

# INSTITUTION BUILDING AND RURAL DEVELOPMENT IN NEPAL: GADKHAR WATER USERS COMMITTEE

Upendra Gautam<sup>1</sup>

## INTRODUCTION

Building institutions in rural areas has become an important task for development projects undertaken by the government. The idea **is** that without decisive involvement, neither the benefactors nor the beneficiaries can fully identify with a project and donated resources will not be utilized effectively.

The government has now developed "users' committees" at the rural project level to increase the involvement of the beneficiaries. Formation of these committees is consistent with the Decentralization Act of 1982, which states that enlisting maximum participation from the local people in managing scarce resources and equitably distributing the fruits of development would promote the welfare of the whole population. The Act specifically provides for users' committees in Clause 19. Clauses 35 and 85 of the Decentralization Regulations laid down in 1984 stipulate that the committees would be responsible for the operation and maintenance of rural projects and for the collection of taxes levied on services delivered by the project. This would institutionalize a pattern of self-reliance in the rural development process.

## FOCUS OF THE STUDY

Documentation is needed in the areas which have begun to build institutions to monitor ongoing projects, and it is the purpose of this paper to record part of this process.

The study focuses on the Gadkhar Irrigation Project Water **Users** Committee (WUC). It assesses the Committee's capacity for: 1) maintaining harmonious plural memberships; 2) distributive equality across command units; and 3) sustaining the irrigation system.

The Users Committee is jointly managed by panchas (elected officials of local government agencies), public personnel, and users' representatives. There is a complex mix of political, bureaucratic, and socioeconomic influences in the organization which manages the physical structures. These diverse interests influence water allocation and distribution and the irrigation users' behavior.

## OBJECTIVES OF THE STUDY

The major objectives of the study are to:

1. Examine relationships among the users' representatives, panchas, and public personnel involved in **the** Users' Committee, and the effect of these relationships on their ability to carry out the tasks required;

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<sup>1</sup> Upendra Gautam is a Lecturer on the Public Administration Campus, Tribhuvan University, Kathmandu, Nepal. He is currently working with the Irrigation Management Project **as** an institutional development consultant.

2. Assess the capacity of the command units in terms of their accessibility and the extent of the Committee's ability to distribute irrigation resources equitably;

3. Identify the relationship between the status of the system and the Committee's ability to meet the system's maintenance requirements.

## METHODOLOGY

Comparative analysis was used on information primarily gathered from organizational groups. Three groups were identified to meet the first objective of the study: the users' representatives, panchas, and public personnel involved in the Committee. The first group was categorized into classes in terms of land holding, ethnic group, and location status. Panchas were divided into incumbents and landholders. The public personnel were from agricultural and irrigation sectors.

To meet the second objective, the general users were taken as the reference group. They were organized into command units in terms of each unit's access to the irrigation facilities: head, middle, and tail.

For the third objective, attitudes of members of organizational groups towards resource mobilization to operate and maintain the system were identified. Information was sought on the formal (government) and informal (users) systems of operation and investment management. Members' attitudes towards public property, sanctions, and awareness of the status of the system vis-a-vis their values and expectations were ascertained.

The study was mainly empirical. All the members of the Water Users' Committee (WUC), 20 percent of households in the command area (20 households each in the head, middle, and tail units of the command, chosen at random from lists obtained from the Subdivisional Irrigation Office in Battar, Nuwakot), and relevant persons associated with the system were separately interviewed. Participant observation provided insight into the workings of the Committee. Gadkhar Irrigation Project was visited in June and August, 1986. Secondary data was collected from the WUC's Minute Books, the DHM (Department of Irrigation, Hydrology and Meteorology), the Central Region Irrigation Directorate, and Battar Irrigation Subdivision Office (ISO).

