The Influence of Community Level Institutions and their Governance on Use and Management of Forest Resources in the Hills of Nepal

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1. Introduction

Between 1965 and 1995, forests including shrub land in Nepal have been shrinking on average 24,757 hectares (0.83 percent) per year (Table 1). In general, increasing demand for forest products to maintain a rural household, extension of agriculture land in accessible forests, and logging and clear felling particularly in Terai plain and inner valleys are the causes of deforestation in Nepal (Sharma and Amatya, 1978; HMG 1988; NEPAP, 1993 and KMG, 1996). There has been an average decline in forest vegetation and its loss has been much higher in Terai plains and in mid-hills up to 1,600 m particularly in the vicinity of settlements Bhattarai (1998). Only about 15 percent of the forests has a crown cover of more than 70 percent (HMG, 1993).

Table 1: Changes in Population, Forest Area and Agriculture Land in Nepal

	1965	1978	1985	1990	1995
Population (000)	10,374	13,421	16,975	18,106	21,127
Forest Area[1/] (000 ha)	6,466.9[2/]	6,084.9[2/]	5,827.1[3/]	5,778.2[3/]	5,724.2[3/]
Shrub land (000 ha)	388.0	623.3	694 5	746.8	797.4
Forests (000 ha)	6,078.9	5,461.9	5,132.6	5,031.4	4,926.8
Agriculture Land[4/] (000 ha)	1,831	2,326	2,464	2,584	2,641
Forest area per Person (ha)	0.63	0.45	0.34	0.32	0.27[5/]
Forest as % of Total Area	43.9	4.3	39.6	39.3	38.9
Forest per ha of Arable Land	3.53	2.61	1.89	1.78	2.17[5/]

Total Country Area 14,718,100 ha

1/ This is the total forest area including shrubland and degraded forests.
2/ Sharma and Amatya, 1978; LRMP, 1986.
3/ HMG, 1988.
4/ HMG, 1978; HMG, 1996
5/ In real term the forest area available per person is 0.18 ha, and per ha of farmland is 1.46 ha, assuming 32.5% of the forest land is protected as national parks, which prohibit harvesting of any forest product.

While some areas have experienced a slight increase in vegetation during the past 8-10 years, no analytical information exists to provide a sound reasoning for such changes. Community forestry programme initiated in mid 1970s and leasehold forestry in early 1990s paved the way for user's participation in development and management of forests. There are a few examples of successful conservation and forest management systems, where rights to forest use and local organisations are involved (Messerchmidt, 1990; Gilmour, 1991; Shah et. al.,. 1998; Shah and Shrestha, 1997).

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Forestry development projects have formed community level organisations, locally called user groups and user committees, with responsibility to manage the forests given or leased to them for a fixed period. Little is known about the governance in these local level institutions, the structure of which vary depending upon the projects. It has been hypothesised that the local level institutions are greatly influenced by external factors and that their governance largely affect the use and management of forest resources.

The present paper examined the local level institutions, their rules and regulation and their functioning. Biological and socio-economic aspects of forest resources as influenced by these institutions are analysed in midhill situations, the external factors affecting the governance of local level institutions and the development and management of forests are also assessed.

2. Socio-economic and Biological Aspects of Forests

Socio-economic Attributes

Polycultural farming systems which integrate forests, domestic animals and crop production have been in operation in most parts of Nepal, particularly in hills and mountains, where forests provide grazing, foliage, materials for organic fertiliser and protection of water resources (Shah and Fried, 1992). Crop yields in the hills and mountains are directly related to the organic fertilising of the land, which is influenced by the number of livestock per households and nearness to the forest (Berthet - Bondet, 1983). About 80% of the forests have access to farmlands and to grazing domestic animals (Shah, 1996).

Almost all households depend upon forests for fuelwood particularly in the hills and mountains. Forests provided about 73 percent of total energy consumption in domestic sector in 1995 (CBS, 1996). During the same year, forests provided 57.8 percent of the total energy need for industrial sector and 26.1% of energy need for commercial sector. There is heavy dependence on forests for energy supply. Forests also supply poles and branches as supporting material to vine crops such as cristophine, and gourds, and timber material for household use. Some farmers also harvest forest products for commercial purpose e.g. medicinal plants, mushroom and vegetables, orchids, Himalayan bamboo to make baskets, and many others.

Biological

Thirty five different forest types have been recognised from tropical to alpine life zones in Nepal. There are 11 bio-climatic zones and the vegetation map of Nepal prepared by Nepalese and French Scholars has identified 118 different ecosystems (Dobremez, 1972; Shrestha, 1998). Vegetation is diverse in these ecosystems and the biodiversity richness is high. It is estimated that over 6,500 species of flowering plants, over 1,500 species of fungi, and over 350 species of lichens are contained in the bio-climatic zones (HMG, 1993). About 370 species of flowering plants are considered endemic to Nepal and around 700 species are known to possess medicinal properties. Of these endemic plant species, 28 species are rare, seven species are threatened and nine species are endangered (Bhattarai, 1998). HMG has listed 26 plant species, which are restricted to harvest. The current level of deforestation and devegetation is threatening the bio-diversity status.

Efforts are made to arrest deforestation and to conserve biodiveristy by establishing protected areas and by implementing community forestry and leasehold forestry programmes. Nepal

has gazetted 15.4% of its total area in eight national parks, five wildlife reserves and three conservation areas. Altogether the protected areas contain 32.5 per cent of the total forest and shrub land, assuming about 82% of the protected area as forest and the rest 18% as alpine grassland and water body. Community forestry programme covers about 12% of the total forests while the forest coverage by leasehold forestry programme is less than 0.1 percent. The forest development scenario indicates that about 55% of the total forest is national forest under the management of government agency, which is mostly uncontrolled and overexploited by *de facto* users and loggers alike. This poses threats to vegetation density and biodiversity.

Ecologically, the forests are in the threshold of degradation. There is tremendous pressure on the existing forest resources due to heavy dependence of increasing population for essential forest products e.g. fuelwood, forage, compost materials and timber. Moreover, about 90% of the rural households cannot afford to buy fuelwood and forage required for household sustenance. This is the micro-economic reality. Forest per person has considerably decreased from 0.63 ha in 1965 to 0.27 ha in 1995, and again not all these forests are available for rural households to use e.g. protected forest areas - and non-accessible forests (Table 1). The ecological relationship between forest and agriculture has further deteriorated; forest available per ha of farmland decreased from 3.53 ha in 1965 to 1.46 ha in 1995. To maintain the farmland productivity, when farming is oriented to subsistence, one ha of arable land would need 3-5 ha of forest (Wyatt-smith, 1982).

