA OFFICE BEARERS

12.1 General

This chapter deals with the distribution of castes and the settlement patterns of the WUA office bearers. This chapter:

- describes the castes of the WUA presidents among the five Sub-systems;
- gives detail pertaining to the distribution of castes of other WUA office bearers;
- delineates the settlement patterns of WUA presidents; and
- narrates the settlement patterns of other WUA office bearers.

In each case, the comparative distribution among the five Sub-systems is evaluated.

12.2 Distribution of Castes

Based on the selection of WUA office bearers, it is now clear that Arain is the dominant caste residing in the area. Joia is the second major caste in the region. Among other prominent castes are the Jats and Rajputs, which are in third and fourth positions, respectively. After Rajputs and Jats, another two significant castes living in the area are Sukhera and Wattoo.

12.3 Distribution of Castes among WUA Presidents

The distribution of castes among WUA presidents shows that, overall, the majority was selected from the Arain, followed by Jat, Joia and Rajput. Arain has emerged as the biggest caste in the entire area. Figure 11 presents the distribution of castes among WUA presidents.

In the case of presidents, however, different castes dominate in different Sub-systems.

In Sub-system 1, most of the presidents were selected from the Joia caste, and from among Rajputs as the 2nd main caste. In Sub-system 2, most of them were selected from the Rajput caste, and Arain and Sukhera as the following major castes. In Sub-system 3, Arain is in the majority, and Jat, as the 2nd major caste. Most of Sub-system 4's presidents were selected from among the Joia caste. Wattoo is the 2nd major caste in the area. As in Sub-system 3, the watercourse level leadership is dominated by the Arain caste in Sub-system 5. See Table 27.

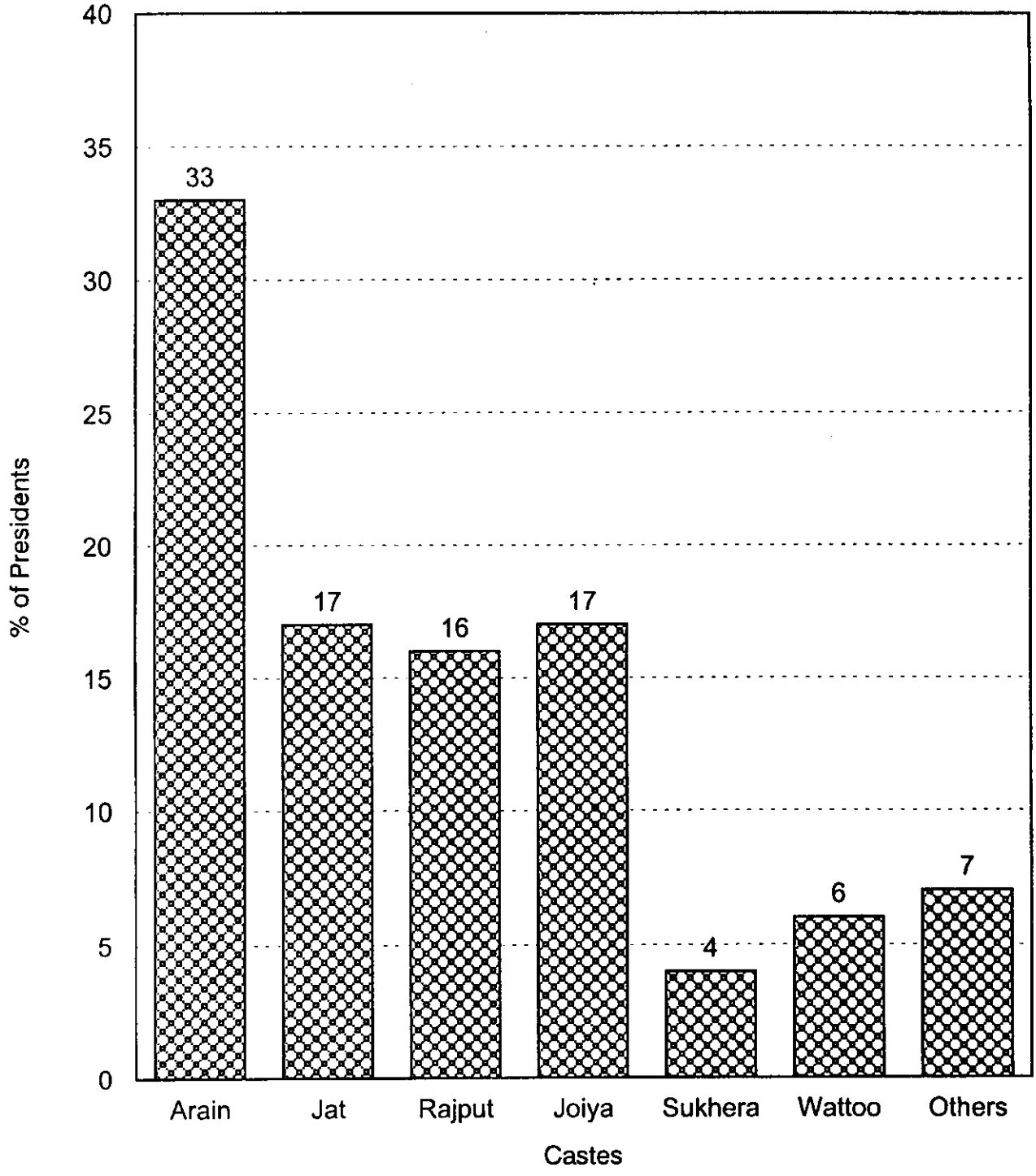


Figure 11. Distribution of castes of 121 WUA presidents .

Table 26. Caste Distribution of WUA Presidents for 5 Sub-systems.

Name of the SS	Total WUA presidents	Distribution of castes						
		Arain	Jut	Rajput	Joia	Sukhera	Whattoo	Others
SS1	23	2	0	5	11	0	2	3
SS2	23	4	3	7	1	4	0	4
SS3	27	15	8	2	2	0	0	0
SS4	15	0	0	2	7	1	4	1
SS5	33	19	9	3	0	0	1	1
Total	121	40	20	19	21	5	7	9

12.4 Caste Distribution Among Other WUA Office Bearers

The distribution of castes among other office bearers shows an almost similar pattern to that of WUA presidents. Overall, the majority of other office bearers were selected from among the Arain caste. Arain has emerged as the biggest caste in the entire area, representing one-third of the total number of office bearers. Joia, Jat and Rajput are the other three major castes. Figure 12 presents the distribution of castes among other WUA office bearers.

Among the five Sub-systems, however, different castes dominate different Sub-systems.

In Sub-system 1, most of the office bearers other than presidents were also selected from the Joia caste, with Rajput as the 2nd main caste. Interesting to note is that most presidents of Sub-system 2 were selected from the Rajput caste, but other office bearers are selected from the Arain caste. Sukhera and Rajput are two other major castes. In Sub-system 3, Arain is in the majority, and Jat emerges as the 2nd major caste. Most of Sub-system 4's other office bearers were selected from the Joia caste. Wattoo is the 2nd major caste in the area. As in Sub-system 3, the watercourse level leadership is dominated by the Arain caste in Sub-system 5. See Table 28.

12.5 Settlement Patterns

Based on the evaluation of socio-cultural features among office bearers, the leaders of the Hakra 4-R Distributary present a mixed settlement pattern. All three major communities; locals, *mohajirs* and settlers are present in the area. However, overall, locals are in the majority. In addition, single communities do not dominate each Sub-system. Some Sub-systems are dominated by locals, by *mohajirs* and settlers, and others yet, by more than two communities.

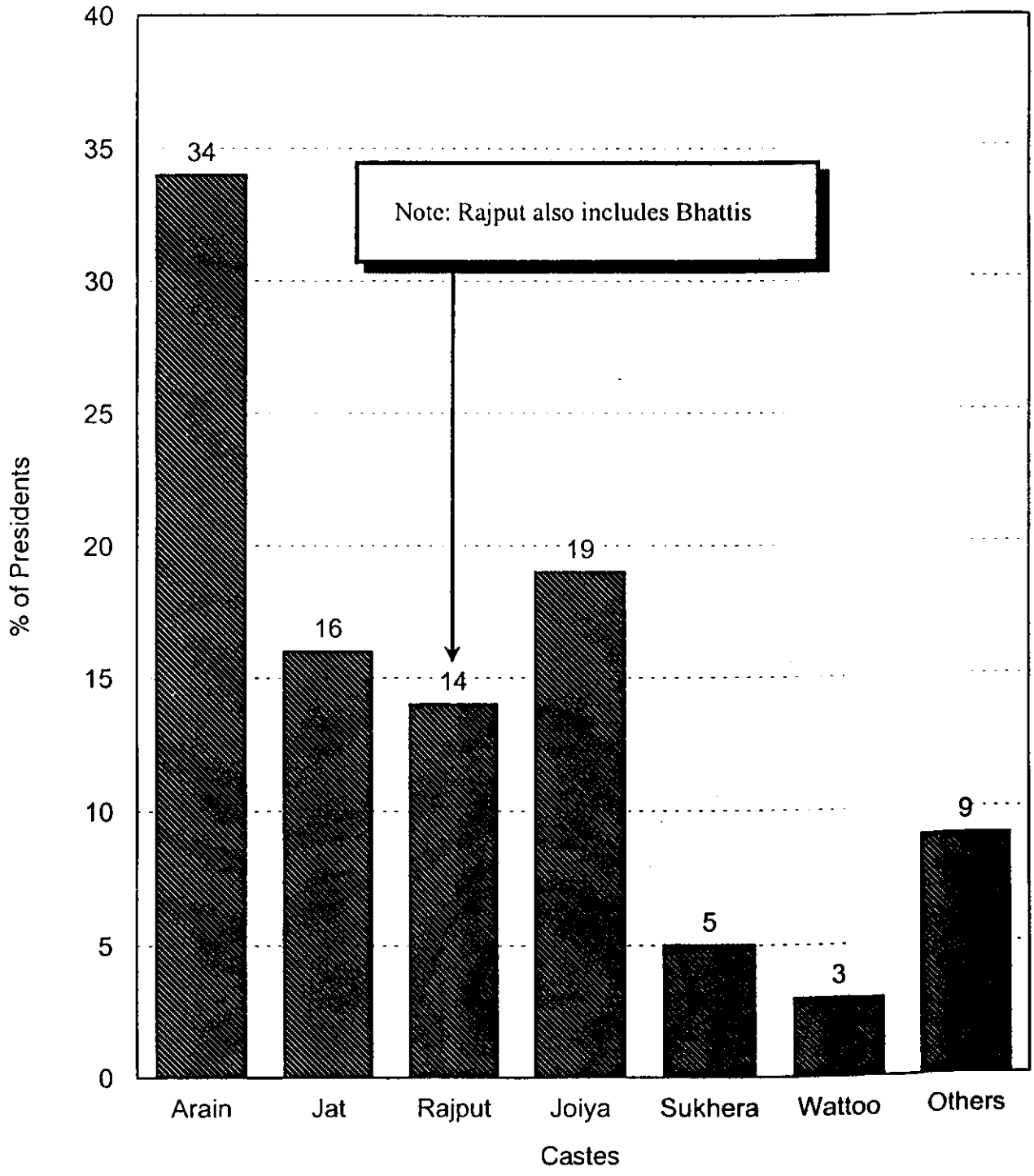


Figure 12. Distribution of castes of 589 other office bearers.

Next >>

Table 27. Distribution of Castes of other WUA Office Bearers for 5 Sub-systems.

Name of the SS	Total WUA OBs	Distribution of castes						
		Arain	Jat	Rajput	Joia	Sukhera	Whattoo	Others
SS1	116	4	2	35*	50	6	9	10
SS2	86	23	7	20	4	18	0	14
SS3	133	77	50	1	1	0	0	4
SS4	87	3	2	2	58	4	9	9
SS5	167	90	32	27*	0	0	2	16
Total	589	197	93	85	113	28	20	53

Also included is the Bhatti sub-caste.

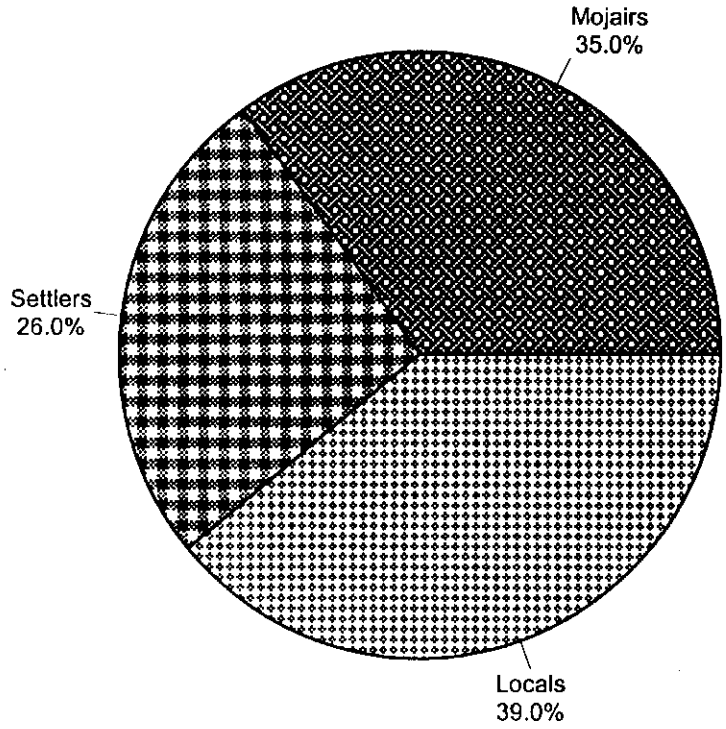
12.6 Settlement Patterns of WUA Presidents

Overall, 39 percent of office bearers were selected from among locals, 35 percent from *mohajirs* and 26 percent from settlers. Figure 13 presents the status of settlement patterns of WUA presidents.

In Sub-system 1, most of the presidents were selected from among the *mohajirs*. In Sub-system 2, the majority of them were selected from among settlers. A significant number of presidents, however, were also selected from among *mohajirs*. In Sub-system 3, presidents are approximately equally represented from both, settlers and *mohajirs*. Most of Sub-system 4's presidents were selected from among the locals. Like that of Sub-system 3, the locals dominate watercourse-level leadership in Sub-system 5. A significant number is, however, selected from among the *mohajirs* in this Sub-system. See Table 29.

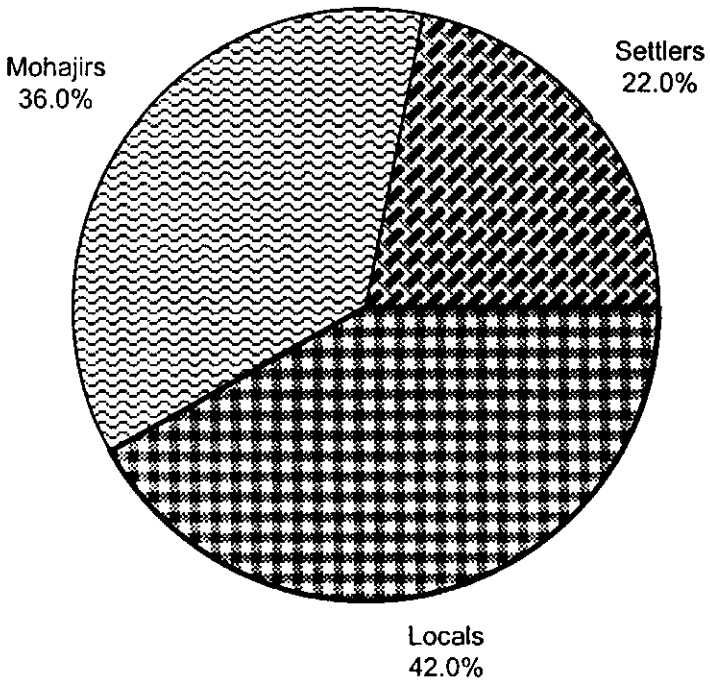
Table 28. Settlement Patterns of WUA Presidents among 5 Sub-systems.

