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## **Multi-stakeholder Perspective in Catchment Management –Case from Nepal**

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### **Executive Summary**

Users' organizations at local level play an important role for the management of water and forest resources by organizing the users in the management of resources. A study carried out in Nepal focuses on institutional arrangement between forest and water resource users in Begnas Watershed of Indo-gangetic basin, Nepal. This study attempts to understand the dynamics of resource use. The information was collected through checklist in focused group discussion with different users group of water and forest. Forest Users Groups (FUGs) in the upstream are protecting the environment through Community Forest activities which has helped in protecting the lake environment downstream and users' access to the sustained use of forest resources. The WUG at downstream is more diverse as it includes irrigation users, fishermen and boaters groups whose livelihood is dependent on water in the lake. However, the Water Users Groups have different level of interest and the benefit they derive from the lake is also varied. Therefore, these institutions have not been able to address the problems of resource management in an integrated way. Beside, the local level elected institutions also have interest in collecting taxes from the users of these resources but their contributions in overall management is negligible. The downstream irrigation groups and the fishers group are the immediate and major beneficiaries of the lake. The irrigation group and the fisheries group are using the water of lake and have benefited with agriculture and fish farming respectively. However, benefit distribution among the fisher group is more equitable than among the irrigation users group because of co-operative arrangement. But there is no relation among various users in the management process of natural resource. In practice, all

the users' organizations are working in their own way without consultation with other user in resource management. The preliminary finding suggest that interaction between various local level institutions like WUG, FUG and other local institutions, could help in maximizing the benefit from resource management through integrated approach. It was also found that they all wish to work in integrated way with other users group also. But they do not know how? It seems that a platform creation could be helpful for these user groups by providing opportunity to express their view, interests and issues. The up-scaling of their institutional role to look at resource management from catchment perspective seems to be useful through appropriate intervention from outside.

## **1. Background**

Poor rural women and men face critical food security and livelihoods challenges, particularly in marginal upper catchments of the Nepal and Indian Himalayas. Restricted access to often-degraded water, land, and forest resources combined with low productivity of open-access resources invariably result in seasonal or permanent out-migration and the loss of traditional knowledge, labor for management and community solidarity to address resource degradation. Functioning models of CBNRM seem to work for a single critical resource, e.g., forest. Examples of more integrated approaches tend to be found only at a small scale, in one or just a few communities. Yet communities need to manage multiple resources, particularly forests and water, and also have to address resource competition issues with other communities, e.g., upstream diversions of water that affect downstream availability. Successful examples of multiple resource management by communities are less common, and are generally confined to single sectoral approaches such as the community forestry program and farmer-managed irrigation systems (FMIS) in Nepal.

An action research entitled **Resource Management for Sustainable Livelihoods** is being implemented since April 2005 with the support from Challenge Program for Water and Food (CPWF) of CGIAR. The action research was initiated to contribute to enhanced sustainable livelihood opportunities and reduced vulnerability for poor rural people in upper catchments in Nepal and India through improved understanding of existing linkages or limitations among institutions for integrated natural resource management.

### **1.1 Objective of the study**

The objective of the study is to analyze forest and water based livelihoods opportunities and constraints through the lens of institutional dynamics exhibited by various resource management groups and

institutions at sub-basin level. This study attempts to understand the dynamics of resource use with following questions.

- What are the institutional roles of each of the resource user groups in the management of natural resources?
- How these user groups are linked to each other in contributing to resource management?

## 1.2 Methodology

Households out of the 310 households from the aforementioned community villages were randomly selected for interview and mostly the households head were interviewed. Direct interviews, transect walk, unstructured The research was undertaken in a 75.04 sq. km. *Begnas-Rupa* Basin (Figure 1) which spreads over undulated mountains in the upstream and a flatter valley floor in the downstream. Between the two lies the Begnas lake which has an earthen dam that feeds to the Begnas Irrigation System (BIS) in the valley floor area. Three communities each in the upstream and valley floor was considered for the study. Although at the same watershed these communities are situated at different altitudes and their association with the management of forest and water resources depicts an interesting characteristics. In the upstream, three community villages, namely *Lamichhane Gaon*, *Thapa Gaon* and *Bhurtel Gaon*, situated in *Dund Khola* micro watershed were selected. Whereas in the valley floor three community villages, *Saat Muhane*, *Raja Ko Chautara* and *Sainik Basti*, located at different junctions of the Begnas Irrigation System were taken. The major basis of the selection of these communities was the water rights differentials displayed by them.

The basis of collection of data was a comprehensive checklist<sup>1</sup> which was designed through participatory focus group discussions to generate data related to resource assessment, information on livelihood, resource management practices and institutional analysis. Eighty six small-group interviews, and direct observation methods using Participatory Rural Appraisal (PRA) techniques are the few to mention among the arrays of data collection tools used for this research.

