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PRACTICE AND CONFLICT MANAGEMENT IN FARMER MANAGED IRRIGATION SYSTEM IN NEPAL

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Abstract

The main objective of this research is to investigates the practice of farmer managed irrigation system and existing conflicts management practice of farmer managed irrigation system (FMIS), which concerning the construction, operation, maintenance and conflict management of local irrigation systems. The farmers of the study area managed the irrigation system with the adaptation of indigenous knowledge and practices relating to various irrigation management activities such as water allocation, distribution and conflict management. The study is based on structured interview, Focus Group Discussion (FGD) and Key Informant Interview for the data collection. The major battle in FMIS in Nepal that are discussed here are water allocation and distribution, external development, assistance, resource misuse, operation and maintenance, and water tax collection.

Key words: Irrigation System, Practice, Conflict Management, Farmer, Allocation

Introduction and Concise Review

Nepal is predominantly an agricultural country with 57 percent of its total economically active population engaged in agriculture (CBS; 2011). Agriculture is the main source of livelihood for the people and backbone of the country. The chief economic activities of the people of the area, is agriculture. For the agricultural development irrigation is most important factor. So, agriculture is referred to us the “backbone” of the Nepali Economy due to its unchallenged contribution to the gross domestic production (GDP). Irrigation has proved to be one of the most important factors of agriculture production in those areas where the rainfall is not adequate. Most of the farmers are depend on rain fed agriculture. Therefore irrigation is identified as the key component to accelerate intensity and sustain the agricultural production.

Traditionally, Farmer Managed Irrigation System (FMIS) in Nepal have been survived on self-help basis. Mechanisms of irrigation management tasks- allocation, distribution, resource mobilization and conflict management are properly established by the FMIS. Farmer managed irrigation system has been playing vital role in agriculture of the country and contributing to the evolution and development of irrigated agriculture in Nepal. Farmer managed irrigation syst em occupies a significant status in the national economy and food security of the country. It is estimated that forty percent of food product is produced out of 15000 FMIS in hill areas and 1700 systems in the Tarai of Nepal. Out of the irrigated area in Nepal almost 70 percent fall under the FMIS. They are the vibrant system. FMIS has the long history and they are still active institutions in Nepal. FMISs are the national heritages like other monuments of the country. Again FMISs are the symbols

of democratic values. The community owing the system manages the resources on their own. Hence, FMISs has special place in the irrigated agriculture in Nepal (Pradhan, 2000).

Little is known about the evolution of irrigated agriculture of Nepal. Irrigation development probably started as early as the first agriculture settlements. Many authors agreed that the history of irrigation development in the hill valley of Nepal date back centuries. Some of them represent words oldest irrigation system built and operated by farmers (IIMI, 1991). Historically, irrigation development in Nepal has fallen under the domain of religious trust, individual initiatives or community efforts. Some ancient irrigation systems and their institutions are still working in the hill.

Poudel (2000) states that farmer's practices for water use were first recognized during the Lichchhavi dynasty. Since then the legal tradition and local administrative structures have permitted FMISs to operate without interference from an irrigation agency. The Malla kings, however, made, repair and maintenance of the irrigation canals by their respective users mandatory once every year. For the agricultural development, the kings managed the various irrigation systems in the form of public and private sectors, which are known as *Raj Kulo*. And other rulers also continued to the irrigation system as *Nahar* (canal) for the people.

The irrigation related water resource act 1967 was the first attempt by the state to introduce specific legislation on water resources for multiple uses (Pradhan, 1994). The rights of individuals and groups to construct irrigation system were recognized under this act as well. The concept of the payment of irrigation services fees was also in corporate into the act. Government approaches and policies for irrigation development introduced major changes beginning with the seventh five year development plan, which emphasized people's participation in irrigation management and development the Eighth, Ninth and Tenth development plan also for the emphasized users' participation from inception to operation and management of the irrigation schemes, use of local materials and technology and private sector participation in irrigation development.