## BACKGROUND

Gadkhar Irrigation Project (GIP), which covers 105 hectares (ha) of land, lies in Choughada village panchayat of Nuwakot district, in the Central Development Region of Nepal. GIP is 12 kilometers (km) southeast of Trisuli, the district headquarters. Trisuli is linked to Kathmandu by a 70 km secondary highway, built to transport materials and labor for the construction of the Trisuli Hydel Plant in 1965. Gadkhar is difficult to reach by vehicle, especially in the monsoon, as there is no bridge over the Tadi River which separates the village from the mud road that starts off from Gungate, on the Kathmandu-Trisuli highway.

### External Assistance

GIP was an offspring of the Rasuwa–Nuwakot Rural Development Project, financed by the International Development Association (IDA) and the International Bank for Reconstruction and Development (IBRD). These two donors provided 67 percent of the irrigation construction costs. The other third was borne by His Majesty's Government of Nepal (HMGN). The design, construction, and implementation of GIP were done under the umbrella of the DIHM. The project cost US\$ 134,555 (NRs 2,946,743) to construct. Construction was started in 1979 and finally completed in 1982.

Between 1983–86, a total of US\$ 44,642 (NRs 977,651) was invested in project maintenance and renewal works. Over this period, the per ha average maintenance and renewal costs were US\$ 106 (NRs 2,328) each year. This increased substantially with the additional cost of an increasingly frequent labor contribution. The users also bore the cost of panipales (water guards). Each household would supply one pathi of paddy (about 3.6 kg) which would be equally divided among panipales as wages.

## INTERRELATIONSHIPS AMONG MEMBERS OF THE WUC

The first WUC was constituted in 1980 to assume responsibility for operating and maintaining the irrigation system. Specifically, it was to set and enforce policies relating to water use (Peabody 1983). The engineer at the Battar ISO/DIHM, who was implementing GIP supervised its formation.

The farmers' assembly was presided over by the pradhan pancha (chairman of the village political unit). He was unanimously elected chairman, and 14 others, including a vice-chairman and secretary were also chosen. The irrigation engineer, overseer, and agricultural assistant were invited to attend.

### Composition of the WUC

There were three Brahmins, eight Rais, one Chhetri, one Newar, and two others on the Committee. Four members were panchas; the rest considered themselves more users' representatives than panchas. There was no formal representation of public personnel in irrigation or agriculture.

Relationships among members of the committee were characterized by rank undiscipline. The vice-chairman was involved in more than one deliberate breaching of the branch II canal at the head, in order to divert water to his farm. The irrigation engineer ordered his personnel to repair the canal breach out of the maintenance budget. For various political and social reasons, the irrigation personnel became increasingly dependent on the vice-chairman, and the more the local farmers saw them hobnobbing with him, the more the farmers distrusted them, which in turn pushed the irrigation personnel further towards the panchas. The history of the area may throw light on how such a situation developed among a majority of the local farmers.

### Historical Perspective

The head unit of the command used to be a large mango grove. It was a horticultural estate belonging to the Rana family. On the death of the Rana owner, the estate was divided into seven equal parts for his six sons and wife. The Rais, an ethnic group who lived on the periphery of the estate, were considered inferior by the estate owners and were not allowed on the premises.

The death of the sole owner, the fragmentation of the estate, and the new laws stripping the Ranas of their power caused anarchy in the area. People tried to encroach upon the estate from all sides and take as much of the horticultural property as they could. A Newar businessman who was a pradhan pancha, and a Brahmin pancha took the opportunity to convince the heirs to the estate to dispose of their part of the estate. The Newar managed to pool enough resources from several buyers to purchase a major portion of the estate for himself. Then he cleared the horticultural resources for commercial gain, and resold the estate in plots to those buyers from whom he had already collected money. These buyers were predominantly Brahmins and Chhetris.

The Brahmin pancha purchased part of the estate directly from one of the deceased owner's sons. Thus, the estate was populated by Brahmins and Chhetris, who filled the socioeconomic vacuum left by the Ranas. The Rais did not gain at all from the changeover.

The Rais' point of view. The Rais felt that the irrigation project was for the benefit of the elite group living in the head unit of the command. In 1979 they opposed the project as they felt that what was a communal river and supply of water would become tied up in a system that excluded them.

