WORKING PAPER 15

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IWMI
INTERNATIONAL WATER MANAGEMENT INSTITUTE

FUTURE HARVEST
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Summary

The Nepal West Gandak Irrigation System is one of the first large-scale canal irrigation schemes in developing countries that have been handed over to farmers. The new Water User Association (WUA) also undertook innovative efforts to include women. Therefore, this scheme was selected for the present research, which examines the gendered organization of irrigated farming and identifies processes of inclusion and exclusion of women irrigators and women leaders in the committees, with the aim of formulating recommendations for gender inclusiveness of the new organization. The sample considered for this study consisted of 45 male-headed households (MHHs) and 19 *de jure* and *de facto* female-headed households (FHHs). Although irrigation is often assumed to be a male task in MHHs, women were sole irrigators in 7 percent of the MHHs and they irrigated jointly with their male kin in 36 percent of the cases. Expectedly, in FHHs this proportion was higher with 40 percent of the women being the sole irrigators. However, in absolute numbers scheme-wide, most women irrigators belong to MHHs. Systematic differences between male and female irrigators were found in various aspects of irrigation, such as field irrigation strategies, attendance at informal or formal meetings of water users, conflicts faced in accessing water, night irrigation, ethnicity-based social restrictions in carrying out maintenance work, and application of the new share system and payment of irrigation fees. Possible solutions recommended are: better water distribution arrangements, inclusion of women landowners, forms of joint membership for women farm decision makers without land titles, and more liberal participation of women in labor contributions and informal and formal fora. Such measures may also benefit both women who lease-out their land because of problems in irrigation and men who have occupations other than farming. The study also evaluated the recent initiative of the management of the WUA to appoint women members in committees at the lowest and highest tiers of the WUA. Positive impacts were that a new pool of women irrigators was tapped for leadership, a rare occurrence, and that meetings became more orderly. Problems that emerged were the recruitment procedure was not transparent, the roles of the new committee members were unclear for both men and women, and that women leaders lacked training and capacity building, also by male colleagues. Last, the study showed the 44 percent of the poorest households but none of the better-off households used canal water for purposes other than irrigation. Hence, rights to water for multiple purposes by poor men and women, who are often landless and completely excluded from the WUA, need more attention.

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We also thank the management and the farmers of the West Gandak Irrigation System for their hospitality and the precious time they spent with us. We hope that the observations we have noted in this report may contribute to the well-being of the people in the scheme.

1. INTRODUCTION

Worldwide, governments and public irrigation agencies are exploring the possibilities of the options to enhance the participation of farmers in irrigation management, strengthen their use rights and transfer responsibilities to them (Vermillion and Sagardoy 1999; Shah et al. 2000). An important aspect of the organizational design of new WUAs is their gender inclusiveness. If the new organization aims its membership to be equally open to both genders, this needs to be reflected in formal membership and leadership criteria, and also in actions that ensure both men and women can concretize their rights as members and leaders. To design new organizations that fit existing reality, more insight is also needed in women's current role in irrigated farming and their water rights, today.

This is especially relevant in Nepal, a country with a centuries-old tradition of farmer participation in irrigation, even in sites where, more recently, public schemes have been implemented. Moreover, His Majesty's Government of Nepal and the Department of Irrigation are among the most active agencies in developing countries that pursue irrigation management transfer (Parajuli and Prasad 1999). With regard to gender, several case studies have shown women's higher participation in irrigation than was often assumed (Pradhan 1989; Bruijns and Heijmans 1993; Zwarteveen and Neupane 1996). These and other studies highlight, above all, the complexities of women's water rights (Pradhan et al. 2000). Therefore, more study is needed, especially to identify the implications of reality on the ground for the newly designed WUAs. The present research addresses these gender issues and aims to assess:

- the gendered organization of irrigated agriculture and access to water by women farmers
- inclusion and exclusion processes of women farmers in the new WUA and as its members and leaders, from the lowest to the highest tiers
- similarities and differences between women and other water users who tend to be marginalized, especially poor male farmers, including tenants, taking into account that water is used for irrigation and other purposes

The study was carried out in the West Gandak Canal Irrigation System (in short: West Gandak) in the *Terai*, Nepal. This is not only one of the first large-scale agency-managed irrigation schemes in developing countries whose management has formally been handed over to new WUAs (Mishra and Molden 1996) but also one whose new managers have deployed innovative efforts to include women (Van Etten et al. 1999). Rural poverty is widespread in the Terai with 70 percent of the population living below the poverty line and each of 59 percent of the farmers cultivating holdings less than one hectare (CETS 1993).

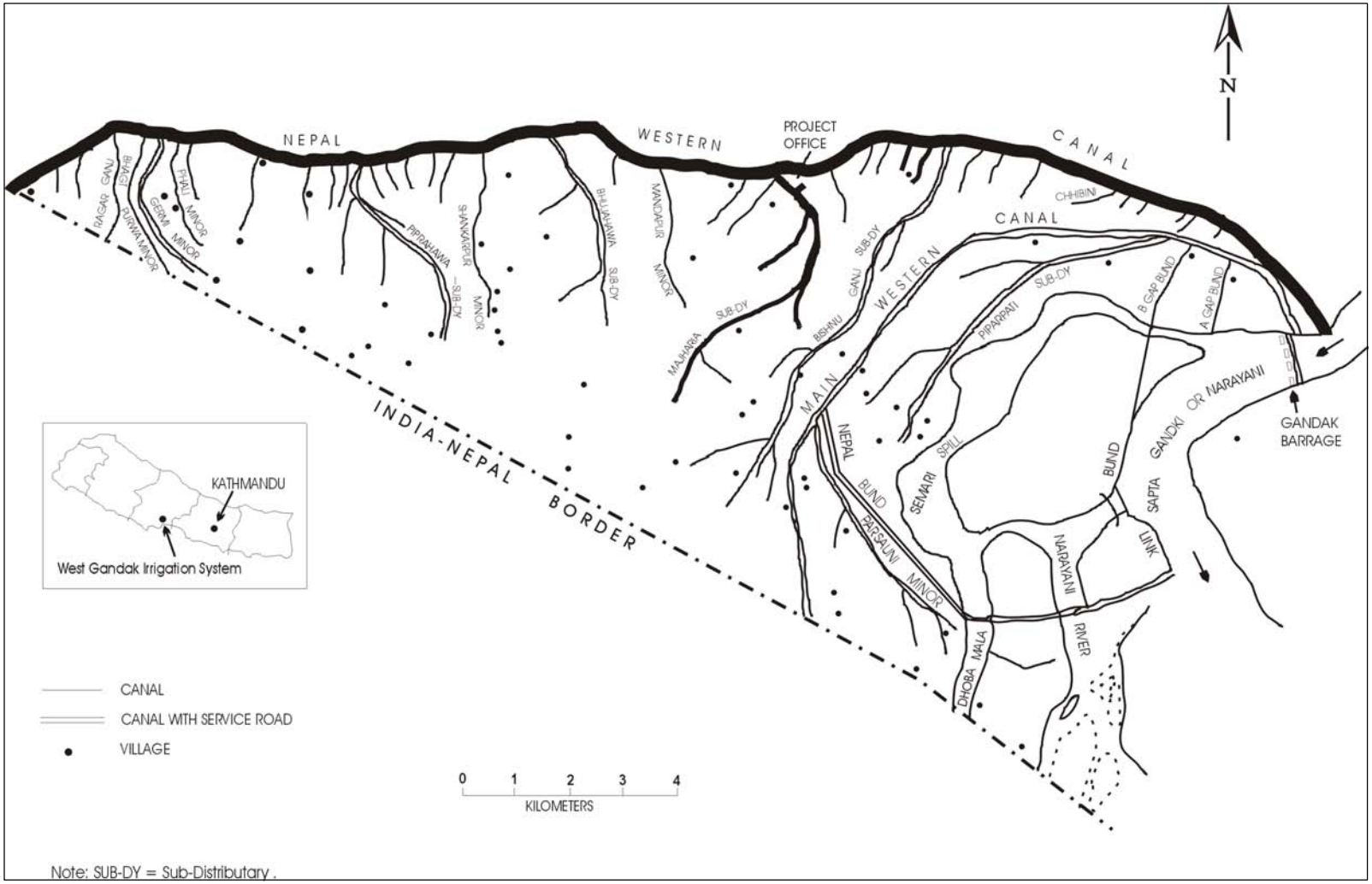
Structured surveys were conducted with male and female members[1] of 64 households. The sample purposively included, first, poor, middle, and relatively better-off farmers, second, both *de facto* and *de jure* FHHs and MHHs and, third, sharecroppers, tenants and landless cultivators,

