

CHAPTER 12

Rules, Rule Making, and Rule Breaking: Examining the Fit between Rule Systems and Resource Use

This chapter examines institutions that guide fodder and fuelwood use in community forests. The community forests discussed are called *panchayat* forests. They are managed by local institutions called *van panchayats*—literally, councils of five individuals who are responsible for making collective choices about the rules to be used in a particular forest. The forests and *van panchayats* all lie in the middle Himalayan ranges in Almora district. Almora is one of the eight mountainous districts that together comprise the Uttarakhand in Uttar Pradesh (see fig. 12.1). The analysis focuses on the effects of institutional rules on common resource use—particularly rules related to enforcement. The chapter is based on intensive fieldwork conducted during 1990 in six villages located in the Almora district.

Successful institutional solutions to the governance and management of forests depend on rules that can solve appropriation and provision problems related to the use of community resources. Among the more important rules are (1) boundary rules that limit who can use a forest, (2) authority and scope rules that specify how much of what type of forest product can be extracted or the condition of the resource after harvesting, and (3) the authority and payoff rules that empower monitoring, sanctioning, and arbitration.

The creation and enforcement of these rules constitute a collective-choice problem as described in chapter 2. If the collective-choice problem is solved successfully, institutional arrangements are created that support sustainable use of a resource. Those engaged in collective choice may design rules that are too lax or overly restrictive in regard to the amount of resource units that can be harvested. If too lax, the capability of the resource to continue generating resource units is threatened. If too restrictive, users may be forced to violate prescribed rules due to their extreme need for forest products. Behavior in violation of prescribed institutional rules creates higher-

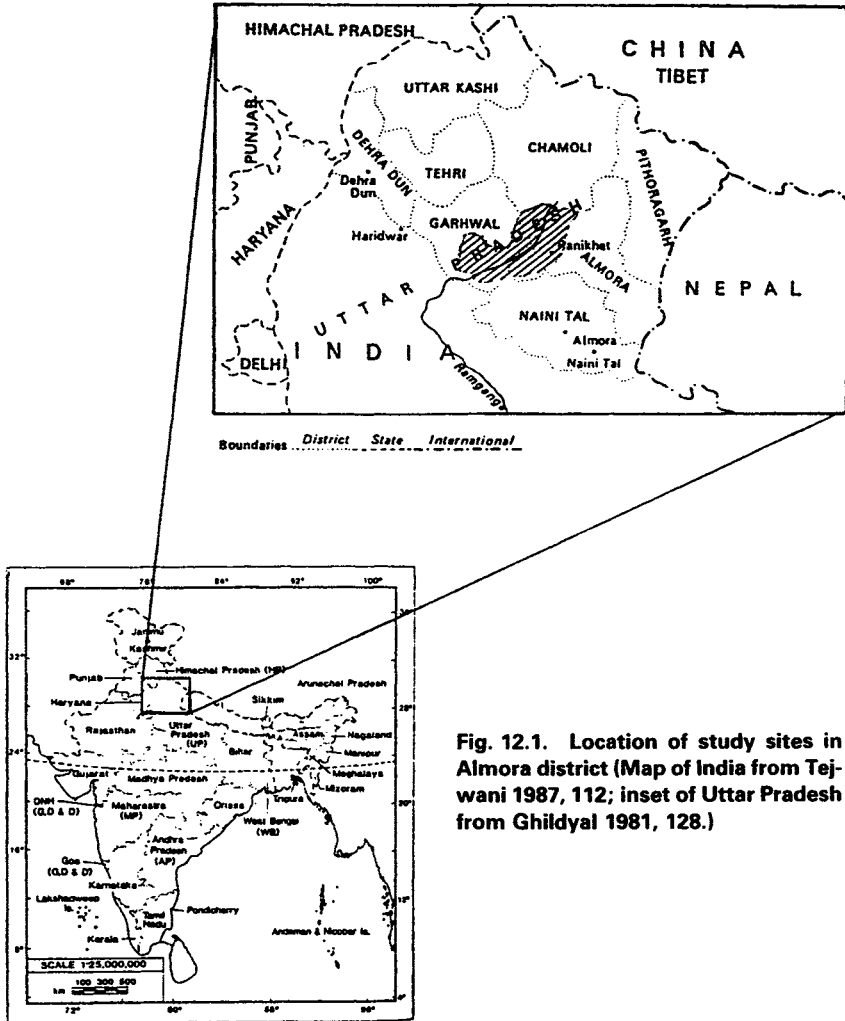


Fig. 12.1. Location of study sites in Almora district (Map of India from Tejwani 1987, 112; inset of Uttar Pradesh from Ghildyal 1981, 128.)

order CPR dilemmas that require a solution to problems associated with monitoring and sanctioning (see chap. 1).

