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ANALYSIS

Stability and outcomes of common property institutions in forestry: evidence from the Terai region of Nepal

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Abstract

The purpose of this paper is to explore the conditions for success of local common property institutions in forestry. The analysis is based on a case study of the Terai (lowlands) region of Nepal. Common property institutions were found to be stable despite the presence of inequality, ethnic heterogeneity, and migration into the region. This is due to the fact that these institutions build upon established systems of authority in the villages, include monitoring and enforcement mechanisms, and benefit from a supportive legal environment. As far as outcomes are concerned, common property serves well to protect forests locally; however, many village residents resort to exploiting forests managed under state property. The impact of common property on poverty alleviation is ambiguous.

Keywords: South Asia; Nepal; Common property; Forestry; Participatory development

1. Introduction

There has been a rising interest in common property institutions in natural resource management in developing countries. Many bilateral and multilateral donors expect that local level common property institutions perform better than state or private property in conserving (or regenerating) natural resources. At the same time, common property is expected to have a positive impact on the livelihoods of the rural poor.

The question remains, under which circumstances will these institutions produce the desired effects. The purpose of this paper[1] is to explore the conditions for success of local common property institutions in forestry. The analysis is based on a case study of the Terai (lowlands) region of Nepal.[2]

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[1] The evidence presented in this article is based on the fieldwork I conducted in 1997 with a study group of the German Development Institute. The other members were Ines Freier, Friederike Kegel, and Martina Mäscher.

[2] The concept of "Terai" is ambiguous: in its narrow version, it refers to the southern lowlands of Nepal, which are part of the Gangetic plain. A broader version includes the first (northern) mountain range, that is, the Shivalik or Churia Hills. A third version also includes the river valleys between the Shivalik and Mahabharat ranges, which are generally referred to as the "Inner Terai". In this article, the concept of "Terai" refers to the 20 administrative districts along the southern border of Nepal. Hence, it roughly corresponds to the second version.

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In Nepal, the evolution of common property institutions in forestry (locally known as *community forestry*) has experienced a new impetus in recent years: under a new forest law enacted in 1993, village residents have been encouraged to form forest user groups who design and enforce a set of forest management rules in co-operation with the state forest administration. Until December 1994, 2756 community forestry user groups constituted themselves and managed 112 626 ha of forests. Despite this increase, community forestry is still in its initial phase, as it accounts for only 2% of the forest area in Nepal (His Majesty's Government of Nepal, 1988b, p. 24; Hobley, 1996, p. 89). Most community forests are located in the mountains. Only 10% of all user groups and 17% of all area under community forestry are situated in the Terai region (Hobley, 1996, p. 89).

In the mountains, the main reason for deforestation has been the erosion of traditional common property institutions in forestry, which occurred as a result of changes in the forest policy of the state and demographic and technological changes (Bromley and Chapagain, 1984; Talbott and Khadka, 1994). The strategy of donors has been to revive the traditional institutions through project interventions at the village level, and by supporting a favourable institutional environment by providing technical and financial assistance to the forest administration.

In the Terai, in contrast, deforestation has predominantly been caused by the demand for agricultural land and forest products from settlers who migrated to the region from the mountains or from the Indian part of the Gangetic plain. The region was thinly populated before 1960 because it was infested with malaria. Migration started after malaria was eradicated in the early 1960s. As a result, traditional systems of forest protection do not exist (apart from those practised by a small and now dispersed indigenous population). Hence, the challenge to development co-operation is to support the creation of *new* local forest management institutions.

There is widespread agreement on the appropriateness of community forestry in the mountain regions of Nepal (His Majesty's Government of Nepal, 1988a, p. 147; Gilmour and Fisher, 1991; Talbott and Khadka, 1994; Hobley, 1996). As far as the Terai region is concerned, however, considerable controversy exists about its feasibility. It has been argued that the agrarian structure, the ethnic composition of the Terai population, migration, and the spatial distribution of forests and settlements make community forestry in the Terai infeasible (Shrestha and Budhathoki, 1993; Nepal Working Group, 1995, p. 11; Hobley, 1996, pp. 154–165). The *inequality* inherent in the agrarian structure of the Terai is considered as an obstacle to co-operation among village residents because the poor are expected to have less incentive to protect forests than the non-poor. The *ethnic diversity* that has resulted from the migration of very different ethnic groups to the Terai is considered as another obstacle to co-operation because it is seen as making the creation of trust among village residents of different ethnic origin more difficult. Continued *migration* into the Terai is feared to destabilise the membership (and, hence, the effectiveness) of user groups. Finally, the *spatial distribution* of forests is considered as an obstacle because many forest users live too far from the forests to be able to protect them against unauthorised users.