The way the project developed in its initial years (1979-81) only strengthened the Rai's notion that it was to serve the local elite. A farmer was deprived of his water mill upstream because it was using water from the Likhu River. The farmer also lost part of his land to the canal. He has not yet received compensation.

The Rais noted that in the first two years of the project's phased water delivery, most of those who practiced irrigated agriculture were head unit, high caste people. Rais were pressured into selling good pieces of land that were favorably located in terms of the irrigation network. The buyers were quick to anticipate an increase in the value and agricultural productivity of the land. It has been estimated that the Rais lost over 10 percent of their land to high caste immigrants.

The committee chairman, who was an immigrant himself, seemed reluctant to open cases of illegitimate water diversion by his committee colleagues for public hearing, or to punish the guilty. The committee's failure to punish its own errant members affected its legitimacy. The head unit farmers enjoyed license to tamper with the canal anywhere and take the quantity of water they wished, whereas it was difficult for the middle and tail unit Rais to get the water they needed. The situation divided the farmers both at the command level and at the committee level. Many members began to feel that the chairman and vice-chairman were siding with the high castes and bullying the lower ones.

Irrigation officials did not contribute to harmony and equity. The engineer would informally allow high caste influential farmers to open new outlets unilaterally. The overseer was responsible to the engineer and to the committee. He did not have the power to correct or punish violations of the distribution system, and it was impractical for him to antagonize the committee's influential high caste pancha leaders.

The relationship between the committee and the water users often rendered committee decisions on water allocation and enforcement of sanctions against rule violators redundant. The committee was not able to bring its

plural membership together to realize its purpose in a positive way. Although 8 out of 15 members were Rais they were too weak to correct the imbalance.

Another general assembly of users replaced the first committee with a new one in 1982. By this time, the village panchayat had a new pradhan pancha and the new committee was chaired by him.

Subsequent WUCs. The new chairman was a Rai who therefore represented the majority ethnic group in the command area, although this time they did not constitute the majority on the Committee (4 out of 11). He himself held less than ten ropanis (one ropani equals 0.13 acres) of land in the command. He was the first pradhan pancha to be elected by universal adult franchise, a system adopted in 1980 when the Third Amendment of the Constitution became effective. The controversial chairman and vice-chairman of the first committee both got membership positions on the second.

This reorganization probably reflected the users' concern to make the WUC ethnically broad-based and make it a more representative agency of cooperative relations among the communities that managed land in the head, middle and tail units. From a socio-organizational perspective this was an outstanding effort to sustain the users' divergent irrigation interests in terms of ethnic group, land ownership, and geography.

A perspective on 1981-86. Between 1981 and 1986 the water users of Gadkhar have elected five WUCs: a total of 58 members. A few were elected several times. Undisciplined water users were sometimes elected to the Committee. This was an attempt to make them accountable for a cause that called for collective cooperation and equitable irrigation management. A tradition of giving almost ex-officio membership to the Agricultural Technical Assistant and the irrigation overseer, was broken in later years since the users were interacting with these people less and less. In the last five years the total membership of the five WUCs decreased from 29 to 26 as public personnel were no longer included.

A majority of the Committee members were politically affiliated (54 percent), although 57 percent were non-incumbent and only 43 percent owned large pieces of land mostly at the head of the command. Rais constituted the largest single group (50 percent), followed by Brahmins (19 percent), Chhetris (11 percent), and Newars (8 percent). Most members were big landowners, with 31 percent and 27 percent in middle and small landownership strata respectively. Committee members equally represented the different locations in the command.

No important relationship between ethnic identity and land ownership status was noted. The Rais made up 23 percent of the big landholders, and the Brahmins were equally divided between the big and medium landholders. Each caste group had at least one politically affiliated member, except the Chhetris. Both Newars were panchas. Though one tenant and one big landowner were elected to all five Committees, it is clear that more farmers from the medium and small land ownership bracket were repeatedly re-elected than from the others.

