Farmer Managed Irrigation Systems in Nepal:
Some Issues and Trends’

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INTRODUCTION

Nepal is a poor country but is rich in water resources. Unfortunately the utilization of water resources is extremely limited. Nepal is an agrarian country but it has been able to irrigate merely 38% of its total cultivable land. Given the limited capacity of both the private and the public sectors to take new initiatives and the scarcity of resources, and despite the efforts being made to develop water resources, one can rightly assume that it will be difficult to narrow the gap between the growing demand and available supply of water, especially for irrigation. Due to the gap between growing demand and the available supply, disputes are inevitable over water rights, especially over the use of water for irrigation and other domestic purposes. As such, it has been deemed necessary to make an initial study of the issues and problems relating to the overall development of irrigation systems in Nepal.

This paper reports the findings of the survey on the water rights situation of the Nepalese farmers and the nature of conflicts over the use of water as well as the prevailing conflict resolution practices. The study team surveyed 40 farmer managed irrigation systems in seven districts and also visited judicial and quasi-judicial bodies in these districts. The basic objectives of the survey were to obtain a general impression about the legal status of irrigation management systems and the prevailing practices regarding conflict resolution as well as possible future research issues in this regard. The study team attempted to get general information of the 40 irrigation systems without going into much detail. Some of the important questions addressed in the field were as follows: Have these irrigation systems acquired legal status? Are the water use rights of the people curtailed or disturbed during expansion of the irrigation systems? Do the irrigation canal construction initiators get priority in the water use as per the existing legal provision? What is the process of acquiring land for canal construction? What are the problems of the farmers in the operation and maintenance of the irrigation systems?
GENERAL INFORMATION OF THE IRRIGATION SYSTEMS STUDIED

With the aforesaid objective the study team conducted a general survey of 40 irrigation systems of 7 districts representing both the inner valley and mid hill districts of Nepal. They are: 1. Gorkha, 2. Parbat, 3. Palpa, 4. Dang, 5. Chitwan, 6. Tanahun and 7. Sindhupalchowk. (See Annex-1 for the list of names of all irrigation systems studied). A check list of topics and questions was used to conduct the survey.

History of the Settlements

To begin with the overall analysis of the irrigation system, it is worth looking at the history of settlements of the areas undertaken for study. The settlements in the study areas are either old, new or mixed (settlement comprising of old and new settlers). For this reason, the settlements as a whole are classified into three different categories: (a) Old settlements, (b) New settlements and (c) Mixed settlements.

(i) **Old Settlements**: This category includes those areas where settlers began to live for at least 100 years or more. The settlers of 23 (58%) irrigation systems fall under this category.

(ii) **New Settlements**: In this category the settlements are occupied by new settlers. This category includes settlements where the settlers started living more than a hundred years ago. A total of 10 (25%) settlements are in this category, one of which, Dhanmashe Kumaltari in Gorkha District, is just over 8 years old.

(iii) **Mixed Settlements**: This category of settlement consists of both old and new settlers. Altogether there are 7 (17%) settlements in this category. In 6 settlements under this category Tharus are the traditional settlers whereas the new settlers belong to different ethnic communities. In the seventh settlement, people from different communities are living together who represent themselves as both old and new settlers.

Religious Composition

The overwhelming majority of the population (97.5%) in these settlements are Hindus, the others are Buddhists and Muslims. An isolated case of a settlement with Hindus and Buddhists living together in the Arjung Khola Irrigation Project area in Dang District is also recorded.

Political Organization

For administrative purposes Nepal is divided into five development regions, 75 districts, 36 Municipalities and 3995 Village Development Committees. All local bodies, viz., District Development Committees (DDC) and Municipalities or Village Development Committees (VDCs) have their own elected bodies to carry out day to day work and developmental activities. The DDCs are sub-divided into sub-districts known as *ilaka*, which vary in number between 9 to 17, depending on the area and population size. Similarly, Municipalities are divided into nine or
more wards whereas the VDCs are divided into nine wards. The wards are headed by elected representatives.

These local bodies have the legal mandate to initiate water related projects, utilize and protect water resources and dispense justice to the extent permitted under the existing laws. However, in practice, the majority of the irrigation projects are constructed and managed by the beneficiaries themselves without, or with minimum support and intervention of, the concerned local level bodies. The canals are in general extended beyond one ward or VDC.