Name of the SS	Total WUA presidents	Settlement Pattern		
		Muhajir	Settler	Local
SS1	23	16	5	2
SS2	23	9	13	1
SS3	27	4	12	11
SS4	15	2	1	12
SS5	33	12	0	21
Total	121	43	31	47



Mujahirs : Migrated from India after Partition
Settlers : Migrated from Other Areas of Pakistan and Settled in the Region
Locals : Settled in the Region before Partition

Figure 13. Settlement pattern of 121 WUA presidents.



Mujahirs : Migrated from India after Partition
Settlers : Migrated from Other Areas of Pakistan and Settled in the Region
Locals : Settled in the Region before Partition

Figure 14. Settlement pattern of 589 WUA other office bearers.

12.7 Settlement Patterns for other WUA Office Bearers

As for presidents, the majority of other office bearers are also selected from among locals. Overall, 42 percent of the office bearers were selected from among locals, 36 percent from *mohajirs* and 22 percent from among settlers. See Figure 14 presents the status of settlement patterns for other WUA office bearers.

The settlement patterns of the other office bearers is also very much akin to the pattern of the presidents among the Sub-systems, except in Sub-system 2.

In Sub-system 1, most of the other office bearers were selected from among the *mohajirs*. However, a significant number is also selected from among settlers. Unlike presidents, the majority of them were selected from among *mohajirs* in Sub-system 2. However, a significant majority of the office bearers were also selected from among settlers. In Sub-system 3, other office bearers provide exactly equal representation from both, settlers and locals. However, a small number is also selected from among the *mohajirs*. Most of the other office bearers of Sub-system 4 are selected from among the locals. However, they are also chosen from among settlers and *mohajirs*. As in Sub-system 3, locals dominate in watercourse level leadership in Sub-system 5. A significant number is, however, selected from among the *mohajirs* in this Sub-system. See Table 30.

Table 29. Settlement Patterns of Other WUA Office Bearers for 5 Sub-systems.

Name of the SS	Total WUA OBs	Settlement Pattern		
		Muhajir	Settler	Local
SS1	116	82	28	6
SS2	86	47	35	4
SS3	133	21	56	56
SS4	87	23	12	52
SS5	167	38	1	128
Total	589	211	132	246

Chapter 13

LAND RELATIONS AND TENANCY STATUS OF THE OFFICE BEARERS

13.1 General

This chapter deals with the land relations and tenancy status of office bearers of the Hakra 4-R Distributary. First, it:

- describes the pattern of the WUA presidents' holding sizes;
- gives the detail of holding sizes for other office bearers; and
- covers the tenancy status of presidents and other office bearers.

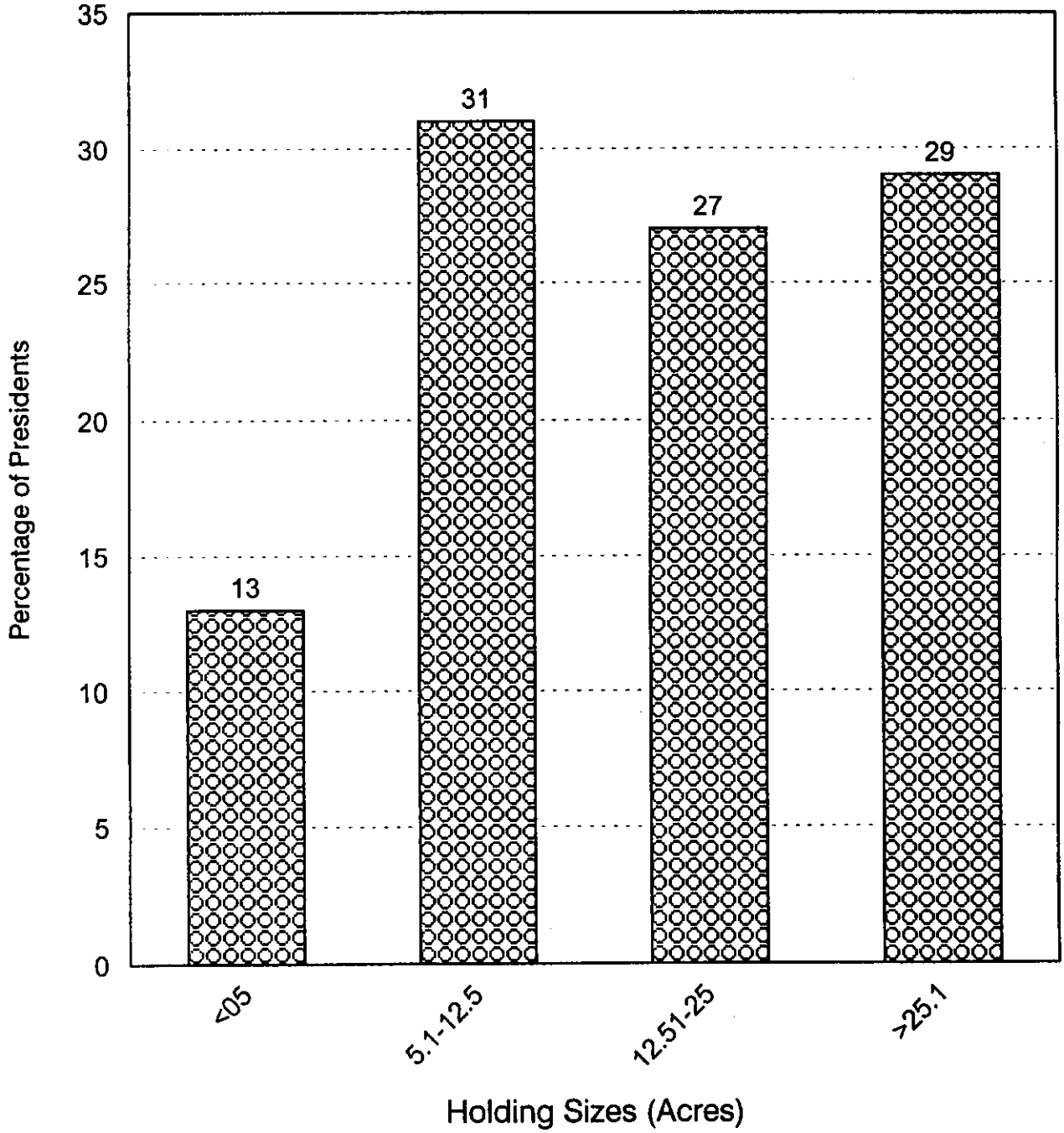
13.2 Land Relations of WUA Presidents

The holding sizes of the WUA presidents are grouped into four classes; small, medium, large and very large. The analysis shows that all four ranges of holding size exists among the presidents. The results indicate that 13 percent of the presidents are small farmers, 31 percent have medium holding sizes, 26 percent have large holdings, and 29 percent have relatively very large holdings. Figure 15 presents the status of the WUA presidents' holding sizes.

The distribution of the office bearers' holding sizes is not evenly spread among the Sub-systems. This is, for example, interesting to note that in Sub-systems 1 and 4, almost all the presidents selected are from among farmers owning medium and large holdings. In other categories, the distribution is relatively even. See Table 31.

Table 30. Status of Holding Sizes for WUA Presidents of 5 Sub-systems.

Name of the SS	Total WUA presidents	Holding Sizes			
		Small (0-5 ac)	Medium (5.1-12.5 ac)	Large (12.51-25 ac)	V. large (> 25 Acre)
SS1	23	0	3	8	12
SS2	23	4	5	8	6
SS3	27	6	10	6	5
SS4	15	1	8	4	2
SS5	33	5	12	6	10
Total	121	16	38	32	35



Figugre 15. Status of holding sizes for 121 WUA presidents.

13.3 Land Relations of Other WUA Office Bearers

The analysis shows that all four ranges for holding sizes exists among the other office bearers. The results indicate that, overall, 24 percent of other office bearers are small farmers, 42 percent have medium holding sizes, 28 percent have large holdings, and only 6 percent have relatively large holdings. Figure 16 presents the status of holding sizes for other WUA office bearers.

A comparative look at the holding sizes of other office bearers among the Sub-systems shows that a very significant number of the office bearers is selected from among the large farmers in Sub-system 1. In the other four Sub-systems, all four categories of holding size are fairly distributed among the office bearers. See Table 32.

Table 31. Status of Holding Sizes for Other WUA Office Bearers of 5 Sub-systems.

Name of the SS	Total other WUA OBs	Holding Sizes			
		Small (0-5 ac)	Medium (5.1-12.5 ac)	Large (12.51-25 ac)	V. large (> 25.1 ac)
SS1	116	25	41	35	15
SS2	86	10	40	33	3
SS3	133	42	64	23	4
SS4	87	35	27	23	2
SS5	167	29	77	51	10
Total	589	141	249	165	34

13.4 Tenancy Status

In terms of tenancy status, the office bearers of the Hakra 4-R Distribuatry can be divided into four distinct classes:

- owner-cultivators, who own the land they cultivate;
- non-cultivating owners, who own the land, but do not cultivate themselves;
- owner-cum-tenants, who cultivate the land that they own, as well as land rented in;
- tenants, who cultivate the land that they rent in, but do not own the land.

Two types of tenants cultivate in the area; contractors, or lessees, who pay a fixed amount of cash to land owners on an annual basis; and sharecroppers, who cultivate the land on a 50:50 share of cost and return basis (Waheed-uz-Zaman and Bandaragoda, 1996).

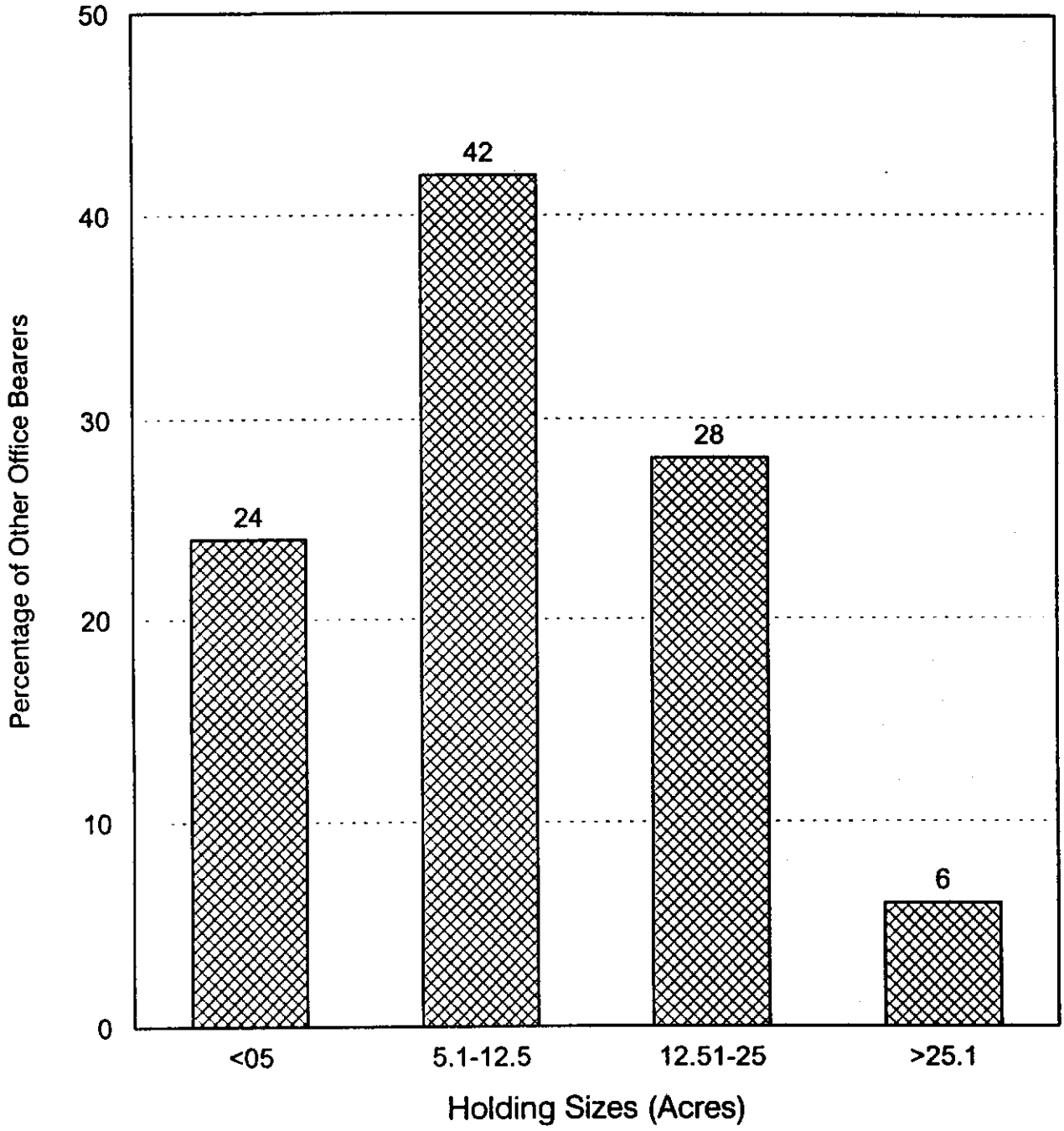


Figure 16. Status of holding sizes for other WUA office bearers.

13.5 Tenancy Status of WUA Presidents

Overall, an overwhelming majority of the WUA presidents (87 percent) belonged among the owner-cultivator category, 8 percent were owner non-cultivators, 3 percent were owner-cum-tenants, and only 2 percent were from among the tenant community. Figure 17 shows the ownership status of the WUA presidents.

The tenancy status of WUA presidents among the Sub-systems has been compared. Table 33 shows that from three out of five Sub-systems, all the presidents were selected from among owner-cultivators. In one Sub-system, the WUA presidents were selected from among all four classes of cultivators. In another Sub-system, the majority was selected from among owner-cultivators, and a few from non-cultivating owners. See Table 33.

Table 32. Tenancy Status of WUA Presidents for 5 Sub-systems.

Name of the SS	No. of WUA presidents	Tenancy Status			
		Owner-cultivators	Non-cultivating owners	Owner-cum-tenants	Tenants
SS1	23	23	0	0	0
SS2	23	11	6	4	2
SS3	27	27	0	0	0
SS4	15	15	0	0	0
SS5	33	29	4	0	0
Total	121	105	10	4	2

13.6 Tenancy Status of Other WUA Office Bearers

Overall, a dominant majority of other WUA office bearers (85 percent) were from among owner-cultivators, 9 percent were owner non-cultivators, 3 percent were owner-cum-tenants and again, 3 percent were from the tenant community. Figure 18.

The tenancy status for other office bearers among the Sub-systems has been compared. Table 34 shows that from two out of five Sub-systems, almost all the presidents were selected from among the owner-cultivators. In one Sub-system, the WUA presidents were selected from among all four classes of cultivators. In the remaining two Sub-systems, the majority was selected from among owner-cultivators, and a few from among non-cultivating owners or tenants. See Table 34.

