Explaining Enforcement Mechanisms in Collaborative Natural Resource Governance: A Study of Cases of Van Panchayats from Central Himalayan Region, India

DISSERTATION

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By

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ABSTRACT

This study examines factors that influence communities to organize themselves to successfully govern common pool resources (CPR). Commons scholarship has long sought to identify the most important factors within CPR management schemes. There is a consensus that monitoring and sanctioning may be necessary factors that promote successful and sustained natural resource governance. Despite this growing consensus, less is known about the causal mechanisms of monitoring and sanctioning and the factors that influence its levels.

More specifically, less is known regarding how monitoring and sanctioning is structured, how it is carried out, who is involved and in what capacity. Further research is needed to explore the challenges and factors that promote cooperation in the collective action process and self-governance of CPR management. Pure self-governance may not be a reality in most community-oriented efforts, as external factors might have some influence. Hence, it is crucial to also identify the roles that all actors involved play and how roles impact natural resource governance.

This dissertation sheds light on these important issues by first focusing on how monitoring and sanctioning is structured and who is involved and in what capacity. The dissertation delves into the details of various challenges that are related and explores how communities overcome those challenges. Finally, the dissertation
shifts focus from community action to the collaborative role that external actors play in determining goals, strategies, and outcomes in natural resource governance.

A multiple case study method was adopted to address these issues. Van Panchayats, a traditional local institution that has been involved in natural resource governance for more than eight decades, were chosen for this study. They form one of the earliest examples of decentralized resource management through formal state community partnerships. These van panchayats operate in diverse partnerships with government agencies and non-government organizations. Twelve cases of van panchayats with diverse institutional configuration were identified and selected for dissertation research.

The dissertation helps in understanding institutional factors, different sets of rules, and partnerships that affect collaborative natural resource governance. It highlights the importance of identifying diverse collaborative partnerships in which community-based institutions operate and how these might be helpful in explaining why some groups govern their resources more effectively than others. The results show that although government plays a key role in formulating rules, in practice both government and van panchayat formulated rules and actions are interdependent. Dissertation results highlight the biggest challenges to effective monitoring and sanctioning and factors that motivate communities to overcome these challenges.
Dedicated to the villagers of Kumaon
Acknowledgements

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FIELDS OF STUDY

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## Abbreviations

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<th>Full Form</th>
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<tr>
<td>CPR</td>
<td>Common Pool Resources</td>
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<tr>
<td>VP</td>
<td>Van Panchayat</td>
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<td>IAD</td>
<td>Institutional Analysis Development</td>
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<td>SES</td>
<td>Socio-ecological Framework</td>
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<td>GIF</td>
<td>Governmental Impact Framework</td>
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<tr>
<td>CBNRM</td>
<td>Collaborative Natural Resource Management</td>
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<tr>
<td>NRM</td>
<td>Natural Resource Management</td>
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<tr>
<td>MoEF</td>
<td>Ministry of Environment and Forests</td>
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<tr>
<td>FD</td>
<td>Forest Department</td>
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<tr>
<td>Govt.</td>
<td>Government</td>
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<tr>
<td>NGO</td>
<td>Non Government Organization</td>
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<td>JFM</td>
<td>Joint Forest Management</td>
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<td>NREGA</td>
<td>Mahatma Gandhi National Rural Employment Act</td>
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<td>CAMPA</td>
<td>Compensatory Afforestation Fund Management and Planning Authority</td>
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Chapter 1: Introduction

1. Common Pool Resources

Common-pool resources (CPR) are goods to which no single decision-making unit holds exclusive title, where exploitation by one user reduces resource availability for others, and from which exclusion of potential beneficiaries through physical and institutional means is costly. Unlike rights over private and public property, the property rights and ownership for most CPRs are unclear (Ostrom 1990; Acheson 1994), so managing and governing CPR use poses significant challenges and CPRs are susceptible to overuse, degradation, and risk of depletion. Garret Hardin’s seminal article (1968) on CPRs described this overuse and degradation as a “tragedy of the commons,” which he predicted would befall any CPR unless it was regulated by centralized government restrictions or individual property rights. In the 1980s, however, several other CPR scholars challenged Hardin’s approach. They argued that Hardin’s model was too simplistic and that managing CPRs to avoid “tragedies” must account for CPRs’ complex natures. Moreover, they contended that every CPR is unique and there are no panaceas, therefore solutions cannot simply be generalized (Ostrom 2007).

Despite the complexity and limits to generalizations, there are some general patterns and principles that some scholars have used to predict successful community-level CPR management, and researchers have identified some underlying structural
commonalities. These researchers have developed analytical tools that are being applied to diverse cases of CPR management. They include 1. Ostrom’s (1990) design principles; 2. Agrawal’s (2001) set of 35 critical enabling conditions for durable community-led CPR governance; and 3. Ostrom and colleagues’ (1994) Institutional Analysis and Developmental Framework for identifying variables affecting outcomes arising from human interactions with CPRs in particular biophysical, cultural, and institutional contexts; 4. Ostrom’s (2007) model for identifying different variables and their patterns of interaction to diagnose complex resource governance problems in multivariable and multilevel systems embedded in socio-ecological systems; and 5. Koontz and colleagues’ (2004) Governmental Impacts Framework for understanding the pathway of external agents’ impact and influence on social and environmental outcomes among CPRs operating in a collaborative fashion. I used the eight design principles to highlight how those principles apply to the case studies chosen for this research. The IAD framework on the other hand was helpful in understanding how rules pertaining to monitoring and sanctioning were developed. Later in the research, I used the socio-ecological framework to identify different factors that challenge and motivate the community to perform monitoring and sanctioning activities. Lastly, I observed that the community-based institutions that I was working on had influence from government agencies and non-government organizations. I utilized and adapted the Governmental Impacts Framework to understand how external factors like government agencies and non-government organizations influence community action and the kinds of outcomes that such an interaction leads to.
Since the 1980s, CPR scholarship has been expanding based on empirical case studies conducted all over the world, to determine what management strategy or mechanism works when and how. As a result, CPR research is no longer about defying Hardin’s predictions; instead researchers focus on building on the existing research, broadening knowledge of application (where, when, how, under what circumstances) and contributing to a shared goal to produce research so that policymakers can develop adequate policies and tools for implementation to successfully and sustainably govern the commons. This goal is of interest to this dissertation project too.

Specifically, some leading scholars in the field of CPR research and management have identified specific conditions that they propose may contribute to more effective long-term CPR management (see Wade 1984; Ostrom 1990; Baland and Platteau 1996; Agrawal 2001; Dietz et al. 2003). Analysis of a large database on forest management, for instance, showed that the existence of practices such as monitoring resource use and sanctioning rule violations (known as M&S\(^1\)) tends to have strong correlations with improvement in forest conditions (Gibson et al. 2005; Ostrom and Nagendra 2006; Coleman 2009).

M&S is widely considered to be a factor that can contribute to general improvement in CPR conditions (Gibson et al. 2005; Coleman 2009; Coleman and Steed 2009), but there are gaps in understanding of the causal processes of M&S and fit to or required adaptations across different contexts. As a result, further analysis is needed.

Questions about what factors lead to the development and implementation of M&S

\(^1\) In these cases, monitoring is defined as the act of watching, observing, or checking, while sanctioning is the act of penalizing rule-breakers, either in the form of imposing fines or imposing legal sanctions.
systems, how M&S is structured, how external factors may affect M&S, and what challenges exist in carrying out M&S in different contexts need to be addressed. This dissertation was designed to compare cases of M&S across multiple settings within a similar legal and institutional context in India.

There are other issues that were relevant to dissertation research. Though other researchers establish that M&S is a key variable associated with successful CPR management in a number of contexts, it may receive low priority or be missing in the process due to the high transaction costs that are involved (Danielsen et al. 2008). These high transaction costs are due to setting up and developing the monitoring and sanctioning system and subsequently hiring/assigning/appointing someone to perform monitoring and sanctioning tasks and duties. Some scholars argue that locally based monitoring involving users can serve as a viable solution for overcoming cost obstacles, as it is more timely, cost-effective, and reliable (Danielsen et al. 2009; Chhatre and Agrawal 2008). In addition, there is some literature that underscores M&S as a nested enterprise\(^2\) in CPRs, where external factors (for example, government agencies and non-governmental organizations) can be seen as complements to monitoring and sanctioning efforts (Ostrom 2007; Andersson et. al. 2014).

Following on the points highlighted in the above discussion, this dissertation research was designed to analyze situations of M&S of forest-based common pool resources that involve the participation of local communities (users of forests), non-governmental organizations, and government agencies. Research was carried out in the

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\(^2\) Nested enterprise refers to different levels of governance involving, for example, federal, state and local levels.
central Himalayan region in India where M&S involves not only government rules and institutions but also “van panchayats,” local institutions based on traditional forms of organizing that were established to protect local natural resources through the implementation of rules, monitoring and sanctioning. In this dissertation, I specifically address some key gaps in knowledge by investigating the causal mechanisms of M&S and the roles different actors (institutions and resource users) play in the process through an empirical study of community-based institutions operating in diverse collaborative partnerships.

The rest of this chapter is organized as follows: Section 2 focuses on the conceptual background for research, Section 3 discusses the research design and specific methods applied to data collection, Section 4 discusses important details of the study setting, and Section 5 provides an overview of the remainder of the dissertation.

2. Conceptual Background

There is no definitive theory that can predict the outcomes of monitoring and sanctioning or that supports a singular approach or model. However, the literatures on collective action and CPR management provide useful ideas drawn from case study research. This section introduces specific theories, concepts, frameworks, and models that influence the dissertation research design and provide underpinnings for analyses in later chapters.
2.1 Solving CPR problems: Three influential models and design principles

A CPR is a resource system (RS) where three kinds of activities take place: Appropriation, Production, and Provision. Appropriators are resource users, Producers are individuals involved in constructing, repairing, or taking action to ensure long term sustainability of resources, and Providers are individuals who arrange for provision (for example, make policies and rules) for long term sustainment of CPRs. Ostrom in her seminal work *Governing the Commons: The Evolution of Institutions for Collective Action* (1990) separates CPR problems into two types: (1) appropriation problems and (2) provision problems. In appropriation problems, there is overexploitation of a resource system because of excessive use. Unfair and inadequate enforcement of access of rights and duties can also adversely affect appropriators’ willingness to invest in provision activities. These are all collective action problems, and Ostrom argues that there is no one way to solve them.

Ostrom (1990) further attempted to critique foundations of policy analysis as applied to natural resources; she presented alternatives to solving CPR problems by using *three influential models*: Tragedy of the Commons, the Prisoner’s Dilemma, and Logic of Collective Action. Ostrom further posits that all these models are interconnected. According to “Tragedy of the Commons,” CPRs will be bound to tragedy because of its

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3 Prisoner’s dilemma is an example of a game used to study cooperative behavior. It shows that two individuals driven by their self interests might not cooperate even if it appears that it is in their best interest to do so.
4 The logic of collective action attempts to explain how individuals operate in groups. According to the logic of collective action, individuals in a group work together in order to further the interests of the group. This is because all of the individuals in a group would gain if they achieved their group objective.
The second theory is “Prisoner’s Dilemma,” where each player has a dominant strategy to defect and to be better off than other players. According to this theory, the dominant strategy is sub-optimal compared to if everyone cooperates, yet players are punished if they unilaterally cooperate without assurance that others will also do so. Thirdly, the “Logic of Collective Action” defies Tragedy of the Commons and Prisoner’s Dilemma and proposes that an individual in a group can act towards attaining a common good, provided the group size is small and there is some coercion. “Unless the number of individuals in a group is quite small, or unless there is coercion or some other special devise to make individuals act in their common interest, rational\(^6\) self-interested individuals will not achieve their common group interest” (Olson 1965, 2).

A central question of CPR research focuses on how a group of actors who are in an interdependent situation organize and govern themselves to obtain continuing collective benefits when some or all face temptations to act for individual self-benefit. Common examples of self-benefitting behavior include free riding and rent seeking. Free riding refers to when an actor benefits from a group process without contributing equitably to the process, and rent seeking occurs when the results of collaborative decision making yield unearned benefits to only some participants (Ostrom et al. 1993). Related research has sought to explain the combinations of variables that are associated with increasing the initial likelihood of self-organization, enhancing the capabilities of

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5 Open access resources are those that can be accessed by anyone at anytime without restraint. Such resources may be subjected to overuse because users have an incentive to harvest as much as they can as rapidly they can (Titenberg 2006).

6 Rationality is a notion used by western thinkers to refer to selfish individuals who overharvest/overexploit resources for economic benefit. In my case, however, it does not seem justified to use the term “rational” to refer to individuals who are free-riders or who violate the rules, because these individuals live in dire situations. They violate a rule about forest use in order to support and sustain themselves and their families.
individuals to continue self-organized efforts over time, or with exceeding the capacity of self-organization to solve CPR problems without external assistance of some form.

A much cited set of eight design principles that are believed to help self-governing CPR institutions overcome the problems of free riding and rent seeking has been explained by Ostrom (1990). The list has served as the guiding framework for numerous studies of CPR problems, at different scales, and in different cultures (see Table 1.1). These design principles are relevant for my research because my study sites exemplify how an ill-defined principle can lead to some serious challenges. For example, the community-based institutions I worked on are nested enterprises (P8) where the governance of resource is organized in multiple layers. The high incidence of encroachment and damage by the non-residents of the village was reported due to boundaries that were damaged and were not clearly defined7 (P1). Similarly, lack of congruence between appropriation and provision of rules marred users’ ability to contribute to rule formation (P2). In addition, rules pertaining to forest use are monitored and gradually sanctioned by the forest users (P4 and 5). There are instances of conflicts that are experienced during meetings. These conflicts mostly arose due to a clash of interests, and my data revealed that conflicts tend to be resolved mutually by coming to a consensus (P6).

7 The boundary walls as mentioned in the text are mostly imaginary guideposts. However, there are some villages that have either barbed wire or low height stone walls. These physical walls were often reported to be damaged by non-residents of the village.
Table 1.1: Design principles illustrated by long-enduring CPR institutions

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| 1 | Clearly defined boundaries  
Individuals or households with rights to withdraw resource units from the CPR must be clearly defined, as must the boundaries of the CPR itself. |
| 2 | Congruence between appropriation and provision rules and local conditions  
Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions and to provision rules requiring labor, material, and/or money. |
| 3 | Collective-choice arrangements  
Most individuals affected by the operational rules can participate in modifying the operational rules. |
| 4 | Monitoring  
Monitors, who actively audit CPR conditions and appropriator behavior, are accountable to the appropriators or are the appropriators. |
| 5 | Graduated sanctions  
Appropriators who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and context of the offense) by other appropriators, by officials accountable to these appropriators, or by both. |
| 6 | Conflict resolution  
Appropriators and their officials have rapid access to low-cost local arenas to resolve conflicts among appropriators or between appropriators and officials. |
| 7 | Minimal recognition of rights to organize  
The rights of appropriators to devise their own institutions are not challenged by external governmental authorities. |

For CPRs that are part of larger systems:  
8. Nested enterprises  
Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers that are nested.

Source: Ostrom (1990, 25)

A central tenet that runs through much of the work on successful CPR management is that resource users must have primary decision-making authority over the resources (Koontz 2004). Following this tenet, all of Ostrom’s (1990) initial case studies were of small-scale CPRs, where the appropriators of the resource depended on the very
systems they were managing for their livelihoods. Much CPR research has focused on decentralized institutional arrangements for governing common resources. According to a survey of national forestry policies in over 50 countries, governments claimed to be implementing new initiatives that would devolve some control over resources to local users (Agrawal 2002). Many governments expressed concern with strengthening CPR institutions and policies by devolving authority to resource users. However, within these arrangements, resource users have a diminished ability to influence decision-making. Further, the difference between resource users who depend on the resource and stakeholders who value the resource complicates who should and does have a say in decision making. This discussion highlights the shift from self-governance to mediated governance through government officials (Koontz 2004). It also influenced selection of my cases, wherein I chose cases of community based institutions working in different capacities with government agencies and non-governmental organizations to clearly understand the dynamics of the relationship of external actors with the community based institutions and the outcomes generated by those interactions. I discuss this shift from self-governance to external intervention by government agencies and NGOs in Chapter 4.

2.2 Institutional analysis

Institutional analysis is a way to examine problems a group of individuals or organizations face and to determine how the rules they adopt influence their interactions and outcomes (Imperial 2001). There are several promising tools that are widely accepted in the field to help institutional analysis. Of these tools, for my research I utilized the following theoretical frameworks: 1. Institutional analysis and development (IAD)
framework, 2. Socio-ecological systems framework, and 3. Governmental impacts framework. These theoretical frameworks helped identify elements and relationships that needed to be considered for my institutional analysis. These frameworks provided a general list of variables that could be used to analyze all types of institutional arrangements. Frameworks also provided a metatheoretical language that I used to compare theories, identify the universal elements that study of similar phenomena would need to include, and to help generate questions that would need to be addressed during research and analysis (Hardy 2007; Ostrom 1999).

2.2.1 Institutional analysis and development framework

The Institutional Analysis and Development (IAD) framework was useful to the construction of my research problem and design. It was developed by Ostrom and her colleagues (1994) who were interested in understanding how individuals behave in collective action settings and the institutional foundations that inform such arrangements. The IAD framework provides a “list of variables likely to affect outcomes arising from human interaction in light of biophysical, cultural, and institutional contexts” (Koontz 2006, 16). At the heart of the IAD framework is the action arena, which is a conceptual unit that includes actors and action situations. This action arena is a social space where interactions take place; it helps to keep research focused on actors in research relevant situations in order to link actions to outcomes as well as to variables such as systems, rules, attributes of settings and individuals, among others (Ostrom et al 1994) (see Figure 1.1).
The IAD framework is useful because it distinguishes among three levels of rules that can affect action arenas: operational rules, collective choice rules, and constitutional rules (see Fig 1.2) (Kiser and Ostrom 1982). Ostrom also proposed a useful distinction among analytical levels according to the type of decision that is being made (1990). They are:

- Operational rules concern “when, where and how to withdraw resource units, who should monitor the actions of others and how, what information must be exchanged or withheld, and what rewards or sanctions will be assigned to different combinations of actions and outcomes” (Ostrom 1990, 51).

- “Collective choice rules indirectly affect operational choices. These are the rules that are used by appropriators, their officials, or external authorities in making
policies—the operational rules—about how a CPR should be managed” (Ostrom 1990, 51). They specify, “who is eligible to be a participant and the specific rules to be used in changing operational rules” (Ostrom 2005, 58).

- “Constitutional-choice rules . . . affect collective-choice activities by determining who is eligible to be a participant and the [constitutional-choice] rules to be used in crafting the set of collective-choice rules” (Ostrom 2005, 58).

How the model is implemented is represented graphically as follows:

![Diagram of Levels of Analysis and Outcomes](Ostrom 1999, 52)

Those who use the IAD framework argue that it contains no implicit or explicit biases with respect to how policies should be implemented (Imperial 1999). This makes the framework applicable for studying a variety of collaborative natural resource
management cases. It is meant to be an effective tool for institutional analysis and for evaluating project outcomes (Haeber 1998; Hardy 2007). Also, the IAD has been shown to be flexible in its application. As a result, it allows analysts to apply the framework to conduct comparative studies for analyzing diverse institutional/collaborative partnerships for natural resource management and allows the researcher to address questions that he/she wants to address. For this dissertation, my research drew on the IAD framework to analyze government and local user-made rules and decision making at multiple theoretical levels: operational-choice, collective-choice, and constitutional-choice. The IAD framework, therefore, helps to analyze institutional rules on those three levels, with particular attention to differences between government and local user-made rules across the three levels and across the cases selected for study. Hence, in my research, I use IAD as a foundation to understand multi-level rule analysis in resource governance. This analysis helps me to answer questions about how actors at different levels interact and the influence these interactions have on monitoring and sanctioning.

2.2.2 Socio-ecological systems framework: A diagnostic approach

Common-pool resources also include socio-ecological systems (SESs). A socio-ecological system is an ecological system intrinsically linked with and affected by one or more social systems, which include both institutions and humans (Janssen et al. 2007). Both social and ecological systems are recognized to be interdependent systems that contain “units that interact interdependently and each may contain interactive subsystems as well” (Anderies et al. 2004, 3). This concept is similar to the concept of “coupled human and natural systems” proposed by Liu et al. (2007) where both social and
ecological system components, which are immensely dynamic in nature and are structured by multiple variables, interact to produce complex patterns and outcomes over a period of time.

SESs “frequently involve groups of resource users who are linked to each other and to multiple resources that occur across multiple scales through multilevel governance arrangements.” Multilevel refers to nested, human organizational structures that operate at separate levels (Janssen et al. 2007, 310). In the SES approach, operational decisions are conceptualized as made on a daily basis within the context of a set of rules that have been created at collective-choice levels (Ostrom 2005). The SES model also is multiscale. This refers to ecological and biophysical processes that operate at several geographic and temporal scales; both ecological and biophysical processes are often linked across these scales (Gibson et al. 2000). In sum, this framework establishes a useful construct for providing a comprehensive list of variables that are conducive to collective action (see Section 3 in Chapter 3), and it includes both user-generated rules and externally imposed rules. In addition, the framework was also useful for my research because it helped to identify factors that help motivate the community to overcome problems associated with collective action. In general, the socio-ecological systems framework helps researchers focus analysis on interactions and outcomes of linked SESs. This framework draws on knowledge from the IAD framework discussed above, and it posits a broader set (and subsets) of variables affecting the likelihood of users to overcome collective action dilemmas for resource management. However, these variables are not always associated with success or failure in avoiding the tragedy of the commons. Rather, it is the overall
combination of these variables in particular settings that affects whether communities successfully avoid the tragedy of the commons. This framework therefore, is helpful in identifying combinations of variables that affect actors’ incentives under diverse governance systems. According to the SES framework, all socio-ecological systems are composed of four internal systems (Resource Systems, Resource Units, Governance Systems, and Actors) that are embedded in two external systems (Social, Economic, and Political Settings [S] and Related Ecosystems [ECO]) (see Figure 1.3).

**Figure 1.3: Action situations embedded in broader social-ecological systems**

(Source: Ostrom 2007, 8)
Scholars from diverse disciplines have used the framework as a method for analyzing the internal dynamics within the components of an SES and important links between components (Janssen et al. 2007). It enables organizing the analysis of attributes of resource systems, resource units, users of those systems, and governance systems that jointly affect and are affected by interactions and resulting outcomes at a particular time and place. This framework has been proposed as a step toward building a strong, interdisciplinary science of complex, multilevel systems that enables diagnosis of natural resource governance problems embedded in socio-ecological systems (Ostrom 2007). For my research, I drew on the SES framework to identify and create a set of variables in my research setting that could affect the likelihood that users would be able to overcome collective action dilemmas for resource management. The framework was helpful for identifying combinations of variables (see Chapter 3) likely to affect actors’ incentives under varying forms of governance systems (Ostrom 2007, 2009).

2.2.3 Governmental impacts framework

As mentioned above, the IAD framework is a flexible and effective framework for conducting institutional analysis and for identifying possible variables that arise from interactions of humans in various biophysical, cultural, and institutional contexts. However, despite the flexibility in its application, IAD does not emphasize specific roles that external agents (government agencies and NGOs) play in collaborative efforts. Koontz and his colleagues (2004) identified this gap and developed a framework that helps in understanding how governments affect collaborative efforts. Their framework illustrates how governments serve both as actors and as institutions, and consequently
how these roles affect collaborative environmental management (Koontz 2006). This framework is called the Governmental Impacts Framework (GIF). The GIF explains that government agencies impact collaborative environment management via three primary channels: 1. Issue definition, 2. Resources for collaboration, and 3. Group structure and decision-making (see Chapter 4 Section 5.1 for more details). With its emphasis on governmental impacts, the GIF, however, does not take explicitly into account how external entities that are not governmental may impact collaborative management. This gap is important for my research, as NGOs play an important role in forest governance and monitoring and sanctioning activities in some of the study sites selected. Hence, I adapted the GIF framework to include NGOs in order to make the framework applicable for analyzing the impact of not only government agencies, but also that of NGOs (see Chapter 4 section 7 for more details).