Land Cultivators and Landowners

In all the systems surveyed, land is cultivated both by the landowners as well as by tenants. Land cultivated by the owners themselves vary from system to system: between 4% to 100% of the land indifferent systems. More than 50% of the land are cultivated by the owners in 31 systems. Tenants cultivate less land than owners in most systems. There are three types of tenancy:

(i) Tenants do the farming and take most of the harvest. This system of land tenure is practiced in 21 systems and between 10 to 30% of the cultivated land is fanned in this manner.

(ii) Tenants do all the fanning but share the produce equally with the owners of the land. This type of land tenure covers between 20 to 50% of all cultivated land in 28 systems.

(iii) Tenants do the farming and share the produce with the landowner, based on agreement. This system was recorded in only 2 systems: in one 5% of the cultivated land was cultivated according to this land tenure system and in another less than one hectare.

Most of the land are owned by the high caste Brahmans and Chhetris. They own on an average 43% and 31% respectively of the land in the irrigation systems studied. Brahmans are the major landowners in 21 systems and Chhetris in 8 systems. Tharus own about 30% of the land in the systems they are predominant whereas Newars own 13% and the low caste Damais, Kamis and Sarkis jointly own 12% of the land. In other words, the highest and the lowest castes own most and least portion of land.

Ownership of Land on Which There is a Source of Water

Land on which there is a source of water may belong to (be owned by) the government, the public or private individuals, depending upon the nature of the water source. The term ‘public’ has been used to refer to land owned by local bodies. It is to be noted that none of the sectors may monopolize the use of water resources only on the basis of ownership of the land. There are altogether 21 irrigation systems (67%) which have exploited water sources originating on government lands. The origin of the source of water of one system, the Arjung Khola Irrigation Project in Dang District, is a jungle, a government property. The sources of water of other systems originate simultaneously in both public (of VDCs) and private lands. One of the systems in this category is Anjana canal in Chitwan District which was initially owned by the Government but was later handed over to private owners.
Land Acquisition Methods

Canals pass through government, public or private land. Land on which the canal is to be constructed has to be acquired by the canal users either by paying compensation or by agreement without paying compensation. Compensation is usually not paid for government or public land and for the land of those who benefit from the canal. In the irrigation systems studied, lands for constructing canals were acquired by adopting a few but effective methods. Only two cases were detected in which compensation was paid in the form of cash or land for the acquisition of the land. In the first case, the construction of Gangate Irrigation canal in Gorkha District was initiated in 1959 by local farmers, under the leadership of Mr. Ghanshyam Aryal and his brothers. The problem faced in this project was that there was a small plot of land (about 684 Sq. ft.) owned by Mr. Abdul Miya near the source of water and unfortunately the canal had to occupy all of his land but he would not benefit from the project. The local farmers decided to raise a fund from the beneficiaries of the project to purchase a plot of land (10952 sq. ft.) for Mr. Miya which could be irrigated by the canal. This plan was accepted by Mr. Miya and canal construction was completed as per the agreement. However, some farmers gave their land without taking any compensation on the ground that they were to benefit from the project.

In another case, namely, the Chauwa Khola Irrigation System, the original canal was constructed by local the Tharu community in 1839 and it was improved and enlarged in 1993 with partial loan assistance from the World Bank and the Agriculture Development Bank, Nepal. The Village Development Committee decided to provide compensation to the land owners whose land had been acquired by the project but did not benefit from it. The total amount of compensation was about two hundred thousand rupees.

Compensation has not been paid in any form in 29 (94%) of the systems because the affected parties also benefitted from the irrigation canals constructed on their land. The affected parties of 10 systems out of the 29 were also convinced by the advice and suggestions received from the local leaders.

Similarly, extension of canals were done by acquiring lands of the users. Compensation was not necessary in such cases because they benefitted from the extended command area. It was observed that in 25 systems the required lands have been acquired from the users without paying any compensation. It is interesting to note that in 5 out of the above mentioned 25 systems lands were acquired by mutual understanding from individual or families who did not benefit by the extension of the canals. In another 10 systems land was acquired from the public or government agency. There is an isolated case of compensation being paid to 15 affected families. The Kumroj Paschim Third Irrigation Project, Chitwan District, paid a sum of a little over Rs. eight million as compensation to the concerned landowners. The amount of compensation indicates that the construction of the project must have been initiated (and financed) by the government.
HISTORY OF THE IRRIGATION SYSTEMS

The Water Sources of the Systems

The sources of water for most of the irrigation systems (93%) are streams. Only 5% (2 out of 40 systems) tap rivers (Narayani in Chitwan District and Rapti in Dang District). And one system, Anjana canal in Chitwan District, depends on a water fall and a lake.