## CAPACITY AND IRRIGATION ACCESS OF THE COMMAND UNITS

Most land that was supplied with irrigated water was tar (flat highland) lying between two rivers, the Tadi and the Likhu. The former flows along the north boundary of the command area, and the latter, the water source of the

project, flows along the south side. Ethnic groups were not evenly spread over different quality land in terms of access to irrigation, ability to use fertilizer, soil texture, and topography.

### Ethnic Groups and Land Distribution

Although a majority of the households in the command area are Rais, only 27 percent of them lived in the head unit. All the Brahmin, Chhetri, and Newar households were located in the head unit.

Choughada Agricultural Subcenter Official Report of 1986 gave the following socioeconomic data on the Gadkhar command. There were 230 households of 1,610 people. Small landowners made up the largest group (45 percent), followed by marginal landowners (24 percent), medium landowners (20 percent), and big landowners (4 percent). Five percent were landless and the average landholding size in the command was 0.5 ha (10 ropanis), with the highest average at 0.83 ha and the lowest at 0.25 ha. These figures exclude land owned by Chhetrapal School and land under guthi (socio-religious trust).

What emerges from the findings is the fact that the Gadkhar command head unit was socially and economically dominated by Brahmins and Chhetris. They were strategically placed in terms of access to irrigated water. They used chemical fertilizers to compensate for the chemical deficiencies in the soil. The Rais were overwhelmingly the largest group in the middle and tail units, but their landholdings were smaller than those of the Brahmins. Some of their land was less productive than the soil in the head unit, but some had a clay-based soil and could match the latter's paddy and maize production. The tail unit farmers could not afford to use chemical fertilizers. If they could, they might substantially increase summer paddy yields.

### WUC's EFFORTS TO DISTRIBUTE WATER EQUITABLY

Almost six months before the formation of the first WUC, GIP reached a stage in construction when water was released onto two ha owned by a Brahmin who used it to prepare paddy seedlings.

In the second year, water was released to 93 ha in the command. The Committee meeting held in 1980 set rules for rotational distribution of water, because it found that there was too little water for continuous irrigation throughout the command. Water would be released through one branch canal at a time. It would be distributed through the set tertiary pipe only. Distribution channels would be built after consulting with irrigation officials. The Committee also agreed that as there was not enough water, a ceiling would be fixed on each farmer's area of irrigated agriculture.

The rotational distribution schedule was for both wheat and an early paddy crop. It was decided that all farmers should grow summer paddy on 25 percent of their land, and traditional maize and millet crops on the other 75 percent (Committee Minute Book 1980). These decisions were rarely enforced. Farmers took water from wherever they could and cultivated summer paddy over large areas, despite the ceiling. This resulted in a shortage of water and unequal distribution of what was available.

## Distribution Schedules

At a second major meeting held in 1981, the Committee decided to change the four-day rotational schedule to a five-day one, as the earlier one could not meet the users' requirements. It also elaborated on the method for water allocation in each branch canal area. Ostensibly for equity purposes, priority was given to tail unit households.

The second water distribution schedule was an improvement over the first: it was more equitable in terms of branches I and II and branches III and IV, water distribution priority was given to the tail unit users, and the area to be served was delineated geographically.

Unfortunately, these improvements were only put down on paper; the four-day distribution schedule continued in practice. The four-day rotation schedule had a built-in bias in favor of branches I and II. The two branches, which irrigated a total of 31 ha, were given water for 48 hours. There were widespread complaints from tail and middle unit farmers of branches III and IV of not getting enough water. Possibly more revealing was the fact that the tail unit farmers of branches I and II also complained about the erratic supply. The committee leaders--the chairman and vice-chairman--were head unit users of branches I and II. A new four-day rotational distribution was activated that was to be effective from the 1982 summer paddy, because of water scarcity (Committee Minute Book 1981). By this time, irrigation water could potentially reach the entire command area.

