

# The Community vs. the Market and the State: Forest Use in *Uttarakhand* in the Indian Himalayas

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**Abstract** *Most writers on resource management presume that local populations, if they act in their self-interest, seldom conserve or protect natural resources without external intervention or privatization. Using the example of forest management by villagers in the Indian Himalayas, this paper argues that rural populations can often use resources sustainably and successfully, even under assumptions of self-interested rationality. Under a set of specified social and environmental conditions, conditions that prevail in large areas of the Himalayas and may also exist in other mountain regions, community institutions are more efficient in managing resources than either private individuals or the central government. In advancing this argument, the paper undermines the often dogmatic belief in the universal superiority of private forms of ownership and management.*

**Keywords:** common property, resource management, forests, Himalayas, *Uttarakhand*, collective action, institutions, new institutionalism.

## Introduction

In the debate on the causes of deforestation, the role of local populations, especially at the village level, occupies a controversial space. The debate divides participants into two opposed camps. Ranged on one side are those who believe that local populations consume resources unsustainably, "to the point where subsistence needs overwhelm all possibility of protecting long-term viability" (Abernathy, 1991: 324). According to Raven, the "very poor people who make up the bulk of the population in most developing countries often use natural resources very destructively" (1991:

260). Not only do local populations consume resources unsustainably, it is also presumed that they do not possess the capacity to stint on their rate of resource use (Cool, 1983; Ehrlich, 1988; Wilson, 1988; Myers, 1976). The other side in the debate argues that the situation is quite the contrary. Local populations not only possess the capacity to conserve their resources and use them rationally, they often do so. Their capacity to create institutions for guiding resource use and to manage resources well is usually impaired not by the logic of growing numbers but by the interventions of the state and sometimes market pressures (Agrawal, 1992; Ostrom, 1990).

Pessimistic conclusions about the role of villagers in deforestation lead analysts to two types of policy prescriptions. According to one group, since villagers do not know their own good, and since they are incapable of constructing durable institutions for sustainable resource management, central governments must control their destructive practices and educate them (Ehrenfeld, 1972; Hardin, 1978; Ophuls, 1977). Indeed, government policies towards the environment are usually premised on the above prescriptions. Alternate policy prescriptions stem from economists who are averse to big government and collective ownership alike. Markets and price signals, according to most economists, are the *sine qua non* of efficient management. But forests in developing countries are seldom owned under private property rights regimes, and the management of forests at the local level is usually not influenced strongly by market pressures. Economists, therefore, prescribe the transformation of collectively owned and managed resources into systems of private ownership and management.

More recently a large number of studies, in counterpoint to the devotees of markets and state control, have begun to dispute the generality of conclusions that emphasize the destructive aspects of local collective management of resources. These new studies, although in a minority, stress the positive aspects of local management increasingly vociferously. Many of these studies argue that villagers possess unmatched knowledge about the resources they possess, and follow sound management regimes that take into account both ecological considerations and the individual and collective welfare of community members. They buttress their arguments with a wealth of references to actual villager practices (Acharya, 1984; Brokensha, Warren, and Werner, 1980; Gupta, 1990, 1992; Lea, 1993; McKean, 1985, 1986; Messerschmidt, 1987; Netting, 1993; Warner, 1991; Warren, Slikkerveer and Brokensha, 1991).

In the face of conflicting claims and contradictory evidence, the problem is to find a theoretical basis for reconciliation. It is certainly possible to find yet more empirical instances where villagers have overexploited their resources, and, conversely, situations where they have carefully husbanded and managed benefits from collectively owned resources in the face of individual incentives to over-consume. It is also clear that finding more examples of over-exploitation or careful use will not settle the more general question about the capacity of villagers to manage resources without "help" from outside. At the same time, the theoretical explanations cannot afford to ignore available empirical evidence, nor its conflicting nature. Given the multiplicity and high degree of diversity of factors that affect resource use, it may

be more fruitful to search for middle-range theoretical explanations than for universally generalizable solutions.