[1]In MHHs both the wives and the male heads were interviewed. However, in some cases, women were not interested or thought they were ignorant. Some husbands also refused to allow their wives to be interviewed, claiming that they were ignorant, but wives also openly contested such claims.

besides landowners. For the study of women's inclusion in committees, both female and male committee members, at the different tiers, were interviewed. Also, the researchers participated in meetings of the Board and the General Assembly. Interviews were held with key informants, besides open interviews and group discussions. The interviews took place in 1999/2000.

The households were chosen from three tertiary and sub-tertiary canals of the West Gandak scheme (Manjharia Minor, Main Canal Course 6 and Main Canal Course 7). They are in the middle and head reach, respectively, of the scheme (see figure 1). Households were selected from the head, middle and tail reaches of the distributaries. These areas represent ethnic and caste diversity and include *Tharus* (the main original inhabitants of the Terai), the so-called *Deshis* (other people in the Terai but not Tharus, such as Hindu *Koeri, Yadav, Kohar*) and *Pahadiya* (who are migrants from the surrounding hills and mainly Brahmins).

Figure 1. West Gandak Irrigation System.



2. BACKGROUND

The Irrigation Context

The West Gandak Canal Irrigation System is located in the Nawalparasi district of the Western Development Region in the Terai, where farmer-managed irrigation has existed for along time. The scheme takes its water from the Narayani river. The government of India completed the construction of the new scheme in 1976 and handed its management, except for the head works, over to His Majesty's Government of Nepal in 1979, in particular the Department of Irrigation (DOI). The largest part of the stream is diverted to India.

The main canal has a length of 32 km. The command area is 8,700 hectares and covers 16 Village Development Committees and 14,000 households. Private groundwater irrigation is becoming more widespread.

The average size of an operational holding is 1.02 hectares. The majority of cultivators (80 percent) own the land, while another 15 percent own both land and leases-in land. Legal tenants constitute 2 percent of the cultivators. Three percent are informal tenants (GON and GEOCE 1996).[2]

The major crops cultivated, in order of importance, are paddy, wheat, sugarcane, pulses, mustard and other oilseeds, and potato. Eighty-nine percent of the farmers practice double cropping: paddy–wheat–fallow. Sugarcane is grown throughout the year, especially in the head and middle reaches (GON and GEOCE 1996). Between 1992 and 1997 the annual precipitation varied from 1,000 to 1,800 mm. Most rain falls between June and September.

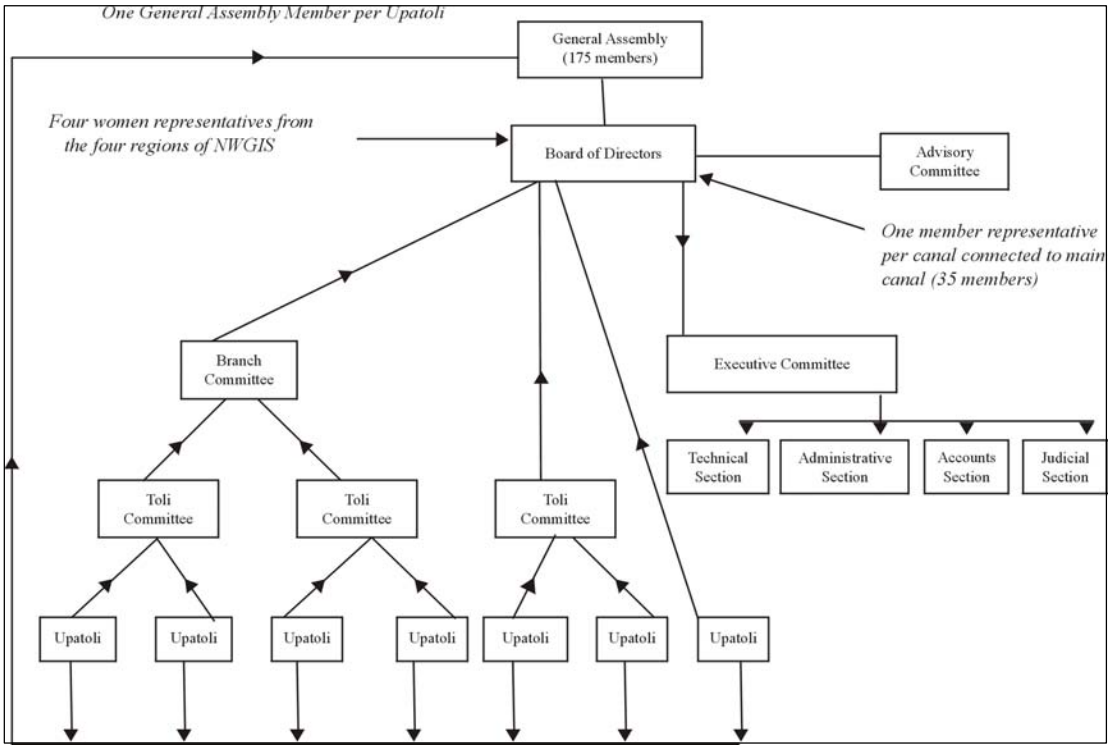
The WUA

The preparations for the organization of water went on in the Command Area Development Project (CADP) from 1982 to 1989. The Joint Management Program (JMP), which started in 1992, successfully established a WUA in 1993. Under a new Irrigation Management Transfer Program (IMTP), from 1994 onwards, users further organized themselves. On 29 November 1997, system management, except for the head works, was fully turned over to the WUA (Sijapath and Prasad 1998). On that occasion, the earlier constitution, which a group of farmers, guided by the Department of Irrigation as facilitator, had drafted, was slightly amended. In this amendment women's inclusion was explicitly stipulated. Besides a governing body, an operating structure is appointed for daily operation: the Canal Management Work Force.

