

Arun Agrawal

**RULES, RULE MAKING AND RULE BREAKING:  
 EXAMINING THE FIT BETWEEN RULE SYSTEMS AND RESOURCE USE**

**INTRODUCTION**

This chapter examines institutions that guide fodder and fuelwood use in community forests<sup>1</sup> in Almora district.<sup>2</sup> The analysis focuses the effects of institutional rules on common resource use - particularly rules related to enforcement of use rules. Six instances of resource use provide the empirical grist for the analysis.

Successful institutional solutions to resource management problems, I hypothesize, must create and enforce rules on at least four operational levels: resource utilization,<sup>3</sup> monitoring, sanctioning, and arbitration.<sup>4</sup> The creation and enforcement of rules at each of these levels constitutes a problem of collective action which if solved successfully creates institutional arrangements that support the sustainable use of resources.<sup>5</sup> If the collective action problem remains unsolved at any one of these

---

<sup>1</sup>The community forests I discuss are called panchayat forests. They are managed by local institutions called forest or van panchayats. A van panchayat is literally a forest council comprised by five members.

<sup>2</sup>Almora lies in the Middle Himalayan ranges in the state of Uttar Pradesh in India. Eight districts, of which Almora is one, comprise the hilly region of Uttarakhand in northern Uttar Pradesh.

<sup>3</sup>Rules for utilizing the resource refers to five sets of property rights - rights to access, use the benefits from, manage, exclude others from, and finally, transfer, the resource.

<sup>4</sup>In this chapter, I use the term "enforcement rules" to refer to rules related to monitoring, sanctioning and arbitration.

<sup>5</sup>The exact aim of resource management can vary. Thus the word "sustainably" can be replaced by "efficiently", or "equitably" or for that matter, "unequitably".

levels, it can (and possibly, will) lead to the unravelling of the entire institutional arrangement. For example, failure to sanction rule violators, or mistakenly sanction those who never violated rules, encourages further rule violations or promotes resentment among users against existing institutions. Or, incorrect prescription of use rules can lead either to excessive withdrawal of benefits from the resource system or to withdrawal of very limited benefits - the latter enticing users to extract greater benefits in violation of prescribed rules. The analysis of different rule arrangements in the studied villages shows that it is invariably the failure to create or enforce rules at some operational level that leads to institutional failure. Indeed, constraints on the capacity of village institutions to enforce rules were most often the cause behind unsuccessful institutions and degraded panchayat forests.

### **The Historical Context**

The institutional rules in the forest *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.<sup>6</sup>

From the 1850s the British government asserted its absolute rights over all land and forests in Kumaon and Garhwal and brought more than 60% of the land in Kumaon under its control between 1840 and 1910 (Atkinson 1882, Pant 1922). The primary motivation was economic. In the 1830s, forest revenues were low, less than Rs. 4,000.00 a year. Over the next 30 years they grew enormously, surpassing agricultural revenues (see table one).

T A B L E 1 H E R E

---

<sup>6</sup>Kumaon and Garhwal are the names of the two ancient hill kingdoms in Uttar Pradesh province. The names today refer to administrative and geographical divisions. Almora is one of the three districts in Kumaon Division. The other two are Nainital and Pithoragarh.

The state could extend its rights over forests only by limiting villager access and use rights in the resource. The Imperial Forest Department protected state forests from trespassing, unauthorized tree felling, grazing and firing.<sup>7</sup> Against encroachments by the state on their traditional rights in the forests, villagers protested incessantly. They employed what Scott has called "everyday forms of resistance" (1985, 1986, 1990), 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 I and Class II forests. Class I forests were transferred to the Revenue Department and the Class II forests were retained by the Forest Department. Under the provisions of the Van Panchayat Act, the 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<sup>8</sup> out of revenue department forests falling in the village boundaries.

The Van Panchayat Act also prescribes about the process of forming van panchayats and imposes certain duties on village forest councils. Villagers must protect forests from illegal tree felling, fires, encroachments and cultivation. They must demarcate the boundaries of the panchayat forest. In addition, 20% 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

---

<sup>7</sup>Villagers fired the grasses and undergrowth before monsoons to get a good grass crop. Such fires prevented forests from growing and regenerating.