It is, of course, also possible for those who undertake collective choice (the van panchayats) to design rules that advantage some users over others. The costs of monitoring and enforcing rules that are not perceived to be equitable are higher than enforcing rules that participants consider to be equitable. In addition, failure to sanction rule violators, or mistakenly sanctioning those who did not violate the rules, encourages further rule violations

or promotes resentment among users against existing institutions. The analysis of different rule configurations in the six villages shows that constraints on the capacity of village officials to enforce rules are associated with unsuccessful institutions and degraded panchayat forests.

The Historical Context

The institutional rules in the van panchayats in Almora are powerfully influenced by the Van Panchayat Act of 1931. This statute forms the framework for the rules that villagers devise to manage forests. The British government passed the act after prolonged resistance offered by the hill villagers in Kumaon and Garhwal.¹ Almora is one of the three districts in Kumaon Division. The other two are Nainital and Pithoragarh.

From the 1840s, the British government asserted its absolute rights over all land and forests in Kumaon and Garhwal and brought more than 60 percent of the land in Kumaon under its control between 1840 and 1910 (Atkinson [1882] 1973; Pant 1922). The primary motivation was economic. In the 1830s, forest revenues were low, less than four thousand rupees a year. Over the next 30 years they grew enormously, surpassing agricultural revenues in some years.²

The state was able to extend its rights over forests only by limiting villager access and use rights to the resource. The Imperial Forest Department protected state forests from trespassing, unauthorized tree felling, grazing, and firing.³ Villagers protested incessantly against encroachments by the state on their traditional rights in the forests. They employed what J. Scott (1985, 1986, 1990) has called "everyday forms of resistance," as well as more active resistance. Guha (1989) describes and traces in detail the more active and militant forms of protest by the peasantry in Kumaon. Faced with the prospect of unceasing and unmanageable peasant protest, the government was forced to look into the demands of the peasants (Pant 1922).

On the recommendations of the Forest Grievances Committee, set up in 1921, the government reclassified forests into class 1 and class 2 forests. Class 1 forests were transferred to the Revenue Department, and the class 2 forests were retained by the Forest Department. Under the provisions of the

1. Kumaon and Garhwal are the names of the two ancient hill kingdoms in Uttar Pradesh province.

2. In 1872, forest revenues were about Rs 267,000 to agricultural revenues of about Rs 164,000. In the next year, forest revenue rose to over Rs 365,000 while agricultural revenues remained the same. By 1876, however, forest revenues fell below those of agriculture and remained there for some time.

3. Villagers fired the grasses and undergrowth before monsoons to get a good grass crop. Such fires prevented forests from growing and regenerating.

Van Panchayat Act, villagers could create community-managed forests from the forests controlled by the Revenue Department. The provisions of the act were simple and facilitated collective action by villagers. Any two villagers could apply to the deputy commissioner of the district to create the panchayat forest out of revenue department forests that were located within the village boundaries.⁴

The Van Panchayat Act also prescribes the process of forming van panchayats and imposes certain duties on village forest councils. Officials must be elected regularly to the van panchayat. The elected officials (the council for managing forests—the van panchayat *samiti*, and the head of the council—the *sarpanch*) must meet three to six times every year. Villagers must protect forests from illegal tree felling, fires, encroachments, and cultivation. They must demarcate the boundaries of the panchayat forest. In addition, 20 percent of the area of the forest must be closed to grazing every year. Villagers feel that through the act, the bureaucracy exercises excessive control over forest panchayats. Bureaucrats, on the other hand, believe that in the absence of central control, villagers would clear-cut the entire forest. It is certain, however, that the act facilitated the efforts by residents of nearly four thousand villages to create local institutions that would permit them to use and manage a significant proportion of local forests.

The Local Context

The day-to-day management of panchayat forests was observed in six villages where the author did fieldwork in 1990. Daily operation is chiefly governed by rules that villagers have crafted. In most instances, the panchayat officials elected by the villagers designed the rules. In others, they were aided by government officials or villagers. As table 12.1 shows, in the first three villages the forest is in excellent, or excellent to good condition. In the other three, the resource condition is poor to fair.⁵ Since the six study villages are

4. Currently, at least a third of the village residents must apply to form the village panchayat, as required by the law authorizing the creation of forest panchayats.

