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## CASE STUDY

# **Integrated Management of Water, Forest and Land Resources in Nepal: Opportunities for Improved Livelihood<sup>1</sup>**

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## Summary

Successful activities by both Forest User Groups (FUGs) and Water User Groups (WUGs) have made important contributions to the livelihoods of people in Nepal. This study explores the possibility of integration or establishing linkage between these two that could have a direct impact on reducing poverty at local level. The findings of this study are based on fieldwork carried out in two catchments in western Nepal. Initial field study found that FUGs and WUGs have high impact on local livelihoods, community affairs and socio-institutional aspects. There were no significant differences observed in FUG and WUG management at two catchments except for the kinds of conflicts/problems that are inherent in big and small irrigation systems. The positive impacts of these institutions could be multiplied considerably if the two can be integrated or their activities coordinated or linked at the catchment level. It is observed however, that challenges do exist and that needs to be addressed to cash on the opportunities for the integration of these two institutions

## 1. Introduction

Integrated Natural Resources Management (INRM) at catchment level has been evolving together with concepts of Integrated Water Resources Management (IWRM). Despite increased thrust (expression? – better: emphasis) in international meetings and policy forums on the need of basin level planning and application of IWRM, very little literature is available that provides knowledge base in understanding the integration process at the catchment level in developing countries. In addition, the actual cases of the IWRM framework at local level is inadequate in South Asia including Nepal, although the consensus at the national policy making bodies for the need of an IWRM framework exists.

In this context, this study tries to document the existing interaction process that links Forest User Groups (FUGs) and Water User Groups (WUGs) at catchment level and explores the possibility of integrating their activities. It is believed that the integration of activities of Forest User groups (FUGs) and Water User Groups (WUGs) at the catchment level could lead to a better management of resources for the increased and wider benefit to the community. The integration/linkage is also expected to resolve various existing intra and inter-institutional conflicts and hence facilitate other developmental activities that support rural livelihoods. The major objective of the study is to learn community-based strategies for the sustainable management of water, forest and land resources at the catchment level, through the experience of FUGs and WUGs, to identify potential areas for action research based on this assessment.

## 2. Research Approach

The research was conducted in two irrigation systems- Begnas Irrigation System and Bhanu SHERA Irrigation System in Kaski and Tanahu Districts respectively - at the catchments of the two districts<sup>6</sup> (Kaski and Tanahu) of the Gandaki River Basin in Western Nepal (Figure 1). The research sites were selected in consultation with District Irrigation Offices (DIO) and District Forest Offices

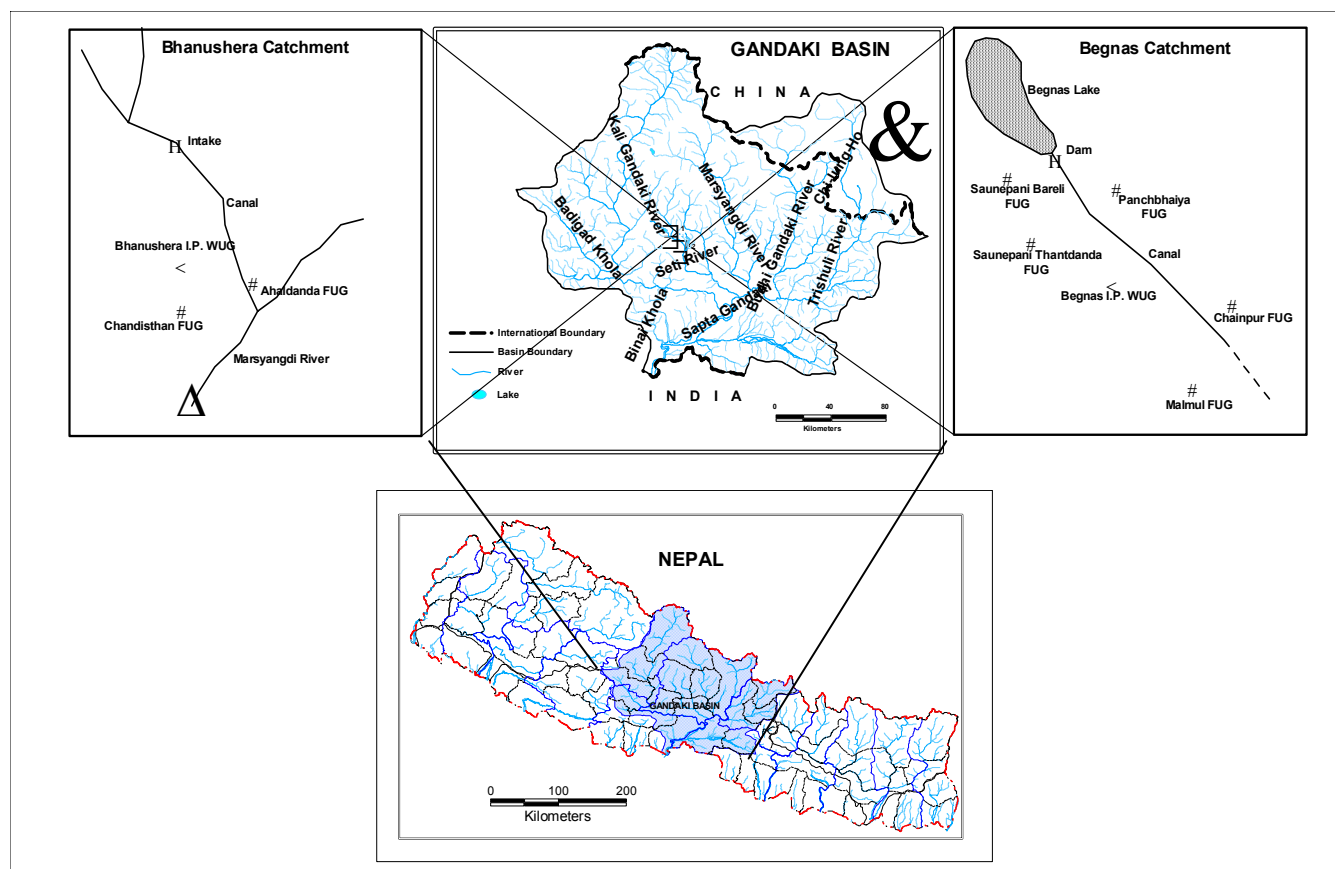
<sup>1</sup> District is a politico-administrative unit and the focal unit for the implementation of development programmes. The country is divided into 5 Development Regions, 14 Zones, 75 Districts and 3915 Village Development Committees.