2.3 Addressing shortcomings in CPR studies

Although many scholars have sought to understand self-governing institutions within CPR management and several key contributions have been identified above, several issues still remain unaddressed. Arun Agrawal (2002) identified shortcomings in existing CPR research and although it has been twelve years since his research was published, these shortcomings still persist and have been consistently pointed out by various scholars (for example, see Persha et. al. 2011; Laerhoven and Ostrom 2007; Andersson and Gibson 2007; Agrawal et al 2008). Agrawal (2002) called attention to two types of problems. Firstly, many CPR studies have focused narrowly on community-based institutions, as there is lack of attention paid to the collaborative partnerships in
which these institutions operate. Agrawal (2002, 45) contends that “because existing studies of commons are relatively negligent in examining how aspects of user group membership and the external social, physical, and institutional environments affect institutional durability and long-term management at the local level, we need new work that considers these questions explicitly.” This argument influenced my research design and inspired me to focus attention on membership in community-based institutions and, at the same time, to analyze the role of external factors and the possible outcomes that emerge from the dynamics of interactions among the different partnerships (see section 1 in Chapter 3 and sections 5 and 6 in Chapter 4).

Secondly, Agrawal (2002) notes that although a large number of factors have been identified as being critical to the organization and to adaptability and sustainability of common-pool resources, the existing work has not yet fully developed a theory of what makes for sustainable CPR management. This is information that planners and practitioners need. Similarly, he argues that few studies connect the different variables identified into causal chains or propose plausible causal mechanisms. Edella Schlager (1999, 251) explains why this is a problem: “Unfortunately, ... the theory of common-pool resources fails to provide any guideposts to direct the analyst to particular rules. That is, there are no meta-rules for guiding the analyst through this complexity.” Instead, analysts are left to their own judgment and perseverance to sort it out.

In spite of the shortcomings of CPR research, scholars continue to build on the principles and theories laid out in Ostrom’s *Governing the Commons* to frame diverse and broad CPR problems. Wade (1994), for example, presents environmental risks and
rules of restraint on access as crucial factors in successful CPR management. Baland and Platteeu (1996) include the importance of external aid and strong leadership. Dolsak and Ostrom (2003) challenge traditional common-property institutions, along with the ever-increasing scale of human interactions affecting the governance of larger-scale common-pool resources. An example would be forms of institutional arrangements for mitigating global climate change or global fishing harvests.

The work of all these scholars provided a solid foundation for my dissertation research on CPR dilemmas and established ideas for analysis of these issues.

3. Research Design

For this dissertation, I focused on the knowledge gaps discussed by other researchers (see section 2.3 for more details) to develop the focus of my own research, which examines some fundamental questions regarding implementation and outcomes of collaborative forest management. As indicated above, the focus of my dissertation research is the monitoring and sanctioning practices in publicly owned forests in a region of India. As the largest democracy in the world, India has promoted collaboration and increased partnerships in forest management in recent decades (Guha 2007; Rangan and Lane 2001; Sundar 2001). Specifically, I analyzed specific cases of collaborative forest management efforts in order to assess their strengths and weaknesses in the area of monitoring and sanctioning. The general questions that guided my research design and fieldwork are:
1. What are the circumstances under which government agencies seek collaboration with the local community for the purpose of monitoring and sanctioning?

2. Who participates in CPR management, how, why, and with what results? This question includes attention to the ways in which people are involved in monitoring and sanctioning, the kinds of duties they perform, incentives and challenges involved, and the degree of people’s participation in the diagnosis of problems and formulation of solutions pertaining to protection and management of resources of the forest. I also included attention to the role that gender might play in participation and the impacts of management strategies, monitoring and sanctioning.

3. How do the approaches of the forest agency and NGO staff differ from each other and from the approaches of community members? And how do approaches of local people differ or converge regarding the details of how to manage, how to monitor, how to sanction, and what the management goals should be (i.e. reduce pressure on resources, equitable distribution of resources, proper regulation of resource use)? How are these goals operationalized?

I designed the research to produce empirical data, collected through multiple methods, to address these general research questions. These guided the process of collecting and analyzing data and interpreting observations.

For research, I adapted the case study method to allow comparisons of multiple cases. I chose 12 cases of van panchayats (see Table 1.2) from a list of 30 van panchayats. To obtain this list of prospective study sites, I collaborated with one of the leading NGOs in the region that was working in the field of community participation in
resource management. I was in touch with the head of the NGO and interacted with him regularly to discuss my research agenda, questions and expectations. On the basis of our conversations, we were able shortlist some possible 30 cases. Before initiating data collection, I surveyed the prospective study sites and eventually selected the final 12 cases on the basis of their institutional configurations. Different configurations were studied to investigate causal M&S processes and to evaluate the role of the government forest agency and local NGOs through collaborations. I also chose field sites that were primarily in the temperate climatic zone. Only V6 is located in the sub-tropical zone. Vegetation composition of the region was noted to determine the kind of tree species that are vital to the survival of local communities in the region and differences in dates of establishment of the van panchayats in order to consider age as a possible variable of interest for understanding the effectiveness of a van panchayat to govern the resources under its oversight.

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8 Institutional configurations are the types of collaborative partnerships in which the van panchayats participate.
Table 1.2: Site description with details of van panchayats shortlisted for the study.

<table>
<thead>
<tr>
<th>Van Panchayats</th>
<th>Number of Households</th>
<th>VP Forest Area (ha.) (ratio of hectares to households)</th>
<th>Primary tree species</th>
<th>VP formation date</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>150</td>
<td>74 (.49)</td>
<td>Oak, Rhododendron and Box Myrtle</td>
<td>Aug-46</td>
</tr>
<tr>
<td>V2</td>
<td>52</td>
<td>20 (.385)</td>
<td>Oak, Rhododendron and Box Myrtle</td>
<td>Aug-46</td>
</tr>
<tr>
<td>V3</td>
<td>75</td>
<td>75 (1)</td>
<td>Pine, Oak, Rhododendron, Box Myrtle</td>
<td>Dec-80</td>
</tr>
<tr>
<td>V4</td>
<td>40</td>
<td>90 (2.25)</td>
<td>Oak and Pine</td>
<td>Aug-46</td>
</tr>
<tr>
<td>V5</td>
<td>80</td>
<td>92 (1.15)</td>
<td>Pine</td>
<td>Oct-41</td>
</tr>
<tr>
<td>V6</td>
<td>35</td>
<td>10.98 (.314)</td>
<td>Pine and Oak</td>
<td>Dec-99</td>
</tr>
<tr>
<td>V7</td>
<td>65</td>
<td>1.078 (.016)</td>
<td>Pine and Oak</td>
<td>Jul-96</td>
</tr>
<tr>
<td>V8</td>
<td>350</td>
<td>415 (1.19)</td>
<td>Pine, Oak, Rhododendron</td>
<td>Dec-69</td>
</tr>
<tr>
<td>V9</td>
<td>250</td>
<td>113 (.452)</td>
<td>Oak, Rhododendron and Box Myrtle</td>
<td>Jan-32</td>
</tr>
<tr>
<td>V10</td>
<td>40</td>
<td>95.8 (2.4)</td>
<td>Pine and Oak</td>
<td>Dec-98</td>
</tr>
<tr>
<td>V11</td>
<td>80</td>
<td>24 (.3)</td>
<td>Pine and Oak</td>
<td>Nov-01</td>
</tr>
<tr>
<td>V12</td>
<td>250</td>
<td>193.926 (.776)</td>
<td>Oak, Rhododendron and Box Myrtle</td>
<td>Apr-35</td>
</tr>
</tbody>
</table>
The multiple case method approach that I designed for the study included semi-structured interviews, document analysis, group discussions, participant observation, and writing down comments and notes from observations during fieldwork.

3.1 Multiple case studies

The case study method in general allows the researcher to retain holistic and meaningful characteristics of real-life events (Yin 2003; Miles and Huberman 1994), making it ideal for complex situations. This allows the researcher to develop analyses regarding how outcomes (of single or multiple cases) are impacted by local conditions (Miles and Huberman 1994). I chose this method for my study primarily because it is useful in exploring causal mechanisms and examining a large number of intervening variables (George and Bennett 2005), and because it supports theory development (Miles and Huberman 1994). However, analyzing case study data can be challenging, as the researcher may have to cope with large volumes of data. To address this problem, I created detailed outlines or notes for each of the cases studied (Eisenhardt 1989). These outlines and notes helped in keeping the large volumes of data organizing and more manageable. Also, during analysis the notes were useful in adding insight to the data collected.

Just like with any other methodology, there can be some trade-offs associated with the case study method--primarily selection bias and lack of generalizability (George and Bennett 2005). Selection bias may be a problem when cases are self-selected by the investigator. However, self-selection is more of an advantage than a disadvantage for my study as it provided an opportunity to select cases that shared or differed on the variables.
of interest. Other researchers have argued that making selections based on variables under study can serve the purpose of “identifying the potential causal paths and variables leading to the dependent variable of interest” (Miles and Huberman 1994, 30). George and Bennett (2005) pointed out that making selections on the basis of preliminary knowledge of the cases also can support much stronger research designs, as cases can be selected on the basis of how crucial they are for the theory being tested. Similarly, if all cases are specific in nature, then findings cannot be generalized. Yin (2009, 36) provides the best answer to this dilemma. He says, “Case studies, like experiments, are generalizable to theoretical proposition and not to populations or universes… the case selection researcher must be informed by theory, so that findings can be attributed back to and build understanding along those theoretical lines.”

At the same time, examining cases from different contexts helps scholars understand complex phenomena in real world settings, as it reveals things about a case that would be difficult to grasp if studied in isolation (Yin 2009). When we study a case in isolation, we may take a lot of important things about that case for granted because they appear familiar and normal in that setting. However, comparative research has shown that things that appear normal when studied in isolation may in reality be unusual and distinctive across cases (Manor 2010). Cross-case analysis also helps correct for limited data or researcher bias and forces the researcher to go beyond first impressions, create a robust analysis of the findings, and understand where multiple factors may be important (George and Bennett 2005).
In the next sections, I will explain each of the specific methods used to produce data for multiple case study research in a region of India.

3.1.1 Interviews

Before each interview, time was spent in rapport building via informal interaction with the interviewees to promote trust building and to help the interviewees feel comfortable answering questions honestly (see Glesne 2006). In all, 100 interviews were conducted for this research project, of which 60% were with van panchayat and other community members, 15% were with government agency officials, 15% were with NGO staff and the remaining 10% were with social activists and independent researchers (see Figure 1.4). This diversity in the population interviewed was intended to create a pool of data that included information from all critical sources. Firstly, members of the community included members of the van panchayat, ex-members of the van panchayat, elderly members of the community and the local forest guards. Members of the van panchayat were interviewed to get insights regarding the day-to-day challenges that the van panchayat faces in carrying out local-level forest governance activities. Apart from the current members of the van panchayat, some of the ex-members of the van panchayat and some elderly members were also interviewed. The ex-members and the elderly members of the community were interviewed to get information about the state of forest management and governance by van panchayats. User-group committee members were interviewed to learn more about how they organize themselves and understand the role they play in van panchayats and in monitoring and sanctioning. To get first-hand knowledge about the challenges and motivations involved in monitoring and sanctioning,
the local forest guards also were interviewed. Government agency officials were interviewed to learn about duties and responsibilities of local, state and federal level agencies and the roles they play with respect to the van panchayats. Similarly, NGO staff were also interviewed to gauge their perception about van panchayats in general and also to understand the role that the NGOs play in van panchayats. While surveying the van panchayats and conducting interviews, I simultaneously created a list of potential interviewees by asking people for suggestions. It was during that time I learned about some social activists and independent researchers who had conducted research in the area and who were very enthusiastic about van panchayats. Therefore, I interviewed those researchers and social activists to get their insights and feedback and also learn about the existing literature (study/reports/plans/published articles) that they thought was relevant for my study.
A semi-structured interview approach was followed where questionnaires were developed for each group, but the interviews did not rigidly follow the prepared list of questions. Instead, efforts were made to make the interview more like a two-way conversation where I kept the questions in mind but questions and discussion evolved more organically during the interview. Interview questions varied somewhat for community members, government agency officials, and NGO staff (see Appendices A, B and C). Interactions with social activists\(^9\) and scholars\(^10\) were limited to discussions about some key areas of relevance to them.

\(^9\) There are some leading social activists in the region who are fighting for the rights of van panchayats in forest governance. They often meet with people to make them aware of their rights and also carry out protests to promote recognition of rights of the people in the community to access forests.

\(^{10}\) “Scholars” refers to social scientists who have studied or are presently studying van panchayats. I met them during field work.
The questions in Appendices A and B probed community members’ participation in forest management activities, awareness of the objectives behind these activities, population demographics and forest conditions in villages, sociopolitical conditions including gender relations and politics, and perceptions of the value of forest management activities like creation of plantations, flood control, and seasonal changes in harvest trends. Questions also probed levels of concern, perceptions, and understanding regarding the biophysical condition of forests, the responsibilities and activities of forest institutions and/or of van panchayats, monitoring and sanctioning practices—in particular how monitoring and sanctioning are carried out in the areas studied, who is involved and to what effect, and what the factors are that impede or facilitate the process of monitoring and sanctioning. In addition, to examine the role of external influences questions were also asked regarding the possible impacts of government agencies’ involvement and people’s perceptions and opinions on external influences over management and governance. (Government agencies are involved at the local, state and federal levels and partake in decision-making regarding forest management and governance; they also have administrative responsibilities towards van panchayats. These agencies include, but are not restricted to, the State Forest Department, Ministry of Environment and Forests, Revenue Department, and the Planning Commission. I interviewed staff from each agency.) Due to the involvement of NGOs in community-based natural resource management in some areas, questions were also asked about the role of NGOs and people’s perceptions of them.
3.1.2 Document analysis

Document analysis involved identifying and reading relevant records and project reports on collaborations and monitoring and sanctioning (M&S). These were collected from government agencies involved in the process of forest management. Apart from government publications, management plans for each of the van panchayat cases included in the research were also studied to identify objectives behind collaboration among government agencies and community members via van panchayats and ways in which collaboration and specific M&S policies are operationalized in the respective study cases. Scholarly works previously done on van panchayats were also studied. Project reports of the NGOs also served as a useful resource.

3.1.3 Participant observation

Participant observation allows the researcher to observe a social setting without getting inextricably caught up in the setting’s ongoing affairs. This method gives the researcher an opportunity to be fully attuned to what is going on around him/her without being the focus of attention (Glesne 1991; Emerson 1995). To be able to conduct participant observation successfully, it is essential for a researcher to invest substantial time in adjusting to the system and to take the opportunity to establish credibility in the community where research will take place (Handwerker 2001; Angrosino 2003). Although I grew up in the state in which I conducted my fieldwork, I was not familiar with specific region I chose to work in. Therefore, I designed a step to familiarize myself more and make myself known to the people in the area.
During participant observation, I arranged homestays with families in some of the villages where I did fieldwork. These families “hosted” my stay. Meals were shared, and I attended community meetings and workshops, local festivals, and weddings. This allowed me to learn about the local contexts, develop insight into peoples’ ways of life, understand details regarding their level of dependency on the forests for resources, and obtain hands-on experience in how van panchayats and community members make decisions pertaining to forest management and monitoring and sanctioning. Through this experience, I witnessed everyday activities that revealed, for example, that men would go to the town and deal with finances while women remained to perform household responsibilities, including those that took them into the forest (i.e., collect firewood and fodder for animals). I also observed that all the families had cattle, which they used for dairy, and they mostly grew all of their food, including grains, vegetables, and spices.

3.1.4 Group discussions

Group discussions are helpful for generating ideas about and collecting information on values that are shared by a group and community members in general. During group discussions, participants are able to build on one another’s responses and come up with ideas they might not have thought of in a single-person interview. Group discussions are helpful for triangulation purposes where data produced through different methods can be compared for consistency. The method is also useful in identifying factual errors or extreme views (Charmaz 2006). During this phase, I asked people who were interviewed together some questions about rules and about monitoring and sanctioning, rule implementation and compliance, associated challenges, motivations for
compliance or noncompliance, and incentives to comply. These group discussions were valuable for gaining insight into collective perspectives about how monitoring and sanctioning were conducted, and also helped with brainstorming about challenges that the community agreed or disagreed with. These challenges mostly pertained to lack of monetary resources, high rates of rule violations, and high levels of social pressure involved in monitoring and sanctioning.

3.1.5 Memo writing

Memo writing is a process that allows the researcher to personally reflect on the data while they are being collected. Memo writing also provides an opportunity to monitor and assess data collection by thinking about, for example, whether questions and answers asked in individual and group interviews seem to portray a detailed picture of the issues, if there is sufficiently detailed information covering a range of views among participants, if data are sufficient to predict possible changes in the future, and other considerations (Charmaz 2006). In addition, memo writing also helps to answer questions like: How do the observed social processes emerge and how do the participants’ actions construct them? Who exerts control over those processes and under what circumstances? What meanings do different participants attribute to the process? How do they talk about it? What do they emphasize? What do they leave out? How and when do their meanings and actions concern the process of change? In addition to providing an opportunity for reflection, memo writing can serve as an opportunity for a preliminary analysis that can be re-assessed at regular intervals and that helps the researcher capture and keep an
account of some observations that might help explain or provide possible reasons for some of the findings of the study (Emerson et al. 1995).

4. Study Setting: Van Panchayats in Uttarakhand, India

4.1 Uttarakhand: A brief profile

Uttarakhand is one of the northern states of India, located between latitudes 29°5’ and 31°25’N and longitudes 77°45’ and 81°E, covering a geographical area of 53,485 sq. km. Uttarakhand is predominantly a mountainous state (92.57% hills and 7.43% plains) lying in the central Himalayan zone of the Hindukush Himalayan Range between the state of Himachal Pradesh to the west and the country of Nepal to the east. Around 12.6% of the hilly region is cultivated, and 64% is forested (Saxena 1995), signifying the importance of forests to the people’s livelihood. The state is divided into two administrative regions: Kumaon and Garhwal.

This study focused on villages in the Kumaon region’s Nanital district (see Figure 1.5). Kumaoni society grew out of distinct cultural groups that came from different parts of Asia, but the Kumaon region was formed after annexation by the British colonizers in 1815. In the contemporary situation, Kumaoni society is a predominantly Hindu\textsuperscript{11} society. Socioeconomic differentiation has increased, based on an increase in the number of cash-earning members in some households. But village communities are relatively homogenous in the sense that there is less social differentiation on the basis of caste compared the plains regions in India (Guha 1989; Arnold and Stewart 1991). The

\textsuperscript{11} The word “Hindu” is attributed to all persons professing the religion of Hinduism.
reason for less social differentiation also could be attributed to the fact that the traditional Kumaoni society is comprised of people from the top three tiers of the Hindu caste hierarchy. Agriculture is the main occupation of the majority of the population in the region and it is mainly subsistence oriented with crops cultivated under rain-fed conditions.

Figure 1.5: Map of Kumaon, Uttarakhand, India (Source: Wildlife Institute of India)

India’s Hindu caste system is a complicated and widespread social structure that is embedded in 2,000 years of religion. There are four main castes. At the very top are the Brahmins—the priests, scholars, and philosophers. The second highest caste is the Kshatriyas—the warriors and rulers. Third is the Vaishyas, who are traders, merchants, and people involved in agricultural production. The lowest caste is the Shudras, the laborers and servants for the other castes; below Shudras are the Dalits, the lowermost caste seen as outcasts who perform menial and unsanitary tasks. It is mainly the Dalits and the Shudras who are highly discriminated against, which is a source of conflict.
Forests in the Kumaon region are important for rural residents because they provide resources such as animal fodder (grass, leaves), fuelwood, green manure (leaf litter that the farmers use to enrich nutrients in their fields), and timber for construction (see Figure 1.6). These resources are critical to each household to meet daily needs. Without them, the lives of the people would be greatly affected (Agrawal 1995). Therefore, communities have an interest in creating rules to assure that appropriation of forest resources takes place at a sustainable level, and to develop some kind of enforcement mechanism to ensure compliance by users of forest resources. In the following section I discuss the historical background of van panchayats and Van Panchayat Act and explain the evolution of rules pertaining to forest use.

4.2 Historical background of the Indian Forest Act and Van Panchayat Act

India is one of the first countries in the world to enact a forest policy. Large-scale organized regulation of forest use began in the 1860s under British rule.\textsuperscript{13} Dietrich Brandis, a German forester, was appointed officer on special duty in 1862, the Imperial Forest Department was set up in 1864, and in 1865 the first Forest Act\textsuperscript{14} was passed. Under the Government Forest Act of 1865, amended in 1878 and 1927 (the latter version is still in effect), the colonial government took over large tracts of land (nationalization of forests), initiating a process through which the rights of locals to access and harvest the land were terminated. Subsequently there was a proliferation of numerous forest acts in the 1880s and 1890s that continued to demarcate large stretches of forest land for commercial exploitation of timber, due to which traditional community rights to forest

\textsuperscript{13} India was colonized under British rule for nearly 200 years from 1757 to independence on August 15\textsuperscript{th}, 1947.

\textsuperscript{14} All forest acts are formed and reformed by the federal agency and are applied to the entire nation.
access and harvesting of products steadily eroded (Poffenberger and McGe 1996).

After achieving independence in 1947, independent India experienced accelerated commercial exploitation of forests to supply the timber industry which grew rapidly post-independence. The Forest Policy Act of 1952 kept the forest lands under the exclusive control of the state. The policy also introduced the idea of “village forests” that serve the needs of people in the surrounding villages. It did not specify that villages had the right to manage the forest areas. But this had happened with the Van Panchayat Act of 1931 discussed in the next section.

4.3 Van panchayats

The van panchayats\textsuperscript{15} in the Himalayan region that I studied represent one of the earliest instances worldwide of decentralized resource management through formal state-community partnerships. The birth of van panchayats can be traced back to the 1880s, when the British colonial government attempted to transfer vast areas of the Himalayan forests in the Kumaon region to the newly created Forest Department; this was to be completed by 1917. The process greatly limited the villagers’ customary subsistence rights. Elaborate rules specified new restrictions on the lopping\textsuperscript{16} of tree fodder, regulated grazing, prohibited the extension of cultivation into forest areas, strengthened the number of government forest guards whose job was to keep people out, and banned the use of forest fires, which villagers used to promote the growth of grass for fodder. These restrictions led to widespread protests. The resulting violent demonstrations led the government to appoint a committee, the Kumaon Forest Grievances Committee (1931),

\textsuperscript{15}Literally, “van” means forest and “panchayat” means a committee of five. Van panchayats have between five and nine members, depending on the size of the village.

\textsuperscript{16}Lopping is a process where branches of trees are cut to get leaves that people use as fodder for their cattle.
to look into local complaints and demands. On the basis of the committee’s recommendations, the government enacted the Van Panchayat Act of 1931. The Act has undergone reforms since its inception in 1931 in the years 1972, 2000 and 2005.

The rules prescribed by the Van Panchayat Act lay down the broad parameters defining management practices of the van panchayats. These rules also delineate how new van panchayats can be formed and existing ones dissolved; outline the duties of the van panchayats in terms of demarcation of forest boundaries, auditing of each van panchayat account (money available/funds from the government), and relationships with government agency officials. The Act also empowers van panchayats to manage the forests through monitoring and sanctioning of rules. The existing rules grant van panchayats the power to harvest and allocate subsistence benefits from the forests, and provide van panchayats with limited formal rights to sanction rule breakers (Agrawal 1995).

Elections for the van panchayat committee are held every five years. All village residents vote by show of hands. The candidate receiving a simple majority of the vote gains office. The head (locally known as the sarpanch) of the van panchayat and the other committee members are posts held by individuals elected from and by the community.