5. In the cases studied, market and population pressures do not help to explain the differences between successful and unsuccessful cases of forest management. The first three villages, where the forest is in good condition, are located 3.1 kilometers away from the market on the average. The latter three, where the resource condition is poor to fair, are 2.8 kilometers distant. In the first three villages, there is .57 hectare of panchayat forest land per household; .14 hectare per livestock unit. In the other three villages, the corresponding figures are .41 hectare and .14 hectare. These differences are not important. If we consider total forest and pasture land available to households and livestock, in the first three villages there is .86 hectare available per household and .22 hectare per livestock unit. In the remaining three villages, the same figures are 1.0 hectare and .36 hectare. In sum, no systematic relationships exist between the condition of the resource and market or population pressures on the resource system.

TABLE 12.1. Basic Statistics on the Six Villages Studied

Village	Resource Condition	Households	Livestock	Panchayat Forest (in ha.)	Other Pastures (in ha.)
1	8	37	220	14	55
2	7	13	52	16	9
3	7	124	424	70	86
4	4	38	194	10	39
5	3	79	228	39	83
6	2	108	305	27	66

Note: The resource condition is denoted by numbers ranging from 0 (degraded) to 8 (excellent). Thus, the higher the number, the better the condition of the resource. See Agrawal 1992 for a description of the methods used to evaluate resource condition.

all situated in Almora district, their resource management institutions have been subject to the same administrative and bureaucratic rules. Government regulations, we can therefore infer, are not responsible for variations among the study villages. The variation in the resource condition of the two sets of villages can be explained best by examining local rules for (1) using the resource, (2) monitoring the use, (3) sanctioning violations, and (4) arbitrating disputes.⁶

Authority Rules Related to Allocation

The first set of operational rules we consider are rules for taking fodder from the community forests. These rules specify who can withdraw benefits from the forest, how much fodder can be extracted, the manner in which fodder can be extracted, and the obligations users must fulfill to remain beneficiaries. In all but one of the cases, boundary rules specify that users must be residents of the village where the forest is located. In the exceptional case, the family of an individual who aided in creating the panchayat forest is allotted rights to harvest benefits from the resource.

In most of the villages, allocation rules specify how fodder is to be extracted from the resource system. Animals cannot graze in the forest for most of the year. Villagers can harvest fodder only for 2–12 weeks. When cutting leaves from trees for fodder, villagers must leave behind at least two-thirds of the leaf cover on the tree.⁷ In different villages, rules also vary in the type of rights they confer on users. In some of the villages, users have equal

6. Most of the data on rules is culled from records of the forest panchayat meetings (which in some instances go back more than 60 years) and records kept by the village revenue officials (the *patwari*).

7. The main fodder tree in this region is oak.

rights—without regard to their contributions in maintaining the resource. Villagers can buy and sell rights among themselves.⁸ In others, their rights to the resource are a function of the effort they have invested in the maintenance of the resource (by paying the salary of the guard or by helping in planting trees); in yet others, their rights are a function of their ability to make high bids in auctions where benefits from the forest are sold to the highest bidder.

In some cases, institutional rules not only specify who has the rights and how these rights can be used, they also state how much fodder can be withdrawn from the resource. Fodder from forests constitutes a renewable resource. To ensure regular annual supplies and the continued health of the forest, it is therefore essential to match extraction levels to regeneration. Villagers who designed rules have attempted to match regeneration levels and withdrawal levels by assessing fodder growth during the year, fixing extraction levels below the annual regeneration, and metering fodder extraction using simple measures. To assess regeneration, panchayat officials visit forest compartments prior to opening them to the villagers. The officials make an eyeball estimate of the total amount of fodder bundles available and then open the forest for limited grazing or grass harvesting. The total number of animals that can graze or bundles of grass that can be extracted depends on the initial estimates made by the panchayat officials. Forest guards, selected by the panchayat officials from among villagers, monitor (and enforce) the panchayat's decision. Bundles of grass are measured with the help of uniform lengths of rope that are used to tie the fodder bundles. In villages 1, 2, and 3, users can cut grass from the forest only for a specified number of days in the year. The panchayat officials carefully meter the amount of grass extracted. Passes entitle holders to cut a specified number of fodder bundles from the forest. All users are provided with a rope that they must use to make a bundle out of the grass they have cut. All villagers, therefore, can extract only specified levels and equal amounts of fodder.