(DFO) in the respective districts. The purpose of taking irrigation systems as the selection unit was due to the impracticability of studying a large number of FUGs and WUGs present in the catchment and because of the exploratory nature of the study as well as the availability of resources.

The quantitative data focused on generating information at household level.

## Location Area of Study Sites

During the field visit, both quantitative and qualitative data were collected at the catchment and household level. The quantitative data focused on generating information at household level. A questionnaire consisting of inquiries on household livelihood status and their relationship with FUGs and WUGs was designed. A total of 30 households were surveyed by appointing two local facilitators in the Begnas Irrigation Project area. The information for Bhanu Shera Irrigation Project was collected through group discussions and secondary sources. Qualitative data mainly focused on collecting information from concerned community stakeholders during group discussions. Direct observation of local conditions of resources that entailed visiting forest and irrigation canals also formed part of the qualitative assessment. Some PRA methods like resource mapping, oral histories on resource use pattern and land use changes were also utilized.



Location Area of Study Sites

### 3. Profile of the study sites

#### The Irrigation Systems

The construction of the Begnas Irrigation System with a command area of 580 ha was initiated in the year 1984 and was completed in 1988 by the Department of Irrigation (DOI) with loan assistance from the Asian Development Bank. Three tier WUGs were formed to manage this irrigation system and management transfer to the user groups is underway. The canal system of this irrigation scheme did not include the 157 ha of land at the tail end, which has continued to be the most contentious issue in the catchment.

Bhanu Shera Irrigation System on the other hand, is a small Farmer Managed Irrigation system (FMIS) with a total command area of 20 ha. Two years ago, the Department of Irrigation assisted in renovating and extending the canal system at the request of users, after which the users formally registered as Water User Groups. The community now manages the entire system and there are no management controversies among users.

#### The Forest Users Group

A total of 7 FUGs, five in Begnas and two in Bhanu Sera, were studied. These FUGs were close to the irrigation systems. The profile of the FUGs (Table 1) indicates that some of the FUGs were as old as 12 years while some were recently formed.

Catchment	Name of FUG	District	Location	Date of Formation	Area (ha)	Total Member Hhs	Forest dependent population (%)	Main Forest Species
Begnas	SaunePani Bareli	Kaski	Lekhnath Municipality -9	1990	16.0	NA	50	Sal, Chilaune, Katush
	Syankhudi Simle	Kaski	Majthana-6	1990	29.8	52	50	Sal, Chilaune, Katush
	Panch Bhaiya	Kaski	Lekhnath Municipality -11	1997	235.3	378	75	Sal, Chilaune, Katush
	SaunePani Thantdanda	Kaski	Lekhnath Municipality -8	2001	NA	NA	20	Sal, Chilaune
	Malmul	Kaski	Lekhnath Municipality -13	1996	115	170	25	Sal, Chilaune
Bhanu Shera	Ahal Danda	Tanahu	Bandipur VDC-4	1994	156.6	150	90	Sal, Chilaune, Katush
	Chandisthan	Tanahu	Bhanu VDC-5	2002	35.7	135	100	Sal, Chilaune

Note: *Castanopsis indica* (katus), *Schima wallichii* (chilaune), *Artocarpus intergra* Shorea robusta (sal).

Table1 List of FUGs studied in two Catchments

## Existing land use pattern

Both the studied catchments are undergoing rapid land use changes enforced by new market pressures in the region. The total area is much larger (1130 ha) in Begnas catchment than that of Bhanu Shera Catchment (75ha). The construction of irrigation systems and delineation of community forest area has also brought change in land use pattern in the catchment.