This paper argues that community forestry *is* a feasible institution for forest management in the Terai, as some villages have protected their village forests even informally over an extended period of time. In this sense, the article extends an earlier study by Bromley and Chapagain (1984). The reasons include strong support from the rural élite, the incorporation of monitoring and enforcement mechanisms into local rules, and a supportive legal environment. The available evidence suggests that community forestry serves well to protect forests locally. However, the distributive conflict between the rich and the poor on the establishment of strong forest protection rules is eased by the fact that the latter resort to exploiting forests managed under state property. The impact of community forestry on poverty alleviation has been found to be ambiguous.

The article is organised as follows. Section 2 develops a framework for the analysis of common property forest management institutions which

distinguishes between stability and outcomes. Section 3 provides an overview of the study area. Sections 4 and 5 analyse the stability and outcomes of community forestry, respectively. Section 6 presents conclusions and discusses implications for other settings.

2. An analytical framework

Institutions are formal and informal rules that govern human behaviour. More precisely: "Institutions consist of informal constraints, formal rules, and the enforcement characteristics of both" (North, 1989, p. 239). Institutions are linked to behaviour by the incentive structures they represent and the physical and social environment in which human beings live. The approach followed in this article is therefore to analyse the patterns of behaviour which alternative property regimes generate in the particular economic, political, and social setting of the contemporary Terai society. The analysis of property institutions in this article focuses on two aspects of institutions: their stability and their outcomes.

The concept of stability intends to capture sufficient conditions under which a set of rules generates a constant pattern of behaviour at a low transaction cost over an extended period of time. Obviously, this is the case when actors comply with an unchanging set of rules. More precisely, an institution is called *stable* if compliance is high and rules are rarely changed over an extended period of time. Transaction costs rise when compliance is low or declines over time (i.e. the number and intensity of rule violation rises) or when rules are frequently changed. Alterations in rules cause transaction costs because they need to be negotiated and agreed upon – a process, which can absorb considerable economic resources. It is possible that alterations contribute to stability if they set incentives that support compliance. However, this does not necessarily involve *frequent* changes in rules. An institution is therefore called unstable if compliance is low or rules are changed frequently.

The stability criterion alone is insufficient to assess the performance of an institution. Institutions that govern economic behaviour have evolved because actors seek certain *outcomes* in terms of the allocation and distribution of economic resources. If individuals pursue their own objectives, it is possible that all actors conform to an unchanging set of rules, but that the resulting pattern of allocation and distribution is different from what has been desired. In this sense, stability does not guarantee particular outcomes.

Two types of outcomes are considered in the following analysis: ecological sustainability and poverty alleviation. Ecological sustainability requires that the forest area does not shrink further and forest quality (in terms of the diversity of forest products and the age composition of the forests) does not decrease. Poverty alleviation requires that the per capita quantity or the range of forest products (e.g. in terms of species) available to the rural poor expand compared to a historic point of reference or compared to an alternative forest management institution. This increase may be continuous or once-and-for-all. Poverty alleviation may also take place when other economic opportunities for the poor arise as a result of a forestry institution. For example, a forestry institution may raise the employment of the poor if it increases labour demand from the non-poor.

The specification of ecological sustainability and poverty alleviation as criteria for the evaluation of outcomes represents a simplification, as it neglects the complex choices between competing land use patterns (agriculture vs. forestry) and the structure of output in forestry (i.e. whether biodiversity conservation or the production of wood or other forest products should be a priority). As far as the structure of output in forestry is concerned, any allocation of forest area to particular uses has to strike a compromise between the basic needs of the rural poor and other objectives. Given the importance of forest products for the livelihoods of the poor, the objective to increase the availability of forest products to the poor appears to be justified.

As far as the conflict between agriculture and forestry is concerned, a standard result of dynamic optimisation models is that, along an efficient path, the static marginal benefits of the two land use alternatives are equal (see, for example,

Ehui et al., 1990). Two observations indicate that the marginal benefits from forestry currently exceed those from agriculture in the Terai. First, the relative prices of forest products have increased. Respondents in Dhanusha District stated that the prices for *sal* (*Shorea robusta*) timber and for fuelwood increased at annual rates of 25% and 17%, respectively, during 1987–1997, which is above the inflation rate of roughly 11%. Second, private returns from tree plantations exceed returns from agriculture in a variety of settings. Kanel (1995, p. 102) calculates an ex ante financial internal rate of return to a block plantation of *sissoo* (*Dalbergia sissoo*) of 25% and an economic internal rate of return of 35%. Similar results have been calculated for agroforestry (Jaiswal et al., 1994; Kanel, 1995). Most Terai farmers who have access to formal credit are currently offered market interest rates below 20%. Consequently, there has been a considerable increase in the establishment of block plantations by farmers in the study region.