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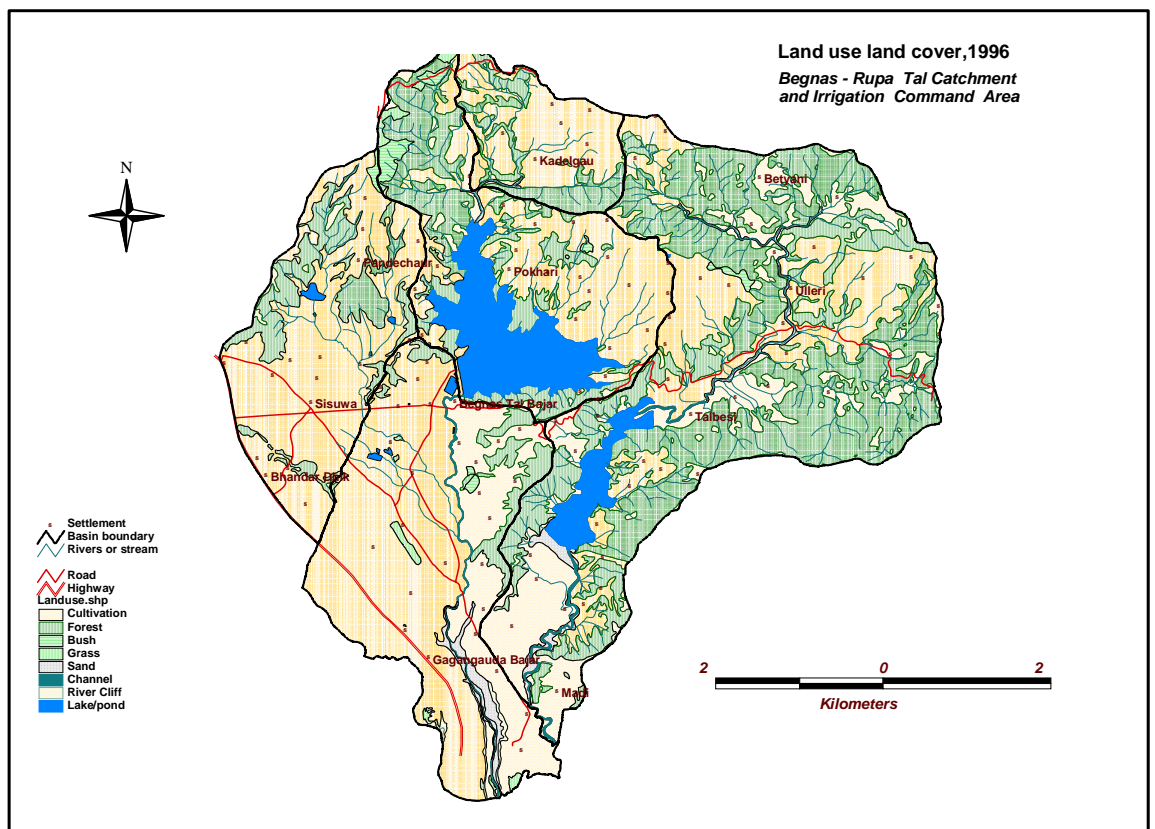
<sup>1</sup> These include checklists for studying management of (a) domestic water supply system, (b) Begnas Irrigation System, (c) irrigation and agriculture aspects, especially for FMISs, and (d) community forest.

## 2. Socio-Economic characteristics of Begnas Catchment

### 2.1 Population

The average family size among the total sampled population of 963 from the survey of three communities each from upper watershed and valley floor in the catchment is 5.7 (Table 1). The average family size is 5.7

Figure1 Begnas-Rupa Basin



### 2.2 Landholding and tenure System

The landholding size of the majority household both in the upper catchment and valley floor is less than 0.5 ha, which indicates that the people are living below poverty line. Nevertheless, in terms of the irrigation availability, the households in the valley floor are better off. But the inequity among the households having land in the upper reach

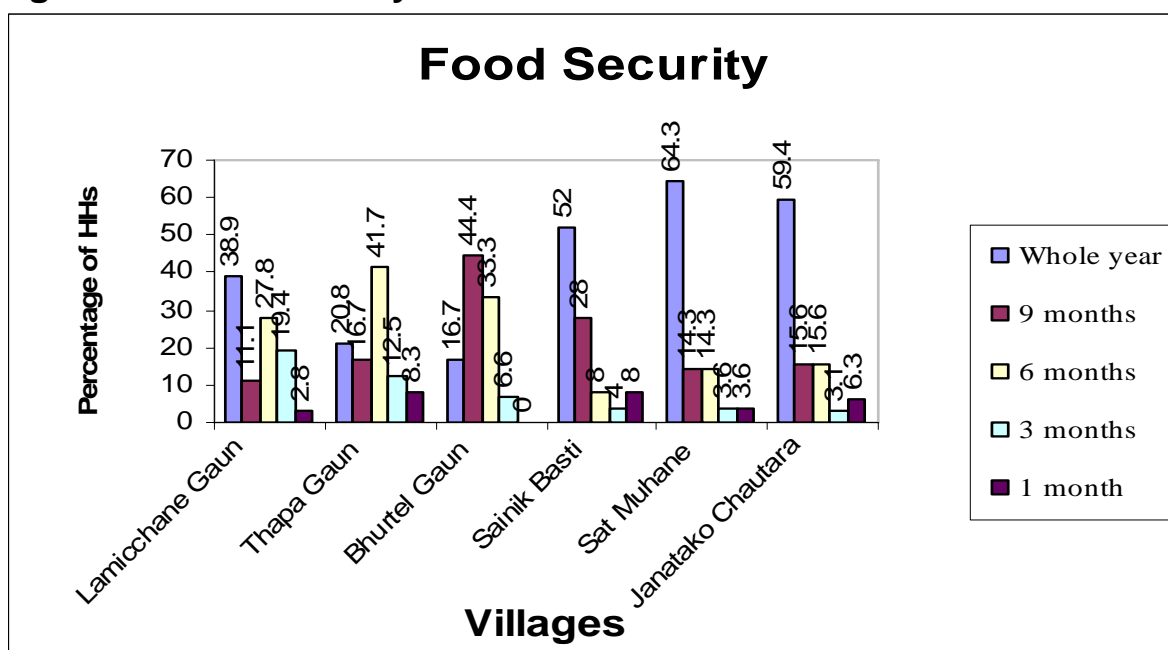
of the canal and those at the tail reach is great. The land at the tail end is mostly irrigated during the monsoon only.