Forest Types

The Forest Act, 1993 has given legal definitions to various forest types in Nepal. National forest denotes all demarcated or non-demarcated forest except private forest. A part of national forest could be developed, protected, utilised and managed as protected forest, community forest or leasehold forest as per the decision and declaration made by the national government. Any kind of product harvest including fuelwood, fodder tree lopping and grazing is prohibited in national forest unless authorised. The Forest Act 1993 and the Forest Regulations 1995 prescribes strict penalties.

Protected forest is understood as national forest, which is declared by the government either as national park or wildlife reserve or conservation area with the consideration of ecological, scientific or cultural importance. Community forest means the national forest handed over to the user groups in order to protect, develop and utilise the forest for the benefit of the community. Whereas leasehold forests are those national forests, which would be leased to any institution, forest-based industry or community established in accordance with the existing law for the production of raw materials or forest products to sell or use in households.

3. Institutional Arrangements and Forest Harvests

There is a long history of government's involvement in protection and management of forests in. Nepal. Between the 13th and the middle of the 18th century, there were strict rules on forest harvest, use of products and management of forests. There were sanctions on harvesting live trees for firewood and the offenders were penalised. Taxes were imposed on animal grazing and on the sale of products like timber and herbs (Tiwari, 1991). During the first quarter of the 19th century, laws and by laws were promulgated to protect and manage the forest; many families who developed and protected the forests got incentives and their land tax payments were waived.

The commercial value of forests in Terai plain was recognised by Rana rulers and they established government institutions in Terai plains in 1883. They were named "Kathmahal" - Timber House. These offices were established mainly to protect forest and to make arrangements to sell forest products to British India. Under the Muluki Ain (Act) 1853, villagers and common people had to take permission to harvest forest products and the restrictions were imposed on harvesting of timber and fuelwood from the water source areas and in the vicinity of irrigation canal. In practice these sanctions were not much applied to the elite groups in society (Tiwari, 1991; Bhattarai, 1996).

To generate more revenue from the sale of timber and other products to India, forest offices were established in early 20th century in towns bordering India. The Rana rulers misappropriated forest lands in the forms of `Birta' and `Jagir' tenure; the government gave forests to the Rana families and the other privileged or elite families as economic support. They legally owned the forest, collected tax from the users and used to pay a part of it to the government. They had private institutions to manage the forest. The `Birta' owners regarded the forests as private property and they were strict on forest protection and some of them spent time and money to manage them while others logged the forest and made into arable land. Till the early 1950 about one-third of the total forest was under `Birta' and `Jagir' tenure (Regmi 1978). In most of the rural areas the privileged families called 'Mukhia' used to collect some tax from forest users on behalf of the government. The forest resources were abundant for the small population the country had, 6.3 million in 1940, and the transhumance pastoralists used the accessible forest for grazing their migratory livestock. There were no any informal group or organisation at community level related to forest use and management. It was mostly under private control, including the alpine grasslands.

The Private Forest Nationalisation Act, 1957 nationalised all the private forests in access of 2.5 ha in hills and 3.5 ha in Terai plains and the government became the sole owner of all forest lands in the country (Regmi, 1978). All the private institutions involved in protection, maintenance and utilisation of forests became defunct overnight, and the Forest Department, a government institution, was given the responsibility to protect and manage all the forests in the country. The administrative and the technical coverage of government institution was very low due to lack of trained persons and also due to limited number of field offices. While community level institutions, either informal or formal, were non-existent. The Forest Act of 1961 was promulgated to encourage private sector participation in forest development and management and to regulate and systematise forest use. It could not get the confidence of the people because of the ownership problem, forest belonged to the government. Some efforts were made after 1976 to develop Village Panchayat level forest institution through transferring degraded forest to them in the form of Panchayat forest. It had very limited success mainly due to political motive. The forest users were seldom participated.

Between 1957 and 1975 very little efforts were made to develop formal or informal community level groups, which could have played an important role in forest management and development. In spite of donor agencies initiation in forest development and conservation, and the 'police-work' of the government institutions, after 1957 a large part of forests in Terai plains, valleys and in the vicinity of settlements and arable land in the hills up to about 2,200 m were destroyed. In late 1970s donors like World Bank and FAO implemented community forestry programme, which gave right to use and manage the forest to a community. It aimed at developing a better understanding among community members to protect and manage the forest. The declining availability of forest products and the strong leadership in the community made some of the community forests look good. The community level institution was not formalised, rather the institution was loosely knitted and

was dependant more on individuals. As the forest resources became scarce, some of the local people gradually developed their own arrangements for protecting and regulating forests (Prasai et.al., 1987; Gilmour and Fisher 1991, Tamang, 1990b).

The Decentralisation Act of 1982 legitimised the process of handing over the forests to the user groups. The objective was to decentralise authority in order to enable the people (users) to take decisions and to make arrangements themselves for forest conservation, use, and management on a sustainable basis (Gilmour and Fisher, 1991). Master Plan for the Forestry Sector (1988) emphasised on transferring forest to users. It, however, needed a great effort to institutionalise the user groups, adopting sociological approach for forest protection, utilisation and management. The Eighth Five Year Plan (1992 - 1997) paved the way for community level institutional development as most of the forestry management and development programmes were supposed to be implemented with increased participation of the community. The entire responsibility concerning community forest would be handed over to some 5,000 user groups managing 252,000 ha of community forests (HMG, 1992). Similarly, the leasehold forest management programme and national park buffer zone development programme have created community level institutions in the 1990s. It looks as if the government institutions are shifting their responsibility related to forest development and management to rural community. It is still to be seen how these project or programme driven institutions function since the rural community in Nepal has little or no experience of institutional management and they know very little about the modern governance system. Forest products needed for rural households are getting scarce and this situation might lead to conflicts with the user groups and between the user groups for forest resource use and management.

4. Materials and Methods

Study Area

Institutional arrangements, governance, and biological and socio-economic status of forest resources were examined in eight sites, where IFRI studies were conducted during the last four years. These sites are Riyale, Manichaur, Sunkhani, Doramba, Chaubas and Bhagwatisthan (Table 2).

Community level forest institutions have been established and they are operating in all the sites with an exception to Shivapur site located in buffer zone of Bardia National Park, where the community members or the users have recently initiated to form a user group with UNDP assistance.

All these sites except Shivapur are situated in the Middle Hills of the Central Development Region (Table 2). The Shivapur site is situated in Terai plains. The elevation of the study area ranges from 180 m at Shivapur to 2,150 at Manichaur and with subtropical to warm temperate environments. The area has predominantly mountain topography with steep to rolling terrain. The area covers 257.5 ha of community forest, 151.3 ha of leasehold forest and 514 ha of protected forest, 233 ha of national forest managed by informal groups and 170 ha of national forest managed by government agency (Appendix 1). There are 6 community forest user groups and 23 leasehold forest user groups; each of these user groups has a working committee with defined rules and regulations.