The following paper attempts to intervene in the charged debate on the role of local populations and collective resource management in deforestation. Using the context of villages in the Middle Himalayas, where the debate has ranged as fiercely as in any other location, I will, in contrast to most economists and resource management theorists, provide a theoretical justification for the proposition that collective management of forests by villagers under certain specific management objectives will be more efficient than either private or central government management and control. Long-term efficiency of resource use is, after all, at the heart of the debate on whether villagers can collectively protect and sustain their forest resources. Using stylized facts from primary research and secondary sources, I will construct an account of the rural ecology in the Middle Himalayas. The account I provide, while a Weberian ideal-type, contains the significant and relevant characteristics of large regions in the inhabited areas of the Himalayas, and also possibly in other mountainous regions. Several existing case studies describe the geographical and economic characteristics I use in my description, but usually do not draw the inferences highlighted in this paper.

My analysis deploys insights from transactions costs economics (Ouchi, 1980; Williamson, 1985) and new institutionalism (Bromley, 1989; Eggertsson, 1989; North, 1990) to underline the crucial variables on which efficient use of forests depends. I assume throughout that individuals are rational, instead of relying on a moral economy framework (see Scott, 1976), and that people act to achieve self-oriented goals, not altruistic or extra-rational ones (Margolis, 1982). The paper develops an institutional analysis framework to establish links between geographical and historical features of forest use in the Indian Himalayas to argue that these features make it more efficient for forests to be utilized as common pool resources at the same time as it may be possible for cultivated lands or other resources to be owned and managed through a private property regime. In so doing the analysis will highlight the specificities of resource characteristics that render particular institutional arrangements more or less desirable; and at the same time undermine the belief that private ownership is universally desirable over other forms.

While I argue that collective management of forests is likely to be more efficient than private or central government management, I do not make any claims about the durability of institutional arrangements that are more efficient. Nor do I suggest that more productive resources will be managed under private property regimes. And, unlike many property rights theorists who believe that more efficient institutions displace less efficient ones, and then persist (Alchian, 1950; Barzel, 1989; Nelson and Winter, 1982; Netting, 1981; North, 1981; North and Thomas, 1973), the argument in the paper implies neither that efficiency is the progenitrix of new institutions, nor that more efficient institutions survive longer.

## **Ecological Environment**

As a result of policy incentives created by the government, changes in occupational

structure, and increasing population needs, the general tendency in the Indian Middle Himalayas has been an increase in the cultivated area at the expense of area under forests.<sup>1</sup> At the same time, agricultural practices in the hills differ considerably from those in the Indo-Gangetic plain. The most important feature of hill agriculture is the interdependence of livestock and crop farming, and the linkages between forests, livestock and agriculture. In contrast, in the plains, where returns to specialization in agricultural production are high, such integration is uncommon. A number of factors account for the close interdependence of agriculture, forests, and livestock.

The relative isolation of farming systems in the higher altitudes and the topography of these regions are two major factors that account for the continuation of integrated farming systems. Since transportation is difficult in the hills, farmers are often effectively isolated from factor and product markets. This means that the relative prices of inputs such as chemical fertilizers, HYV seeds, pesticides and other inputs for modernized agriculture are higher in the mountains. But owing to the terrain and the physical features of the region, it is also more difficult to use these inputs and mechanized implements. Soils are shallower and poorer than in the plains, variations in daily and annual climates is large, and the differences in other natural factors such as aspect, slope, and sunshine hours, are often great enough to resist the introduction of modern methods of agriculture because of the uniformity they require. Further, markets for specialized equipments are also non-existent in hill areas owing to the low level of industrialization and low agricultural demand for mechanized equipment.<sup>2</sup> Under the conditions outlined, animals assume a highly significant role in the predominantly agricultural hill economies. They provide both draught power for ploughing and fertilizers for the crops in the form of manure. They are also good sources of protein through milk, milk derived products, and meat.