Majority of the households are the owner cultivator as the land size is small. However, some of the households have rented out as they have land size larger than one hectare, which is nearly 2 percent of the households. And a few (5 percent) of the households are share cropper.

### 2.3 Food Security

More than half of the households (hhs) of valley floor grow food sufficient for whole year because of the availability of irrigation facilities. While in the upstream communities, little less than 30% of the households produced sufficient food for the whole year. However, about one-fifth of the households had food deficit for three months and one-third of the households produced sufficient food for up to six months only in the valley floor. A significant number (18%) of the households produced sufficient food for only three months from their farming in the upper catchment. This shows that the more households in the valley floor are better off in terms food sufficiency for the households compared to the households in the upper catchment. This is largely because, majority (61%) of the households in upper catchment reported that they have access to limited irrigation. Only about 10.5 percent of the households did not have any access to the irrigation channels.

**Figure 2- Food Security**



Source: Field Study 2006-2007

### **Off-farm activities**

Besides engaging in agricultural activities including farming, livestock keeping and selling milk are some other sources of income for the households. Well-off households get remittances either from family members serving in Nepali, Indian and British Army or from overseas employments in Gulf countries, Malaysia and Hong Kong. Middle income category households get remittances from seasonal migration to nearby towns or other urban areas in the country. Relatively poorer households, however, earn income from seasonal labor wage within the villages besides income from fishing, boating, and tea shops along trails. Farmers in the upper watershed have a growing tendency of migrating to the valley floor or to the urban areas because of the less economic opportunities available in the village. As a result new constructions are coming up in fertile agricultural land in the valley floor.

## **3. Institutions in Begnas-Rupa Watershed**

Since the Begnas Lake is the interface between the upper watershed and valley floor, there are several local level organizations - both governmental and non-governmental and various user groups engaged in the management of resources. Some of those organizations include the Forest Users' Group, Water Users Group which also includes Fishers' Group and boat operators' Group. Besides, there are Fishery Development Board, local elected institutions, local NGOs and Community Based Organizations. Many of these groups are formally or informally organized. They carry out their activities independently except for some occasions when people affiliated to two or more institutions happen to interact, more in an informal way.

### **3.1 Forest Institutions**

Due to heavy pressure on forests from the extraction of various products, the forests in the past were badly degraded. In the subsequent years, however, community forestry program contributed tremendously in regenerating and restocking the forests in the watershed. The forests in the watershed are subtropical forests and lower temperate forests. The subtropical forests are in the lower altitudes and are dominated by hill sal (*Shorea robusta*) forest with chilaune-katus (*Schima wallichii* - *Castanopsis indica*) forest dominating between 1,000 m and 1,700 m. The lower temperate forests are mainly broadleaved forests with *Pinus roxburghii* up to 2000 m and *Pinus wallichiana* at the higher elevations.

Begnas Tal Rupa Tal (BTRT) project has initiated community managed forest concept in the Begnas Catchment since 1985. FUGs have its

own institutional arrangement with regard to appropriation, inventory of forest product, graduated sanctions, conflict-resolution mechanism, and monitoring systems through collective-choice arrangements as specified in its rules. Forest Users Groups are becoming effective for the management of forest resources. It is due to the community-based management approaches, FUGs have evolved in diverse conditions over time and space. These have been mostly affected by location of resource use, resource use pattern, local socio-cultural, political-institutional arrangements and their linkages with them. They have confined boundary area and have their own rights within that area. The FUGs are at different stages and are evolving as effective institutions in social development processes. But they are not financially strong due to lack of resource generation activities, as the major species does not have economic value. This has been one of the constraints in providing economic benefit to the households.

In this context, community forestry in Nepal has significant contribution for forest protection and regeneration. Community Forestry (CF) has been the dominant forest policy mechanism in Nepal since the Forest Act of 1993 standardised and institutionalised the process of forest handover and management to the Community Forest User Groups (CFUGs).