When Were They Built?

Of the 40 irrigation systems surveyed, 17 systems (43%) were constructed between 100 to 450 years ago and 22 systems (55%) were constructed within the past 100 years. The Raj Kulo in Palpa District was constructed by King Mani Mukund Sen, about four centuries ago. King Mukund Sen was the king of a petty kingdom ruled by the Sen dynasty. One system, the Narayani Irrigation System in Chitwan District, constructed by the government, could not be completed. The system operates only in some part of the command area.

Who Initiated Construction of the Canals?

From the very beginning, local landlords have initiated the construction of canals; but other farmers and institutions have also contributed. Individuals who had ‘good influence’, i.e., who were respected in their communities, initiated construction work of 18 systems. In some cases they were local leaders and in two instances (both in Palpa District) it was King Mani Mukunda Sen and Shree 3 Maharaja Juddha Shamsher (i.e., the Rana Prime Minister then) who were involved in initiating construction of the canals. Local farmers (the users) initiated construction of 11 canals (31%). Although some influential individuals floated the initial idea of construction of canals, the ordinary farmers initiated the actual construction work. They were the major contributors for the construction works.

Governmental or non-governmental agencies initiated construction of canals where the necessity for such a construction was realized by either the government or the local farmers but the latter lacked the required resources. The survey reveals that some governmental and non-governmental organizations are involved in the construction of several irrigation projects. Such construction works were carried in 7 systems (19%). Governmental and non-governmental organizations undertaking construction of such canals are: the Department of Irrigation, the Department of Soil Conservation and Meteorology, Small Irrigation Project, Agriculture Development Bank, District Development Committees, Village Development Committees, Ward Committees, and projects such as Irrigation Line of Credit (ILC).

Sources of Expenditure

The leading persons (local elites) in all the systems have mobilized various resources for the construction of their respective canals. Such resources include individual contributions, HMG’s grant, DDC and VDC development funds, loans (even from international agencies like the ADB and World Bank), Food-for-Work Program, people’s participation in the form of cash and labor,
etc. However, it needs to be noted that the contribution of the users in terms of cash is not as important as their participation for the sustainability of the system.

Loans were sometimes taken by farmers from the Agriculture Development Bank (ADB/N) for the construction or rehabilitation/enlargement of irrigation systems with the intention of repaying the amount through the increased grain production. Large loans taken from international agencies such as the Asian Development Bank and the World Bank are to be repaid by the government per the agreement. Seven irrigation systems had to take loan from the Agriculture Development Bank. In most cases, the farmers took loan to fulfil their financial commitment (i.e., from 5% to 10% of the total budget) in the projects in which substantial portion of the cost for the construction of irrigation systems was either donated or given as loan by HMG, the World Bank, SINKALAMA Project, ILC project, etc. for the construction of the irrigation projects. Loans were taken for the construction of four irrigation systems, for the rehabilitation and improvement of two systems and for the construction as well as repair of one system.

The farmers have to mortgage their land to the bank when they loan from it. Usually, the concerned water users association decide how much individual farmers have to contribute to repay the loan and this is normally based on the size of the land to be irrigated. If the loan is not repaid as per the agreement with the bank, it can auction off the mortgaged lands to recover the loan. Of the systems studied, notice for the auction of mortgaged lands has been served to the farmers of only one system. When questioned about this issue, the farmers informed the study team that they were unable to repay the loan because agriculture production was not sufficient to save money and they lacked alternative source of income.

This may lead one to wonder how a bank, established for the welfare of the farmers and to increase their standard of living, can render the farmers “landless.” There may be other issues to be examined in this regard such as the problems faced by the farmers and the bank in this direction. Why are the farmers unable to repay the loan? What could be other alternatives if loans are not repaid? What are the ultimate result in majority of cases?