Stability and outcomes are interdependent. On the one hand, stability is a necessary condition if particular outcomes are to be achieved continuously and the physical and social environment of an institution does not change significantly. On the other hand, stability can only be achieved if incentives exist for the actors that the outcomes they prefer will be achieved at least in the long run.

The analysis in the following sections focuses on the stability and outcomes of common property institutions. Under common property, a set of rules exists which limit both access to the resource system and the extraction of resource units. The rules can be designed, enacted, and enforced by the group of individuals who jointly own the resource.[3] Recent theoretical and empirical contributions emphasised that stability, ecological sustainability, and economic efficiency can be achieved if natural resources are managed under common property (Larson and Bromley, 1990; Ostrom, 1990; Ostrom et al., 1994; Bromley, 1992; Baland and Platteau, 1996). Incentives exist for all actors to establish a common property institution because efficiency gains can be attained. However, actors fail to establish appropriate institutions if transaction costs are too high. Furthermore, a common property institution may not remain stable after it has been established because incentives exist for individual resource users to defect from their commitments as long as their actions remain unnoticed by others.

Three factors can support the stability of an institution (Ostrom, 1990, pp. 192–214). First, each actor has to make a commitment to comply with the rules, which has to be credible in the eyes of all other actors. This is generally difficult to achieve because incentives to defect are always present. Second, monitoring and enforcement mechanisms are required. Monitoring mechanisms help to detect violators while enforcement mechanisms raise the cost violators have to incur for their infringements. The existence of these mechanisms works as an additional incentive to make a commitment. Third, external factors (i.e. the legal and political environment) can support or erode the stability of an institution.

The following analysis therefore focuses on commitment, monitoring and enforcement mechanisms, and external factors to explain the stability of the common property institutions that exist in the Terai. First, however, an overview is provided on the study region.

3. The study area

3.1. Overview

The Terai is the most important agricultural region in Nepal. Agriculture accounts for 56% of the total cultivated area in Nepal and contributed approximately 77% to the national rice production in 1993/1994 (Central Bureau of Statistics, 1994, p. 36; Central Bureau of Statistics, 1995a, pp. ii, 99). Landholdings are distributed more unequally than in other regions: the Gini coefficient of the distribution of land is 0.54 in the Terai as opposed to 0.43 in the Hills, 0.45 in the Mountains, and 0.52 for Nepal as a whole. At the

[3] The concept of common property employed in this article corresponds to the concept of "regulated common property" used by Baland and Platteau (1996).

same time, the average size of agricultural holdings is 1.26 ha in the Terai, which is the highest in Nepal (Hills: 0.77 ha, Mountains: 0.68 ha, Nepal: 0.96 ha) (Chakraborty et al., 1997, p. 34). Members of landless households and subsistence farmers work under wage labour or sharecropping arrangements on fields owned by the other landowning classes. Bonded labour is reported to persist. It is difficult to obtain data on migration into the Terai. However, the population growth rate of the Terai (as compared to other regions) is indicative of the fact that in-migration has occurred on a large scale, as Table 1 shows. Population growth rates have been above the national average and the rates in other regions during 1961–1991. Hence, the ethnic diversity of the Terai is largely a result of recent migration.

Strong deforestation took place in the 1960s and 1970s. During 1978–1991, deforestation continued at an annual rate of 1.25%, which, however, conceals large subregional differences. The annual deforestation rate was highest, i.e. 3.8% in Rupandehi District, which is located in the western Terai (data from His Majesty's Government and FINNIDA, 1994). The calculation of deforestation rates for the period 1978–1991 was based on the interpretation of aerial photographs taken in 1978/1979 and satellite images (Landsat Thematic Mapping data) taken in 1990/1991. Field verification was undertaken on sample plots. His Majesty's Government and FINNIDA (1994) contains a description of the methodology.

Wood is still the most important source of energy both in rural and urban areas. The converted energy content of the fuelwood amounts to 67% of total rural and 75% of total urban energy consumption (calculations based on Water and Energy Commission Secretariat, 1996, Annex 1 and 4.1c).

Table 1
Annual population growth rates by physiographic zone, 1961–1991[a]

Period	Terai	Hills	Mountains	Nepal
1961–1971	2.39	1.85	1.85	2.05
1971–1981	4.11	1.65	1.35	2.62
1981–1991	2.75	1.61	1.02	2.08

[a] Source: Central Bureau of Statistics (1995b, p. 43).