Land Use Type	Area (ha)		Land use in percent	
	Begnas Catchment	Bhanu Shera Catchment	Begnas Catchment	Bhanu Shera Catchment
Irrigated Land	580	20	51.33	28.57
Rainfed land	154	20	13.63	28.57
Forest/Scrubs	315	20	27.87	28.57
Grazing Land	81	15	7.17	14.29
Gross Command Area	1130	75	100.00	100.00

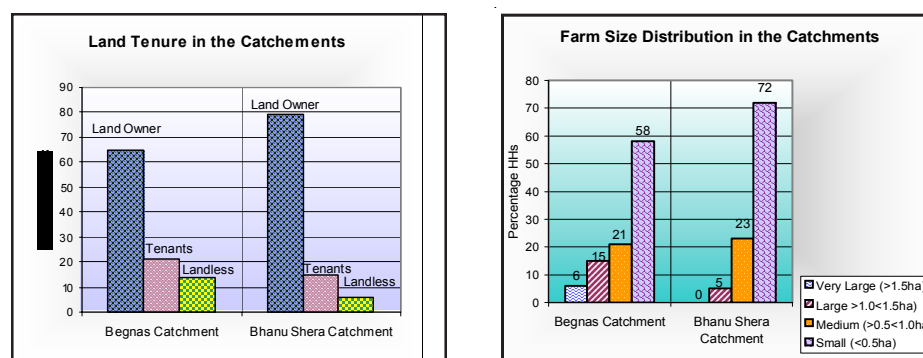
Source: District Irrigation Office (DIO), Kaski and Tanahu Districts

Table 2 Land use pattern in the study sites

The forest area in both catchments indicates the users' awareness of resource conservation and utilization as it covers almost one third of the area. The irrigation intensity in the Begnas area is almost double compared to the that in the Bhanu Shera catchment.. This shows that the land resource is more productively used in the Begnas catchment due to the availability of irrigation facilities and that there is the possibility of productive use of land through irrigation expansion in Bhanu Shera.

## Land Tenure and Farm Size

In the catchments, land tenure and farm size distribution determines the well being of a farmer. A farmer with no land or a small plot of land is often the poorest. Though large landholding is not always equivalent to being rich, it certainly indicates that the farmer is socially and economically better positioned in the community than others. The following figures depict the land tenure and farm size distribution in the two catchments.



Source: Field Survey 2002

Figure 2 Land tenure and farm size distribution

Agricultural production shows significant difference before and after the establishment of irrigation systems.

Among the total 550 households in the Begnas catchment, a large proportion (65%) owns the land and the majority (58%) are small farmers having less than 0.5ha of land. The percentage of large (1.0-1.5 ha) and medium landholders (0.5-1.0 ha) is also significant with 21 and 15 percent respectively. Likewise, a significant number of households are tenants (21%) or landless (14%). Nevertheless, the percentage of very large owners is relatively small (6%). From the data collected from 53 households in the Bhanu Shera catchment, it can be derived that there is a comparatively large number of land-owners in this catchment (79%) and that the majority (72%) of these land-owners have small plots of land indicating more equitable access to land. The percentage of large farmers having more than 1.0ha of land is negligible in this catchment.

The presence of a large number of small landholders in both catchments explains that the majority of households have low food sufficiency level. The small landholders in the catchments either share crops or rent the farmlands from large landholders for additional supply of food to their families. A large percentage of small landholders is hence also indicative of the poverty level of the catchments and their dependence on natural resources.

Ethnically, the community in the Begnas catchment is more homogenous as one upper caste (Brahmin) group is dominant (57%) followed by other upper caste groups (23%). Therefore, these groups of people are more influential in the decision making in the community. Nevertheless, other caste groups do not feel sidelined when major decisions are to be made in the community affairs.

In contrast, the community in the Bhanu Shera catchment is more heterogeneous and Newar and Magar (38% and 32% respectively) are the majority in comparison to the two upper caste groups. Thus, the dominance of one group is not prevalent indicating a more egalitarian decision-making process in the community.

## 4. Impacts of FUGs and WUGs

FUGs and WUGs have considerable impacts on livelihoods, the environment, community and socio-institutional aspects in the village. An effort was made to assess the effects of these changes.

### Livelihood Impact

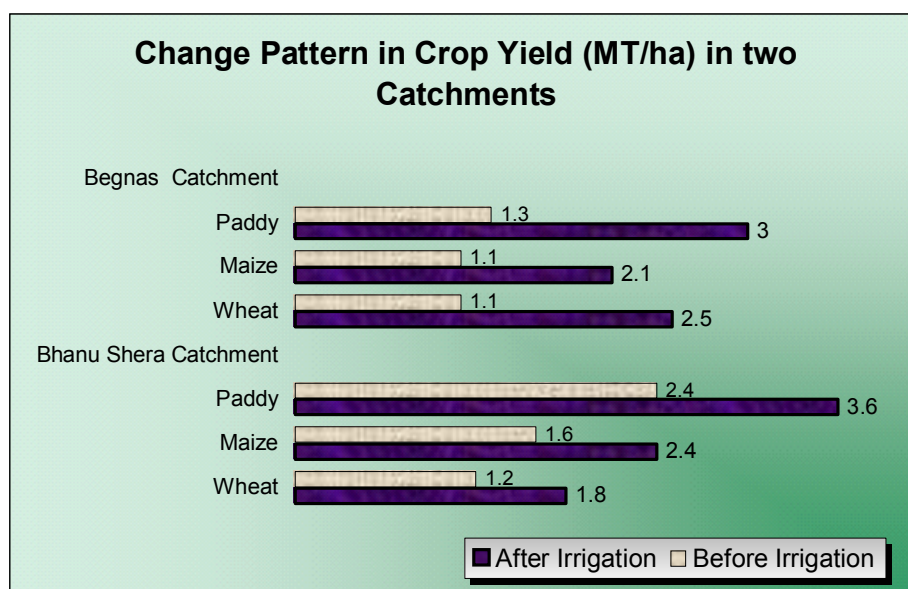
At both catchments, agriculture has predominance as main economic activity. In the Begnas catchment, 86 percent of households had agriculture as the main income source. Besides agriculture, 23.3 and 16.6 percent of households have small-scale business and services as auxiliary income source respectively. In the Bhanu Shera catchment, 90 percent of the respondents (results obtained from group discussions) had agriculture as the main source of income and 25 percent of them had other auxiliary sources of income like small-scale business and private/government services.