[2]For example, in one-year sharecropping arrangements the sharecropper is responsible for labor for cultivation, field irrigation and canal maintenance. The crop choice and the costs for fertilizer are shared. The landowner has formal water rights and is responsible for the costs of membership shares and irrigation fees. The output is shared, after allowing the sharecropper to take out seed needed for the following season.

The structure of the three-tiered federated WUA corresponds to the branched infrastructure and the subdivision of the command area in four regions from the intake to the tail of the main canal (Sijapath and Prasad 1998) (see figure 2).

Figure 2. Organization of the WUA according to the new Constitution.



Members' Representation

? *Upatolis* (lowest tiers of the WUA) at tertiary and quaternary level Watercourses are defined according to the position of the intake (24 Main Canal Courses (MCs), 7 Special Farm Ditches (SFDs), and Main Farm Ditches (MFD). A tertiary block consists of 20 to 100 farmers.

There are 173 Upatolis at the lowest quaternary and tertiary levels, each consisting of 5-9 members, including a Chairman; a Vice-chairman; a member to represent the Upatoli in the General Assembly; a member to represent the Upatoli at the *Toli*, which is the next higher tier of the organization; and a woman. The farmers of their constituency elect committee members for periods of 4 years.

? Tolis at the secondary level.
There are seven Minors and related watercourses (19 in total) and three branches.

Toli committees consist of member representatives from the respective Upatolis and elect, among them, a Chairman, a Vice- Chairman, Secretary, and a member to represent the Toli in the next higher tier, to which the Toli is connected.

? A system-wide General Assembly representing the 173 Upatoli committees is the apex body. The General Assembly, which is held once a year, elects the Board members in the WUA for 4 years.

Governance Structure

? The Board of Directors (BOD) consists of about 35 member representatives from lower tiers, plus four women representatives from the four regions. For the post of Chairman and Vice-Chairman the 35 member representatives of the BOD and General Assembly members can be both contestants and voters.

? The Executive Committee of the BOD performs the day-to-day administrative functions of the WUA. This committee consists of five BOD members, appointed with majority consent of the BOD. One of them is the Manager and four are heads of the Judicial, Accounts, Technical and Administrative Sections. There is no representative of the Department of Irrigation any more, as in the earlier governing body.

? Four regional committees, consisting of the representatives of the four respective regions in the BOD coordinate the operation and maintenance activities within each region.

Operational Structure

? The Canal Management Work Force (in short: *Karyadal* or Work Force), is responsible for water delivery and maintenance and repair of the infrastructure at the different levels. The lowest-level Work Force also collects the Irrigation Service Fees (ISF). Work Force members are appointed to guarantee continuity of knowledge and experience for technical maintenance works within the WUA.

Water is allocated by rotation. For example, the upper sector in which the Manjharia Minor is located gets water during 3 days per week. Within the Minor it is distributed each day to one of the three groups of watercourses. Water turns generally start in the head and end at the tail. Since the handover of the scheme, some areas, such as the Minor Canal 6 command area, shifted from the earlier system of labor contributions per household to the new system of obligations proportional to land size. Poor farmers generally prefer the new system.[3]

[3]Poor farmers also mentioned risks of this rule and the need for the compliance of all, "If the big landowners have to contribute more labor, they cannot finish the work in time, so releasing water in the canal will be delayed."

Table 1. Structure of the Work Force.

Group	Responsible for	Appointed by	Remuneration
Mool Karyadal (Coordination group)	Main canal	Board of Directors	NRs 700 per month per person[a]
Tewa (Support group)	Branch canals and minors	Respective Branch And Toli Committees	no
Sewa (Service group, i.e., the lowest tier of the Work Force)	Lower-level watercourses	Respective Upatoli Committees	20% of ISF collected.

[a]In June 1999, US$1.00=NRs67.60.

3. THE FARM HOUSEHOLDS AND THEIR LIVELIHOODS

For the survey, 64 households were purposively selected to include both MHHs and FHHs and several socioeconomic classes. The main characteristics of the sample households are summarized in table 2.

Table 2. Distribution of sample households by gender of the household head and class (number and percentage).

Class	MHHs	FHHs			Total households
		de facto	*de jure*	Total	
Poor	25 (56)	10	4	14 (73)	39 (61)
Middle	14 (31)	2	1	3 (16)	17 (27)
Better-off	6 (13)	1	1	2 (11)	8 (12)
Total	45 (100)	13	6	19 (100)	64 (100)

Out of the 64 households, 31 are in Manjharia Minor, 16 in Main Canal Course 6, and 17 in Main Canal Course 7.

All *de jure* FHHs are widows without adult sons; one case of a household of a widow and her adult son is included as MHH. The *de facto* FHHs include households in which men migrate and only return occasionally, say, once a year or once every 2 to 3 years. The wives do all agricultural works and take most household decisions. In another type of FHHs, most husbands leave the home for no longer than a week or a month. However, they are not involved in agriculture, even though they return home daily, as is the case of taxi drivers.

Households were classified in poverty groups on the basis of farm size, household food security, irrigated versus rain-fed land, and off-farm income. Most households with irrigated holdings below one *bigha* (0.66 hectare) fell in the category of "poor;" between 0.66 and 1.32 hectares in the category of "middle;" and above 1.32 hectares in the category of "better-off." Information on the average holdings is given in table 3.

Table 3. Average irrigated area, rain-fed area and number of plots of sample households by category.

	Average irrigated area per household (ha)	Average rain-fed area per household (ha)	Average number of irrigated plots
Poor (n=37)[a]	0.3	0.1	2
Middle (n=17)	0.8	0.3	3
Better-off (n=8)	4.1	1.3	4

[a]Two poor households are landless bonded-laborers in a *haruwas* (a large farm household).

Sharecropping and lease are practiced in this area. Among the poor, 33 percent lease-in land. Another 8 percent lease-out their land, for reasons of, for example, age (an elder woman to her son) or to repay a debt. In the middle group, 20 percent lease-in and another 27 percent lease-out. Half of the better-off households give land in lease.