There are also villages where panchayats have not designed rules to match withdrawn regeneration. In villages 4 and 5, rules fail to facilitate the metering of withdrawal from the resource. The grass in these village forests is sold primarily through auctions. The auction winner is free to cut grass from that section of the community forest for which he or she has successfully bid. This means that the winning bidder has little incentive to stint in his or her behavior when cutting the grass. He or she may cut too close to the ground, damaging roots and harming the growth for the next year. In auctions involving leaf fodder, he or she may harvest too many leaves, damaging the capacity of the tree to produce fodder. In village 6, users are

8. Users mainly buy or sell rights to bundles of fodder rather than rights to use the forest for the entire year.

allocated spaces on the commons where they must harvest grass. Although this prevents disputes among the users by solving an assignment problem, users still attempt to harvest as much as they can from the area allocated to them. As pointed out in chapter 3, solving assignment problems may eliminate some of the costs associated with suboptimal allocations, but the incentives to overextract are not necessarily countered by clear rules assigning individuals to a spatial location on the commons.

Two factors may explain why the right to harvest fodder is auctioned in some villages. Auctions reduce the management effort that the panchayat must expend in extracting and distributing benefits from the resource. Once the auction has been held, the panchayat officials need no longer worry about regulating and supervising the removal of fodder from the forest.⁹ To create institutional mechanisms that would distribute benefits among a large number of small users might improve equity, but at the cost of greater management and supervision effort on the part of the owners or managers.

A second, possibly more important factor prompting auctions is that auctions effectively concentrate the fodder harvested from the forest in the hands of just a few users. In villages that use auctions, panchayat records document that the same three or four individuals repeatedly make successful bids for the rights to harvest fodder from panchayat forests. In villages 4 and 5, the upper and lower castes (Brahmins and Harijans) have a history of simmering hostility. The Brahmins, who are also the richer individuals in the two villages, were instrumental in the creation of the forest panchayats. They designed the rules that guide fodder extraction from the panchayat forests. Although the panchayat elects officials every five years, the numerical superiority of the Brahmins in the two villages has guaranteed them effective control over the panchayat.

We can draw the following conclusions. At the local level, there are cases of successful rule designs to use resources sustainably and equitably. Village panchayats have demonstrated their capacity to craft rules that limit the extraction of fodder and that distribute it equally among villagers. Local users and managers have many advantages over centralized governments and bureaucracies in creating appropriation rules that can match demands on a resource with its regenerative capability. They have greater information about themselves, about their needs, and about the resource.¹⁰ Such information is

9. A similar procedure for distributing resources is followed by the Uttar Pradesh government, which auctions grass in the Himalayan foothills. In the foothills, the rights to harvest grass from large areas (up to a hundred square miles) are sold to the highest bidder. The government interacts with just a few persons who then create their own systems for harvesting the grass.

10. A large number of authors have extolled the virtues of local management. I do not survey this literature. See E. Ostrom, Schroeder, and Wynne 1993 for a thorough discussion and for relevant literature citations.

crucial if rules guiding extraction levels are to match regeneration and mitigate appropriation externalities. Central governments seldom have requisite capacity to gather necessary information regarding variations in productive capacities of different fodder plots. It is almost axiomatically true, therefore, that central governments cannot achieve “congruence between rules and physical reality.”

Simply because local governance structures possess the capacity to carefully craft rules to match withdrawal levels with sustainable yields, it does not follow that they will necessarily create rules that solve the resource problem. Therefore, even if forest management is delegated to the local level, local managers¹¹ may not (be able to) use resources efficiently, sustainably, or equitably. In three of the cases above, van panchayat officials failed or chose not to exercise their capacity to create rules that would promote sustainability and equity. Local factional struggles played a role in generating behavior that led to suboptimal rules. Issues of ensuring compliance to rules, however, remain equally pivotal in our explanation, since the rules that villagers created were not self-enforcing.

Monitoring

The problem of ensuring compliance to rules is acute. In all the villages studied, violations of allocation rules occurred routinely, even if they were not always reported. In the two villages that maintained detailed records on rule violations (villages 3 and 6), minor violations occurred almost every day (see table 12.2). Villagers illegally entered the panchayat forests, cut grass and leaf fodder from trees, grazed their animals, collected twigs and branches, and in some instances even felled trees. Their activities occurred in violation of the rules, and in spite of the presence of guards who could discover and report them to the panchayat, which would then try to force them to pay fines. The records, while documenting high levels of abuse, underestimate the extent of illegal grazing and cutting. The guards are often absent from the forest and even when at their posts cannot monitor all compartments of the panchayat forest simultaneously. The community forest is too large and dispersed.