It is certainly true that different areas in the hills may possess some comparative advantages in producing either animals or crops because factors such as altitude, slope, soil characteristics, precipitation, light conditions, drainage and temperature vary, often significantly over very small distances (Britt-Kapoor, 1995). However, the relative isolation of most villages from markets, and the high costs of transporting factors of production and agricultural and forestry products between markets and fields, mean that returns from specialization are not very high. Each area needs to produce some minimal level of crops and rear a minimal number of livestock to achieve subsistence. Typically, most hill families possess at least a pair of cattle for ploughing (Personal Survey, 1993). Since animals perform a highly complementary role in hill agriculture, sources of food for animals are equally essential. One source is, of course, crop residues. But forests remain, perhaps, the most important source for animal fodder. Little fodder is ever purchased.

Not only are forests significant sources of fodder, they fulfill a number of other important functions in the household economy. Fuelwood for cooking, leaf litter for animal bedding, compost and fertilization, and timber for local construction purposes are some of the more important uses. In addition, they also provide fruits, medicines and herbs. As is evident, many of these are subsistence uses and may provide relatively low returns to input. But notwithstanding relatively lower commer-

cial value, forests, in light of their enumerated uses, are essential to the hill farmers and households, especially in comparison to the plains (Mahat et al., 1987: 66–67). Given the great importance of forests in hill economies, and higher costs of their commercial exploitation in the remoter areas, it is not very surprising that even in places where deforestation has proceeded apace, some forest cover can be found, and in some instances, has even increased (Fox, 1993). In contrast to the plains, where there may be no distinguishable stands of trees and the average number of trees per hectare may often be less than five, in hills, areas where the average number of trees is less than a hundred may be rare (Gilmour, 1988: 348). In many instances, the forest cover may even be quite dense (Agrawal, 1995; Somanathan, 1990).

Further, most local level studies of forest use in the hills suggest that the geographical distribution of areas under agriculture and forest cover follows a distinctive pattern. Even for settlements that are not nucleated, forests are usually on the boundaries of cultivated fields, on the outskirts of villages and are often exploited as common resources that belong to the village community, rather than to individual families and households. There may be more than a single stand of forest that is managed by the village community, but the number of forests belonging to the village is nowhere near the number of distinct households. Cultivated land, on the other hand, is owned privately and holdings of arable land are often contiguous.<sup>3</sup>

### **Criteria for Judging Efficiency**

Efficiency in resource use can only be defined from the perspectives of particular sets of users. Under some conditions, efficient use of resources may be quite compatible with deforestation—as when the net present value (NPV) of clear-felling a stand of trees today, is higher than the NPV of harvesting after a year. It can also be argued that deforestation and using the land for agriculture may be more efficient than using the land for producing trees. But efficiency is likely to coincide with conservative use of forests under the following conditions: (1) a general scarcity of forest products such as fuelwood, fodder, and timber exists; (2) the forest contains relatively few commercial species and is exploited chiefly for subsistence by villagers living near the forest; (3) alternative uses of the land on which the forest is growing are not very productive. This will be the situation when the land is rocky or slopes steeply, or when the soils are shallow and poor; and (4) the users expect to rely on the forest for their subsistence for a long time. Under these conditions, deforestation will be highly inefficient for users and they will attempt to devise institutional arrangements that can minimize the costs of maintaining the forests to increase efficiency of resource use.

To argue that collective management of forests will be more efficient under the ecological conditions I have described, it is necessary to identify the sets of costs and benefits that different systems of property rights will entail. Keeping benefits constant, property rights and transactions costs theorists stress the significance of two sets of costs incurred in institutional operations. These can be broadly categorized as costs incurred in negotiating and creating property rights institutions that can allocate benefits from resources (*ex ante* costs); and costs incurred in ensuring that

the rules for allocating benefits are faithfully observed (ex post costs). While these are analytically useful categories, it is difficult to operationalize them.

