Improvement and Enlargement of a Farmer Managed Irrigation System in Tanahu: Changing Rights to Water and Conflict Resolution[1]

Durga K.C. and Rajendra Pradhan[2]

INTRODUCTION

Throughout Nepal, irrigation has been subject to considerable change. Changes in the physical structure or in operation and management (which often, hut not always, go hand in hand) have often resulted in changes in various rights over water. This is not a new development but the recent irrigation projects, launched by the government and often financed by international donors, have increased the pace and extent of change. Project planners and implementors have not always been sensitive to the fact that changes in the physical structure, in distribution and allocation of water, and in operation and mangagement have a strong impact on existing rights to water and have often been a source of considerable conflict (U.Pradhan 1994, R.Pradhan and U.Pradhan 1996, R.Pradhan, A. Haq and U.Pradhan, this volume, and M.Pradhan and R.Pradhan this volume). This raises the question of the impact of such changes on existing rights and obligations. Three questions will be raised in this paper:

1. What happens with existing rights to water if a physical structure (canal, weir) is altered or built?
2. What happens with existing rights to water if operational or management organization is changed?
3. What conflicts arise from such changes; how are disputes prevented; and how (if at all) are they resolved?

We will discuss these questions with an example of the Satrasaya Phant irrigation system in Tanahu, which over the years has undergone a number of important changes. Some changes have been initiated and implemented by local people and others by the government. In 1989 the government launched a project, financed by the World Bank, to improve and enlarge the system. This irrigation system is therefore a good example to study the effects of changes. The changes involve the three main types of irrigation management activities as described by Uphoff et el. (1985), i.e. (i) physical system activities, such as maintenance, operation and construction; (ii) water use activities, such as acquisition, allocation and distribution of water; and (iii) other organizational activities, such as resource mobilization, decision making and conflict management. We will describe how with each change the rights to water were affected, whether and if so, what new operation and management structure, enforcing agency and sanctions were introduced. In particular it will be discussed how and to what extent physical structures can be used to reduce orprevent conflicts from arising. The government enlargement project of 1989 gave rise toseveral disputes, showing the tensions, shifting relations and negotiations between old and new users. In the second part of the paper we will discuss some of the disputes that arose in this system and see how they were dealt with and what the outcome was.

CHANGING RIGHTS TO WATER

A wide range of rights and obligations exist concerning water use, distribution and allocation, operation and management of irrigation systems. These include (priority) use rights, ownership to both land and water, access rights, rights to turns in rotation, rights to convert *pakho* (upland) into *khet* (low land), full rights to use water, rights during monsoon or winter only, rights for way (for a canal), rights of compensation (for a physical structure), rights and obligations to contribute labour (especially for tenants who do not have ownership rights), and so on.

Rules and regulations facilitate mobilization of resources for operation, maintenance, improvement and construction of irrigation systems, and help actualize water rights. Rights are held by individual fanners or one or more groups of fanners to allocate and distribute water. Allocation and distribution of water are usually based on resource contribution by the users for original construction or current maintenance of the irrigation system.

From a water rights perspective, the three sets of irrigation mangagement activities mentioned above may be seen as different means to actualize and protect water rights. For example, proportioningstructures (whichare means of water distribution) are "mechanism for realizing and verifying water rights" (Ambler 1990 38) and water rights are related to past and present contributions to the construction and\ or maintenance of the system (ibid: 47). Similarly, Coward (1990 83) argues that the rules for allocating water "are useful in structuring the broad relationships among the various groups and individuals with a claim to water and between them and those without such claims." This means that everytime one of these three kinds of activities undergo changes, rights and obligations related to water change accordingly.

Most of the fanner managed irrigation systems in Nepal have developed their own written or unwritten rules and regulations. These local rules and regulations are altered in response to the

changes mentioned above. However, the state is becoming increasingly involved in irrigation and is imposing its own notions on rights and obligations related to water, which may or may not correspond with local law. When government projects are introduced, new sets of regulations are introduced as well, causing much tension and conflict among old and new users of the upgraded system.

IMPLEMENTATION OF LAWS

Unless laws are effectively implemented or enforced, there is no assurance rights will be protected. Enforcement of laws helps better operation and maintenance of irrigation systems, prevention of conflicts and protection and actualization of water rights. There are mainly four factors crucial for implementation or enforcement of laws.

Acceptable Rules

The fanners of local communities must agree that rules are adequate and acceptable. This factor is very important for farmer managed irrigation systems because rules are often negotiated between the users and between them and non-users. Lack of agreement often leads to 'water stealing' and disputes.

Enforcing Agency

Rules are implemented or enforced by formal or informal organisations. Strong organizations can effectively contol water allocation and distribution, mobilize resources for operation and maintenance, and prevent of resolve conflicts. Earlier, in many irrigation systems, the leading farmers in the command area enforced the rules, often made by them. A government appointed revenue collecter, such as Jimmawal, assisted by another lower level functionary, such as Kotwal, also often enforced rules. Other farmer managed irrigation systems had managing committees. Over the past few decades, more and more irrigation systems have formal and registered irrigation management committees which are responsible for enforcing rules. Many imgation management committees, as in Satrasaya Pbant Kulo, are assisted by water contractors or moniters, variously called *pani thekdar* (water contractor) or *pani chowkidar* (water guard). These moniters or contractors are employed to deliver water in the main and branch canals, patrol the system and carry out minor repairs. Many systems have found water moniters to be effective in lessening conflicts between fanners over water acquisition and delivery (cf. Shivakoti and Pradhan **1995).**

Sanctions for Violation of Laws

Sanctions are tools for protecting and upholding water rights. In irrigation systems, violation of laws take place when farmers disregard local laws or state laws or both, such as taking water out of turn, stealing water, not contributing resources, and damaging the canal. Those who violate rules are usually fined or prevented from acquiring water, especially if they are not organized and powerful.

Physical Structures

Physical structures, such as diversion weirs and proportioning weirs and distribution outlets, are means of allocating and distributing water. Through them waterdistributionmay becontrolledand conflict over water distribution may be prevented. Physical structures may make equitable distribution possible, but they do not always do ***so,*** nor are they always equally suitable to do ***so.*** And not all physical structures are equally suitable to prevent conflicts from arising.

ISSUES OF CONFLICTS

Conflicts and disputes between fanners over water rights related issues are very common in irrigation systems. Some of the conflicts are between individuals, others between groups (e.g., head and tail end; existing and new users) within an irrigation system. Conflicts between fanners of different systems are not uncommon. There are three major issues of conflicts.