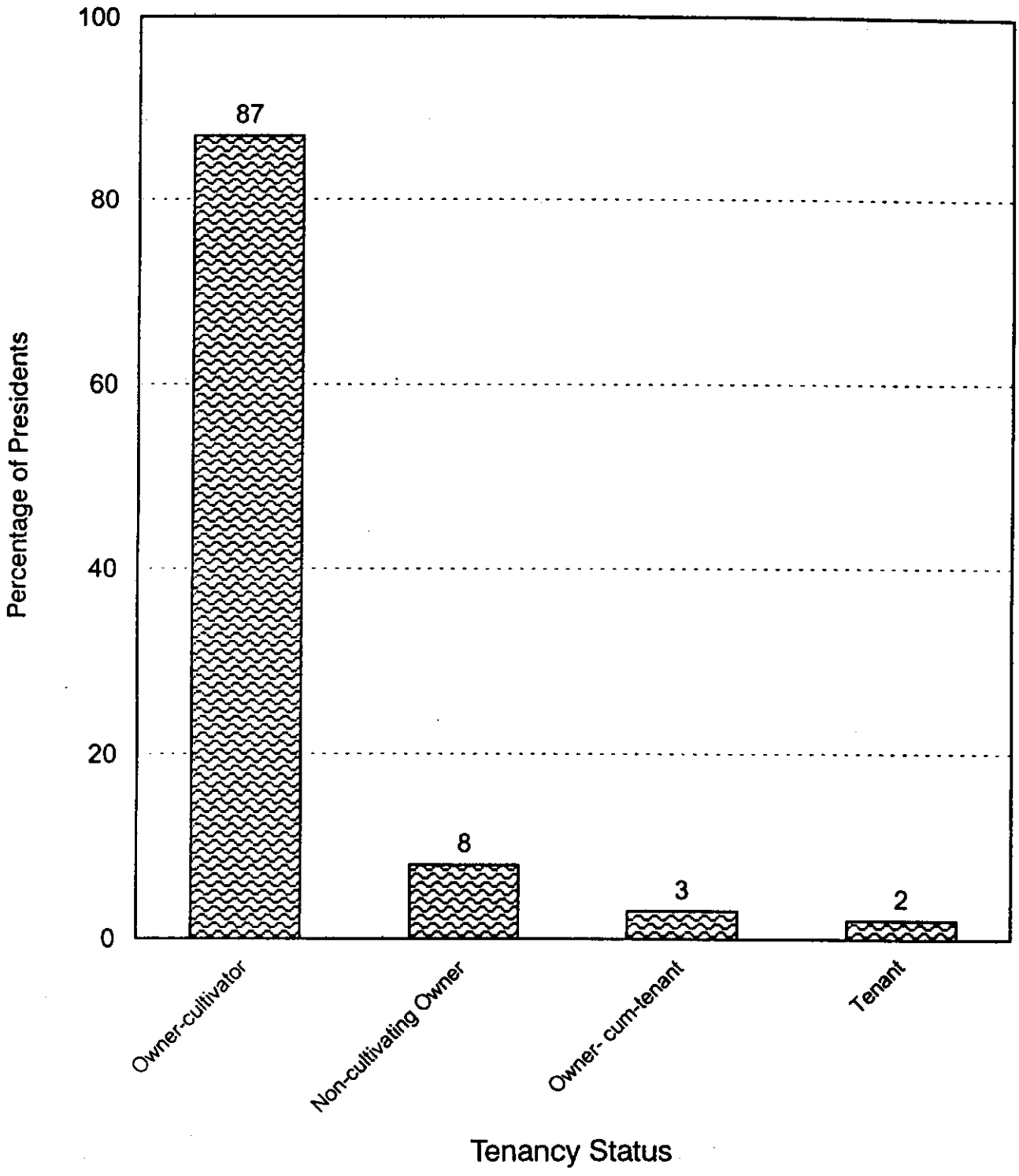


Figure 17. Tenancy status of 121 WUA presidents.

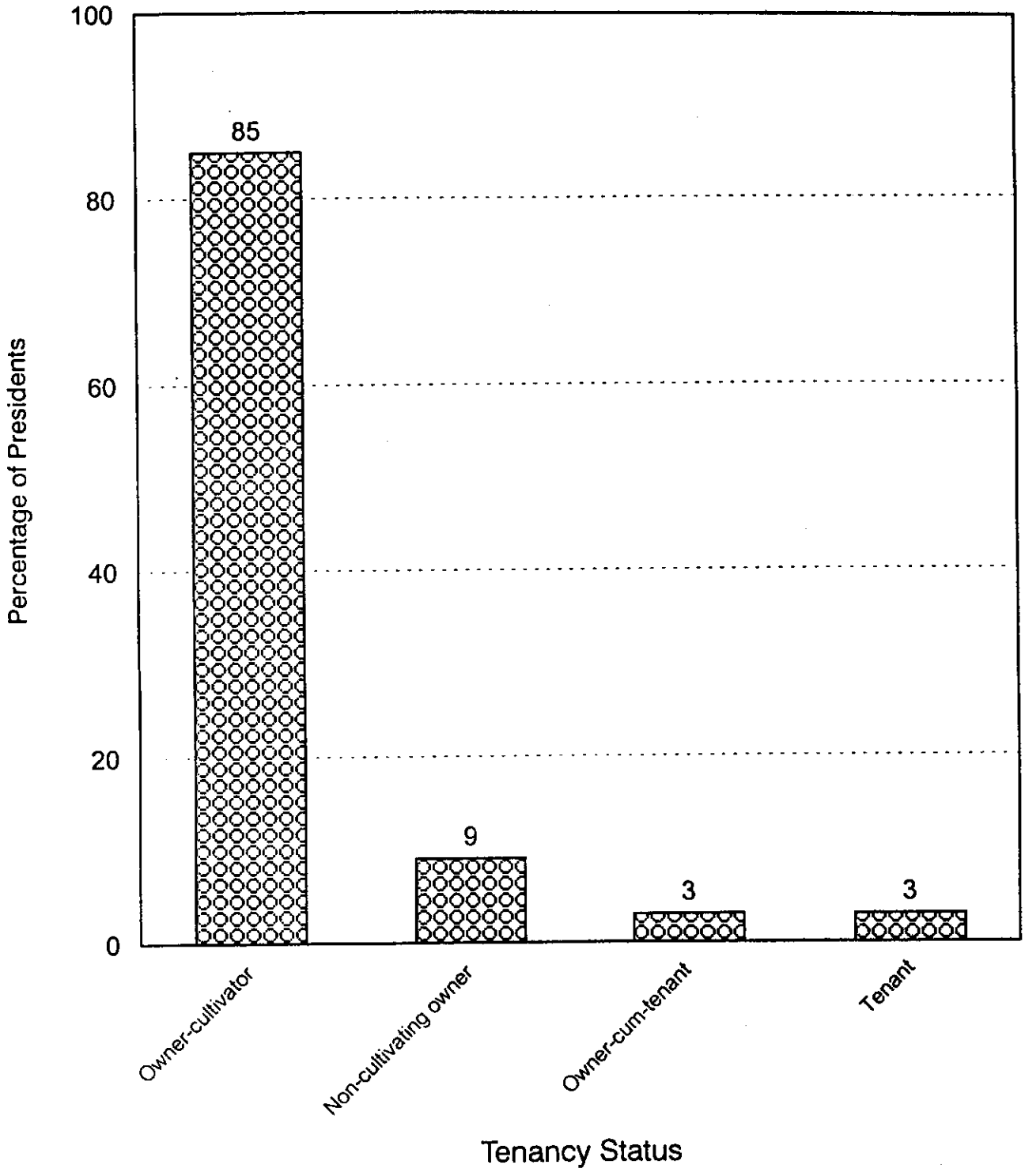


Figure 18. Tenancy status of 589 other WUA office bearers.

Table 33. Tenancy Status of Other WUA Office Bearers for 5 Sub-systems.

Name of the Sub-system	No. of other WUA OBs	Tenancy Status			
		Owner - cultivator	Non-cultivating owner	Owner-cum-tenant	Tenant
SS1	116	115	1	0	0
SS2	86	49	18	8	11
SS3	133	131	2	0	0
SS4	87	70	8	9	0
SS5	167	138	22	0	7
Total	589	503	51	17	18

Chapter 14

SOCIAL STATUS RELATED TO POLITICAL AFFILIATION

14.1 General

This chapter deals with the social status and political affiliations of the office bearers of the Hakra 4-R Distributary's WUAs. First, it:

- covers the social status of the WUA presidents and office bearers;
- covers the political affiliations of the WUA presidents and other office bearers; and
- provides a comparison among the Sub-systems.

14.2 Social Status of the WUA Presidents

Overall, 43 percent of the presidents have a formal social status among the community. They hold positions such as members of the *Usher* and *Zakat* Committees, members of defunct local bodies, *numberdari*, office bearers of political parties, and WUA office bearers as created by the OFWM. Overall, 53 percent of the presidents were selected from among the ordinary farmers. Figure 19 presents the social status of WUA presidents.

The highest proportion (67 percent) of presidents with a formal social status was from Sub-system 4, and the lowest proportion (26 percent), from Sub-system 1. In the remaining three Sub-systems, their social status was almost equal in ratio, i.e., 48, 41 and 46 percent for Sub-systems 2, 3 and 5, respectively. See Table 35.

Table 34. Social Status of WUA Presidents for 5 Sub-systems.

Name of the SS	No. of WUA Presidents	Social status						
		M. Usher & Zakat	Ex. Cou	Numberdar	OB, P. party	OB (OFWM)	Others	Total
SS1	23	0	1	1	1	0	3	6
SS2	23	4	5	1	0	1	0	11
SS3	27	4	5	2	0	0	0	11
SS4	15	5	0	2	0	3	0	10
SS5	33	5	6	3	1	0	0	15
Total	121	18	17	9	2	4	3	53

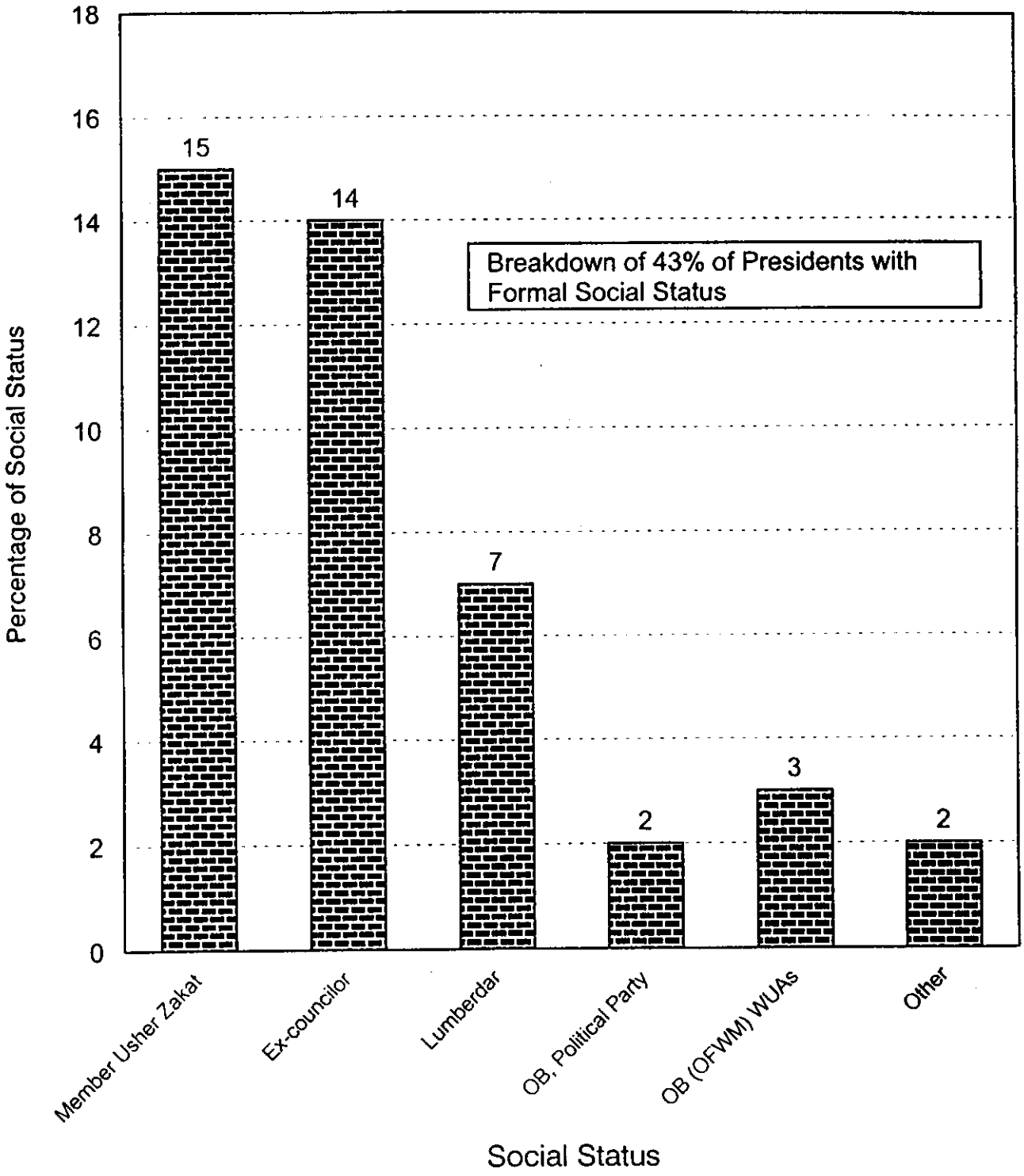


Figure 19. Social status of WUA presidents.

14.3 Social Status of Other WUA Office Bearers

Overall, only 18 percent of other office bearers have a formal social status among the community. As for the WUA presidents, they also hold similar positions, like that of members of *Usher* and *Zakat* Committees, members of defunct local bodies, *numberdari*, office bearers of political parties, and WUA office bearers created by the OFWM. Overall, 82 percent of other office bearers were selected from among ordinary farmers. Figure 20 presents the social status of other WUA office bearers.

The pattern of social status for other WUA office bearers is very much analogous to the pattern of their presidents. The highest proportion (60 percent) of office bearers with some social status was selected from Sub-system 4; the lowest (8 percent), from Sub-system 1. In the remaining three Sub-systems, social status rated 13 and 20 percent for Sub-systems 1 and 5, respectively.

Table 35. Social Status of Other WUA Office Bearers for 5 Sub-systems.

Name of the SS	No. of other WUA OBs	Social status					
		M. Usher & Zakat	Ex. Cou	Numberdar	OB, P. party	OB (OFWM)	Others
SS1	116	0	5	4	0	0	0
SS2	86	WR	MR	WR	MR	NR	NR
SS3	133	10	5	2	0	0	0
SS4	87	31	1	7	0	13	0
SS5	167	12	4	8	3	7	0
Total	589	43	15	21	3	20	0

14.4 Political Affiliations

Although the process of formation for WUAs was free of politics, their political affiliation was scrutinized after office the bearers were selected. The Pakistan Muslim League (PML) and the Pakistan Peoples Party (PPP) are the two dominant parties in the region. The majority of office bearers belong to these two parties. Other political parties are non-existent in the area. Besides, a significant number of office bearers do not belong to any political party.