<sup>8</sup>Currently, at least a third of the village residents must apply to form the village panchayat (Van Panchayat Niyamawali 1976).

other hand believe that in the absence of central control villagers would clear-fell the entire forest.

### The Local Context

The day-to-day management of panchayat forests in the six study villages is chiefly governed by rules that villagers have crafted. As table 2 shows, in the first three villages the forest is in an excellent, or excellent to good condition. In the other three, the resource condition is poor to fair.<sup>9</sup>

### TABLE 2 HERE

Since the six study villages are all situated in Almora district, their resource management institutions have been subject to similar administrative and bureaucratic rules. Government regulations, we can therefore infer, do not create variations among the study villages. The variance in the resource condition of the two sets of villages can be explained best by examining rules for using the resource, for monitoring the use, for sanctioning violations and for arbitrating disputes.<sup>10</sup>

---

<sup>9</sup>There seems to be little difference in the force that market or population pressures exert on the village forests in the six villages. The first three villages where the forest is in a good condition are located 3.1 kms. away from the market on the average. The latter three where the resource condition is poor to fair are 2.8 kms. 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. 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. These figures would seem to indicate that there is little systematic relationship between market or population pressures on the resource system, and its condition.

<sup>10</sup> Most of the data on rules is culled from records of the forest panchayat meetings (which in some instances go back more than sixty years; and records kept by the village

## Use Rules

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 the cases (but one), users must be residents of the village where the forest is located. In the exception, the family of an individual who aided the creation of the panchayat forest is allotted rights to harvest benefits from the resource.

In most of the villages, rules also 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 two to twelve weeks. When cutting leaves from trees for fodder villagers must leave behind at least two thirds of the leaf cover on the tree.<sup>11</sup> In different villages rules also vary in the type of rights they confer on users. In some of the villages, users have equal rights - without reference to their contributions in maintaining the resource (although they can buy and sell rights among themselves).<sup>12</sup> 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 in which 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

---

revenue officials (the patwari).

<sup>11</sup>The main fodder tree in this region is oak.

<sup>12</sup>Users mainly buy or sell rights to bundles of fodder rather than rights to use the forest for the entire year.

to match supply and withdrawal by assessing fodder growth during the year,<sup>13</sup> fixing extraction levels below the annual regeneration, and metering fodder extraction using simple measures.<sup>14</sup> In village one, two and three, 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 that match growth with withdrawal. In villages four and five, rules fail to facilitate the metering of withdrawal from the resource. The grass in these village forests is sold primarily through auctions after which the purchaser is free to cut grass from that section of the community forest he has successfully bid for. This means that the winning bidder has little incentive to stint in his behavior when cutting the grass. He may cut too close to the ground, damaging roots and harming the growth for the next year. In auctions involving leaf fodder, he may harvest too many leaves, damaging the capacity of the tree to produce fodder. In village six, withdrawal by users is metered to some extent. Users are allocated spaces on the common where they must harvest grass. Although this prevents disputes among the users, they still attempt to harvest as much as they can from the area allocated to them.

Two reasons may account for auctions of grass in some villages. Auctions reduce the management effort that the panchayat must expend in extracting and

---

<sup>13</sup>To assess regeneration, panchayat officials visit forest compartments prior to opening them to the villagers. The officials make an eye estimate of the total amount of fodder bundles available. They 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. The forest guard monitors and enforces the panchayat's decision.

<sup>14</sup>Bundles of grass are measured with the help of uniform lengths of rope using which the fodder bundles are tied.

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.<sup>15</sup> To create institutional mechanisms that would distribute benefits among a large number of small users would improve equity, but at the cost of greater management and supervision effort on 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 used 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 village four and five the upper and lower castes (Brahmins and Harijans) have a history of simmering hostility. The Brahmins who are also the richer individuals in the village, 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 design 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. But such cases are not ubiquitous. Even if forest management is delegated to the local level, the local managers<sup>16</sup> may not (be able to) use resources efficiently, sustainably, or equitably. Local users and managers have many advantages over centralized governments and bureaucracies in creating use rules that can match supply with demand. They have greater information about

---

<sup>15</sup> 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) is sold to the highest bidder. The government interacts with just a few persons who then create their own systems for harvesting the grass.