Place of Irrigated Agriculture in Livelihoods

Irrigated agriculture critically contributes to the livelihoods of the respondents' households. From the 43 male respondents in MHHs, 65 percent indicated that irrigated agriculture was the first source of income to meet family needs; 21percent mentioned it as the second source of income, and for another 14 percent the irrigated plot is the third source.

In the 19 FHHs, the importance is high as well, and only slightly less pronounced than in the MHHs. Of the women heads of households 58 percent regard the irrigated plot as the first income source, 16 percent as the second, and 26 percent as the third. Out of the other income sources, such as wage labor, rain-fed agriculture, and remittances, the latter may be relatively more substantive in *de facto* FHHs. Of the 64 households 28 also cultivate homestead lands, which are irrigated as well.

Multiple Uses of Water

As commonly observed in irrigation schemes, water of the West Gandak irrigation canals is also used for purposes other than agriculture. Bathing, washing, bathing and drinking of livestock, and fishing are reported. Due to silt, irrigation water is unfit for drinking and cooking. It was found that a higher proportion of the poor uses canal water for multiple uses (in 44% of their households), while this was only 35 percent among the middle households. None of the better-off households uses canal water for purposes other than irrigation. During the time of the survey, the WUA hardly paid any attention to the uses of water other than for irrigation.

4. THE GENDERED ORGANIZATION OF IRRIGATED AGRICULTURE

To understand the gender dimensions of irrigation, it is essential to understand the gender relations in the broader farming enterprise in which water is an input. The intra-household organization of irrigated farming was studied for a range of agricultural activities and decisions, by assessing whether they were primarily carried out by men, by women, or jointly by both men and women. The agricultural activities included in the survey were the technology-intensive tasks of ploughing, field preparation and sowing; irrigating; and, the labor-intensive, unskilled tasks of transplantation and weeding. The decisions studied were related both to the benefits of the farm (crop choice, use of the crop, use of money from sale) and to credit taking, and application of technologies like fertilizers and hiring labor.

Table 4 shows that both in MHHs and FHHs the labor-intensive task of transplanting is mainly women's chore, while weeding is also much more often done by women. In MHHs, ploughing, sowing and, to a lesser extent, irrigating, are primarily done by men. If we compare this with FHHs, we see that in the latter, women "take over," especially irrigating and, to a lesser extent, also sowing but never ploughing. Women in FHHs are almost solely engaged in weeding.

Table 4. Distribution of households by agricultural activity and gender of principal worker in MHHs and FHHs (number and, in parentheses, percentages of the total of MHHs or the total of FHHs).

Activity	MHHs (n=42[a])			FHHs (n=15[b])		
	Male	Female	Both	Male	Female	Both
Ploughing	42 (100)	0 (0)	0 (0)	15 (100)	0	0
Sowing	39 (93)	1 (2)	2 (5)	6 (40)	8 (53)	1 (7)
Irrigating	24 (57)	3 (7)	15 (36)	3 (20)	6 (40)	6 (40)
Transplanting	0 (0)	30 (71)	12 (29)	0 (0)	11 (73)	4 (27)
Weeding	3 (7)	16 (38)	23 (55)	0 (0)	12 (80)	3 (20)

[a]Out of 45 MHHs 3 households are landless.

[b]Out of 19 FHHs 4 households gave the land for sharecropping.

There is an exceptional case where three women are the main irrigators in MHHs "because the field is adjacent to the canal and near the house" and because "men are busy in other works." The women who jointly irrigate with their husbands said they did this either temporarily when men were out but that they usually irrigated together, for example if one needed to guard the water from being stolen upstream. In FHHs, the women who are the main irrigators have no male members in their households who could irrigate. If young sons are around, they help, or sharecroppers do the job jointly or by themselves.

This finding implies that irrigating is not the exclusively male task as sometimes perceived. Even in MHHs, women can be the sole irrigators (7%). More often, in 36 percent of the MHHs, women irrigate together with their husbands. In FHHs, the pattern is different: households with

men as sole irrigators are in the minority of 20 percent. In the other 80 percent of the FHHs, women irrigate either alone or jointly with men. So while irrigation is rather a male task in MHHs, it becomes a predominantly female task in FHHs unlike, for example, in the case of the typical male technology-related task of ploughing.

Although women in MHHs contribute labor, their role in decision making remains limited. This is different in FHHs. The higher involvement in other agricultural tasks is accompanied by a stronger say in decision making, as shown in table 5.

Table 5. Distribution of households by agricultural decision and gender of principal decision maker in MHHs and FHHs (number and, in parenthesis, percentages of the total of MHHs or the total of FHHs with valid values).

Decision	MHHs (n=42[a])			FHHs (n=15[b])		
	Male	Female	Both	Male	Female	Both
What to grow	19 (45)	2 (5)	21 (50)	2 (13)	10 (67)	3 (20)
Sell harvest [c]	12 (52)	1 (4)	10 (43)	1 (13)	4 (50)	3 (37)
Spend money [c]	12 (52)	1 (4)	10 (43)	1 (13)	4 (50)	3 (37)
Use fertilizer	34 (81)	0 (0)	8 (19)	0 (0)	12 (80)	3 (20)
Obtain credit [d]	9 (69)	0 (0)	4 (31)	1 (33)	2 (67)	0 (0)
Hire labor [e]	16 (44)	0 (0)	20 (56)	0 (0)	6 (67)	3 (33)

[a]Out of 45 MHHs 3 households are landless.

[b]Out of 19 FHHs 4 households give land for sharecropping.

[c]26 households do not sell the harvest.

[d]41 households do not obtain credit.

[e]12 households do not hire labor.

In half or more of the MHHs, men take most agricultural decisions alone. In less than half of the households and for most decisions, men and women take decisions jointly. There are hardly any women, who take any decision by themselves in MHHs, except in two cases (5%) of a mother of the respondents. In FHHs the situation is diametrically opposite, where in half or more of the households the women are the only decision makers. In considerably less than half of the households they decides jointly with male relatives, like adult sons or fathers-in-law. The rare cases where men alone took decisions in FHHs were a husband in one *de facto* FHH and a son in a *de jure* FHH.

In the foregoing, women's and men's roles in irrigated farming were analyzed by task and decision. Taking these elements together for each household, various types of farm households can be distinguished.

Table 6 shows that, as expected, farms that are exclusively managed and operated by women are found only among FHHs. However—and this is often ignored—in about half of the FHHs both men and women are involved in labor and decision making. In 27 percent of the MHHs women are merely unpaid family laborers.

Table 6. Distribution of types of farm household by gender of the household head.