In twenty-three out of the twenty-four systems for which data is available, the basis of resource contribution for construction of canals is either size of landholding or the number of user households. The users with larger landholding contribute more than those with smaller lands. In some cases, all households contribute equally irrespective of the size of land they own. The Sishne Dovan Irrigation Project in Palpa District is an isolated case of “will and financial capacity” of the donors as a basis for contribution of resources. This means that affluent households as asked to contribute more than others, irrespective of the size of their lands.

Expansion of the System

It has become necessary to expand irrigation systems to meet the increase in demand for irrigation. For this reason, the irrigation capacity and command areas of 30 systems (about 83%) have been increased. Although all the demand for irrigation cannot be met, the enlargement of these systems means that they are capable to benefiting new irrigators to some extent. However, the irrigation capacity and command areas of about 17% of the systems could be increased.
The expansion of the systems were mainly done through the decisions and understanding of the Water Users’ Associations (WUAs) and the Department of Irrigation (DOI). The WUAs normally call a meeting of the users and the issues are decided by the users present. The number of the decisions taken by both the actors are almost similar, i.e., 14 and 13 respectively. Whereas, the decision regarding expansion of the irrigation facilities of the remaining 3 systems were taken by their respective water user’s committees.

In 27 of the irrigation systems not a single existing beneficiary household has been left out from the extended command areas. In three systems existing user households have been left out of the expanded command area.

**LOCAL LEADERSHIP AND ORGANIZATION**

**Organization/Water Users Associations**

**Registration of WUA**

The data of the survey indicates that 38 WUAs have been formed by the respective users. Among them only 21 WUAs (a little over 55%) have registered their organizations with the concerned governmental agency, i.e., the CDO office. The WUAs have to submit their constitution while filing application for registration. The informally formed or unregistered WUAs are not considered as legal entities and have to face many legal complications such as they are not entitled to receive loans, they can not operate bank account in their own names, etc.

**Formation Process**

The records of the survey provides information of the formation process of only 36 systems. The formation processes of committees and associations of water users includes consent, nomination and election. In 26 systems committee members were selected by common consent of the users. In four systems both nomination and election are used to select their committee members. This has happened in systems where nomination alone was not effective and some of the candidates had to be selected by means of elections. There are two more systems which use both consent and election as the basis for the formation of their organizations. One of the systems has adopted election as the process of forming the main body and consent as the basis for the formation of sub-committee established for the operation of branch units. In the other system election is used to select members of its executive body.

**Basis of Membership of the Executive Committees**

The systems have several criteria for providing membership to the executive committees (management committees) of the WUAs. The foremost criteria to be a member of the executive committee of WUA is to be a user of the system. But this criterion has not been mandatorily applied in all the 33 systems which responded to this question. It seems that much attention has been paid, while selecting the committee officials, to geographical representation and to personalities who
are active, trustworthy and have leadership quality; and also those who can spare time to work for the committee. The responses received reveal that they tried to select their members, as far as possible with all the qualities mentioned above. For some systems only one quality was enough while selecting the committee members.

**Tenure of Officials**

The tenure of the officials of the WUAs is between one to three years. The tenure in most of the systems is two years. The Kalapani Praganda Kulo in Dang District has a unspecified period of tenure, but the project may if it feels necessary restructure the committee and may make required changes among the officials especially during the month of Magh (15 Jan. to 14 Feb.).

**Fund and it’s Operation**

The funds of WUAs are generated through cash and lab or contribution, grain donation, water fees, fines, etc. Only 15 WUAs generate funds from these sources but they have very little cash funds, which range between Rs. 200 to Rs. 35,000. Only a few systems have been able to save money. The maximum amount saved by the WUAs was by the Katuwa Khola Irrigation Project in Dang District which, after accounting all the expenses incurred, saved only Rs. five to six thousand. In one-fourth of the total systems studied, resources are raised whenever it is felt necessary (and not regularly as in other systems). The farmers currently contribute both cash and labor as required for their systems.

The funds of the WUAs are operated by officials who vary from one system to another. The chairmen of 10 WUAs operate the funds of their associations. Amongst them, in some cases, the secretaries and, in others, treasurers co-operate with the chairmen in the operation of the funds. The treasurers operate the funds of their WUAs solely by themselves in six systems and the treasurers in three. In two WUAs the watchmen have been made responsible for the operation of the funds.