Agricultural production shows significant difference before and after the establishment of irrigation systems. Before the construction of the irrigation canal in the Begnas area, paddy production was only 1.3MT/ha but soon after the construction of the irrigation canal the production increased to 3.0MT/ha. Correspondingly, the production of maize and wheat also increased. The results are similar for the Bhanu Shera catchment where renovation of the traditional

irrigation system helped to increase the production of paddy and other crops significantly.

Members of WUGs in both catchments said that increased irrigation water availability has resulted in good agricultural productivity. The cropping pattern of rice, wheat and maize as main crops however, has not changed but cropping intensity has increased after the irrigation scheme was constructed. Cropping intensity in Begnas Catchment has increased to 200% from 129% after the completion of the irrigation scheme (DIO, Kaski District) and farming systems have been improved through active promotion from Non-Governmental Organization (NGOs) and International Non-Governmental Organizations (INGOs). This is evidenced from the increase in the use of chemical fertilizers, as reported by the respondent households in Begnas Catchment. From the 30 surveyed households, it was found that on an average a household uses chemical fertilizer in the ratio of 0.4kg per doko (equivalent to 25kg) of animal manure. Few farmers have initiated large-scale coffee production and fruit farming.

All poorer families in both catchments said that after improvement in the irrigation system, opportunity for wage employment (mainly in big landholders' farmlands) has increased. Besides, the renting of land from the big landholders by the poor and small farmers has increased due to less involvement of people from the upper class in agricultural activities. Due to an increased opportunity of wage employment, they have been able to buy more food. However, overall living conditions in have not changed significantly.



Source: Field survey 2002

Figure 4 Change in cropping pattern and crop yield before and after irrigation

The requirement of fodder, firewood, litter and timber determines the household's dependence on forest resources. In Begnas Catchment, 38% of the FUG member households said that they are highly dependent on forest products. They make frequent visits to forests to collect firewood and fodder. Respondents also said that they could take as much quantity of firewood for household consumption as they need but that they cannot sell firewood in the market while 42%



The community welfare program was targeted at assisting poor users who could not go to health posts during illnesses and funds were even spent on death rituals.

households were partially dependent (meaning of sentence?) They mostly collect fodder for livestock and occasionally (once a year) apply to the FUG committee to take timber. The rest of the member households (20%) expressed that they are not dependent on forest products at all. They use LPG (what does it stand for?) or biogas for cooking, do not keep livestock and have modern houses made of bricks and cement. They have become members of FUGs because of potential benefits that may arise in the future. The lesser dependence on forest products is also due to tree plantation, as 60 percent of the respondents (30) reported to have more than 10 trees on their own land. The presence of a large number of trees can be attributed to large land-holding size. This further shows that farmers with large land holdings tend to be less dependent on forest resources compared to small farmers and the landless. *Alnus nepalensis* (utis), *Castanopsis indica* (katus), *Schima walichii* (chilaune), *Artocarpus intergra* (katahar), *Shorea robusta* (sal), are the type of trees chiefly planted by households, which are mainly for used for fodder and timber.

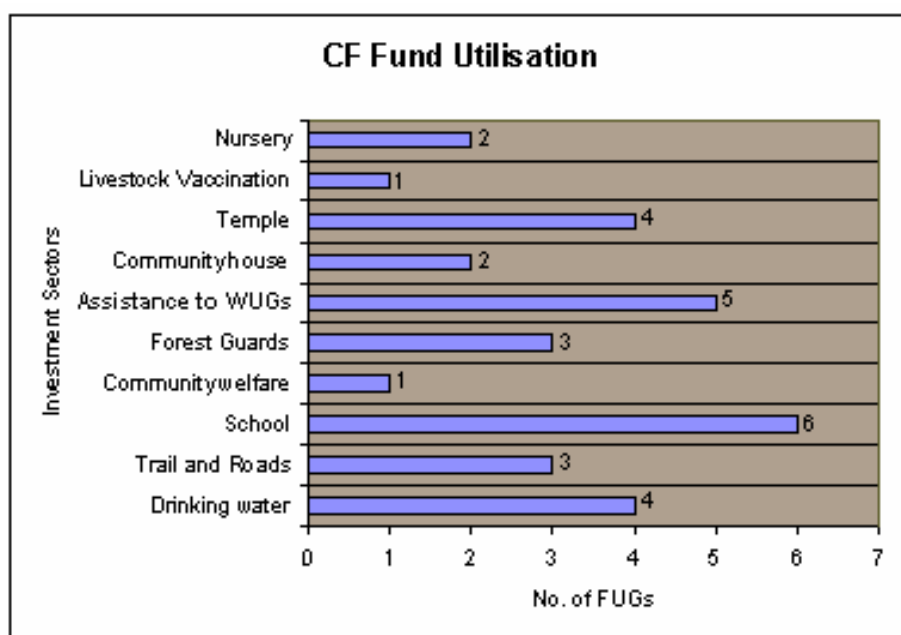
At the study sites, all the households, including those that had switched over to using LPG for cooking, were still bringing firewood from the forest for cooking livestock feeds. Income generation for poor families from Non-Timber Forest Products (NTFP) in forests has also not been achieved at the study sites. Consultation with FUG members revealed that there is high potential for income generation from NTFPs in forests of both the catchments. Different kinds of herbs and sal leaves (*Shorea robusta*) could be a very good income source for the poor. However, the FUG members cannot identify important and useful herbs in the forest and also do not know the extractable limits for the ones they can identify. In some cases, they are unaware of the market values of the NTFPs they extract. This has led to under-utilization of the NTFPs and hence, a potential income source for improving the livelihood of the poor is being lost.

