

# Forest in Almora district, India (5)

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## 1 Part I: Static Analysis - Collective action

The community forests discussed in this case study are called panchayat forests. They are managed by local institutions called van panchayats. The forests and van panchayats all lie in the middle Himalayan ranges in Almora district, India. Almora is one of the eight mountainous districts that together comprise the Uttarkhand in Uttar Pradesh. The analysis focuses on the effects of institutional rules on fodder and fuelwood use in community forests. Village 6 is one of six villages located in the Almora district.

The key resource is fodder from the community-managed forests. In village 5, the resource condition is poor (p. 270).

The original CPR report may be found at <https://seslibrary.asu.edu/seslibrary/case/185/cpr>. Coupled Infrastructure Systems framework is explained in more detail in Anderies (2014) <http://link.springer.com/article/10.1007/s11538-014-0030-z>

### 1.1 The Commons Dilemma

- The potential appropriation problem / poor coordination of appropriation

Villagers in village 5 did not successfully create appropriation rules that could prevent users from overexploiting and degrading resources (p. 282). First, village 5 is one of the villages where panchayats have not designed rules to match withdrawn regeneration. In village 5, rules fail to facilitate the metering of withdrawal from the resource mainly because the grass in this 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. In auctions involving leaf fodder, he or she may harvest too many leaves, damaging the capacity of the tree to produce fodder (p. 272). Secondly, village 5 did not emphasize monitoring. Once the auction has been held, the panchayat officials need no longer worry about regulating and supervising the removal of fodder from the resource (p. 273). The panchayat in village 5 did not employ a guard for most of the year (p. 276). There were not even institutionalized mechanisms through which adequate information on rule breaking

could be collected. In fact, monitoring seemed to be prompted by a desire to persecute the lower class (Harijans) in caste system (p. 282). Thirdly, villagers have created rules for sanctioning rule breakers. In the absence of accurate information about rule breaking, however, sanctions could not be imposed particularly on the higher class (Brahmins) in village 5 (p. 276; 282). It seems that the panchayat, dominated by Brahmins, used its control over the panchayat forest as a way of dominating the Harijans (p. 276). Lastly, the panchayat acts as arbiters over disagreements that arise when it imposes sanction on rule breakers, interprets institutional rules, and resolves disputes over the creation of rules (p. 280). However, panchayat officials in village 5 could not assert their authority as arbiters due to the class-biased monitoring and sanctioning (p. 282).

- The potential under provision of public infrastructure

According to Anderies et al. (2004), public infrastructure combines two forms of human-made capital: physical capital including any engineered works, such as dikes, irrigation canals, etc; and social capital including the rules actually used by those governing, managing, and using the system and those factors that reduce the transaction costs associated with the monitoring and enforcement of these rules. This paper does not report which physical capital have been made by villagers. In terms of social capital including the rules for withdrawing resources, monitoring the monitor, and sanctioning rule breakers, village 5 failed to solve the dilemmas involved in providing public infrastructure. The panchayat which was dominated by the higher class (Brahmins) did not employ a guard for most of the year, though resource users elected the panchayat officials. And rights to extract fodders from community-managed forests are function of their ability to make high bids in auctions (p. 272). Under this auction system where winners take all, the panchayat has little incentive to produce public infrastructure for monitoring resource users behavior. As a result of this absence of monitoring, the panchayat did not need to enforce the rules for sanctioning overexploitation.

## 1.2 Biophysical Context (IAD)

- **Natural infrastructure**

Village 5 lies in the middle Himalayan ranges in Almora district, India. Almora is one of the eight mountainous districts that together comprise the Uttarkhand in Uttar Pradesh. Natural infrastructure in village 5 is the community-managed forests that provide resource users with fodder as a main resource from the forests. The community forest is too large and dispersed to monitor all behavior (p. 274). In spite of this weakness arising from natural infrastructure, villagers did not create the rules-in-use for selecting their forest guards and encouraging them to monitor rule infractions by linking their performance to their salary. Village 5 is one of the villages whose forest quality is poor (p. 270). There are no reports that the natural infrastructure helps to have clearly defined boundaries and generates asymmetries of power and information.

- **Hard human-made infrastructure**

There is no explicit information about hard human-made infrastructure such as roads and fields of seedlings.