Table 2: Characteristics of Study Area

Study area	Physiographic Location	Elevation (m)	Programme	Implementation	Study Conducted
Thulo Sirubari	Middle Mountain	980	NF, CF, LF	LFFDP	April 1955
Bhagwatisthan	Middle Mountain	1,325	CF, LF	LFFDP	June 1995
Agra	Middle Mountain	2,100	CF, LF	LFFDP	June 1995
Doramba	Middle Mountain	1,850	CF, LF	LFFDP	May 1995
Manichaur	Middle Mountain	2,150	WR, CF	SIWDP	June 1996
Sunkhani	Middle Mountain	1,880	WR, CF	SIWDP	Sept. 1996
Riyale	Middle Mountain	1,990	LF, CF	LFFDP	May 1994 March 1998
Shivapur	Terai Plains	180	NF, Zone of NP	PPP	May 1998

LF = Leasehold Forest, CF = Community Forest, NP = National Park, WR = Wildlife Reserve.
LFFDP = Leasehold Forestry and Fodder Development Project Financed by International Fund for Agriculture Development (IFAD), and the Technical Assistance Provided by Netherland Government through FAO.
SIWDP = Shivapuri Integrated Watershed Development Project, Financed by Norwegian Government and Technical Assistance Provided by FAO.
PPP = Parks and People Project in the Nepal Terai Financial and Technical Support Provided by UNDP.

Sources of Data and Information

Project reports and site reports on all the sites were examined and analysed for information and data relevant to community level institutions, both formal and informal, governance system, and the biological and socio-economic aspects of forests, which are managed by these institutions. All these reports are prepared by IFRI study Team - Nepal (see References).

IFRI research protocals were used to conduct fieldwork. The IFRI Research programme is designed to examined relationships among the physical, biological, and cultural worlds in a particular location and the defacto rules that are used locally to determine access to and use of a forest (Ostrom and Wertime, 1995). The theoretical foundations for this research programme is derived from the Institutional Analysis and Development (IAD) framework, an evolving method, which identifies and analyses the interaction between `physical and environmental resources', the users, community or individuals, and the rules-in-use, the latter influencing incentives for a possible outcome (Ostrom, 1994). The IAD framework was developed at the workshop in Political Theory and Policy Analysis, Indiana University, USA, which has also developed data base system for IFRI research programme.

The IFRI research team was established in Nepal in 1993, and the IFRI Collaborative Research Centre (CRC) in Nepal was associated with the Agriculture and Forestry Development Associates (AFORDA), Kathmandu till November 1997; now, the IFRI-CRC Nepal is a fullfledged non-government organisation.

5. Results

5.1 Changes in settlement area in the past two decades

Settlement Characteristics

All the settlements except in Doramba site were established 150 to 200 years ago, whereas Doramba settlements are fairly new, about 70 years old (Table 3). In Riyale site one settlement has been established fairly recently, 13 years ago. During the past 20 years there

has been significant increase in the number of households in Doramba and Manichaur site compared to other sites; their number has increased by two-three folds. Ethnicity is fairly homogenous with Tamang in five sites and Newar in 2 sites. Literacy among Tamang community is low (8-15%) compared to Newar (27%). This low literacy rate has implications on use of technology and on the management of institutions, which have been established by external agencies. All these settlements are located very close to the forests, at 0.2 to 1.0 km and this has made them to depend more on forest resources both for agriculture operations and for households maintenance. Now, they have added advantage in managing the forest handed over or leased to them. The current agriculture production is sufficient to feed them only for about 7-8 months on average.

Table 3: Settlement Characteristics

Site	Settlement History 1/	Increase in household (%) 2/	Ethnicity	Dominant Group 3/	Literacy	Food Sufficiency (months)
Thulosirubari	1790	61.5	Heterogeneous	Tamang	NA	6-8
Bhagwatisthan	1730	NA	Heterogeneous	Newar	NA	6-8
Agra	1550	37.2	Homogeneous	Tamang	NA	8-10
Doramba	1927	237.5	Homogeneous	Newar	26.6	6-8
Manichaur	1795	127.5	Homogeneous	Tamang	11.8	8-9
Sunkhani	1830	73.5	Heterogeneous	Tamang	14.7	7-8
Riyale	1845	62.9	Heterogeneous	Tamang	7.7	8-10

1/ The period when the first settlement was established
2/ Percentage of increase in the past 20 years
3/ Dominant single ethnic group having more than 70% population

Almost all the households are subsistence farmers adopting traditional agriculture practices and producing most of the food items they consume. They depend primarily on forest resources for farming, rearing livestock and managing a household e.g. firewood, herbs, raw materials to make basket and others. Qualitative changes to the agriculture and household production systems are less visible and so is the intensification in crop and livestock farming. The average arable - landholding per household is about 0.7 ha and with this land a household has to feed 5.8 persons. Naturally, the food produced in the farm is hardly sufficient for 7-9 months a year.

Exposure to socio-economic development ideas and the changes in lifestyle due to infrastructure have substantially increased needs for money and materials, and to meet these needs rural people temporarily migrate to urban areas for opportunity. People from Thulosirubari, Bhagwatistha, Dorambha, Manichaur and Sunakhani, Riyale sites come to Kathmandu and in adjoining urban areas for work in carpet industry, other services or in other manual job including portering and they stay 6-7 months outside their village. While some of the farmers turn to cash crops e.g. vegetables as observed in Bhagwatisthan, Agra, Manichaur, and in Sunkhani, potato seed production in Doramba site and bouquet grass planting for broom in Riyale. A majority of the households in Agra site collect herbs from the national forest and sell them to the herb contractors. Very few have own small business in settlement and the number of people working permanently in government job (usually army and police service) and other services is negligible.

Major changes observed during the past 3-4 decades are described below:

Thulosirubari

Villagers reported decrease in availability of forest products, decrease in average crop productivity and livestock population, decrease in use of organic manure, and increase in use of chemical fertilisers. Annual soil loss from the unterraced arable land, and less availability of leaflitter from the forest to make compost were referred by the villagers to be the main cause of declining productivity.

Agra

There has been a slight decrease in livestock population mainly because of declining fodder availability. Increased soil erosion and landslide in the forest area was the direct effect of slate-stone quarrying, which has been contracted by District Development Committee in spite of the villagers plea to stop them. The contractors are mainly from the adjoining villages who also use the forest occasionally. This landslide has destroyed arable land and other property. There has been some innovation in agriculture such as the use of fertiliser and the cultivation of potato and cauliflower for commercial purpose.

Manichaur site

Over-exploitation of forests in 1960s and up to early 1970s was associated with free range grazing and tree felling for timber and fuel, which were supplied to Kathmandu Valley. Damage of crops by wild boar coming from the protected forest has forced farmers to keep the land fallow land up to 2 hours walking distance from the protected forest to the farmland area. Intensification in vegetable farming especially the native crop `Iskus' Cristophine has taken place because of the market availability and good price. Lastly, there has been a phenomenal increase in the number of households during the past 20 years (Table 3).