A number of other institutional theorists, however, have used functional criteria to create categories of costs that can be employed for real life analyses. Thus Dahlman (1980: 116), in his analysis of the English common field system, refers to four sets of costs that are involved in producing and consuming resources: (1) costs of establishing and protecting property rights; (2) costs of decision-making with respect to the use of a scarce resource; (3) costs of establishing organizations to facilitate production and exchange; and (4) costs of policing the implementation of decisions about the desired use of productive resources. Ostrom et al. (1993) use production costs, co-ordination costs, information costs and strategic costs in their analysis of institutions for managing rural infrastructures. While the theoretical ambition in each of the cited cases is to create a universalizable set of costs that can account for the particularities of different empirical contexts, it is obvious that no pre-specified set of costs can cover all conceivable empirical situations. Thus, Dahlman does not consider strategic costs in his analysis, while Ostrom et al. do not take into account all the categories that Dahlman employs.<sup>4</sup>

While the problem seems obvious, the solution is less clear. In my analysis, I will proceed on the basis of the particulars of the situation that I want to explain, and use existing discussions on different kinds of costs as guidelines. Since the analysis is aimed at examining the relative advantages of different forms of property rights (private, communal, and government) in managing resources, I will ignore the costs of establishing rights. In my comparative static analysis, I will proceed from the assumption that different forms of property rights already exist. Proceeding from this assumption, I will consider the costs that must be minimized under different institutional forms, and assess which types of institutions are most likely to lower a particular type of cost.

Once property rights are already in existence, there are three major costs that will affect the utilization of forests under a given institutional arrangement: costs of using the resource, monitoring the use of the resource according to agreed upon rules, and enforcement of rules by punishing those users who deviate. The sum total of these costs is likely to be lower under collective management of forests in the hill regions as compared to private or central government control and management. Private ownership refers to a system of property rights where individuals or households possess the right to use and manage the resource in question. Central government ownership and control refers to those arrangements where the government or some agent of the government at the local level defines and enforces rules about the use and management of resources. And communal institutions authorize the community to make such decisions and the resource is collectively owned.<sup>5</sup> Communal arrangements usually exhibit a higher diversity in form than private or government ownership. The boundaries of a community may also be harder to locate. For the purposes of this paper, a community is defined as a group of resource users at the local level that is formally or informally constituted and that sees itself as a spatially situated group.

## **Analysing Efficiency**

Three features of the environment in the hills are crucial to the ensuing analysis: there exists a very close link between forests, livestock and crop production; forests are usually not interspersed with cultivated fields, but are most often found on the outskirts of the village; and with changes in the relative isolation of the mountain regions, greater economic advantage may be reaped from specializing in the production of livestock, or crops or some other commodities. How do these factors affect the costs discussed in the previous section under different institutional arrangements?

### *1. Costs of Using Forests*

If the technology of utilizing forests remains the same in the three cases (private, communal and government ownership and control), then the costs of using them will also remain the same. It may be argued that over time some institutional arrangements will favour the use of more efficient technologies compared to others. A satisfactory functional form for technological innovation, however, remains to be developed. In fact, usually the development of new technologies is itself taken to be a function of how benefits from a resource are allocated to different individuals in relation to the costs they bear (Hayami and Ruttan, 1985; North and Thomas, 1973).

If, following Schultz (1964), we treat the organization of the use of a resource as part of the technology of use, then grazing in communally owned forests can cost less than under private or government ownership. On average households in village communities own no more than three or four animals each because they seldom specialize in livestock production. But any individual can oversee a much larger number of grazing animals, up to possibly 50 in mountainous regions. Under communal organization of grazing, therefore, fewer individuals will be required to look after the animals than under private ownership of forests where each household will need a herder for its animals. Under government ownership of forests, if rights to grazing are assigned to each village household, the same condition will obtain as under private ownership of forests. If rights are assigned to the entire community, then it is again communal organization of grazing that is more efficient.