Water Allocation and Distribution

Conflicts often occur over hierarchy and priority in water rights between senior and junior rights holders. Conflict usually **arises** over water allocation and distribution between owners of irrigated rice land (*khet*) and unirrigated land (*bari*), between head reach and tailend farmers, between downstream and upstream irrigation systems, and between prior right holders and new right holders (often through government intervention).

Water Stealing and Acquisition (within and Between Systems)

During peaks periods of water scarcity, 'stealing' is frequently resorted to. Conflicts usually occur within systems when a farmer steals water to irrigate his fields during another person's turn; or when non-rights holders steal water from a system. Non-rights holders usually try toacquire water rights through stealing. Conflict between irrigation systems usually occur over acquisition of water from water source shared by the systems.

Resource Contribution

Farmers need to constantly mobilize resources for operation and maintenance, improvement and development and effective operation of their irrigation systems. Conflicts occur between new and old irrigators over the basis of contribution of resources towards the improvement of irrigation systems, with aid from the government or donor agencies, and from whom and how much contribution is to be mobilized. Old irrigators want to contribute less resources than the new irrigators, reasoning that they are prior holders of rights to water and have contributed resources regularly, whereas the new irrigators want to use the government or donor agency aided system on an equitable basis. They refer to state law because local rules do not give them rights of access to water, if prior users refuse to do ***so,*** or only under unfavourable conditions.

CONFLICT MANAGEMENT

Since conflicts between fanners are endemic to irrigation systems, conflict management is an important water management activity. Conflicts within irrigation systems, especially between individuals of between individuals and the management committee are usually resolved locally, often by the management committee. And if the management committee is strong, it may also resolve conflicts between groups, for example, between head and tail end fanners over water distribution or resource contribution. Negotiation, compromise, threat to use sanctions (fine, temporary suspension of water rights, etc.) are common means of settling disputes between fanners within systems. Disputes between groups of farmers, especially between existing rights holders and new claimants as well as between farmers of different irrigation systems are difficult to resolve by negotiation or accomodation and are often played out in quasi-judicial or administrative offices, such as Village Panchayat or Village Development Committee offices or the Chief District Office. Disputes are also taken to courts. Conflicts and disputes are not always resolved or resolved only temporarily.

HISTORY OF SATRASAYA PHANT KULO

There have been many changes in the Satrasay Phant Kulo irrigation system since its consturction over 150 years ago. In this section we describe changes in the physical structure and command area, operation and management, water allocation and distribution and resource mobilisation. We will discuss these changes for three phases, namely, (i) original construction and immediately after; (ii) from this period till the rehabilitation and enlargement project (roughly 1850 to 1989); and (iii) after the completion of the project (1989 to the present).

Original Construction and Immediately After

Satrasaya Phant lies on the right bank of Andhi Khola in Ward no. 1 of the Anbu Khaireni Village Development Committee (VDC) in Tanahu District. Satrasaya Phant was once a dense forest and was cleared for cultivation by Markande Upadhyaya Adhikari about two hundred years ago. Later Markande's son as well as four other fanners (who too had cleared the forest for cultivation) construted a canal to irrigate their fields in Satrasay Phant. The main source of water of this canal was (and is) Thulo Andhi Khola, a tributary of Andhi Khola. Thulo Andhi Khola is fed by Andhi Mul, aperennial spring, located some three kilometers from the command area of Satrasaya Phant Kulo. The intake of the canal is located about two and a half kilometers from the command area.

Initially, the canal irrigated 8.99 ha (719 *mato muri*) of rice fields, divided into five plots. Each plot was owned by one farmer and named according to its size, measured in a unit known as *mato muri* (80 *mato muri* = 1 ha). Later, it is not know exactly when, the farmers irrigated additional 6.07 ha of land which they bad converted to rice fields, below their original fields. The original fields were and are still known as Upallo (upper) Chhabise, Upallo Sathimure, Upallo Chalise, Upallo Satbise and Upallo Barabise and the new, lower fields as Tallo (lower) Chhabise, Tallo Sathimure and so on (see Table 1).

Table 1: Original and Expanded Irrigated Land in Satrasaya Phant Kulo Before the Rehabilitation and Expansion.

Original Irrigated Fields Upper Area (Upallo)		Expanded Irrigated land Lower Area (Tallo)		Total Irrigated land
Name of the Plot	Area (ha)	Name of the Plot	Area (ha)	
Uppallo Chhabise	1.50	Tallo Chhabise	0.62	2.12
Upallo Sathimure	0.75	Tallo Sathimure	0.75	1.50
Upallo Chalise	2.25	Tallo Chalise	2.00	4.25
Upallo Satbise	1.75	Tallo Satbise	1.50	3.25
Upallo Barabise	2.74	Tallo Barabise	1.20	3.94
Total	8.99	Total	6.07	15.06

The five farmers managed and operated the irrigation system. Soon after completion of the canal, water was apportioned into five parts for the five original canal-builders, based on the share of investment in the construction of the canal. The share of investment was in turn based on the size of land to be imgated. In other words, water allocation was based on the size of land to be irrigated. After the enlargement of the command area, water allocation and labour contribution for repair and maintenance were done, as earlier, in proportion to the size of land to be irrigated.

Between the Original Construction and 1989

During this phase, operation and management functionaries changed twice. First, Jimmawals (revenue collectors also responsible for irrigation management) were appointed by the state and after the abolition of this post a canal committee was formed. Additional 1.66 ha of rice fields were irrigated and there were some changes in water allocation and distribution.

Changes in Operation and Management Functionaries

We do not know when a Jimmawal was first appointed for Satrasay Phant but it was probably around mid-ninteenth century. Jimmawals were non-official functionary who collected taxes on irrigated rice fields (*khet*) in the hills. He was responsible for the operation and maintenance of irrigation systems within his jurisdiction. He was responsible for mobilizing labour and cash for operation of the canal, and for allocating and distributing water to the farmers. He also adjudicated disputes relating to land and water.

Jimmawals were assisted by a village functionary known as Katuwal. Katuwal functioned as the village policeman and messenger. The main responsibilities of the Katuwal were to inform the villagers about irrigation activities, social activities, marriages and rituals; to to collect land tax (*malpot*); and to carry out irrigation activities as directed by the Jimmawal.

Jimmuwals ceased functioning after 1978. In Satrasay Phant, the functions of Jimmuwals as regards irrigation activities were performed by water contractors and the canal committee. Water contractor is the literal translation of the Nepali term '*pani thekdar*'. His main responsibilities are to distribute water according to a schedule agreed upon by the farmers and to carry out minor repairs. He also patrols the canal to prevent diversion of water out of turn. A water contractor was first employed in 1977 on a trial basis to prevent disputes which arose between farmers due to diversion of water from the canal out of turn or for longer time than alloted. The water contractor was able to decrease such activities and consequently he has been hired on an annual basis since then.