As a part of the national policy attempt have also been made to reform the land use pattern, agricultural system and to develop new irrigation system while improving existing ones by increasing their productivity. During this process several conflicts have erupted at different level and intensities in several part of the country (Upreti, 2000). Nevertheless, such conflict is still not receiving proper attention at the level of researchers. Physical and tyrannical issues, lacking social dimensions, dominate research agendas of Nepal's natural resource management. This has tremendous implication for the sustainability of natural resources. Surprisingly, very few studies focus on the roles and impacts of conflicts in Nepalese NRM (Sheila et.al. 1997, Hadean et.al. 1997, Upreti, 1998, Khanal, 1998). Farmer managed Irrigation Systems (FMIS) of the country facing the conflict associated major problems. It would be problematic to find example of irrigation systems, where conflict never happened. The planned FMIS is also not free from the reality.

Based on the report of Shukla and Sharma (1994), it is estimated that the public sector now supports the irrigation of only 11 percent of the total cultivated land in Nepal. It

accounts for only about 30 percent of the total irrigated land. Department of Irrigation (DoI) manages nearly hundred irrigation systems covering approximately 267,500 hectares of irrigated land (IMC, 1989). The state also started the rehabilitation, extension and improvement of FMISs in 1981 (Pradhan and Pradhan, 1996). Many government and non-governmental agencies have been involved in assisting to manage-mental and improvement of traditionally FMIS in Nepal. The common objectives of all these agencies are to help farmers preserve their organizational and managerial strengths. Assistance of some of the FMIS, have decreased the maintenance cost to user and increased the overall efficiency of their irrigation systems. But in some cases the local organizational effectiveness has declined to external intervention (Shivakoti, 1992).

The local community witnesses' decentralization through the Farmer managed irrigation system (FMIS) and natural resource management. The development of its' own organization, norms and values governing the management of water resources; resource mobilization and conflict management is accomplished by the community.

Daniels and Walker (1997) have mentioned that conflict is an active stage of disagreement between people with opposing opinions, Principles and practices manifested in different forms (grievance, conflict and disputes). Grievance is an initial stage of conflict in which individuals and groups are perceived to be unjust, and provides ground for the resentment or complaints. This condition potentially erupts into conflict when this stage turns into conflict antagonism is caused by a clash of cultural, political, social or economic interests between individual and groups. At the final stage of conflict, people make the matter public and opting the confrontation. They further write that conflict management is making process. A part of improving the conflict situation, progress may be developed in mutual gins, learning, achieving agreements, laying foundations for further negotiation or fully resolving conflict. Progress is a way of thinking about a conflict situation that recognizes hat conflicts are inevitable and ongoing and management of these conflicts comes from continual improvement in areas of substance and relationships.

The tradition of self-governing system and community participation are important and common features throughout the management of this system. FMIS are now at the crossroads. Farmer managed irrigation system has to face the various challenges from the very beginning. There are challenges in operation and maintenance, external intervention, technology, new command area, resources utilization and conflict management. The above discussion shows that FMIS have been contributing considerably to the national economy by increasing agricultural production. This apparent interest in irrigation management, however, does not focus on conflict, on of the major issues of FMIS.

In order to practice and management of FMIS in Nepal, many researcher and organizations were involved in several irrigation related research projects. They have studied several socio-economic, disputes management and institutional characteristics of many FMIS in the country. As far as the farmer's participation in irrigation management is concerned, especially in decision making, such problems and grievances are no less important then the open and observable disputes. The majority of FMISs in Nepal have been suffering from various conflicts. Therefore, in this study special attention is given to investigate and explaining all conflicts in *Bansbote Kulo* irrigation system.

Research Problem

This research tried to find the answers of the following questions.

- What are the customary practices of irrigation system?
- What are the existing conflicts and management practice of the system?

Especially, this study was focused on the practice of FMIS and conflicts management under farmer managed irrigation system. Importance has been given on conflict management because, as far as, irrigation practice and management is concerned, but conflicts are major challenges in FMIS. Frequent conflicts in FMIS lead to poor performance. Poor performance may in turn lead to more conflict; such conflict may range from simple social confusion to greater civil strife (Malla and Khadka, 1997; IMI, 1990). Thus, there is need for research that could help to produce more insight into how irrigation related conflicts are managed in FMISs.

Objective

- The specific objective of this research is to investigate and analyze the practice of Farmer Managed Irrigation system (FMIS) and
- existing conflicts and management practices in farmer managed irrigation system of Bansbote Kulo irrigation system of the study area. Importance has been given to the conflict and its' management system among the users.

Study Area

For the research *Basbote Kulo* irrigation system of Dang district, of Sewar Basbot village was purposively selected. In this village, customary systems of farmer-managed irrigation are largely practiced. Characters of farmer managed irrigation system (FMIS) of *Basbote Kulo* irrigation system are distinct which are traditional and age-old practices and followed by the users from the very beginning. And this system is widely known among the users of the other areas of the district.