### **3.2 Water Institutions**

The Majority of the water users' groups are in the downstream because of the existing economic potential. Water institutions including Water Users Association (WUA) and Farmer Managed Irrigation System (FMIS) perhaps represent the largest group of institutions in Begnas-Rupa Watershed followed by *Jalhari* (Fishers' Group) and Boat Operators Group. They are discussed below.

### **3.3 Irrigation Users**

The upper watershed, *Dund Khola* micro-basin, has a total of 15 FMIS which fall in the category of informal institutions as they are not registered with any government departments. Some of these FMIS were rehabilitated by the erstwhile BTRT Watershed Management Project. Even at informal levels, the functioning of these FMIS are important as evidenced by the reduced erosion and increased water availability for drinking and irrigation as a result of management of irrigation system by them. Water allocation and distribution rules based on traditional water rights in all three communities are contributing to maintaining status quo promoting inequities. Mobilization of labor input for the maintenance of irrigation channels is inherently an age-old practice which is not sufficient for increasing irrigation efficiency. Lack of external support has hindered the timely improvement in the



irrigation system as they usually cannot collect adequate resources on their own. Our study found that with the improvement in the infrastructures and management practices, the existing inequities among the users at the head reach and at the tail end could be removed because the available flow of irrigation water is sufficient to irrigate the land.

Absence of their formal recognition by government's Divisional Irrigation Office is the constraint for obtaining any governmental assistance that requires formal registration with the authority. This is evident of inadequate linkage or association that they have with the government agencies. In the valley floor area, the Begnas Irrigation System (BIS) Water Users' Association (WUA) is the formal institution. The BIS WUA is a formal organization with written constitution and registered as three tiered organization: at main, branch and tertiary level. Even though drawing water from Begnas Lake, the WUA is not involved in the maintenance and protection of the water source, the dam and the head works. There is no enough collection of Irrigation Service Fee (ISF) for the maintenance of the irrigation systems and the tendency is more on getting increased governmental support. As a result they are dependent on the annual grant from the government. For maintenance activities at branch canal level, the resource is generated locally on an ad hoc basis.

### **3.4 Jalhari(Fishers Group)**

Fishers group are also a major resource users of Begnas Lake. Fishers have their association named as "*Machha Byawasayi Samiti, Begnas Tal*" (Fish Farming Committee of Begnas Lake). The organization was formed in 1981 and registered in 1999 in the municipality. The organization has 42 members. Each household are the member. The members have to get license from Fishery office near the lake. License costs Rs.150-200 (US\$ 2.2-3.0) per year and one has to pay Rs.15 (22 cents) for one fishing net in the lake. Fisherman pay fee of Rs.2 per kg to Fish Collection Centre (FCC) and that goes to District Development Committee (DDC). They have to pay Rs.360 (US\$ 5.5) annually to municipality.

### **3.5 Boat Operators**

Boaters association is a formal water user group in Begnas Tal formed in 1985 and registered with the DDC in 1994. It is a source of additional income for the household. Now a day one boat earns only half (US\$ 15-22) of the amount in a month than 5 years before due to increase in the number of boats and decrease in the number of tourist arrival due to the deteriorating security situation in the country. Compared to the cost of making boat which is Rs17, 000-Rs.20,000 (US\$ 259.5-305.0),

the earning from it is not satisfactory. However, having own boat is also important to travel from their village to other side of the lake for marketing and other purposes.

### **3.6 Government and other institutions**

Besides the roles of WUAs and FUGs in the resource management in Begnas Lake, the Fishery Centre of Government, local governmental bodies and I/NGOs are another set of institutions which are associated with the resource management in the catchment. The Fishery Centre provides technical support for the fish farming in the lake by the *Jalhari* (Fisher's group) and their livelihood is dependent on fish raising in the lake. As per the Local Self-governance Act (LSGA), the Lekhnath municipality and the Kaski District Development Committee (DDC) are two locally elected bodies with legal entities that have stake in the management of the natural resources at the local level. One major problem with them is that their roles and responsibilities are sometimes overlapping with those of the government line agencies within the district and the central government.

## **4 Equity in resource management**

One of the important aspects of the resource management is the process through which users have equal opportunity to participate in collective decision making by crafting rules. The rules are important for the functioning of group, which the users by becoming a member of the group should adhere to. That participation ensures access to benefit from resource management for which the users will have to invest their resources. Nevertheless, the access to benefit should be equitable among and across the resource users. Therefore, equity in common property resource management should be looked into from the perspective of equity within the resource users group and equity among the resource users group.

### **4.1 Equity within the resource user Group**

#### **4.1.1 Irrigation Users**

Social relations play an ever-increasing important role in the individual and collective water rights to the irrigation water in the Begnas-Rupa watershed. According to tradition, water rights are tied to land in the historic command area, however increasing competition in the allocation of water at the system level has led to the access of water becoming more socio-political in nature. The water scarcity have resulted due to the increase in the command area due to the conversion of *bari*(unirrigated) land to *khet*(irrigated) land in the upper

catchment and construction of Begnas Irrigation System (BIS) in the valley floor which intended to irrigate 540 ha of land.