All van panchayats are formally empowered by law and by training to craft and enforce rules to govern the use of village forests. These rules are created after gaining consensus from all the van panchayat members. The van panchayat also selects people to serve as guards, raises funds, fines rule breakers for infractions such as violation of forest
use rules (some of the major infractions are tree felling and stone mining) and arbitrates disputes to settle the vast majority of management issues within the village.\textsuperscript{17}

The van panchayats serve as a unique example of democratic autonomous local institutions that have been involved in managing legally demarcated village forests. However, there was a large disparity across villages and the size of the forests allocated to them. The number of households in a village is not a factor that determines the size of the forest (see Table 1.2). Also, there is disparity in the time the van panchayats were formed (see Table 1.2). Some van panchayats have been in existence since the year 1930 while others are more recent. Apart from following van panchayat rules established by the government Forest Department, each van panchayat makes its own rules and delegates members of its community to carry out monitoring and sanctioning activities. Although the state of Uttarakhand’s forests face challenges in the form of illicit resource extraction, van panchayats have maintained and guarded their forests. What makes van panchayats interesting to study is the fact that in spite of the existence of formal rules from the national government, the committees can form their own rules regarding forest use. These rules are mutually agreed upon by community members (not just the van panchayat elected committee members), and in most cases members from the community accept the responsibility to monitor compliance with those rules. Apart from forest governance, these van panchayats also serve as an example of community organizing that involves the participation of both men and women, unusual for most rural areas of India.

\textsuperscript{17} See Ballabh and Singh (1988) for more details on how van panchayats are formed.
In the following chapters, I will explore some important challenges that van panchayats face in the process of monitoring and sanctioning and will discuss how they overcome those challenges. In addition, I will discuss the broader collaborative environment in which these van panchayat function, including the involvement of government agencies and, in some cases, non-governmental organizations.

5. Organization of Dissertation

This dissertation consists of five chapters that are choreographed to contribute to the growing importance of commons scholarship. They are as follows:

Chapter One has established the foundation of the research, explained key elements of the conceptual background, research design, and methods selected for data collection, and provided important details about the cases selected for study and the setting for the research.

Chapter Two focuses on multilevel rule analysis to understand how monitoring and sanctioning rules emerge and the role government agencies and van panchayats play. Multilevel analysis is followed by the investigation of causal pathways of monitoring and sanctioning mechanisms. The following questions guide research in Chapter 2: Q1. In a system where rules are formed by government agencies and van panchayats, how do these rules differ at constitutional, collective-choice, and operational-choice levels for a given resource? How do rules at one institutional level impact rules at other levels? Q2. What are the mechanisms used for monitoring, specifically in terms of third-party
monitoring and the role of gender? Q3. What are the mechanisms used for sanctioning?

What roles do government agencies and van panchayats play in sanctioning?

In Chapter Three the focus shifts to the challenges associated with rule enforcement and how van panchayat communities attempt to overcome those challenges. The chapter explores the issue through the socio-ecological framework developed by Ostrom and colleagues (2007) in order to identify factors that affect monitoring and sanctioning activities. The questions guiding the research in this chapter are as follows:

Q1. What are the different challenges associated with monitoring and sanctioning in systems of community-based management that include external interventions? Q2. What are the factors that motivate a community to overcome challenges of monitoring and sanctioning in these systems? These questions are addressed by looking at how monitoring and sanctioning play out in specific institutional contexts in order to explain why some communities are able to overcome certain challenges more successfully than others.

In Chapter Four the focus shifts from self-governance and van panchayat activities to external agents like government agencies and non-governmental organizations. Here I examine the impact that each has on community-based natural resource management. The primary objective of this chapter is to answer the following research question: What are the roles of government agencies and non-governmental organizations in community-based natural resource management (CBNRM)? The Governmental Impacts Framework (GIF) developed by Koontz et al. (2004) is utilized for this purpose and applied to van panchayats.
Chapter Five, Conclusions, discusses the findings in previous chapters and their significance for advancing the field of commons research and for filling gaps in knowledge. The chapter includes a discussion of the limitations of the current research and suggestions for future research.
Chapter 2: Multilevel Rules and Rule Enforcement: Explaining Causal Mechanisms

1. Introduction

Rules are an important tool used to regulate the behavior of appropriators. They are prescriptions that forbid, permit, or require some action or outcome and have sanctions associated with failing to follow the rule (Ostrom 1990). These rules can be formal (for example laws, policies, and regulations) or informal (generally understood but without an identifiable decree). For years CPR scholars engaged in studying rules and institutions involved in rule-making have established the importance of monitoring and sanctioning for successful CPR management (Gibson et al. 2005) and have examined the role that locals play in monitoring and sanctioning activities (Kameda et al. 2003; Danielsen et al. 2005; Danielsen et al., 2009). These locals act as stewards, and they have a good understanding of local forest conditions and their dependence on forest resources (Berkes, Folke, and Colding 1998; Coleman 2009; Andersson 2014); hence, they are capable of crafting rules that are adaptive to local variation and monitoring their compliance amongst users in the community. While several studies have underscored the importance of locally based monitoring and sanctioning in successful management of forests across diverse political, social, and ecological contexts, some have argued that in

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18 Institutions in this dissertation are referred to as systems structured by rules, norms, and shared strategies. (Crawford and Ostrom 1995, 582).
many instances monitoring and sanctioning are not completely decentralized; rather, there is a certain level of influence from external government agencies (Agrawal 2001, 2005; Agrawal and Chhatre 2008). Studies have shown that while external influence can sometimes make up for the deficiencies of decentralized systems and can be viewed as being more authoritative, at the same time they might also hinder a community’s self-reliance in the future (Agrawal and Chhatre 2008; Andersson and Ostrom 2008).

Several studies have analyzed cases of monitoring and sanctioning by communities and external agencies (Ostrom and Nagendra 2006; Ghat and Nagendra 2005; Coleman and Steed 2009; Gibson et al. 2005), yet there is a gap in the systematic multilevel analysis of rules pertaining to monitoring and sanctioning and how rules made by government agencies and those made by the local communities differ (Hardy 2007; Andersson and Ostrom 2008; Armitage 2005). Also, there are varied mechanisms of monitoring that a local community can adopt; it is unclear under what circumstances a local community adopts a particular mechanism and how the choice of mechanism helps or hinders success (Andersson et al. 2014; Agrawal and Goyal 2001). In my study, I attempt to fill this gap by conducting a multilevel analysis of rules pertaining to monitoring and sanctioning in order to explain how monitoring and sanctioning rules formed by the government agencies\(^\text{19}\) and local communities emerge, how the government agencies and the local communities interact, and what outcomes are generated by these interactions.

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\(^{19}\) Government agencies referred to here are government agencies that are directly involved in decisions pertaining to forest management and these involves federal level agency called the Ministry of Environment and Forests and state and local level government offices are called “Van Vibhaag”, which translates to Forest Department.
After conducting multilevel analyses, monitoring mechanisms adopted in 12 different cases of local forest management in van panchayats of India were identified, and that was followed by an analysis of the impact of external governments and van panchayats, the roles they play in monitoring and sanctioning, and what role gender might play in the process. Such questions were deemed important to answer as they help in tracing the causal pathways of monitoring and sanctioning. Although monitoring and sanctioning are often recognized as important, there is a dearth of research investigating their causal mechanisms (Coleman 2009; Persha et al. 2011; Andersson 2014). Questions related to causal processes are critical to address for better resource regulation and governance (Gibson 2005; Persha et al. 2011; NRC 2002). The questions guiding the research discussed in this chapter are as follows:

Q1. In a system where rules formed by government agencies and van panchayats exist, how do these rules differ at constitutional, collective, and operational levels for a given resource? How do rules at one of these institutional levels impact rules at other levels?

Q2. What are the mechanisms used for monitoring, specifically in terms of third-party monitoring and the role of gender?

Q3. What are the mechanisms used for sanctioning? What roles do government agencies and van panchayats play in sanctioning?

To address these questions, my research employed a multilevel analysis of rules that are formed at the operational, collective-choice, and constitutional-choice levels. In the following sections I discuss actions and rules for each level, how monitoring and
sanctioning are structured, and the roles governments and van panchayats play in the process. I then examine the different monitoring and sanctioning mechanisms across the different cases studied and the circumstances under which those mechanisms emerged.

2. Operational, Collective-Choice, and Constitutional-Level Rules

Scholars of institutions and rules have long differentiated between rules from the state and rules made by local resource users. Rules from the state are often developed by more skilled professionals who have access to resources, but often these rules are not effective in different local circumstances, because they don’t fit local people’s needs, norms, problems, and knowledge or the characteristics of the resources that they use (Fitzpatrick 2006). Rules made by local resource users are typically described as better suited to the local environment and needs of local users and are considered to be more fair. Therefore, more individuals are willing to abide by these rules because they participated in their design (Ostrom, 1990, 2000; Bowles 1998; Bardhan 1999). However, fully decentralized systems have limitations. For example, in a fully decentralized system governance relies on the self-organization of local resource users, and for some local users self-organization is too costly (Meinzen-Dick 2007). While there is evidence from the field that many users do invest considerable time and energy in their own regulatory efforts, others do not (see Chapter 3 section 5 for more details). One of the most cited challenges is the problem of local conflict (Platteau 2004; Platteau and Gaspart 2003; Andersson and van Laerhoven 2007). Not all self-organized resource governance systems are able to resolve their conflicts through the input of the users. Also, it is challenging for
locals to design an institution in such a way that the community has an incentive to support the institution and manage the resource sustainably (Gibson and Lehoucq 2003; Lutz and Caldecott 1997; Ribot 2002). Therefore, although much research lauds benefits of complete decentralization, it is important to highlight that complete decentralization, especially in the case of less industrialized countries, might not be realistic (Andersson and Ostrom 2008; Wade 1997). Governance in such instances is nested, where government agencies and local communities interact with each other at different levels. Andersson and Ostrom argue that a “multi-level rule analysis has not sufficiently penetrated empirical studies of environmental policy reforms in less industrialized countries” (2008, 72). As a result, questions about how actors at different levels interact and the influence these interactions have on monitoring and sanctioning are still inadequately addressed (Andersson and Ostrom 2008; Bickers and Williams 2001).

One goal of my research was to address this gap by analyzing government and local user-made rules and decision making at multiple levels. This section of the research draws on the Institutional Analysis Development (IAD) framework for its theoretical standpoint (refer to Chapter 1 for more details). An important component of the IAD framework is that it allows decision making to be analyzed on multiple theoretical levels: operational-choice, collective-choice, and constitutional-choice. In this chapter I build on the IAD framework to analyze institutional rules at those three levels, with particular attention to differences between government- and local user-made rules across the levels.
2.1 Multilevel rule analysis

In the context of local forest governance, action at the operational level includes communities withdrawing resources from the forest; action at the collective-choice level might include approval of certain forest management activities; and action at the constitutional level might include establishing an entity and authorizing it to make laws, policies, and rules regarding forest governance. Hence, operational-level activities are identified with appropriation, collective-choice level action with resource management and policymaking, and constitutional-level action with governance (Ostrom 1990, 2005).

1. Operational rules concern the “when, where and how to withdraw resource units, who should monitor the actions of others and how, what information must be exchanged or withheld, and what rewards or sanctions will be assigned to different combinations of actions and outcomes” (Ostrom 1990, 51). Rules at the operational level affect day-to-day decisions made by participants in a setting. The processes of appropriation, provision, monitoring, and sanctioning occur at the operational-choice level. Government has made the provision under the Van Panchayat Act of 1931 that each van panchayat is responsible for developing micro-plans (more details about micro-plans in the subsequent section). Van panchayats draft forest operational use rules as per the micro-plan and subsequently monitor its compliance and accordingly sanction the violations.

2. “Collective choice rules indirectly affect operational choices. These are the rules that are used by appropriators, their officials, or external authorities in making policies—the operational rules—about how a CPR should be managed” (Ostrom
They specify “who is eligible to be a participant and the specific rules to be used in changing operational rules” (Ostrom 2005, 58). The process of policy making, management, and adjudication of policy decisions occur at the collective-choice level. Activities at this level can improve the effectiveness of resource management.

3. “Constitutional-choice rules. . . affect collective-choice activities by determining who is eligible to be a participant and the rules to be used in crafting the set of collective-choice rules” (Ostrom 2005, 58) and in turn also influence operational rules (Kiser and Ostrom 1982). Additionally, formulation, governance, adjudication, and modification of constitutional decisions occur at the constitutional-choice level (Ostrom 1990). Multiple sets of constitutional rules are prescribed under the Van Panchayat Act. The Van Panchayat Act serves as a guideline about how the van panchayat committee should be constituted and how those van panchayats should go about forming operational-level rules.

The three levels of analysis suggested by the IAD framework define how rules at one level can be changed or influenced by other levels and help to illuminate nested sets of rules and processes affecting partnership outcomes (Figure 2.1 below). For example, as depicted in the figure operational rules determine how actions should be monitored, what sources of information should be exchanged or withheld, and the rewards and sanctions that correlate with specific actions and outcomes. Collective choice rules in turn influence operational level rules and, similarly, the constitutional level rules affect the collective choice level. To understand the causal process of monitoring and sanctioning,
it is important to distinguish between these levels. However, prior research has not adequately sought to link levels to differences between government- and local user-made rules. In the model depicted in Fig. 2.1 below, I propose that while government-made rules have been associated with establishing constitutional-level rights and responsibilities, local users may also have a role to play. Conversely, operational-level rules may be most commonly associated with locally crafted rules, but the state may establish some rules about operational actions with regard to natural resources.

![Figure 2.1: Linking levels of analysis (Ostrom et al. 1994, 118)](image-url)
3. Mechanisms of Monitoring

Two areas of natural resource research provide a useful starting point for understanding monitoring mechanisms: *third-party versus mutual monitoring and the role of gender in monitoring.*

3.1 Third-party versus mutual monitoring

There are many mechanisms of monitoring from which van panchayats can choose. Agrawal (2001) discusses two broad categories: mutual monitoring and third-party monitoring. Under mutual monitoring, user households can either assume the duties of monitoring each other or be assigned monitoring responsibilities by the van panchayat committee for a given duration. This type of monitoring is mostly volunteer monitoring where individuals willingly participate in monitoring tasks as they think that it is their responsibility to protect the resources. Normally, there is no payment assigned for mutual monitoring. Under third-party monitoring, specific persons—either someone from within the community or a government-appointed guard—have the power to ensure that others are following rules. These specialized guards are paid for their duties, and their payment can come from several different sources such as a state agency, an NGO, or the community. A community-appointed guard receives payment through the contributions made by each household; a government-assigned guard is paid by the Forest Department (Agrawal 2001; Agrawal and Goyal 2011).

Mutual monitoring and third-party monitoring have been well researched by several scholars, resulting in contrasting arguments. For example, Singleton and Taylor (1992) found that community enforcement of rules is more important than the presence of
government assigned guards. Ostrom (1990) posits that long-term survival and comparative effectiveness of resource regimes are characterized by a set of design principles (refer to Table 1.1). These design principles have been subjected to extensive empirical testing to explain how groups sustain and build their cooperation over long periods of time. There are eight design principles, and the fourth principle focuses on monitoring. According to the fourth design principle, long-surviving resource regimes select their own monitors, who are accountable to the users or are users themselves and who keep an eye on resource conditions as well as on user behavior. However, Ostrom (1990) argues that specialist third-party monitoring and enforcement may be necessary for the maintenance of the community itself. Baland and Platteau, in addition, highlighted the importance of third-party monitoring: “External sanction systems are often needed to make up for several deficiencies of decentralized punishment mechanisms, whether the latter are embodied in strategies of conditional cooperation or involve payoff transfers among agents” (1996, 345).

Both mutual and third-party monitoring have advantages and disadvantages. While mutual monitoring gives an opportunity to users to assume responsibility and be accountable to each other for their behavior, there are chances that levels of monitoring effort might be reduced as the community’s cooperative behavior erodes in the future. Third-party monitoring, on the other hand, makes provisions for specialized paid guards who are accountable to the community. It has been argued to be inadequate mostly due to
“lumpiness” in monitoring. A goal of my research has been to identify monitoring mechanisms - third party or mutual- adopted by the van panchayats included in my study, investigate the rationale behind the adoption of a strategy by each van panchayat, and examine community perceptions about the monitoring practices in their forest. The idea is not to compare or prove that a particular monitoring mechanism is better than another, but rather to understand why certain communities adopt certain monitoring strategies and what works when and how (Andersson 2014).

3.2 Role of gender in monitoring

The role of gender is an important question to ask in the context of who participates in monitoring, or rather who is best suited for monitoring tasks: men or women. This question in general has not been addressed well since much of the collective action research focuses more on institutional factors and economic, biophysical, political, sociocultural, and demographic indicators (Agrawal and Goyal 2001; B. Agarwal 2000; Mwangi et al. 2011).

In the context of the Central Himalayas in India, this is an important question because women are the primary users of the forest, and they shoulder the major burden of sustaining agriculture and cattle care, along with domestic responsibilities such as bringing fuel, fodder, and water from long distances (Sarin 1995, as cited in B. Agarwal 2007). It makes more sense for women, as the primary users, to be the monitors (Ostrom 1990). In addition, apart from being primary users of the forest, women in the Himalayas

20 “Lumpiness“ of monitoring arises because hiring a guard who could not be there 24/7 means that individual actors can avoid detection by extracting needed forest resources at other times. Monitoring for less than a certain duration thus provides negligible protection. Lumpiness arises naturally in third-party monitoring (see Agrawal and Goyal 2001 for more details).
have played a dominant role in mass movements to protect forests and have played a crucial role in regenerating degraded forest lands in the region (B. Agarwal 2009, 2007). All of these factors have contributed to a growing realization that forestry projects cannot succeed unless they involve women (B. Agarwal 2009, 2007). As a result, government agencies have been involved in promoting women’s participation. There are policy provisions at the national level to devolve authority and ensure women are adequately represented, including the van panchayat rule of reserving one-third of seats for women, some all-women van panchayats, and innovative government programs such as Mahila Mangal Dal (Women’s Welfare Group), that are focused on mobilizing women for self-empowerment (Sarin 2001). However, in the process of emphasizing women’s involvement in rule enforcement, the role men play in the process can be overlooked both in the literature and by government agencies. Mwangi et al. (2011) found in their study that “mixed female and male groups offer an avenue for exploiting the strengths of women and men, while tempering their individual shortcomings” (206).

Given the attention focused on women’s roles and the gap in knowledge of the role that men can play or have played in rule enforcement and regulation of forest use, my research focused explicitly on the role of gender in determining who might be a better monitor. Specifically, my study gauged community members’ perceptions about male and female guards and inquired into the reasons why they thought one was better than the other. As community-based institutions and efforts receive greater attention from both national and international agencies, policies are being crafted and adopted to advance decentralization of politics and decision making. It is important to address questions
pertaining to gender roles in natural resource governance to foster successful natural resource management policies.

4. The Role of External Agencies and Communities in Sanctioning

There is ample evidence from experimental studies suggesting that high contributions of individuals in collective action are important to sanctioning (Yamagishi 1986, Ostrom et al. 1992, Fehr and Gachter 2000, 2002; Sefton et al. 2007; Ballet et al. 2011). These sanctioning mechanisms are directed toward free-riding\textsuperscript{21} individuals to prevent them from defecting from agreed on rules and overexploiting resources. Sanctioning is also an effective tool for resolving collective action problems and is vital to assure compliance. Some studies have found that the mere threat of punishment or anticipation of being sanctioned can be enough to deter some individuals from free riding (Fehr and Fischbacher 2004; Dari-Mattiacci and De Geest 2010).

Normally, sanctions are imposed when a decision is collectively made that a certain actor should be sanctioned due to infractions; time and effort are invested for devising appropriate sanctions for regulating resource use and imposing them. To reduce the high cost of sanctioning on those who might be poor and also in terms of time and effort of those who sanction, provisions for graduated sanctioning are made. As per graduated sanctioning, rule offenders are not subjected to punishment at the first instance of rule breaking but instead are given a warning; the penalty imposed becomes higher if

\textsuperscript{21} Free-riding in a collective action situation is an instance when there are individuals who reap benefits from the efforts contributed by others in the group.
the individual breaks the rule recurrently. Ostrom’s fifth design principle points out that successful resource regimes use graduated sanctions (Ostrom 1990):

When CPR appropriators design their own operational rules to be enforced by individuals who are local appropriators or are accountable to them using graduated sanctions that define who has rights to withdraw from the CPR and that effectively restrict appropriation activities, given the local conditions the commitment and monitoring problems are solved in an interrelated manner. (Ostrom 1990, 99)

As suggested by Ostrom (1990), the idea that I tested in my research was that there are two reasons behind this necessity for graduated sanctions: firstly, to give appropriators the message that cheating will be noticed and punished, and secondly, to show that those breaking rules repeatedly will face increasingly heavy penalties. The cost of breaking rules becomes higher than the benefits they get from it, and thus rule breaking becomes an unattractive option for the users (Ostrom 1990, 2000).

Community members are often argued to be the best source of sanctioning for several reasons (see Stern et al. 2002), but the main reason is that the offender cares about social pressure because he/she cares about future interactions as it might become uncomfortable for the offender to confront the rest of the community members (Wade 1987). However, some scholars have identified the importance of external entities in fostering successful common-pool resource management (Steins and Edwards 1999; Ostrom et al. 1996; Rodriguez-Sickert and Guzman 2008). External agency sanctioning seems to increase the levels of conformity in individuals because it can create an additional fear of being sanctioned (Wade 1987). In any case, such studies that compare
community-based versus external sanctioning treat the two as independent, when in theory they can interact. It is unclear what influence external sanctioning may have on community-based sanctioning or whether community-based sanctioning is dependent upon external sanctioning. In my study I sought to address this knowledge gap by asking questions about the roles that external entities and community members both play in sanctioning. I also conducted multilevel rule analysis to understand how rules pertaining to resource access emerge and how the activities to ensure enforcement of such rules are organized.

5. Methods

5.1 Study context: Van panchayats

The van panchayats are the only legally recognized forest councils in India and their numbers have been reported to be growing since their inception in 1931. To date there are approximately 12,098 van panchayats in existence (Uttarakhand State Progress Report 2008–09). Each van panchayat consists of members of the village: typically nine members in total who are elected by the adult residents of the village, who vote by show of hands in the presence of a designated government officer. Once the members are selected, the group then chooses a leader from amongst themselves by majority vote (as per the Van Panchayat Act of 1931). These van panchayats follow formal rules established under the Van Panchayat Act of 1931 and are also fully empowered to craft and enforce their own rules (please refer to Chapter 1, Table 1.2, for more details about van panchayats).
5.2 Case selection

Before data collection, I spent a month and a half familiarizing myself with the area and contacting 30 villages that had van panchayats (see Figure 2.2). During this phase, I spent time establishing rapport with the community by meeting with community members, introducing myself and my study, learning about the community, and simultaneously taking cues about word choice and ideas for question framing so that interviewees would understand the questions as I intended. For example, the community refers to the rules they craft as *upniyams*; this was helpful because if I asked questions about *niyams* (rules) they would refer to the formal rules and laws.

![Figure 2.2 Map of Nanital District with study sites (12) (Source: Wildlife Institute of India)](image-url)
Once the initial reconnaissance survey was completed, 12 villages were shortlisted for the case studies (see Figure 2.2). All but one of the cases selected were in a similar climatic zone (temperate); V6 alone is in a sub-tropical zone. However, the villages varied in the date on which their van panchayats were constituted (for example, V9 is 82 years old and V10 is 14 years old) and the area of the panchayati forest allotted to each village (for example, V8 has a forest area of 415 Ha, and V7 has forest area of 1.078 Ha). Forest size is not related to the number of households or the size of the population that uses forest resources (see Table 1.2 in Chapter 1).