The distribution bias continued, though this time the tail unit was given equal chance to get irrigation services. They continued to complain about the illegitimate canal breaches and water theft in the head unit, and the erratic supply.

On the advice of the engineer, the Committee decided that summer paddy should be planted on 50 ha of land, and millet on another 50 ha. No user heeded this suggestion and they continued to grow paddy on larger than prescribed areas, stealing water, and illegitimately breaching canals to do so. Later, the Committee admitted that it could not implement its decision. It felt that the intake of the system was too low, so it was suggested that the Irrigation Subdivision increase the system's capacity. At that time, they decided on a new rotation schedule which was unique in that it demarcated command units into more specific sub-command entities. For example, of the 32-hour supply given to the tail unit, water specifically flowed into one area of the tailend for 16 hours, and the second 16-hour supply flowed into another area.

Despite measures to be equitable, the problems of water theft and canal breaches continued, so the WUC decided to form a sub-committee for supervision and control of each branch canal. In a later meeting, these branch level sub-committees were reshuffled and authorized to punish those found guilty of water stealing and canal breaches. The punishment for each crime was fixed in the form of fines ranging from US\$ 4.57-22.84 (NRs 100 to NRs 500). Private, overlarge, channel level distribution pipes were removed. A nine-day rotational schedule was adopted with branches I and II receiving water for 96 hours, and the other two for 120 hours.

In 1984, the nine-day schedule was replaced with the five-day one which had been proposed in 1981. Within 30 days the decision was amended as the committee tried hard to adapt to changes in water availability. The WUC also

decided to dissolve the branch level sub-committees on the grounds that each branch had a representative on the main committee.

The WUC did not have problems of illegitimate water diversion in the command area alone. Farmers who had developed cropland just below the five kilometer idle main canal were now using water straight from the main canal.

### WUC Persistence

The WUC's persistence in finding a rotation pattern that would allow a scarce resource to be distributed equitably was impressive. It was at pains to admit that despite these efforts, conflict and tension during rotational water distribution was increasing over the years (Gadkhar households were divided on the question of whether discipline levels had improved or declined). A farmers' general assembly was convened in 1985 to discuss the issue and a resolution was made. The resolution provided a new position of two panipales (water guards) in each branch canal who were employed by the committee. Their main duty was to distribute water equitably. They were solely employed at summer paddy time when the conflict for water was at its highest.

The panipales were a remarkable innovation. Although the middle and tail unit farmers were happy, the head unit farmers felt that panipales were a useless investment. In anticipation of such an attitude from the higher castes, the assembly nominated a high caste, head unit farmer as adviser to the present Committee on water distribution. The new Committee found the panipales to be useful and satisfactory so the arrangement was continued through 1986. However, some problems arose. Head unit farmers gave incorrect quantities of grain as payment for the panipales. The panipales felt that some of those they had caught stealing were not punished and therefore that the job was not worthwhile. The head unit farmers thought that the committee was simply shifting its responsibility for equitable water distribution onto some petty wage earners.

### Communication

The users were not uneasy about so many institutional changes and innovations. They were aware when they were entitled to water, of the water allocation entitled to each branch of the command area, and limitations or constraints on access. This shows that the WUC maintained close communication with the farmers and made sure that they understood every decision.

The committee introduced all the major changes at the farmers general assembly which functioned as a mass communication mechanism. The committee was elected and structured in a manner that allowed representation of all four branch canals. Whenever the Committee made an important decision regarding water distribution, a representative from each branch would brief his fellow farmers. In addition, the panipales could inform farmers of any decision that related to them. All meetings and general assemblies were recorded in a Minute Book maintained by the member-secretary of the WUC. All decisions were taken formally: an agenda would be fixed by the Committee, a date and place agreed upon, and the signatures recorded in the Minute Book of all those who attended.



## WUC AS RELATED TO THE STATUS OF THE SYSTEM

WUC members were also aware of the state of the Gadkhar Irrigation Project. They were aware of organizational problems and that the physical state of the project was seriously interfering with the Committee's potential for organizational growth.