It should be pointed out that the above argument will not hold if animals are stall-fed. Each household, then, must collect fodder for its animals from the forest, and there will be no economies of scale available to users under any institutional arrangement. But in most hill villages there are at least some animals that are not stall-fed, especially after crops have been harvested. Further, a few species of animals, such as goats and sheep are almost always grazed outside. A second condition may equalize the costs of grazing under the three different property rights arrangements: if households arrive at an arrangement to graze their animals collectively although they own the forests on an individual basis. But this alternative, again, only shows the superiority of the collective option over the individual household operating alone.

## 2. *Monitoring Costs*

Monitoring members of groups while they are using a resource leads to two kinds of costs: those stemming from individuals explicitly opting to use more units than their entitlement, and costs resulting from the manner in which individuals use the resource (carefully or carelessly), and which cannot be easily detected. For example, an individual may be allowed to extract a certain amount of timber from the forest for repairs to her/his house. The person can cheat and harvest more; s/he can also be careless in the extraction: cut small trees and not branches from a mature tree, cut more than required and then discard the unneeded portions, harvest inappropriate species, damage other vegetation in the process of harvesting, and so forth. If rules do not specify the amount of care that must be exercised, or if the monitoring and detection of the person's activities is difficult, the consequent costs will be contained differently by different property regimes.

It is usually assumed that when an individual owns a resource, then s/he is careful in harvesting benefits from such a privately owned resource. Such an argument, however, ignores the fact that individuals are socially situated and they not only have to protect their resources from their own carelessness, but also from the carelessness and rapacity of others. Once we take into account the particular spatial distribution of forests in the hill villages, and the costs that result from the activities of others, the costs of monitoring use will be higher under government and private ownership and control of forests than under communal tenure.

Recall that most forests are grouped together at the outskirts of the villages. To utilize them on a private basis, it will be necessary to demarcate the share of each individual household in a given patch. Then each individual must prevent others from breaking rules and using any of his/her part of the forest. Such a course of action, even if the demarcation of rights and their acceptance were accomplished without cost, would impose very high monitoring costs. Why?

Assume that forests have been privatized. Since individuals must also cultivate their fields, often located at a fair distance from their forests, either they must interrupt their agricultural activities to look after their forest parcel and identify those defecting from the agreement, or they must hire someone to look after their forests, and then monitor the monitor, and so forth, in an infinite regress (Elster, 1989: 40–41; Ostrom et al., 1994: 47–49). The problem becomes especially acute in light of the nature of the products that forests produce – timber, fuelwood and harvestable fodder – which are easy to extract illegally in a short period of time. If no one is monitoring, an individual can enter another person's patch of forest, lop off branches and leaves from a tree for fodder, fell trees for timber within an hour or two, or cut grass for fodder, and get away without detection. Such a course of action would be particularly easy if this individual's patch of forest were contiguous to that of another individual. The other individual can enter his own forest legally at any time, and under cover from trees extract use units from the neighboring patch. Hiring someone to prevent this, or interrupting work to monitor forests at the edge of the village may be effective in preventing others from malfeasance, but is very costly. Conversations with villagers in the course of my research revealed numerous documented instances



of residents from other villages harvesting fruits from privately owned trees that were located at a distance from the houses of individual owners.

While private property rights in forests seem a costly proposition in terms of monitoring, government ownership of forests can create even greater incentives to cheat and deforest. Governments must appoint agents or guards to look after the forests in each village. Guards sent to rural areas are likely to treat their assignments as punishments. Further, since their salaries are likely to be high (in comparison to locally selected guards), they will turn out to be prohibitively expensive for guarding forests that are used primarily for subsistence (Ostrom et al., 1994). And, of course, unless the government appoints a large number of agents, it will be difficult for them to effectively protect forests. Given mountain topography and difficulty of access, one monitor/guard will probably be able to protect no more than five or six village forests. What makes the problem even worse is the likelihood that any guard appointed by the government may be bribed by villagers to look the other way while they illegally harvest products from the forest. The government agent does not have any personal stake in protecting the forest. He is neither a long-term resident, nor does he stand to gain any personal benefits from protecting the forest. He would be especially prone to deviance if the amount of bribes is large. On the other hand, whoever offers a bribe is certain to extract more from the forest than the amount of bribes. Clearly there exist few incentives for the government agent or for the local population to protect a forest belonging to some distant and mythical entity called the "government". And finally, if the government agent finds it worth his while only to accept relatively larger bribes, then it is the wealthier villagers who will get the most benefits from government-owned forests.