5.3 Data collection

Data for the research on rules and rule enforcement were produced through the interviews, participant observation, group discussions, and document research. For individual interviews, members of the community were chosen (N=60) of whom 40% were males and 60% were females. This difference in size with respect to male vs. female interviewees was mostly because women were more involved in forestry activities than men. Initially, some of the contacts with van panchayat leaders came from the local NGO working in the region; subsequently, more contacts were generated using a snowball sampling method. Using the snowballing method (Emerson 2005) existing study subjects (based on their knowledge, experience, and/or acquaintanceship) were able to refer other subjects to be recruited for the study. On average, five members in each of the 12 case locations were interviewed. To confirm the veracity of results obtained in these five interviews conducted in each village, several informal conversations and group discussions were also held in each village (V1-V12). The interviewees chosen for the
study belonged to different categories: 1. Leader of a van panchayat, 2. Member of a van
panchayat, 3. Guard in a van panchayat, 4. Elderly community member/ex-member of a
panchayat committee, and 5. Active members of a user group committee. Elderly
members, ex-members of van panchayat and active user group committee members were
interviewed to gain deeper insight and include diversity of viewpoints.

The user group committees consist mainly of women who meet at regular
intervals to discuss forest conditions, management strategies/activities being performed in
their forest, and ways they can get involved and contribute to those activities (McKean
1996). User group committees in the region are involved in activities like planting,
maintaining nurseries, and monitoring. In addition to engaging in forest management,
these user groups also serve as support (solidarity) groups, a requirement for applying for
small loans to support livelihood strategies (Agrawal 1995). The interviews were
implemented using a semi-structured approach where, although an interview protocol
was used (see Appendix 1), the order of questions and wording was changed to facilitate
a smoother conversation with the interviewee (see Chapter 1 section 3.1.1 for more
information). The strength of this approach largely relies on the researcher’s ability to
adapt the interview process to ensure that each participant provides information about the
same topics (Derver 1997).

Most of the interviews were 30-40 minutes long. However, interviews with some
van panchayat leaders lasted between 60 and 90 minutes. The interviews and group
discussion took place either at interviewees’ homes or at a van panchayat office. These
interviews were conducted in Hindi and later translated into English. The investigator is a native Hindi speaker and fluent English speaker.

Once the interviews were complete, they were transcribed and coded line by line using the qualitative software program MAXQDA. Also, memo taking was maintained during the data collection phase to keep a record of concepts and insights learned during fieldwork.

In addition to interviews, I engaged in participatory observation of a series of informal interactions with some of the potential interviewees (Glesne 2006). Homestays with some of the families in the community were arranged, meals were shared, and community meetings and workshops, local festivals, and weddings were also attended. This phase mainly helped in gaining insight about the community’s way of life, gaining an understanding of their level of dependency on the forests, and getting hands-on experience regarding the way van panchayats make decisions pertaining to monitoring and sanctioning. I attended 12 van panchayat meetings (i.e., one van panchayat meeting in each village) to gauge the kind of issues discussed during the meetings and other activities performed (decisions regarding rule infractions and management activities in the forest).

Group discussions were also held where I asked some of the same questions about rules and their monitoring and sanctioning that I was asking during individual interviews. This helped in gaining the group’s perspective about how monitoring and sanctioning was conducted, and it also helped brainstorm some of the challenges that the community agreed and disagreed with. There were certain challenges with group discussion, as there
were instances when one or two participants would dominate the discussion, leaving others with no room to express themselves. During those instances I would politely ask those sitting quietly in the group for their opinion. In all, I conducted six group discussions with a total of 30 people.

For document analysis, I analyzed the Van Panchayat Act and all its amendments (1931, 1970, 2000, 2005), van panchayat annual reports to see what constitutes the act, what provisions and rights it has made available to the community, and what kind of amendments have been made to the act over a period of time.

6. Results

6.1 Multilevel rules analysis: External agency vs. community rules across levels

Q1. In a system where rules formed by government agencies and van panchayats exist, how do these rules differ at constitutional, collective, and operational levels for a given resource? How do rules at one institutional level impact rules at other levels?

6.1.1 Constitutional-choice level actions

Multiple sets of constitutional rules prescribed under the Van Panchayat Act affect the governance of van panchayat forests (see more details about the Van Panchayat Act in Chapter 1, section 4). The Van Panchayat Act was established by the federal government, and it serves as a guideline for how the van panchayat committee should be constituted and how the van panchayats should go about forming operational-level rules. In addition, the Act also determines the functioning of the van panchayats, which
includes duties and responsibilities of the van panchayat committee (Table 2.1). The Act decrees that the van panchayat decisions shall be taken by majority vote of the van panchayat members. Forest Department officials can attend van panchayat meetings, but they are not entitled to vote.

In contrast, the van panchayat itself does not make constitutional-level rules. Questions about who is permitted to wield what power in decision making are not answered by the van panchayats themselves, but rather come from federal law. An exception, however, is that some van panchayats have created rules for third-party monitoring, including establishing who has what authority in performing monitoring duties. For example, van panchayats decide the monitoring mechanism to be adopted based on the resources available and the consensus of the community (more details about third-party monitoring are provided in section 6.2).

Table 2.1 Constitutional-level actions at the government and van panchayat levels

<table>
<thead>
<tr>
<th>Government</th>
<th>Van Panchayat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish resource use rights; constitute van panchayat committee; establish system of formation of micro-plan and its execution; modify and make amendments to the Van Panchayat Act (1931, 1976, 2001, 2005).</td>
<td>Van panchayats do not play a role at the constitutional level, although in some cases they do establish enforcement mechanisms and prescribe third-party monitoring duties.</td>
</tr>
</tbody>
</table>
6.1.2 Collective-choice level actions

At the collective-choice level, the government is primarily responsible for implementing and initiating management plans and projects in the forests (Table 2.3). The biophysical scale of restoration and management activities to be undertaken by these plans is determined by the size of land. These projects are initiated under the rural employment scheme (NREGA, MNREGA), afforestation schemes (CAMPA- Comprehensive Afforestation Management Plan), and projects funded by the World Bank (e.g., Joint Forest Management). While the government develops plans for management and restoration, at the local level van panchayats engage the communities to execute those plans. The van panchayats have rights to ensure there is no encroachment in the panchayati forest and that forests are utilized for the best advantage of the rights holders.

The Act establishes the rights as well as duties of the users. As per the Act, individuals who are entitled to rights of forest use are expected to perform duties such as: providing help in fire control; informing the van panchayat of any encroachment, illicit grazing, or felling in the forest; and providing support for the van panchayats’ protection of plantations.

At the local level, van panchayats develop micro-plans, which are five-year management plans for panchayati forests (Table 2.2). The micro-plans are developed giving due consideration to the needs of the rights holders but also to ensure the region’s

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22 National Rural Employment Guarantee Act (NREGA or MNREGA) is a national Act passed in 2005 that aims at enhancing the livelihood security of people in rural areas by guaranteeing hundred days of wage employment in a fiscal year to a rural household whose members volunteer to provide unskilled manual labor to a government project.
23 As per the Van Panchayat Act, residents of a particular village have rights to use of and access to their village’s forest.
24 Community members plant native varieties to regenerate their forests.
ecological balance. A micro-plan, once developed, is discussed with the community members. It is implemented upon receiving approval from a Sub-divisional Officer. It is the duty of the van panchayat committee to strictly follow the prescriptions of the approved plan. Van panchayats also have rights to regulate forest use and make specific rules in the micro-plans regarding which sections of the forest are to be used and which sections are to be kept closed, who can access those sections, what kind of resources can be extracted, and how much of a given resource can be extracted.

Table 2.2 Collective-choice level action at the government and van panchayat levels

<table>
<thead>
<tr>
<th>Government</th>
<th>Van Panchayat</th>
</tr>
</thead>
<tbody>
<tr>
<td>District Forest Officer (DFO) transmits information regarding conservation and improvement of forest; establishes policies regarding bans on illicit felling, lopping, fire, and other damages; develops plans and projects for conservation of wildlife and regeneration of forest areas and to protect catchment areas.</td>
<td>Creates micro-plan and annual implementation plans. These include making rules about forest use across space, types of resources to be extracted, and quantity of resources to be extracted.</td>
</tr>
</tbody>
</table>

The key output of collective choice deliberations is the set of operational-level rules. Across the 12 cases, these rules are mostly focused on conserving the forests and

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25 Sub-divisional officer is a bureaucrat who takes decision pertaining to administration at district and local level.
making resources available to rights holders. In addition, the van panchayats also have rights to sanction by excluding access and use rights of individuals found responsible for any damage to the forest.

The operational rules mostly pertain to withdrawing fodder and fuel from the panchayati forest; the van panchayats (V1–V12) develop rules based on specific ecological conditions and resource demand on the forest assigned to them. These details were provided during group discussions. For example, V8 has a large forest, which is divided into eight compartments. However, it allows access to only two or three compartments for harvesting. Access to these compartments is open throughout the year, but the villagers have to follow the rules for resource extraction (Group discussion, V5). While tree felling and plucking leaves from the trees are strictly prohibited (green leaves are used as fodder for cattle), villagers are allowed to gather grasses and fallen dead branches and leaves. V6, on the other hand, is a very small forest. It has two compartments, and the van panchayat has been working hard on restoring the forest so grazing is strictly prohibited in the forest. It is subject to enclosure and strict access rules so that the grass grows naturally during the rainy season. However, in the months of October–November, small areas of the forest are made available to the village. V7 is an interesting case: the community does not have its own forest, but it shares one of V8’s eight compartments. It also does not have its own van panchayat committee; instead, it has representatives from its village on V8’s van panchayat committee. However, it has another committee called Van Suraksha Samiti (VSS), which literally translates to “forest protection committee.” VSS, just like any van panchayat, is a formal committee that is
engaged in protection, management, and regulation of forest use. Members work closely with a local NGO to regenerate their forest area. They have their own guard establish rules, and assign forest resource extraction limits.

I observed that across all cases, van panchayats set use limits based on pressures on the resource and its availability. Van panchayats that have designed rules have attempted to match supply and extraction by assessing fodder growth during the year, fixing extraction levels below the annual level of regeneration, and measuring fodder extraction using simple techniques. In most villages, rules also specify how fodder and fuel are to be extracted from the forest resource system. In my field notes, I recorded information about how community members can cut from the forest only for a specified number of days in the year. The panchayat officials carefully measure the amount of grass extracted. Rights holders are allotted a specified number of fodder bundles they can take 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 households, therefore, can extract only specified amounts of fodder (the limits are assigned based on the number of individuals in each household).

It seems evident that at the van panchayat level, there are cases of successful rule design to use resources sustainably and equitably. I learned by interviewing elderly ex-van panchayat members that some van panchayats have demonstrated their capacity to craft rules that limit the extraction of fodder and to distribute fodder access fairly among households. But such cases are not ubiquitous. Even where forest management is delegated to the local level, the local managers may not allocate resources efficiently,
sustainably, or equitably. Nonetheless, 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 themselves, about their needs, and about the resource. Nevertheless, they may fail or choose not to exercise their capacity to create rules that promote sustainability and equity.

6.1.3 Operational level actions

At the operational level, both government agencies (Forest Department) and the van panchayats carry out actions on the ground. This is where monitoring and sanctioning occur to catch users breaking the operational-level rules and to levy penalties. Forest users most often break rules pertaining to fodder and fuel extraction. At the operational level, as mentioned above it is mainly the van panchayat that is involved in making sure that user extract resources as per the micro-plans and that no major harm is being done to the forests.

The task of monitoring is not limited to restricting forest use; it also involves making a note of damaged boundary walls and degraded patches. One of the challenges in managing the forests is that the users often encroach on off-limits forest areas; it is the responsibility of the van panchayats to keep a check on that. Once rules are broken they are reported by local guards to van panchayats, which then assess the monetary value of the offense and subsequently sanction the rule breakers.

While van panchayats perform a lot of duties and tasks pertaining to monitoring and sanctioning, some areas of responsibility are left to the government agencies like the local and state Forest Department. The van panchayats are only allowed to exact fines of
less than 500 rupees, while fines above 500 rupees are reported to the Forest Department for action to be taken (the infractions pertaining to tree felling and stone mining are the ones that cost more than 500 rupees).

For the operational level activity of selling forest products, government agencies other than the van panchayats hold authority. Before selling any forest products, the van panchayats must seek permission from the Deputy Forest Officer (designated Forest Department officer) to do so. In the case of timber, sales valued at over 5000 rupees must have prior approval of the Forest Department.
Table 2.3 Operational-level actions at the government agency\textsuperscript{26} and van panchayat levels

<table>
<thead>
<tr>
<th>Government Agency</th>
<th>Van Panchayat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark trees suitable for felling; deal with offenses whose sanctions cost more than Rs. 500; Deputy Forest Officer’s permission is required to sell forest products; District Magistrate or Deputy Forest Officer’s permission is required to auction trees up to Rs. 5000; Forest Department auctions trees worth more than Rs. 5000.</td>
<td>Ensure fodder and fuel extraction from panchayati forests as per the micro-plans; ensure no encroachment on panchayati forest areas; protect trees from being damaged (human or natural factors); make boundary walls; repair broken boundary walls; engage in conservation and improvement of forest condition; utilize forest products to the best advantage of the rights holders; protect forests from illicit felling of trees, lopping, fire, and other damage; engage community in conservation and forest management activities; assess market value of the offense; enforce federal forest protection Acts.</td>
</tr>
</tbody>
</table>

When I compared government and local actions across the three levels, I identified several patterns. First, government agencies are more involved at the constitutional level than are the van panchayats. However, van panchayats do sometimes act at the constitutional level when setting up third-party monitoring. Second, both government and van panchayats actively engage at the collective choice level;

\textsuperscript{26} Government agency here refers to the state level Forest Department that delegates responsibilities to district and regional offices
government agencies and federal law dictate that van panchayats must make plans with certain components, but van panchayats fill in the details of such plans based on time- and place-specific information, local pressures on the resources, and people’s needs.

Third, the operational level is dominated by van panchayats, although government power supersedes van panchayats in instances of selling forest products, especially timber.

Questions that I asked about shared authority and interactions between government and local van panchayats largely received mixed responses from interviewees (both individual and group interviews). Some of the interviewees expressed that they felt government agencies were impinging on their rights and limited their rights and privileges to the forest, but the majority were satisfied with the role of government.

According to interviewees, because the government is more of an authoritative entity, they were satisfied with government having greater control over their forests. For example, one interviewee said: “Van panchayat needs support and guidance, someone to oversee its activities. We always appreciate when some government representative visits us and interacts with us.” (Van panchayat member, V5)

6.2 Mechanisms for monitoring

Q2. What are the mechanisms used for monitoring, specifically in terms of third-party monitoring versus user monitoring and the role of gender?

In all of the villages studied, interviews with the guards revealed that violations of forest use rules occur routinely. Often the villagers illegally enter the forests, cut grass and leaf fodder from trees, graze their animals, collect twigs and branches, and in some
instances even fell trees. These activities occur in spite of the presence of guards. I was unable to obtain data about the number of violations, but interviewees described numerous such instances and violators are reported to the van panchayat for sanctioning by individuals involved in both mutual and third party monitoring. The most common rule infractions are harvesting beyond specified quantitative or time limits and non-payment of dues.

Van panchayats have experimented with a variety of monitoring mechanisms in order to safeguard village forests in Kumaon region (see Chapter 1 for more details). These include, as mentioned above, (1) year round mutual monitoring by village households, (2) rotational selection of households to guard the forest, or (3) use of third parties, i.e., having a specialized guard. Data show that although the majority of the van panchayats have adopted the option of hiring a guard, van panchayats with smaller forest areas rely on mutual monitoring where the community members undertake the responsibility of guarding their forests. This is the case in V6, V7 and V11. V2 is an exception to this pattern for, although it has a small forest area, the village still has appointed a specialized guard (see Table 2.4). This anomaly can be explained by the availability of funds. Having specialized guards requires that van panchayats raise funds to pay salaries for them. The major sources of such funds are sale of forest products such as fodder and fuel wood, contributions from households in lieu of forest products they harvest, and the fines that villagers pay when their rule violations are detected. Interviews with the leader of a van panchayat (V2) revealed that, typically, raising such funds is

27 The trees felled by the villagers are not for selling. They usually are for either building or repairing houses or for cooking meals during festivals or weddings.
easier in larger forests, but V2 has obtained some of the needed funds from household contributions and some from a local NGO. Thus, the use of third-party monitoring was not limited to government-supported monitoring. Some villages carried out local third-party monitoring by hiring their own guards.

Another factor affecting the choice of monitoring strategy is the ability of van panchayat leaders to network with higher-level government officials. In V1, for example, the community has frequent interactions with officials from the Forest Department as well as with district and state level officials. Interactions such as these can keep the communities informed about changes in policies, plans, and projects that may be available to the van panchayats. An interviewee from V1 clarified, “Through our interaction with the Forest Department officials we are kept abreast of the financial resource we have access to and the way we can go about accessing the resource.” This is not typical; since V1 is very close to the local Forest Department office, the van panchayat has higher levels of interaction with officials who visit the area. They also worked for some time with the local NGO, but since the NGOs work on a project basis they provide funding only while the project is active. Once the project is over the van panchayat is largely on its own.
Table 2.4: Monitoring methods adopted by each van panchayat

<table>
<thead>
<tr>
<th>Van Panchayat</th>
<th>Forest area (Ha)</th>
<th>Households</th>
<th>Monitoring methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>74</td>
<td>150</td>
<td>Third party</td>
</tr>
<tr>
<td>V2</td>
<td>20</td>
<td>52</td>
<td>Third party</td>
</tr>
<tr>
<td>V3</td>
<td>75</td>
<td>75</td>
<td>Third party</td>
</tr>
<tr>
<td>V4</td>
<td>90</td>
<td>40</td>
<td>Third party</td>
</tr>
<tr>
<td>V5</td>
<td>92</td>
<td>80</td>
<td>Third party</td>
</tr>
<tr>
<td>V6</td>
<td>10.98</td>
<td>35</td>
<td>Mutual monitoring</td>
</tr>
<tr>
<td>V7</td>
<td>1.078</td>
<td>65</td>
<td>Mutual monitoring</td>
</tr>
<tr>
<td>V8</td>
<td>415</td>
<td>350</td>
<td>Third party</td>
</tr>
<tr>
<td>V9</td>
<td>113</td>
<td>250</td>
<td>Third party</td>
</tr>
<tr>
<td>V10</td>
<td>95.8</td>
<td>40</td>
<td>Third party</td>
</tr>
<tr>
<td>V11</td>
<td>24</td>
<td>80</td>
<td>None</td>
</tr>
<tr>
<td>V12</td>
<td>193.926</td>
<td>250</td>
<td>Third party</td>
</tr>
</tbody>
</table>
Other scholars have pointed out some drawbacks of third-party monitoring, focusing on drawbacks that stem largely from hiring a third party who is not a member of the local community (Gibson et al. 2005; Agrawal and Goyal 2001). My research found that there are diverse benefits and drawbacks depending on whether the third-party monitor is a member of the community or an outsider. For example, third-party monitors from within the community can be highly motivated, as they are aware of the importance of the forest to their community. The following quotes are representative of what most local guards and even members of the van panchayat shared during individual interviews.

Once our guard got information from a community member that there was someone trying to damage the forest late in the night, around 2 a.m. It is dangerous to be in the forest that late, but he still went to inspect. Now, you cannot expect a government guard to be out there at 2 in the night patrolling the forests, no, they would never do that. A guard from within the community holds more accountability to people. (Guard, V2)

Another noted:

While a guard is patrolling in the forest, their duty is not just to detect illegal harvest, but they are also responsible for any maintenance or upkeep in the forest. They repair the boundary wall if it is broken, replant a sapling if it has been uprooted. Another reason why local guards are better is because they have a higher sense of ownership and they know the people very well, hence they are more personable. (Leader, V3)
A drawback of third-party monitors from within the community is that they may be less motivated to sanction rule breakers, since they fear that doing so will hurt their relationship with an individual with whom they interact outside of the forest. One interviewee said, “I grew up in this village so most of the villagers are either family or good friends. People always expect me to be nice and spare them when they are caught doing illegal harvesting, so it is a challenge for me to impose fines on them” (Guard, V2). Another said, “Most of the time people hardly listen to or obey the local guards; they always take them for granted” (Guard, V4).

On the other hand, third-party monitors from outside of the community are often viewed as more authoritative, having the backing of the state, which may increase deterrence of rule breaking. As one interviewee said:

Unlike local guards, people are more scared of government guards. They fear being caught and having to pay fines. With local guards they can still get their way out by imposing social pressure or by simple denying the authority, but that is not the case with government guards. Therefore, government guards are good because they create a sense of fear in people. (Villager, V12)

However, external third-party monitors may have a lower vested interest in the sustainability of the forest because they are not part of the community that depends on it. Another interviewee commented, “Government guards do not feel they are accountable to the community so they slack and shirk their duties.” (Leader, V5)
Clearly, it would be impossible to detect every rule violation. To improve the likelihood of detection, I observed that the van panchayats adopt certain strategies to improve effectiveness of monitoring activities. For example, in V5 to reduce levels of violation the van panchayat increased the quantity of hours spent on monitoring and tried to impose graduated sanctions (see next section). In V4 and V8, van panchayats adopted measures to monitor the guards. In the instances where guards were caught violating any rule, the panchayats would sanction them accordingly.

In a number of cases (V4, V5 and V8), the van panchayats paid the guard a lower salary when too many rule violations occurred. There were also examples (V2 and V5) where a van panchayat dismissed guards and refused to pay them a salary if they found the rule violation level to be very high. Thus, van panchayats created institutional incentives for the guards to monitor users.

6.2.1 Role of gender

Women often performed monitoring across the 12 cases. In fact, as mentioned above, the Van Panchayat Act institutionalized positions for women on local councils; 30% of all seats must be filled by women. Of the nine cases of VPs with hired guards, three cases had had at least one female guard at some point in time. Of the cases with mutual monitoring, women were most often doing the monitoring because they spent substantially more time in the forest then did men based on division of labor by gender. Following the lead of other researchers who have argued for the importance of greater involvement of women in natural resource management, including monitoring, during individual interviews and group discussions I asked about their views on gender in
monitoring. I learned that members of communities had mixed views about whether women should be in charge of monitoring the village forests, with 45% of the respondents (n=27) expressing that they preferred women guards, whereas 55% (n=33) said they did not (see Table 2.5). The supporters’ main argument was that women are the ones who access forests the most; therefore, it makes more sense for them to be in charge. However, the naysayers opined that because women are the ones who use forest resources the most, they cannot be trusted with the responsibility of guarding the forest. Some interviewees also claimed that men have a tendency to take bribes and they often do not pay much attention to what is going on.

In general, responses to questions about gender preference in monitoring activities (which was asked of all the interviewees) were mixed and exhibited no clear variation in pattern based on forest size, institutional setup (i.e., the collaborative partnerships in which the van panchayats are working with a government agency, NGO, or user group), or other characteristic. I concluded that, in spite of the rural and traditional nature of the villages, many community members (just under half) are open to having women participate in the forest regulation process.
Table 2.5: Examples of comments regarding women guards

<table>
<thead>
<tr>
<th>Are women better guards of the forests?</th>
<th>Yes (45%)</th>
<th>No (55%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- men do not pay much attention;</td>
<td>- women cause most damage, so they cannot be trusted;</td>
</tr>
<tr>
<td></td>
<td>- since women are the ones that cause most damage, they can control it too;</td>
<td>- women cannot patrol in the forests alone;</td>
</tr>
<tr>
<td></td>
<td>- men take bribes, women do not.</td>
<td>- men are better at controlling offenders.</td>
</tr>
</tbody>
</table>

6.3 Mechanisms for sanctioning

Q3. What roles do government agencies and van panchayats play in sanctioning?