In two cases, the operation of the WUA funds have been entrusted to the VDC chairman and an individual of the respective communities. In the Dhanmashe Kumaltar Irrigation System in Gorkha District, the Village Development Committee chairman and a villager, who possess the largest area of land in the system, operate the WUA fund. The users of the Pakhariya Irrigation Project in Dang District have selected an individual, Mr. Durga Bahadur K.C., as their leader and also entrusted him with the responsibility of operating the fund.

Bank accounts have been opened by 13 WUAs (out of 32 systems) to operate their funds whereas others have yet to do so, for unknown reasons. The users of Shirkatty Kulo, Dang District, revealed that they had not opened a bank account as they were lending money to local individuals levying interest which in turn helped them make extra money for the system.

The survey did not discover any financial irregularities in the funds of the WUAs. However, it was noticed that the account keeping system practiced is not very “scientific”. The reason being that the local people lack proper knowledge about keeping accounts ‘scientifically’.
Decision Making Process

The meetings of the executive body of WUAs are held in different months in different systems as per the will and necessity felt by the respective WUAs. The Sishnevan Irrigation Project in Palpa District seems to be the only WUA which holds its meeting every month. In fourteen WUAs, meetings of the executive committee are held twice a year, especially during the months of *Jestha* and *Magh* (mid-May to mid-June and mid-January to mid-February), i.e., right before plantation seasons of summer and winter crops. Meetings are held annually in five systems and in the remaining systems they are held whenever necessary. In general, the meetings are called during *Jestha, Kartik* and *Magh* (between mid-May to mid-June; mid-October to mid-November; and mid-January to mid-February). Meetings are necessary during these months because the canals have to be cleaned and arrangements made for water distribution in preparation for irrigation of the monsoon and winter crops.

The meetings of WUAs are generally held in public meeting areas such as open fields, VDC buildings, schools, etc. However, there are four WUAs which hold meetings in the courtyards of some individuals. The meetings of the *Budhi Kulo* in Gorkha District, are held near the source of water because the committee members make on the spot inspection and monitor the situation from time to time.

All the WUAs have made it mandatory for all the committee members to attend the meetings. Those who are absent from meetings are liable to be punished. In some associations, membership may be revoked if a person does not attend three consecutive committee meetings, while in two WUAs, committee members are not punished for not attending meetings. The study team recorded one instance of a committee member being fined Rs. 50 for being absent from a meeting.

In 28 WUAs decisions are made jointly by the committee officials and the ordinary members of the associations during meetings. The procedure usually followed is that the committee members first extensively discuss the agenda and then all the members unanimously pass the resolutions. However, in two WUAs, decisions are passed during meetings by majority vote and not by unanimous consent of all present. In the majority of their irrigation systems (36), the WUA meetings are attended by both the committee members as well as ordinary members and although all the present may not vote, they do sign the minutes of the meetings. This allows for transparency as well broad participation in the decision-making process.

Relation with Local Bodies

Of the irrigation systems studied, 27 WUAs stated that their relations with their respective local bodies, namely, VDCs and DDCs was good and only one recorded dissatisfaction with the role of their local bodies, but the reason thereof is not known. And nine WUAs have not involved the local bodies in their activities.
Functioning of the Systems

Operation and Maintenance

In most of the irrigation systems surveyed, maintenance and operational works such as cleaning, repairing, acquisition and delivery of water, etc., are carried out as per traditional practices or the needs of the area. Maintenance and operation activities may be carried out by the users themselves or by operators employed by the users. However, an operator is basically a watchman called by different names in different localities and irrigation systems, such as Pale, Katkandar, Chaukidar, Dhalpa, Sardaruwa, Thedkar, Sipahi, Peon, etc. The responsibilities of the operators (watchmen), whatever they may be called, are to guard and operate the canal and look after the smooth distribution of water for irrigation purpose. Watchmen have been appointed, usually by the chairmen of the WUAs, in 45% of their irrigation systems on an annual basis while in a few systems, they are appointed only for the monsoon season, when the demand for water as well as conflicts increase. A few WUAs do not plan to employ watchmen while they will be appointed in other systems when they (the irrigation systems currently 'managed' by the government) are handed over (turned over) to the users' associations by the government.