Types of farm households	MHHs	FHHs	Total
Women contribute all labor and take all decisions	0 (0)	8 (53)	8 (15)
Women contribute labor and share at least in some decisions with male relatives	27 (73)	6 (40)	33 (64)
Women contribute labor but do not take decisions	10 (27)	1 (7)	11 (21)
Total number of households	37 (100)	15[a] (100)	52 (100)

[a]Out of 19 FHHs, 4 households gave land for sharecropping and are not taken into consideration here.

To conclude, irrigated farming in the West Gandak Irrigation System depends on both men and women. In MHHs, men's roles are more substantive. In 27 percent of the cases, women's contribution is limited to labor provision only. However, in all other cases men and women share in decision making. Women contribute to irrigation in 36 percent of the MHHs, while in another 7 percent women are the only persons in the household to irrigate. FHHs depend much more strongly (but not exclusively) on women's inputs, both as decision makers and irrigators (in 80% of the households). Although FHHs still constitute a small minority of all households in the area, this may become more important when male emigration expands further. Therefore, it is important that the scheme management and support agencies know whether the water needs of these women irrigators are met and whether and how they are included or excluded in the WUA. This is explored in the following sections.

5. GENDER ASPECTS OF LOCAL-LEVEL WATER DISTRIBUTION

As in any gravity irrigation scheme, the site-specific water distribution primarily depends on the water supplies at the intakes of the lower-level watercourses, and the volumes of water reaching the tail ends. Serious water scarcity was reported in the tail end of the Manjharia Minor Canal, by men and women, poor and better-off farmers. In some other areas, especially in the tails, water was reportedly only sufficient if the nights were also used to irrigate (or "steal water"). Moreover, blocking of canals to raise water levels to the higher-lying fields, another kind of so-called "stealing," was reportedly needed as well. Other problems were found in the fields without a direct intake from the watercourse, which, hence, depended upon the irrigation of the higher fields.

The establishment of the new WUA with its Work Force and Upatoli committees was accompanied by efforts to improve water distribution. For example, it was tried to institutionalize water distribution and abolish water theft whenever the canals were filled. Instead, regular and sequential turns were introduced. Incidentally, these turns even started in the tail ends rather than the head. The appointment of locally recruited, paid gatekeepers of the Work Force also led to better water distribution, as noticed in the Manjharia Minor Canal.

The first level for the study of inclusion and exclusion in water distribution is at the farm level, where rights are concretized. Both men and women in the sample encountered the general range of water distribution problems, but some poor people felt that class inequities compounded these problems, and they complained that "might is right" prevails in water distribution. Gender-inequities were also found to exacerbate the general problems. One often-cited problem is night irrigation, which is generally claimed to be especially troublesome for women because they are not supposed to go out at night to irrigate, to guard irrigation or to attend preparatory meetings of informal groups of male irrigators who together prepare for "stealing water." Women who do not irrigate reported this as an explanation. However, among the respondents, several women heads of households and women assisting their male kin were actually involved in night irrigation, for example in blocking of canals. Apparently, there is a gap between norms and reality. A poor 70 year-old widow at the tail end, who is the female member of the Upatoli, explained:

> *The watercourse from which our fields get water for irrigation is at a higher level, so we have to make a small dam in the distributary before it can flow into our watercourse. Nobody makes that dam, so my grandsons have to construct the dam. Every time I go to the office of the WUA for approval and to neighboring villages to negotiate business our watercourse gets water. When our watercourse gets water, I am the first to irrigate, but other people steal water even before I finish my work. That is why I have to guard water even at nights. But after becoming a member of the Upatoli I have no longer faced this problem.*

The study of women's perceptions revealed that, especially for a number of respondents, gender and class inequities are clearly dimensions that add to the existing problems. The following is such an example:

My plots are at the tail end and it is difficult to get irrigation service. When I start irrigating, the people at the head reach block water and refuse to give my water turn. I sometimes ask the Work Force member who tells us to irrigate with mutual understanding. I requested him twice and he came to help me. He told the others not to take water. Anyway I have to irrigate my neighbor's field before my fields because my fields do not have direct access to the watercourse. Sometimes, I have to fight with him also. He underestimates me because I am a woman.

Another poor woman also referred to women's weaker position as follows:

If male farmers have taken a water turn of a woman it is difficult for her to win the battle. For example, the other farmer will admit immediately that he is wrong but he will not change his practice.

Another poor woman explained her informal, time-consuming strategy as follows:

Our holding is very small, so when I see that other farmers are irrigating, I come to irrigate ours. However, other farmers give me the water turn only when all have finished, because I am poor.

A woman from an MHH who failed to contest said:

Once my brother-in-law was irrigating his fields and after him, the turn was mine, but when I went to irrigate my plot, another person was taking water. So, I returned home that day and irrigated my plot only the following day.

A poor woman who is the *de facto* head of her household said:

There is a conflict of interests between a person who owns 0.67 ha of land and myself. He diverts the irrigation water while I irrigate my field. He usually says, "you need only a bit of water so I will irrigate first." My land is at a higher level than the canal so we have to block water somewhere in the canal to lift water for irrigating my plot. He blocks the water to my plot and takes the water to his fields. He can wait for some time, because I do not need much water, but he does not do that. He dominates us because we are poor.

A quantitative comparison between women's and men's strategies in obtaining water also showed differences between men and women. Among men in MHHs 57 percent mentioned contacts with the Work Force as an important strategy to get water, and only 43 percent either just took water or arranged this among neighboring farmers. In FHHs, however, this was the reverse: 73 percent of them pursued the more informal and risky latter strategy.

The second level at which inclusion and exclusion processes are manifest is in the participation in informal and formal meetings. Attendance rates of both informal and formal fora to discuss water issues were skewed indeed. While 44 percent of poor men and 50 percent of middle- and better-off male farmers participated in such fora, none of the women did. Women are not informed or invited. “It is no practice for women” to attend either informal meetings, like those held at public places of the village at night or formal Upatoli meetings. Even if women are invited and are interested in attending meetings, their husbands may object to their participation. This was the case with a wife of a migrant who wanted to become a member, but when her husband heard this, he said he would not let her go as “there is no use of females in the WUA.” Another woman, who once went to another women’s meeting, was later scolded by her husband “for walking around when the goats here are hungry.” Women are disappointed about this resistance: “If I had got the chance to become a member I would have got a good irrigation service to my plot.”

In sum, women face specific problems in watering their fields. This is related to the fact that they especially lack access to the informal and formal fora in which water distribution is discussed and arranged. This leaves women irrigators, more than men, with the risky informal arrangements. The new Upatoli meetings and committees have not improved as yet, as they are still open mainly to men. The one woman Upatoli member who negotiates with the scheme management for water for her land is clearly an exception this pattern of activities.

These findings suggest that better insight is needed and action warranted, with regard to women irrigators’ relatively graver problems to obtain water, norms against night irrigation and strategies to cope with that, and especially with regard to women’s inclusion in informal networks and Upatoli member organizations. This also raises the issue of women’s formal membership criteria and their opportunities to fulfill obligations. The following section focuses, in detail, on these further components of the new WUAs: cash and labor contributions and their gender dimensions.