In order to gain a better understanding of the stability and outcomes of community forestry, a field study was conducted in the Terai districts of Banke and Dhanusha during March–April, 1997. Banke is situated in the western part of Nepal while Dhanusha is located in the east. Three to four forest user groups were visited in each district. Besides, discussions were held with government officials, representatives of forest-based industries, and other social actors. Rapid rural appraisal methods were employed.[4]

Differences and commonalties exist between the two districts: in Banke, an area of 148 111 ha is covered by forests, which amounts to 66% of the district area. The forests are easily accessible and commercially valuable. Dhanusha, in contrast, has a forest cover of only 30 846 ha, which accounts for 26% of the district area (data provided by the district forest administration). Almost all of the remaining natural forests are concentrated in the north of Dhanusha. Access to some of these forests is difficult, as they are located in the Shivalik Hills. Other forests are accessible only for residents in the north and centre of the District, as the residents of the south would have to travel too far to obtain forest products (Soussan et al., 1991). Estimates on deforestation rates are available only for the plains in the two districts: while the annual rate of deforestation in Banke was 1.18% during 1978–1990, forest cover in the plains of Dhanusha increased by 2.2% annually. This increase has been attributed to tree planting on private land. Its high rate is due to the fact that it started from a very low level of 2000 ha in 1978 (His Majesty's Government and FINNIDA, 1994, p. 6).

Community forestry is still in its initial phase in the two study districts. In Banke, a total community forest area of 200 ha has been handed over to four user groups so far. The earliest handover was

[4] The methods included semi-structured interviews, group discussions, participatory mappings, the creation of forest lifelines and seasonal calendars, and (in some cases) rankings. For a more detailed account of the methods of the study, see Chakraborty et al. (1997).

to the Gijara user group in 1995. However, nine more groups have applied to oversee community forests. In Dhanusha, only one community forest of 5.5 ha has been handed over to a user group so far. The handover took place in 1996. However, 15 more groups have constituted themselves and applied for community forests that would cover a total area of 1000 ha. There is a strong demand for community forestry in the two districts. Many groups visited complained about the forest administration's delaying the handover.

3.2. State and private property to forests

More than 80% of all forests in Nepal are managed as *state property*. State management of forests in the Terai has proved to be unsatisfactory both in terms of *stability* and *outcomes*. Instability has been caused by the fact that compliance has been low. There is a general consensus that it has not been possible to effectively prevent the illegal extraction of forest products by various actors (Shrestha and Budhathoki, 1993, p. 24; Talbott and Khadka, 1994, p. 7). The evidence in the study districts confirmed this view. Smuggling by rural households and organised traders takes place in both directions across the border to India. Furthermore, a considerable proportion of the population has to rely on the extraction of forest products from government-managed forests for their livelihood. Finally, tolerating illegal forest use is known to be a source of illegal income for officials at all levels of forest administration.

The continuing non-compliance with state property rules has been caused by ineffective enforcement, high monitoring costs, and a lack of credible commitment by the rural population. Ineffective enforcement is partially a result of corruption within the forest administration. In addition to this, forest officials appear to tacitly acknowledge that a large part of the rural population has no alternative to using government forests for their subsistence. Monitoring costs are high because it is costly for the forest administration to collect information on the state of the forests, the behaviour of the rural population, and the monitors themselves. The commitment to state property rules is low because the right of the state to exclusively use the forests is not considered as legitimate by a large part of the population.

As far as outcomes are concerned, state property has neither achieved *ecological sustainability* nor has it contributed to *poverty alleviation*: The inability of the forest administration to "protect" the forests against rural households and commercial interests has caused a continued degradation of forest resources. As a result, the availability of forest products to the poor has decreased.

Between 1971–1972 and 1991–1992, the area of woodlands and forests *on private land* in Nepal increased from 4700 ha to 108 800 ha (Central Bureau of Statistics, 1994, p. 40). The experience of Dhanusha District confirms this trend, as the number of trees on farms increased 6.5 times from 174 570 in 1981 to 1 133 090 in 1991 (National Sample Census of Agriculture, 1981/1982 and 1991/1992, quoted after Kanel, 1995, p. 96). A significant part of this increase took place in the south of the District.

Tree growing on private land (farm forestry) has turned out to be very stable because it is based on the stable institution of private land ownership. It can make a significant contribution to the increase of forest area in the Terai. Moreover, it can reduce the pressure on government-managed forests and cover a large fraction of the urban industrial and household demands for timber and fuelwood in the future. In this sense, farm forestry contributes to *ecological sustainability*.