## Community Impact

Of the total 7 FUGs studied in the two catchments, 6 FUGs had invested some amount of their funds for upgrading and building infrastructures of local schools. Another major investment of the Community Forest (CF) fund (5 FUGs in total) was found to go into assisting WUGs. FUGs either contributed cash or supplied timber from forests for the maintenance of irrigation canals in the village. Drinking water and temple construction were other main sectors in which 4 FUGs had already made some investments. CF fund was utilized either in maintaining the already existing drinking water scheme or launching a new one. Most of the drinking water sources that originated inside the community forest were protected by FUGs. Similarly, the community also prioritized trail and road construction and the appointment of forest guards for which considerable CF fund was utilized by 3 FUGs. One of the FUGs was well ahead of others in investing in community welfare and livestock vaccination programs in the village. The community welfare program was targeted at assisting poor users who could not go to health posts during illnesses and funds were even spent on death rituals.



The biggest portion of the collective funds of WUGs was utilized for regular operation and maintenance of the irrigation system. Irrigation systems need all year round maintenance and hence it leaves very little opportunity for WUGs to invest in various developmental programs in their village. The discussion above indicates that FUGs' role in income generation through investment in various community activities has been beneficial for the poor households in the community. Further, their contribution to the maintenance of irrigation systems has direct bearing on the livelihoods of the people dependent on agriculture. The investment in other social and economic activities has promoted cohesion between various groups and social development in the community. This is important in terms of future co-ordination and integration of WUG and FUG activities that would have a direct impact on the livelihood of the people.



Source: Field survey 2002

Figure 5 Distribution of Community Forest Fund utilization

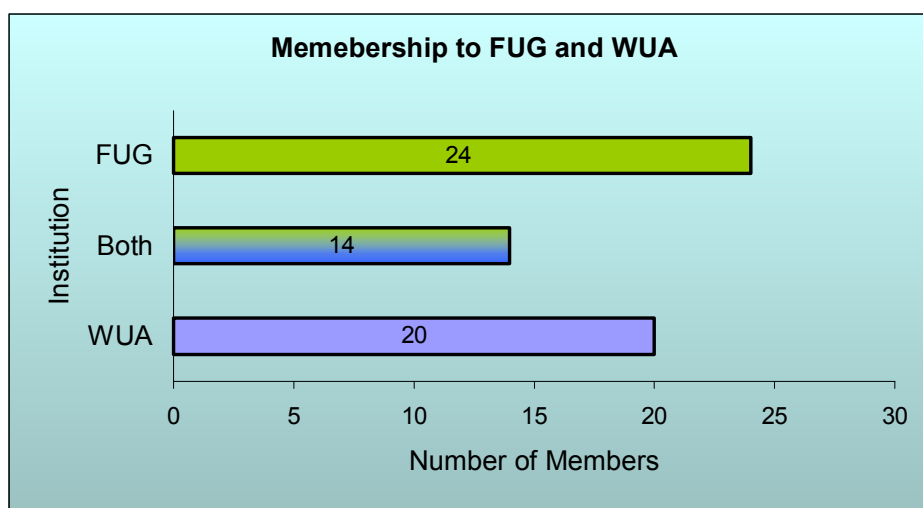
## Environmental Impact

Environmental impact was measured in terms of changes in resource quantity and quality before and after the emergence of FUGs and WUGs. Oral histories on changes in resource use pattern and conditions obtained from elderly persons at the study sites formed the basis for assessing the ecological impacts. With agricultural intensification at study sites, small irrigation systems management by communities is increasing. Correspondingly, informal WUGs are also increasing. In Begnas and Bhanu Shera Catchments, users affiliated to WUGs and FUGs said that water availability and forest conditions have improved over the years. The respective user groups have started regular operation and management of the canal system in their villages, as well as the regulation of forest products. Over-harvesting of grass and fodder, irregular and illegal felling of trees has been reduced in both the catchments. The users said that after handing over of the forest to them, the forest has become more dense and firewood, fodder and leaf litter availability in the forests has increased. In Malmul

## Socio- Institutional Impact

### Membership in WUG and FUG

At the study sites, the community consisted of members that were affiliated to a one or both the institutions. Since, there were many forest user groups in a catchment, households had membership in at least one of the FUGs whereas only those households having land in the command area had membership in a WUG. Considering this, members of FUGs and WUGs were overlapping. The following figure for Begnas Catchment represents how WUG and FUG members overlap in a given catchment.