The farmers with rights to water from the canal formed a seven member canal committee in 1979, with the former Jimmawal as the chairman, to oversee the operation and management of the canal. The committee was empowered to take decisions on behalf of the farmers. It appointed the water contractor, supervised his work, mobilized cash and labour for repair and maintenance, collected fines from farmers who did not contribute labourers or diverted water out of turn. It also mediated in water related disputes between the farmers of Satrasaya Phant.

Water Allocation and Distribution

Two types of water distribution methods were used for the monsoon rice irrigation during the period of the Jimmawal and until the ILC project: i) continuous supply of water, known as *ni palo* (withoutturn), and ii) rotation method (*thokuwa palo*) which could be either a) *dui palo* (two turns) orb) *char palo* (four turns).

The *ni palo* method was used when there was abundant water in the canal and fields (due to good rains). In this method of water distribution, water is available continuously throughout the whole canalandthe farmers themselvesopenedtheoutletstotheirfieldswheneverand foraslongas they wanted. The commond area was not divided into sectors, as in other water distribution methods.

In the *thokuwa palo* method, waterwasdistributed by turn todifferent sectorsofthecommandarea for a fixed duration, depending on the volume of water in the system. As soon as the allotted time was up another area received water even if all the fields bad not been irrigated. Such unimgated fields, however, were given first priority in the next turn. In the*dui palo* (two turns) distribution method, the command area was divided into upper and lower sectors which correspond to the Upallo (8.99 ha) and Tallo fields (6.07 ha) mentioned earlier. Each sector received water for 12 hours by turn, beginning with the upper area. This method of water distribution was used after transplantation of rice and if water was not sufficient, they used thecharpalo (four turns) method which was also used for monsoon rice transplantation when there was drought.

A variation of two turns method known as *bijuwa palo* (wet turn) was introduced in 1982 by the canal committee. In this method, as in the two turns method, the command area was divided into two sectors. head and tail but these two sectors did not correspond to the upper (Upallo) and lower (Tallo) fields. Further, the size of the sectors varied for different turns. Within each sector, water is distributed sequentially from head to tail, from one field to another, the lower field is irrigated only after the upper field has been covered with water. All the fields receive irrigation in each turn. This method of water distribution was used to irrigate the fields after rice had been transplanted in the whole command area.

In the *char palo* method, the command area was divided into 4 sectors and each sector received water for 24 hours in each turn. Each sector received another water turn after 96 hours. Sometimes two sectors combined to form one sector and received water for 48 hours. The four sectors were as follows:

1st sector:	Upallo and Tallo Chabise Upallo and Tallo Sathimure	[3.62 ha]
2nd sector:	Upallo and Tallo Chalise	[4.25 ha]
3rd sector	Upallo and Tallo Satbise	[3.25 ha]
4th sector:	Upallo and Tallo Barabise	[3.94 ha]

In theory, all the fields were alloted equal shares of water from the canal, measured in units of time. This may have been the case when the original five investors in the construction of the canal operated and managed the system. But in practice, some sectors and fields were allotted more water than others. For example, Upallo and Tallo Satbise with 3.25 ha of rice fields were allocated water for the same duration as Upallo and Tallo Chhalise with 4.25 ha. Fields which did not retain water easily were alloted more water than those which did. Similarly fields owned by the Jimmawal and his relatives were alloted more water than fields owned by others. Jimmuwals alloted to themselves more water than others for the same unit of land.

In addition to the fields in the command area, fields in Simle, Dungadi and Kundare were also irrigated from Satrasaya Phant Kulo but only if there was drought during monsoon. Farmers from these locations requested the farmers of Satrasaya Phant for water and diverted water to their fields 'licitly' if permission was given and 'illicitly' (i.e., 'stole' water) if they were not granted permission.

Resource Mobilisation

Operation and maintenance of irrigation systems require resources. In farmer managed irrigation systems, the users of the system contribute cash, labour or grains depending on the requirement. Construction and maintenance work are often done by the farmers either by themselves or hired labourers. Cash or grain contributions are collected to pay contractors or guards.

Regular repair and maintenance of Satrasay Phant Kulo was carried out two times a year: once in June in preparation for the monsoon rice crop and once in November for the winter crop. The irrigation system was also repaired during monsoon due to damages caused by heavy rains.

The users of the canal contributed a total of 128 labour days for the pre-monsoon and pre-winter repair work. Depending on the type of work to be done and the urgency, either eight persons worked daily for sixteen days or sixteen persons worked daily for eight days. For this, the command area was divided into eight sections. Uppalo Chhabise and Uppalo Sathimure formed one section and Tallo Chhabise and Tallo Sathimure another unit, the other six plots formed individual sections. Every section contributed one labourer in the eight *khetala* (agricultural labourer) system and two labourers in the sixteen *khetala* system.

In theory, the fanners contributed labourer according to the size of land irrigated but in practice the farmers contributed the same number of labourers for different land size serviced. For example, Upallo Chalise with 2.25 ha of irrigated land, Upallo Satbise with 1.75 ha and Tallo Barabise with 1.20 ha all contributedone lahourereach. Some fannerscontributedmore labourerperunitofland imgated because their fields, which were sandy, required more water and other fanners contributed less labourer because they were powerful. The Jimmawal, for example, contributed less labourer per unit of irrigated land than others.

If repair work was not completed within the stipulated date then all beneficiary households contributed one labourer daily until the work is accomplished. This type of labour contribution is known as *sithe* and was often done for emergency work during monsoon.

With the abolition of the Jimmawal system, it was difficult to mobilize labourers for repair and maintenance. The fanners then opted to contribute cash instead of labourers. The cash was used to pay either a contractor (not the water contractor) or daily wage labourers, whoever was cheaper, to repair the canal. The fanners contributed cash on the basis of the area of land irrigated. The rate varied between Rs. 1 to Rs. 10 per 0.25 ha, depending on the total amount to he collected for expenses.

The fanners contributed grains (paddy), based on size of land irrigated, to pay for the services of the water contractor.

The fanners of S i d e , Dungadi and Kundare had to help repair the canal if it was damaged during monsoon hut they werenotallowedtocontributelabourorcashforregularrepairandmaintenance for fear that they would later claim rights to water from the system.

From 1989 to the Present

During this phase there were major changes in the physical struture and command area of the irrigation system, the operation and management functionaries, water allocation and distribution and resource mobilisation.