Evidence from Dhanusha District suggests that the impact of farm forestry on *poverty alleviation* is limited. First, farm forestry cannot satisfy the demand of the landless for forest products, as the landless are hardly able to pay for them. Second, only medium and large farmers can allocate resources (especially land) to farm forestry on a large scale. Farmers who produce (almost) exclusively for self-consumption are not in a position to establish block plantations. Instead, they grow trees on field bunds, if at all. This result confirms the findings of other empirical studies (Soussan et al., 1991, p. 1305; Kanel, 1995, p. 118). Furthermore, tenants have only weak incentives to plant trees because they have no legal rights to them (Subedi et al., undated, p. 2).

4. Stability

The community forestry management institutions have shown a high degree of stability in all except one of the eight forest user groups visited. All groups protected their community forests *informally* for several years. Furthermore, the regimes have remained stable after the transfer of formal property rights: rules have seldom been altered and compliance has been high. The reason is that the groups were able to solve the problems of *credible commitment*, *monitoring* and *enforcement*. Furthermore, the *external environment* played a supportive role.[5]

4.1. Formal rules

Under community forestry, the transfer of property rights to local communities is governed by a legal procedure defined in the Forest Act of 1993. When a forest user group is founded, it formally approaches the district forest administration for registration. Then a "constitution" is drafted in co-operation between representatives of the group and the forest department. The constitution defines membership, the organisational structure, the objectives of the group, and the distribution of forest products among the members. It contains a list of ordinary members and a list of members who perform administrative functions in the User Group Committee, its executive body. The constitution has to be enacted by the consent of all members and has to be accepted by the head of the district forest administration. After enactment, the group can apply to manage a forest as community forest. To this end, a work plan is negotiated between the user group and the forest administration, which defines the geographical boundary of the forest, the silvicultural treatments to be applied, and the patterns of extraction and protection.

Both the constitution and the work plan must conform to the rules defined in the Forest Act of 1993 and the Forest Regulation of 1995. For example, the rights to sell forest land or to convert it to non-forestry uses remain with the state and are never transferred to the local communities. In general, there is considerable scope for designing the work plan according to local needs. However, negotiating power is distributed asymmetrically in favour of the forest administration, as the forest user groups are not in a position to exert strong pressure on the latter. After the work plan has been accepted by the head of the district forest administration, the forest is formally handed over to the group, i.e. the property rights defined in the work plan are transferred.

The head of the district forest administration can decide to withdraw the rights if the rules of the work plan are violated. However, this process is rule-based. If the user group does not accept the withdrawal, it can appeal to the next higher administrative level, the regional forest director, who directly reports to the Ministry of Forests and Soil Conservation.

4.2. Credible commitment

The observation of high stability implies that the problem of credible commitment has been solved. An important reason is that user groups build on existing power structures in the villages, which have been shaped by the distributions of land and a general acceptance of the traditional social hierarchy. These "systems of authority" (Bromley, 1992, p. 5) are reinforced by community forestry, as powerful community members increase their influence through the control over the forest as a resource that is of central importance to rural livelihoods.

All villages visited have a clear structure of authority. Participation in decision-making on community forestry management rules is de facto limited. Village leaders, who usually belong to the wealthy strata of the community, support community forestry and determine the rules for the user group together with the forest administration. Generally, it is the large farmers who are members of the User Group Committees. This can be seen from the fact that the actual process of the formation of the Committees remained unclear to the research team even after many interviews. It appears that user group committee members are

[5] See Chakraborty et al. (1997) for a more detailed presentation.

not elected in a true sense. Instead, they are presented (or present themselves) to the general users meeting and are assigned their positions by an act of general consent (acclamation).

There is external pressure from donor agencies and (sometimes) from the forest administration to make the composition of the User Group Committees more democratic. User Group Committees are informally required by the forest administration to include one or more female members and – sometimes – one or more members who are landless. The forest administration refuses to register the user group unless these requirements are satisfied. However, women and the poor do not appear to play a very active role in the Committees (Chakraborty, 2000). This partially reflects the fact that the traditional class and gender hierarchy has a high legitimacy in the villages. Furthermore, the poor depend on the non-poor for a variety of reasons other than forestry (e.g. for employment during the harvest season), which inhibits the poor from articulating their demands too strongly.