To detect all rule violations, all behavior must be monitored—a prohibitively expensive proposition. A resource system need not deteriorate, however, if the infractions are minor and a significant proportion of rule breakers are discovered and sanctioned (Tsebelis 1990a). In the forest panchayats, officials monitored user behavior, but not perfectly; and users broke rules, but

11. Local managers in my cases are the panchayats; in other cases they would be the relevant community organizations.

TABLE 12.2. Detected Rule Violations in Panchayat Forests

Year	Village 3 ^a	Village 6 ^b
1977	—	138
1979	40	91
1980	—	2
1981	354	—
1982	—	26
1983	389	95
1985	114	—
1987	87	—
1988	—	30
1989	40	—

^aData is for the fiscal year ending in the year posted.

^bData is for the calendar year.

not always. The exact frequency of rule violations and probability of detection depended upon the benefits from breaking rules, the incentives to monitor, the costs of getting caught, and the cost of monitoring. Therefore, it is only when rules are not enforced or monitored and violations not sanctioned that formal rules become meaningless as guides to behavior.

In the first three cases of sustainable resource use, the panchayats took great pains to monitor. Panchayat officials recognized the higher-order CPR dilemma involved in monitoring and realized that unless resource use is effectively monitored, rules serve no purpose. Not only did they understand that monitoring is necessary, they also recognized and solved the problem of monitoring the monitor (see chap. 1; Elster 1989, 40–41). They employed two methods. First, they linked the monitor's performance to the rewards he or she received. Second, they untangled the Gordian knot of monitoring the monitor by closing the loop between monitors and users.

In the first three cases, the guards were monitored by panchayat officials. Guards were assigned different compartments of the forest. It was easier then to monitor the guards than to monitor the villagers. To monitor villagers and assign blame, individuals must be discovered in the act of violating rules. But freshly cut grass or tree branches in the forest provide evidence that the guard had not been guarding. Further, the panchayat could easily sanction the guard since the panchayat controlled the purse strings. In some cases, the panchayat paid the guard a lower salary when high levels of rule violations occurred. In others, panchayats dismissed guards and refused to pay them a salary if they found rule violation levels to be very high. Panchayat officials would resume the guard's salary and reinstate him or her only when he or she promised to improve his or her performance. Thus,

officials created institutional incentives for the guards to monitor users assiduously.

The panchayat in village 3 solved the problem of who would monitor the monitor by involving all the villagers. The panchayat officials monitored the guard who monitored the users who monitored the officials. At each level, incentives were created for reporting violations. When a *panch*¹² or his or her family members were discovered in the forest, illegally grazing cattle or cutting fodder, an open meeting of the whole village could be summoned where the panch would confess his or her crime and pay a fine. The confession in front of the assembled village was as potent a deterrent as the fine. By creating a closed loop, and providing monitoring incentives to all the links in the loop, the problem of who would monitor the monitor was successfully solved.

In none of the cases did villagers use trigger strategies to force individuals to reduce their levels of rule violations. When the panchayat or the villagers discovered that rule infractions had increased (as in village 3), their response was not to step up their own level of infringements to punish the infractors for their rule breaking (as in a trigger strategy). Instead, the panchayat and the users took other steps to ensure that the level of rule violations would be reduced. They attempted to improve the efficiency of monitoring, increased the hours spent on monitoring, and tried to innovate graded sanctions (see next subsection). The behavior of the panchayat officials in village 3 exposes a problem in suggesting trigger strategies as solutions to collective-action problems generally. Trigger strategies work best when none of the individuals in a group actually defect. Defection by one individual triggers defection by all. Trigger strategies by themselves can create cooperation only as threats, not after an individual has initiated defection. Panchayat officials used other mechanisms, discussed earlier, to ensure rule compliance. These mechanisms, once in place, helped villagers follow rules.

In contrast to villages 1, 2, and 3, panchayat officials in villages 4, 5, and 6 did not emphasize monitoring. In village 4, the panchayat did not employ a guard for most of the year. In village 5, panchayat records mentioned few instances of rule violations. Most recorded instances were connected with intercaste disputes in the village. It seems that the panchayat, dominated by Brahmins, used its control over the panchayat forest as a way of dominating the Harijans. Instances of rule breaking by Harijans were mentioned in panchayat records with regularity. But from the records, it appeared as if Brahmins never broke rules. Such prejudiced reporting and enforcement could only increase rule violations and resource degradation. The Brahmin residents in the village, if never reported and sanctioned, would get a license

12. A panch is an elected official of the panchayat. Five panches make up the panchayat.

to break rules; the resentment against the Brahmins would goad Harijans to break rules as often as possible. In village 6, the community forest was highly dispersed. The panchayat considered monitoring important but was unable to devise a system of salary payments to guards that could allow it to employ two guards for the dispersed panchayat forest compartments. It seems, then, that in contrast to villages 4, 5, and 6, the first three panchayats not only realized the importance of monitoring user behavior but also successfully devised mechanisms to ensure compliance by users.