Sunakhani site

The road construction from Kathmandu Valley, which passes through this site, has induced radish and broadleaf mustard cultivation on commercial basis. Use of chemical fertiliser has increased. There has been some decrease in forest vegetation, however the wild life from the protected forest has caused great damage to field crops. Recently, the buffalo rearing has significantly increased with the INGO programme and this has put immense pressure on forests for forage.

Riyale Site

The most noticeable changes are the deteriorating conditions of the national forest and reduced fuelwood selling practices. There has been vegetation improvement in forests, which were handed over or leased to the community. Establishment of milk collection centre close to the site has encouraged farmers to replace cattle with buffalo population and they have also made significant improvement in livestock feeding practices, especially in feeding crop residues. A gradual decline in agriculture production has been observed with a sharp decline in potato cultivation.

5.2 Forests in the Study Area

5.2.1 Forest Types

Based on access, use and management criteria, forests in this study are grouped into a) national forest, b) protected forest, c) community forest, and d) leasehold forest. The current use and management are described here. There are altogether 29 forests in this study area (Table 4).

Table 4: Number of Forests in this Study Area

Type of Forest	No. of Forest	No. of Sites
Community Forest	6	4
National Forest Managed by Community[1/]	6	4
National Forest Managed by Government	3	2
Leasehold Forest	11	5
Protected Forest	2	2
Total	28	

1/ Primary users have organised informal groups and they are protecting and managing the forests

National Forest

Two types of national forests are observed in this study: a) national forest managed by community and b) National forest managed by District Forest Office. National forest managed by government agency is an `open access forest' such as Phulchowki and Champ Kharka forest in Riyale site and two forests in Sunakhani site. These forests are used by more than one community from several villages and the users harvest the products and graze their animals at their will till the forest stops providing any useful forest product (Shah et. al., 1998). There is little or no any forest improvement activity initiated from the government agency, and the villagers use and over use the forest resources without investing in their improvement and management. They usually consider forest products as highly substractable.

The second category of the national forest is the `community controlled forest', which the local community, mostly the primary users, have managed the forest through coherent rules and regulations and regulated forest use and controlled access with some community consensus (AFORDA, 1998; Shah et. al., 1998). The primary users have gradually developed their own arrangement for protecting and regulating access to forest resources. Altogether there are six patches of community managed national forest (233 ha) and three patches of government managed national forest covering 170 ha (Table 4 and Appendix 1).

In principle, any kind of product harvest including fuelwood, and livestock grazing in national forests is illegal, and the users either loggers, herb collectors or the rural households have to take written permission to harvest products (Forest Act 1993, Forest Regulation 1995). The forest rules prescribes penalties, however, rules and regulations are seldom followed and the villagers, who have been customarily using the national forest for years, continue to use them for household purpose e.g. fuelwood, forage, leaflirter and grazing. Could it be the fact that the villagers have no knowledge or information on the legal use of national forest or the types of sanctions legally imposed by the government on essential product harvest other than felling

trees for timber. Moreover, monitoring and patrolling from the local range post and the District Forest Office is limited only to tree felling for timber.

Community Forest

Five patches of national forests with total area of 257.5 ha have been handed over by the government to the community for its sustainable use and management (Table 4, Appendix 1). Rules and regulations to regulate forest use and control access are prepared with the help of external institutions. A five-year work plan starting from the date of forest hand over is developed to improve and manage the forest. In fact, the work plan is a `blue print of national community forestry programme' developed by forest offices and it is given to the community for implementation with little or no modification. It is handed over to the community along with the forest.

Leasehold Forest

Eleven patches of degraded national forest covering about 154 ha are leased for a period of 40 years to the resource poor primary users in five sites (Table 4). Selection of lessees is based on land holding size and per capita income criteria usually below the poverty line. Rules and regulations, and work plan are prepared similar to the community forestry programme. Unlike the community forest the leasehold has a small size group, 6-10 members. The work plan basically focuses on the integration of forestry and horticulture/livestock development.

Both the community forest and the leasehold forest have the `common property regime' characteristics as described by McKean and Ostrom (1995) where a group of resource users share rights and duties towards the defined or allotted resource. For the practical expression it is termed as `community property resource'.

Protected Forest

The Shivapuri forest located at the northern part of Kathmandu Valley, which is a vital catchment area for water supply to the valley, was declared as 'Shivapuri Protected Area' in 1972. It aimed primarily at halting the degradation process of watershed and also aimed at preserving the ecosystems, habitat and biodiversity. The total area is 97 sq km and two forest sites covering 514 ha were studied. There are strict rules and regulations that prohibit use of forest products and unauthorised access. A boundary wall has been constructed to protect the area, and there are army check posts established in strategic points to protect the forest and to restrict unauthorised access to the forest. Similarly, the Bardia National Park is protected with barbed wire, military check-post and the strict rules and regulations. There have been significant conflicts between protected area authorities and the local inhabitants who have been customarily using the forest to maintain their household production system. In many places the local communities greatly depend upon the natural resources of protected areas for their livelihood.

Planners are in the process of formulating policies and strategies to make the management of protected areas more effective and sustainable through an approach known as 'Collaborative Management'. The active participation of local communities is sought to develop forests in buffer zone area, and some efforts are on the way to hand over forest patches in the buffer zone area to users as 'community forest'. This aims at reducing pressure in the protected area.

5.2.2 **Forest Vegetation**

General Condition of Forests

All the sites have natural forests that have existed for a long time. The forest had a climax vegetation until the mid 1950s and then deteriorated due to nationalisation of all forests in Nepal, and due to over use and lack of protection and management in the past 3-4 decades. All the 24 forests in this study lost both the area and vegetation and the degradation continued until the primary users formed informal groups to arrest the further degradation through regulated access and use. Such informal user groups were formed in Bhagwatisthan and Agra sites in 1987, and at Thulosirubari in 1995 (Table 5). Households from Manichaur and Sunakhani sites have access to protected forest whereas villagers from Riyale site uses national forests but they have not formed any group to manage them. They have easy access to Phulchowki national forest covering an area of over 1,200 ha.

Forest degradation was mainly due to over use and free range grazing, which is still in practice in national forests managed by the government agency. In Agra site the forest area decreased because of landslides. Government responded to the forest degradation through a) plantation, b) handing over the forest to the users as community forest, and c) leasing patches of forests to resource poor farmers. District Forest Office planted saplings in late 1970s and early 1980s in small patches in Bhagwatisthan, Doramba, Manichaur, Sunkhani and Riyale sites, with limited participation from users; protection lacked in most of the planted areas and only few plants survived. However, there has been good regeneration in forests handed over or leased to the community. Similarly, the community- protected national forests are in better shape compared to the national forests managed by the government agency (Appendix 2).