Sanctions are a function of the van panchayat as well as the federal level agency (Ministry of Environment and Forests) looking after forest management. As seen in the table above (see also operational-level actions, Table 2.3), the existing rules set by the federal agency grant the van panchayats the power to harvest and allocate subsistence benefits from the forest, limit the van panchayats’ formal rights to sanction rule breakers. For example, the Van Panchayat Act of 1931 (and the 1976 amendment) limited the maximum amount of fines that a van panchayat can impose to less than Rs. 500. The violations that elicit a fine of more than Rs. 500 must be reported to the Forest Department. However, even where the van panchayat does not have formal legal power to extract larger fines from rule breakers, interviewees agreed that in courts of law a van
panchayat’s word carries greater weight than that of an ordinary villager, since the VP was created by legal statute. However, not all panchayats are willing to take matters to court. They prefer to handle matters locally. My research revealed that the panchayats make every effort to sanction rule infractions themselves (see Table 2.6). One VP leader explains how his VP acts:

We deal with all the rule-infraction cases ourselves. There are instances when the cost of violation is more than Rs. 500 and we still do not report it. This is because we can empathize with the situation in which a poor farmer might commit that offense. So instead of involving the government agency or court in the matter we instead arbitrate amongst the members of the van panchayat and other villagers about the appropriate sanction. However, there are rare situations when someone causes extreme damage; those are the times when we have to report to the police. For example, there was one time when someone from the village had cut several oak trees in the forest and there was another time when someone was caught mining stone.28 Such cases need stricter action taken against them, and that is why we reported them to the police. (Leader, V9)

I also found that for most offenses the van panchayats, rather than the local Forest Department, take responsibility for sanctions. External agencies intervene only when approached by the community for advice; therefore, in addition to taking on formal roles on behalf of the local Forest Department for certain types of fines, van panchayats also

28 As mentioned earlier, the tree felling and stone mining activities carried out by the villagers are not for the purpose of selling, but for either building or repairing houses.
interact with the local Forest Department informally for guidance in handling sanctions.

One interviewee said, “We did not know how to deal with one of the individuals who was recurrently breaking rules; we were in a dilemma about whether to wait for him to pay his fine or to report him to the government official, so we informally discussed and consulted the situation with a local Forest Department officer” (Interviewee, V3). Another interviewee reported, “There have been instances when we felt that our sanctions were not very effective, so we consulted with the local NGO and local Forest Department officers for advice” (Interviewee, V1). The few van panchayat members that mentioned seeking such external guidance tended to be those with larger forests and that were struggling with managing their entire forest area.

**Table 2.6 Sanctioning powers of van panchayats**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>To assess monetary value of forest offenses committed within the panchayati forest and sanction offenses up to Rs. 500.</td>
</tr>
<tr>
<td>b.</td>
<td>To regulate grazing and admission of cattle into panchayati forest.</td>
</tr>
<tr>
<td>c.</td>
<td>To impound cattle trespassing in the panchayati forest in accordance with Cattle Trespass Act of 1871.</td>
</tr>
<tr>
<td>d.</td>
<td>To exclude from all privileges in the panchayati forest, any person whom the van panchayat may, on sufficient grounds, consider to be responsible for any fire or damage to the panchayati forest.</td>
</tr>
<tr>
<td>e.</td>
<td>To seize all tools or weapons used in committing forest offenses within the area of the panchayati forest.</td>
</tr>
</tbody>
</table>

Source: Van Panchayat Act (2005)
7. Discussion

Q1: In a system where rules by local self-organized communities and government agencies exist, how do these rules differ at constitutional, collective, and operational levels for a given resource? How do rules at one institutional level impact rules at the subsequent level?

The results of this study confirm and also add to the IAD framework and previous research studies that take an institutional approach to better understand multilevel rule analysis. For example, my application of multi-level rule analysis, which is part of the IAD framework, confirmed the widely accepted idea that institutional rules at a distinct level of analysis impact processes at other levels. As suggested by Ostrom (1990), the linkages between all three levels of rules directly influence choices and actions of actors involved in the other levels of decision-making. For example, constitutional rules institutionalized by federal, state, and local government actors can mandate the process of monitoring and sanctioning at constitutional, collective, and operational choice levels. My results also show that the government is primarily responsible for establishing forest management plans, whereas the van panchayats engage individuals to execute those plans. Though lauded as an example of decentralized resource governance, the van panchayats are not entirely decentralized because VP actors are nested within a system in which government actors and local actors interact with each other at varying levels but with differing levels of authority. Authority is hierarchical (Agrawal 2000). My research found that government-created rules are less specific, while van panchayat-created rules provide the details of management: timing, quantity, what part of the forest to access,
what time of the year the forest can be accessed, etc. These findings support Fitzpatrick (2006), who suggests that while government-established rules are broad and generalized across all contexts, rules made by local users are not only more specific but also are better suited to the local environment (see also, Ostrom 1990, 200; Bowles 1998; Bardhan 1999; Andersson and Ostrom 2008).

I found that categorizing institutional rules across the three levels of analysis might only seem fairly straightforward. However, when applied to specific cases, the results can be much more complicated. For instance, van panchayat committees do not have much of a role to play at the constitutional level, yet in some instances they act at the constitutional-choice level when they adopt a monitoring mechanism and appoint guards. With this example we can see that there is overlap across what the framework identifies as discrete levels. Hardy (2007) also observed this overlap across levels, finding that some watershed groups, although involved at the collective-choice level, acted on the constitutional-choice level when they create subcommittees and voting rules. My research revealed a new finding, which is, that it is primarily the process of enforcement that enables the van panchayats to engage in constitutional-level action. Thus studies that do not focus on enforcement may miss such interactions across levels.

Q2. What are the mechanisms used for monitoring, specifically in terms of third-party monitoring versus mutual monitoring and the role of gender?

I observed that the monitoring strategies adopted by some VPs depended on the financial capacity of individual committees and the ability of their leaders to network with higher level government officials. The van panchayats studied have experimented
with different alternatives but have converged toward the option of hiring a guard to monitor forest use. As discussed above, my study also revealed that there are pros and cons to both mutual and third-party monitoring. When it comes to choosing a better monitoring mechanism, instead of generalizing that a third party is better than mutual monitoring or vice versa, what is more important is how effective a particular mechanism is in monitoring forest use rules and how suitable that mechanism is for a particular context. This point has been made by other studies (e.g., Agrawal 2001; Andersson et al. 2014) but the data from my research also suggest that third-party monitoring may be best in situations where forest size is large and the forest is far from the village, whereas mutual monitoring may be best in situations where forest size is smaller and the forest is within the village. Moreover, third-party monitoring is not synonymous with external provision of monitoring, as out of nine van panchayats that follow third party monitoring, six created their own third-party monitoring positions and rules (see Table 2.4).

With respect to role of gender, I found that gender plays an important role in monitoring and sanctioning. In spite of stereotypes about relations between women and men living in traditional rural societies like those studied, women in the region actively participated in forest management activities (See Section 3.2). Based on my observations and interviews, I suggest that there is a need to foster participation of both men and women in order to devise a more effective monitoring mechanism. This is an important empirical observation that makes a useful contribution to the existing CPR research. Although the research has been successful in highlighting the importance of locals in
monitoring and sanctioning, it has not accounted for the specific role that gender plays and the varying impacts that both genders may have on the overall process.

Q3. What roles do government agencies and van panchayats play in sanctioning?

My research found that rule violations occur across all cases studied. Illegal collection of fodder and fuel wood was one of the most frequent violations. High levels of rule violation pose significant challenges to forest conditions. The results also show that although the van panchayats have rights to harvest and allocate subsistence benefits, they do not have significant formal rights to sanction more serious rule breakers. Moreover, I found that van panchayats in most cases avoid reporting violations to the government agency or taking matters to court; instead, they prefer to arbitrate imposition of sanctions among themselves. At the same time, there are instances of van panchayat members seeking informal guidance from government officials in matters of sanctioning, especially where forests are larger, financial resources are constrained or damaged forest areas need restoration. This is an important finding as it highlights that the roles of community and government are intertwined with regard to sanctioning and that the relationships exhibit variation across contexts.

8. Conclusion

For my research, I set out to examine government-community interactions in rules for forest management and subsequent enforcement of those rules. A multiple-case study of 12 van panchayats in the Himalayan region of India included 60 individual interviews, along with document analysis, group discussions, and observations.
My study used the IAD framework to better understand multi-level rule analysis. Using the framework, I was able to demonstrate how institutional rules at various levels the shows that government plays a key role in formulating rules. It determines the “what, who, and how” patterns of monitoring and sanctioning. Through multilevel rule analysis, I demonstrate that although the government establishes rules, the van panchayats translate those formalized rules into working rules and subsequently develop mechanisms to monitor and sanction them. The Van Panchayat Act serves as a constitutional set of rules that established local community self-governance, while maintaining some authority at collective-choice and operational levels. In practice, government and van panchayat rules and actions are interdependent. It is important to recognize that both government and community can act at all three levels of action: constitutional, collective-choice, and operational. While the government clearly dominates the constitutional level with regard to forest management, it is in the act of enforcement that local communities are able to act at the constitutional level, by establishing third-party monitors with specific roles and duties. Conversely, van panchayats are most active at the operational level, although governmental actors intervene for highly valued activities such as timber sales.

Data collected via individual interviews and group discussions reveal how van panchayats develop mechanisms for monitoring behavior to detect rule violations. In the face of frequent rule violations, many communities have turned to third-party monitoring. Rather than having the government establish and do the hiring for such a monitoring position, communities have done so, with mixed results. Interviewees reported that third-party guards are beneficial for creating pressure on rule breakers and having someone
who can be held accountable; this system, however, may be subject to problems such as lack of sufficient funds to pay the guards, guards accepting bribes, or guards simply slacking off. Using third-party guards was largely a function of sufficient funding or of networks with government officials who could provide resources to the community and increase the authoritativeness of the van panchayats. In addition, one of the interesting findings of the study was that while women were caught for illegal collection of fodder and fuel wood, men were caught stone mining and tree felling. This implies that women are more likely than men to be sanctioned by the van panchayats, men are more likely to be sanctioned by the Forest Department.

Monitoring in the 12 cases involved both men and women. Women played a particularly important role in mutual monitoring, as women’s household labors typically involved more time spent in the forest than men. Women had also been hired as guards in at least 30% of the cases. Community members expressed mixed views about the value of having women serve as guards, often basing their position on the recognition that women access the forests more often than men. However, some referred to this as a benefit, in that women could have better chances of spotting rule breakers, while others viewed it as a drawback, suggesting that women were more likely to be rule breakers themselves. Investigation into the role of gender in this area is thus far preliminary, and further analysis of this question should examine specific roles that men and women play in monitoring and sanctioning, as well as their motivations and challenges. Future research should explore specific roles, motivations, and challenges of both men and women in
order to develop a more effective monitoring and sanctioning system (Mwangi et al. 2011).

Both government and community actions play important roles in sanctioning. While the government has reserved for itself the power to sanction for higher-value violations (e.g., timber theft), it delegates power to van panchayats to develop sanctioning mechanisms for smaller offenses. At the same time, van panchayats sometimes seek guidance from government officials regarding effective sanctioning.

The cases in this study include instances of government agency guidance and support that have fostered van panchayat monitoring and sanctioning activities. However, in that process they might hinder communities’ self-reliance. This is not to suggest that external agency involvement hampers the ability of a community to self-organize to successfully govern their resources. It is, rather, to highlight that in the case of van panchayats where complete decentralization might not be a possibility, it is important to understand dynamics of interaction between government agencies and the van panchayats and ways these interactions might facilitate or impede monitoring and sanctioning.

Results of this study are affected by several limitations. First, the selection of 12 cases, while they are diverse, cannot be a basis for generalizing to all 12,000 van panchayats, or to all cases of community-based natural resource management. Rather, the cases provide insights into particular mechanisms and processes, which relate back to prior studies and theories. Second, attempts to obtain quantitative data on rule violations and sanctions were unsuccessful due to lack of availability. Thus, the results depended largely on interviews, which can be subject to bias and faulty recollection of facts and
events, though the use of multiple interviews for each case increases the validity of interview data. Finally, although my study managed to clarify the role of government and the van panchayats in sanctioning, the question of to what extent the government should be involved and whether van panchayats should have more legal powers to sanction rule breakers is still unaddressed. Such questions are important as they can suggest necessary amendments in the Van Panchayat Act in the future and help make sanctions more effective. These questions can also help scholars and practitioners to better understand the limits and possibilities of community-based natural resource management, especially the role of monitoring and sanctions and how communities and external governments interact to provide them.
Chapter 3: Overcoming Challenges to Rule Enforcement in Community-Based Forest Management Institutions

1. Introduction

There are several challenges to overcoming common pool resource (CPR) management problems. These challenges arise due to the fact that CPRs are openly accessible by everyone and thus susceptible to overuse and degradation. Although there is significant scholarship dealing with overcoming CPR challenges in community-based institutions, one important aspect of community-based resource management theory suggests that overcoming the second-order dilemma of monitoring and sanctioning is important for addressing CPR problems. For example, punishment costs have been observed to stabilize cooperative behaviors that are important to community-based resource management (Boyd and Richerson 1992).

The discussion in Chapter 2 on multilevel rule analysis addressed how rules pertaining to monitoring and sanctioning emerge and the roles that communities and external entities play. The current chapter takes a step forward and examines challenges that van panchayats encounter while addressing the second-order dilemma of monitoring and sanctioning. In this chapter, I present data on factors that facilitate cooperation and
help communities overcome this second-order dilemma. Following is the articulation of the two research questions that this chapter focuses on:

**Q1:** *What are the different challenges associated with monitoring and sanctioning in systems of community-based management with external interventions?*

**Q2:** *What are the factors that help communities to overcome challenges of monitoring and sanctioning in these systems?*

To address these questions, I adopted the socio-ecological systems (SES) framework (see Section 3 for details) to identify factors that help communities to overcome problems associated with collective action. I looked at how monitoring and sanctioning are influenced by community-based natural resource management institutions working in different types of collaborative partnerships. Several of the van panchayats studied engage in collaborative partnerships. These cases were classified into three types (Types 1-3) (see Table 3.2).

This chapter highlights the importance of empirical data; it shows that it is important to understand CPR challenges and the factors that help overcome those challenges from the perspective of resource users themselves rather than only making assumptions grounded in theory. An important contribution of my research is that it helps identify factors that do not easily fit within the SES framework and that should be considered by researchers and planners who explore the obstacles to effective monitoring and sanctioning.

The chapter is divided into the following sections: Section 2 is a review of the literature concerning collective action problems and the evolution of cooperative
behavior in collective action problem situations. Section 3 explains the socio-ecological systems (SES) framework and its application in my research. Section 4 briefly revisits study sites and data collection. Section 5 presents empirical results of the study. Section 6 discusses implications of the results and Section 7 presents the conclusions.

2. Collective Action and Cooperative Behavior

2.1 External coercion and community self-governance

For this research, collective action was defined as a situation where more than one person is directed towards achievement of a common goal or the satisfaction of a common interest (Wade 1987). However, as pointed out in earlier chapters, such a situation often creates an opportunity for individuals to seek personal gain rather than cooperate with the rest of the group, thereby leading to collective action problems. Collective action problems come in many forms, including “shirking” (Alchian and Demsetz 1972), the “free-rider” problem (Edney 1979; Grossman and Hart 1980), “moral hazards” (Holmstrom 1982), the “credible commitment dilemma” (Williams, Collins, and Lichbach 1997), “generalized social exchange” (Ekeh 1974; Emerson 1972; Yamagishi and Cook 1993), the “tragedy of the commons” (G. Hardin 1968), and exchanges of threat and violent confrontations (Boulding 1963).

Formal analysis of collective action problems has been strongly influenced by Mancur Olson’s work. With the publication of The Logic of Collective Action, Olson challenged a cherished foundation of modern democratic thought that groups would tend to form and take collective action whenever members jointly benefitted (Bentley 1949;
Truman 1958). He offered a provocative assertion that no rational person would contribute to the production of the public good: “unless there is coercion or some other special device, rational self-interested individuals will not act to achieve their common group interests” (Olson 1965, 2). Olson’s argument was further supported, at least in theory, by Garret Hardin’s well-known “Tragedy of the Commons” article (1968), which described rational self-interested individuals as acting against their common group interests. In this case the common pool resource (CPR) was a pasture used by herders who received individual gains by adding additional livestock, which consumed more resources. Each additional animal reduced the quantity of the grass for all, yet it was in nobody’s best interest to unilaterally reduce their withdrawal of resources. The result, Hardin argued, was tragedy for all as the CPR was destroyed due to lack of external coercion or externally supported property rights.

Olson’s and Hardin’s arguments were contradicted by evidence from experimental and empirical studies that suggested that coercion, the term Olson used for externally imposed rules supported with the threat of force, has a tendency to “crowd out” endogenous cooperative behavior. Several other studies followed up this finding and further confirmed that externally imposed rules and systems of monitoring and sanctioning might erode cooperative behavior (Johnson and Libecap 1982; Bohnet, Frey, and Huck 2001; Cardenas, Strandlund, and Willis 2000). Some studies have identified numerous examples of overcoming incentives to free ride through tailored rules suitable to particular situations (Ghate and Nagendra 2005).
Nevertheless, not all communities act collectively to protect their natural resources. The difference can be attributed to the design of community-based institutions (Andersson 2013) and/or the incentives for individuals to impose restrictions on self-consumption (Ghate and Nagendra 2005; Lise 2000). Where monitoring and sanctioning are costly, individuals may be tempted to free ride and not contribute to the very activities that may address the collective action problem in the first place (Ostrom 1990). This is known as a “second-order dilemma.”

Some researchers have found that subjects solve this second-order dilemma by voluntarily contributing resources to monitor and sanction others who are not cooperating in collective action (Tang 1992; Gibson et al. 2005; Ostrom, Gardner, and Walker 1994). Evidence from both experimental and empirical studies have shown that individuals may have inequality aversion (Fehr and Schmidt 1999) and a preference for fairness (Rabin 1993), and that those individuals may cooperate out of self-interest, altruism, and conformity (Cardenas 2000).

Research using observational data also shows that some groups of individuals engage in collective action to provide local public goods or manage common-pool resources without external coercion (see NRC 2000). These studies have challenged the conventional view of egoistic, self-interested human behavior and improved game theoretic predictions in collective action dilemmas (see Chapter 1). For example, other work after Ostrom’s (1990) *Governing the Commons* was published posited that people are willing to cooperate and sanction non-cooperators at a personal cost to themselves. This influenced experimentalists to explore cooperation and sanctioning in laboratory
settings (Ostrom, Gardner, and Walker 1994; Fehr and Gachter 2000). Such experiments helped demonstrate that some individuals cooperate even when it is not in their short-term self-interest. These were important ideas for my research and provided the theoretical foundation for studying cooperative and coordinated behavior in the collective action process of monitoring and sanctioning.

2.2 Evolutionary theory

Another line of inquiry about the emergence of cooperative and punishing behavior is known as evolutionary theory. According to this theory, individuals tend to inherit certain strategies in their lifetime that are intransigent. These are successful strategies that predominate over a period of time because they work well enough to outcompete other strategies (Axelrod 1986). There is supporting empirical evidence that humans have an inherent tendency to learn social norms (Pinker 1994) that are shared understandings about actions that are obligatory, permitted, or forbidden (Crawford and Ostrom 1995). In a common-pool resource (CPR) situation, which is susceptible to collective action dilemmas, the evolution of cooperative norms is based on the perception of the relative scarcity of a good, the predictability of resource flows, size of the group, dependence of the group on the good, common understanding of the good by the group, common understandings of cooperation, and the temptation to free ride (Ostrom 2000). As per the theory, our ancestors learned how to effectively solve collective action problems and how to recognize who was a trustworthy reciprocator (Barkow, Cosmides, and Tooby 1992). Clark and Karmiloff-Smith (1993) argue that as humans’ ability to reason evolved over time, for reasoning about deontic relationships—what is forbidden,
obligated, or permitted—humans use confirmation strategy. This deontic effect in humans is not associated with overall intelligence or educational level (Oaksford and Chater 1994) but is associated with the individual’s level of exposure to and experience of evolving norms.

This evolutionary process then leads to the emergence of three types of norm-using players: unconditional cooperators, conditional cooperators, and willing punishers. While conditional cooperators follow the norm of reciprocation and exhibit cooperation when they estimate that others will reciprocate as well, unconditional cooperators are willing to restrain resource use even when other collectors are not. Conditional cooperators have been found to constitute a substantial proportion of the population (Rustagi et al. 2011). Willing punishers, on the other hand, are individuals who, if given an opportunity, punish presumed free riders through verbal rebukes or use costly material payoffs when available. The presence of willing punishers is important because the punishment of non-cooperation is necessary for overcoming collective action problems (Boyd and Richardson 1986). Conditional cooperators and willing punishers represent strong reciprocators (Gintis 2003). Ostrom (2000, 142) underscores the importance of these individuals by saying, “Together cooperators and punishers create a more robust opening for collective action and mechanisms for helping it grow.”

In sum, prior theorizing about collective action dilemmas and the role of coercion suggest that external coercion can be critical for persuading egoistic, rational actors (rational in the economic sense of selfish and profit oriented) to cooperate. However,

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29 The use of mechanisms by Ostrom (2000) here refers to processes that cooperators and punishers create to harness collective action.
empirical studies provide examples of cooperation without external coercion, where users
develop institutions that include monitoring and sanctioning, often through evolutionary
processes. Such institutions can also be thought of as sources of internal coercion, where
rule breaking brings penalties to the users. Although these empirical studies tend to
examine one or the other form of coercion (external or internal) in isolation, in practice it
is likely that these two forms coexist (Ostrom 2000). Thus it is important to identify key
challenges associated with monitoring and sanctioning in mixed systems of user self-
governance and external interventions. It is also important to understand what factors
help a community overcome these challenges in such mixed systems.

3. Socio-Ecological Systems Framework

When will users invest in making rules to govern their use of a common-pool
resource? This is an important question to which a very general theoretical answer can be
given. Users of a resource system will continue to harvest resource units, without trying
to self-organize, unless they perceive that the benefits they would receive from a change
in their rules will be greater than the costs involved (Ostrom 2001, 2009). My research
draws on the SES framework to explain successful CPR management. The framework
developed by Ostrom and her colleagues in 2007 helps identify a large set of variables
affecting the likelihood of users to overcome collective action dilemmas for resource
management. However, these variables are not always associated with success or failure
in avoiding the tragedy of the commons. Rather, the framework proposes that it is the
overall combination of these variables in particular settings that affects whether
communities successfully avoid the tragedy of the commons. This framework is helpful in identifying combinations of variables that can affect actors’ incentives under diverse governance systems (Ostrom 2007, 2009).

The SES framework examines nested attributes of a resource system (RS) (see Table 3.1) and the resource units (RU) generated by that system that jointly affect the incentives of users (U) within a set of rules crafted by governance systems (GS) affecting interactions (I) and outcomes (O) over time (Ostrom 2007). These are all affected by social, economic, and political settings (S) and by the state of related ecosystems (ECO). These eight first-tier variables (RS, RU, U, GS, I, O, S, ECO) are further unpacked in the second-tier set of variables (see Table 3.1), which are considered to be the initial core conceptual variables necessary for identifying the type of SES operating in a particular location, as well as the reasons for sustainable or unsustainable outcomes (Ostrom 2007). These second-tier variables include, among others, 30 variables identified by Agrawal (2001) as critical factors in the organization, adaptability, and sustainability of common property.
Table 3.1: Second-tier variables in framework for analyzing an SES. Letters and numbers in parentheses represent first-tier variables: RS=resource system, RU=resource units, U=users, I=interactions, GS=governance system, S=socioeconomic/political settings

<table>
<thead>
<tr>
<th>Resource System (RS)</th>
<th>Governance System (GS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS1- Sector (e.g., water, forests, pasture, fish)</td>
<td>GS1- Government organizations</td>
</tr>
<tr>
<td>RS2- Clarity of system boundaries</td>
<td>GS2- Nongovernment organizations</td>
</tr>
<tr>
<td>RS3- Size of the resource system</td>
<td>GS3- Network structure</td>
</tr>
<tr>
<td>RS4- Human-constructed facilities</td>
<td>GS4- Property-rights systems</td>
</tr>
<tr>
<td>RS5- Productivity of system</td>
<td>GS5- Operational rules</td>
</tr>
<tr>
<td>RS6- Equilibrium properties</td>
<td>GS6- Collective-choice rules</td>
</tr>
<tr>
<td>RS7- Predictability of system dynamics</td>
<td>GS7- Constitutional rules</td>
</tr>
<tr>
<td>RS8- Storage characteristics</td>
<td>GS8- Monitoring and sanctioning</td>
</tr>
<tr>
<td>RS9- Location</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resource Units (RU)</th>
<th>Users (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RU1- Resource unit mobility</td>
<td>U1- Number of users</td>
</tr>
<tr>
<td>RU2- Growth or replacement rate</td>
<td>U2- Socioeconomic attributes of users</td>
</tr>
<tr>
<td>RU3- Interaction among resources</td>
<td>U3- History of use</td>
</tr>
<tr>
<td>RU4- Economic value</td>
<td>U4- Location</td>
</tr>
<tr>
<td>RU5- Size</td>
<td>U5- Leadership</td>
</tr>
<tr>
<td>RU6- Distinct markings</td>
<td>U6- Norms/social capital</td>
</tr>
<tr>
<td>RU7- Spatial and temporal distribution</td>
<td>U7- Knowledge of SES</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interactions (I)</th>
<th>Outcomes (O)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1- Harvesting levels of diverse users</td>
<td>O1- Social performance measures</td>
</tr>
<tr>
<td>I2- Information sharing among users</td>
<td>O2- Ecological performance</td>
</tr>
<tr>
<td>I3- Deliberation processes</td>
<td>O3- Externalities to other SESs</td>
</tr>
<tr>
<td>I4- Conflicts among users</td>
<td></td>
</tr>
</tbody>
</table>

Ostrom (2007, 421)
These variables have been diagrammed to show interactions among first-tier variables, as shown in Figure 3.1. Governance systems are shown as affecting interactions and outcomes, which have a feedback loop back to governance systems.