Firstly, water resource use, and struggles for access to water, can be seen to operate at several levels. The claim of tail enders in the upper catchment is legitimate in the sense that there are no further water sources that they may access and develop for providing irrigation facilities for their land. However, the users at the head end in the upper catchment do not agree to this for fear of losing their water right. While, the users at the tail end of the BIS in valley floor do not have adequate control of the irrigation system and also do not have resources to implement any intervention that help in reducing inequity.

Secondly, the age-old rules for water allocation and distribution within the command area have become ill-equipped for dealing with the increased number of stake-holders within the command area, as evidenced by water scarcity particularly for tail-enders (i.e. those with *khet* lower down) both in the upper and valley floor. The rules are traditional based on customary right and may have been subject to little change in decades. Today's pressures of water resource scarcity are magnified by environmental change causing more variable rainfall, and a rising population having developed further *khet* and requiring water for irrigation. It is clear that for equity amongst tail and head-enders in the existing command area, rules of allocation and distribution within the command area should be developed further. This is possible only when service delivery capacity of the irrigation infrastructures is improved. Users have not collected Irrigation Service Fee (ISF) and have not done any significant maintenance activities for long. Annual maintenance comprises of a labour contribution of one person per household irrespective of land holdings in the command area in the upper catchment and occasional maintenance by the users at branch level at the valley floor.

#### **4.1.2 Forest Users**

FUGs have enforced rights, duties and punishments for its members' involvement in the management of Community Forest (CF). However, the rules varies across the Forest Users' Groups (FUGs) in the catchment, as each of the groups have flexibility in drawing rules within the CF framework prescribed by the government. Although, members come from various social strata, there is no discrimination in rights and duties among the members. FUGs harvest the forest once a year from January-March in a plot wise rotation and distributed among member households in an equal amount. The harvested products are mainly used for fuelwood and fodder at home. However, the present practice cannot be termed equitable, as the poorer households, especially the land less are more dependent on the forest product for their livelihood but they also receive equal amount of forest products. The gender

aspects in the forest management are weak in terms of representation of women users in the executive committees.

Since, most of the forest products are for domestic consumption, income generation from forest products is lacking. Because of this, FUGs are constrained in expanding their social and community activities due to lack of funds. Some of the CF groups tried for the plantation of valuable species like *Amriso* i.e. *T. maximus* and other medicinal plants. But they could not receive expert inputs for adequate planning to diversify the activities. This seems to be an important area where the concerned government agency, District Forest Office (DFO) could provide expert guidance to diversify forest plantation upon request from the users. This is essential to contribute to the livelihood of user household through increase in household income from the forest products.

#### **4.1.3 Jalhari (Fishers Group)**

There are 40 households of Fisher men engaged in the fish raising in the lake. The number of cage is decided among the Fishers Group with the technical advice from Fishery Development Centre. Fishers usually keep 5-6 cages per household for fish raising in the lake and the cage is equally distributed among 40 households. In one cage, 300-400 small fishes are kept. One buys fingerlings and raises it in the cage. It takes one year for fingerling to weigh 1kg, after that it takes one year to grow by 0.5kg. There is no restriction for fishing. User can collect fish as many as they can in one day. There is no discrimination between rich and poor.

Fishers collect Rs.2 from the fishermen for paying Re 1 per kg to municipality for the renewal of their occupation. They have to pay tax of Re 1 per kg of fish to District Development Committee. One household earns Rs.6000-Rs.8000 (\$90-122) per month. Fishermen are satisfied with their earnings and occupations. This is the only source of income for their livelihood.

Female have formed their own group and are also actively involved in fish raising and selling. Female group has started cooperatives for saving. They have also started child care centre. They have built their own organizations building.

#### **4.1.4 Boat Operators**

None of the boat operators are entirely dependent on the earning from the boat for their livelihood. Each of the boat need to wait for their turn as boats is operated on a rotational basis. Association regulates the activities of boaters through implementation of the rules which has been prepared for boaters such as enforcement of queue system in

boat operation, taking fee from each boater on monthly basis. Everyone has equal chance to canoeing boat and waits for their turn to come. But if there is any emergency case like someone has to be taken to hospital or other, they don't wait for their turn. Females are also actively involved in canoeing the boat and are member in association from each household so that they can get license to canoeing boat.

## **5 Institutional Linkages and its Dynamics**

FUGs have formal relation with the District Forest Office (DFO), as they are registered to DFO with approved work plan. They receive technical assistance and get involved in capacity building activities organized by DFOs. Besides, FUGs have linkage with both government and non-government organizations including DDC, VDC and District Federation of Forest Users (DFFU). But they are more occasional instead of a regular contact.

The FMIS group upstream which is informal does not have any relation with government and other local organization except FUGs. They have informal relation with the other resource users at the downstream. BIS have defined its boundary area near the lake and have claimed that it has been encroached by other groups by constructing building.

Fishers Group has linkage with Fishery Centre, as it receives license for the fish raising and also technical support from this office. Also, they have to register their occupation in Municipality. However, they do not have formal or informal relation with FUGs upstream except that they are also member of FUGs. They seek cooperation from Boaters' Group for maintaining the environment of lake. But Boaters do not take interest in cleaning the lake according to the fisher group.