Changes in the Physical Structure and Command Area

In 1989 the farmers received a grant assistence from the District Irrigation Office (DIO), as part of the World Bank funded Irrigation Line of Credit (ILC) program, to rehabilitate and enlarge the irrigation system. Under the grant, the intake point was improved with gabion, the canal was widened and lined, crossings and culverts were constructed in various parts of the canal, and the length of the canal was increased at the the tail end of the system. These modifications resulted in better supply of water in the canal and irrigation of additional fields.

After the completion of the project, the command area (or more specifically the service area) increasedfrom 16.72 ha to 25.13 ha.Theadditional8.41haofirrigatedfieldsarelocatedin Andhi Khola at the head end and in Dumtar, Kundarc, Simlc and Dungadi at the tail end of the command area. The beneficiary households increased from 45 to 73 14 households converted 1.86 ha of pakho land to ***khet*** in the newly extended command area sectors.

Operation and Management Functionaries

The canal committee was not recognized as a legal entity by the state because it was not registered with the Central District Office (CDO). So, when the ILC project was to be implemented, the farmers formed and registered a water users's association (WUA) and selected members of the managing committee, as required by the project.

The responsibilities of the managing committee are similar to those of the canal committee which it replaced. They carry out decisions made hy the association members during the annual general meeting which is held just bcforc monsoon. During the meeting the members review the performance of the water contractor(s), renew contract, select members of the managing committee, prepare work plan for canal maintenance, and approve thc annual budget proposal.

Water Allocation and Distribution

After the implementation of the project, water is allocated to additional areas, namely, Andhi Khola at the head end and Simle, Dungadi, Kundarc and Dumtar at the tail end of the expanded command area. The old command area receives priority in water distribution and receives more water than the new sections of the command area.

As before the project, water is distributed either continuously (*ni palo*) or by rotation from head to tail, depending on the availability of water, the type of crop and the phase of the crop cycle.

Water Distribution During Monsoon

For the monsoon rice crop, the fields are irrigated at least three times: first for transplanting rice, second, the day after transplantation (known as *maad pani*) and third, a few weeks later (known as *chara* paani). For the first two irrigation, the command area is not divided into sectors; the fanners irrigate their fields, as much as required, generally starting at the head end.

Transplanting of the rice seedling, and thus the irrigation of the fields, begins from the head of the command area. The farmers have to inform the water contractor (*thekdar*) one week in advance to get water for rice transplantation. The farmers have to arrange their rice planting schedule according to the availability of water because the first priority of water is for those who have already transplanted their rice and need to flood their fields.

The day after transplanting, the rice fields are flooded with water (known as *maad pani*). This flooding is very important because otherwise the fields may dry and crack resulting in poor harvest. If necessary, transplanting activities are stopped to allow the transplanted rice fields to be irrigated. While the *maad pani* is distributed from night to 11 a.m. in the morning, water for transplantation is provided after 11 a.m. (The labourers come to work in the fields at 11 a.m.).

Maad pani irrigation is followed by *chara pani* irrigation a few weeks later, during the growth period. *Bijuwa palo* method of water distribution is used for this irrigation. The command area is divided into three sectors, and not two as it was before the ILC project: i) Uppalo Chabise to Tallo Satbise, ii) Tallo Chabise to Dumtar, iii) Simle, Kundare and Dungadi.

While the ILC project was being implemented, the water users managing committee decided that for the monsoon rice irrigation Simle, Kundare and Dungadi would receive one turn of water after the old command area had received 5 turns. However, after the project was completed, they received water only twice a month for *chara pani* and only if there was drought. Later, they received water for 12 hours after the old command area received water for two turns. After prolonged negotiation between the farmers of the old and new sections of the command area, from 1994, the first two sectors receive water for 24 hours each by turn during monsoon and for 36 hours immediately after monsoon whereas Simle, Dungadi and Kundara receive water for 24 hours every Tuesday, irrespective of the season. Dumtar receives water for 2 hours out of the 24 hours alloted to the second sector.

Water Distribution in Other Seasons

The demand for water in the winter and pre-monsoon seasons is not as high as during the monsoon season because the crops grown during these seasons require much less water than monsoon rice crops. In these seasons too, fields in the old command area have first priority to water from Satrasay Phant Kulo. Fields in the old command area receive water first, as much as required, and without any fixed system as to turns or time. Farmers in the new command area may deliver water to their fields after the fields in the old command area have been irrigated. The fields in the new command area usually receive as much water as they want in winter but supply is limited once spring rice is planted in the old command area.

Resource Mobilisation After the ILC Project

After the ILC project, the irrigators have stopped using contractors or daily wage labourers for repair and maintenance prefering to do this task themselves. There are several reasons for this change in resource contribution from cash to labour. First, the canal requires less repair and

maintenance after the rehabilitation and extension project, which included lining of the canal. Second the number of households which benefit from the canal and thus contribute resources increased from **45** to **73.** And third, the big farmers, who control the managing committee, were able to change the basis **of** labour contribution from the size of land irrigated to household.

Such system of labour contribution whereby every beneficiary household was to contribute one adult male labourer for repair and maintenance is known as *sithe.* The *sithe* system **of** labour contribution is not new; it was used for emergency repair work during monsoon. However, it is now used for normal repair and maintenance. This system of labour contribution benefits the big farmers because they have to contribute less labourers per unit of land than the small farmers. That this is recognized as unfair is reflected in the fact that less than one third of the households turn up for repair and maintenance work despite threats of fine being imposed on those who do not contribute labourers.

As earlier, the farmers of the old command area who irrigate their monsoon rice crops from the canal pay the water contractors in grains instead of cash. However, the farmers from Simle, Dungadi, Kundari and Simle do not pay the water contractors because they do not deliver water to their fields.

CONFLICT CASES

Conflicts between farmers over water for irrigation are common in all irrigation systems. Many **of** these conflicts are minor disputes about diverting water out of turn or using more water then alloted, especially during monsoon irrigation when in the heat of the moment words and blows may be exchanged. These disputes are usually resolved quickly by the farmers themselves, often mediated by neighbours or the operation and management functionaries, only to **occur** again next year. In Satrasay Phant water contractors have helped to decrease such conflicts because they deliver water and patrol the canal and their contract is renewed if they perform well. But such disputes still occur.

Other conflicts occur, not **so** much annually, almost as part of the irrigation cycle, but when changes are introduced, in management, water allocation, resource mobilisation or the physical structure.

In the following section we describe two cases of conflicts between farmers with existing rights to water from Satrasaya Phant Kulo and new claimants to such rights which occurred when the World Bank funded Irrigation Line **of** Credit project was initiated to rehabilitate and enlarge the irrigation system. There were a series of disputes before, during and after the implementation of the project between the disputants. The disputes between these farmers were over three issues, namely, a) resourcecontribution, b) who had rights to water from the system and the basis of these rights and c) priority and hierarchy of rights.