An overwhelming majority of WUC members mentioned the following detrimental physical characteristics of the Project: 1) bad links between the intake and the river; 2) narrow canals that cannot contain and convey monsoon water; 3) emergence of new cropland between the river and the intake; 4) emergence of 20-25 ha of agricultural land just below the five km idle main canal; 5) indiscriminate insertion of distribution pipes of different sizes by irrigation officials; and 6) unstable, slide-prone sections along the main canal.

The project's physical state had been largely responsible for the promotion of certain organizational issues. The Committee was able to handle many of these issues, but not all. It mobilized the necessary labor every year to maintain/build a link canal or feeder channel between the intake and the river, and to restore unstable sections of the main canal destroyed by landslides. It took the initiative in demanding first rights to the water from farmers who had started to cultivate the area between the intake and the river.

However, the Committee was not so successful in preventing the indiscriminate insertion of varying sizes and qualities of pipes. This reflected a certain degree of manipulation as the more influential, high caste farmers laid the biggest pipes and therefore received the most water. With the introduction of panipales, the Committee had tried to control the release of water through the pipes, whatever the size, so that every farmer had three inches of water covering their summer paddy, but they did not exercise enough control.

Structural problems hampered efficient water conveyance and equitable water distribution. WUC members felt that the initial structural design was at fault and stressed that even though the water in the Likhu River was sufficient for nine months of the year, they were not getting enough water to irrigate their fields.

Irrigated farming below the idle main canal was diverting water illegitimately to farmers outside the command, adding 25 percent to the irrigated area. The Committee repeatedly suggested ways to tackle the problem. They pressed the dhalpales (government-employed canal guards) to be more vigilant, but during the night they could do nothing. The Committee tried a conciliatory approach at the last 1986 meeting. They offered farmers an agreement which would insure access to the water every 96 hours. This has come into operation recently and seems to be working, but the Committee has found itself supplying a much larger area than originally anticipated.

## EXPECTATIONS

WUC members have had high expectations of the project for a long time. However, they feel that the future of the irrigation system **is** insecure due to the lack of a clear-cut government program that defines the government's responsibilities and their own **for** the system. Furthermore, their experience with the erratic performance of the government regarding the fulfillment of its maintenance responsibilities has made the committee members skeptical as to its fulfillment of promises in the future.

All WUC members perceived labor mobilization for system maintenance as critically important. It was increasingly felt that the Committee substantially filled the serious lapses and gaps in the public bureaucracy. It was becoming more involved at all levels of system management.

One year after the system went into operation, it became apparent that a new feeder channel had to be built every year, to feed water into the intake. The Likhu River channel had shifted almost one km to the south. The Committee had to mobilize villagers to excavate the channel. Simultaneously, they had to perform the task of cleaning landslide debris out of the main canal and regular field canal maintenance. The Committee became more involved in maintenance each year, as the problems and defects of the system were revealed. The original design had not included structural facilities to drain excess rain water, and mud slides caused by deforestation on higher reaches of the main canal had made the canal portion with buried hume pipe more unstable.

The increasing preoccupation of the WUC with main canal maintenance, which was considered the responsibility of the Battar Subdivision, had an adverse effect on branch field channel maintenance and supervision. On several occasions, branch canals were left uncleaned. The Committee was aware of the situation and so organized the system of sub-committees for each branch canal mentioned earlier. Then they proposed to the Subdivision that it place its dhalpales whose task it was supervise the main canal repairs under WUC direction, thereby ensuring a continuous flow of water.

A major expectation is related to the construction of a new intake canal about one km upstream from the existing intake point to solve the problem of the gap between the latter and the river. Another pertains to increasing the capacity of the system. Water scarcity during the dry season was understandable, but non-availability during the summer monsoon months was intolerable. Members wanted larger hume pipe to be inserted along the canals to increase the capacity of the system. A suggested alternative was to link Gadkhar with a proposed irrigation project upstream at Simara. If Gadkhar could receive all the drainage water from Simara, it would solve Gadkhar's perennial water shortage. In response to queries, the WUC members replied that they could not possibly take over the system because they would not be able to maintain it. They felt they would need the technical supervision and assistance of irrigation officials to maintain some of the structures.