Source: Field survey 2002

Figure 6 Distribution of Membership in Begnas Catchment

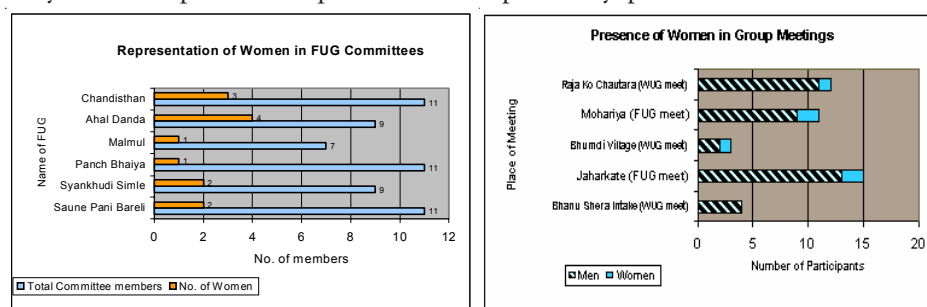
Of the total 30 respondents in Begnas Catchment, nearly 50 percent are common members of both FUGs and WUG. Unlike WUG membership that requires land holding in the command area as the principal criteria for membership, FUG membership is flexible as it allows various categories of households to become members: Forest dependent households that live close to the forest as well as partially or non-dependent households that live far from the forest. Many FUG member households take membership even though they are not dependent on forests for firewood and fodder. Many of them seek FUG membership due to considerations of future requirements of timber for construction purposes. As FUG membership only requires an entrance or membership fee, a large number of households become members. The cost of participation of these households is, therefore, only the membership fee that they pay to the FUG. However, the cost for members that do not contribute actively to the management of forests is higher than that for those who are actively involved in forest management. The participation in group meetings in FUGs was higher (87.5%) compared to the WUGs (60%), indicating users'

interest in FUGs due to the wide range of activities they are undertaking for the benefit of the community.

## Gender participation

Equality in roles of men and women in FUGs and WUGs was primarily determined by their representation in the committee and their role in decision-making processes. The inclusion of women in one-third of the total committee positions has been a rule in recent years. The majority of FUGs and WUGs at the study sites (Figure 7) has, however, not followed this rule. Only in two of the FUGs in Bhanu Shera Catchment, women hold one-third of the positions in the committee. Moreover, the positions filled by women were mostly those of ordinary members having less responsibility. Important positions like of chairperson, secretary, treasurer, etc. were filled by men.

Women's representation in WUG committees is no better than in FUGs. Only in one sub-committee of Begnas WUG (Begnas-1), the committee consists one-third of women. One of the WUG committees, Begnas-3, does not even have a single woman. In spite of the existing rules to have one-third of women in the committee, both in FUGs and WUGs, women are under-represented. Women's participation in meetings was also reported to be negligible. From the member households, mostly men attend committee and general assembly meetings. Only in one of the surveyed households, the respondent said that his wife attends meetings. This trend of only men attending meetings was evident during group discussions where women's presence was minimal. Where women were present, they did not speak until questions were specifically put to them.



Source: Field survey 2002

Figure 7 Distribution of Women in FUG and WUG Committees

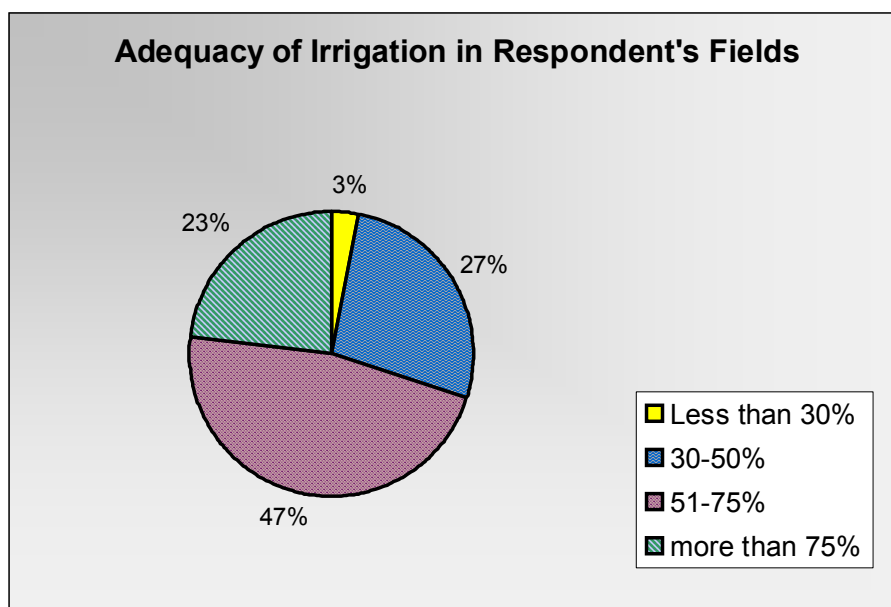
## Equity in benefit sharing

The successful institutionalization of FUGs and WUGs depends on how effectively equity issues, mainly usufruct rights and benefit-sharing among users, are addressed by them. At study sites, usufruct rights and benefit sharing mechanisms in FUGs and WUGs were complex. As land tenure right is the prerequisite for getting benefit from irrigation water, equity between members with small and big land holdings and users at the head and tail end is the chief concern. For example, in Begnas Catchment, very few households (3%) reported that less than 30 percent of their land receive irrigation (Figure 10). However, the majority reported that they received inadequate irrigation (51-75%) in

their field and nearly 25% of the households reported having received irrigation for more the 75% of their land. Interestingly, fifty percent of the total (30) respondents said that they are not satisfied with the present management of the irrigation system in their village. It was interesting to note that all upstream farmers (15 respondents) expressed their satisfaction and downstream respondents expressed dissatisfaction.