Negotiation Between Farmers Before the Project Was Implemented

The World Bank funded a project known as Irrigation Line of Credit (ILO), implemented by the Department of Irrigation, in the mid-eighties to expand irrigation in the hilly areas of Nepal. Tanahu District was one of the project areas and Satrasaya Phant Kulo was selected as a potential irrigation system to be rehabilitated. The initial plan was to rehabilitate the system to benefit the existing irrigators but the command area was too small to meet the technical and economic conditions of the program. So as suggested by the overseer from the District Irrigation Office (DIO), who had carried out the survey, the farmers with existing rights to water from Satrasaya Phant Kulo agreed to extend the canal and increase the command area to include Andhi Khola, Simle, Dungadi, Kundare and Dumtar.

Once the technical and economic aspect of the system was approved, the farmers had to fulfill two conditions before the project would be implemented: First, the farmers had to form a duly registered Water Users' Association and second, they had to deposit cash in an approved bank as security money. The fanners also had to contribute labour for the construction work. They would forfeit the deposit if they did not meet their labour contribution requirements. The District Irrigation Office was responsible for ensuring that the project was completed.

The farmers held several meetings to discuss issues concerning expansion of the command area, allocationofwaterandcontributionofcash. They finallyagreed that Simle, Dungadi and Kundare, at tail end of one branch of the canal, and Dumtar at the tail end of the other branch would included in the proposed extension of the command area of Satrasaya Phant Kulo **(see Map).** The farmers of the proposed extension areas also agreed to the conditions stipulated by the fanners of the old command area. The four major conditions were as follows:

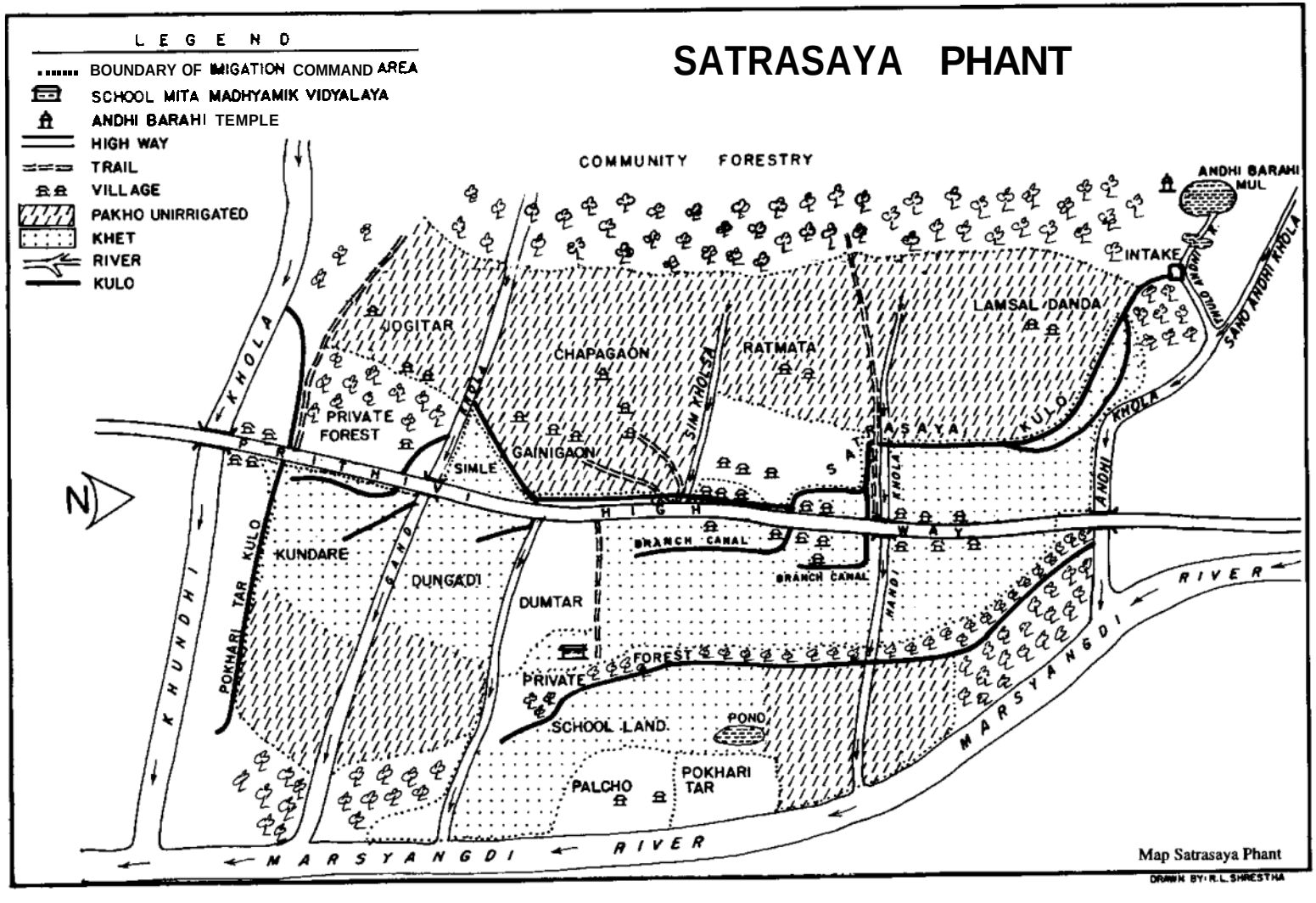
(i) Theexistingcanal structure would berehabilitatedfirst and it would be enlarged toirrigate new fields only if there was money left after the rehabilitation.

(ii) The traditionally irrigated rice fields (*sabik* kher) in the old command area would have the first priority in water distribution; the extension areas would receive water after the *sabik khets* were irrigated.

(iii) Pakho (upland) fields in Dumtar, Simle, Dungadi and Kundare would receive water only after the khers (traditional as well as new) were irrigated.

(iv) The fanners from the different sectors would contribute cash for the deposit in varying proportion, depending on whether their fields were traditionally irrigated by Satrasaya Phant Kulo, or are part of the new command area, and whether the fields were *khet* (rice fields) or pakho land.

The rate andamount agreedupon changedoverdifferentmeetings. They first agreed to collect Rs. 20 per 0.05 ha from the fanners of Satrasaya Phant, Rs. 50 from the farmers of Simle, Dungadi and Kundare (all *kher* land) and Rs. 80 from the farmers of Dumtarpakho land. This was later revised to Rs. 45, 75 and 100 respectively because the old rate was insufficient to cover the total amount required for the security deposit.