On the other hand, a community can use some simple rules to prevent individuals from using forests purely in their own personal interests. Communities can institute rules regarding the timing of entry into the forest, about the type and amounts of products that can be harvested, about who possesses the rights of entry and use, and so forth. Since the forests lie together, a single watchman may be sufficient to prevent rule violations, especially if he is paid (partly or fully) out of fines collected from violators. The same factor—spatial situation of forests—that prevents individual ownership rights from being efficient, now acts to render communal tenure over forests superior. Under communal ownership, not only the watchman, but also individual users are likely to report rule-breakers since it is their property that is being used illegally. In this context it is interesting to note that in almost all of the cases discussed by Messerschmidt in his works on community management of forests in the middle Himalayas (1984, 1987) villagers employ a watchman and he is often paid from fines collected from violators. Under community control it may also be more easily possible to solve the problem of monitoring the monitor by assigning the task of evaluating the performance of the monitor to users (Agrawal, 1994). Such devolution of responsibility to users helps solve the ubiquitous question of "Who will monitor the monitor?"

Waste arising from careless use of forests will be lowest, without the presence of a monitor, under private property rights than under either community or government ownership. Under government management and control, local users will per-

haps have the least incentive to be careful in harvesting methods. Since it is difficult to monitor the amount of care villagers are exercising, even under community management such costs cannot be completely avoided unless the villagers come to feel that the forest they are using is their own. All individuals bear some costs as they exercise care, so unless there is a cost effective way of monitoring the level of care exercised, costs of careless exploitation under community management are also likely. They could be reduced in the presence of monitoring, but they will be absent under private ownership.

### *3. Enforcement Costs*

Enforcement costs are incurred in one of two ways: when individuals must be appropriately sanctioned once their rule infringements have been detected; and, in the process of compensating the wronged party. In both of these situations, enforcement of rules requires that the power to enforce be vested in some authority recognized as legitimate by all parties; or that some voting procedures among the affected parties are available to lead to decisions in concrete instances. It seems, then, reasonable to assume that whether property rights in forests are private, communal, or government-owned, collectively agreed upon procedures will be necessary to create enforcement rules, to enforce these rules for using and monitoring forests, and to punish offenders. In the realm of enforcement, all procedures are collective in nature. Individual enforcement is either arbitrary, or worse, runs the risk of being autocratic, and systematically unfair, exploitative, and oppressive.

Enforcement that is collectively recognized can be carried out either through central government institutions, or local collective procedures. In the context specified for this paper, government institutions of enforcement will prove more costly than enforcement at the community level. Disputes may arise in the group of forest users over minor matters such as an individual collecting a few more headloads of fodder from the forest, or entering the forest at unauthorized times. They may also arise over more weighty issues such as illegal harvesting of a stand of timber or removal of some valuable species of vegetation. If users have to refer each dispute to a centrally governed enforcement agency, the costs incurred are likely to be very high.