Research Methods

For the exploration of practices of farmer managed irrigation system and conflict management in FMIS structured interview was used. Basically, Focus Group Discussion (FGD) and Key Informant Interview (KII) were also employed for the primary data collection. The two FGDs have been done in Sewar, Bansbot village. Ten persons have been actively participated in each FGD. Three persons have been designated as Key Informants. Head of the FMIS, *Sardarwa and Katuwale* have been selected as key informant. For other respondent members of the water user committee and members of the water user group were selected respectively.

The interviews were conducted in the compound of the water user groups meetings as well as their houses. The study adopted descriptive and exploratory research design. For this, necessary primary data were collected from the field and secondary data were collected from published and unpublished sources to document the practices of farmer managed irrigation system and conflict management practices in FMIS of *Bansbote Kulo* irrigation systems of Dang district. The data used in the study is qualitative in nature.

Results and Discussion

Farmers of the users of *Bansbote Kulo* irrigation system have developed distinct system of irrigation, which is an age-old customary practice. Every user of this system should follow the practice from the very beginning. For the creation, maintenance, and preservation of any irrigation system, certain organizational system and water-use activities need to be undertaken (Coward 1980; Uphoff 1986 cited by K.C. and Pradhan 1993). This study shall explore key irrigation management practices regarding the construction, operation, and maintenance conflict management.

In the irrigation history of Nepal, farmer participation in irrigation has been a long customary tradition. The public awareness of irrigation management has been far ahead of the state. Some irrigation canals, which were developed and managed by farmers date back thousands of years, and are still functioning in the different part of the country. *Bansbote Kulo* irrigation system is one of them.

Water Allocation System

Water allocation and distribution system is depending upon the inlet size of the branch canal. The water allocation criteria for the individual plots in some FMIS are based on the season, the priority of demand, and the security of the standing crops (Poudel, 2000). Some FMISs permit nearly twice the amount of the land to be under irrigation during the winter and summer seasons then in monsoon season (Martin, 1986). However, special attention is given in such cases to water needs. Unlike the continuous flooding method practiced during monsoon, the winter and summer are irrigated in turns with access depending on the following two major principles.

First Come, First Served

During the winter and summer seasons the flow of water in all FMIS is small, even a small amount of water is very important therefore, most of the FMIS, have developed a sub rule for these seasons requiring that at least are farmer should work as water guard in the main canal every day farmer who feel their crops may need water priority may register on the list of water guard before the other farmer. The first attendant on the main canal gets the first turn for irrigation. Once a farmer has registered his name as an attendant at the Water User Association (WUA) office, the WUA asks him / her to start working on the day the previous attendant irrigates his land. Then the latter should regularly attend to the canal clearing and canal water increase until it is his turn to irrigate.

If there is a problem of crop damage while the attained it is waiting for his turn, the concerned farmer should report his problem to the WUA in time. WUA authority should examine the problem in the field themselves and may allow water to be used even before it is the farmers' turn. All farmers usually respect this special right of the WUA to award early irrigation to those farmers who really need it (Poudel, 2000).

During the monsoon, water is divided proportionately according to the size of the land, different types water division box (Sancho) are left alone allow a continuous flow of water throughout the season (Poudel, 2000). In some FMIS only the defined service area is entitled to the use of irrigation. Farmers outside the service area are not allowed to use water. The outsider farmer got the opportunity if there is surplus water. Even though, in some FMIS, the command area has the potential to be expanded.

Inter System Water Allocation

Many FMISs of hills and Tarai practice customary rules and regulation for inter system water allocation (Poudel, 2000). The basic for such inter system water allocation is that farmers usually honor whatever decisions were made by their forefathers in consideration of prior water right of oldest and downstream canals and irrigated area of each lands. However, most of the practices for inter system water allocation are base on the length of canals, adequacy of water flow at the source during the irrigation seasons, and the abrupt scarcity of water soon after monsoon floods (Poudel, 2000).