<sup>16</sup>In my cases panchayats, in others the relevant community organizations.

themselves, about their needs, and about the resource.<sup>17</sup> Nevertheless, they may fail or choose not to exercise their capacity to create rules that promote sustainability and equity.

### Monitoring

The problem of ensuring compliance to rules for using resources is acute. In all the studied villages, violations of use rules occurred routinely, even if they were not always reported. In the two villages which maintained detailed records on rule violations (village three and six), minor violations occurred almost every day (see table 3 and 4).

Tables 3 and 4 here

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 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, they can not monitor all compartments of the panchayat forest simultaneously. The community forest is too large and dispersed.

Clearly, not all rule violations can be detected. A resource system need not deteriorate, however, if the infractions are minor and a significant proportion of rule

---

<sup>17</sup>A large number of authors have extolled the virtues of local management. I do not survey this literature. See Ostrom, Schroeder and Wynn (1990) for a thoughtful discussion and for relevant literature citations.



breakers are discovered and sanctioned (Tsebelis 1990). It is only when rules are not enforced or monitored, and violations not sanctioned that institutions become meaningless as guides to behavior.

In the first three cases of sustainable resource use, the panchayats took great pains over monitoring. Panchayat officials recognized 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 (Elster 1989:40-1). They employed two methods. First, they linked the monitor's performance to the rewards he received. Second, they untangled the Gordian Knot of monitoring the monitor by closing the loop between monitors and users. Let me explain.

In the first three cases, the guards appointed by the village forest panchayats were monitored by the panches. Guards were assigned different compartments of the forest to watch over. 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 for guards, if there was evidence of freshly cut grass or tree branches in the forest, it meant that the guard had not been "guarding". Further, the panchayat could easily sanction the guard since the panchayat determined both how much the guard would be paid and controlled the purse strings. In a number of cases, the panchayat paid the guard a lower salary when high levels of rule violations occurred. In other instances 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 only when he promised to improve his performance. Thus officials created institutional incentives for the guards to monitor users assiduously.

The panchayat in village three solved the problem of who would monitor the monitor by involving all villagers in monitoring. The panchayat officials monitored the guard who monitored the users who monitored the officials. At each level incentives

were created for reporting violations in panchayat meetings. When a panch<sup>18</sup> or his 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 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 by the panchayat.

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 three), their response was not to step up their own level of infringements in order to make infractors reduce rule breaking (as a trigger strategy may suggest). 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 man hours spent on monitoring, and tried to innovatively impose graded sanctions (see next sub-section). The behavior of the panchayat officials in village three exposes a problem in suggesting trigger strategies to solve collective action problems. Trigger strategies can work only as long as none of the individuals in a group actually defect. As soon as an individual defects, all other individuals in the group will also defect.

Ostrom's attempt (1990:186) to salvage the trigger strategy solution as a real life solution for collective action problems can work only when combined with effective monitoring and sanctioning mechanisms. An individual following a contingent strategy<sup>19</sup> can only increase her rule deviance when confronted with rule deviance by others. But her contingent strategy will fail to induce rule following behavior among

---

<sup>18</sup>A panch is an elected official of the panchayat. Five panches make up the panchayat.

<sup>19</sup>A contingent strategy is any strategy that depends on how other individuals behave. For any individual 'i', a contingent strategy may be to follow rules if all others follow rules; to break rules if any other individual breaks a rule. Another contingent strategy may be to follow rules as long as rule violations do not exceed a critical limit; to break rules when the critical threshold is exceeded.

other individuals. By increasing her rule deviance she will increase the total level of rule deviance in the system, inducing others not to stop breaking rules, but to break them more often. The only way to improve rule following behavior is through monitoring and sanctioning rule-breakers. Trigger strategies by themselves can create cooperation only as threats, not after an individual has initiated defection. Understanding the futility of trigger strategies, panchayat officials used other mechanisms, discussed earlier, to ensure rule compliance. These mechanisms, once in place, helped villagers follow rules.