They don't have formal relation with BIS. However, they are affected by the use of lake water which is controlled by them. But in recent years they have established working relationship with irrigation users' group which was indicated by approval they received to plug the irrigation outlet by placing net to check the fish flowing to the irrigation canal.

Boaters association has collaboration with Fisher Group at local level for the pollution control in the surrounding of lake. The linkage with DDC/Municipality is more formal, as they have to register with them.

Non-government organizations or local organizations also support the households through introduction of new technologies and income generation activities. These organizations help in implementation of drip irrigation and vegetable production and selling.

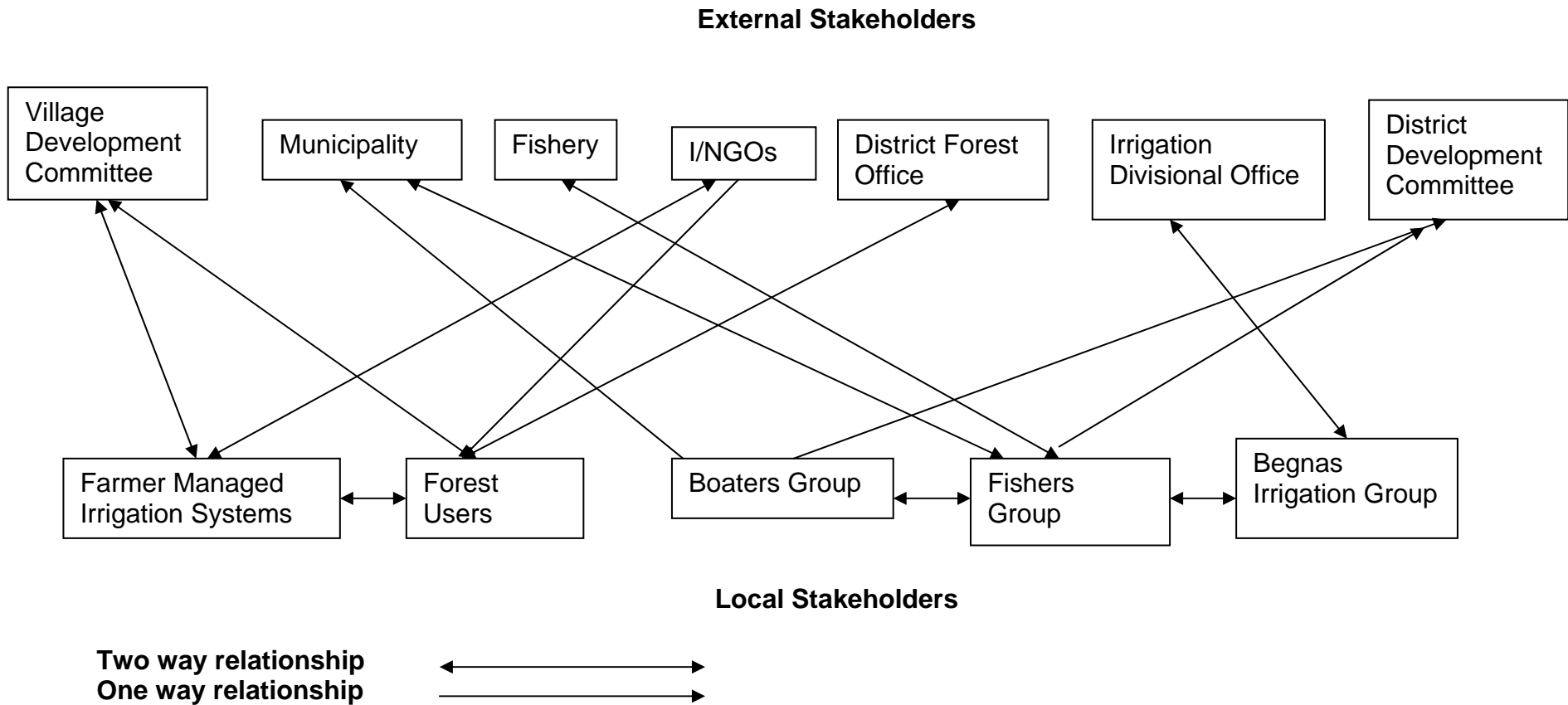
From the discussions above it has become clear that two sets of institutes have stake in the catchment management. The users' organizations are the local level stakeholders whereas the institutions that influence/control, facilitate/provide technical support and collect taxes from local stakeholders and also who claim ownership of local resources are the external stakeholders. The following table provides a glimpse of institutional linkages between them.

The institutional linkage among the local stakeholders is horizontal whereas the linkage with the external stakeholders is vertical as indicated in the figure 2. The horizontal linkage is important for functional linkages among resource user group. Whereas the vertical linkage is important for policy support as the activities of these resource users group is facilitated/controlled by sectoral policies. The figure shows that institutionally, the forest users groups and irrigation users groups at upstream are more isolated in terms of their linkage with other local resource users groups and external stakeholders. It is interesting to note that the FMIS at upstream does not have vertical linkage with government agencies indicating that they do not have access to external resources. This has constrained improvement in the irrigation systems to address the equity issue as mentioned earlier.