The farmers were wary of relying on the DHM for assistance, even if they were assured of it. As one farmer explained, "even under the present arrangement whereby the DHM is responsible for the operation and maintenance of the project, it took three years for them to release a grant to repair main canal damage". Fulfillment of farmers' expectations is a pre-condition for more responsible participation of the users in joint management of the project.

## DECENTRALIZATION

Under the provisions of the Decentralization Act's Work Arrangement Regulation, and present policy level thinking, the GIP should have been handed over to the users for management. Legally, the users must have the leadership of the pradhan pancha and should function alongside the village panchayat. The WUC has met all these requirements.

A team of DIHM personnel visited the project at the beginning of 1986 and suggested that Battar Subdivision hand the overall management of it to the users. This suggestion was also made earlier by the Rasuwa-Nuwakot Rural Development Project Coordinator and his expatriate advisers. However, due to the physical state of the irrigation network, both the users and their pancha representatives were unwilling to take it over completely. Irrigation officials related to the project also felt that it should not be handed over until it had been remodeled. Estimates of the cost of remodeling ranged from US\$ 27 398- US\$ 91,324. According to the Subdivisional Assistant Engineer, the project was in the "poorest shape".

At the remodeling stage, the entire process would have to go through a different institutional channel. Under the Decentralization Act rules, Nuwakot District Panchayat had to approve the resolution. It would then be referred to Battar Irrigation Subdivision for implementation (all field level developmental work agencies come under the District Panchayat Secretariat, in accordance with the provisions of the Decentralization Act). The District Panchayat has so far not touched the GIP as it is considered a central level project. In 1985, about 50 users approached the Local Development Officer with their grievances--the main one being the need for a new intake further upstream--but the District Panchayat Office could not respond in any meaningful way as the Project is beyond their jurisdiction.

## CONCLUSIONS

Throughout the years, Committee members have upheld certain values that will eventually have a far-reaching impact on the institution and its future prospects:

1. They have been continuous and untiring in experimenting with new rules and regulations for water allocation and distribution in an effort to adapt to the needs of the users and physical changes over time.

2. They have steadfastly tried to make water distribution equitable, giving tail unit members priority and carefully selecting WIJC members so that all farmers were represented.

3. They have tried not to antagonize the high caste Hindu farmers who migrated to the area and took over strategically placed, good farmland, giving rise to sentiments such as "strong versus weak". The Committee's endeavors have helped the "weak" by giving them influential membership positions. Tail unit productivity increased as a result.

4. The Committee actively participated in system maintenance at all levels through massive labor mobilization and its belief that, irrespective of what is written in the Decentralization Act, it can manage the system only when the users and the DIHM cooperate to evolve a meaningful framework on which to build a capable institution.

The GIP case study highlights the struggle of a WUC to perform certain roles with the ultimate goal of distributing a scarce resource equitably. In its struggle, the Committee has repeatedly had to negotiate with interference from local politicians and elite. As the government proceeds to decentralize the operation and maintenance of irrigation systems, it must be recognized that WUCs are susceptible to a number of constraints including the physical

limitations of the system, the need for government support for some technical expertise and monetary resources, and local power politics. Also, to function effectively, most members who have been repeatedly elected to the Committee feel that it needs authority to enforce sanctions on those who tamper with the system. It does not have sufficient power to punish abusers effectively. The decentralization process needs to consider the users' perceptions of what they can reasonably manage themselves and what external resources, including technical and legal support, need to be provided by government.

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### SECTION III: COMPARATIVE CASE STUDIES

#### COMPARATIVE STUDY OF PITHUWA AND CHAINPUR IRRIGATION SYSTEMS

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