Finally, rule violations occur in successful as well as unsuccessful village institutions. As table 12.2 shows, in just two panchayats (in villages 3 and 6) is the detected number of rule violations relatively high. If villagers are to be believed, the actual incidence of rule violations may be much higher.¹³ Casual walks with panchayat officials in community forests revealed villagers illegally collecting fodder and fuelwood almost each time we took a walk. For just two villages,¹⁴ possibly a thousand rule violations occurred every year in the panchayat forests. Almora, which has more than three thousand inhabited villages, probably has three million rule violations occurring every year. Given such high levels of rule violations, it seems safe to infer that in unsuccessful village panchayats, a very large gap exists between actual rule breaking and reported incidents of it. The lack of reported incidents of rule breaking reflects not that villagers do not break rules. Rather, it reveals that monitoring arrangements are lax or nonexistent.

Although village panchayats seem lax or slow to detect rule violations, the government bureaucracy is even less capable. Guha (1989) reports that for the entire Kumaon region, between 1926 and 1933,¹⁵ the forest department detected a total of 16,805 violations¹⁶—that is, less than three thousand violations per year, a thousand times less than what may actually have been

13. I interviewed more than 40 individuals who had been sanctioned by the panchayat officials for rule breaking. With remarkable regularity, these villagers asserted that the panchayat had been too hard on them, was not even aware of offenses by their neighbors and friends, and was too lax in controlling fuel and fodder theft by "other" villagers. Villagers who had not recently been sanctioned by the panchayat also pointed the finger at numerous village families whose rule-breaking behavior often went undetected. According to them, the panchayat discovered no more than 20 to 30 percent of rule violations.

14. The nature of rule violations is similar in both villages. In both village 3 and 6, guards detected villagers in the act of cutting grass and leaf fodder, collecting twigs and branches, and grazing animals.

15. Kumaon circle at this time included most of the present-day Nainital district, Almora district, and Pithoragarh district. So the population in Kumaon Circle in the 1930s and in Almora today is probably roughly similar, making the figures on rule violations in Kumaon Circle then somewhat representative of rule violations in Almora district today.

16. Violations detected by forest department officials are for the most part quite similar to those that guards employed by panchayats detect. They include illegal grazing, tree felling, fodder and fuelwood collection, and firing.

occurring. Although these are figures from the past, they indicate a general failing of central authorities to enforce rules. Even if the forest department increased the number of guards (at present it employs one guard for 15–20 villages), it would not be able to accurately monitor rule violations. Any increase in the size of the bureaucracy would increase expenses on salary and infrastructure and at the same time either promote collusion between the forest guards and unscrupulous villagers, or force villagers to pay bribes to the guards in exchange for extracting basic means of subsistence from the forest.

Sanctioning

In all the village institutions, villagers have created rules for sanctioning rule breakers whose activities caught the attention of the panchayat. The panchayats employ a variety of mechanisms to increase the effectiveness of the sanctions they imposed. They ask offenders to render written or public apologies, confiscate cutting implements such as scythes, strip villagers of use rights, impose fines, report villagers to government officials, and sometimes, seek redress in courts. The sanctions they impose depend on a number of factors: the severity and nature of the offense, the economic status of the offender, whether the person is known to be a troublemaker, the attitude that the rule breaker displays towards the panchayat and its authority, and so forth. The purpose of the sanctions is as much to punish somebody for a crime that was committed as to uphold the authority of the panchayat in issues of resource use.

Upholding authority is very important in the context of the forest panchayats, because they have no formal or legal powers to automatically impose sanctions on rule breakers. If the users openly flout panchayat authority by breaking use rules and disregarding panchayat directives to pay fines, the panchayats will be hard put to create any kind of management system for the panchayat forests. Thus, the panchayats often excuse even repeat violators from paying fines imposed on them, if the offender is willing to render a written or public apology.¹⁷ Such an apology reinforces the authority of the panchayat to manage the forest and to punish other individuals who commit rule infractions.

Given the fact that the panchayats have no legal authority to impose sanctions on villagers who break rules, it may seem puzzling that many of the villagers pay the fines, especially in view of the fact that none of the panchayats invoke social boycotts or ostracize offenders as punishment. If we examine the income and expenditure statements of the different panchayats in table 12.3, the proportion of income from fines is significant for all the suc-

17. Of course, if a person is found to continue infringing rules even after rendering a written apology, the panchayat is more strict in imposing sanctions on the individual.