The users of the canals have to contribute labor, cash or kind (grains, construction materials, etc.) for the operation and maintenance of their irrigation systems. In 31 systems, the users are compelled to contribute resources on a regular basis for repair and maintenance. Amongst them, the chairmen of 23 WUAs (74%) call the farmers to work to repair and maintain their canals. In some of the cases the chairmen direct the contractors/watchmen to call the users for their participation in the maintenance works. The survey also recorded three systems where maintenance work is done on the basis of information given by individuals or the users. In two systems the users are called by the Sardaruwas (the watchmen) to contribute their labour for maintenance works.

Emergency maintenance work had been carried out in 36 (90%) of the 40 systems; the other systems did not require emergency maintenance work because they were newly built.

Water Distribution

Altogether 33 systems were recorded to have given some sort of priority to the process of water distribution. Amongst them almost all the systems have given priority for the irrigation of different kinds of crops. However, the Chepetar Irrigation Project in Gorkha District has given water use priority to brick making for the construction of the house of a user. Similarly, the Kharkhola Khahare and Armadi and Pahare Khanda Irrigation Projects in Gorkha and Parbat districts have given priority to drinking and irrigation purposes respectively.

In general, turn by turn method of water distribution is practiced. Altogether 36 irrigation systems (90%) follow this method, of which 34 systems have adopted the head-to-tail end or vise versa method of water distribution. The widespread use of this method shows that most associations use systematic method of water distribution for irrigation.

The timing of water distribution for irrigation is an important factor especially during the plantation period. However, water cannot be delivered to the fields as demanded because of the
high demand and the limited capacity of the systems. The users of 20 systems (50%) are satisfied the timing of water delivery to their fields whereas the users of 17 systems expressed dissatisfaction for not receiving water at an appropriate time. In some systems, for example, the Anjana Irrigation System in Chitwan District, water is inadequate for the extended command area especially during the winter period. This sort of problems is faced especially by the tailend users due to insufficient flow of water in the canal.

The role of water distributor is performed by different individuals in different systems. In 13 systems the chainmen of water users committee are responsible for taking decisions on distribution of water to the users whereas this task is performed by the users themselves in nine systems. This task is carried out by watchmen in eight systems and by committee members themselves in six systems. For Khageri Irrigation Project in Chitwan District, it was observed that the officials of the project and the committee jointly play the role of water distributor but, in case of extreme dry season, the elderly persons of the Katuwal family are also engaged in the distribution of water. The Shirkatty Kulo in Dang District presents an isolated case of a Sardaruwa (watchman) being fully in charge of decision making regarding water distribution.

In most systems the water distributors are responsible only for distribution of water whereas in other systems additional duties have been entrusted to them. However, additional responsibilities relating to water distribution depends on the position occupied by the water distributor. Such additional responsibilities are necessary in 24 systems for the smooth and effective operation of the irrigation systems. The water distributors are required to undertake activities as suggested by their respective committees. Some of the important additional duties entrusted are as follows:

- To collect fines;
- To work as directed by the committee or project chief;
- To report to the committee on the status of the canal;
- To arrange for the outlet of the canal;
- To supply water to all the users within the command area on turn by turn basis by giving priority to those plots where seeds are drying for lack of water;
- To mobilize resources and labor for the operation, repair and maintenance of the canal;
- To implement the rules regarding the operation and maintenance of the systems;
- To facilitate dispute resolution process.

During the process of water distribution the water distributor has to face varied problems and the systems under survey were no exception. The problems noted are more or less the same as mentioned below, under the sub-heading of “operational problems”.
PROBLEMS, CONFLICTS, DISPUTES

Operational Problems

It is rare to find irrigation systems without any operational problems. The survey also reveals that the majority of the systems are plagued with operational problems. In many cases the problems have disrupted the smooth functioning of the systems. The following are the common problems prevalent in the systems studied:

(i) Lack of leadership and passiveness of water users' associations have led to problems of regular operation of the canals and mobilization of resources, especially cash;

(ii) Lack of definite rules for the operation of the canals;

(iii) Problems of water stealing;

(iv) Controversy over labour contribution and sharing of water between old and new users;

(v) The conversion of bari or bhit (unirrigated, upland) to kket (irrigated land) by head and middle users decreases water flow to tail end users;

(vi) The volume of water in the canals are reduced during the dry season due to the fact that the canals are not lined/cemented;

(vii) Government projects are handed over to the users even before they are completed;

(viii) The watchman appointed by the government has no contact with the users, leading to lack of coordination;

(ix) Lack of persons to work as watchmen

Disputes

During the survey, water related disputes were recorded in 37 of the 40 irrigation systems studied. The average number of disputes annually per system was five (190 cases of disputes in 37 systems). The number of disputes varies from system to system: 2 conflicts each in 2 systems, 4 in 20 systems, 6 in 8 systems, 7 in 4 systems and 10 in 3 systems. Surprisingly no conflicts were recorded in three systems.