Figure 3.1 Multitier framework for analyzing socio-ecological systems (Ostrom 2007)

Several SES factors make the forests in the Himalayan region of India historically amenable to community-based management. Most notably, there were perceptions amongst the community members that there were clear and well-defined boundaries (RS2), easy accessibility by a community (RS9), and the community’s dependence on forests for sustaining agricultural livelihoods (U7) provided great incentives to collectively manage the resources (Gibson et al. 2007). Pressure on these forests increased over time as the number of households (U1) grew in the area. However, these were generally homogenous and stable villages and communities with long histories of
resource management (U2). Historically, local people enjoyed unlimited rights and privileges for the use of forests (U3).30

Of particular interest for my study, given the second-order dilemma of monitoring and sanctioning, is how the framework treats the “monitoring and sanctioning” variable (GS8). The framework indicates that monitoring and sanctioning is an important variable and therefore included as a part of the governance system. My research focused on teasing out that particular variable (GS8) to explain how it is related to other variables that might be present or absent in the SES framework, in particular challenges to monitoring and sanctioning and the factors that motivate individuals to engage in it. A key contribution of my research is that I identify different challenges to M&S from interviews and focus group discussions with community-members themselves. In doing so, I was able to identify variables that are not yet explicitly addressed by the SES framework.

3.2 Utility of the SES framework

The SES framework has been widely utilized by researchers to analyze factors that impact sustainable resource management. For example, Brooks and Tshering (2010) utilized the framework in their research to focus on factors that hinder sustainable management of matsutake mushrooms in Bhutan. Blanco (2011) utilized the SES framework to analyze successful voluntary environmental initiatives in tourism. Nagendra and Ostrom (2014) looked into lakes that were vanishing due to urbanization in Bangalore, India and used the SES framework to investigate why certain locations have

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30 See Guha (1990) for a discussion of the minimal social and economic stratification in Kumaon, site of my research. According to him, “Hill society exhibits an absence of sharp class divisions” (16). See also Srivastav (1996) for additional historical and contemporary evidence.
been successful in managing and restoring their water bodies more effectively than others.

In the past decade, significant progress has been made with respect to investigation of interactions between social and ecological systems (Young et al. 2006; Liu et al. 2007). Different frameworks were developed by adopting approaches that combined material flows and economic flows (Duchin and Steenge 1999), human behavior and drivers that impact ecosystem services (Redman 1999), specific goods relevant for human systems as well as for the ecological system (Liu et al. 2007), and resilience and adaptive management of socio-ecological systems (Folke et al. 2002; Holling and Allen 2002). These different frameworks have significantly improved our understanding of the complexity of interaction between human/social and ecological systems. However, these frameworks differ in the way they have been conceptualized and, therefore, differ in the way they are applied. Hence, even though these numerous interdisciplinary frameworks have significantly improved our understanding of the complexity of interactions between human/social and ecological systems, various scholars have shown concern about having a framework that treats both sub-systems, social and ecological, with equal depth (Folke 2006; Sylvester and Redman 2008) and supports international networks for integrative and interdisciplinary research (Turner and Carpenter 1999; Liu et al. 2007).

In the special issue of *Ecology and Society* called “A Framework for Analyzing, Comparing, and Diagnosing Social-Ecological systems,” Binder et al. (2013) published a study in which they described 10 different frameworks developed to understand socio-
ecological systems. They studied the applicability of each of those frameworks. 

Through their analysis, Binder et al. (2013) were able to justify the applicability of different frameworks for different uses. According to them, in the SES framework, the social and governance structures affect the way in which the actors behave, and those actors might be part of the governance that shape it. They further go on to say that: “the SES framework is one of the unique frameworks that explicitly includes dynamics of the social system. The SES framework includes variables containing natural language descriptions that refer to dynamic processes such as information sharing, deliberation processes, and self-organization activities grouped under the label interaction (5). They also added that: “the SES framework is best suited to understand under what conditions the users of the resource develop rules for sustainable management of the resource” (8). This comment formed a useful idea for my research, as I was interested in looking into the circumstances in which community members come together to discuss and formulate mutually agreed upon rules regarding forest use.

4. Methods

As discussed in Chapter 2, data for this comparative case study were produced through research on and in 12 van panchayats in the Himalayan region of India. See

Chapter 1 for a discussion of the sites of research, history of the van panchayat system and forest management in India, and data collection methods. Following is a brief discussion of background details relevant to the SES analysis.

As discussed in Chapter 1, the year 1931 marked great change in forest management in the central Himalayan region. Colonization had led to nationalization of forestlands, which, as a result, deprived communities of their customary control over, and access to the forests (Baland et al. 2001). This process of exclusion disenfranchised community members, some of whom reacted by setting forests on fire (Ballabh and Singh 1988). A grievance committee comprising legislators at local, state, and federal levels was formed to come up with ideas to appease the local community members. The result was the Van Panchayat Act of 1931, which was designed in part to regenerate sense of local ownership and provide a sense of local control over local development (Ballabh and Singh 1988). As discussed earlier, the van panchayats are forest management committees composed of members and a leader elected from among the community (U5). As discussed earlier, these van panchayats do not independently govern the resources; rather, there is significant involvement from the government’s forest department, revenue department, and other district and state level officers (GS1), as well as—in some cases—nongovernmental organizations (GS2). This formalized arrangement generated over 12,000 van panchayats across the entire state from which I selected the 12 where I conducted my research. Given the combination of user-based management with involvement from governments and nongovernmental organizations, these van
panchayats are good subjects for investigating the challenges and factors that affect monitoring and sanctioning.

Van panchayat cases selected for this study are appropriate sites for this analysis because they have diverse institutional setups with some working in collaboration with different parties, including government agencies (typically the Ministry of Environment and Forests, state forest departments, revenue departments at the state and district level), nongovernmental organizations, and user groups. I collaborated with a local nongovernmental organization working in the field of community participation and natural resource management, and this NGO helped select the study cases (see Chapter 2, Section 5). We developed a list of about 40 van panchayats in the area. We studied each of the van panchayats and keeping in mind my objective to study different collaborative partnerships in which the van panchayats work, I was able to subsequently identify 12 cases. Given their collaborative partnership with different parties, these 12 van panchayats were categorized into three Types (see Table 3.2).

32 Federal level agency involved in decision-making pertaining to forest management.
33 Administrative unit of a state.
Table 3.2: Description of van panchayat Types (1–3)

- **Type 1**: includes cases of van panchayats working in collaboration with government agencies, nongovernmental organizations, and user group committees. Type 1 includes villages V1–V4.

- **Type 2**: includes cases of van panchayats working in collaboration with government agencies and nongovernmental organizations. It includes villages V5–V9.

- **Type 3**: includes cases of van panchayats working in collaboration with government agencies. Group 3 comprises villages V10–12.

As indicated in Chapter 2, Table 2, van panchayats varied in age, size of the forest, and number of households in the community. As discussed above, the data for the research was drawn from multiple sources, including interviews, group discussions, and participant observation.

Overall, 75 interviews provided data for the analysis in the chapter. 60 interviews were with van panchayat and community members and 15 were with NGO personnel. (See Chapter 2, Section 5 for more details) This analysis draws from:

1) The responses of NGO employees who are directly engaged with van panchayats in forest operations, and;

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34 *User group committee* should not be confused with forest users of the village. User group committees here refer to groups of individuals who are actively involved in managing forests. They are different from van panchayat committees.
2) The responses of van panchayat and community members to interview and group discussion questions (45 of the 60 interviewees were members of a van panchayat committee; the rest from elderly members of the community, ex-members of the van panchayat committee, guards and some active members of user groups). To supplement interview data, six group discussions with approximately 30 community members were held where more ideas, opinions, perspectives, attitudes, and beliefs were brainstormed (see Chapter 2, Section 5.3, and Chapter 1, Section 3.3, for more details).

5. Results

Q1: What are the different challenges associated with monitoring and sanctioning in systems of community-based management with external interventions?

To answer this question, I asked the interviewees about challenges they face while carrying out duties pertaining to M&S. I did not suggest specific challenges when I framed my question, in order to avoid influencing the answers of the interviewee. However, I would let the interviewee talk until they stopped.

Interviewees (community members) identified nine key challenges associated with monitoring and sanctioning (see Table 3.3).

35 Forest users sometimes form groups and delegate forest management tasks among their members, including planting, maintaining nurseries, and monitoring. In addition to engaging in forest management, they also serve as a support group that can apply for micro-credit loans to generate livelihoods.
Table 3.3: Challenges involved in monitoring and sanctioning (N=60)

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Description</th>
<th>Type 1 Frequency (%) n=20</th>
<th>Type 2 Frequency (%) n=20</th>
<th>Type 3 Frequency (%) n=20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Consuming</td>
<td>The process of patrolling the forest takes a lot of time as it requires one to cover the entire forest area on foot.</td>
<td>84</td>
<td>80</td>
<td>82</td>
</tr>
<tr>
<td>Social Pressure</td>
<td>Families in a village are close-knit and that makes it hard for guards to penalize family and friends.</td>
<td>42</td>
<td>58</td>
<td>71</td>
</tr>
<tr>
<td>Lack of clear boundary walls</td>
<td>There is encroachment and people from neighboring villages exploit resources.</td>
<td>28</td>
<td>65</td>
<td>79</td>
</tr>
<tr>
<td>Inadequate resources</td>
<td>There are more guards required and more money to pay these guards for their service.</td>
<td>62</td>
<td>75</td>
<td>68</td>
</tr>
<tr>
<td>People are not aware of rules</td>
<td>Often, people are not informed of the rules, and they come to know only upon violation.</td>
<td>20</td>
<td>48</td>
<td>58</td>
</tr>
</tbody>
</table>

Continued
For monitoring, it is important to recall that in Chapter 2 I noted that although there are several mechanisms of monitoring that are followed in the van panchayats of Kumaon, most van panchayats are converging toward hiring a guard. The guard performs the task of monitoring by patrolling the forest areas. Typically there is only one guard assigned for the task, who spends 20-30 hours in the forest per week. It is a very time-
consuming process, as it requires guards to roam around in the forest on foot. As one interviewee reported:

It is not an easy task at all. It easily takes me at least a couple of hours to take one complete round of the forest. We don’t just merely patrol, we are also in charge of doing restoration work that we come across during our rounds. Sometimes, the boundary wall is broken, sometimes a sapling is uprooted, and there are many other miscellaneous things that we take care of. It is a lot of responsibility.

(Guard, Village 9).

The **time consuming nature of the work** was the most frequently listed challenge of monitoring and sanctioning, mentioned by 82% of van panchayat interviewees overall, and by 85%, 80%, and 82% of Type 1, 2, and 3 van panchayat and community members respectively. This challenge persists in most van panchayats regardless of the size of the forest, but the task becomes more cumbersome as the size of the forest increases.

The second-most frequently reported challenge of monitoring and sanctioning was **social pressure**. The families in a particular village are often very close: the families are either related to each other or they are good friends. The guards reported that there was significant social pressure for them not to sanction a close relative or a friend, and they often let violators go without sanctioning them for their violations. As one interviewee said, “I have often spotted my friends and relatives breaking rules in the forest. It is hard for me to impose fines on them. So, I usually ask them politely to not
violate the rules, but that is not very effective as people will continue breaking rules until they are penalized for their offense.” (Guard, V2) Another said,

You see, our village is very small and all the villagers are either family or friends. It becomes very hard to confront when we catch one of our family or close friend violating forest use rules. Sometimes they do not even take us seriously and instead expect us to spare them and not report them to the van panchayat. This is a really difficult situation because not only does it prevent us from performing our duties properly, but it also risks our relationship with our community members.

(Guard, V3)

Across the cases, *social pressure* was mentioned by 42% of van panchayat and community interviewees overall, and by 42%, 58%, and 71% of Type 1, 2, and 3 van panchayats respectively.

The third-most frequently mentioned challenge for monitoring and sanctioning was *inadequate resources*. The interviewees reported that not only is the guards’ job time consuming, but also they are also not adequately paid for the tasks they perform. Many van panchayat members also stated that they needed more guards; however, they were not able to hire them as they lacked resources. As one of the interviewees reported: “We do not have adequate guards in our forests, but we cannot do anything. We don’t have money to afford more guards, so we have to make do with the limited resource we have.” (Van panchayat member, V4) Another said, “One guard is not enough; this forest needs more guards. Also, we are not adequately paid for the work we do, so really there is no
major incentive to invest so much time and effort into this” (Van panchayat member, V9). Lack of resources was mentioned by 66% of van panchayat and community interviewees overall, and by 62%, 75%, and 68% of Type 1, 2, and 3 van panchayats respectively.

Another frequently reported challenge across the cases was a lack of clear boundaries. The boundaries are often not clear because, for example, a stream, a tree, or a temple serve as guideposts. Hence, due to lack of proper boundary walls, a lot of encroachment cases have been reported. One interviewee said, “Since there are no boundary walls it is easy for villagers living around the forest to encroach. They slowly expand their agricultural activities from their farms to the adjacent forest.” (Elderly community member, V10) Despite the fact that walls may not physically demarcate boundaries, villagers showed that they have a very clear idea about the boundaries of their forest resource.

One of the responsibilities of the guard is to keep a check on encroachment and to report potential cases of encroachment to the van panchayat. Across the cases studied, lack of clear boundaries was mentioned by an overall average of 54% of van panchayat and community interviewees, and by 28%, 65%, and 79% of Type 1, 2, and 3 van panchayats respectively.

In addition, some van panchayat leaders mentioned that in most instances people do not realize they are breaking a rule; they realize only once they are caught. One of the reasons for this, as one interviewee said, was that “there is hardly any attendance from the community during VP meetings, so if people do not come to the meetings they are not
aware of the rules, days during which the forests are open, or any changes that have been made to the rules” (Leader, V8). The results indicate that the community’s members’ lack of awareness towards rules was highest in Type 3 (58%) followed Type 2 (48%) and then Type 1 (20%).

A lesser challenge is guards losing interest in monitoring forests. One interviewee attributed this to inadequate pay and frequent confrontations: “A guard’s salary is 500 rupees/month for the duties they perform. How can you expect them to support their families with that money? Plus there are so many frequent confrontations that make guards’ task even more unpleasant.” Overall, 33% of van panchayat and community interviewees mentioned guards losing interest, and 26%, 31%, and 42% of Type 1, 2, and 3 van panchayats respectively.

In just over a quarter of the cases, interviewees said another challenge was getting violators to pay their fines. As one interviewee said, “it is hard to get the violators to pay the fine and almost makes the process of monitoring and sanctioning seem irrelevant.” (Van Panchayat Member, V8). Across the cases, the challenge of getting violators to pay their fines was mentioned by 27% of van panchayat and community interviewees overall, and by 15%, 32%, and 24% of Type 1, 2, and 3 van panchayats respectively.

Lastly, the eighth and ninth most reported challenges for monitoring and sanctioning were lack of training and threats from wildlife. There is little to no provision to train individuals assigned to guarding duties. On most occasions they are just informed of the rules and how they should go about sanctioning a rule violator. Although in some van panchayats guards attended formal workshops organized by the forest academy in
Haldwani,\textsuperscript{36} a majority of the guards did not receive any training. It was interesting to note that upon asking the guards whether they felt they needed training, a majority of them replied saying that they do not require any training. As one of the interviewee reported, “We grew up in these forests and we know everything about these forests. Why would we need any training? ” (Guard, V3) But those citing lack of training mentioned a concern about guards not being skilled at dealing with rule-violators or even wildlife. For example, one of the interviewees mentioned that, “It is high time that the van panchayats should realize how important it is for the guards to receive proper training. A guard’s work is very challenging both emotionally and physically. Merely explaining the rules to them is not adequate.” (Van Panchayat Member, V5). Overall, 23% of the interviewees expressed lack of training as a challenge, 12%, 22% and 35% in Type 1, 2 and 3 van panchayats respectively.

Since the guards patrol the forest unarmed, they face occasional risks of wildlife attack. One interviewee mentioned, “There are risks of being attacked by bears and wild boar while we are roaming around in the forest.” (Guard, V5) Approximately 20% of the interviewees expressed threat to life from wildlife, and 38%, 14% and 8% respectively in Type 1, 2 and 3.

Looking across all three van panchayat Types, several patterns seem evident. First, two challenges are reported at similar frequencies regardless of van panchayat type: \textit{time consuming} and \textit{inadequate resources}. These appear to be widespread across settings. Second, the frequency of several challenges is lowest in Type 1 cases, higher in

\textsuperscript{36} A town in the state of Uttarakhand, India. The Forest Academy there organizes workshop for van panchayat leaders and guards.
Type 2, cases, and highest in Type 3 cases. This result suggests self-reported challenges in Type 1 cases might have been overcome due to the active engagement of van panchayat with all the stakeholders (governments, NGOs, and user group committees). However, this trend reverses with two challenges reported most frequently among Type 1 cases: lack of training and threats from wildlife.

The results show varied frequencies of the challenges reported by the interviewees. The challenge of social pressure was reported highest in Type 3, followed by 2 and then 1. This challenge primarily stems from higher frequency of rule-breaking behavior. The variation in the frequency can be attributed to the group type. Type 1 has higher monitoring levels due to higher engagement of community members and the NGOs, so there is higher awareness amongst people and the forest use is comparatively regulated better which contributes to fewer people breaking rules. However, in Types 1 and 2, apart from weak levels of monitoring, another reason that contributes to higher levels of social pressure is the forest size. In types 1 and 2 on average, the size of the van panchayat forest areas is higher (see Table 1.2) than Type 3 villages, which makes it even more challenging to effectively monitor forest areas.

The challenge of lack of clear boundaries is impacted by the community engagement in the different Types. The boundary walls were in a better condition in the villages where there was active user group involvement, however, just like the challenge of social pressure, the bigger area of the forests in the Types 2 and 3 prevents better maintenance of boundary walls.
The frequency of the challenge of *lack of adequate resources* was reported almost uniformly across all cases (62%, 75% and 68% in Types 1, 2 and 3). This is because given the area is rural and is in a remote location it lacks adequate access to financial and technical resources. The local NGOs and the Forest Department do offer some assistance, but as reported by the interview and gathered from group discussion, it does not seem enough.

People reported to be not *aware of the rules* was mentioned more frequently in Types 2 and 3 (48% and 58% respectively) cases, whereas in Type 3, it was 20%. The extent to which community members are aware of the rules also depends on the type of collaboration and extent of engagement of the communities, which is high in Type 3. In addition to type of collaborative partnership, another factor that influences people’s awareness about rules is frequency of meetings. The frequency of meetings is higher in Type 1 villages in comparison to Type 3 villages. The challenge of *guards losing interest* also emerges, as already mentioned the guards job is mundane so that definitely impacts their interest in their duty. In addition, it becomes frustrating for the guards to find community members being oblivious about the rules, not caring for the forest and *not paying their fines on time*.

There is a reverse trend observed in Types 1-3 for challenges pertaining to *lack of training* and *threat from wildlife*. The frequency of *lack of training* as a challenge was 35% in Type 1 and 22% and 12% in Types 2 and 3 respectively. During interviewees and my interaction with the guards, the guards belonging to Type 1 villages shared some horrific stories about wildlife encounters and how they felt they were at a disadvantage,
as they did not how to effectively deal with situation. The interviewees in Type 2 and 3 mentioned threat from the wildlife almost in passing. Although there is more concrete reasoning required to explain these percentages, my data lacks the additional insight to explain this variation.

**Q2. What are the factors that help a community to overcome the challenges of monitoring and sanctioning in systems of community-based management with external interventions?**

To answer this question, I asked the interviewees about factors that facilitate community’s cooperation in the collective action. The interviewees shared what factors they thought worked for them and the rest of the community in the past. I did not suggest or mention specific factors when I framed my question, this was in order to avoid influencing the answers of the interviewee, in fact, I would let the interviewee talk until they stopped.

Interviewees (community members) identified several factors that help to overcome challenges of monitoring and sanctioning. A list of factors conducive to community cooperation in collective action was created during interviews. All factors were then compiled and analyzed (see Table 3.4). The most frequently reported factors were related to benefits that community members valued. The forests’ salience to these community members motivates them to invest time and effort in enforcement activities like citizen patrols and household contributions for paying guards’ salaries. Interviewees mentioned a desire for having assigned guards, preferably a local guard to monitor and sanction in order to ensure that the forest would continue to provide support for
agriculture. As one of the interviewees reported, “We cannot live without forests. We need these forests for our crops, for our cattle, for our food. We don’t have a future without these forests.” (Group discussion, V2) The majority of the interviewees across all three types reported that they think M&S is important to protect forests for sustaining agriculture and for future generations too. Another reason that community members said it was important to monitor and sanction was to protect plantations. Many forest regeneration activities initiated by the van panchayats engage communities. These include raising saplings in the nurseries, caring for plantations, and monitoring the growth of the planted saplings.

Planting in the forest is not easy. First of all, it takes a lot of care for the seeds to germinate and then once these saplings are transferred to the field there is only a fraction that is able to survive. So it requires lot of time and effort, but all this effort seems worthwhile when we see the sapling grow into trees and when we succeed in regenerating our forest areas (User group member, V2).

In a group discussion, group members mentioned, “The task of oak plantation requires lot of effort. We have to constantly monitor to make sure that the sapling is growing right and protect it from damage. We put so much effort into this, how can we let them get destroyed like that?” (Group discussion, V3) In total, 61% of the interviewees mentioned that protecting the plantations facilitated their cooperation in M&S, including 85%, 78% and 20% of interviewees from Types 1, 2, and 3 respectively. In Types 1 and 2, the local NGOs have been engaged in afforestation activities with the
van panchayats, the villages in both these types have experienced how much hard work went into restoring forest areas and how immensely the people in those villages benefitted from their rehabilitated forests.