Typically, government institutions to resolve disputes will not be located near the villages, but in a larger town or administrative centre. The use of these institutions will require familiarity with formal procedures, literacy, and ability to invest large sums of money and substantial amounts of time, and the ability to travel regularly away from the village to courts and lawyers; especially in comparison to communal institutions for settling disputes that may be located within the village and recognized by a national government. Members of such a communal body are also likely to be more familiar with the facts of a given case and with the disputants, and they can speedily settle a given quarrel or dispute. Since both communal and private ownership of forests will require a collective institution for settling disputes, costs of enforcement will be the same for the two types of property regimes, unless private individuals choose to have recourse to central government institutions. It can be argued that in village level bodies disputes may be settled in favour of the

elites or that the communal body itself may be composed of the more powerful members of the community who promote their own interests. Yet if the body is selected through democratic procedures, the force of these arguments is eroded, especially when we realize that there are no proven ways of eliminating bias in favour of the powerful from the enforcement mechanisms that may be located outside the village.

This argument, in fact, holds not just for Uttarakhand, but for most rural areas in India. Villagers are universally reluctant to seek redressal of their disputes in courts, or take recourse to lawyers. Where matters get serious or irresolvable at the local level, they do turn to institutions of justice and arbitration that the state creates. In such instances, they are usually doomed to carry on a court battles for years, sometimes decades, and even generations. For simple and reasonably clear cases of wrongdoing, it makes much greater sense, then, to vest in local community institutions the power to enforce the management of local forest resources.

## **Conclusion**

This paper provides an argument undermining the dogma that private forms of ownership and management are universally more efficient in comparison to communal tenure or government ownership. While a number of different theorists have highlighted the significance of extra-rational, moral, or altruistic motivations in promoting co-operation and communal activities, this paper showed that even under the assumptions of individual rationality, and in the presence of actions oriented towards the achievement of self-interested goals, communal institutions for managing resources may prove more cost-effective. Under conditions outlined in the paper, conditions that prevail in large areas of the Himalayas and may also exist in other mountain regions, community institutions are more efficient in resource management than either private or government ownership. Thus the efficiency of different tenurial forms is a function of resource characteristics, prevailing societal and economic conditions, and institutional arrangements.

It may, therefore, be reasonable to assume that co-operation will characterize the activities of resource users in mountain regions to the extent that the conditions outlined in this paper hold. Under a variety of conditions, each altering the assumptions that form the basis of the analysis advanced in the paper, communal tenure may not prove the best mechanism for managing forest resources. Community institutions, thus, are likely to become less effective if the rural economy becomes more closely integrated with the national economy, and the close relationship between livestock, forests, and agriculture fractures; or, if forests are highly dispersed, lying close to cultivated fields, rather than being located in contiguous patches near the outskirts of the village; or, if there are rapid demographic or technological changes that outpace institutional development.

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## Notes

- 1 For changes in the population in the Himalayan districts of *Uttarakhand*, see GOI (1981, 1991). For changes in land use patterns see Office of the Director of Census Operations, Uttar Pradesh (1961, 1971, 1981, 1991).
- 2 A large number of studies lament the traditional nature of hill agriculture (see Sah et al., 1990; Shah, 1982, 1986; Singh, 1985). But the preceding paragraph suggests that there are solid reasons for the unwillingness of hill farmers to switch to new agricultural technologies. They are less remunerative.
- 3 In my own research conducted between 1989 and 1993 in Uttarakhand, villages in the Middle Himalayas usually had between three to four pieces of forests whose boundaries abutted those of cultivated fields. The village was seldom nucleated, but equally rarely were there more than two or three clusters of houses. The reasons for the spatial distribution of forests and arable land are not very important for the purposes of this paper. Netting (1981) provides one account from the Swiss Alps for the interested reader.
- 4 Other theorists have created categories that also do not match any universal set. See, for example, Alchian and Demsetz (1972); Furubotn and Pejovich (1974); Williamson (1985).
- 5 While all of the three institutional contexts exemplify a particular system of governance, I make a deliberate distinction between community and government institutions. Community institutions possess a relatively higher degree of autonomy in making rules for using the resource, for monitoring use, and for enforcing sanctions on rule-breakers. They are not very highly dependent on central government institutions for their authority in conducting village affairs, at least where governance of the collective good is concerned (the forest in this instance).

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