Income inequality does not appear to be a hindrance to the stability of community forestry user groups. In most villages, the less powerful users comply with community forestry rules; neither did they object to the rules in the interviews. One reason is that they do not effectively question the prevailing power structure in the villages. Another is that they expect to gain in the long run (see Section 5.2 below). Furthermore, the intensity of conflicts over the protection rules for community forests is reduced by the fact that government forests are de facto available as a reserve, at least to user groups in northern Dhanusha and Banke. Heavily forest-dependent people (who are usually poor) can (and do) switch to these forests for the extraction of forest products. This makes it easier for these groups to commit themselves to strong protection rules. The non-poor, in contrast, can resort to tree growing on their own land.

Neither was *ethnic heterogeneity* found to be a hindrance to user group stability. There are two reasons for this. First, many user groups are ethnically homogenous, i.e. the ethnic diversity of the Terai region partly manifests itself in the form of different ethnically homogeneous villages coexisting with each other. Second, ethnically heterogeneous groups exist in which one ethnic group dominates all others.

It is useful to distinguish three broad ethnic groups in the region: mountain migrants, Terai Hindu castes, and the indigenous Tharu. Mountain migrants comprise various ethnic subgroups whose culture is Hindu–Buddhist. The Terai Hindu castes are migrants from the Indian part of the Gangetic plain. The Tharu are the first known ethnic group to live in the Terai region before the 1960s. Their economy was based on swidden cultivation and silvipastoralism. The rise in migration into the Terai after 1960 sparked off a process of land alienation from the Tharu to the migrants. As a result, the Tharu have become a socially and economically marginalized group (Müller-Böker, 1995, pp. 96, 162).

Table 2 shows the ethnic composition of the user groups visited. Mountain migrants exclusively inhabit four villages. In one case (Madhubasa), an entire village community consisting of Magars migrated from the mountains to the plains. Another village (Haththipur) is exclusively inhabited by Terai castes. In all cases, the internal hierarchy of the village communities remained largely intact, which enabled the village elders to exert strong leadership in the establishment of common property institutions.

In three groups (Srideshwor Mahadev, Binauna, Maal Tole), mountain migrants live together with Tharus or Terai Hindu castes, but represent the strongest social, economic, and political force in the village. These groups did not appear to be less stable than the villages just described.

The *spatial distribution of forests* and villages has not been an obstacle to credible commitment because only villages who are located adjacent to a forest have formed user groups. As these groups are able to effectively exclude outsiders, the wood demands from non-local users do not threaten user group stability. They rather reinforce stability, as non-local villagers who ''encroach'' on the user group's forest are considered as common enemies. In one group, a market solution is practised to resolve conflicts between the user group and more distant users: all users (i.e. members

Table 2
Ethnic composition of the forest user groups visited

Name of user group	Location	No. of households	Ethnic groups[a]
Gijara	Udarapur, Banke District	256	Mountain migrants: Newar, Chhettri, Brahmin, Gurung
Mahila Upakar	Kohalpur, Banke District	69	Mountain migrants
Sridheshwor Mahadev	Khaskusma, Banke District	42	*Mountain migrants*: Magar, Chhettri; 3–4 Tharu households
Binauna	Binauna, Banke District	255	*Mountain migrants*; Tharu
Kemalipakha	Dhalkebar, Dhanusha District	142	Mountain migrants: Tamang and others
Madhubasa	Pushpalpur	61	Mountain migrants: exclusively Magars
Haththipur	Haththipur-Harwada, Dhanusha District	256	Terai Hindu castes: Das, Mandal, Pasman, Mohara, Dhobi, Makatara
Maal Tole	Uma Prempur, Dhanusha District	200	*Mountain migrants*: Lama, Magar, Tamang; few Terai Hindu castes

[a] Italic – dominant ethnic group(s).

and non-members) have to pay a fee for extracting forest products.

In-migration into the villages is small and is not perceived as a problem by the users. Where it is tolerated, the new settlers can become members of the user group. In general, however, new settlers do not join existing village communities but settle on public land which, generally, happens to be forestland. That is, the conversion of forests to agricultural land caused by in-migration is a problem for public policy, but does not threaten the stability of existing community forestry groups.

4.3. Monitoring and enforcement

Effective monitoring and enforcement mechanisms exist in all user groups visited. As forest user groups build on the existing power structure, monitoring and enforcement is comparatively easy. Graduated sanctions exist. In the Mahila Upakar user group, for example, grazing fines for goats are Rs. 5 for the first time, Rs. 10 for the second, and Rs. 15 for the third time (Mahila Upakar Community Forestry User Group, 1997). These amounts are substantial, given the agricultural wage level: the lowest daily wages encountered in Banke District were Rs. 20–30 for women and Rs. 50–60 for men.