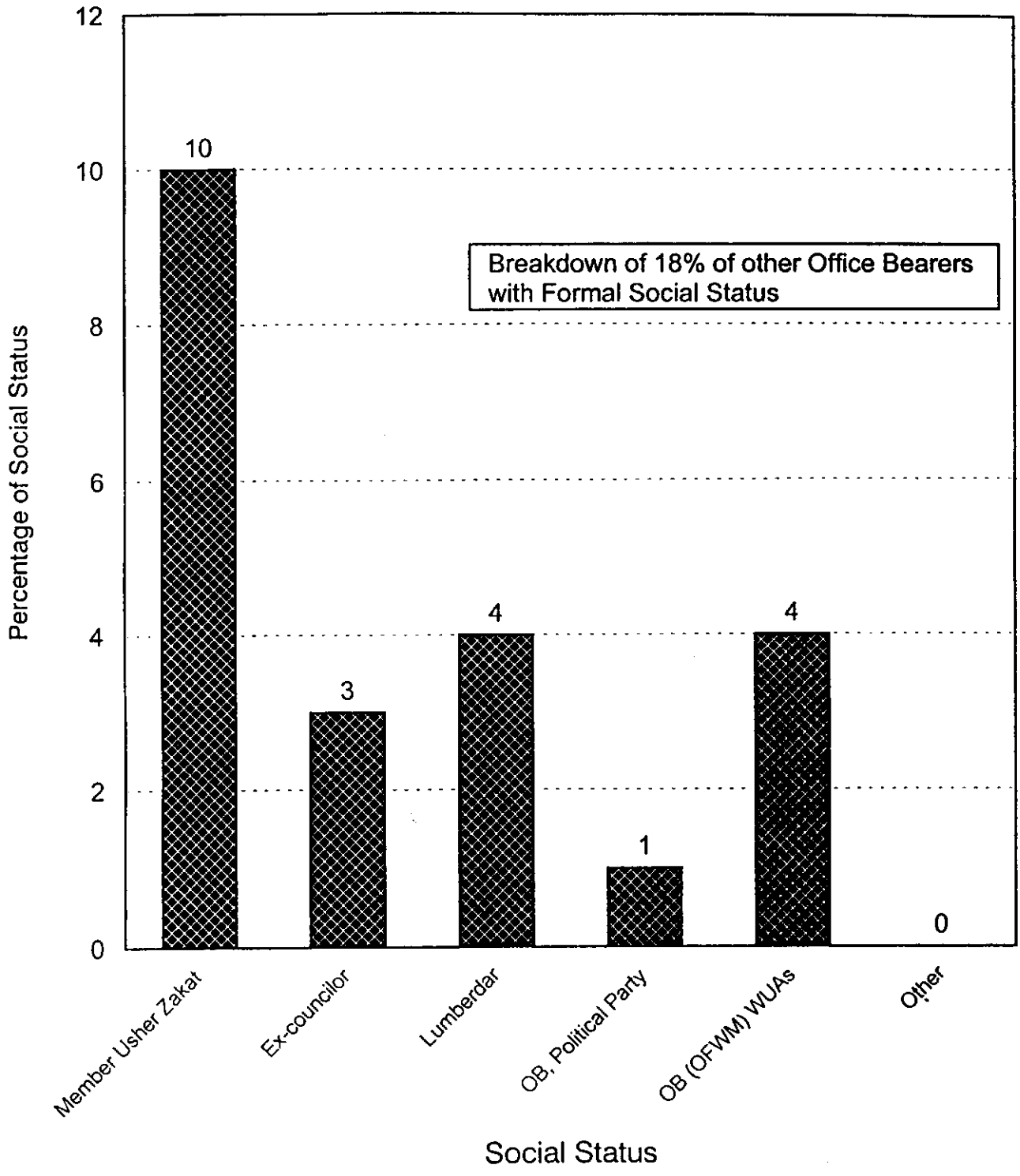


Figure 20. Social status of WUA office bearers.

14.5 Political Affiliation of WUA Presidents

Overall, 68 percent of WUA presidents have affiliations with the PML, 26 percent with the PPP, 6 percent have no affiliations with political parties. The Jamat-e-Islami membership is tantamount to none. Other parties are non-existent in the area. Figure 21 presents the political affiliation of 121 WUA presidents.

The political affiliations of the presidents, however, vary among the Sub-systems. In Sub-systems 3 and 4, there is a relatively higher PML influence than that of the PPP. In the remaining Sub-systems, although the PML is dominating party, the PPP has more influence than in other Sub-systems (Table 37).

Table 36. Political Affiliation of WUA Presidents for 5 Sub-systems.

Name of the SS	Total WUA Presidents	Political Affiliation				
		PML	PPP	JI	Neutral	Others
SS1	23	14	9	0	0	0
SS2	23	14	7	0	2	0
SS3	27	20	4	0	3	0
SS4	15	13	2	0	0	0
SS5	33	21	10	0	2	0
Total	121	82	32	0	7	0

14.6 Political Affiliations of Other WUA Office Bearers

The pattern of political affiliation for other office bearers also presents a similar pattern as that of presidents. Overall, 66 percent of other WUA office bearers have affiliations with the PML, 22 percent with the PPP, 11 percent had no affiliations with any political party. Figure 22 presents the political affiliation of 589 other WUA office bearers.

Similar to that of WUA presidents, the political affiliations of other office bearers also vary among the Sub-systems. In Sub-systems 3 and 4, relatively more office bearers belong to the PML than the PPP. Although the PML is the dominating party in the remaining Sub-systems, office bearers belonging to the PPP are relatively more (Table 38).

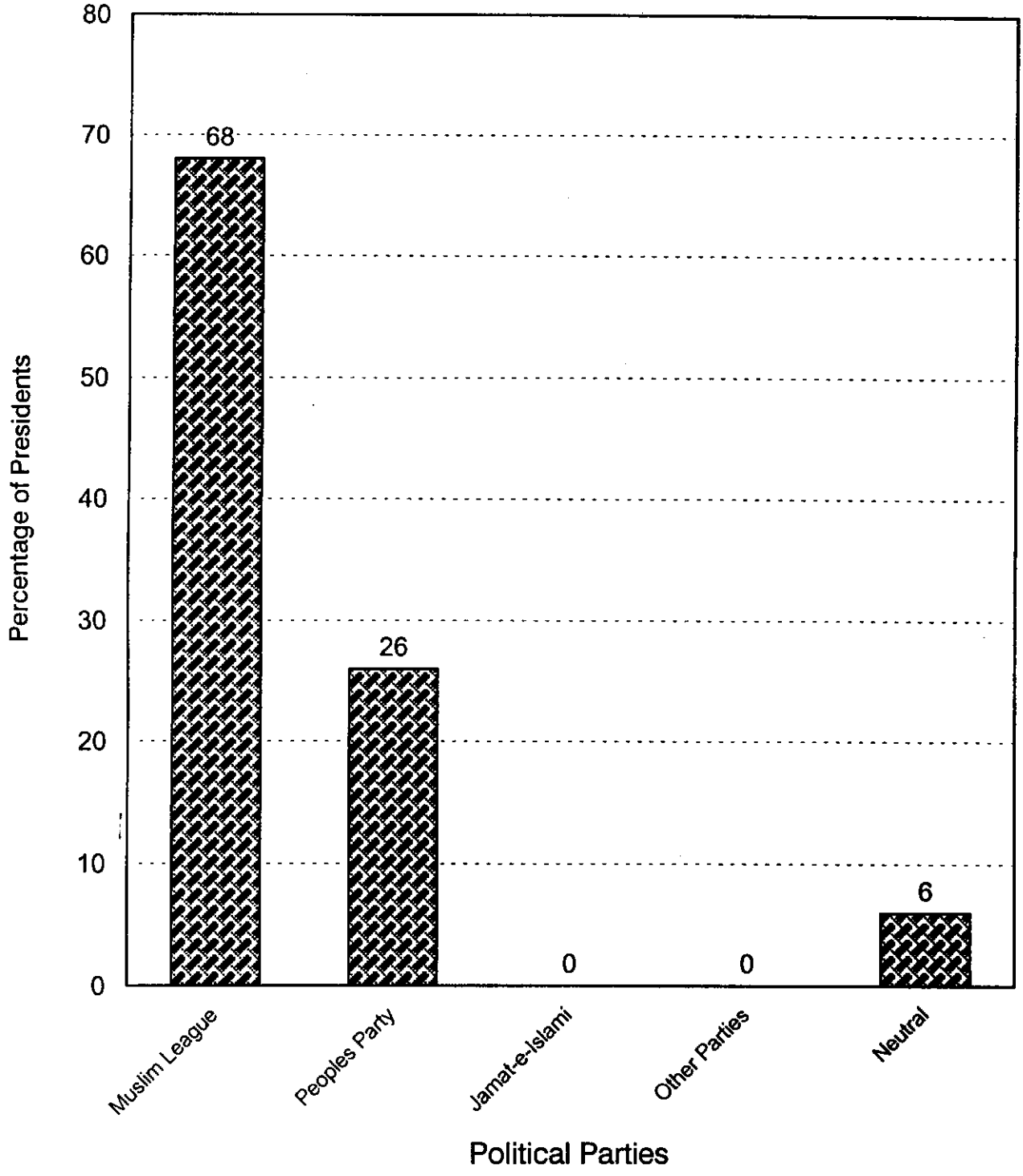


Figure 21. Political affiliation of 121 WUA presidents.

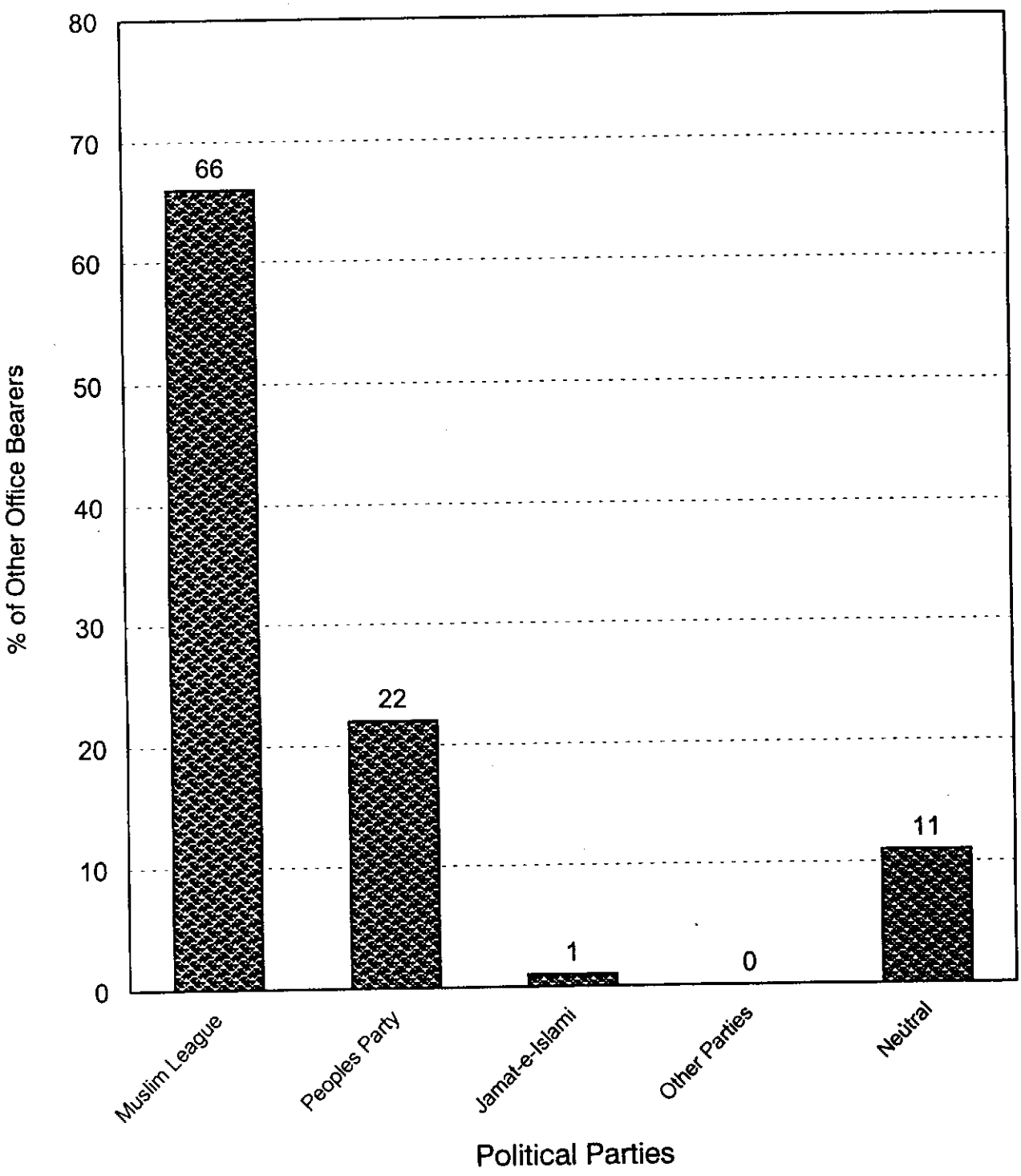


Figure 22. Political affiliation of 589 other WUA office bearers.

Table 37. Political Affiliation of Other WUA Office Bearers for 5 Sub-systems.

Name of the SS	Total WUA OBs	Political Affiliation				
		PML	PPP	JI	Neutral	Others
SS1	116	73	36	0	7	0
SS2	86	67	17	0	2	0
SS3	133	89	21	2	21	0
SS4	87	66	12	0	9	0
SS5	167	96	45	0	26	0
Total	589	391	131	2	65	0

Chapter 15

NON-AGRICULTURAL SOURCES OF INCOME

15.1 General

This chapter deals with the non-agricultural sources of income for WUA office bearers of the Hakra 4-R Distributary. First, it:

- identifies the non-agricultural activities of the office bearers;
- discusses the extent of WUA presidents' involvement in the non-agricultural business;
- reviews the degree of involvement of other office bearers with non-agricultural sources of income; and
- compares the involvement of these office bearers among the Sub-systems.

15.2 Non-agricultural Sources of Income

As has been discussed in Chapter 10, approximately 90 percent of the WUA office bearers are actual cultivators. Only 10 percent of farmers own land, but do not cultivate themselves. Some office bearers are also involved in non-agricultural activities. They generate income from different sources, i.e., shops in the villages and towns, government service, private service, as commission agents, from factories and others.

15.3 Non-agricultural Sources of Income of WUA Presidents

Overall, 23 percent of WUA presidents have access to other sources of income. Of this 23 percent, 12 percent run shops in the villages towns, 6 percent are involved in government service, 3 percent work as commission agents, and 2 percent own factories. Overall, 67 percent of presidents do not have other sources of income. Figure 23 presents the status of non-agricultural activities for WUA presidents.

Table 39 indicates that variations are existent among the degrees of involvement in non-agriculture businesses of WUA presidents among the Sub-systems. The highest percentage (40 percent) exists in Sub-system 2; apparently because the proximity of the Sub-system to Haroonabad provides easy access to other businesses. The lowest percentage (13 percent) exists in Sub-system 1. The visible reason is the remoteness of the Sub-system from main cities, presenting difficult access to other businesses. The percentage of presidents involved in non-agriculture businesses is 27, 20 and 33 for Sub-systems 3, 4 and 5, respectively.