Vegetation Characteristics

Vegetation characteristics of forests were measured in altogether 422 randomly selected plots; 73 in protected forest (514 ha), 84 in community managed national forest (233 ha), 57 in government managed national forest (170 ha), 80 in community forest (258 ha), and 128 plots in leasehold forests (154 ha). Vegetation composition and densities of tree, shrub, tree sapling and tree seedlings are presented in Table 6 and Appendix 2.

National Forest Managed by Government Agency

National forests managed by the District Forest Offices have the lowest number of tree species, and the densities of tree, saplings and tree seedlings are also much lower than other forests (Table 6). Compliance to the national rules and regulations by users does not exist and, moreover, there is no monitoring from the concerned organisations to stop people from over-exploiting the forest other than tree felling for timber. There is lack of protection and management and there has not been any forest enhancement programme. These forests are at the mercy of users, who are usually from more than one or two settlements. A recent study in Riyale site has shown a considerable decrease in plant population during the past five years; the tree sapling population decreased from 5,100 per ha in 1994 to 2,932 per ha in 1998 (Shah et.al., 1998).

National Forest Managed by Primary Users

Forest vegetation in national forest managed by primary users is slightly better than government managed forest (Table 6). Primary users in Thulosirubari, Bhagwatsthan, and Agra have been trying to control access to the forest and to protect the forest from other users since 1987 (Table 5). The primary users in Agra have requested the District Forest Office to hand over the forest to them under community forestry programme. They have had mixed success in protecting the forest (AFORDA, 1998). Maruwa forest in Sunakhani has been protected and managed by the villagers as religious forest for over two decades. Harvesting of forest product is not permitted other than for religious purposes, and consequently, vegetation density, particularly tree species, is much higher compared to the other national forests as well as the protected forest in the same site (Shah and Shrestha, 1997). In the same site two women groups have initiated development and management of two small forest patches, 0.5 ha each, in 1995. They have also planted tree saplings in 1996.

Community Forest

Vegetation status of community forest is better compared to either national forest or leasehold forest (Table 6, Appendix 2). This exceptional vegetation condition e.g. tree species and density in Doramba site is attributed to strict protection and regulated harvest practices adopted by the users since 1982 although the forest was handed over to them only in 1993 (Table 5, Appendix 2). Even a two-season protection has made a great difference, a good regeneration, in forest vegetation in Manichaur site, number of tree saplings and seedlings now matching with the protected forest (Appendix 2).

Leasehold Forest

Only the degraded forests were leased to resource poor members of a community from the late 1993 to mid 1995, and in many instances these forests were degraded to a barrenland condition with very few standing trees. The ground cover was dominated by weed species such as Eupatorium sp., fern, Imperata sp. and Carex sp., which are usual found growing on degraded forest land (AFORDA, 1998; IFRI-Nepal, 1996). The forest patches leased to the two groups had no trees and only two species of shrub with 106 plants per ha (Appendix 2).

However, there has been a significant increase in number of tree saplings per ha (from 6 in 1994 to 16 in 1998), in sapling density (50% increment), and in seedling densities in Riyale site (Shah et. al., 1998). Nearly about four and half years of protection, and zero grazing and zero harvesting have had positive and visible impacts on forest vegetation, which could be easily seen from the settlements. Currently, these leasehold forests have higher seedling and sapling density compared to the national forests, and have plant counts similar to protected and community forests indicating a good natural regeneration (Appendix 2).

Protected Forest

Tree and shrub species richness is higher in Manichaur and Sunkhani protected forests than in any other types of forests, however, the densities of tree, saplings and seedlings are lower compared to the community forest (Table 6, Appendix 2). This indicates lax in control of product harvest or grazing, although they have been strictly protected with legal rules and regulation, fencing and by military check posts since 1976.

Table 6: Tree, Shrub, and Tree Sapling Species and their Densities

	National Forest		Protected Forest	Community Forest	Leasehold Forest
	Community Managed	Government Managed			
Number of Forest Patches	4	3	2	3	11
Number of Species					
- Tree	10.8	6.3	19.0	12.7	2.8
- Shrub	6.3	8.0	17.0	7.7	48
- Tree Saplings	11.3	16.0	34.5	21.3	11.7
- Tree Seedlings	-	7.3	18.0	17.0	10.8
Stem Counts/ha					
- Tree	333	55.3	76.5	1446	20
- Shrub	800	904.3	2779	305	740
- Tree Saplings	2154	1892	4593	5354	3182
- Tree Seedlings	-	25988	19408	25770	23469
Av. Tree DBH (cm)	16.2	13.4	12.3	14.1	14.3

This Table is based on Appendix 2. Figures are averaged.

5.3 Forest Institutions and their Governance

Institutions are an established custom, practice or relationship in a society. Institutions: sets of working rules that are used to determine who is eligible to make decisions in some arena, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, and what payoffs will be assigned to individuals independent of their actions (Ostrom, 1996). Institutions include families, communities, private organisations and government agencies. In this study the characteristics and governance of both harvesting and non-harvesting organisations are analysed. A non-harvesting organisation does not directly use the forest, but designs or influences the design of rules, policies about forest entry, harvesting and maintenance. The harvesting organisations include formal or informal user groups or committees.

5.3.1 National Forest Institutions

All the sites except Doramba and Manichaur have patches of national forest either managed by the government agency or managed by the primary users. The local level institutions and their governing system are described below.

a) National Forest Managed by primary Users

Thulosirubari site

The users of Sitheghari national forest, who live in two settlements in Thulosirubari site organised an informal group in 1995 to regulate the use and management of already degraded forest, about 8 ha in area. This user group approached the District Forest office to legally hand over the forest to the community in 1995 (AFORDA, 1998). This forest is heavily used by the villagers and meets about 30 % of fodder and 70% of their fuelwood requirement.

The primary users of Sitheghari national forest have developed themselves working norms and guidelines. Influenced by community forest and leasehold forest governing structure, they have even formed a committee to control over use of forest resources. They are now looking for some incentives from the government agencies.

Bhagwatisthan site

In 1977/78, the local Village Panchayat (VP) formed Forest User Committee (FUC) to manage the Charpiple-Tappal national forest. There was some pine plantation on the top of the hill (about 5 ha) by District Forest Office and the local users including a youth club with the support of Nepal-Australia Community Forest Project in 1983. Since the FUC could not control illegal harvesting, especially by the neighbouring village, a new Forest User Group was formed in 1986/87, which also included the households from the neighbouring village. This reorganised user group functioned until 1991 when the local politics influenced by the national political upheaval caused the breakdown of the FUG (IFRI-Nepal, 1996). Now they have a loosely organised group.