In contrast to the institutions in villages one, two and three, panchayat officials in the latter three villages did not emphasize monitoring. In village four, the panchayat did not employ a guard for most of the year. In village five, panchayat records mentioned few instances of rule violations. Most recorded instances were connected with inter-caste disputes in the village between the upper and lower castes. It seemed 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 deviance and resource degradation. The Brahmin residents in the village, if never reported and sanctioned, would get a license to break rules; the resentment against the Brahmins would goad Harijans to break rules as often as possible. In village six, the community forest was highly dispersed. The panchayat considered monitoring important, but was unable to devise a system of salary payments to guards which could allow it to employ two guards for the dispersed panchayat forest compartments. It seems then that in contrast to villages four, five and six, the first three panchayats not only realized the importance of monitoring user behavior, they also successfully devised mechanisms to ensure compliance by users.

Finally, rule violations occur in successful as well as unsuccessful village institutions. As table 3 and 4 show, in just two panchayats (in villages three and six) the detected number of rule violations is 1,279. If villagers are to be believed the

actual incidence of rule deviance may be much higher.<sup>20</sup> Casual walks with panchayat officials in community forests revealed villagers illegally collecting fodder and fuelwood almost each time we took a walk. Just for two villages,<sup>21</sup> we have a figure of possibly a thousand rule violations every year in the panchayat forests. Almora which has more than 3,000 inhabited villages probably has 3 million rule violations occurring every year. Given such high levels of rule violations, it seems safe to infer that in unsuccessful village panchayats, there is a very large gap in 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 non-existent.

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 to 1933 (for 7 years)<sup>22</sup> the forest department detected a total 16,805 violations<sup>23</sup> -- i.e., less than 3,000 violations per year; a thousand times less than what may actually be occurring. Although these are figures from the past,

---

<sup>20</sup>I interviewed more than forty 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 offences 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.

<sup>21</sup>The nature of rule violations is similar in both villages. In both village three and six, guards detected villagers in the act of cutting grass and leaf fodder, collecting twigs and branches, and grazing animals.

<sup>22</sup>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.

<sup>23</sup>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.

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 a guard for fifteen to twenty villages), they will 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 from the forest basic means of subsistence.

### **Sanctioning**

In all the village institutions, the villagers have created rules for sanctioning those 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 offence, the economic status of the offender, whether the person is known to be a trouble-maker, 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.<sup>24</sup> Such an apology reinforces the authority of the panchayat to manage the forest and to punish other individuals who commit infractions of rules.

Given the fact that the panchayats have no legal authority to impose sanctions on villagers who break use rules, it may seem puzzling that many of the villagers pay the fines.<sup>25</sup> If we examine the income and expenditure statements of the different panchayats in Appendix 1, income from fines is significant for all the successful panchayats (except for the panchayat in village three - where the total income is very high), and quite low for all the unsuccessful panchayats. It follows that effective sanctions are necessary for successful institutions. Why some of the panchayats were able to make their sanctions effective; and others not, is something that I discuss in the section on arbitration.

### 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, inspite of the lack of formal powers, lies in the relative power position of different actors if the panchayat chooses to take to court any of the users who break rules. Even if the panchayat does not have formal legal power 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,

---

<sup>24</sup>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.

<sup>25</sup>Especially so in view of the fact that none of the panchayats invoked social boycotts or ostracized offenders as punishment.

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 innocence. Finally, the panchayat is likely to have more funds available to fight law suits in comparison to an ordinary user.

The above factors imply that unless the user who violated rules is influential and wealthy, he will find it worthwhile to settle the small fine that the panchayat imposed on him rather than go to court. It is this ultimate loading of the dice in the favor of the panchayat that drives the outcomes in intermediate stages in its favor - so that we find that many of the users pay the fines imposed on them by the panchayat, that many of the users render apologies and promise not to break rules in future.

Still, not all panchayats are equally willing to take matters to court, or to apply rules equally strongly. We find that for panchayats in villages one, two and three, 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<sup>26</sup> indicate that in village one, the panchayat spends 90% of its expenses on monitoring; in village two, 76% of the panchayat expenditure is on monitoring and legal expenses; and in village three, 74% of the panchayat expenses are monitoring and legal expenses. In contrast, villages four, five and six spend a much smaller proportion of their expenses on these tasks. In village four, just 9% of the expenses are spent on legal expenses, nothing on monitoring; in village five, a total of 29% of expenses are incurred on these heads; and in village six, again, only 28% of the

---

<sup>26</sup>The major proportion of benefits that panchayats provided villagers were extracted from the forests. Villagers used fodder and fuelwood from panchayat forests either without paying, or at rates substantially lower than market prices.

expenses are towards enforcement.<sup>27</sup> These figures tell a clear story about the importance of ensuring monitoring and sanctions for creating effective institutions (see figure 1).