15.4 Non-agricultural Sources of Income of Other WUA Office Bearers

When compared to that of the presidents, the involvement of other office bearers in non-agricultural activities is significantly less. Overall, 14 percent of other WUA office bearers have access to other sources of income. Of this 14 percent, 3 percent run shops in villages and towns,

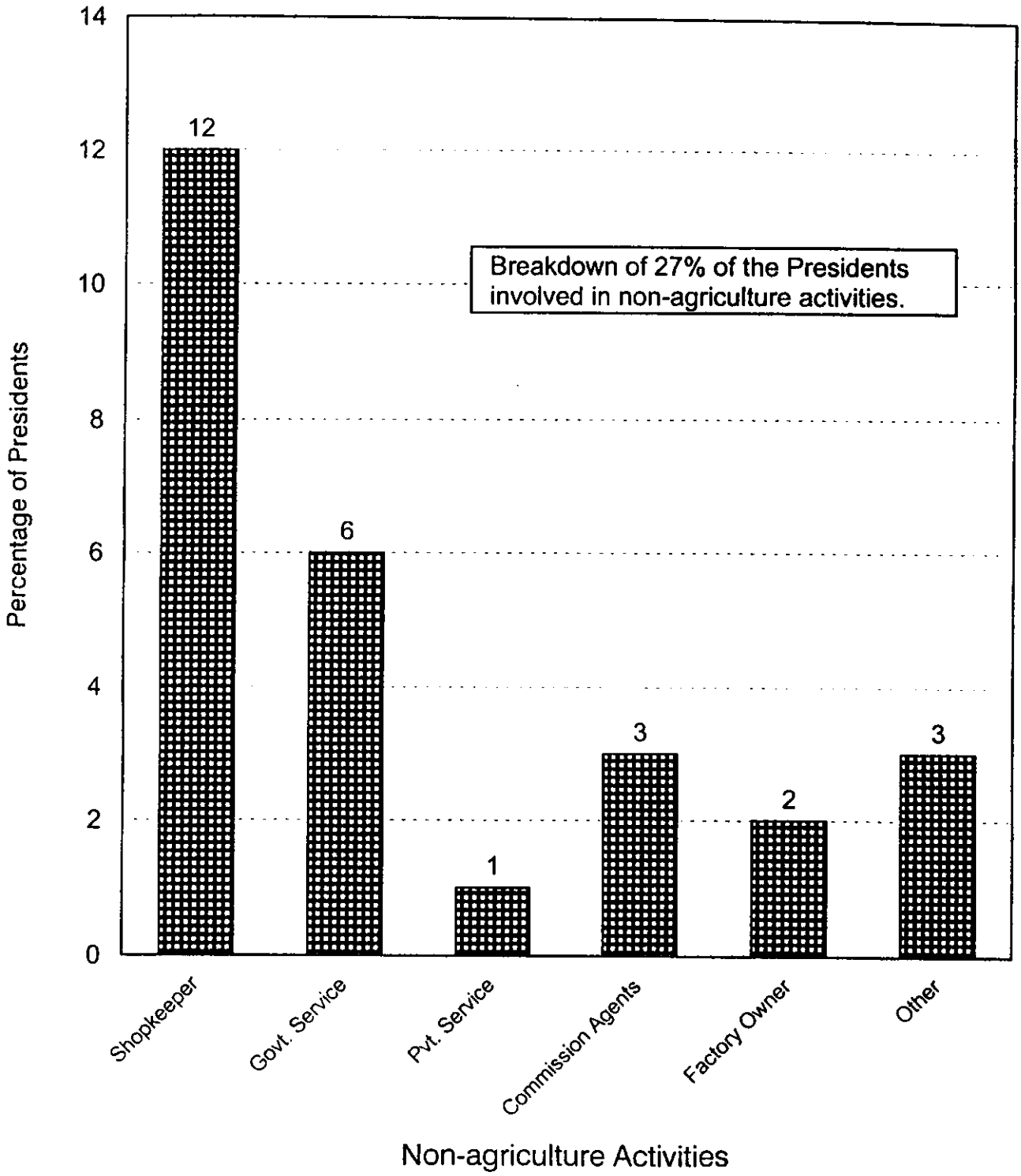


Figure 23. Status of non-agriculture activities of 121 WUA presidents.

2 percent are in government service, 2 percent work as commission agents, 1 percent owns factories. Overall, 86 percent of them does not have any other source of income. Figure 24.

Table 38. Non-agriculture Activities of WUA Presidents for 5 Sub-systems.

Name of the SS	No of WUA Presidents	Other occupations corresponding to no. of presidents					
		Shop-keepers	Govt. Service	Pvt. Service	C. Agents	F. Owners	Others
SS1	23	2	1	0	0	0	0
SS2	23	2	0	0	2	2	3
SS3	27	5	1	0	1	0	0
SS4	15	1	1	0	1	0	0
SS5	33	5	4	1	0	0	1
Total	121	15	7	1	4	2	4

Table 40 indicates that variations exist in the degrees of involvement in non-agriculture businesses of other WUA office bearers among the Sub-systems. Similar to that of presidents, the highest percentage (27 percent) of involvement exists in Sub-system 2. The obvious reason is the close proximity of the Sub-system to Haroonabad, thus, providing easy access to other businesses. The lowest percentage (5 percent) exists in Sub-system 1. The visible reason is the remoteness of the Sub-system from main cities, making access to the other businesses difficult. The percentage of other office bearers involved in non-agriculture businesses is 16, 20 and 17 for Sub-systems 3, 4 and 5, respectively.

Table 39. Non-agriculture Activities of other WUA Office Bearers for 5 Sub-systems.

Name of the SS	No. of other WUA OBs	Other occupations corresponding to no. of other office bearers					
		Shop-keepers	Govt. Service	Pvt. Service	C. Agents	F. Owners	Others
SS1	116	1	4	0	0	0	2
SS2	86	3	6	0	5	4	5
SS3	133	20	1	0	0	0	0
SS4	87	5	3	4	6	0	0
SS5	167	9	5	5	3	1	5
Total	589	38	19	9	14	5	12

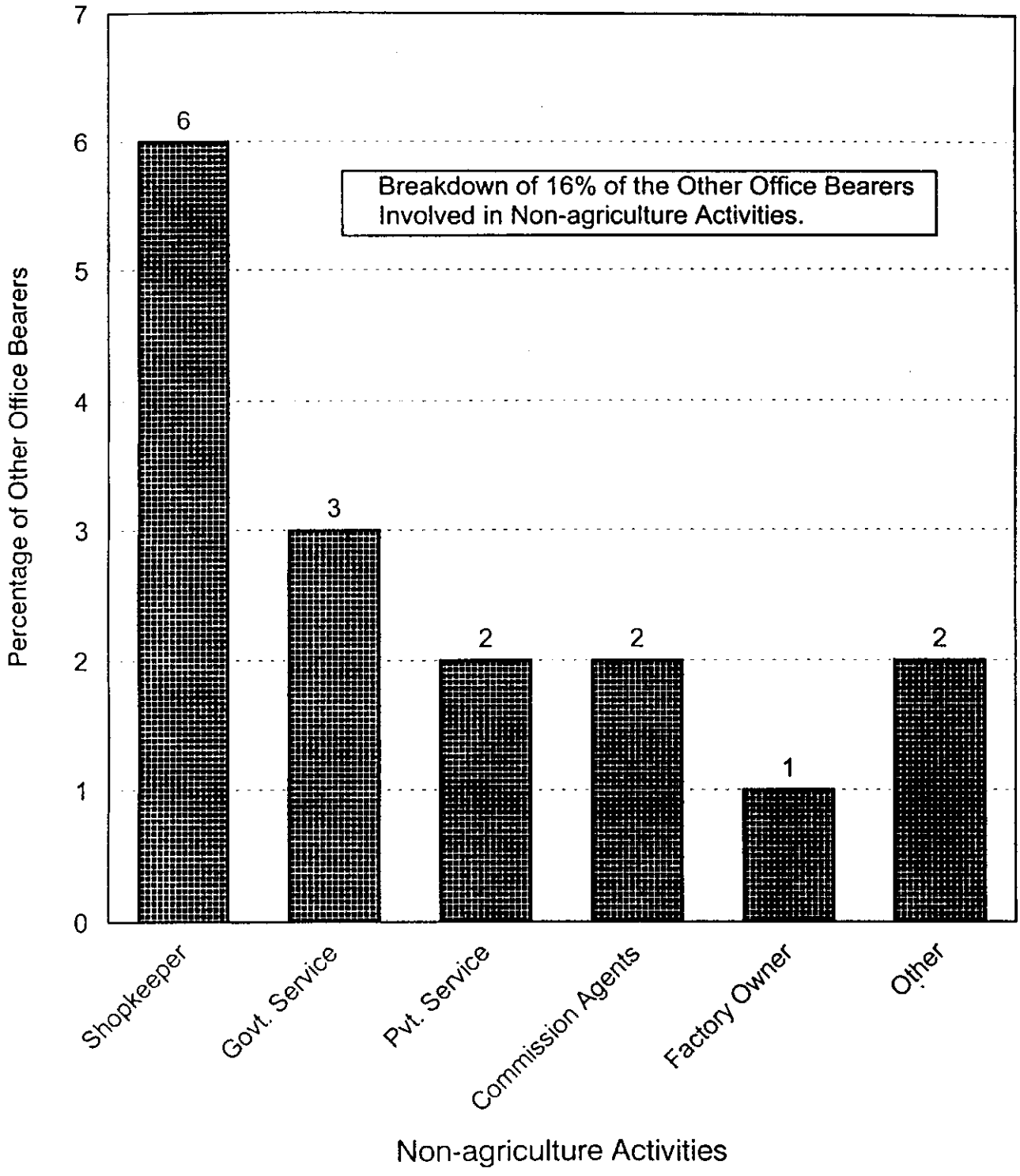


Figure 24. Status of Non-agriculture activities of 589 other office bearers.

CONCLUSIONS

The WUA formalization process was a targeted effort in order to select formal office bearers and to prepare legal documents for their legal registration. Both of the objectives were accomplished during the formalization process. Another objective was to see to what extent the WUO office bearers can be involved in organizational development activities. Different ranges of leadership parameters, covering all levels of organizational structure, were actively involved in organizing formalization meetings. Therefore, this third objective was also achieved with considerable success. Since the formation of the WUF on March 5, this was the more widespread grassroots activity in the organizational development of the Hakra 4-R Distributary's WUF.

Although the 2nd phase took more time than the 1st to accomplish, the reason was that during the 2nd phase, some other activities (flow measurement training and maintenance campaign) took priority. The 2nd phase was, however, easier than the 1st; improved rotational irrigation, reduced water theft and increased interaction with government departments. These short-term effects of social interventions contributed towards the increased interest of water users to join the associations. These effects also induced farmers to actively participate in the formalization process.

The Joint Management Agreement (JMA) has not yet been signed. The organizational activities in the pre-takeover period have less appeal for the farmers. The enthusiasm shown by the farmer leaders in completing this massive organizational task proves the effectiveness of their organizational strength.

More than 90 percent of the office bearers have affiliations with political parties. These facts help to deepen our understanding towards the possibility of the farmer leaders indulging into politics.

The reasons for low and high participation in the formalization meetings suggest that rapport among the social organizers and contacts, influence of the farmer leaders coupled with the times meetings were held, are important factors of high participation.

Many factors made the formalization process easier than the preceding process; the organizational maturity was the one factor which expedites the formalization process. The informal WUAs were created about one year before the formalization process. The WUOs were mature enough to undertake organizational development activities. Times and venues for most of the meetings were decided by the WUO leaders. Timing was the second factor. In the beginning, the organization process was regarded with apprehensions, fears and doubts. With the afflux of time, this process was later described as that of trust and confidence. Many factors related to the ease with which the process emerged; because of time and not necessarily through socialization. The variations and differences in the achievements among the WUOs are indicative of the capability of farmer leaders to undertake organizational development activities. Likewise, it is symptomatic of the performance of the social organizers in their respective subsystems.

There were several contributing factors of high participation in the formalization meetings:

- influence and the personal contacts of farmer leaders and their active facilitation roles in organizing meetings;
- homogeneity of the water users;
- cohesiveness among water users; and
- continuous contacts of IIMI SOs with WUO members and common farmers through periodic meetings.

These factors identify three main variables for effective social organization work:

1) influence of community-based leadership;
2) appropriate social and physical infrastructure; and
3) effective rapport of the social organizers.

One of the reasons for the postponement of meetings was the propaganda spread by agency field staff. This situation suggests that motivation of the agency staff is also essential before the implementation of the social organization work.

During the 2nd phase, a significant number of office bearers were replaced by old ones. Illiteracy, disinterest in the organizational affairs, migration of share holders from the area, change in tenancy status, death of an actual share holder and holding offices in more than one watercourse command were the important reasons for the change in office bearers. These reasons show the high level of awareness about the quality of the leadership among the water users.

Although, overall, Arain are in the majority in the area, the distribution of caste, however, among the Sub-systems can be regarded as double, or multiple caste. The social factors related to caste have some impact on social organization work. However, this is not seen as a major contributing factor in the socialization process.

Critics always show their apprehension about WUAs being monopolized by the large farmers. They also question the fairness of the democratization process. The land relations of the office bearers indicate that 44 percent of the WUA presidents belonged to small and medium farmers. Similarly, among the other office bearers, 66 percent of the office bearers fall in the category from small to medium. Emergence of such a large number of office bearers from the small and medium farmers shows a just distribution among all the categories of the leadership, as well as the genuineness of the WUA formation process.

The tenancy patterns of the leadership suggest that an overwhelming majority of the leadership is owner-cultivators. A significant number of leaders emerging from the non-cultivating owners provide sound knowledge of their tenancy status. This knowledge can be very helpful in defining the membership of the water users association. This pattern suggests that it is worthwhile to include non-cultivating owners and tenants as members of the associations.

The dominant majority of the office bearers (67 percent presidents and 84 percent other office bearers) have their sole source of income from agriculture. A significant number of office bearers also have non-agriculture sources of income, suggesting that the scale of WUO activities should be expanded beyond the irrigation management to help alleviate the poverty of the farming community.

The involvement of the presidents in the non-agriculture businesses was higher than that of the other office bearers. This suggests that the WUA presidents were selected from that section of the community, i.e., relatively more mobile and well off.

158 Social Organization Volunteers (SOVs) were identified, selected, trained and used for the social organization work. Among them, about 100 SOVs were selected as WUO office bearers. Selection of such a large number of WUA leaders from the SOVs demonstrates that the criteria used for the selection of community-based leaders was quite genuine and flawless. This is also indicative of the competence of the social organizers to maintain the criteria of the leadership.

The leaders of the Hakra 4-R Distributary present a mixed settlement pattern. All three major communities, i.e., local, *mohajir* and settlers are present in the area. The critical analysis of the social organization process indicates that *mohajir* and settlers have more awareness than the locals. They are also socially more cohesive.

Some experts argue that WUO office bearers should have only one office at one time. They also suggest that WUO office bearers should quit the offices of political parties and other elected forums, such as members of local bodies, etc.. Overall, 43 percent of the presidents have a formal social status in the community. They hold positions like members of the *Usher* and *Zakat* Committees, members of defunct local bodies, *numberdari*, office bearers of political parties, and WUA office bearer as created by the OFWM. This finding suggests that farmers who have been elected in other official forums have also proved to be good WUO leaders. Two out of five members of the WUF executive body were elected to the district council in the April 1998 elections. This means that the social elements are inextricably linked with local politics, and should not be ignored while enacting WUO by-laws.

References

Bandaragoda, D.J., Hassan.M, Mirza,Z.I., Cheema, M.A., and Waheed-uz-Zaman, (1997): Organizing Water Users for Distributary Management: Preliminary Results from a Pilot Study in the Hakra 4-R Distributary of the Eastern Sadiqia Canal System of Pakistan Punjab Province IIMI Pakistan Research Report No. 25 IIMI Pakistan Lahore.

Hassan.M.,Mirza,Z.I., Bandaragoda, D.J. (1996). Mobilizing Social Organization Volunteers: An Initial Methodological Step Towards Establishing Effective Water Users Organizations IIMI Pakistan Research Report No. 9 IIMI Pakistan Lahore.

Waheed-uz-Zaman, (1998): Self-help Maintenance Activities by the Water Users Federation of the Hakra 4-R Distributary. IIMI Pakistan Research Report No.44, IIMI Pakistan Lahore.

Waheed-uz-Zaman, Iqbal.A, Abdul Hamid and Skogerboe, G.V., (1998): Flow Measurement Training For Sub-system Management, IIMI Pakistan Research Report No. 53, IIMI-Pak Lahore.

Waheed-uz-Zaman and D.J Bandaragoda (1996): Government Interventions in Social Organization for Water Resource Management: Experience of a Command Water Management Project in the Punjab, Pakistan, IIMI Pakistan Research Report No 14, IIMI Pakistan Lahore.