Monitoring and enforcement systems differ between the user groups. Some groups employ *chowkidars* (watchmen) with salaries ranging from Rs. 200 to Rs. 1200 per month. In general, the members pay these. In some cases, however, the Forest Department paid the salaries. Other groups rely on user group members' monitoring each other's behaviour permanently, i.e. besides their daily activities.

Enforcement is backed by the Forest Department in all user groups. If offenders refuse to pay fines, the users send them to the *ilaka* (forest range) office. The Forest Department staff then collects the fines for the users and sometimes imposes additional penalties. It turned out during the field visits that there is no general pattern concerning the origin of offenders: rules are broken both by user group members and non-members.

4.4. The external environment

The external environment has been broadly supportive of community forestry. Forest legislation created a legal base for the transfer of property rights to village communities who organise themselves in forest user groups. The forest administration assists the groups in defining the property rights and supports the enforcement of forest protection rules. Bilateral donors supported this process by village level project interventions, projects that improve the technical and organisa-

Table 3
Forest regeneration

	Forest size [ha]	Protected since	Evidence of regeneration
Gijara	100	1989	The forest is a plantation of (mostly) *D. sissoo* with high tree density and average tree heights of 3–5 m. Limited undergrowth of grass. Respondents reported the existence of medicinal herbs.
Binauna	200	1993	Dense natural *S. robusta* forest with tree heights of 3–8 m. Dense undergrowth of grass, young trees and other small plants.
Kemalipakha	150	1982	Natural forest (*S. robusta*) and plantations (*D. sissoo* and *khair*) with average tree heights of 3–4 m.
Madhubasa	88	1980	Dense *S. robusta* forest with tree heights of 3–8 m and dense undergrowth.
Haththipur	6	1988	Low-density *D. sissoo* plantation along a canal. Average tree height: 3–6 m. No undergrowth.

tional capacities of the forest administration, and a policy dialogue with the government.

However, implementation problems persist with regard to the role of the forest administration in assisting villages to establish forest user groups. In both districts, more villages applied for the transfer of property rights in 1996–1997 than were actually transferred the rights. Village residents frequently complained in the interviews about delays in the handover process. Some groups are reported to have given up protection while others continue to rely on informal protection of their village forests.

Bribes paid by the local population for covering subsistence needs from state forests are an important source of income to the lower levels of the forest administration. As this source is likely to dry up in the case of successful community forestry, these levels strongly oppose the transfer of property rights to user groups and try to delay it as much as possible.

5. Outcomes

5.1. Natural resource regeneration

As handovers of community forests have occurred only recently, the evaluation of the long-term effects of community forestry on forest area and quality in the Terai has to rely on the history of informal forest protection. Village residents have protected forests for up to 17 years (Madhubasa) have protected forests without their being formally handed over. The Gijara user group protected its forest for 8 years before it was handed over to them.

As quantitative data on the state of community forests in the beginning of informal protection do not exist, the assessment of forest regeneration has to rely on visual comparison between community forests and forests in their vicinity that have not been protected by local communities. Visual comparison showed that community forestry has not only prevented a further reduction of forest area in the protected community forests, but has also led to substantial regeneration (e.g. Binauna, Madhubasa, see Table 3).

In most cases, only degraded natural forests have been handed over to forest user groups, as there is an informal rule within the forest administration not to hand over well-stocked forests. Consequently, access to many community forests has been restricted temporarily in order to allow these forests to recover. As a result, many user group members have to rely on *government-managed forests* to cover their basic needs. Among the communities visited in the two districts, the demand for fuelwood was predominantly covered by illegal extraction from the government forest or, to a minor degree, purchased. Only in one case (Gijara forest user group) was demand totally covered by the yield of the community forest and excess fuelwood was sold to outsiders. In Binauna

and Madhubasa, the forest area protected by the user group appeared to be just sufficient to cover the group's fuelwood needs.

Grazing cattle in community forests is either prohibited or restricted to defined periods during the year. As a result, people rely heavily on government-managed forests for fodder, as could be observed in the Mahila Upakar and Kemalipakha forest user groups.

5.2. Poverty alleviation

The evidence on poverty alleviation effects is ambiguous: while all members of a user group benefit in the long run, the poor are more severely affected by restrictions on forest use in the short run. Furthermore, there is an equity problem between members and non-members of a user group. The analysis therefore distinguishes between *intra*- and *inter*-group equity and long-term and short-term effects.[6]

5.2.1. Intra-group equity

In the long run, every member of a forest user group benefits from community forestry. For without community forestry, the accessible forest area would further decrease. Degraded forests, which are temporarily closed and effectively protected, will yield more forest products in the future. In this sense, community forestry leads to a Pareto improvement for the members of a user group.