FIGURE 1 HERE

We can quickly examine the importance of expenditures by panchayats on monitoring, sanctioning and arbitration.<sup>28</sup> 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<sup>29</sup>. The Beta coefficient is statistically significant at the .001 level<sup>30</sup> (t-statistic is 4.1); and the adjusted R<sup>2</sup> equals 0.76. The statistical evidence would thus seem to bear out our proposition that all the successful institutions commit a large part of their resources to monitor and sanction rule breakers. Conversely, unsuccessful institutions pay little attention to either monitoring or sanctioning.

---

<sup>27</sup>See Appendix 1 for more details.

<sup>28</sup>The regression in this case needs to be taken with even greater caution since we have only six data points.

<sup>29</sup>For explanation of the numbers signifying resource condition, see table 1.

<sup>30</sup>I must here, sound a note of caution. 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 defence. 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 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, is clear enough in its implications.



## **Conclusion**

In this chapter I have suggested that to successfully explain resource degradation and conservation, we must examine the institutional design that guides resource use. Successful institutional design must solve problems of collective action at four distinct levels: creation of rules for using resources, effective monitoring of use rules, sanctioning of violators who break rules, and arbitration of disputes among monitors, users, and managers.

Use rules determine whether communities can restrict resource use to levels below the sustainable yield from the renewable resource. Villages five and six used rules that rewarded different caste groups unequally. Monitoring rules provide information that is necessary to punish rule breakers. We find that while the first three villages attempted successfully to monitor the monitor, in village four, five and six, there were not even institutionalized mechanisms through which adequate information on rule breaking could be collected. In fact, in villages four and five, 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 they assert their authority as arbiters. Thus monitoring and sanctioning which the first three villages emphasized (see data on incomes and expenses of panchayats) were almost ignored by the three unsuccessful village institutions. Similarly, arbitration, which is important to back sanctions, was ineffective in the latter three villages.

Thus villagers in village four, five and six did not successfully create institutional arrangements that could prevent users from overexploiting and degrading resources. The failure of panchayats to create adequate institutions explains resource degradation in these villages. Local political struggles and social factions within villages, as indicated in the section on use rules, explain why villagers may fail to create use rules that distribute benefits equitably. The upper caste factions in villages four and five attempted to effectively exclude the poorer lower caste families from the resource by creating a system of auctioning harvesting rights to panchayat forest plots.

**Bibliography:-**

Atkinson, Edwin T., (1882). The Himalayan Gazetteer. Vols. I, II, and III (rpt. 1973). New Delhi: Cosmo Publications.

Elster, J., (1989). The cement of society: a study of social order. Cambridge: Cambridge University Press.

Guha, R., (1989). The unquiet woods: Ecological change and peasant resistance in the Himalayas. Berkeley: University of California Press.

Ostrom, E., (1990). Governing the commons: the evolution of institutions for collective action. Cambridge: Cambridge University Press.

Ostrom, E., L. Schroeder and S. Wynn, (1990). Institutional incentives and rural infrastructure sustainability. Burlington, Vermont: Associates in Rural Development.

Pant, G. B., (1922). The forest problem in Kumaon. Nainital: Gyanodaya Prakashan.

Scott, James C, (1985). Weapons of the weak: everyday forms of peasant resistance. New Haven: Yale University Press.

Scott, James C, (1986). "Everyday forms of peasant resistance", The Journal of Peasant Studies. 13:2, January 1986, pp. 5-35.

Scott, James C, (1990). Domination and the arts of resistance: hidden transcripts. New Haven: Yale University Press.

Tsebelis, G., (1990). Nested games: rational choice in comparative politics. Berkeley: University of California Press.

T A B L E 1

Agricultural and Forest Revenue in Kumaon (in Rs.)