Waheed-uz-Zaman (1998) .Application of Operations and Maintenance Activities to Support Participatory Irrigation Management. M.Phil Thesis Center of excellence in Water Resources Engineering, University of Engineering and Technology Lahore.

Annex 1

Participation of WUA Members, Sub-system 1.

S. No	W/C NO.	Name of Reps	Actively Participated ,or Not
1	1240/L	Muhammad Akram Wattoo	Actively participated
2	4162/L	Syed Manzoor Hussain	Do
3	6431/L	Muzammil Hussain Wattoo	Do
4	14865/L	Mian Riaz Ahmad	Not participated
5	14670/R	Rao Jumshid Ali	Actively participated
6	16290/R	Rao Muhammad Ramzan	Do
7	21798/L	Ali Sher Ranoka	Do
8	22812/R	Molvi Ghulam Qadar	Do
9	24474/L	M. Shahbaz Khan Bhatti	Do
10	24582/R	Muhammad Riaz Ahmad	Do
11	28208/L	Rana Abdul Moonium	Do
12	31980/L	Muhammad Akmal Khan Aakooka	Not
13	33130/L	Muhammad Akram	Actively participated
14	34630/R	Mian Aish Muhammad	Do
15	35730/L	Nazar Khan Aakooka	Do
16	39610/L	Mumtaz Ahmad	Do
17	40400/R	Qasim Ali	Do
18	43320/L	Mian Abdul Shakoor Aakooka	Do
19	44580/R	Altaf Javed	Do
20	45850/R	Balia Bhatti	Do
21	45810/R	Rao Muhammad Iqbal	Do
22	46240/L	Mian Rizwan Hameed	Do
23	46279/R	Ch. Abdul Khaliq	Do

Annex 2

Participation of WUA Members, Sub-system 2.

S.No.	W/C No.	Name of Representative	Activity Participated, or Not
1	50310/L	Haji Amin Sukhera	Actively participated
2	50950/L	Haji Hanif s/o Jaan muhammad	Do
3	52050/L	Rao Muhammad Ayub	Do
4	52050/R	Muhammad Waris	Do
5	54700/L	Rao Abdul Jabbar	Do
6		Rao Abdul Huq	Do
7	56730/L	Ashiq Hussain	Do
8	57860/R	Abdul Rauf	Do
9	57870/R	Muhammad Talib Sukhera	Do
10	57890/L	Mazhar Hussain Liaqat	Do
11	60490/L	Shah Muhammad	Just participated
12	59100R/R	Raja Ghazanfar	_
13	59130/R	Raja Sultan	_
14	62670/R	Raja Nasir Javed Tipu	_
15	63910/L	Rao Inaam ur Rehaman	Just participated
16	65080/L	Mian Abdul Wahid	Actively participated
17	66050/L	Ghulam Muhammad	DO
18	71270/R	Ghulam Sarwar s/o G. Haider	Do
19	69310/R	Bashir Ahmad s/o Muhammad Din	Just participated
20	69490/L	Saien Muhammad	Actively participated
21	70640/L	Haji Munwar Alam	Do
22	71750/R	Ch. Abdul Ghafoor	Do
23	71735	Ashiq Hussan	Do

Annex 3

Participation of WUA Members, Sub-system 3.

S. No.	W/C No.	Name of Representative	Actively participated, or Not
1	75366/R	Haji Atta Muhammad	Actively participated
2	78400/R	Muhammad Irshad	Just participated
3	79924/L	Muhammad Rafiq	Actively participated
4	81350/R	Muhammad Rafiq Fauji	Do
5	86376/L	Muhammad Akram	Do
6	87640/R	Muhammad Anwar Bajwa	Do
7	88920/L	Mian Muhammad Mumtaz Joia	Do
8	89179/L	Muhammad Anwar	Do
9	91706/R	Muhammad Shafi	Do
10	92631/L	Haji Abdul Ghafoor	Just participated
11	93870/L	Muhammad Akram	Actively participated
12	94300/L	Sufi Muhammad Sarwar	Do
13	95102/L	Muhammad Aslam	Do
14	95920/R	Haji Muhammad Hanif	Do
15	96362/L	Sufi Muhammad Iqbal	Do
16	98729/L	Dr. Faqir Muhammad	Do
17	101069/L	Iftikhar Ahmad Numberdar	Do
18	102214/R	Abdul Ghafoor	Do
19	102237/L	Muhammad Sohial	Just participated
20	104520/L	Master Muhammad Jamil	Actively participated
21	105634/R	Abdul Razaq	Do
22	107020/R	Haji Muhammad Siddique	Do
23	107022/L	Haq Nawaz	Do
24	107055/R	Ch. Muhammad Bashir	Do
25	109980/R	Hashmst Ali	Do
26	112050/TL	Master abdul Hamid	Do
27	112050/TR	Talib Husain	Do

Annex 4

Participation of WUA Members, Sub-system 4.

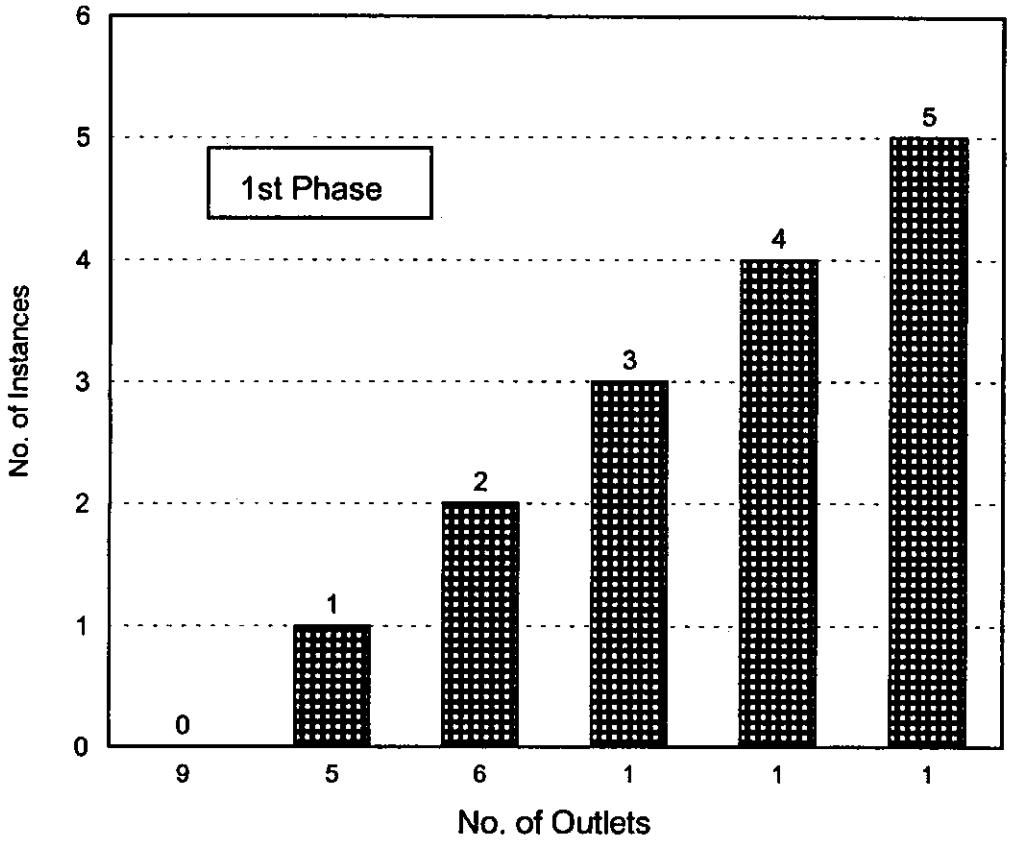
S.No.	W/C No.	Name of Representative	Actively participated, or Not
1	674/L	Rao Abdul Majid	Actively Participated
2	4000/R	Muhammad Arif	Do
3	4700/L	Liaqat Ali	Do
4	8565/L	Muhammad Asghar Joyia	Do
5	9661/L	Abdul Malik	Do
6	10291/R	Khair Muhammad	Do
7	11785/L	Sufi Muhammad Siddique	Do
8	14080/L	Muhammad Hafeez s/o Jan Muhammad	Do
9	16280/R	Ali Muhammad	Do
10	18480/L	Abdush Shakoor	Do
11	19580/R	Hidayatullah	Do
12	22000/TL1	Muhammad Fiaz	Do
13	22000/TL2	Mian Muhammad Khan Sukhera	Do
14	22000/TC	Muhammad Shafi	Do
15	22000/TR	Muhammad Ismail	Do

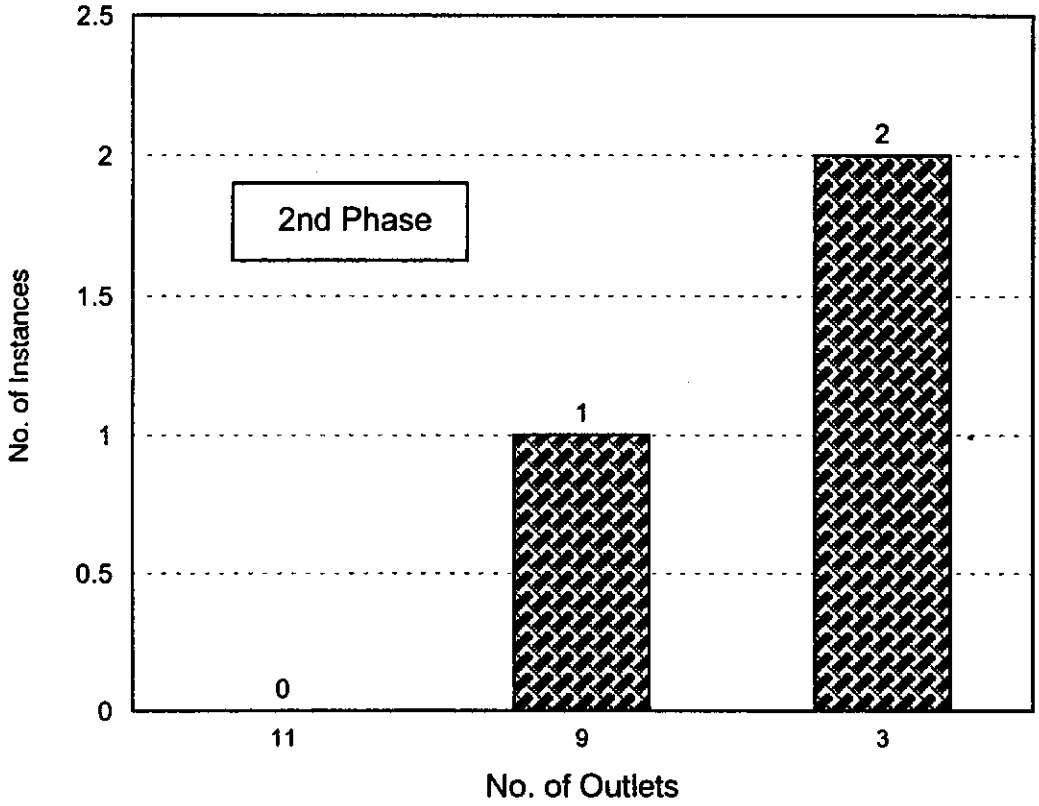
Annex 5

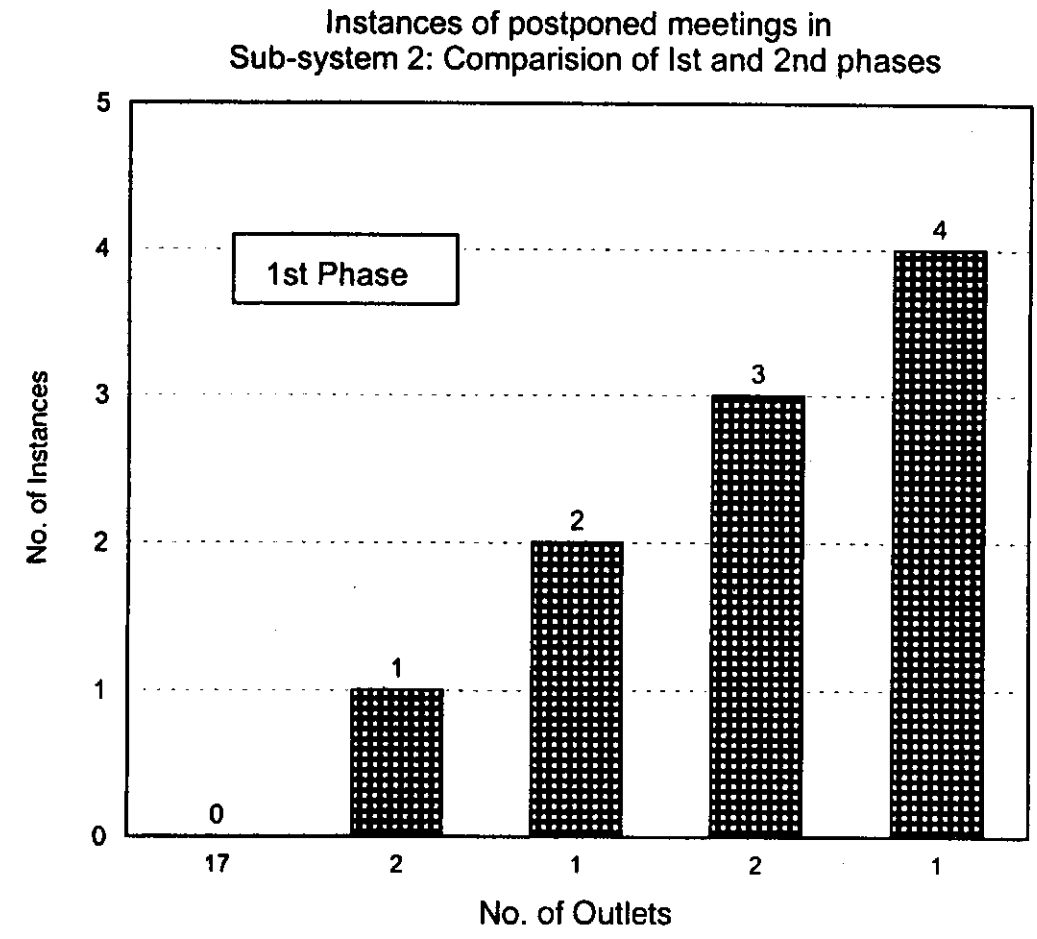
Participation of WUA Members, Sub-system 5.