6. SHARES, FEES AND MAINTENANCE OBLIGATIONS

Shares

One new element of the WUA is the share system. Shares give rights to water and to membership of the WUA, including the rights to vote and to contest for positions in the committee. At the same time, shares imply the obligation to pay the ISF and to contribute to canal maintenance. The number of shares required depends on the holding size. One share is equivalent to one *kattha* (0.033 ha) of land. Costs are nominal, only NRs 1.00. Shares are only given to landowners within the command area of the West Gandak scheme or, strictly speaking, to those who show a landownership certificate. The distribution of shares and collection of ISF is the task of the sewa. In 1997, when the scheme was handed over, about one third of the shares had already been distributed to about 4,000 landowners (Poudel 1997).

Although landownership was the formal criterion for allocation of shares it was not equally applied for men and women landowners. This followed from an analysis of 17 of the 64 sample households in which women owned all household land (6 cases) or in which women owned some of the plots, while the husbands owned other household plots (11 cases). Table 7 shows that even if women are landowners shares are often only registered in men's names.

Table 7. Registration of shares, by gender, in households with women landowners.

Landownership	In name of woman	Jointly with wife and husband	In name of male kin	No share	Total
In MHHs, some plots are registered in women's names and others in men's names.	0	2	7	1	10
In FHHs, six have sole landownership; one FHH has plots in both names.	3	0	2	2	7 (6 *de jure*)

One (better-off) woman *de jure* head of a household has land in her name while the water share had been registered in the name of her father-in-law. But it had not been transferred to her after his death. Another widow has land in her name but the share had been written in the name of her 10-year old grandson who was considered to be the head of the household. On the other hand, one of the other widows had already got the share in her name, although the land, inherited from her husband had still to be transferred to her name after his death.

A poor *de jure* female head of a household who is a landowner has no share and had not heard about shares as nobody had told her about them. Only those women who were better-off, who had been included in the local-level networks, had received their shares. The women landowners with shares in their own names are either members of the Upatoli or active irrigators or are closely related to, or neighbors of, the Work Force members.

Several *de facto* FHHs, with land in men's names, were also overlooked in the distribution of shares. It was only in six of these *de facto* FHHs that shares had been obtained and registered

in their husbands' names. Either the husbands purchased when they were around or a Work Force member who was a neighbor or "a sincere person" approached the women. On the other hand, seven *de facto* female heads had neither received shares as yet nor even heard of them. They complained that committee members were reluctant to visit them and that they were not informed about many things because there were no adult males in their households. Poor farm households were also generally more often ignored in the share distribution compared to the middle- and better-off farm households. While 96 percent of the latter had obtained shares only 54 percent of the poor farmers had received them. One poor farmer highlighted the practicalities, "When I tried to pay for the share to the Work Force member, he was busy with personal work. I did not go back after that and he did not come to me either to collect the money."

A Work Force member responsible for the distribution of shares in Manjharia Minor Canal justified why he preferred to first approach larger farmers. He said many shares could be sold to them at once rather than to farmers with only 1–2 katthas of land or to FHHs whose husbands were absent.

Irrigation Service Fees (ISF)

In the new WUA users are obliged to pay an ISF at the end of each season. The rate is NRs 60 per irrigated hectare of paddy. Similar problems as for the shares were found. Only 42 percent of the FHHs had paid, versus 71 percent of the MHHs. In these MHHs, wives were aware of this payment in 45 percent of the cases. Women in the FHHs, who had not paid, asserted that nobody had come and asked them to pay.

Unlike for the distribution of shares, a comparison of payment of the ISF by class group shows hardly any difference. Sixty-four percent of poor households and 68 percent of the middle- and better-off households paid the ISF. A problem among the better-off was that, often, the Work Force member did not know the precise size of their land so that, often, neither the number of shares nor the amount of ISF corresponds to the farm size. Again, poor households that had not paid often did not know about the rules. A tail-end farmer in the Manjharia Minor Canal adduced quite q different reason for nonpayment: "Head reach people divert all water. In our village only one-third of the people get water. People irrigate at night and fight for water. Only violence is left now. Our people say that if anybody came to collect ISF, they would slap him." The tail enders hardly ever participated in maintenance works either. This conflict led the Upatoli committee members to enter their houses and take away utensils, both in MHHs and FHHs.

At this stage, respondents had no clear notions of the implications of a "share" or what was done with the ISF. Whether there will be feasible sanctions to cut water provision in case of non-purchase of shares and nonpayment of fees is doubtful. "Water just flows. One can take it even during the night."

The main implication, then, of the policy to allocate shares only to landowners and the limited inclusion of FHHs in share distribution and ISF collection is the following: Out of 19 women heads of households most of whom irrigates and manages the farm, only 3 women have shares in their own names, and only 6 in their husbands' names. Less than half paid the ISF. A

similar bias is reflected in the relatively low proportion of poor farmers with shares and the misfit between large farmers' farm size, the number of shares and the amount of ISF. The policy implications are twofold. First, a better implementation of current regulations could avoid the gender and class biases. Second, for those women who are farm decision makers but do not own the land they cultivate, new forms of joint membership or individual membership may be warranted. Apparently, the indirect rights that they might derive from their husbands' rights to accessing water and membership of the WUA, do not provide a sufficient basis in irrigation and organization practice to acquire water and fulfill payment obligations as required.

Maintenance Obligations

Canal maintenance work is gendered. In Pahadiya households, women are involved in maintenance work. They also do maintenance work in MHHs where there are no young and capable men available. However, among the Tharus and Deshis, women are socially restricted from doing maintenance work. Once a woman head of a household in the Tharu community tried to take up maintenance work herself. But she stopped because people laughed at her. Other women still refer to this incident, expressing that they do not want to be treated like her. Nevertheless, all recognize that, if there are no men available at home, women are compelled to hire laborers or pay fines if they cannot do so themselves. This is especially a problem among the poor who cannot afford such cash expenditures. Giving the land for sharecropping is a way for women to avoid this problem (although it is unprofitable), as the sharecroppers fulfill these obligations. This coping strategy is also reported in other schemes in Nepal like the Chhattis Mauja scheme (Zwarteveen and Neupane 1996). In the Rajapur irrigated area, women have to pay exorbitantly high water fees because they are not supposed to work in canal construction and maintenance (Pun 2000).

An exceptional case is where the *de jure* head of a Deshi household and Upatoli member joined maintenance work last year. She hoped that if she, as an Upatoli member, participated in maintenance work other users would think good of her action. However, as she is old, she did not clean the canal but supervised the people.