The Charpiple-Tappal forest user committee formed in 1977 and reorganised in 1987 had some written rules and regulations and provision for sanctions although they were not administered effectively by the committee members. Moreover, the political change in 1991 from Panchayat system of one party government to multiparty government in the country caused a breakdown of the earlier formed user group, and the village level government organisation became unable to regulate forest use and management. This political factor has had long lasting disturbances in Forest User Group governance and the conservation and protection measures adopted by the community were too lax, endangering the sustainability of forest vegetation. The forest condition deteriorated and in September 1994 an agreement was made between the local government and community, and the Hill Leasehold Forestry Project to lease out 78 ha out of the total 108 ha of this national forest to resource poor farmers. The forest patches leased to poor households were more degraded than the national forest left to be managed by the community (Appendix 2). Prior to leasing the forest to poor farmers, each household used to harvest annually 964 kg fuelwood (625 kg/ha), 1,497 kg leaflitter (970 kg/ha) and 1,655 kg grass (1,073 kg/ha).

This is a good example how the changes in the national politics and in the government policy negatively influence the governance of grass-root level institution.

Agra site

The local community from Chaubas and Ghalegaon were involved in protecting the Chaubas-Ghalepakha national forest (190 ha) for the last 21 years. Primarily the youths from the two settlements formed a Forest Protection Committee (FPC) in 1987 and protected tree felling and regulated the harvest of forest products. Until 1989 they had a good success but during the political movement in 1991, the FPC ceased to function and the people from the adjoining villages harvested the products without any control. With the consent of the villagers they formed a new committee in 1993 which primarily aimed at controlling harvest of forest products by other villagers, the secondary users. Tree felling was prohibited. Due to internal conflicts among the primary users regarding sanctions such as cash penalty, the Forest User Committee was dissolved in April 1995. However, the forest was protected by the local people on the basis of prevailing social norms and tradition of the community: grazing, forage harvest and deadwood collection were continued but they were very strict to felling trees (AFORDA, 1998).

Again in mid-1996 the primary users formed a committee and also developed a set of rules and regulation, called 'Article of Association of User group'. They have named the forest as `Shri Chaubas-Ghalepakha Community Forest' and applied to the District Forest Office with

recommendation from the local range post to hand over the forest to the User group Committee. They have prepared a work plan and they aim at controlling stone quarrying and encroachment by neighbouring villagers and they have also included regulated use of forest and economic activities in the forest to increase household income. The compliance to the rules related to maintenance and monitoring of forest is moderate, and verbal chastisement and social pressure are used as penalties for breaking the rules. This national forest urgently needs protection for natural regeneration as the current tree sapling density is much lower compared to other national forests (Appendix 2).

These users fairly understand the importance of secure property rights over the forests they are using for sound forest management and they discuss on ways to get this national forest handed over to them. Moreover, the landslides largely caused by quarrying have put the arable land in the surrounding area at high risk. They have even lodged a complaint against the neighbouring village to the District Forest Office and to the District Soil Conservation Office but so far they have no success. It goes against the wishes of neighbouring village who will loose economic gain if stone quarrying is stopped, and as they are influential people e.g. contractors, they are making indirect steps to delay the transfer of national forest to the primary users. This is how the microeconomic factors and the delay in decision making by the government agency affect the governance of a grass-root institution.

Sunakhani site

There are three patches of national forests protected and managed by the primary users. The Maruwa forest covering about four ha is protected and managed for religious purpose. Almost all 58 households participate in rule making related to forest conservation, use and its management. The rules although not written in any document form are understood and followed very strictly by each member. This is bound by social norms and codes and they have no external influences. This forest is used mainly for religious purposes and during the natural calamity, e.g. providing timber and fuelwood.

Two women user groups one member from each of the 20 households were formed in 1995 by Heiffer Project International (NGO) with the main objective of promoting buffalo farming. These groups were allotted small patches of forest and the Shivapuri Integrated Watershed Development Project (SIWDP) provided them saplings to plant in the forest in 1996. The users have developed some rules and guidelines related to forest protection and use of forest with the help of SIWDP.

b) National Forest Managed by Government Agency

The national forests in Sunakhani and Riyale sites have no any community institutions and they are officially managed by government agency. The government rules and regulations are seldom followed. Villagers have self-demarcated the forest area used by them based on accessibility, and usually others villagers do not use the forest. The users have never participated themselves nor they are initiated to participate in any forest improvement activities. About 10 years ago, SIWDP planted some saplings in Sunakhani forest and the local people participated in planting but very few of them are now surviving. So far they have not faced any threats from the concerned government agency for the currently over-use of the forest, where grazing is common. Species richness and plant density is poor compared to other forests (Appendix 2). In Sunakhani site, some of the users have started discussing to

form user group and to develop the forest as `community forest'. These users have access to protected forest.

The national forest in Riyale site is in bad shape, condition of forest vegetation is deteriorating due to over-use and due to lack of protection and monitoring by the government agency.

National forests are under threat of over exploitation, and if such forest is used by a small group of people living close to it, they tend to form informal group and develop some norms and codes and even rules to protect the forest. The community develops some sort of management system, which is based on their experience, indigenous knowledge, and exposure to forest development programmes. They select chairman and other executive members, which is the influence of government programme. The decisions made are very closely implemented although they are not written in minute book all the time. They even approach the District Forest Office to support them through plantation and to officially hand over it to the community.

5.3.2 **Community Forest Institutions**

Thulosirubari

District Forest Office officially handed over the Kalidevi community forest to the users in 1990. The local community has been loosely managing this forest since the late 1960s. The users number 105 and all the eight committee members are women. They have rules and regulations and work plan, and so far they have no conflicts in forest use. Leaf litter, forage harvest and dead woods are collected in fixed time as decided by the committee members and the users. Grazing is occasionally done. Farmers harvest Emblic Myrobalan, native fruit, from the forest and sell in the market. So far no fee has been levied for product harvest.

Doramba

The primary users of Dhobikhola formed user group in 1982 to control access and use of the 106 ha of national forest by the three nearby settlements. This forest is situated close to Dhobikhola settlement. Initially they had to struggle and face conflict with the nearby settlement people who claimed the `use right' to the Special Department of Police. The District Forest Office, Forest Range Post and the Dorambha VDC mediated and settled the case, and the primary users were given the 'sole right' to use the forest. In 1993, the forest was officially handed over by the District Forest Office (DFO) to the primary user group.

The use group has well defined sets of rules that govern the protection, use and management of the forest. The DFO in consultation with the users prepared a five-year work plan, which is now implemented by the users. The user committee has 9 members and three of them are women. The forest user committee arranges user group meetings, maintains relation with forest range office, makes schedule for forest patrolling on rotation basis, organises harvesting of forest products and checks forest encroachment by unauthorised people. The committee maintains the financial record, and in July, the close of the financial year, provides the financial details to users. Revenue collection from forest harvests and penalties for non-compliance are the major source of income. Some amount collected is also spent in maintenance of the local primary school.