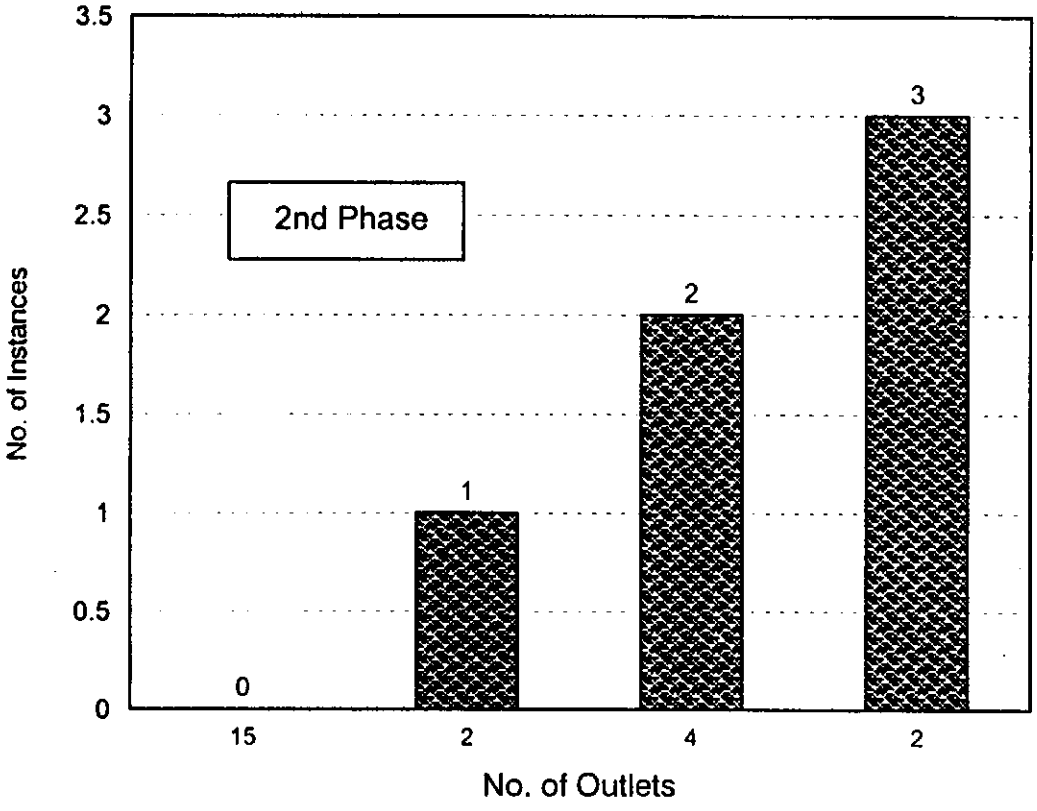
S. No.	W/C No.	Name of Representative	Actively participated, or Not
1	1215/L	Bao khalid	Actively Participated
2	3420/R	Muhammad Naeem Akhatr	Do
3	3750/L	Riaz Ahmad	Do
4	4803/R	Sher Muhammad Wattoo	Do
5	7140/R	Ch. Akbar Ali	Do
6	7641/R	Muhammad Asghar	Do
7	8043/R	Sufi Rashid Gill	Do
8	11792/L	Chaudhry Nazir Ahmad	Do
9	12515/R	Javed Gujjar	Do
10	17619/R	Ch. Muhammad Amin	Do
11	17679/L	Pir Muhammad	Do
12	19116/R	Master Subah Sadiq	Do
13	20419/R	Quarban Ali	Do
14	20630/L	Ch. Akram Chatha	Just participated
15	22600/R	Haji Muhammad Ali	Do
16	23738/L	Humayun Akhtar	Do
17	25883/L	Hafiz Sanaullah	Do
18	27061/R	Haji Iftikhar	Do
19	27514/R	Munir Hussain Advocate	Do
20	29418/L	Mazhar Hussain Chatha	Do
21	33030/L	Muhammad Siddique	Do
22	33674/L	Muhammad Arshad	Do
23	33730/L	Mubark Ali	Do
24	33813/R	Ghulam Murtaza	Do
25	33940/L	Maqsood Ahmad	Do
26	40030/R	Mian Munir	Do
27	43648/L	Ch. Muhammad Aslam	Do
28	46500/L	Muhammad Azim	Do
29	47520/L	Nazeer Ahmad	Do
30	47529/R	Saif Ahmad Bhatti	Do
31	50623/TL	Allah Ditta Batthi	Do
32	50623/TF	Mallah	Do
33	50523/TR	Ashiq Hussain	Do

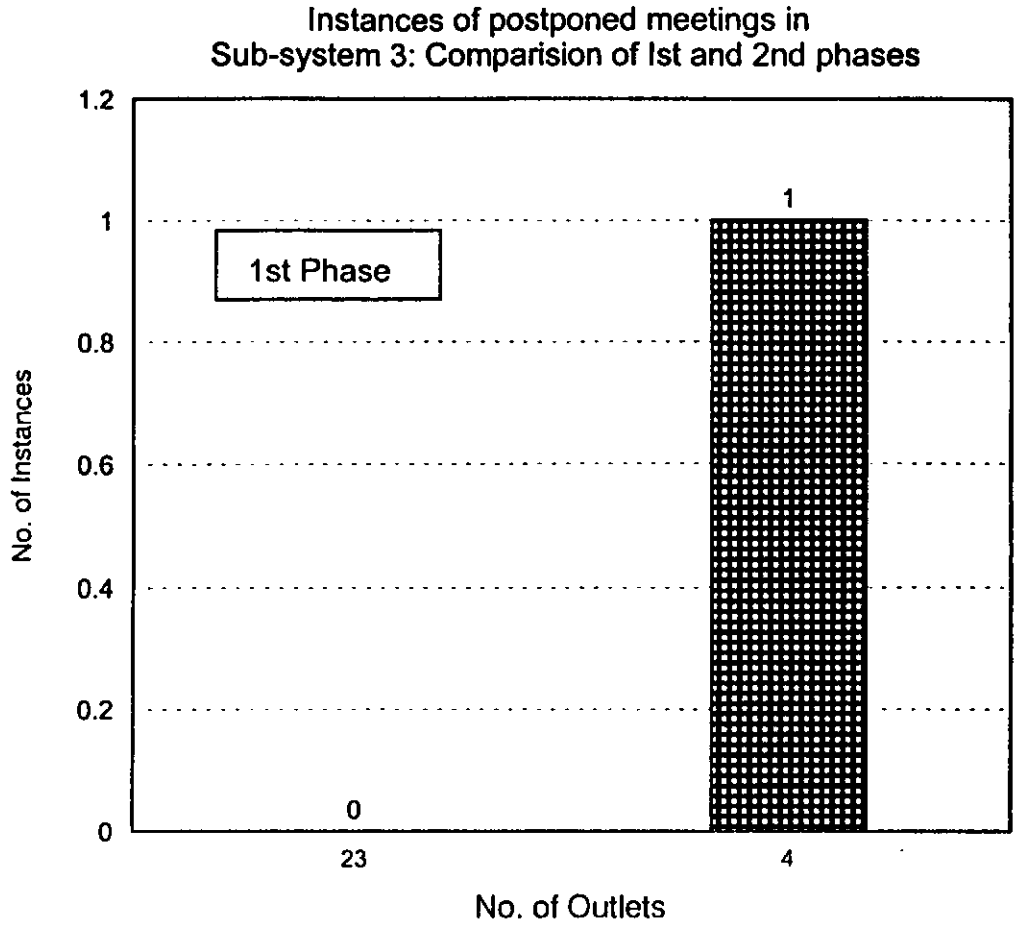
Instances of postponed meetings in
Sub-system 1: Comparision of Ist and 2nd phases

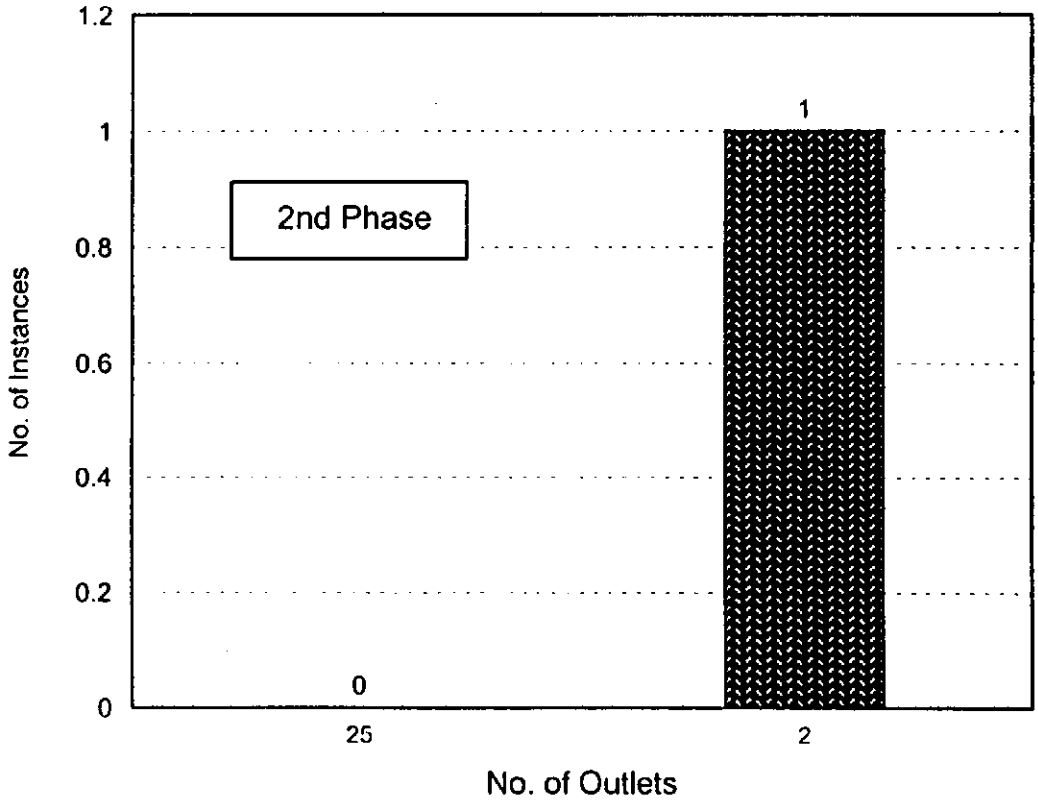




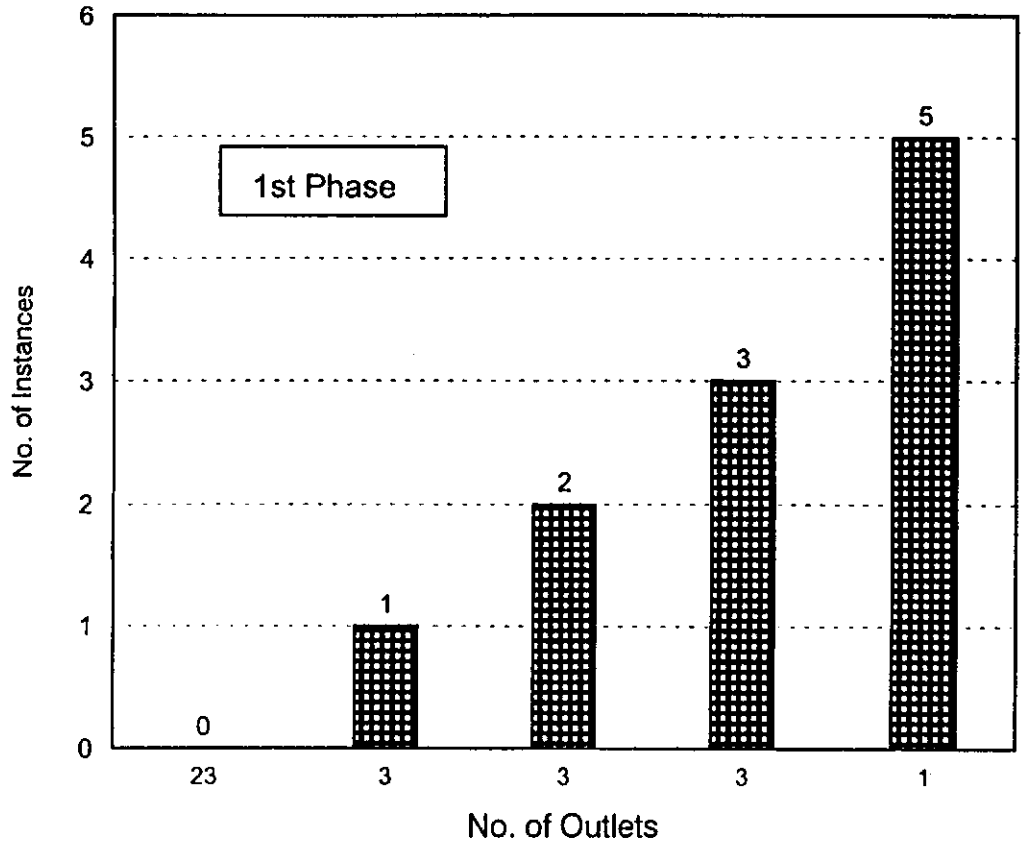

Instances of postponed meetings in
Sub-system 2: Comparision of Ist and 2nd phases
1st Phase
No. of Instances
No. of Outlets
0
1
2
3
4
17
2
1
2
1

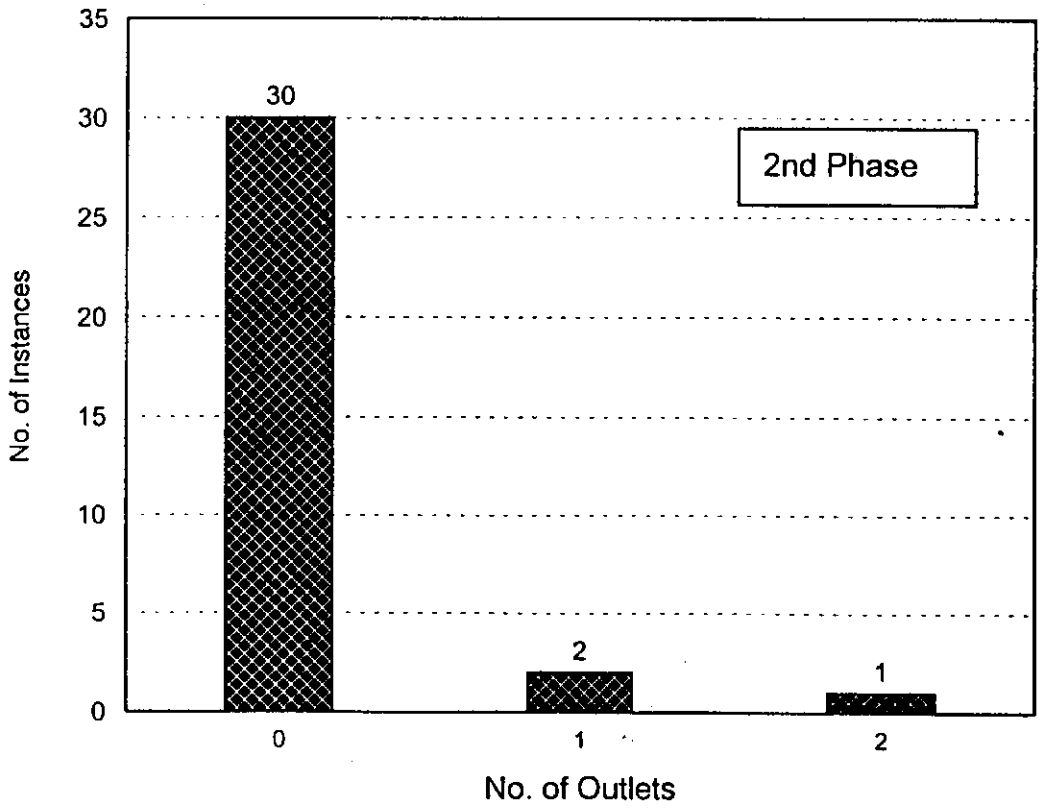

2nd Phase
No. of Instances
No. of Outlets
0
1
2
3
15
2
4
2


Instances of postponed meetings in
Sub-system 3: Comparision of Ist and 2nd phases
1.2
1
0.8
0.6
0.4
0.2
0
No. of Instances
1st Phase
1
0
23
4
No. of Outlets


1.2
1
0.8
0.6
0.4
0.2
0
No. of Instances
2nd Phase
1
0
25
2
No. of Outlets

Instances of postponed meetings in
Sub-system 5: Comparision of Ist and 2nd phases