Interviewees also recognized the importance of forests for preserving water sources. One interviewee said:

We are an agriculture-based community and we rely on rain and natural springs for irrigation and for our own use. Without forest, these springs will dry up and there will be lack of rainfall. There will be a drought and it will be hard to survive. Oak trees are important for our forests; they help regenerate our natural springs, leaves are useful for manure and they provide shade. (Old village resident, V 4)

Across the cases, preserving water sources as a reason for monitoring was mentioned by 56% of interviewees: 81% in Type 1 cases, 72% in Type 2, and 15% in Type 3. There are several reasons that contribute towards the wide gap in this frequency; lack of awareness in people, lack of participation in forest management activities—these reasons further contribute towards lack of initiation of community-based natural resource management projects. “Natural springs are an important source of water in the area, and these sources of water are sustained by the natural forests “(NGO employee) Van panchayats that have active user group committees (Type 1) and that have engaged with the NGOs (Types 1 and 2) have greater awareness and have greater identification of sustaining natural resource.
Active user groups were mentioned as a key factor facilitating cooperation in the community in nearly half of the cases. Although only Type 1 cases have active user group committees, the other case Types also have groups of users that can undertake monitoring and sanctioning activities if mobilized. As one interviewee mentioned,

Our user group is comprised of women who have been engaged in managing forests for years now. We understand the importance of forests for sustaining our lives, our families’ lives, and also the gruesome consequences our families might face if we lost our forests. Initially, there was inhibition in women to become part of the user groups and speak up in the meetings. But, with time things have changed and the confidence of the women improved. We are not alone anymore. We receive guidance and support from the NGOs and the van panchayats. We are proud of the forest areas we have helped to regenerate and we continuously encourage other community members to help us too. (User group member, V1)

The user groups engaged in forest management activities perform tasks like maintaining nurseries and plantations in the forest and boundary wall repair. The NGOs work closely with the communities, and it is mostly through user groups that they extend their support to rest of the community. The user groups serve as a platform for the NGOs to perform forestry related tasks and other activities in the forest. “The user groups are a way for us to get in touch with the community. They serve as a perfect mediator for transferring information and educating the rest of the community.” (NGO employee)

However, these user groups do tend to become weaker over time and these are the times when the NGOs intervene and try stimulating them. As one interviewee reported,
There are times when members of user groups start losing interest. Those are the times when the group starts becoming weak due to conflicts between members. We try advising the members and tell them the repercussions of not having the user groups and encourage them to resolve their conflicts and misunderstandings and focus on the purpose of the group. (NGO employee)

In some cases an important factor that promoted monitoring was the chance to win an award. “We work very hard in maintaining our forests and it is because of that we have been winning the ‘best kept forest prize’ for all these years. We would like to keep winning that prize in the future.” (Group discussion, V1) Another said, “Our forest has been winning the ‘best kept forest’ award for past several years and that has made us very popular in the region. We feel honored when researchers from all over the world come to study our forests and our strategies.” (Group discussion, V1)

Overall, 44% of the interviewees reported winning awards as a factor that promoted M&S: 55% in Type 1 and 78% and 0 in Type 2 and 3 respectively. There is always competition among villages for the “best kept forest prize.” Villages where individuals are actively involved in maintaining their forest areas consider this prize to be an honor and an acknowledgement of their hard work. Forests of V1 and V2 have won the prize for the past few years.

Frequent meetings and face-to-face interactions were also reported as one of the factors that help community members overcome the second-order dilemma of monitoring and sanctioning. In Type 1 33%, in Type 2 29%, and 35% of the interviewees in Type 3
reported that the more the community gets a chance to meet either during van panchayat meetings or user group committee meetings, the more aware they become about the problems in their forest and the more they feel encouraged to contribute to combatting those problems.

*Technical and financial assistance* were also reported by some communities as factors that promotes M&S. 48% of interviewees in Type 1, 39% in Type 2, and 17% in Type 3 reported that being able to access and garner technical and financial assistance helps in facilitating the monitoring and sanctioning process. As one interviewee reported, “The guards’ task is arduous and time-consuming. Not being adequately paid for the task performed compromises the quality of monitoring. Therefore, having some assistance from government or an NGO really helps.” (Van panchayat leader, V6)

Finally, some interviewees mentioned ownership rights to the forests as a factor that encouraged them to contribute to M&S. Although van panchayat forests are publicly owned, having the governance rights has--to a certain degree--built a sense of ownership among community members that eventually makes them more protective and possessive about their resources and motivates them to monitor, sanction, and protect their forests--especially from outsiders. One interviewee said, “The forest belongs to us. If we don’t protect it, then it would not take long for it to be gone.” (Van panchayat member, V2)
### Table 3.4: Factors that facilitate monitoring and sanctioning

<table>
<thead>
<tr>
<th>Facilitating Factor</th>
<th>Description</th>
<th>Type 1 Frequency (%)</th>
<th>Type 2 Average n=20</th>
<th>Type 3 Average n=20</th>
<th>Overall Average (across all cases) n=60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustains agriculture</td>
<td>Mostly agriculture-based families that rely on forest for green manure</td>
<td>98</td>
<td>100</td>
<td>85</td>
<td>94</td>
</tr>
<tr>
<td>Sustains forests for future generation</td>
<td>Families dependent on fodder for fuelwood, fodder, and timber</td>
<td>100</td>
<td>95</td>
<td>80</td>
<td>92</td>
</tr>
<tr>
<td>Protects plantations</td>
<td>Individuals invest a lot of time and effort in plantation</td>
<td>85</td>
<td>78</td>
<td>20</td>
<td>61</td>
</tr>
<tr>
<td>Preserves water sources</td>
<td>Rely on forest’s natural spring water sources</td>
<td>81</td>
<td>72</td>
<td>15</td>
<td>56</td>
</tr>
<tr>
<td>Have active user groups</td>
<td>Are actively involved in protecting the forest &amp; encourage rest of the community</td>
<td>72</td>
<td>62</td>
<td>12</td>
<td>49</td>
</tr>
<tr>
<td>Monitoring award</td>
<td>Van panchayats that have received “best kept forest” prize in the past strive to get the prize in the future</td>
<td>55</td>
<td>78</td>
<td>0</td>
<td>44</td>
</tr>
<tr>
<td>Frequent meetings/workshops</td>
<td>Help solve rule infraction cases in a timely fashion.</td>
<td>33</td>
<td>29</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>Technical and financial assistance</td>
<td>Guidance/technical assistance easily accessible</td>
<td>48</td>
<td>39</td>
<td>17</td>
<td>35</td>
</tr>
<tr>
<td>Sense of ownership</td>
<td>Property rights of use and access established by Van Panchayat Act</td>
<td>25</td>
<td>20</td>
<td>5</td>
<td>17</td>
</tr>
</tbody>
</table>

Source: Interview data from van panchayat and community members
Looking across van panchayat types, several patterns seem evident. First, two factors that promote M&S are reported at similar frequencies regardless of van panchayat type: *sustain agriculture* and *sustain forests for future generations*. Second, the frequency of several factors is highest in Type 1 cases, lower in Type 2, cases, and lowest in Type 3 cases. These results suggest greater diversity of factors that facilitate monitoring and sanctioning is associated with van panchayats that engage with governments, NGOs, and user group committees. As mentioned above, with diverse partnerships the communities become more aware of their issues pertaining to natural resources and learn ways they can organize themselves and cooperate towards better management.

6. Discussion

Identifying and analyzing the frequency of the factors that act as a challenge to or that promote monitoring and sanctioning can provide insights into the second-tier variables of the socio-ecological systems framework (Table 3.1).

6.1 Challenges

Much of what has been written about the challenges of monitoring and sanctioning and second-order collective action problems is very theoretical in nature or is derived from laboratory results (Persha et al. 2011; Coleman 2009). My research makes an important contribution by uncovering information about the costs and challenges of monitoring and sanctioning in the field from the perspectives of resource users and those who monitor and sanction. Although some of my findings reflect what theory might predict, others do not match theoretical predictions--for example, *social pressure* and
guards losing interest. My survey of the relevant literature revealed that these two factors receive little or no attention in research or frameworks.

The guards reported that they face a very high social pressure while carrying out monitoring and sanctioning. The comments made by guards about the impact of social pressures on their decision to sanction or not are important for two main reasons. First, it does not directly match with components of the SES framework. Secondly, from a theoretical viewpoint, prior research suggests that communities that are close knit have higher social capital, a fact that might lead to higher levels of cooperation (Ostrom 1990; Putnam 1993; Ostrom 2000; Pretty and Ward 2001). This is because higher social capital often leads to higher levels of trust and that facilitates cooperation to render outcomes that are mutually beneficial to the community members (Ostrom 2000). The work of Putnam (1993), Ostrom (2000), and Pretty and Ward (2001) suggest that high social capital in close-knit communities also would lower the transaction costs of collective action. Ishihara and Pascual’s (2013) argument supports this conclusion when they say that, since higher social capital leads to creation and sharing of common knowledge among community members, it might lead to successful collective action in order to solve collective-type environmental governance problems. Hence, it is apparent that the research literature strongly emphasizes the positive consequences of social capital and tight-knit communities. Portes (1998) explains this by saying that “it is perhaps because of our sociological bias to see good things emerging out of sociability that we often ignore the bad things that might be associated with the behavior” (16).

37 “Shared knowledge, understanding, norms, rules and expectations about the pattern of interaction that a group of individuals bring to recurrent activity” (Ostrom 2000,176).
However, what I found in my results is something that contradicts the theory. My results show that close-knit societies do not always facilitate collective action; they can also impede it, especially in the case of monitoring and sanctioning where community members are responsible for keeping a check on each other. In such a situation, one might argue that having an external guard would solve the problem. But, as we saw above, having an external guard has been reported to be not as effective as local guards, since the perception is that external guards slack off because they lack a sense of ownership towards the forests. This is an important issue that could be explored in future research on how to address this dilemma.

Another interesting challenge that was reported was about “guards losing interest.” This again is a challenge that has not been adequately addressed by previous research and it also is not a component of the SES framework. As noted above in Section 5, the task of monitoring was considered a mundane one where the guards were required to mostly patrol the forest areas on foot. Apart from that, high social pressure on the guards also prevented them carrying out their duties effectively, hence causing them to lose interest. This again is an important challenge in locally-based monitoring and sanctioning that might hold true in settings where the highest pressure on the resource is imposed by the community members themselves. A possible solution to this problem could be to increase the stake of the community members in M&S by mobilizing the community members to also contribute to the M&S activities. Hence, promoting mixed monitoring methods, i.e. both assigned guards and mutual monitoring, and subsequently rewarding the monitors might help address this problem in the future.
Lack of clear boundaries was reported as one of the challenges to monitoring and sanctioning. Clarity of boundaries is also one of the eight design principles (see Chapter 1 Section 2) and a variable in the SES framework (RS2) (Ostrom, 1990; Ostrom 2007). It is a critical variable as it helps communities determine whom to include and whom to exclude from rights of use and access in a resource system (Agrawal and Ostrom 2001). Guideposts, barbed wire or boundary walls should demarcate these forest areas. Concerns regarding damaged boundary walls were often expressed, as this gave entry to cattle and also created an opportunity for encroachment by outsiders, making the task of monitoring and sanctioning more challenging. My research results suggest that clear boundaries are helpful not only for CPR management generally, but for monitoring and sanctioning in particular.

The challenge “lack of training” is related to the SES framework variable U7, knowledge of SES, but rather than lack of knowledge about the SES, it is lack of knowledge about how best to monitor and sanction. Thus U7 could be modified to include this challenge.

The challenge “threat from wildlife” is a function of the resource system (RS) but is not present in any of the second-tier variables listed in Table 3.1. This is likely because the SES framework focuses on resources being used, rather than the broader resource system context that would include non-resource elements. Expanding the SES to include such resource system elements could make the SES framework more broadly applicable.

6.2 Reasons that community members support M&S
As already discussed, communities in the region have a long history of conservation (U3). Interviewees reported that the primary reason they felt monitoring and sanctioning was important was to make sure that the resources are protected as they are important for sustaining the lives and livelihoods of the communities (U8).

In addition, active user groups motivated monitoring and sanctioning in some cases. But user group engagement varies across different VP types (Types 1-3). User group engagement was observed to be highest in Type 1 cases. The members of user groups mobilize the community and encourage people to contribute to forest management tasks and they also perform monitoring and sanctioning activities. As mentioned in the Section 5, these user groups serve as a mediator both for NGOs and government agencies, so anytime these organizations have to implement a project in the forest it is always easier to reach out to the rest of the community members through the user group committees.

Much of the CPR literature deals with negative sanctions. Even in the SES framework there is no differentiation between negative and positive sanctioning (GS8), but evidence from other research suggests that rewards can motivate increased levels of community participation in monitoring and sanctioning (Ostrom, Walker and Gardner 1992; Yamagishi and Sato 1986), Levitt and List 2007). Results from my research point to the value of positive rewards at the group level. Group level rewards can help strengthen cooperation within groups (Gurerk et al. 2006). For example, I discussed a similar factor: a monitoring award. This award encouraged the collaboration of many community members in cases from Types 1 and 2. Type 1 and 2 village have successfully competed for “best kept forest” awards with resulting pride and new efforts to win again.
My research results also identified “frequent meetings and interactions” as one of the motivating factors for contributing to monitoring and sanctioning. This face-to-face interaction can be a function of facilitative leadership (U5). In the cases of the van panchayats studied, I noted that the leaders took most initiatives for organizing forest management activities, forming groups, and undertaking projects and plans. Leadership, in the case of van panchayats, seems to be crucial for setting and maintaining clear ground rules, building trust, facilitating dialogue and exploring mutual gains (Baland and Pleateau 1996; Ansell and Gash 2011). Other researchers have proposed that facilitative leadership lowers transaction costs as it provides essential meditation and facilitation for reaching agreements, and it lowers cost monitoring costs (Ostrom 2009). It also can play a key role in bringing community members together and getting them engaged in a collaborative spirit (Ansell and Gash 2011).

Availability of adequate technical and financial resources is also one of the driving factors of monitoring and sanctioning mentioned by community members. I noted that both government agencies (GS1) and nongovernmental organizations (GS2) are important sources of technical and financial resources. But there are several factors that impact a community’s ability to access the resource; one is location (RS9). It was reported by the interviewees that being closer to a government agency and/or NGO offices helped them to get more attention and facilitated resource access. These external entities can do much to enhance or impede the likelihood and performance of community-based institutions. Studies have reported that external intervention can stimulate local collective action (Barnes and Learhoven 2013) and support operation of
resource governance at broader scales (Andersson et al. 2014). But there also is evidence that external intervention can act as an impediment and impair successful self-governance by the community (Agrawal et al. 2012). A more detailed discussion of the impacts of government agencies and nongovernmental organizations is provided in the following chapter.

“Sense of ownership,” another factor mentioned by the interviewees, is a function of property-rights systems (GS4). Coleman and Steed (2009) referred to the rights to harvest as “local residual claimancy” and established it as an important determinant of monitoring and sanctioning. While local residual claimancy may enhance levels of local participation in monitoring and sanctioning under some circumstances, it is not clear whether this is true for cases like van panchayats where all forests are publicly owned and the government (GS1) sets the harvest limits. That is a question for further investigation.

Some theorists have argued that evolutionary theories also may help explain the cooperative behavior of individuals in M&S. Per evolutionary theories individuals tend to inherit certain success strategies in their lifetime (Axelrod 1986). In a common-pool resource (CPR) situation, which is susceptible to collective action dilemmas, evolution of cooperative and punishing behaviors is based on the perception of relative scarcity of the good, predictability of resource flows, size of the group, dependence of the group on the good, common understanding of the good by the group, and common understanding of cooperation and the temptation to free ride (Ostrom 2000). My research suggests that,
from this list of factors, dependence of the group on the good (in terms of value placed on sustainability of forest resources) is a key motivating factor.

6.3 External coercion and community self-governance

My research results highlight the role of both external and community-based factors for overcoming the second-order dilemma of monitoring and sanctioning. In general, I observed that external coercion (influence) by government agencies appeared to be more important than that by NGOs. However, the impact of both organizations varied across different group types (Types 1-3). Additionally, scholarship based on selfish, economically rational actors has often emphasized the importance of external coercion. In the case of van panchayats I found that rewards have a motivating effect. Community members expressed a desire to win the “best managed forest award.” Thus, internal coercion also can play an important role, where users penalize those who break user-generated rules. Hence, my research indicates that both external and internal forms of coercion promote cooperation and facilitate monitoring and sanctioning.

7. Conclusion

“Successful collective action is not just about forming groups, it is about being successful in achieving objectives for which the group was formed” (Agrawal 1998, 96). Most studies of collective action have assumed that success in organizing a group and success in achieving the objective for which the group is being organized are the same. Under many conditions, the distinction might not be necessary, but in the case of van panchayats successfully forming a group to protect village forest resources is different
from succeeding in protecting these resources. Once formed, not only must the group create institutions to overcome first-order collective action dilemmas such as free riding and shirking, but it also faces the second-order dilemma of providing monitoring and sanctioning actions to enforce those institutions.

My research identified important challenges to providing monitoring and sanctioning that are not linked to the SES framework and that have not been addressed in the existing literature. Notably, I found that social pressure is one of the key challenges across all the cases that I studied. This finding has implications for resource management in small, tight-knit, interdependent communities and presents a counterpoint to studies that suggest that high social capital should facilitate resource management. My study also unpacked how factors like active user groups, rewards and availability of the financial and technical resources that promote cooperation in a community facilitate M&S. I expand on these findings in the following paragraphs.

My research offers one approach to understanding community-based efforts to overcome monitoring and sanctioning challenges. The comparative case study approach provided the opportunity to understand monitoring and sanctioning processes more in depth and from the perspective of community members.

A limitation of my research is that both challenges and factors that promote M&S were gauged using the frequency with which a limited number of interviewees from each van panchayat reported on each challenge and factors, making the results susceptible to bias and faulty recollection. To correct for this, information was also gathered through group discussions and participant observation to improve the validity of the findings.
Another limitation is that I was unable to investigate the impact of challenges and factors that promote M&S on ecological conditions. I did not include collection of ecological data due to the limited resources available for fieldwork. However, the interviewees’ perceptions serve as a good starting point and useful empirical base for further analysis of “why some people do what they do” to enable a better understanding of community action in natural resource management.

These limitations open new avenues for further research. My research raises important questions regarding which community characteristics and institutional designs are more or less conducive to successfully overcoming collective action problems. Given the finding that the second-tier variables of SES affect GS8, which in turn impacts first-tier variables, it would be useful to pursue more empirical research to test their interactions.
Chapter 4: Applying the Governmental Impacts Framework to Analyze the Impact of the Collaboration of Governments and NGOs in Community-Based Natural Resource Governance

1. Introduction

Collaboration in community-based natural resource management represents an approach that addresses the complexities of natural ecosystems. Collaborative partnerships involving diverse institutional actors (governmental, nongovernmental, and community) attempt to integrate anthropocentric and, more often, ecological needs by incorporating scientific information, stakeholder values, and socioeconomic information to produce better informed and more sustainable resource management decisions (Cortner and Moote 1999; Wondeleck and Yaffee 2000).

Collaborative partnerships can take many forms. Some are comprised of diverse stakeholders including government, industry, environmentalists, and local citizens. Others are grassroots nonprofit organizations that operate with little government support. According to Koontz et al. (2004), a common theme necessary for a management initiative to be considered collaborative is interaction among or between different stakeholder groups as a means for airing diverse viewpoints and generating information that will address increasingly complex environmental problems. These collaborative
partnerships have diverse membership profiles (Moore and Koontz 2003). Research has suggested that a partnership’s membership profile often correlates with group goals, activities, and outcomes (Ibid.).

For my research, I used the Governmental Impacts Framework from Koontz et al. (2004) to examine interactions among collaborators in natural resource management and the social and environmental impacts generated by those efforts. The framework focuses on the role of governments but excludes the role NGOs play. Yet, in many places NGOs play crucial roles in collaborative management (Ghate 2003; Barnes and Laerhoven 2013). In this study, I observed some critical roles played by NGOs in natural resource management in the context of forest management in the central Himalayan region in India. That is, I extended the applicability of the GIF by using the framework to identify specific roles played by both governments and NGOs in community-based natural resource management.

In the preceding chapters, I focused on the self-governance of van panchayats and how they are capable of formulating their own rules and have groups (i.e., user groups) that are actively involved in enforcing those rules. In this chapter, I analyze the activities of external agents, i.e., government agencies and NGOs, and subsequently compare their roles to examine the impact that each has had on community-based natural resource management. My primary objective in this chapter is to answer the following research question:
What is the role of external agents in community-based natural resource management (CBNRM)?

The roles of external agents will be analyzed in terms of their impacts on:

1. Issue definition
2. Structure and decision-making
3. Resource provision and distribution
4. Environmental and social outcomes

2. Literature Review

Self-organized communities are sometimes able to develop their own internal institutional arrangements for regulating, monitoring, and enforcing forest use rules, and they often outperform governments in maintaining healthy and stable forest conditions (Gibson et al. 2000; Hayes and Ostrom 2005; Ostrom and Nagendra 2006; Agrawal and Chhatre 2006; Chomitz et al. 2007; Somanthan et al. 2007; Chhatre and Agrawal 2009).

However, rarely do these institutional arrangements operate without the involvement of external agents. The external agents are mostly government agencies and nongovernmental organizations. The extent of involvement of external agents varies with the type of property regime. Common property regimes, especially in developing
countries, are most likely to have significant levels of involvement by government agencies, which operate at federal, state, and regional levels. It is these government agencies that make most of the decisions regarding regulation and maintenance of CPRs (Andersson et al. 2014). Since resources are governed on multiple levels and scales, they generate “multi-level problems that require multi-level solutions” (Young 2012, 108). Such external intervention has been found to stimulate local collective action (Barnes and Laerhoven 2013) and support operation at broader governance scales (Andersson et al. 2014).

Studies of community-based approaches have also mentioned the importance of external support for self-governance and demonstrated a variety of plausible support functions that external organizations may provide to improve the likelihood of successful self-governance (Ostrom 2005; Agrawal 2001). For example, external organizations can offer legal enforcement of local agreements, share scientific information about the resource system, and provide financial and technical resources as well as facilitate information exchange between local actors and technical experts for smoother operation of local institutions (Ostrom 1990, 2005; Lubell et al. 2002; Andersson 2004). Young (2006, 2012) posits that policy outcomes depend on the performance of local governance arrangements and how well they fit with the governance arrangements at broader governance scales; but these local efforts can at the same time also benefit from the support of other external agents.
Government agencies and nongovernmental organizations can reduce the collective action burden and facilitate management of CPRs by providing necessary support that self-governing institutions might need. But there is also evidence that these external agents can act as an impediment and impair successful self-governance by the community. For example, Joint Forest Management (JFM) in India (as noted in earlier chapters) is a policy linked to political and administrative decentralization and faces criticism as questions are raised against the very essence of participation in the policy. Sundar (2000) shares examples of communities that are being deprived of rights of forest use with the adoption of JFM. Similarly, in the United States, the policy of “ecosystem management,” widely adopted in the early 1990s, was received with great enthusiasm in the beginning; but over time criticism arose as it started becoming clear that the agency’s role was privileged over citizens’ roles (Moseley 2000). In another example, Agrawal et al. (2012) share their findings about motivation crowding\footnote{This refers to external interventions hurting a community’s motivation to maintain its resources.} out in the communities protecting forests in northern India where, through project-based interventions, material incentives were provided to the community to provide services to protect the forest which, in turn, replaced the community’s longstanding nonmaterial incentives (i.e., sense of belongingness, sense of ownership).

The role of external interventions in natural resource management can be described as “yin and yang,” which is to say that agency involvement in natural resource management has both bright and dark sides, and both sides are complementary to each other. Some scholars have criticized the literature analyzing both positive and negative
impacts of external intervention on collaborative natural resource partnerships as inadequate because, according to them, the external agent’s involvement is not fundamentally questioned (Mansuri and Rao 2004). That said, it is important to highlight that most of the collaborative natural resource management literature and much of the commons literature focuses on self-governing capacity and on how local appropriators do not always need outsiders’ assistance. Agrawal (2001) noticed this gap in understanding of the influence of external agents in the commons literature. To this, Andersson (2013) added that, although there are existing studies that have identified the role of external agents in supporting local efforts in resource management, there have been relatively few empirical studies that show what works when. Barnes and Learhoven (2013) attempt to address this gap in their study on the impact of the state forest department and NGOs in the operationalization of JFM in India. However, their study did not take into account federal and local level agency actors and the impact they have on the implementation of JFM. In addition, communities engaged in natural resource management have varying levels of interaction with NGOs and government agencies, which Barnes and Learhoven’s study did not address. In the discussion of my research in this chapter, I use the example of van panchayats in India in order to address this gap in knowledge. My research delved in detail into the roles that nongovernmental organizations and government agencies at federal, state, and local levels play in community-based natural resource management at the local level. I examine those roles to understand how they might facilitate or impede a community’s efforts to sustain its commons.