Field survey was done in May 1995, just two years after the establishment of the community forest and till then there was no conflict reported. There are good reasons for functioning of this user group: a) only one settlement is involved and they are all the primary users, b) large forest size, about 4.0 ha per household (Table 7), and c) struggle to obtain 'property right' from the government. Only dead woods or branches are collected for fuelwood. They have restricted harvesting and the quantity harvested is much lower compared to national forests (Appendix3). Fuelwood harvest from the community forest is not enough and they supplement it from their farmland and small patches of private forests. This is the best forest in terms of species richness and plant density (Table 7).

Table 7: Fuelwood, Forage and Leaf Litter Harvest from Forests

	Bhagwatisthan*	Doramba **	Manichaur***		Riyale****	
	NF-C	CF	CF	PF	CF	LF
Area (ha)	108	106	115	316	29	23.5
Users (household)	70	26	249	242	95	28
Year of harvest	91-94	1994	1996	1996	1997	1994
Forest available (ha/hh)	1.54	4.08	0.46	1.30	0.97	0.84
Fuelwood harvest						
- Kg/ha	605	142	132[1/]	960[2/]	-	50
- Kg/household	964	576	143	1,169	-	45
Leaflitter harvest						
- Kg/ha	970	132	533[1/]	625	41	-
- Kg/household	1,497	538	403	813	40[4/]	-
Forage harvest						
- Kg/ha	1,073	NA	499[1/]	837	21	156
- Kg/household	1,655	NA	378	1,088	30[3/]	131

Source: * IFRI-Nepal (1996), **AFORDA (1998a),
***Shah and Shrestha (1997a)
****Shah, Karmacharya and Kama (1998).
NF-C = National Forest managed by Community-Informal Group.
CF = Community Forest, PF = Protected Forest, LF = Leasehold Forest

1/ 106 households from two forests covering 82 ha harvested fuelwood during thinning operation.
2/ Fuelwood harvest by military checkposts stationed in Manichaur is not included.
3/ Only 20 households harvested forage.
4/ Only 30 households harvested leaflitter.

Manichaur

There are three community forest user groups officially established in April 1994 and each of these user groups has a User Group Committee consisting of 11 members. One of the committees is headed by all women members and this is assisted by an `Advisory Council' of nine members, all men.

According to the local residents, forests around their settlements were dense till 1950s. Nationalisation of forest in late 1950s and lack of forest control and protection encouraged local residents to fell trees for fuelwood and timber to meet the growing need in the Kathmandu Valley. The forest vegetation degraded and much of the forest area was put under cultivation, and the declaration of protected forest in 1972 further reduced forest area and vegetation available to them. In 1992, two forest conservation committees were formed and one of them had all women as committee members. They formulated rules for forest harvest and even penalised a few farmers for their negligence over use of forest. These settlements

depended to a greater extent on Shivapuri protected forest area for forest products. In the following years the Shivapuri Watershed Integrated Development Project initiated and organised meetings with the local residents and formed user groups and user committees as per the government's act.

A community forest plan for five years (1994-98) was prepared by District Forest Office and it was discussed with the users. The work plan has set rules and regulations concerning access to the community forest and harvesting of products and there are provisions of penalty for breaking the rules. Only regulated use of forest for fuelwood, forage and leaf-litter was allowed, and the timber harvest was prohibited till the end of work plan. There are defined forest conservation policies. Rules and regulations and sanctions are minutely written in the work plan. These rules, given in the work plan, are primarily based on set of rules and guidelines prepared by the Department of Forestry for community forestry programme throughout the country.

Information about the institutional functioning is limited to a two-year period (Table 5). During the past two years, the groups planted saplings provided by SIWDP and one of the user groups sanctioned one user for harvesting leaf-litter without permission. The forest is well protected mainly because of the property right and that they have access to the protected forest for fuelwood, forage and leaflitter. Firewood was collected during forest thinning operation only in two community forests, and the total fuelwood and forage harvest is much low compared to the harvests from the protected forest (Table 7). Vegetation status especially the tree sapling and seedling densities are at par with the protected forest, which legally has been prohibited for harvesting since 1976 (Appendix 2).

There is variation in administering work plan between the three user groups and the group consisting of the women members is more promising than the other two groups. There are some sign of conflict between the users and the user committee in Ratmate community forest. Some of the households who have the customary right are not included in the user group and they are asking to be included as members or to separate the forest to be managed by them. User group and user committee meetings are important to bring the people together and discuss about the forest development and management. The work plan advocates monthly user committee meetings and half-yearly user groups meetings, however, in practice it has never happened. The last committee meeting was held after 18 months in February 1996, and the committee called the users meeting in July 1996 but no one turned up. The informal meeting of some of the users and the committee members made workable decisions on planting. This is common with other groups as well.

Executive committee members especially the chairman and the secretary are usually respected in their society and they command a social position in informal gatherings. They enforce the rules and regulations. However, when they call an official meeting very few turn up. It is a social problem in the community where the level of education and exposure to formal development plans are low. Formal meetings of any kind where records of meetings and decisions are kept with their signature are very new to this area. This social behaviour and attitude has put more pressure on committee members who are not paid and do not get incentives more than any user group member. Surprisingly, many of the committee members have no idea of what the work plan really contains. What they understand is that the forest now belongs to them and that they have to protect and use them. The chairman signed the handing over contract along with the District Forest Officer in a ceremony, and no efforts were made to make them understand the work plan in detail.

Riyale

Nigrepakha community forest user group was formed in 1992 and the forest was officially handed over to the user group committee in July 1994. The forest was very much devegetated at the end of 1980s, mainly due to lack of protection from the government agency. The local residents requested the visiting forester to plant saplings in the degraded forest, who timely responded to the villager's request and about 45,000 pine seedlings were planted with people's participation. Following the plantation, Forest Range Post assisted the users to prepare a forest plan. The forest covers 29 ha and its 95 users are from three settlements. There are sets of rules and regulations like the other community forest described earlier, with slight modification.

Nearly six years of protection, zero grazing and restricted harvesting of forage and leaf litter (Table 7) have increased densities of tree and shrub saplings and tree seedlings (Shah et.al. 1998). These households have access to national forest, own patches of private forest and leasehold forest. A current impact study in this area has shown that the national forest supplies 65.8% of the total fuelwood, private land (farm and forest) provides 33% and the rest 1.2% is supplied by leasehold forest (Shah et. al., 1998). There is no fuelwood harvest from the community forest. Similarly, national forest supplies about 90% and 52% of the total leaflitter and fodder respectively and the rest comes from private land. Community forest even after 6 years of protection merely supplies about 1% of the forage and 10% of the leaflitter. Easy access to and unlimited forest harvests in the national forest have made the users to restrict harvesting in community forest. The improved vegetation condition is at the cost of national forest. The local people say "the current level of harvest will turn the Phulchowki national forest into shrub land in 8-10 years time".