The fact that there are fewer (more?) numbers of satisfied users at the head end while dissatisfied users are mostly found at the tail end is reflective of the unequal access to the resource use. (Contradiction?) This situation was partly due to a lack of adequate consultation by DOI with the users while designing the project. To address the issue of inequality, it is important to increase the participation of the users in resource management. Initiation of on-farm water management practices in consultation with the farmers could help in addressing this issue.

In FUGs, usufruct rights and benefit sharing among different members varied according to their differing dependence level on forest products. Some users were highly dependent on forest products and hence were actively involved in overall management. There were other sets of users who were partially dependent on the forest. Few users were not dependent on forest at all. Benefit sharing by these different sets of users depends on the kind of contribution they make into forest management. Partially dependent users that do not actively contribute labor into forest management are liable to pay more cash for fodder and timber. Also, highly dependent users have priority over partially dependent users for getting any forest products. It is usually the poor in the society who are more dependent on the forest resources, as they are not able to spend cash on getting forest resources. Therefore, they also contribute more to the management of the forest.



Source: Field survey 2002

Figure 10 Adequacy of irrigation in farmers field

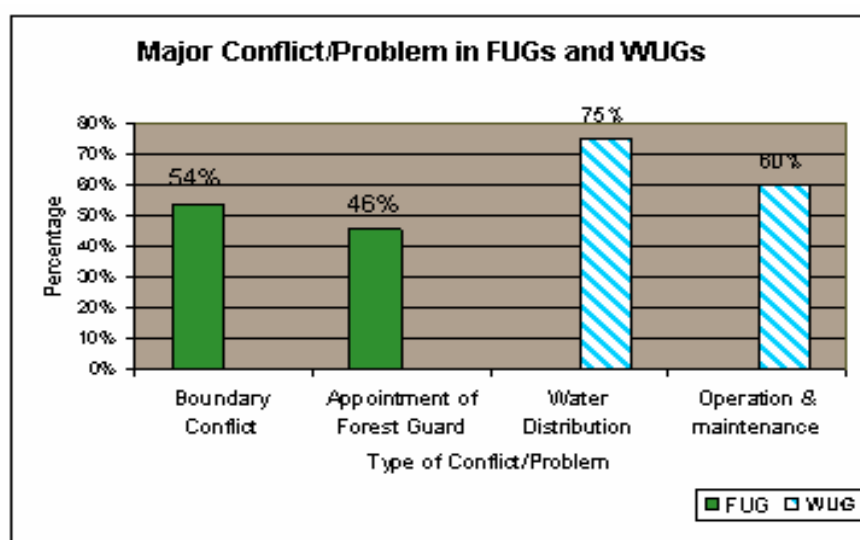
In some FUGs in the catchment, the equity issue appeared to be an inherent mechanism of a social change process. Some users who earlier were dependent

on forest are, in the course of a social change process, no longer dependent on it. Many of these members come from richer households who held important positions in the FUG committee. After they opted out from the committee, poor users who highly depend on the forest got an opportunity to be represented in the FUG committee.

Boundary conflicts arose mainly due to the encroachment of forestlands by adjacent private landholders.

## Intra-institutional conflicts

Intra-institutional conflicts/problems within FUGs and WUGs were of differing nature, most of which arose due to the respective resource nature of forest and water. Of the total 24 FUG members at the study sites, the majority (54%) cited boundary conflict as the major problem existent in their FUGs (Figure 11).



Source: Field survey 2002  
Figure 11 Conflicts in FUG and WUG

Boundary conflicts arose mainly due to the encroachment of forestlands by adjacent private landholders. In one of the FUGs, members told that forestland was encroached by landless immigrants from different parts of the country and illegal felling of trees by non-users. The rest of the respondents (46%) mentioned problems like the rising number of temporary users due to market expansion, irrigation canal and road construction through the middle of forest land, etc. In another case a new FUG was formed after it separated from a previous FUG. The reason for their separation was that the users managing the forests came from two different hamlets (wards) of the same VDC reflecting the effect of political boundary in the management of the forest.

The majority (75%) of WUG members cited water distribution among users to be the main problem. Conflict over equal/fair distribution of water between head and tail ender communities was existent in two of the three WUGs studied. The respondents also said that community cohesion for operation and maintenance of the irrigation canal was another major problem existent in WUGs. Members were reluctant to contribute cash or labor for the maintenance of

irrigation canals in the case of the large irrigation system in the Begnas catchment.. This sort of problem was not existent in the small irrigation system in Bhanu Shera. The majority of users held the opinion that the District Irrigation Office that had invested in the canal construction should maintain the canal system, indicating their reluctance or inability to contribute to the operation and maintenance of the system.

## Inter-institutional Conflicts

In the current situation of resource management at the study sites, sectoral institutions were increasingly found to enter into conflicts with each other. For instance, within the boundary of Chandisthan FUG (Bhanu Shera catchment), Karnalitaar WUG has its source and its alignment also passes through this community forest. Users of Chandisthan FUG think that the careless lying around of huge (unknown word) pipes of the Karnalitaar irrigation canal is the main cause of landslides in their forest. Co-ordination of their activities, which is lacking at present, could be beneficial to both users groups.