Theoretically, it is assumed that watershed management in the upper catchment helps in maintaining good environment downstream. This has been acknowledged by the Fishers Group. They have observed changes in water quality, increase in water level and fish production also due to check in debris flow to the lake after the plantation upstream and with the increase in crown cover. But, changes that occurred were due to the linkage between forest and water, which is acknowledged both by the upstream and downstream users, is yet to be established. This has been hindering the establishment of institutional linkage between the upstream forest users and downstream water users, which is fundamental to the integrated resource management.

**Figure 3**

**Institutional Linkage between Local and External Stakeholders**



The water users at downstream (BIS, Fishers Group and Boaters Group) have linkages to each other. This is because the downstream irrigation groups and the fishers group of the lake are the major beneficiaries from the lake water followed by the boaters group. The irrigation users claim first use right of the lake on the ground that the dam construction was for diverting water to irrigation. Therefore, their vertical linkage with external agencies is also intense and expanded because the external stakeholders also collect taxes from the users and some of them claim ownership of the lake. The other indirect beneficiaries from the lake are the communities running hotels and shops nearby lake side. However, their linkage with other users at local level for the resource management is limited.

The vertical linkage of local users group with external agencies also reflects sectoral orientation i.e. BIS linked to Directorate of Irrigation and Fishers Group linked to the Fishery Centre of the Government. Likewise, The FUGs at upstream are linked to District Forest Office under the Ministry of Forest. These three district level agencies represent three different ministries: Ministries of Water Resources, Ministry of Agriculture and Ministry of Forest respectively and follow their sectoral policies. Therefore, it could be said that the integration at the policy level is more important to have integrated activities at the local level.

One of the mechanisms to establish linkage among resource users from upstream and downstream is to introduce Environmental Services Fee (ESF). But benefit downstream is due to the action of upstream users' needs to be established and the cost/ benefit needs to be ascertained before its introduction. Beside, the enforcement of ESF is not possible without any intermediary that plays the role of mediator between the resource users upstream and downstream. Foremost of all, the users need to acknowledge and accept the concept of ESF, which is quite new to the users in the catchment.

## **6. Analysis and Conclusion**

FMISs at upstream are informally organised and are not able to mobilise adequate resources for the improvement of infrastructure. For example, about half of the land area in one of the scheme upstream does not have irrigation facilities due to traditional practices prevalent in the area. The improvement in the infrastructure and redefining the existing water right could provide benefits to the farmers by irrigating their entire fields. But lack of their linkage with the external agencies, because of their informal nature, they have not been able to access to external support needed for infrastructure improvement.

The Forest Users Group (FUG) upstream are formally organised and has been managing forest that is community owned. Households in the



community have access to the forest product, mainly the firewood. Organisationally, they are strong but their linkage with other institution downstream is non existent. There is no linkage between the local forestry institution (CFUG) and local water institution (WUA) in terms of managing resources

Though several water user groups including the WUA of Begnas Irrigation System are functioning downstream, the functional linkage among them is weak. Each of the user group is trying to maximize the benefit from the lake without making substantial contribution for its sustenance. But at the same time if one looks at the system level, equitable delivery of water can improve access to water for poor farmers and then improve their livelihood. Such improvement in water management at system level will help in managing water at the basin level. In such a situation, quite often, conflicts arise within and among the institutions due to their diverging interests. The interest of various resource users group is reflected through their organisational undertaking. There exists an institutional gap in actualizing the said linkage. For example, during long dry spell, BIS wants to release more water from the lake to the main canal to irrigate their dry land. In contrast, the fishermen's associations object for such activities, as it lowers the water level in the reservoir threatening the fish farming. This is because, the dam in the lake was constructed mainly for irrigation purpose, so the irrigation users have first use rights of water from the lake according to the president of Water Users' Association.

The resource users recognise the water-forest (upstream–downstream) linkage although it is not clearly visible and users are unable to identify and establish this. Actualization of such linkage at the basin level would be possible only when the governance at the system level is improved and delivery of water to users becomes reliable and equitable at system level. As far as water delivery at system level is concerned, it was assumed that users could manage the internal water distribution on their own in an equitable way without needing external input. This assumption is not turning into reality mainly because of lack of resources and adequate communication among users. As a result, in many water use systems, water distribution has remained inequitable leading to several types of water use conflicts. Thus, improvement in governance and actualization of equitable and reliable delivery of water at system level are pre-requisite for realizing upstream-downstream linkages at basin level. This could be addressed with the proper delineation of ownership and management right of the users.

A holistic approach of Lake Management in consultation with relevant stakeholder can create a win-win situation for all of them. This is not happening due to lack of relevant policies that delineate the roles and responsibilities of both external and local organizations in common property resource management. This clearly supports for integrated management of resources in the catchment. This is because; the

sectoral line agencies, with which some of the local stakeholders have vertical linkage are guided by relevant sectoral policies.