SATRASAYA PHANT
LEGEND
BOUNDARY OF MIGATION COMMAND AREA
SCHOOL MITA MADHYAMIK VIDYALAYA
ANDHI BARAHI TEMPLE
HIGH WAY
TRAIL
VILLAGE
PAKHO UNIRRIGATED
KHET
RIVER
KULO
COMMUNITY FORESTRY
ANDHI BARAHI MUL
INTAKE
LAMSAL DANDA
SANO ANDHI KHOLA
JOGITAR
CHAPAGAON
RATMATA
SIM KHOLA
PRIVATE FOREST
GAINIGAON
SIMLE
SATRASAYA KULO
ANDHI KHOLA
KHOLA
KUNDARE
DUNGADI
DUMTAR
BRANCH CANAL
BRANCH CANAL
HIGH WAY
POKHARI TAR KULO
KHUNDHI
HANDI KHOLA
FOREST
PRIVATE
SCHOOL LAND.
PONO
PALCHO
POKHARI TAR
MARSYANGDI RIVER
MARSYANGDI RIVER
N
Map Satrasaya Phant
DRAWN BY: R.L. SHRESTHA

The agreement between the fanners reflected the status of the farmers of the old command area as the original holders of rights to water from the system and the (proposed) change in property relations due to government intervention (investment). Thecommandarea would beenlargedonly if the old rights holders agreed but they had to agree to increase the command area if they wanted the ILC project to rehabilitate their irrigation system. The farmers of the new command areas would not be denied access to water but their rights would be secondary to the existing rights holders. The new rights holders could irrigate their fields only after the old imgaters had irrigated theirs. Further, the existing rights holders were to contribute less amount for the deposit than the new irrigators. The new irrigators had to contribute over one and a half times (Simle, Dungadi and Kundare) or twice (Dumtar) the rate to be contributed by the existing irrigators.

The farmers with existing rights to water in Satrasaya Phant Kulo were not really keen to share water with other farmers and had agreed to enlarge the command area only to meet the conditions of the ILC project. This becomes clear from their disputes with the fanners of Simle, Dungadi and Kundare over water allocation and distribution, with the farmers of Dumtar over extension of the canal and with the fanners of Andhi Khola over access to water from the canal.

In all these cases the new irrigators demanded rights to use the improved and extended canal to irrigate their fields on two grounds. First, the improvement and extension work were done with government grant. Second, they had contributed cash for the security deposit, i.e., they invested in the irrigation system. In other words, they acquired property rights to the system and rights to use water by public (i.e., government investment) and private (i.e., their own) investment. The old irrigators, although formally acknowledging rights of the new irrigators, did not grant them rights to use water easily. The farmers at the head reach were able to actualise their claims because they were organised and threatened to use violence. Moreover, they could always breach the canal to divert water to their fields located at the headreach. The small farmers in Dumtar, at the tail end of the command area, were not able to enforce their claims to their water rights from the canal because they were not strong enough to do so. They neither complained to the authorities, nor threatened to use violence.

We will begin with the dispute between the farmers of Andhi Khola and other farmers first

Dispute between Satrasaya Phant and Andhi Khola Irrigators

The fields in the Andhi Khola area were shown as part of the proposed enlargement of the command area but the farmers who owned land there were neither called for the meetings nor asked for contributions by the farmers of the old command area and the proposed extension at the tail end. The farmers of Andhi Khola were under the impression that their fields would he irrigated by Satrasaya Phant Kulo so they did not protest until the rehabilitation work was well under way and they realized that they would not be provided an outlet for their fields. Then nine farmers filed a complaint in the District Irrigation Office (DIO) against the Water Users' Association (WAU) construction committee members. In their complaint they argued that they should be provided water from the canal because it was being rehabilitated and enlarged by the government. Moreover, Andhi Kholaarea was shown apartoftheexpandedcommandareainthe survey report.

The DIO instructed the WUA construction committee members to provide an outlet for the fields in Andhi Khola. The WUA committee members agreed to do so but only on the condition that the Andhi Khola farmers contributed **Rs.** 500 per 0.05 ha of land to be irrigated. This condition was not acceptable to the Andhi Khola farmers who then threatened the committee members with sticks. They argued that they would not contribute more than the fanners of the tailend who had contributed between **Rs. 45** to 100 per 0.05 ha of land to be irrigated. They further accused the committee members of discriminating against them by not informing them when money was collected from other farmers for the security deposit before the project was initiated. They then threatened to prevent work on the canal unless an outlet was provided to their fields and they did not have to contribute more than others. The committee members finally agreed to grant them rights to water from the canal upon payment of **Rs.** 100 per 0.05 ha of land to be irrigated as contribution for the deposit and an outlet was provided for them.

The threat of violence **by** the Andhi Khola farmers, the location of their fields at the head reach of the canal, andpossibly, the instructions by the DIO, compelled the committee members to grant them water rights upon payment of the deposit money. If they were not allocated water they could easily divert water to their fields unless the other farmers guarded this area day and night. One of the reasons why the old irrigators were reluctant to grant them water rights was precisely because theirfieldsarelocatedupstreamandit would bedifficult toregulateandcontrol theshareofwater they diverted. This is borne out by the case of one farmer in Andhi Khola who refused to pay **the** his share of the security deposit and illicitly diverts water to his fields even though the outlet to his fields is blocked off time and again and downstream farmers as well as the management committee members threaten him.

Despite opposition from the existing rights holders, the Andhi Khola farmers acquired, or appropriated, water rights. In effect, they could now legitimately divert water to their fields, instead of doing it illicitly. Government grant and their cash contribution as well as their threat changed property relations and water rights in their favour.

Dispute between Farmers of Satrasaya Phant and Dumtar

In the case discussed below, a few small farmers of Dumtar have been denied access to water even though they have 'acquired' waterrights because they are neither organised nor powerful. Further, their fields are located at the tail end of the official command area and the canal does not reach their fields, ***so*** they are unable to steal water. The conflict here is not only between Satrasaya Phant (old command area) and Dumtar fanners but also between big and small fanners in Dumtar. Farmers whose fields are located at the tail end **of** the canal do not allow the canal to be extended through their fields (i.e., give right of way) to irrigate the fields of the small farmers. These disputes remained unresloved during our fieldwork.

In the meetings held before the project was implemented, the fanners had agreed that Dumtar would be included as part of the extended command area and the fanners of Dumtar contributed **Rs.** 100 per 0.05 ha of land to be irrigated as part of their share of the security deposit. While the construction work was going on they were under the impression that the canal would be extended to their fields after the old canal was rehabilitated and improved. They had no reason to be

suspicious because the responsibility for the project was undertaken by the District Irrigation Office and the WUA construction committee and further, many of the farmers owned fields both in Dumtar and in the old command area. However, the canal was not extended to Dumtar.