IIMI-PAKISTAN PUBLICATIONS

RESEARCH REPORTS

Report No.	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
	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
	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 Sodicity Research in Pakistan - Proceedings of a one-day Workshop	J.W. Kijne Marcel Kuper Muhammad Aslam	Mar 1995
R-3	Farmers' Perceptions on Salinity and Sodicity: A case study into farmers' knowledge of salinity and sodicity, and their strategies and practices to deal with salinity and sodicity in their farming systems	Neeltje Kielen	May 1996
R-4	Modelling the Effects of Irrigation Management on Soil Salinity and Crop Transpiration at the Field Level (M.Sc Thesis - published as Research Report)	S.M.P. Smets	June 1996
R-5	Water Distribution at the Secondary Level in the Chishtian Sub-division	M. Amin K. Tareen Khalid Mahmood Anwar Iqbal Mushtaq Khan Marcel Kuper	July 1996
R-6	Farmers Ability to Cope with Salinity and Sodicity: Farmers' perceptions, strategies and practices for dealing with salinity and sodicity in their farming systems	Neeltje Kielen	Aug 1996
R-7	Salinity and Sodicity Effects on Soils and Crops in the Chishtian Sub-Division: Documentation of a Restitution Process	Neeltje Kielen Muhammad Aslam Rafique Khan Marcel Kuper	Sept 1996
R-8	Tertiary Sub-System Management: (Workshop proceedings)	Khalid Riaz Robina Wahaj	Sept 1996
R-9	Mobilizing Social Organization Volunteers: An Initial Methodological Step Towards Establishing Effective Water Users Organization	Mehmoodul Hassan Zafar Iqbal Mirza D.J. Bandaragoda	Oct 1996
R-10	Canal Water Distribution at the Secondary Level in the Punjab, Pakistan (M.Sc Thesis published as Research Report)	Steven Visser	Oct 1996
R-11	Development of Sediment Transport Technology in Pakistan: An Annotated Bibliography	M. Hasnain Khan	Oct 1996
R-12	Modeling of Sediment Transport in Irrigation Canals of Pakistan: Examples of Application (M.Sc Thesis published as Research Report)	Gilles Belaud	Oct 1996
R-13	Methodologies for Design, Operation and Maintenance of Irrigation Canals subject to Sediment Problems: Application to Pakistan (M.Sc Thesis published as Research Report)	Alexandre Vabre	Oct 1996

Report No.	Title	Author	Year
R-14	Government Interventions in Social Organization for Water Resource Management: Experience of a Command Water Management Project in the Punjab, Pakistan	Waheed uz Zaman D.J.Bandaragoda	Oct 1996
R-15	Applying Rapid Appraisal of Agricultural Knowledge Systems (RAAKS) for Building Inter-Agency Collaboration	Derk Kuiper Mushtaq A. Khan Jos van Oostrum M. Rafique Khan Nathalie Roovers Mehmood ul Hassan	Nov 1996
R-16	Hydraulic Characteristics of Chishtian Sub-division, Fordwah Canal Division	Anwar Iqbal	Nov 1996
R-17	Hydraulic Characteristics of Irrigation Channels in the Malik Sub-Division, Sadiqia Division, Fordwah Eastern Sadiqia Irrigation and Drainage Project	Khalid Mahmood	Nov 1996
R-18	**Proceedings of National Conference on Managing Irrigation for Environmentally Sustainable Agriculture in Pakistan**	M. Badruddin Gaylord V. Skogerboe M.S. Shafique (Editors for all volumes)	Nov 1996
R-18.1	Volume-I: Inauguration and Deliberations		
R-18.2	Volume-II: Papers on the Theme: Managing Canal Operations		
R-18.3	Volume-III: Papers on the Theme: Water Management Below the Mogha		
R-18.4	Volume-IV: Papers on the Theme: Environmental Management of Irrigated Lands		
R-18.5	Volume-V: Papers on the Theme: Institutional Development		
R-19	Detailed Soil Survey of Eight Sample Watercourse Command Areas in Chishtian and Hasilpur Tehsils	Soil Survey of Pakistan IIMI-Pakistan	Nov 1996
R-20	Unsteady Flow Simulation of the Designed Pehur High-Level Canal and Proposed Remodeling of Machai and Miara Branch Canals, North West Frontier Province, Pakistan	Zaigham Habib Kobkiat Pongput Gaylord V. Skogerboe	Dec 1996
R-21	**Salinity Management Alternatives for the Rechna Doab, Punjab, Pakistan**	Gauhar Rehman Waqar A. Jehangir Abdul Rehman Muhammad Aslam Gaylord V. Skogerboe	May 1997
R-21.1	Volume One: Principal Findings and Implications for Sustainable Irrigated Agriculture		
R-21.2	Volume Two: History of Irrigated Agriculture: A Select Appraisal	Gauhar Rehman Hassan Zia Munawwar Asghar Hussain	Jan 1997
R-21.3	Volume Three: Development of Procedural and Analytical Liniks	Gauhar Rehman Muhammad Aslam Waqar A. Jehangir Abdul Rehman Asghar Hussain Nazim Ali Hassan Zia Munawwar	Jan 1997
R-21.4	Volume Four: Field Data Collection and Processing	Gauhar Rehman Muhammad Aslam Waqar A. Jehangir Mobin Ud Din Ahmed Hassan Zia Munawwar Asghar Hussain Nazim Ali Faizan Ali Samia Ali	Jan 1997
R-21.5	Volume Five: Predicting Future Tubewell Salinity Discharges	Muhammad Aslam	Jan 1997

Report No.	Title	Author	Year
R-21.6	Volume Six: Resource Use and Productivity Potential in the Irrigated Agriculture	Waqar A. Jehangir Nazim Ali	Feb 1997
R-21.7	Volume Seven: Initiative for Upscaling: Irrigation Subdivision as the Building Block	Gauhar Rehman Asghar Hussain Hassan Zia Munawwar	Apr 1997
R-21.8	Volume Eight: Options for Sustainability: Sector-Level Allocations and Investments	Abdul Rehman Gauhar Rehman Hassan Zia Munawar	Apr 1997
R-22	Salinisation, Alkalinisation and Sodification on Irrigated Areas in Pakistan: Characterisation of the geochemical and physical processes and the impact of irrigation water on these processes by the use of a hydro-geochemical model (M.Sc Thesis published as Research Report)	Nicolas Condom	March 1997
R-23	Alternative Scenarios for Improved Operations at the Main Canal Level: A Study of Fordwah Branch, Chishtian Sub-Division Using A Mathematical Flow simulation Model(M.Sc Thesis published as Research Report)	Xavier Litrico	March 1997
R-24	Surface Irrigation Methods and Practices: Field Evaluation of the Irrigation Processes for Selected Basin Irrigation Systems during Rabi 1995-96 Season	Ineke Margot Kalwij	March 1997
R-25	Organizing Water Users for Distributary Management: Preliminary Results from a Pilot Study in the Hakra 4-R Distributary of the Eastern Sadiqia Canal System of Pakistan's Punjab Province	D.J. Bandaragoda Mehmood Ul Hassan Zafar Iqbal Mirza M. Asghar Cheema Waheed uz Zaman	April 1997
R-26	Moving Towards Participatory Irrigation Management	D.J. Bandaragoda Yameen Memon	May 1997
R-27	Fluctuations in Canal Water Supplies: A Case Study	Shahid Sarwar H.M. Nafees M.S. Shafique	June 1997
R-28	Hydraulic Characteristics of Pilot Distributaries in the Mirpurkhas, Sanghar and Nawabshah Districts, Sindh, Pakistan	Bakhshal Lashari Gaylord V. Skogerboe Rubina Siddiqui	June 1997
R-29	Integration of Agricultural Commodity Markets in the South Punjab, Pakistan	Zubair Tahir	July 1997
R-30	Impact of Irrigation, Salinity and Cultural Practices on Wheat Yields in Southeastern Punjab, Pakistan	Florence Pintus	Aug 1997
R-31	Relating Farmers' Practices to Cotton Yields in Southeastern Punjab, Pakistan	P.D.B.J. Meerbach	Aug 1997
R-32	An Evaluation of Outlet Calibration Methods: A contribution to the study on Collective Action for Water Management below the Outlet, Hakra 6-R Distributary	Arjen During	Aug 1997
R-33	Farmers' use of Basin, Furrow and Bed-and-Furrow Irrigation Systems and the possibilities for traditional farmers to adopt the Bed-and-Furrow Irrigation Method.	Nanda M. Berkhout Farhat Yasmeen Rakhshanda Maqsood Ineke M. Kalwij	Sep 1997
R-34	Financial Feasibility Analysis of Operation and Maintenance Costs for Water Users Federations on three distributaries in Province of Sindh, Pakistan.	Amin Sohani	Sep 1997
R-35	Assessing the Field Irrigation Performance and Alternative Management Options for Basin Surface Irrigation Systems through Hydrodynamic Modelling.	Ineke Margot Kalwij	Oct 1997
R-36	Socio-Economic Baseline Survey for Three Pilot Distributaries in Sindh Province, Pakistan.	Yameen Memon Mehmood Ul Hassan Don Jayatissa Bandaragoda	Nov 1997

Report No.	Title	Author	Year
R-37	Socio-Economic Basline Survey for a Pilot Project on Water Users Organizations in the Hakra 4-R Distributary Command Area, Punjab.	Muhammad Asghar Cheema Zafar Iqbal Mirza Mehmood Ul Hassan Don Jayatissa Bandaragoda	Dec 1997
R-38	Baseline Survey for Farmers Organizations of Shahpur and Mirwal Small Dams, Punjab, Pakistan.	Muhammad Asghar Cheema Don Jayatissa Bandaragoda	Dec 1997
R-39	**Monitoring and Evaluation of Irrigation and Drainage Facilities for Pilot Distributaries in Sindh Province, Pakistan**		
R-39.1	Volume One: Objectives, Stakeholders, Approaches and Methodology	M.S. Shafique B.K. Lashari M. Akhtar Bhatti Gaylord V. Skogerboe	Dec 1997
R-39.2	Volume Two: Bareji Distributary, Mirpurkhas District	B.K. Lashari Waryam Balouch Ghulam Mustafa Talpur Muhammad Nadeem Asghar Ali Memon Badrul Hassan Memon M. Akhtar Bhatti M.S. Shafique Gaylord V. Skogerboe	Dec 1997
R-39.3	Volume Three: Dhoro Naro Minor, Nawabshah District	B.K. Lashari Abdul Rehman Soomro Nizamuddin Bharchoond Muneer Ahmed Mangrio Parvez Ahmed Pirzado Fateh Mohammad Mari M. Akhtar Bhatti M.S. Shafique Gaylord V. Skogerboe	Dec 1997
R-39.4	Volume Four: Heran Distributary, Sanghar District	B.K. Lashari M. Naveed Khayal Niaz Hussain Sial Abdul Majeed Ansari Abdul Jalil Ursani Ghulam Shabir Soomoro M. Ghous Laghari M. Akhtar Bhatti M.S. Shafique Gaylord V. Skogerboe	Dec 1997
R-40	**Maintenane Plans for Irrigation Facilities of Pilot Distributaties in Sindh Province, Pakistan.**		
R-40.1	Volume One: Dhoro Naro Minor, Nawabshah District	Abdul Rehman Soomro Munir Ahmed Mangrio Nizamuddin Bharchoond Fateh Muhammad Mari Parvez Ahmed Pirzado Bakhshal Lashari M. Akhtar Bhatti Gaylord V. Skogerboe	Dec 1997
R-40.2	Volume Two: Heran Distributary, Sanghar District	Abdul Majeed Ansari Niaz Hussain Sial Abdul Jalil Ursani Ghulam Shabir M. Ghous Laghari M. Naveed Khayal Bakhshal Lashari M. Akhtar Bhatti Gaylord V. Skogerboe	Dec 1997

Report No.	Title	Author	Year
R-40.3	Volume Three: Bareji Distributary, Mirpurkhas District	Asghar Ali Memon Waryam Balouch Ghulam Mustafa Talpur Muhammad Nadeem Badrul Hassan Memon Bakhshal Lashari M. Akhtar Bhatti Gaylord V. Skogerboe	Dec 1997
R-41	**Preliminary Business Plans**	Pervaiz Ahmad Pirzada Mohsin Khatri Syed Danyal Haider	Dec 1997
R-41.1	Volume One: Dhoro Naro Minor, Nawabshah District		
R-41.2	Volume Two: Bareji Distributary, Mirpurkhas District	Muhammad Nadeem Mohsin Khatri Syed Danyal Haider	Dec 1997
R-41.3	Volume Three: Heran Distributary, Sanghar District	Niaz Hussain Sial Mohsin Khatri Syed Danyal Haider	Dec 1997
R-42	Prospects of Farmer-Managed Irrigated Agriculture in the Sindh Province of Pakistan. LBOD Project Final Report	D.J. Bandaragoda Gaylord V. Skogerboe Yameen Memon	Dec 1997
R-43	Study Tour of Pakistani Pilot Project Farmer-Leaders to Nepal	Mehmood Ul Hassan Yameen Memon	Jan 1998
R-44	Self-Help Maintenance Activities by the Water Users Federation of Hakra 4-R Distributary	Waheed uz Zaman	Feb 1998
R-45	Semi-Detailed Soil Survey of Chishtian Irrigation Sub-Division	Soil Survey of Pakistan IIMI-Pakistan	Mar 1998
R-46	Tenancy and Water Management in South-Eastern Punjab, Pakistan	Annemiek Terpstra	Mar 1998
R-47	The Collaboration between the International Irrigation Management Institute and Cemagref in Pakistan: Proceeding of a one-day workshop	IIMI Cemagref	Apr 1998
R-48	Methodologies for Developing Downstream Gauge Ratings for Operating Canal Discharge Regulating Structures	Paul Willem Vehmeyer Raza-ur-Rehman Abbasi Musthaq A. Khan Abdul Hakeem Khan Gaylord V. Skogerboe	Apr 1998
R-49	Community Irrigation Systems in the Province of Balochistan	Olaf Verheijen	Apr 1998
R-50	Modelling Soil Salinity and Sodicity Processes in an Unsaturated Zone using LEACHM: A Case Study from the Chishtian Irrigation Sub-Division	M. Aslam J.C. van Dam	Apr 1998
R-51	Water Measurement Training for Subsystem Management of Hakra 4-R Distributary by the Water Users Federation	Waheed-uz-Zaman Anwar Iqbal Abdul Hamid Gaylord V. Skogerboe	May 1998
R-52	Comparison of Different Tools to Assess the Water Distribution in Secondary Canals with Ungated Outlets	Mobin ud Din Ahmad E.G. van Waijjen Marcel Kuper Steven Visser	May 1998
R-53	Sediment Behavior of Sangro Distributary, Mirpurkhas Sub-division, Sindh	Gilles Belaud Abdul Hakeem Khan Ghulam Nabi	May 1998
R-54	Evaluation of the Integrated Approach Developed in the Context of the IIMI-CEMAGREF Collaboration in Pakistan	Patrice Girin Marcel Kuper Frederic Labbe Pierre Strosser	May 1998
R-55	Development of Modified Low-cost Pitot Tube for Measuring Pump Discharges	M.S. Shafique Nisar Hussain Bukhari M. Mohsin Hafeez	June 1998

Report No.	Title	Author	Year
R-56	Institutional and Physical Determinants of Water Management Performance at the Tertiary Level: The Dynamics of Watercourse Maintenance in the Pakistan Punjab	Cris H. de Klein Robina Wahaj	June 1998
R-57	Formalization of Water Users Associations by Farmer Leaders of Hakra 4-R Distributary	Waheed uz Zaman Nasir Sultan Bilal Asghar Muhammad Amjad Kamran	July 1998
R-58	Water Balance in Dhoro Naro Minor Command Area Sindh, Pakistan	Bea Keller Gabor Jaimes	July 1998
R-59	Peroformance Assessment of the Water Regulation and Distribution in the Chishtian Sub-division at the Main and Secondary Canal Level	Zaigham Habib Marcel Kuper	July 1998