Some FMISs, which share a common headwork, provide cemented or wooden proportional weirs for water allocation. The outlet size of these weirs in usually proportionate to the size of the irrigated field by each outlet. In most cases, inter-systems water allocation at the water source depends on mutual consensus between the upstream and downstream systems. It is particularly practiced during the water defect periods of the years. Water is also allocated to different systems along the water source in turn. This practice is commonly known as '*Khole Palo'* or the practices of inter system rotation along a river (Shukla, 1993). In some FMISs formal rules protecting irrigation access rights to the water source are also found in some FMIS sharing water from the some river.

Practices of Water Mobilization

Key informant mentioned that farmers of the users of Bansbote Kulo irrigation system have developed a distinct system of irrigation, which is an age-old customary practice. Every farmer or user should follow the practice from the very beginning. In most of FMIS in the southern plains, cash resources for initial construction are mobilized on the size of landholding while labor is based on household size (Shukla, 1993). The majority of irrigation systems in the western hills of Nepal mobilize labor resource for regular repair and maintenance based on the size of the landholding under the service area of the system (Poudel, 1994). In case of emergency repair and maintenance each household should participate in most of the systems. However the practices of resource mobilization in the FMISs in Nepal vary by ecological zone. Some systems have followed the size of land holding category as the basis for deciding the amount of labor and cash most provide for maintenance.

Maintenance of the System

According to the key informants, *Bansbote Kulo* had a kindling type temporary intake, which is damaged everyday flooding of *Sewar khola* in the rainy season. When the flood came in the *khola* (seasonal river) it damages the intake repeatedly. The respondents further mentioned that the day after flooding, every farmer from the Bansbot, Baraiya, Badahara and Turuntapur village went to headwork for divert the water by stone and *Jhala,* (branches of the trees and bushes, to be used for making a barrage). It is very hard and important task. Around the third or forth week of June or even earlier, if the monsoon comes early, preparations are made for a regular, adequate supply of water for irrigation purposes. After damage of the system *Sardarwa* compulsorily informed all the users for the maintenance of the system. For it, one person per *Hal* cultivating household participates in a joint effort to dredge the canals of the accumulation of clay and wild grasses to ensure a smooth and regular flow of water. This system is known as *Kula Jane* in the study area as well as in Dang and the persons who is involved in the maintenance work called *Jharali*. After the reconstruction of canals the people make a barrage where needed which prevents the canal properly.

After the clearing of the canals, the young man of the team go one day to the forest to bring *Jhala,* (branches of the trees and bushes, to be used for making barrage). Some of the old men of the team go to the proposed barrage site and dig out square or rectangular clay-blocks (cyapa) from the ground, also to be used in the barrage.

As reported from FGD, for making a barrage, first some wooden pegs are fixed in a row, two to three feet apart, across the mainstream line. These pegs help to prevent the barrage from being washed away. In the rivers or streams, which do not have very fast currents during the monsoon, no such pegs are needed. Bundles of *Jhala,* here called *Sirani,* are laid upstream against the pegs, and constrained decisively into place lengthwise. *Sirani* means literally 'a pillow'. Branches are then laid over the *Sirani* to support another layer of *Sirani* above. Just above the *Sirani,* bottom ends of some more branches are laid down. The other ends (the forced end) of the branches rest over the riverbed. Some sand, mud and pebbles are put over these branches and finally a firm topping off clay-blocks, already dugout from the ground. All this, makes one layer of the barrage. Further layers are added to the barrage until it becomes sufficiently high to raise the water level to flow in the canals. No *Sirani* is made in the further layers; only branches, sand, pebbles and clay blocks are attached firmly as in the first layer.

Sometimes if the dam has to be reinforced against floods, extra miniature barrages called out *Badh* (dam) are constructed below the main barrage. For convenience barrages are constructed or repaired just before the monsoon, when there is not much current or flood in the river.

Based on key informant, if any member of the user committee cannot come for *Jhara* (reconstruction of canals) will be fined as village's rules known as *Khara*. According to water user association record they contributed total more than twenty days in the every rainy season. According to the respondent, the water user association could not manage good report keeping about labor contribution by users for operation and maintenance works. They blamed to the water user association that they could not penalty them who could not present in operation and management. According to the water user association decision, either every family must send a young man or woman for operation and management work or they must pay *Khara* (penalty in cash) in cash or kind. But some family sends their child member for the operation and management work. If any family does not have the person for going to *Jhara* (labor work), they should pay and send the person to contribute labor for operation and maintenance work of the water system.