Another important factor is that the upper watershed is the source of water to the Begnas irrigation system and the drinking water scheme serving the downstream towns. Therefore, the activities of upstream users would have detrimental effect on the environment of lake for which they need to be compensated by the downstream beneficiaries. But the concept of Environmental Services Fee (ESF) is quite new and the stakeholders need to be made aware of this and users downstream are convinced of this. Beside, an intermediary needs to be identified if the ESF is to materialise.

The research project aims at creating a platform that could be helpful for these user groups where each of the user group present their view, interests and demands. The Local municipality seems to be in a better position to lead the integrated approach as they are one of the major stakeholders for lake management. Therefore Local municipality is in a better position to lead the platform. Beside, the users could learn from the experiences of each other and some of the experiences should be shared among them for better resource management. For this, the users group could strengthen relationship with local institutions, government agencies and other external institutions for expanded and integrated activities on land and water management. Ultimately, the platform could be facilitated to act as up scaled institutions for integrated natural resource management at catchment level.

## Acknowledgement

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## References

- Bandaragoda, D. J. July 2000. *Framework for Institutional Analysis for Water Resources Management in a River Basin Context*. IWMI, Colombo, Sri Lanka.
- Bandargoda, D.J. 2000 A framework for institutional analysis for water resources management in a river basin Context. Working paper 5, IWMI.
- Chhetri, Rajendra Kishor 2007. Ekikrit Jalsrot Vyabasthapan tatha Pani Sambandhi Adhikar. Paper (in Nepali) presented in Dialogue Forum on Water Right.organised by Jalsrot Vikas Sanstha. Kathmandu, Nepal
- Ghimire, D. P., Dutta, J. P., Poudel, R., Khatri-Chhetri, T. B., Adhikari, K. R., Shukla, A., Upreti, G. and B. Devkota, October 2000. *Socio-economic and Stakeholders Analysis in the East Rapti River Basin of Nepal*.IAAS and IWMI.
- IWMI and WECS, 2001 Integrated development and management of Nepal's water resources for productive and equitable use in the Indrawati River Basin, Nepal (Summary and synthesis of four case studies).
- IWMI and WECS, 2001 Integrated development and management of Nepal's water resources for productive and equitable use. Four individual case study reports in the Indrawati River Basin.
- IWMI, 2001 Integrated development and management of Nepal's water resources for productive and equitable use. Project completion report (December 1999-December 2001).

- Khadka, Shantam S. (1997) Water use and water rights in Nepal: legal perspective p 24 in Rajendra Pradhan, Franz von Benda-Beckmann, Keebet von Benda-Beckmann, H.L.J. Spiertz, Shantam S. Khadka, K. Azharul Haq (eds.) *Water Rights, conflict and policy: proceedings of a workshop held in Kathmandu, Nepal*. International Irrigation Management Institute, Colombo, Sri Lanka.
- Pant, Dhruva.; Thapa, S.; Singh, A.; Bhattarai, M. 2003. Integrated management of water, forest and land resources in Nepal: Opportunities for improved livelihood. In ADB, Water and poverty – A collection of case studies: Experiences from the Field. Manila, Philippines: ADB. pp.79-94.
- Pant, Dhruva, Sabita Thapa, Ashok Singh, Madhusudan Bhattarai, David Molden 2002. Integrated Management of Water, Forest and Land Resources in Nepal: Opportunities for Improved Livelihood. CA Discussion Paper, 2005, IWMI, Colombo, Sri Lanka
- Pant, Dhruva 2002. Public Interventions and Irrigation Institutions: A case of FMIS in Nepal. Paper presented at workshop 'Farmer Managed Irrigation Systems in the Changed Context' FMIS Trust 18-19 April 2002, Kathmandu, Nepal.
- Pant. Dhruva, M. Bhattarai, K. Prashad, G. Rajkarnikar and D. Molden 2001 Interbasin Water Transfer and Irrigation Institutions: A case study from the Melamchi River Basin in Nepal, Proceedings 2001 Water Management Conference, USCID.
- Samad, M. and D. J. Bandaragoda, 1999. *Methodological Guidelines for Five-country Regional Study on Development of Effective Water Management Institutions*. IWMI, Colombo, Sri Lanka.
- Samad, M., Prasad, K. C. and R. L. Shilpakar 2000. *Workshop report on "Development of Effective Water Management Institutions in East Rapti River Basin, Nepal" held on 18 August 2000 in Kathmandu, Nepal*.
- Samad. M. 2001. Institutional arrangements for river basin management: some emerging issues in R.N. Kayastha, U. Parajuli, Dhruva Pant and Chiranjivi Sharma (eds.) *Integrated Development and Management of Water Resources-A case of Indrawati River basin*. Proceedings of a workshop held in 25 April 2001 in Kathmandu, Nepal. Water Energy Commission

Secretariat (WECS) and International Water Management Institute (IWMI).

UNECLAC, 1998. Network for cooperation in integrated water resource management for sustainable development in Latin America and the Carribean. Circular no. 6 and 7

Upadhyaya, Surya Nath 2007. National Water Plan and the Legal Regime on Water Resources. Paper presented in Dialogue Forum on Water Right.organised by Jalsrot Vikas Sanstha

WECS, 2002. Water resources strategy, Government of Nepal, Kathmandu, Nepal