TABLE 12.3. Income and Expenditures of Van Panchayat by Village

Income	Percentage	Expenditure	Percentage
Village 1			
Fines/collections	29	Stationery	2
Tree sale	55	Guard's salary	90
Fodder sale	7	Miscellaneous	8
Minor forest produce sale	8		
Total income for the panchayat for the period was Rs 3,722.00			
Total expenditure for the panchayat for the period was Rs 2,777.00			
Village 2			
Fines	39	Stationery	14
Fodder sale	11	Guard's salary	33
Wood sale	51	Legal expenses	43
		Donations	9
Total income for the panchayat for the period was Rs 1,188.00			
Total expenditure for the panchayat for the period was Rs 2,335.00 ^a			
Village 3			
Resin sale	48	Guard's salary	72
Fodder sale	49	Stationery	1
Fines	3	Legal expenses	2
		Public donations	25
Total income for the panchayat for the period was Rs 20,443.00			
Total expenditure for the panchayat for the period was Rs 21,671.00 ^a			
Village 4			
Tree sale (contractor)	70	Tree planting	48
Tree sale (villagers)	5	Fertilizers	40
Grass sale	24	Stationery	2
Fines	1	Legal expenses	9
Total income for the panchayat for the period was Rs 5,636.00			
Total expenditure for the panchayat for the period was Rs 5,337.00			
Village 5			
Resin royalties	23	Stationery	2
Grass sale	22	Tree planting/fencing	68
Grass auction	53	Guard's salary	15
Tree sale	2	Legal expenses	14
Total income for the panchayat for the period was Rs 4,425.00			
Total expenditure for the panchayat for the period was Rs 8,181.00			
Village 6			
Tree sale	44	Stationery	9
Grass sale	19	Guard's salary	19
Fines	32	Legal expenses ^c	9
Miscellaneous	5	Public donations	43
		Tree planting	21
Total income for the panchayat for the period was Rs 3,779.00			
Total expenditure for the panchayat for the period was Rs 4,974.00			

^aThe excess of expenses over income was met through income accrued in other years.

^bThe panchayat has deposited a large sum, earned from resin sales, with the district magistrate. Rs 16,000 of this amount have been used to lay a water pipeline for the village.

^cThe legal expenses were incurred in a lawsuit with villagers from a neighboring village.

cessful panchayats (except for the panchayat in village 3—where the total income is very high), and quite low for all the unsuccessful panchayats.

Arbitration

All the panchayats also act as arbiters over disagreements that arise about the imposition of sanctions on rule breakers, and for interpretations of rules and disputes over the creation of rules. In this capacity they often reduce or excuse fines, allow villagers to influence the dates when the different forest compartments may be opened for grazing by animals or for removal of fodder, resolve disputes between village users and forest guards, and so forth.

The puzzle of their continued authority, despite the lack of formal powers, lies in the relative power positions of different actors if the panchayat chooses to take any of the users who break rules to court. Even if the panchayat does not have formal legal powers to extract fines from rule breakers, in courts of law its word carries greater weight than that of an ordinary villager. Since it has been created by a statute of law, its mere existence has the support of law. Further, in major disputes with users, there are a number of villagers who will support the interpretation of events presented by the panchayat—the guard who is appointed and paid by the panchayat, and the panches who are official members of the panchayat. The rule breaker, on the other hand, is unlikely to have any witnesses who will attest to his or her innocence. Finally, the panchayat is likely to have more funds available to fight lawsuits in comparison to an ordinary user.

The above factors imply that unless the user who violated rules is influential and wealthy, he or she will find it worthwhile to pay the small fine rather than go to court. It is this ultimate loading of the dice in the favor of the panchayat that drives the outcomes in the intermediate stages in its favor. Thus, we find that many of the users pay their fines, appear before the panchayat when summoned, render apologies, and promise not to break rules in the future.