In the short run, however, the poor have to suffer the most if a community forest is closed temporarily. Opposition to community forestry was therefore expressed during the field visits by several landless village residents (e.g. a basket weaver in Maal Tole). In contrast, better-off factions of a user group, e.g. land owners with trees on their own land, do not oppose community forestry because they have alternatives to forest use.

Most of the groups visited in Banke and Dhanusha District have equal appropriation rules for all user group members. This can be regarded as just and "democratic" in itself, but also perpetuates existing inequalities like the continued discrimination toward female, landless and low-caste user group members. Critics might construe this as an argument against community forestry as such. However, the benefits the poor can expect from community forestry must be weighed against the benefits they are likely to obtain from alternative allocations of property rights. It has been demonstrated above that they would be worse off under a regime of state or private property.

5.2.2. Inter-group equity

Problems of inter-group equity arise when several villages (or user groups in their formative stage) compete for the use (or handover) of a nearby forest, or when distant users compete with proximate users for the same forest.

Relatively well-off villages are more active and articulate to push forward their demands for handover. They are better informed about community forestry and are fast enough to be the first to gain control over the resource. Among the groups visited, this was found to be especially relevant to the groups with a majority of mountain migrants. With the exception of the Haththipur and Maal Tole groups, all groups listed in Table 2 reported conflicts with other villages that occurred after they began to deny access to the community forest to outsiders.

Another problem with regard to inter-group equity refers to the *spatial distribution of forests*. People who live far away from forests (distant users) may be as dependent on forests as are those who live close to the forest (proximate users). In Dhanusha, the distant users live in the southern and central parts of District. In Banke, they live in the southwest. As their villages are scattered over a wide area, it is impossible for them to organise themselves and form user groups. There is an equity conflict between proximate and distant users because community forestry enables proximate users to monopolise control over forests at the expense of distant users. One solution could be to further develop markets for forest products. However, this 'solution' cannot be considered as satisfactory because the distant users who are most dependent on forests – e.g. the landless – cannot afford to buy forest products.

[6] A more detailed account of equity issues is presented in Chakraborty (2000).

6. Conclusion

The evidence presented above has shown that community forestry is a feasible institution of forest management in the Terai. The main reason is that traditional systems of authority are strong in the villages, which enables the village élite to exert strong leadership in forging a consensus among all village residents about the rules that constitute a community forest. The achievement of a credible commitment to the rules is, however, facilitated by two other circumstances. First, the remaining government-managed forests represent a reserve which can be exploited to satisfy subsistence needs. Second, the forest administration supports the efforts of the local user groups to enforce their rules both internally and externally.

In short, the observed stability that results from a high level of compliance and the relative invariance of rules is likely to generate the outcomes described in Section 5 for an extended period of time, if the environment does not change significantly. However, the critical point for community forestry will come when the state-owned forests are no more available as a reserve – either as a result of stricter enforcement by the forest administration or because they have become too degraded or too distant from the user group villages. Community forestry is likely to remain stable if the output of community forests increases to the extent that it completely satisfies local subsistence needs. This can be achieved in two ways. Either the area under community forests has to be increased or the productivity of these forests has to be raised. The latter could be achieved by applying improved silvicultural techniques or by handing over not only degraded forests but also well-stocked forests to local communities. It is doubtful whether the poor will continue to comply with the community forest protection rules in a situation where they cannot satisfy their basic fuelwood needs and at the same time do not have access to fuelwood substitutes.

What can be learnt from the Terai case for the feasibility of common property institutions in forest management in other settings? First, the distributive conflict between poor forest users (who have to make large sacrifices in the short run for the protection of a community forest) and non-poor forest users (who can secure their supply of forest products by growing trees on their own land) can be reduced if a ''frontier'' of government forests exists which can be exploited. However, the exhaustion of this reserve will make the distributive conflict re-appear unless the output of the community forest is raised in due time.

Second, a strong system of authority within the group of resource users and external support in the enforcement of rules help to stabilise common property institutions. This justifies the multilevel approach adopted by several donors who intervene both at the village level and on the regional or national policy level, supporting the forest administration in formulating and implementing community-oriented policies.

Third, as far as outcomes are concerned, progress with regard to ecological sustainability is not necessarily accompanied by poverty alleviation. Instead, the redistributive impact of such schemes can be expected to be small. The positive poverty alleviation impact that can be expected as a result of the increased regeneration of forests will be strong only in the long run.

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