Year	Agriculture	Forest
1872-3	164,000	267,000
1873-4	161,500	365,500
1874-5	162,000	276,500
1875-6	194,000	297,500
1876-7	232,000	218,000
1877-8	229,500	179,500
1878-9	222,000	171,000
1879-80	219,500	165,500

TABLE 2

Basic Statistics on the Six Studied Villages

Village	Resource Condition	Households	Livestock	Panchayat Forest (Area in Ha.)	Other Pastures
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 to 8. Eight denotes excellent, 0 denotes degraded. Thus, the higher the number, the better the condition of the resource.

T A B L E 3

Detected Rule Violations in Panchayat Forest; Village 3

---

<u>Year</u>	<u>Number of violations</u>
1978-79	40
1980-81	354
1982-83	389
1984-85	114
1986-87	87
1988-89	40

---

T A B L E 4

Detected Rule Violations in Panchayat Forests: Village 6

---

<u>Year</u>	<u>Number of Violations</u>
1977	138
1979	91
1980	2
1982	26
1983	95
1988	30

---

## Appendix 1

This appendix presents the income and expenditure accounts of the panchayats in study villages. Each table shows the total incomes and expenses and the proportions for different categories.

**TABLE 1: Appendix 1**

Income/Expenditures of Van Panchayat in Village One

<u>Income</u>	<u>Proportion</u>	<u>Expenditure</u>	<u>Proportion</u>
Fines/collections	29%	Stationery	2%
Tree sale	55%	Guard Salary	90%
Fodder sale	7%	Miscellaneous	8%
Minor Forest			
Produce sale	8%		

Total Income for the Panchayat was Rs. 3,722.00  
Total Expenditure for the Panchayat was Rs. 2,777.00.

**TABLE 2: Appendix 1**

Income/Expenditures of Van Panchayat in Village Two

<u>Income</u>	<u>Proportion</u>	<u>Expenditure</u>	<u>Proportion</u>
Fines	39%	Stationery	14%
Fodder sale	11%	Guard	33%
Wood sale	51%	Legal Expenses	43%
		Donations	9%

The total income for the period was Rs. 1,188.00  
The total expenses for the period were Rs. 2,335.00.  
The excess of expenses over income was met through withdrawals from the accrued income of the panchayat maintained as a deposit in the bank.

**TABLE 3: Appendix 1**

**Income/Expenditure of Van Panchayat in Village Three**

<u>Income</u>	<u>Proportion</u>	<u>Expenditure</u>	<u>Proportion</u>
Resin sales	48%	Guard's salary	72%
Fodder sale	49%	Stationery	1%
Fines	3%	Legal Expenses	2%
		Public donations	25%

The total income for the period to which these figures relate was Rs. 20,443.00

The total expenses for the same period were Rs. 21671.00

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

**TABLE 4: Appendix 1**

**Income and Expenditure for the Van Panchayat in Village Four**

<u>Income</u>	<u>Proportion</u>	<u>Expenditure</u>	<u>Proportion</u>
Tree sale (Contractor)	70%	Tree Planting	48%
Tree Sale (Villagers)	5%	Fertilizers	40%
Grass Sale	24%	Stationery	2%
Fines	1%	Legal Costs	9%

Total Income for the period was Rs. 5636.00

Total Expenditure for the period was Rs. 5337.00



**TABLE 5: Appendix 1**

Income and Expenditure for Van Panchayat in Village Five

---

<u>Income</u>	<u>Proportion</u>	<u>Expenditure</u>	<u>Proportion</u>
Resin Royalties	23%	Stationery	2%
Grass Sale	22%	Tree Planting/ Fencing	68%
Grass Auction	53%	Guard Salary	15%
Tree Sale	2%	Legal Expenses	14%

---

In addition to the above, the 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.

The total income for the panchayat was Rs. 4,425.00  
The total expenses were Rs. 8,181.00.