Still, not all panchayats are equally willing to take matters to court, or to apply rules with equal strength. We find that for panchayats in villages 1, 2, and 3, there is strong evidence that the panchayats expend effort and funds in monitoring and enforcing their rules. The income and expenditure statements of the panchayats shown in table 12.3 indicate that in village 1, the panchayat spends 90 percent of its expenses on monitoring; in village 2, 76 percent of the panchayat expenditure is on monitoring and legal expenses; and in village 3, 74 percent of the panchayat expenses are monitoring and legal expenses. In contrast, villages 4, 5, and 6 spend a much smaller proportion of their expenses on these tasks. In village 4, just 9 percent of the expenses are spent on legal expenses, none on monitoring; in village 5, a total of 29 percent of

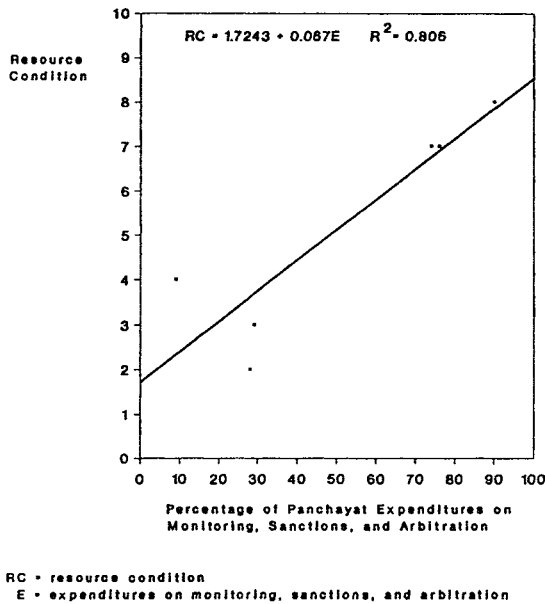


Fig. 12.2. Resource condition and attention to monitoring, sanctions, arbitration: six villages

expenses are incurred on these heads; and in village 6, again, only 28 percent of the expenses are towards enforcement. These figures tell a clear story about the importance of ensuring monitoring and sanctioning to create effective institutions.

We can examine the importance of expenditures by panchayats on monitoring, sanctioning, and arbitration (see fig. 12.2).¹⁸ Using proportions of panchayat expenditures on monitoring, sanctioning, and arbitration as the independent variable, we find that a significant relationship exists between enforcement and resource condition.¹⁹ The Beta coefficient is statistically significant at the .001 level²⁰ (t -statistic is 4.1); and the adjusted R^2 equals

18. The regression in this case needs to be taken with even greater caution since we have only six data points.

19. For explanation of the numbers signifying resource condition, see table 12.1.

20. I must sound a note of caution here. Since the dependent variable is categorical, it can be argued that OLS is not the most appropriate technique to demonstrate the relationship between resource condition and the attention panchayats pay to enforcement. However, there are three points in defense. The observed values of the dependent variable are distributed over the range of the different categories—from poor to excellent. Second, we possess information on only six cases. Using Logit, while more appropriate, may be similar to using a cannon to demolish an

.76. The statistical evidence would thus seem to bear out our proposition that institutions that commit substantial resources to monitor and sanction rule breakers are more likely to be successful. Conversely, institutions paying little attention to either monitoring or sanctioning are less likely to be successful in governing and managing forest resources.

Conclusions

In this chapter, I have suggested that to explain resource degradation and conservation successfully, we must examine the institutional design that guides resource use. Successful institutional design must solve four distinct problems of collective action: (1) creation of boundary and authority rules determining who can use how much from a resource, (2) effective monitoring of rules, (3) sanctioning of violators who break rules, and (4) arbitration of disputes among monitors, users, and managers.

Alternative allocation rules affect whether communities are able to restrict resource use to levels below sustainable yield. Unlike the other villages, villages 4 and 5 used rules that implicitly treated different caste groups unequally. Monitoring rules provide information that is necessary to punish rule breakers. We find that while the first three villages successfully attempted to monitor the monitor, in villages 4, 5, and 6, there were not even institutionalized mechanisms through which adequate information on rule breaking could be collected. In fact, in villages 4 and 5, monitoring seemed to be prompted by a desire to persecute the Harijans. In the absence of accurate information about rule breaking, sanctions could not be imposed in the latter three villages, nor could panchayat officials assert their authority as arbiters. Thus monitoring and sanctioning, which the first three villages emphasized, were almost ignored by the three unsuccessful village institutions. Similarly, arbitration, which is important to reinforce sanctions, was ineffective in the latter three villages.

Thus, villagers in villages 4, 5, and 6 did not successfully create appropriation rules that could prevent users from overexploiting and degrading resources. They also failed to solve the dilemmas involved in designing suitable monitoring and sanctioning rules. The failure of these three panchayats to create adequate institutions explains resource degradation in these villages. Local political struggles and social factions within villages, as indicated above, explain why villagers may fail to create rules that distribute benefits efficiently and/or equitably.

outhouse. Finally, the purpose of using the regression is simply to provide a numerical estimate on the strength of the relationship, not to demonstrate it. The data, even observed visually, are clear enough in their implications.