The small farmers of Dumtar were dismayed and angry. They did not have land elsewhere and depended on their fields in Dumtar for their livelihood. They complained to the District Irrigation Office overseer and the constuction committee members only to he informed that the canal would not be extended to their fields because all the project money had been spent.

After the completion of the project, the construction committee was dissolved and emanagement commitee was formed. The small farmers who have not received irrigation complainedfrequently to the Water Users' Association Management Committee members. These members acknowledged the rights of the fanners of Dumtar to water from Satrasaya Phant Kulo because they had contributed cash and the project was implemented with government grant. But they claimed that they are unable to convince the other fanners to give right of way to construct the canal. These farmers own land both in Dumtar, where they grow lentils (and have recently begun growing rice), and in the old command area where they grow rice. They oppose the construction of the canal through their fields in Dumtar not only because they would lose soil in their land due to irrigation hut also because they may face water shortage in their rice fields in the old command area if additional fields were irrigated, They were, in a way, reserving water for future drought periods.

Sailo Sarki had requested the WUA committee members to resolve the question of right of way. The committee called a meeting of the Dumtar farmers to try toresolve theconflict. Thecommittee requested **Mrs.** Adhikari to provide land for the canal and she replied that she would be willing tc do *so* if other farmers also provided equal area of land. She complained that Sailo Sarki took advantageofher because she never said anything when he dug the temporary canal without asking for her permission. She added, "I have *khet* land in Satrasaya Phant to grow enough paddy to eat rice. In Dumtar I only have *pakho* land whichissufficientto grow blacklentils toeatdal. Honestly, I do not want to convert my *pakho* land in Dumtar to *khet* to grow paddy." She added that the farmers were taking advantage of her because she was weak. She was a widow and her sons were living in Kathmandu.

The committee members then requested another farmer to provide land for the canal. He agreed to provide land which was uneven hut refused to allow the canal to pass through his *khet* fields. But this was not acceptable to Sailo. Some of the committee members then requested other fanners, two of who are committee members, to provide land for the canal. One of them had converted hispakho land to *khet* at the head reach of Dumtar which is irrigated by water from the canal. Like others, he too is not willing to give up a small portion of this land for the canal. This person, who is the current secretary of the WUA Committee, is reported to have told the farmers, " use power and force, if you can, lo plant rice [i.e., to deliver water to the rice fields]". None of the farmers were willing to give up part of their fields for the canal as a result of which the small farmers are unable to plant rice. Sailo Sarki, apoor, low caste farmer, had to revert hack to growing lentils instead of rice.

The rich farmers were protecting their interests (land as well as water for their fields in Satrasaya Phant proper) at the cost of these small farmers and by doing so, they violated a local lawpertaining to rights of way. In other sections of the command area the farmers gave up portions of their fields along the canal alignment without compensation since they would benefit and, as one informant claimed, in the interest of the whole community. Elsewhere in the same village, farmers gave rights of way for another canal which irrigated fields donated to the village school even though they did not benefit directly. And in a neighbouring village, farmers gave right of way for a canal which did not irrigate their fields; they couldrequest and be given water in timesofseveredrought but they had no rights to the water. In all these cases, compensation was not sought or paid for the land given up although according to the National Code (Muliki Ain) they could claim compensation either in cash or land.

Why did the big farmers violate the local law concerningright of way? Laws are usually negotiated for each instance of its actualization. The relative strengths and interests of the negotiators as well as other stakeholders on the one hand, and the degree of effective social control and community feeling on the other, determine how the law will be actualised, put into practice. In this case the small farmers of Dumtar were not powerful enough to insist on right of way for the canal. The big farmers did not want the canal to be extended to Dumtar because once it was done, the farmers would insist on acquiring water and the would affect water supply to their fields in times of drought. Another reason was that farmers from other sections of the command area, e.g., Simle and Dungadi, were demanding that they be allocated more water than they had been allocated *so* far. Distributing water to Dumtar would have reduced water supply to their fields. These fanners, who are more organised and powerful than the small farmers of Dumtar, have managed to increase water allocation to their fields for themonsoon paddy crop fromtwice to fourtimesamonth. These farmers were not supportive of the small farmers of Dumtar because their interests clashed.

The Water Users Association, and especially the Management Committee, are responsible for assuring that the rights holders do receive irrigation but they have not done this. The old irrigators, the elites of Satrasaya Phant, continue to exercise control over water allocation, reserving first priority to themselves. **Farmers** of Simle, Dungadi and Kundare, not only receive water but over the past two years they have been receiveing water more frequently (from two times a month to once a week), after prolonged negotiations. While the big farmers of Dumtar do receive water regularly, the small farmers have not received irrigation yet though they have rights to water from the canal. Sailo Sarki along with other farmers have been demanding that the money they contributed for the deposit be returned to them if the canal was not extended to their fields but they have not yet received it most of the Satrasaya Phant farmers were not willing to return the money.

In both thesedisputes **wecanclearlyseethatallthepartiesacknowledgethefactthatstatefinancial** intervention changed existingproperty relations and water rights. While prior rights of the existing rights holders are recognized, for example, in the agreement that they would have first priority for water, the 'new' rights of those without previous rights to water from the canal are also accepted, but as secondary rights. The existing rights holders do not deny the rights of the 'newcomers' to water from Satrasaya Phant Kulo because the rehabilitation project was implemented with state funds on the condition that their fields are included in the command area and moreover, they had contributed cash for the deposit. The newcomers do not demand equal rights because they accept (or are forced to accept) the local law that prior appropriators and existing rights holders have first

rights to the water. The newcomers agreed to contribute more cash for the security deposit than the existingrights holders who hadpreviously investedinthe system andexistingricelandowners contributed less than upland (*pakho*) land owners. The terms the farmers agreed to took into account the rights of the old as well as new rights holders.

CONCLUSION

Changes in the physical structure, command area and operation and management organisation often result in changes in water rights of existing rights holders and those who did not have rights to water in the irrigation system. Water rights are reflected in water allocation and distribution (which include share of water and priority in distribution) as well as resource contributions made for original contruction and annual repair and maintenance.

We have seen how with the change of management functionary from the original five canal-builders to the Jimmawal, water allocation and distribution were altered. The Jimmawal's fields received more water than the fields owned by other farmers and similarly, he contributed less labourersperunit of land irrigated thanother farmers. When Jimmawals ceasedfunctioning, water contractors were employed to ensure that water was distributed and delivered according to agreed method and schedule.