In sum, women irrigators face gender-based problems that the following actions may resolve:

- Strengthen women's water rights and ability to concretize those, by better general institutional arrangements and also with regard to night irrigation.
- Stimulate women's participation in informal fora and WUAs.
- Design forms of joint WUA membership for those women who are farm decision makers but who do not own the land they cultivate.
- Implement share distribution and fee payment to include women landowners and husbands of *de facto* female heads of households or their wives.
- Challenge social restrictions and make it easier for non-Phadiya women to participate in maintenance work.

Changes in these directions could also encourage women, who now lease-out their land, to take up farming themselves and earn a better income. Husbands of women irrigators with off-farm employment, or sons still attending schools, could also gain if their female kin became less dependent on their regular presence (Pun 2000). Last, if water distribution is better institutionalized many more farmers will be benefited.

7. WOMEN LEADERS IN THE WUA

Women's Inclusion in Upatoli Committees and Board of Directors

The new farmer managers of the WUA and the Department of Irrigation and collaborators under the Irrigation Management Transfer Project (IMPT) pioneered innovative ways to better include women in the new association. Policy intentions for better inclusion date from the Irrigation Policy of 1992 in which it is recommended that "there should be at least 20 percent female users in all the executive units of the new WUA." The IMTP (1995) also envisaged a range of practical measures to promote the participation of women in WUAs and in project activities, including gender awareness training and capacity building. In 1997, the constitutional amendment for the West Gandak WUA, stipulated the following concretely:

- Women shall participate in Upatolis by obligatorily electing one woman and by nominating another woman when the Upatoli is formed.
- The members of the Board of Directors shall nominate one woman representative from each of the four regions. The majority of the respective regions shall nominate women representatives.

This amendment was implemented in the third round of elections in the WUA, which took place in 1997. The management requested the Upatoli committees, through their Chairmen, to select women, who were also offered a training course. The values in table 8 show a sharp increase in the number of women members in the lowest tiers of the WUA from less than 2 percent in 1995 to 12 percent in 1997/1998. There is now a woman member in each of the 145 (84%) of the 173 Upatolis.

Table 8. Number of total members and women elected in the three elections of the WUA.

		Number of Members Elected					
		First Election, 1993		Second Election, 1995		Third Election, 1997/8	
Bodies: names and number		Total	# female members	Total	# female members	Total	# female members
General Assembly	1	155	3	171	3	173	2
Board of Directors	1	-	-	-	-	40	4
Branch Committee	3	39	0	40		44	0
Toli	19	83	1	95	2	98	0
Upatoli	173	1,143	7	1,268	23	1,179	145

Source: IAAS and RTDB, 1998/1999.

Women started to participate in the Work Force as well (see table 9). All these women were trained by the IMTP.

Table 9. Number of total members and women in the Work Force.

Level of the Work Force	Number of Members	
	Total	Women
Mool Karyadal (Main Canal)	5	0
Tewa (Branch Canal and Minors)	52	5
Sewa (Lower-level watercourses)	152	5
Total	209	10

Source: IAAS and RTDB 1998/1999.

Interviews were held with 13 women members in the Upatolis and in the Board of Directors, and with 17 of their male colleagues. Above all, it is evident that the new gender activities in the West Gandak Irrigation System have brought new ideas and potentials to the surface that are not only beneficial for women but also for men in the WUA.

Advantages of Women's Recruitment

First, dynamic and competent women leaders were enabled to deploy their talents for the benefit of the WUAs. It would have been impossible for them to obtain those seats if the normal election procedures were applied. However, once they had proven their capabilities, as in Minor Canal Course 3, fellow committee members elected these women, according to the normal procedures, as the Chairpersons of the committees. Besides the general advantage of a larger pool of talented leaders to tap, several specific advantages of women leaders were recognized as well.

Several men were of the following opinion:

If women participate in meetings, the meeting is more disciplined and goes more quietly.

The latter is also reflected in what several female Committee Members expressed as a main obstacle for their participation:

The committee meeting was called at 10 a.m. but started at 3 p.p. Male members do not come early. They can go back even at late night; that is why they do not bother to come in time and finish the meeting in time. For us it is very problematic. We have to go back early because we have to cook for the family and it is not very good or safe to walk at night.

Several men were of the following opinion:

It is easier for female office bearers to influence the behavior of other women. For example, women dry dung cakes in the canal bed and they use the clay of the canal bed to make pots, which makes the canal shape irregular. Women office bearers can better talk with women about this than men. Only women can understand women.

Another man's opinion was as follows:

Women give a good example. If women participate in cleaning and maintenance, men cannot refuse. Even if women collect the ISF or ask to participate in maintenance work, it is difficult for men to withdraw.

Most women appreciated their new membership. It satisfied their "hunger" for information and contacts with the outer world. Opportunities for exposure visits to other schemes were actively pursued, and training was appreciated.

Moreover, it helped them to gain respect in water distribution affairs.

Before I got in the committee, my neighbors used to take her water and, therefore, I was obliged to guard, but after I got this position, people do not dare to do so anymore.

The new example introduced by the management of the WUA fundamentally challenged notions of women's inferiority or their exclusion from irrigation affairs. It put into practice, for the first time in history, what quite some men and women believed.

There is no work nowadays that women cannot do. The main thing is ability and interest to work.

It is noteworthy that the recruitment process succeeded relatively well in finding and appointing women irrigators, even though they are a minority among all women, as we saw above. In newly created WUAs elsewhere, like Chhattis Mauja in Nepal (Zwarteveen and Neupane 1996) or Andhra Pradesh, India (Shyamala and Rao 1999), politics or husbands often play a strong role, which ultimately hamper the credibility of women as competent representatives of water users. In West Gandak, 6 of the 13 women committee members interviewed are the main irrigators in their households and 5 others share in decision making while their male relatives irrigate. These eleven women were selected even though most did not have water shares in their names. In some Upatolis, husbands wrote letters of consent that their wives could use their shares. Apparently, women's roles in irrigation were easily recognized on the basis of reality rather than of formal land rights. This experience may entail fruitful lessons in designing forms of joint membership in general, also for normal members.

In future elections, women's active involvement and interest in irrigation can be a more explicit selection criterion. Further, it would enhance the credibility if the recruitment process were more transparent. Out of the 13 women interviewed 5 were either kin or had political affiliations with the persons who came to request them for certain positions, including 2 women who were not involved in agriculture at all. Only six women had earlier organizational experience and are relatively well educated (above Grade VII). Of these, four women were health trainers or were involved in adult education. "Casting the net wider" could better ensure that the most competent are recruited in the future, for example, by widely announcing that women are requested to become members of the Upatolis and contest for seats. Wider support and legitimacy for women committee members would probably also mitigate male resistance against working under women, such as when a Working Force member complained about the women board members "I am not her servant." Last, more transparency during the procedure and thereafter would prevent criticism encountered in villages, as expressed by one farmer respondent.