Conflict Management Practices in FMIS in Nepal

Farmer managed irrigation systems function properly in Nepal than the Jointly Managed Irrigation Systems (JMIS) because farmers of FMIS themselves make locally intertwined rules and implement effectively. However, the effective situation of Nepali FMIS different kinds of conflict has been emerged. Earlier studies (IMC, 1990, Pradhan, 1997) have showed that water conflict is normal phenomena if the same source is used for more than one purpose in the absence of clear provision of water rights. The occurrence and intensity of such a conflict is high when the water became scarce in the dry season. The inequitable and unreliable water distribution and excessive use of water in head section limit the supply (in terms of time and quantity) in tail section and often cause frequent conflict in FMIS.

In the water scarcity period the frequency as well as the intensity of the conflict is when several irrigation systems operates upstream and downstream with limited water availability. The main cause of conflict in such systems was an unreliable water supply to tail farmers due to an inability to implement proper water scheduling (IMC, 1990; Pradhan, 1990). Likewise Pradhan and Upreti, 1998 explained that earlier studies also showed that agency intervention in existing FMIS worsens the water supply and gives rise to numerous conflicts. Pradhan (2000) also states that in the agency developed systems constructed under contract arrangement, contractor are the major cause of conflict not only in new systems but also in the operation and maintenance of exacters FMIS.

Conflict management in irrigation management means to solve the problems that occur in the management system of organizational activities. These activities, in general, occur in case of the FMIS among the members of users' groups individuals and outsider of the inter systems. Water user related conflict and its management in FMIS is in Nepal are common phenomena because rules and regulations of irrigation management system cannot wholeheartedly be obeyed by all the member of the head, middle and tail user. In most of FMISs, in Nepal, adopted both formal and informal practices to manage conflict.

Informal Conflict Management Practices

Informal practices are locally developed and practiced and prescribed by the communities. In the other word it is defined as the tradition of the giving community or experience of the ancestors, which is transformed generation by generation. Informal Conflict Management Practices are generally formulated by the local people and discussing the issues in public meetings. Nepali FMIS tried to manage conflict through negotiation, deliberation, and arbitration process.

An informal conflict management practice includes compromise, collaboration, withdrawal, and force. Most of the FMIS in Nepal, user or user association solve the conflict occurring in the system at the local level with their own initiative. That is why, the principle where the conflict, there the resolution is evident in Nepali FMIS.

Conflict Management Practice of the Study Area

As reported by the key informants, the water user association collects cash or crop for the operation and management of the water system and for the salary of *Sardarwa / Chaukidar* (water guard) according to the land holding size of the farmer from each water user. Respondents reported that most of the users are satisfied by the rules of operation and management association for labor contribution. But the main conflicting issue is that labor contribution should be contributed according to land holding size not to household, which is not rationale. But the leader of the water user association does not change the rule because this is the customary rule of their village from the very beginning. The local community for the management and maintenance of the irrigation systems develops systems properly. If any people try to cross the social rules and tradition will be castigated. If somebody steals the water in others' turn the user committee punished publicly. As the village's rule either he should pay in cash or won't get in his turn.

FGD mentioned that, in the every general assembly of the water system, farmers asked to water user association (WUA) to show the balance sheet of the costs for the maintenance works and records of labor contribution together with cash collection records. The WUA, however, only present the reason why it could not publish it at the annual general assembly. But the WUA head and other members replied that the Sardarwa / Katuwale /Chaukidar (water guard) was assigned to collect the Khara (fine or penalty) in cash or kind. FGD again indicated that after the rainy season, head of the system decide a day for Khara Khane. Sardarwa informed the users for the day. They purchase he goat by the collected cash of Khara and all the users gathered in one public place then slaughter and divide equally among them. Due to these conflicting issues the trend of not paying operation and management, share and labor contribution in time has been developed. Many young and active water user leaders are also victim due to previous water user association.

Conclusion

First come first served and the security of the crop are the major principles of water allocation in Nepali FMIS. The practice of farmer managed irrigation systems and the major issues of conflict in FMIS in Nepal are water right, water allocation and distribution, external development, assistance, resource misuse, operation and. maintenance, multiple purpose of same water sources, role of WUA leaders, role of water guard, information and communication and water tax collection. The common objectives of all these agencies are to help farmers preserve their organizational and managerial strengths. Little is known about the evolution of irrigated agriculture of Nepal. Informal practices are locally developed and practiced and prescribed by the communities.

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