### 1.3 Attributes of the Community (IAD)

- **Social Infrastructure**

Village 5 has 79 households, 228 livestock, 39 ha panchayat forest, and 83 ha other pastures (p. 271). In terms of the web of relationships among agents, the Van Panchayat Act 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 must meet three to six times every year (p. 270). Although the panchayat elects officials every five year, the caste system gave the Barhmins to the numerical superiority to guarantee them effective control over the panchayat. The upper and lower castes (Brahmins and Harijans) have a history of simmering hostility. The Brahmins, who are also the richer individuals in village 5, were instrumental in the creation of the forest panchayats. They designed the rules that guide fodder extraction from the panchayat forest (p. 273). The Brahmin residents in this 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 (pp. 275-6).

- **Human Infrastructure**

The provisions of the Van Panchayat Act aims to facilitate collective action by villagers (p. 270). However, village 5 chose auction through which the auction winner takes all, and thus the panchayat officials need no longer worry about regulating and monitoring the appropriation of fodder from the forest. The Brahmins became the winner in this auction system so that the resentment against the Brahmins would induce Harijans to break rules (p. 277). Consequently, I can find no human infrastructure such as the capacities of individual agents to process information and make effort allocation decisions.

### 1.4 Rules in Use (IAD)

#### **Position Rules**

- Panchayat officials: To create the van panchayat, panchayat officials must be elected regularly by villagers (resource users) (p. 270).
- Forest guards: The panchayat in village 5 did not employ a guard for most of the year (p. 276).

#### **Boundary Rules**

- Resource boundary: According to the Van Panchayat Act, villagers must demarcate the boundaries of the panchayat forest (p 270).
- Resource users boundary: They must be residents of the village where the forest is located (p. 271). But actual resource users are winners in auctions where benefits from the forest are sold to the highest bidder (p. 272). The winners are usually the higher class, Brahmins, in the caste system.

#### **Choice Rules**

- Resource users: They can elect their panchayat officials who can design the rules and select forest guards (p. 270; 272). All resource users cannot make animals graze in the

forest for most of the year. Villagers can harvest fodder only for 2-12 weeks (p. 271). The auction winner is free to cut grass from that section of the community forest for which he or she has successfully bid (p. 272). Villagers must protect forests from illegal tree felling, fires, encroachments, and cultivation (p. 270). 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 (p. 270).

- Panchayat officials: The elected panchayat officials must design soft human-made public infrastructure and meet three to six times every year (p. 270). Once the auction has been held, however, the panchayat officials need no longer worry about regulating and supervising the removal of fodder from the resource (p. 273). Due to the winner-takes-all rule, the officials do not have to make an eyeball estimate of the total amount of fodder bundles to assess regeneration level. So they do not need to select forest guards.

- Forest guards: In village 5, the panchayat did not employ a guard for most of the year (p. 276).

### **Aggregation Rules**

The community forests 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.

### **Scope rules**

- Appropriation rules: In principle, everybody can bid in auction to get benefits from the forests. However, actual winner in auction is usually the higher class (Brahmin) in the caste system due to their economic power.

- Provision rules: : Panchayat officials elected by resource users must design soft human-made public infrastructure. But the winner-takes-all auction system gives the officials little incentive to create the rules for monitoring and sanctioning.

### **Information Rules**

- Panchayat officials: Panchayat records mentioned few instances of rule violations. Most recorded instances were connected with intercaste disputes in the village. 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 (p. 276).

- Forest guards: They are not employed for most of the year (p. 274).

### **Payoff Rules**

- Benefits: The auction winner is free to cut grass from that section of the community forest for which he or she has successfully bid (p. 272).

- Costs: If users break the rules for appropriation, panchayat officials ask them 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 (p. 278). But the Brahmin residents in village 4, 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 (pp. 276-7).

## 1.5 Summary

### Resource

The key resource is fodder from the community-managed forests whose quality is fair to poor (p. 270).

### Resource users

They must be residents of the village where the forest is located (p. 271). But actual resource users are winners in auctions where benefits from the forest are sold to the highest bidder (p. 272). The winners are usually the higher class, Brahmins, in the caste system. Resource users can elect their panchayat officials who can design the rules (p. 270). 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. In auctions involving leaf fodder, he or she may harvest too many leaves, damaging the capacity of the tree to produce fodder (p. 272).