Like in other community forest user groups, the meetings are less held. The general assembly is held once a year and recently in late 1997 the users and the committee members through election replaced the previous chairman. Compliance is high and the protection and harvest rules are strictly followed as they have other access. However, the forest development activities such as regular thinning and weeding, and planting on barrenland which would need great efforts have not been implemented as mentioned in the work plan.

5.3.3 **Leasehold Forest**

This study presents data and information from 23 leasehold forest user groups, which are grouped into: a) Establishment stage - information collected within 10 months of their formation, and b) Operation stage - impacts of group functioning on biological and socio-economic systems assessed after four years of their establishment.

a) Establishment Stage

Altogether 16 leasehold forest user groups were formed between April 1994 and February 1996 in four sites (Table 5). The four national forests were divided into 16 forest blocks and were leased to 112 poor households. Each user group has a chairman, secretary, treasurer and members. The District Forest Office prepared a five-year work plan in participation with the users, got it approved from the national organisation and made a contract with user group chairman, who on behalf of all the users signed the leasehold contract. The work plan includes

forest protection, revegetation, nursery establishment and production of saplings, and agriculture loan for livestock and farmland improvement.

Information on these groups was collected between April 1995 and September 1995. Forest blocks leased to the users were mostly degraded with very few trees or shrubs growing there (Appendix 2), and the users were busy planting tree saplings and grass seeds they received from the concerned district offices. The first thing they did was 'protection and no harvest'. Some of the members got the opportunity to see and observe forest development activities in other parts of the country.

b) Operation stage

Seven leasehold forestry user groups were formed in Riyale site, and three national forests divided into seven blocks were leased to altogether 55 resource poor farmers who were also the customary users. The chairman of the respective group signed the leasehold contract between November 1993 and February 1994. Biological information on forests and socio-economic information on user groups were collected in May 1994, and the impact assessment was done in late February 1998.

Institutional Arrangements

Once the groups were formed in late 1993, the district offices concerned with the leasehold forestry programme assist the groups to prepare a five- year work plan. In reality the work plan is a blue print of the leasehold forestry development programme prepared for user groups throughout the country. Discussions were held on the work plan with the district offices. The user group members selected chairman, secretary and treasurer as committee members. The period of their tenure was not fixed. The concerned offices were District Forest Office (DFO), Agriculture Development Bank (ADB/N), and District Livestock Services Office (DLSO).

Role of users committee was defined in the work plan and so were the rules, policies and guidelines, however, the user committee may prescribe rules and guidelines for itself through consensus or decision in user group meetings. So far none of the user groups have formulated any rules or guidelines or even norms related to infractions and penalties which are left out in the work plan.

Governing system

Monthly meetings have been very irregular and their average number per year has decreased from 5 in 1994 to almost nil in 1997. This has adversely affected the co-operation and co-ordination among the members and the group action in forest improvement and maintenance activities. Some of the members blame the chairman for not organising a meeting. There have been changes in treasurer in two user groups and chairman in one group as they did not want to work in that position. In one group the treasurer and the secretary exchanged their executive posts. Members have left one group and joined the other group at their will and convenience. This shows flexibility in group organisation and the new members are not aware of the rules and guidelines or norms. All this affects the governance system.

Some of the members blame the government agency for not responding to the user group's demand for seedlings, other planting materials and technical know-how. Group decisions were seldom materialised and most of the members saw little or no benefit to attend the

meeting. And discuss the same matter over and over again. The promises made by the district offices during the group formation and during leasing of the forest were not fulfilled. Number of their visits and monitoring reduced each year in the same proportion as the user group meetings.

The literacy rate is less than 10 % (Table 3) and many of them can not read and understand the work plan which ends in July 1998 and they have to prepare a second phase programme. Very little efforts have been made to build up the capacity and capability of user groups to make them understand the development programme given to them by government agencies and to govern a formal institution established by outsiders.

The forest revegetation plan was a complete failure. Percentage of achievement is less than 7% in most of the programmes: a) grassland improvement less than 2%, b) seedling production 7%, c) fodder tree plantation 7%, d) fruit tree plantation 3%, and e) multipurpose tree plantation 19% (Shah et.al.,1998). Altogether 3,114 seedlings were planted in seven leasehold forest blocks and only 636 of them survived, with a survival rate of about 20%. Similar was the case with agriculture loan for livestock rearing and land improvement, and saving deposits. All these programmes suffered largely due to poor administration of district level offices. May be they were ambitious and developed wish-list type programme and asked the user groups to implement them or they could not administer the materials and technology required for the effective implementation of the work plan.

However, the biological assessment results are positive: a) significant increase in tree sapling and tree seedling density indicating a good natural regeneration, b) increased species richness, especially seedlings, and c) higher tree and shrub density compared to 1994 (Appendix 2). Four years of protection and `zero harvesting' have triggered these positive impacts. The lessees site these changes mainly due to a) protection and 'zero grazing', b) regulated harvesting during the forest thinning operation which was done once in the last four years, and c) a good monitoring of the forest by users to keep off the encroachers.

Most of the group members have realised the 'property right' of forest, which are leased to them for a period of 40 years and they have protected the forest with great care. They have adopted right level of conservation measures but they lack incentives and knowledge to scientifically develop the forest, which was the main goal of the work plan. The major problems identified are: a) lack of knowledge and motivation among the group members on thinning and weeding in the forest area, b) lack of understanding among the group members about the use of the forest, c) unavailability of desired seeds and planting materials for revegetation, and d) lack of group action. Some demand for fuelwood could be met from the leasehold forest, if thinning is done regularly as an improved forest management practice, and this could also help good growth and development of tree and shrub saplings. May be the fact that the users have easy access to national forest and obtain most of the forest products they need from there, and so they give less time to improve the leasehold forest.

6. Discussion

Four Findings emerge:

a)

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Appendix 1

Demographic Characteristics and Forest Area and User Groups

Study Area	No. of Settlement	House-hold	Popu-lation	Forest Area (ha)		Formal User Groups		National Forest (ha)
				Community Forest	Leasehold Forest	Community Forest	Leasehold Forest	
Thulosirubari	2	105	843	8	14.1	1	4	8*
Bhagwatisthan	3	70	471	-	78	-	8	30*
Agra	2	70	434	-	2.8	-	1	190*
Doramba	1	27	164	106	14.4	1	2	-
Manichaur	5	264	1640	114.5	-	3	-	316[1/]
Sunkhani	4	144	1065	-	-	-	-	198[2/], 75,5
Riyale	4	110	605	29	42	1	7	20
Shivapur	2	128	870	-	-	-	-	75
Total	23	918	6092	257.5	151.3	6	22	917

1/ All the five settlements have access to 316 ha of protected forest.

2/ Households have access to protected forest (198 ha) and two patches of national forests (75 ha).

* Community managed national forest.