With the initiation of the ILC project, there was a change in management organization. All the users of the irrigation system were members of the water users's association which met annually to select the managing committee members and discuss rules and regulations. But the major decisions were actually made by the leading farmers of Satrasay Phant, many of who were elected as committee members. The rules and regulations passed in the meetings often benefitted the big farmers more than the small farmers. This is clear in the case of the rule regarding labour contribution for regular repair and maintenance which previously was based on size of land irrigated and currently is one person per beneficiary household. However, this rule may not be as unfair as it looks at first sight if on takes into account previous contributions of the old beneficiaries to maintain the system.

Without the cooperation of the big farmers, the managing committee is not able to function effectively. This is illustrated by the case of the small farmers in Dumtar who areunable to irrigate their fields for their monsoon crops because the committee was unable to convince fanners to give right of way to extend the canal to their fields.

Changes in the physical structure affect water rights. When canals are improved and enlargement water supply is usually increased. More water can he supplied to traditionally irrigated fields or new fields can he irrigated. The existing rights holders, especially if they are powerful control, to a great extent, how the increased supply of water is allocated and distributed, even when the state intervenes.

In the two cases discussed earlier, physical structures were used as means of allocating and

distributing water. Water was not alloted or distributed to the Andhi Kholafarmers during the early phase of the project and this was done by not constructing outlets in the lined canal. Later when the fanners protested, they outlets were made to enable them to acquire water. The farmers of Dumtar were alloted water inprinciple but they could not acquire water because the canal was not extend to their fields. Whether water is distributed by rotation or simultaneously, the size of the outlets determine the volume of water the fields receive. The smaller the outlet, the **less** the water discharged into the branch or field canals for the same period of time.

When the government is involved in enlarging existing fanner managed irrigation systems, fanners without rights to water from the systems claim rights and often are able to acquire rights, even if secondary to the existing rights holders. But, and this point is often ignored by government officials, enlarging irrigation systems do not always ensure that the targeted beneficiaries have access to water from the system; they may have no access at all (as in the case of the Dumtar fanners) or have less access than targetted (as in the case of the fanners of Simle, Dungade and Kundare who received less water than agreed upon. In other words, some targeted beneficiaries may acquire rights to water from a system but may not have access to water.

The study illustrates the importance of understanding social relations between stakeholders, particularly between existing tights holders and those without rights. As we have seen existing rights holders are usually big farmers who are reluctant to share water with others. Small farmers find it difficult to gain access to water unless they are organized or strategically located at the head end of the command area. Farmers who are in a position to negotiate and negotiate hard are often able to acquire more water than they have been receiving as is illustrated by the case of the farmers from Simle, Dungadi and Kundare who were able to demand and be given water every Tuesday instead of twice a month.

Conflicts and disputes over water are endemic in imgation communities. They occur between individuals and between groups over water allocation and distribution, taking water out of turn, 'water stealing', resource contribution and so on.

There are ways to lessen, if not prevent, the occurence of conflicts. We have seen how better and more effective management such as water **users'** committee and rule enforcing agencies such as water contractors canlessen conflicts. Conflicts are lessened when rules are framed andacceptahle to most oftheusers. Similarly, suitable physical structurescan lessen conflicts if they aredesigned and operated in a manner which allows distribution of water as agreed upon

These mechanisms, however, are not effective in preventing conflicts between existing rights holders and those who do not have rights in **an** irrigation system, especially when the system is to be enlarged by donor or government grant. **In** such cases, the relations between **the** existing rights holders and the new claimants as well **as** the extent of state involvement determine how disputes are resolved, or whether they are resolved at all. If disputes are not resolved, the intended beneficiaries of extension and enlargement projects, especially if they are at the tail end of the command area, **do** not have access to water from the system (see Pradhan, Haq and Pradhan, this volume). Lack of access **to** water defeats the objective of projects to enlarge irrigation systems.

NOTES

1. This paper is a revised version of the paper presented at the conference titled "Water rights, conflict and policy" held in Kathmandu, Jan 23-26, 1996. We are grateful to Keebet Benda-Beckmann for extensive comments on this paper. This paper is based on fieldwork carried out by IIMI and FREEDEAL as part of the research project on " Water Rights in Nepal".

2. Durga K.C. worked for IIMI/ Nepal as research officer. Currently he is working on the process document research in Nepal for Mountain Resources Management Group. a local NGO. R. hadhan was formerly consultant to IIMI/Nepal for the research project on water rights in Nepal. Currently he is directing research on the second phase of the water rights in Nepal project for FREEDEAL, a Nepalese research organization.

REFERENCES

Ambler, John. 1990. "The influence of farmer water rights on the design of water-proportioning devices." In *Design issues in Farmer-managed irrigation Systems.* Colombo: International Irrigation Management Institute. pp 37-52.

Benda-Beckmann, K. von. 1984. "Forum shopping and shopping forums: dispute settlement in a Minangkahau village in West Sumatra, Indonesia. In K. von Benda-Beckmann, *The Broken Staircase to Consensus: Village Justice and State Courts in Minangkabau.* Dordrecht: Foris. pp 31-66.

Coward, Walt. 1990. " Property rights and newtork order: the case of irrigation works in the Western Himalayas" *Human Organization,* Vol. 49 (1):78-88.

Pradhan. Rajendra and Ujjwal Pradhan. 1996. " Staking a claim: Politics and conflicts between statutory and customary water rights in Nepal." Paper presented at the Sixth Annual Conference of the International Association for the Study of Common Property, "Voices from the Commons", Berkeley, California, June 5-8, 1996

Pradhan, Ujjwal. 1990. *Property Rights and State intervention in Hill irrigation Systems in Nepal* Ph.D. dissertation submitted to Cornell University.

1994. " Fanners' Water Rights and Their Relation to Data Collection and Management." In Sowerine, J, G. Shivakoti, U. Pradhan, A. Shukla, and E. Ostrom (eds.), *From Farmers' Fields to Data Fields and Back.* Kathmandu: IIMI\ IAAS. pp 187-198.

Shivakoti, Ganesh and Ujjwal Pradhan. 1995. "Managing support services: A comparative study of processes and performance of FMIS interventions in Nepal." In *Improving Support Services to Farmer Managed Irrigation Systems in Nepal.* Kathmandu: Research and Technology Development Branch\ IIMI. pp 1-16.

Uphoff, Norman, Ruth Meinzen-Dick, and Nancy St. Julien. 1985. *Getting the Process Right: Farmer Organization and Participation in Irrigation Water Management.* A State-of-the-Art paper prepared at Cornell University for the Water Management Synthesis II Project. Ithaca: Cornell University.