---

**TABLE 6: Appendix 1**

Income and Expenditure of the Van Panchayat in Village Six

---

<u>Income</u>	<u>Proportion</u>	<u>Expenditure</u>	<u>Proportion</u>
Tree Sale	44%	Stationery	9%
Grass Sale	19%	Guard Salary	19%
Fines	32%	Legal Expenses	9%
Miscellaneous	5%	Public Donations	43%
		Tree Planting	21%

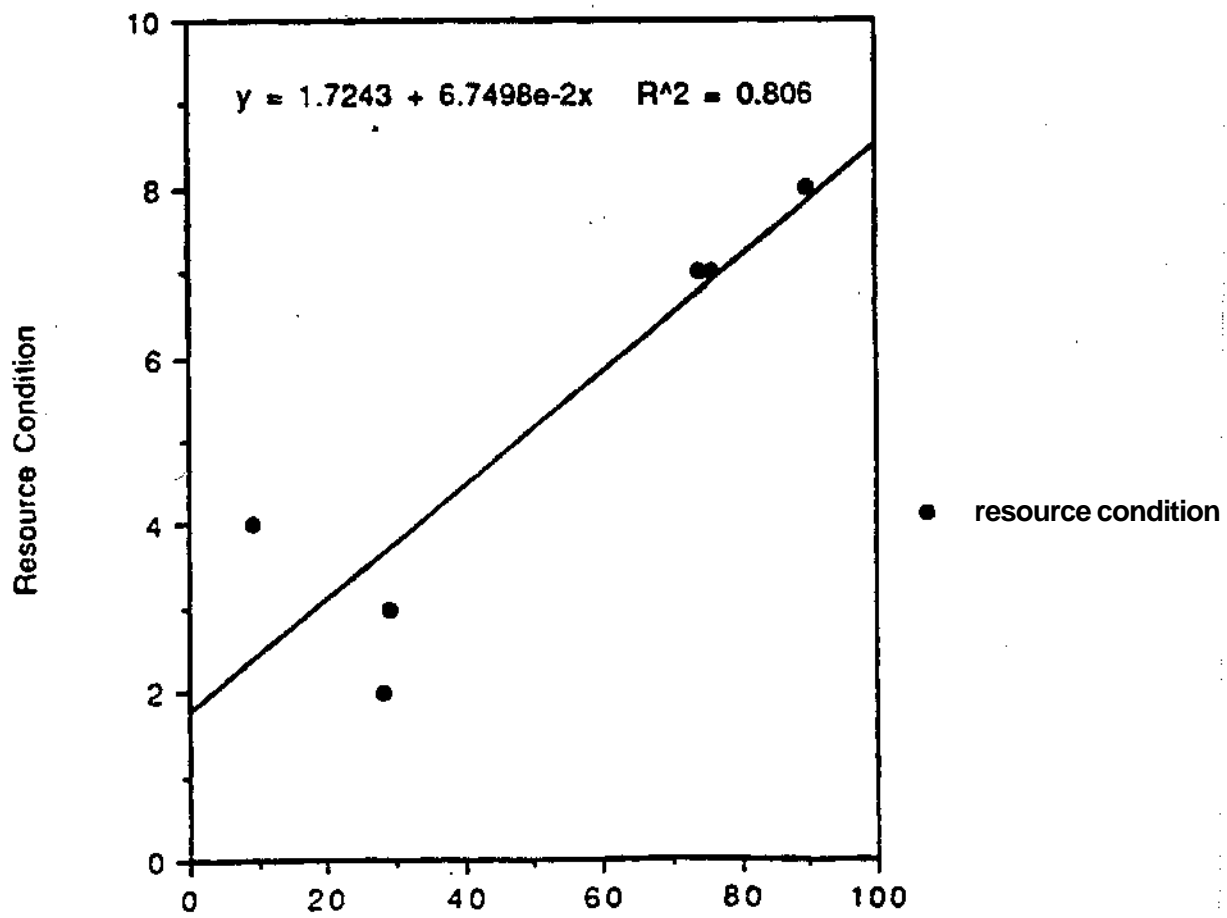
---

The Legal expenses were incurred in a law suit with villagers from a neighboring village.

The total income is Rs. 3,779.00  
The total expenses are Rs. 4,974.00.

---

Fig 5.9: Resource Condition and Attention to Monitoring, Sanctions, Arbitration: Six Villages



Percentage of Panchayat Expenditure on Monitoring, Sanctions, and Arbitration