Reasons for Disputes

The data of the survey on the general reasons for the disputes over water related issues are available for only 33 systems. The reasons for the disputes between the users are very similar. Most of the disputes (67%) occurred when farmers diverted water to their fields out of turn, that is over deviation from the water schedule as arranged by the Water Users Associations. Disputes also occur over sharing of inadequate supply of water, (21% of the cases), especially during the dry season (mid-February to mid-June). Only 12% of the disputes were over the sources of water of the irrigation systems.
Nature of Conflicts

The users of the irrigation systems express their conflicts over water issues in several ways, such as by merely voicing dissatisfaction, quarrelling, physical altercation, and filing cases in local administration offices or the court. During the survey, 35 cases of the following nature were recorded which we have classified in three separate categories, namely, (i) conflicts which were limited to verbal quarrelling only and which did not escalate (71%); (ii) conflicts which were limited to expression of dissatisfaction because the parties, for whatever reason, were not willing to or unable to quarrel (6%); and (iii) conflicts which were taken to the local administration offices or court (23%).

Inter-system Disputes and Their Reasons

The fieldsurveyrecorded not only intra-system but also inter-system conflicts. Of the 40 irrigation systems studied, 15 have conflict with outsiders, of which 14 systems have conflict with users of other irrigation systems and one with a water mill and another irrigation system. Thus in almost all cases conflict is with users of other systems which undoubtedly indicates the lack of proper policy and law on the sharing of water among users of different irrigation systems having the same water source.

The reason for four conflicts are similar: disputes over rights to water sources. The reasons for the other 11 inter-systems conflicts are divergent. They are:

(i) Construction of new canals in an old system.
(ii) Damaging of canals.
(iii) Diversion of water for drinking purposes
(iv) Disputes over water allocation between old and new irrigation systems, from the same source.
(v) Insufficient water during winter season.
(vi) Insufficiency of water due to extension of command area.

Six irrigation systems brought their inter-system conflicts to formal judicial and quasi judicial bodies. Whereas other nine systems tried to resolve their conflicts themselves regarding use and sharing of the water source through mediation but all of them proved to be temporary and the conflict arose time and again. These conflicts are still on going.

Resolution of Disputes

(i) Where do the disputing parties go at first and who settles the disputes?

Several actors are involved in resolving conflicts in the systems studied. Conflicts were resolved in 64 (89%) of the cases by the concerned WUAs with assistance from ward committees, VDCs and local elites. This is because they are more accessible to the users in many respects than other
agencies such as judicial and quasi-judicial bodies in the district headquarters. Local elites have very often been sought for the purpose of dispute resolution. Of these 64 dispute cases, the highest number of cases (66%) were resolved by the help of local elites. From this fact, it may be submitted that the users have more faith in the local elites than other agencies in this regard. The role of VDCs in assisting the WUA in resolving disputes figured in 17 (26%) cases whereas ward committees were involved in helping resolve only 5 (8%) of the cases. A note worthy fact is that not even a single case has been handled by the Water Resource Committee formed under the Water Resources Act in each district of Nepal. This may be because the local farmers are not aware of the existence of such a committee in their district headquarter. The local District Administration Offices (CDO) resolved 3 (4%) of the cases and the district courts 8 (11%) cases. The low percentage of cases filed with and resolved by the CDO office or the court reflects the fact that the users do not want to get involved in cumbersome legal suits which for them is troublesome and an unnecessary waste of time and money.

(ii) **Whether the decisions were implemented or not**

During the survey, the fieldworkers were able to record only 29 decisions, which were made by WUAs, local people, VDCs and district courts. The decisions of 16 cases (55%) were already implemented and the rest of the decisions (45%) were in the process of implementation. The records do not indicate the non-execution of any decision which proves that the disputing parties more or less respect, and to a large extent, accept the dispute resolution decisions made locally.