### Public infrastructure providers

1) Panchayat officials: The elected panchayat officials must design soft human-made public infrastructure and meet three to six times every year (p. 270). Once the auction has been held, however, the panchayat officials need no longer worry about regulating and supervising the removal of fodder from the resource (p. 273). Due to the winner-takes-all rule, the officials do not have to make an eyeball estimate of the total amount of fodder bundles to assess regeneration level. So they do not need to select forest guards.

2) Forest guards: The panchayat did not employ a guard for most of the year.

### Public infrastructure

1) Natural infrastructure: Natural infrastructure in village 5 is the community-managed forests that provide resource users with fodder as a main resource from the forests. The community forest is too large and dispersed to monitor all behavior (p. 274). In spite of this weakness arising from natural infrastructure, villagers did not create the rules-in-use for selecting their forest guards and encouraging them to monitor rule infractions by linking their performance to their salary. Village 4 is one of the villages whose forest is poor to fair (p. 270).

2) Hard human-made public infrastructure: There is no explicit information about hard human-made infrastructure such as roads and fields of seedlings.

3) Soft human-made public infrastructure: See 1.4 Rules in use (IAD)

## 2 Part II. Dynamic Analysis - Robustness

This update to the Forest in Almora district, India (5) case was made in 2015 by Hoon C. Shin at Arizona State University. In-text parenthesis indicate corresponding links in the system representation (Robustness diagram) on the SES library.

## 2.1 Update on the Commons Dilemma

## 2.2 Shocks, Capacities, Vulnerabilities

### **...to and of the Resource (link 7 to R):**

There are no explicit mentions of biophysical disruptions (Arrow 7) such as floods, earthquakes, landslides, and climate change that impact the resource.

### **...to and of the Public Infrastructure (link 7 to PI):**

There are no explicit mentions of biophysical disruptions (Arrow 7) such as floods, earthquakes, landslides, and climate change that impact the public infrastructure.

### **...to and of the Public Infrastructure Providers (link 8 to PIP):**

One of major socioeconomic changes (Arrow 8) in village 5 is the establishment of the Van Panchayat Act of 1931. From the 1840s, the British government asserted its absolute rights over all land and forests. The Imperial Forest Department protected state forests from trespassing, unauthorized tree felling, grazing, and firing. In response to the states control over forests by limiting villager access and use rights to the resource, villagers protested incessantly against encroachments by the state on their traditional rights in the forests. As a result, the Forest Grievances Committee, set up in 1921, recommended the government to reclassify forests into class 1 and class 2 forests. And the Van Panchayat Act of 1931 permitted resource users to create community-managed forests from the class 1 forest controlled by the Revenue Department.

The Van Panchayat Act prescribes the process of forming van panchayats and imposes certain duties on village forest councils. This means that the Van Panchayat Act contributed to changing public infrastructure provider from central government to self-governing community. The panchayat officials are elected by villagers to design soft human-made public infrastructure, e.g. a variety of the rules-in-use described above, and enforce it. However, village 4 introduced auction as appropriation rule and thus winner in auction can only take benefits from community-managed forests. As a result, panchayat officials did not need to play a role in providing soft human-made infrastructure.

### **...to and of the Resource Users (link 8 to RU):**

The Van Panchayat Act aims to facilitate collective action in managing community forests. First, the Act requires villagers to create boundary rules. Villagers must demarcate the boundaries of the panchayat forest (p 270). In order to become legitimate resource users, they basically must be residents of the village where the forest is located (p. 271). Secondly, resource users can elect their panchayat officials who can design the rules and select forest guards (p. 270; 272). Yet, auction as allocation rule offset the strength of the act. The winners in auction, who are usually Brahmins in caste system, are entitled to use resources from the forests without considering regeneration level. This winner-takes-all rule is likely to lead Harijans to break rules as often as possible.

## 2.3 Robustness Summary

In this case study there is no explicit information about ecological shocks to resource and public infrastructure. But the Van Panchayat Act of 1931 can be regarded as a major socioeconomic change from outside of village 5. The act affected both resource users and

public infrastructure providers in that it permitted resource users to create community-managed forests and their self-governing institutions including the van panchayat and a variety of rules-in-use. However, the introduction of auction caused local political struggles and social factions within villages, and thus villagers fail to create rules that distribute benefits efficiently and/or equitably (p. 282). Consequently, the forest condition in village 5 is poor (p. 270).