## 5. Integration of WUG and FUG activities: Challenges, Opportunities and Benefits

The discussions in the preceding sections reflect that the water and forest resources at the local level are managed separately, although these two resources have significant impact on the village livelihood. The main reason behind this is due to the differences in the institutionalization process of the management of these two resources and also due to the sectoral focus of government plans and programs. However, lately it has been realized that the integration of these two activities could help increase benefits for the rural households to reduce poverty. The users found the idea innovative and useful for the future management of these resources. The discussions in the following paragraphs will try to identify some of the challenges and opportunities for the integration of these two activities.

### Challenges

The difference in nature and structure of resources management and usufruct rights between WUAs and FUGs is a fundamental cause for the difference in functioning of these two institutions, their memberships patterns and benefit-sharing. The participation in FUGs is broadly based as a large number of people who live in proximity of the community forest boundary can become members of the institution. In WUGs, the membership is limited to those who have land in the command area of irrigation. Therefore, socio-economic diversity and differences in individual access and control over resources and degree of co-operation and conflicts between and among communities is an important aspect to be considered for the integrated activities at local level. Likewise, ensuring participation of the most vulnerable and disadvantaged groups and a fair distribution of benefits to them has remained as challenging as ever for the integration of these activities.

Another important area for integration at local level depends on provisions at the policy, legal and institutional level. Ambiguities at the policy level are also manifested in the legislative provisions. This is fundamental to the identification

of rights, roles and delineation of authority among various stakeholders involved in the management of natural resources. At the same time the role of local elected institutions in INRM is also not explicit which is impeding the coordination of natural resources activities at local level.

## **Opportunities**

During the group discussions, participants mentioned that a maximization of resource utilization that is available at the local level could help in increasing the income level of the people in the village. Since income from agriculture is not enough to support the family, the income from natural resources could greatly contribute to the income of poor households. For example, natural resources like limestone, sand, and river bed materials (gravel and stones), etc. that have not been utilized fully could be utilized for the benefit of both groups. These resources can be extracted and utilized in a sustainable manner if WUGs and FUGs can be integrated or linked to draw an appropriate plan for their use.

Likewise, the utilization of Non-Timber Forest Products could be an important and regular source of income, if properly utilized. The users from both groups expressed the opinion that the existing potential has not been fully utilized due to a lack of joint effort. Integration could help in overcoming these problems. Further, the resource generation from additional sources could also help in implementing other community activities that would directly benefit the needy in the community.

Users believe that the integration would help better water management at the farm level through increased water availability and through improved on-farm water management practices. This would help resolve some of the intra and inter-institutional conflicts in view of rising competition in the use of resources (forest products and water). Increased co-operation between two sets of users could facilitate increased interaction to solve these problems. Besides, enhanced co-operation between the two users would lead to better management of the available resources thereby increasing benefit to the larger population by tackling problems of erosion, landslides, forest encroachment and drinking water scarcity.

## **Benefits**

Participants of the group discussions identified different benefits through the integration of the two institutions. The participants of group meetings mentioned that integration or linkage between FUG and WUG would increase cooperation, raise awareness among users, would help in conflict resolution and would contribute to the increased resource mobilization for the benefit of the community. A large number of participants said that the integration of FUGs and WUGs would also improve their working relation with government agencies and can also help improve co-ordination between government agencies.

Though users could not exactly tell about the nature of integration, they suggested that FUG and WUG should operate independently like it is now, but some of their activities could be coordinated by forming a higher level



coordination committee represented by the users from both groups. During the group discussion, participants also cited various conditions that need to be considered while looking for opportunities to integrate FUGs and WUGs. The participants highly emphasized the need to have the committee free of party politics.

Similarly, other important aspects mentioned by the users were inter-institutional learning and transparency in fund management. The users said that mutual learning from each other's experiences in FUGs and WUGs could greatly help in bringing equity in the benefit sharing mechanism in both institutions. The users also expressed the need of prioritizing women's and poor users' concerns while integrating FUGs and WUGs.

## 1. Conclusion

Both forest and water management units consist of a group of communities from different hamlets (wards), villages, VDCs (what does it stand for? Village development council?) or districts, who are mostly concerned with and dependent on the respective resources. They form a group and conserve, utilise and manage the resource for collective benefits and their functions are institutionalised. The activities of both of these institutions have considerable impact on the livelihood, community and socio-institutional aspect of the people in the catchments. At the two catchments, the livelihood of people is greatly supported by forest and water institutions through increased agricultural activities and supply of firewood, fodder and litter to the users.

Inequities in the distribution of benefits do exist in both WUG and FUG and that needs to be addressed. There have been cumulative effects of both forest and water resources that have effected land use changes in the catchment with positive effect. Failure to reduce gender inequality as indicated by women's low representation and participation at decision making level is one of the weaker aspects of these institutions.

The case study of two catchments presented above indicates that certain aspects of FUGs and WUGs can be linked at catchment level. Considering the challenges and opportunities in the management of these institutions could be the starting point for any opportunities to link the two. Overcoming policy level and management challenges are important for the integration of these two institutions. The opportunities available from sustainable harvesting and commercial utilization of NTFPs are vital for improved and sustainable livelihood of the people. Both reduction and elimination of intra and inter-institutional conflicts would contribute to an enhanced management of these two resources for an increased benefit to the users. One important aspect of integration of FUGs and WUGs could be inter-institutional learning. Therefore, action research in some of these areas needs to be developed and conducted to explore the possibility of integration of these two institutions.

Quote (Combination of two sentences):

Forest and Water User Groups have made important contributions to the livelihoods of people in Nepal and integrating these two institutions could have an important impact on reducing poverty at local level.