While assessing the implementation of the decisions on the basis of who made the decisions, 10 decisions of WUAs were already implemented whereas 12 were in the process of implementation. Three decisions taken by the WUAs with the help of the local people had already been implemented and two were in the process of implementation. One decision each of a VDC and a district court were also already implemented. This in totality reflects that many water related cases are being resolved by WUAs and the implementation of their decisions is also very high. However, the role of the local people, who have no authority to hear water related cases but nevertheless do so, is vital in resolving disputes. They resolve disputes by themselves or help WUAs or VDCs in this process.

(iii) **Acceptance of the decisions and writ and appeals**

On the issue of whether writ petitions or appeals were filed against the decisions of the WUAs, only 37 responses were recorded during the survey. In only four (11%) of the cases have the parties, unhappy or dissatisfied with the decisions made by the WUAs or those who felt their interests were affected or injustice had been done to them, filed petition in the concerned district courts. In most of the cases (89%) the parties accepted the decisions as an effective mechanism for the resolution of such disputes. It is submitted that the users tend to accept the decisions of the respective WUAs as final and they do not try to follow the cumbersome legal procedures for the settlement of their disputes.
CONCLUSION

The charm and dynamism of successfully running irrigation systems depend on many factors, all of which are found in Nepalese farmer managed irrigation systems. To cite a few factors: inexpensive rehabilitation and expansion projects; accommodation of new users by extending command areas while not excluding old users; equal respect and equal treatment to all the users; priority in water distribution according to need, i.e., need of crops and not of persons; better understanding among the users; voluntary and active participation of the users in the management as well as maintenance of their systems; involvement of users in the decision making process, i.e., decision making is not monopolized by the users’ committee: capabilities to use the available resources properly; and their capability to resolve conflicts in their systems, etc. Another vital dimension is flexibility in running irrigation systems. For example, watchmen are entrusted with judicial authority, an user who is not a WUA committee member can operate the bank account of the association, etc. The issues mentioned above may seem to be problematic in some instances but they are not so critical as to cease the operation of the whole system.

A substantial number of irrigation systems (45%) were initiated by individuals which in turn has resulted in the emergence of informal leadership and has contributed a lot in the establishment of irrigation systems. Though the people who initiated and completed the construction of canals can legally claim prior water use rights, the field staff did not discover such practices which means that everyone is treated on equal footing within the system.

The farmers in all the systems, except two, made available land for the construction of canals without any compensation or creating any dispute or legal complication. This fact has certainly made the projects less expensive and viable as well as less problematic.

In general people try to evade conflicts by being absent from the spot where the other party is reacting in anger. If conflicts arise, they are usually solved locally through mediation process. The majority of the cases which were filed with judicial or quasi-judicial bodies were registered without first trying to resolve them through locally available process of mediation. The number of such cases may be decreased if the people are made aware of the advantages and disadvantages of both methods of conflict resolution.

Disputes between different irrigation systems and competitive users such as water mill or other industries or drinking water projects are on the increase due to limited water supply and high demand, in specific areas, and also the ever growing population pressure. In such a situation, there is an urgent need to protect water rights of the people through legal mechanisms and to make the users aware of their (legal) water rights and the measures to be followed to protect their rights. The level of legal awareness of the local farmers is very poor. In many instances, others have exploited their poor legal awareness to adversely affect them but they lack the knowledge to deal with such situations. The users of irrigation systems experience other problems and conflicts due to their lack of scientific account keeping, knowledge about registration of their association, and good management practices. It is therefore recommended that programmes be launched to make the farmers aware of their legal rights, teach them the process of registering their association and how to effectively manage it. Conducting seminars, workshop, training sessions, legal counselling and
publishing bulletins in simple Nepali are some of the means of making the farmers aware of their rights and helping them manage their associations more effectively.

NOTES

1. This is a revised version of the paper presented at the workshop on Water Rights, Conflict and Policy. Kathmandu, January 22-24, 1996.
2. Both authors are associated with FREDEAL.
3. Due to various reasons, date for all the 40 irrigation systems were not available for all the topics. The number of systems for which data were available vary from topic to topic. Hence while presenting data in different places, the percentages have been calculated on the basis of the number of systems for which data were available for that specific topic.