I know there is a post for a woman member in the Upatoli committee, but I do not know who is ours. I think it is Mrs. X, because her husband is working in the new WUA and she has received some training, but this lady does not like to let others know where she is going.

Clarification of Roles

A second point also became clear in the interviews, which is at least as important as improving the recruitment procedures. That is to clarify women's roles. Four women (out of 13) said that they had no idea what their function implied, while other women could indicate some tasks but expressed the wish to be better informed. Other women wondered whether some men wanted to work with women at all. Reportedly, women did not even know if they were really invited for every meeting.

Once the committee held a meeting but I was not invited. Later I asked the chairman why I was not called. He replied that the issue was not very big and important. "That's why we did not call you. Women were not needed for that meeting".

Men also expressed confusion about women's roles, and a few men even doubted whether there is any role at all.

How can a woman be a functionary if she cannot go out at night?
Women do not have the strength to do gate operating works.
Women do not have time.
I do not like women in the WUA. If women become active they would dominate men.
Women do not know about canal management and irrigation. Women have nothing to do in the WUA.

It seems it is necessary to better stipulate what the tasks of the newly recruited women committee members are, and how that serves the interests of both men and women in West Gandak. Women could more or less perform the same tasks as men. But they could also focus on specific issues of women as irrigators, for example, conduct discussions at field level to understand women's roles in irrigation better and propose improvements. This would challenge stereotypic thinking that irrigation is exclusively a male affair. Solutions may well entail the broad array of issues that women farmers need to overcome, from land tenure to labor mobilization and marketing. Another option is that women, and men as well, specifically focus on multiple uses of water. This research also showed that irrigation water is used for bathing, fishing, and livestock and definitely contributes to people's livelihoods, especially among the poorest. At the time of the interview, the WUA management saw multiple water uses mainly as an evil that should be curtailed. However, a better understanding of multiple water needs, and possibilities for canal water to serve more purposes simultaneously could considerably improve the credibility and acceptance of the WUA, and better ensure that basic hygienic and incomes needs, especially among the poorest segments of society, are met.

Capacity Building

A third need, besides wider and more transparent recruitment and better articulation of women's and men's roles in the overall WUA, is to improve training and capacity building. Several women mentioned education and specific training in irrigation to be important to perform well as committee members. The interviews also revealed that opportunities to give women "on-the-job training" were sometimes forfeited. Some women felt that their male counterparts purposively kept relevant information, such as the constitution, away from them. The WUA of West Gandak can considerably foster women's inclusion in committees by better informing and training them instead of discouraging them from looking for information or from taking the floor. This would considerably enhance women's ability to function.

This early evaluation of the pioneering efforts in the new WUA of West Gandak to include women in Upatolis and in the Board of Directors shows that the important new potential of women committed to the WUA has begun to be tapped, for the first time in history. Symbolically, it challenged stereotypes that do not open up new thinking about a better inclusion of the other half of the people living from the irrigation scheme. Issues such as the lack of discipline in meetings are surfaced with women's participation, but men realize that they would gain as well. Ensuring that both men and women irrigators have good access to water and can equally function as members is also advantageous for other irrigators and could improve their functioning as well. If issues like multiple water uses were addressed, the scheme as a whole, and especially the poor, would gain as a whole as well. Therefore, it is even more necessary that solutions are found for the three main obstacles that emerged in this study: wide and transparent recruitment procedures with credible selection criteria, clarity about women's and men's roles in the committees, and capacity building of new women (and men) members.

8. CONCLUSIONS AND RECOMMENDATIONS

Women Irrigators

Women irrigators in the West Gandak Irrigation System are a small but hitherto rather neglected group. Their proportions are highest in *de jure* and *de facto* FHHs, with women's roles as sole or joint farm decision makers (93%) and irrigators (80%). The proportion of *de facto* FHHs in the canal command area may further increase when men find more rewarding off-farm jobs. However, women irrigators also prevail in MHHs, which are much more numerous. Seven percent of the women are the sole irrigators and another 36 percent are joint irrigators.

Women irrigators face specific problems when considered as a gender.

- Being disregarded, especially as poor women who compound the problems in field irrigation that men face as well.
- Women are generally excluded from informal and formal fora in which rules and practices about water distribution are set and implemented. They are also excluded from the meetings of the new Upatolis and contacts with the Work Force. Women rely more often on "just taking water" and "arranging among farmers" (73%) compared to men (43%) who prefer passing through the Work Force.
- Sometimes, shares are registered in men's names even if women are the sole landowners or own part of the family's plots.
- Households with husbands who own land but are absent are more often overlooked than MHHs, leaving their wives who farm without shares
- Women in FHHs are less often approached to pay their ISF (42%) than men in MHHs (71%).
- Tharu and Deshi women face social taboos against women participating in maintenance work, which forces them to spend money on laborers or fines.

The WUA could remedy these problems by:

- Ensuring more reliable and regular water distribution arrangements for all, also benefiting the men, and exploring solutions for night irrigation, if needed.
- Implementing the regulations of shares and fees as intended, by better including women landowners (who already are the right holders) and also including female farm decision makers without land titles in both MHHs and FHHs (for whom new forms of joint membership have to be developed, and who could use the lessons learnt from experience by the committee members).
- Actively inviting women for meetings, stimulating them to speak up, and creating awareness among women and their husbands, and other farmers about the need to extend membership and attendance to all.
- Redesigning labor obligations and ensuring that they are equally open to male and female irrigators.

These measures are not only advantageous for women irrigators but also for their male kin who now assist women but have other occupations, and for women who have given their land for sharecropping, because of the problems they face as irrigators.

Women Leaders

The normal appointment and election procedures from the lowest to the highest tiers in the WUAs probably constitute insurmountable obstacles for women irrigators. Therefore, the management promoted "from the top" the appointment of women members in Upatolis and the Board of Directors. This challenged stereotypic thinking about irrigation as a male affair. New competent leaders—even though in rare cases as yet—came forward and new issues in the interest of all were brought up, such as the long duration of meetings of men only. However, the roles of the new women leaders are still very unclear both for women and men. Relatively high proportions of the women leaders irrigate by themselves so they could play similar roles as male leaders. Moreover, they could catalyze the inclusion of other female irrigators. Women committee leaders could also build upon expectations by addressing women's use of canals for other purposes and, thus, liaise between all women and the WUA. In fact, inclusion of all nonirrigation water uses by both men and women is needed, especially to alleviate poverty.

A wide and transparent recruitment process enhances the credibility of both the women leaders themselves and the committees in which they function. Training and capacity building, especially by male colleagues, constitute another absolute condition to render the unique approach for gender inclusiveness in West Gandak to be sustainable and fruitful. If this succeeds, the experiences in West Gandak might well serve as the best gender practice for the many new WUAs that are created in Nepal and elsewhere in male farming systems.

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