42 Collaborative NRM discussed here takes place at the local level and focuses on both water and forest
The remainder of this chapter is divided into the following sections: Section 3 provides details of the research design and methods relevant to this chapter, followed by Section 4, which focuses on the institutional analysis and the Governmental Impacts Framework (GIF). Following, Section 5 summarizes the results, Section 6 provides a discussion of these results, and Section 7 concludes.

3. Methods

As with other aspects of my research, the data for the research were drawn primarily from interviews supplemented by group discussions and my own observations. Semi-structured interviews were conducted with government agency personnel, members of the community, and NGO employees. The interview guide/protocol for interviews can be found in Appendix A. As indicated in previous chapters, 100 interviews were conducted, of which 60% were with van panchayat and community members, 15% were with government agency personnel, 15% were with NGO personnel, and the remaining 10% were with social activists and independent researchers. The analysis in this chapter relies on interviews with:

1) NGO employees (N=15) who are directly engaged with the community in forest operations.

2) Van panchayat and community members (N=60), including members of a van panchayat committee, elderly community members, ex-members of the van panchayat committee, and active members of user groups in each village.

resources. Research on NGOs and government agencies in this chapter focuses on the “impacts” of their collaboration with van panchayats/communities.
3) Government agency officials operating at federal, state, and local levels (N=15). A preliminary list of relevant personnel was prepared by inquiring about government agency officials involved in van panchayat administration (see Chapter 2 for details on the procedure for interviews and analysis).

As was the case for other aspects of research discussed in prior chapters, group discussions held with members of the community revealed diverse ideas, opinions, perspectives, attitudes, and beliefs pertaining to van panchayats as local institutions; these were discussed by group participants. In all, six group discussions were held with approximately 30 community members in six different villages (see Chapter 2 Section 3.3 for more details on group discussions and participation observation activities).

4. Institutional Analysis and the GIF

As defined in a previous chapter, institutions are rules, norms, and shared strategies that promote regularity of human action (Ostrom 1990). Institutions are a means to resolve the social dilemmas that result when self-interested individuals pursue actions that do not help members of the collective group. Institutions can, in some cases, prevent Hardin’s (1968) “tragedy of the commons” and resolve collective action and other CPR-related problems (Ostrom 1990; Imperial 2000).

In most CBNRM cases, communities self-organize to form institutions and incur personal costs in an attempt to effectively govern their resources. Individuals are more willing to invest in resource governance if their rights to resource use are secured (Coleman and Steed 2009). Institutions where actors are able to make adjustments to
encourage individuals to act in desirable ways demonstrate flexibility and diversity, where the “ability of the institution to bend, but not break, and to learn through experience, speaks to its ability to manage crisis effectively and efficiently” (Engle and Lemos 2010, 8). Such institutions are called adaptive institutions. Adaptive institutions are able to cope with multiple ambiguous objectives inherent in social-ecological systems (Pahl-Wostl 2009). Foerster (2011) argues that adaptive institutions are necessary for moving towards sustainability outcomes because of their ability to adjust participation from multiple stakeholders with multiple interests that evolve over time. They encourage experimentation with different approaches to respond to challenges that arise, which promotes adjustments to social practices that affect the system (Orlikowski 1996).

Adaptive institutions are thought to help a governance system cope with uncertainty and complexity (Huntjens et al. 2012).

Institutional analysis is a way to examine problems a group of individuals or organizations faces and determine how the rules they adopt influence their interactions and outcomes (Imperial 2001). There are several promising tools that help institutional analysis, including theoretical frameworks, theories, and models (Hardy 2007).

My focus in this chapter is on the theoretical framework developed by Koontz et al. (2004). The Governmental Impacts Framework (GIF) organizes sets of variables for examining collaborative governance, especially the role of government in affecting community-based natural resource management, as described below.
4.1 Governmental Impacts Framework: Its origin and applications

4.1.1 The Institutional Analysis and Development Framework

The Governmental Impacts Framework (GIF) draws heavily from research on the Institutional Analysis and Development (IAD) Framework, developed by Ostrom and her colleagues (1994) and discussed in Chapter 1. The IAD framework provides a “list of variables likely to affect outcomes arising from human interaction in light of biophysical, cultural, and institutional contexts” (see Figure 4.1) (Koontz 2006, 16). At the heart of the IAD framework is the action arena, a conceptual unit of observation involving both actors and the action situation together. This action arena is a social space where interactions take place (Ostrom 2005).

The IAD framework contains no implicit or explicit biases with respect to how policies should be implemented (Imperial 1999). This framework is applicable for studying collaborative ecosystem management cases and is intended to serve as an effective tool for institutional analysis and for evaluating project outcomes (Haeber 1998; Hardy 2007). Also, the IAD is flexible in its application; therefore, analysts can apply the framework for conducting comparative studies for analyzing diverse institutional/collaborative arrangements of natural resource management. The framework allows the analyst to address questions he/she wants to address.
4.1.2 The Governmental Impacts Framework (GIF)

The IAD framework has broad application. It is an effective framework for conducting institutional analysis and for identifying possible variables that arise from interactions among humans in various biophysical, cultural, and institutional contexts. However, despite its flexibility, the IAD framework does not address specific roles that external agents play in collaborative natural resource management scenarios. Koontz et al. (2004) identified this gap and developed a framework that helps in understanding how governments affect collaborative efforts. The framework illustrates how governments serve both as actors and as institutions, and consequently how these roles affect
collaborative environmental management (Koontz 2006). As governmental actors, individuals embody certain skills, values, attitudes, and beliefs that influence collaborative processes and outcomes. Governmental institutions, on the other hand, are the rules, laws, norms, and sociocultural processes of the administrative state that shape human action (Ibid.).

The GIF proposes that governments impact collaborative environmental management via four primary channels (see Figure 4.2):

1. **Issue Definition** (issue framing and biophysical scale) refers to how an issue is framed; i.e., what set of solutions is considered, and which strategic management/restoration activities are the priority for forest management activities. This also refers to the scope and scale of the forest area to be addressed. For example, in my study, the government agency determines the amount of forest area (biophysical scale) allotted to a van panchayat for the community’s use and also ensures the community’s compliance with forest use rules.

2. **Resources for collaboration** include human, technical, and financial resources that facilitate collaborative environmental management processes as per the operational and functional mandates. For example, human resources include volunteers, members of user groups, leaders, etc. These individuals bring knowledge, skills, and experience to the collaborative process. Technical resources include relevant information and the ability to make sense of data about environmental, political, and social contexts. Financial resources come from funds from grants, membership fees, budget allocations, etc.
3. *Group structure and decision making* characterize the way a group is organized (i.e., its membership roles, committees, and the way a group operates). Group decision-making refers to the strategies a group adopts to perform environmental management activities and whether or not consensus is sought. For example, as per the legal Van Panchayat Act, it is established how van panchayat committee is to be formed and the duties that the local Forest Department Officials have in organizing the election assuring formation of the van panchayat committee as per the Van Panchayat Act.

4. *Outcomes:* The GIF identifies both environmental and social outcomes of the collaborative environmental management effort, where environmental outcomes are measured in terms of environmental conditions. Social outcomes include well-being, social capital, mutual trust, and understandings resulting from cooperation among stakeholders (NGOs, government agencies, community members) (Koontz et al. 2004). In my study, both government agency and the NGOs engage the community in forest management tasks that have positive environmental impact on the condition of the forest, further, in the process the community comes together to implement project and that in turn has a positive social impact.
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With its emphasis on governmental impacts, the GIF does not explicitly take into account how external entities that are not governmental may impact collaborative management. This gap is particularly relevant for CBNRM, as NGOs have played important roles in community-based management. Because of this, for my research I examined not only governmental impacts but also NGO impacts on CBNRM in van panchayats as well as the interaction of NGO and governmental impacts on CBNRM. The results discussed below provide a basis for comparing impacts across the three different types of collaborative partnerships with the van panchayats (1: government
agency partners, NGO partners, and user group committee partners; 2: government and NGO partners; and 3: government partner only).

The impact of the external entities was determined based on the data and categorized on a continuum that compares them to each other to determine which are high, moderate and low. There were several measures adopted for this. Conversation and brainstorming sessions with the researchers working in the region were organized and the objective of the research was informed. Further clarifications were also made with other interviewees van panchayat members and guards where questions about impact of government agency and the NGOs was asked and the interviewees were asked to rate the impact as “high”, “moderate” and “weak”. It was observed that the estimation of the level of impact by the interviewees was made based on several indicators, apart from the collaborative partnership in which each van panchayat case was working in, there were other indicators that were also used to confirm the impact of the external agents. For example, to get sense of kind of projects and activities that were being carried out in each of the villages This helped in understanding some of the indicators that could be used to determine the impact of the government agency and the NGOs on the van panchayats. For example, in Type 2 van panchayats, although the impact of government agencies on an average is moderate, in V5 it is high because of the ongoing resin extraction in the forest and because of the presence of presence of government assigned guard. Similarly, NGOs also have a higher impact on V5 because of the vicinity of the village to the NGO office. In V7, high impact of the NGOs in issue definition was observed due to high number of the NGO employees from that village. Overall, it was
observed that the vicinity to the Forest Department office and/or NGO office, having ongoing projects initiated by the government agency or the NGOs are some of the factors that determines the impact that government agency or the NGOs have on community-based activities being carried out by van panchayats.

5. Results

5.1 Issue definition

In this section, I discuss and analyze the impact that the government agencies and the NGOs have on setting forest boundaries for community’s use and also the influence that both these external entities have on regulatory compliance of the van panchayat with forest use policies. As explained above, there are two aspects of issue definition—issue framing and biophysical scale.

5.1.1 Role of Government

In the case of van panchayats, it is the responsibility of the state forest department and local government entities to ensure that communities comply with forest use policies set by state and federal level agencies. I compared governmental impacts on issue definition across the 12 van panchayat cases, grouped by case type (see Table 3.1 for description of group Types 1-3 and see Table 4.1 and Appendix E for details on the role of government in issue definition).

Type 1: The impact of government entities varies across V1–V4. It is high in V1, moderate in V2, V3, and V4. This variation in governmental impact on issue definition for Type 1 cases is mostly due to the level of interaction of the villagers and members of
the van panchayats with the government agency personnel and due to accessibility of each village. In V1, interviewees described the high impact of government agencies on issue definition resulting from the close proximity of the forest department office. “The forest officers visit our forests often and they give us guidelines on the ways we can improve our resource governance.” (Leader, V1) A forest department officer reported that, “We often have the Divisional Forest Officer (DFO) or the Conservator of Forest (CF) or representatives from the Planning Commission come and visit our office. We usually take them to V1 for interaction with community. Since it is close to the office, it is easy to convene a van panchayat meeting on short notice.” In contrast, V2, V3, and V4 experienced moderate impacts: individual interviews and the group discussions offered evidence that there were fewer interactions with forest officers, and it was rare for those officers to visit their forests. The moderate impact of the government agency on V2, 3 and 4 was equated as moderate based on their interactions with forest officers.

Type 2: The impact of government entities varies across V5–V9. It is comparatively high in V5, moderate in V7, V8, and V9, and low in V6. The lower impact of government in V6 can be attributed to the van panchayat’s small forest and population sizes. I observed that government paid more attention to larger forests than to the ones smaller in size. As one community member mentioned during group discussion, “Our forest is so small, we hardly get noticed.” The high impact in V5 is due to the state government’s own ongoing revenue-generating activities in their forest. Part of revenue generation involves resin extraction from the pine trees, which allows the state level Forest Department to steer issue framing towards “forestland preservation.”
moderate impact in V7 and V8 is due to natural resource management projects initiated by government entities in the village. These result in issue framing in V7 and V8 that emphasizes “environmental stewardship for regulatory compliance.”

Type 3: State level and local Forest Department actors have less influence on regulatory compliance in V10–V12 for both environmental stewardship and forestland preservation. For example, one of the interviewees reported that issue definition in V11 came from facilitative leadership and that there is hardly any government agency influence: “Our leader is very active; he has good rapport with all the community members. So, he is the one who takes initiative and makes plans about ways to prevent our forests from getting degraded.” (Van panchayat member, V11) Another interviewee reported that, “Our village has poor accessibility, and that makes it hard for any forest officer to visit us. Due to bad accessibility [roads], there is hardly interaction with any government agency personnel.” (Van panchayat member, V11) Several interviewees noted that V10 and V12 have poor leadership, due to which there is hardly interaction among community members or with forest department officers. One divisional forest officer noted that, just like all van panchayats, V10, V11, and V12 “are independent; we would not offer assistance unless they ask for it.” (Divisional Forest Officer, Nanital District)

In contrast to their varying influence on issue framing, government entities have a uniformly high level of influence on the biophysical scale (is the spatial extent of management). All of the van panchayat cases (V1–V12) operate within a biophysical
scale influenced by size and land use. The biophysical scale is set by the Revenue Department (a district level administrative agency).

Table 4.1: Impact of Government on Issue Definition

<table>
<thead>
<tr>
<th>Type</th>
<th>Issue framing</th>
<th>Biophysical scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>High in V1, moderate in V2, V3, and V4</td>
<td>High</td>
</tr>
<tr>
<td>Type 2</td>
<td>High in V5, moderate in V7, V8, and V9, and low in V6</td>
<td>High</td>
</tr>
<tr>
<td>Type 3</td>
<td>Low in V10–12</td>
<td>High</td>
</tr>
</tbody>
</table>

5.1.2 The Role of NGOs

NGOs\(^{43}\) have little direct impact on issue definition, and they do not have any impact on the biophysical scale. However, they play a key role in communicating government programs and policies to community members. They also support the community in liaising with government officials and understanding the language of officials, and actively discusses and informs the van panchayat committee about their

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\(^{43}\) There are several NGOs working in the area of natural resource management in the region. As mentioned in Chapter 1, I collaborated with one of them--Central Himalayan and Rural Action Group (CHIRAG). Apart from forestry, CHIRAG works on broad range of areas from women health to education to fodder development to poultry. All these projects are community-based, that the NGO carries out with the NGO employees who mostly belong to the local community.
legal rights and responsibilities (see Table 4.2 and Appendix E). NGOs work in close collaboration with Type 1 and 2 cases. As one interviewee explained,

NGOs inform us about government policies regarding rights and responsibilities of the van panchayat towards forest and the way those policies are implemented. They also inform us about which specific government official we should approach for a problem and they always keep us informed about the funding opportunities that are available for our van panchayat. (Van panchayat member, V3)

Table 4.2: Impact and role of NGOs in issue definition

<table>
<thead>
<tr>
<th></th>
<th>Issue framing</th>
<th>Biophysical scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type 1</strong></td>
<td>Indirect impact</td>
<td>No impact*</td>
</tr>
<tr>
<td><strong>Type 2</strong></td>
<td>Indirect impact</td>
<td>No impact</td>
</tr>
<tr>
<td><strong>Type 3</strong>**</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

*NGOs do not have any say in the size of the forest area allotted to the van panchayats.
**Not applicable in Type 3 because of no NGO presence.

5.1.3 Comparing roles of government and NGOs in issue definition

The results show that in many cases government entities play a key role in issue framing and they do so by focusing attention on community compliance with existing laws and policies. Although government agencies at all levels are involved, it is mostly the local level agency actors who directly interact with a community. Moreover, the
government is the only entity that establishes the biophysical scale of management efforts. For example, even in cases where van panchayats are assigned large forest lands, they may be restricted to use of only one part of the forest. Government also establishes the extraction and management activities permitted and whether and under what circumstances van panchayats may sanction abuses. NGOs, on the other hand, play no role in determining biophysical scale. However, they do impact issue framing primarily by explaining the government’s frames to the community.

5.2 Resource provision and distribution

In this section I discuss the human, technical and financial resources that are provided by the government agencies and the NGOs and how that impacts community’s ability to manage its forests.

5.2.1 Role of government actors

Government provides different kinds of resources (human, technical, financial, and material). Government actors operate at federal, state, and local levels to make resources available to communities. In practice, it is the local agency personnel who are most actively involved in providing resources. The state-level agencies (State Administrative Department, Forest Department) delegate responsibilities to local government actors to initiate federal government-aided projects (such as Rural Employment Programs/schemes or Afforestation programs under which forest management is carried out). Also, local government actors play a key role in human resources in terms of conducting van panchayat elections. The government also provides grants, funds, materials, and personnel to help carry out forest management and
restoration activities. The source of grants can be either nationally or internationally funded projects (i.e., JFM, NREGA, CAMPA).

There is a considerable amount of dissatisfaction in the communities with regard to the way government agencies perform their duties. People from all case Types were of the opinion that government agencies do not properly monitor and assess how these funds are used. “Government contributes to forest management, but they don’t ensure that work is done properly; there is lack of monitoring in the tasks performed by the government.” (Van panchayat member, V12) While there were people who complained, on the other hand there were a few who seemed satisfied. “Government [actors] do a lot of work; it is just that they have a different way of doing their work. I am satisfied with the role played by the government.” (Interviewee, V1, Type 1)

Government actors also conduct training workshops, hold meetings, and implement specialized projects to provide technical training. These serve as a great means of interacting with the community (see Appendix E for details). Overall, government agencies and actors are involved in human, technical, and financial resource provision and distribution, which are similar across all 12 cases.
Table 4.3: Impact of government on resource provision and distribution

<table>
<thead>
<tr>
<th>Type</th>
<th>Human</th>
<th>Technical resources</th>
<th>Financial and material resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Mixed: Weak role of federal and state agency personnel but high local agency personnel participation</td>
<td>High state and local government actors’ role</td>
<td>High: Federal programs and state agencies were key funding sources. They provided seeds and saplings for planting</td>
</tr>
<tr>
<td>Type 2</td>
<td>Mixed: Weak role of federal and state agency personnel but high local agency personnel participation</td>
<td>High state and local government actors’ role</td>
<td>High: Federal programs and state agencies were key funding sources. They provided seeds and saplings for planting</td>
</tr>
<tr>
<td>Type 3</td>
<td>Mixed: Weak role of federal and state agency personnel but high local agency personnel participation</td>
<td>High state and local government actors’ role</td>
<td>High: Federal programs and state agencies were key funding sources. They provided seeds and saplings for planting</td>
</tr>
</tbody>
</table>

5.2.2 Role of NGOs

In the cases where NGOs collaborate with the community (Types 1 and 2), they make several types of resources available. NGOs play a key role in providing information about what government policies/plans/projects are about and how they are implemented or can be accessed, they offer training in natural resource management techniques, and build awareness in the community about importance of M&S. All these activities motivate the community to engage in management activities. The NGO personnel are skilled, and they provide science-based information and training on forest rehabilitation
NGOs provide us with important information about managing the forest. They also bring information from outside. They tell people that they are responsible for their forest, tell them to hire the guard, and ask people not to let their cattle graze in the forests. That is why we prefer working with the NGOs than the government agencies; they take better care of us than government. (Ex-leader, V4, Type 1)

NGOs’ greater awareness of the relevance of forests to communities and the importance of sustainability was reflected when interviewees brought up issues like climate change, changing weather patterns, and natural disasters in the region and when they discussed how they related these to changing forest cover. The NGOs also serve as a key source of funding for projects that they initiate in some forests. “NGOs provide training to the community. NGOs contribute funds to help us pay for the guards for monitoring.” (Leader, V2, Type 1)

However, in comparison to the government, NGOs’ funds are modest. Even so, NGOs leverage funds from local communities to undertake forest management activities of interest to those communities. A staff person with an NGO that operates in the region stated:

Our NGOs operate on a shoestring budget, so we have to develop the best strategy to utilize our funds effectively. For example, when we help a village rehabilitate their forest, we work by patches and focus our resources on that patch. We often
do not have enough funds to cover all expenses, so we ask villagers to contribute. For example, we ask the community to cover half of the salary of the guards that we appoint for the sites where a rehabilitation/planting task is being performed. This actually works out great as it increases community participation and engagement in the forest management process. (NGO personnel)

NGOs interact with communities on a one-on-one basis and help a community identify its needs and subsequently address them. “If there was no involvement of the NGO then we probably would have lost our forest. They helped us a lot, gave us seeds and plants, trained us, and helped us do the planting. They engaged us in the process so that we also became more involved in forest management.” (Van panchayat member, V2, Type 1)
Table 4.4: Impact of NGOs on resource provision and distribution

<table>
<thead>
<tr>
<th></th>
<th>Human resource</th>
<th>Technical resources</th>
<th>Financial and material resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>High influence in all cases except V1(^{44})</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Type 2</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Type 3</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

5.2.3 Comparing roles of government and NGOs in resource provision and distribution

Looking at the results it is apparent that there are no significant patterns by type of institutional setup. Across the cases of Types 1 and 2, the government provides more resources than NGOs. However, despite having fewer resources, NGOs are more efficient at utilizing their resources; thus, they have a high impact on van panchayat resources. A plausible reason for this higher efficiency is that these NGOs are more engaged at the grassroots level. In part, this is because they are local; they have a better understanding of the challenges that locals are dealing with and are in a better position to develop strategies to help the community overcome those challenges. One interviewee noted, “Our forest was in a very poor condition. The NGO informed us about all new and old government programs/schemes from which both we people and our forests can benefit. That helped us save our forests.” (Leader, V2, Type 1) Also, the NGO employees are

\(^{44}\) V1 is an exception because currently there are no ongoing NGO projects, there are more government initiated projects that are being carried out in V1.
mainly people who reside in the area and these are among the most active participants. They have a high stake in ensuring tasks undertaken by the NGOs are performed well.

On the other hand, although local government actors engage with the community to implement state or federally funded projects, there is lack of clear understanding among local residents of the administration of these projects (i.e., rules governing access). Given the multiple government agencies that are involved in projects at all levels, it is sometimes unclear which agency is responsible for a certain stage of project implementation. This ambiguity can create confusion among community members, which reduces the effectiveness of these resources: “We initiated the project of boundary wall creation, but couldn’t finish it as we did not receive complete funding. We tried obtaining the remaining part of the funds, but there was no way to find out at which level the funding was stuck.” (Divisional Forest Officer)

In addition to ambiguity in the administration of projects and funding, the system may be negatively affected by corruption. It was consistently reported by community members across all cases that agency personnel took a fraction of the project funding money granted to a van panchayat. “Bribery is a norm; there is a fixed fraction that agency personnel always withdraw before disbursing funds to a van panchayat. There is no one in the government we can complain to about this; they are all corrupt.” (Leader, V3)
5.3 Structure and decision making

In this section I investigate the roles that both government agencies and NGOs play in important group structure decision making and the impact that they have on this process across all three group Types.

5.3.1 Role of government

Although van panchayat committees usually make all decisions pertaining to their structure, they follow guidelines established by the federal agency (Ministry of Environment and Forests) (see Table 4.5 below and Appendix E). There always are government actors present during the elections of van panchayat leaders and committee members to resolve any conflicts that might arise and to ensure that the committee is formed as designated in government guidelines. The committees then develop their own rules by mutual consensus, but committee rules must be in compliance with the formal van panchayat rules established under the Van Panchayat Act.

Type 1: The government’s impact on the group structure of Type 1 cases follows no observable trend. As explained above, the van panchayat committees are formed per the guidelines provided in the Van Panchayat Act. However, variation was observed in the impact government has on decision-making. The impact on V1 is higher in comparison to that on V2, V3, and V4. In V1, interviewees described a decision-making process resulting from ongoing government-initiated programs in the village and regular interaction with government actors. Since the government is well acquainted with V1 and its van panchayat, they initiate activities accordingly and engage in more activities with V1 than with other VPs. In the past there have been plantation and infrastructure
development programs that were initiated by the Forest Department in V1. In contrast, in V2 and V3, during group discussion those present shared that decision making resulted more from interaction among members of the van panchayat and sometimes due to interaction with local NGOs, but rarely through interaction with any government agency personnel.

Type 2: Government’s impact on the group structure of Type 2 cases also follows no observable trend. Just like Type 1 cases, variation was observed in the impact government actors have on decision-making. The impact on V5 and V8 is higher in comparison to other cases in this type, as evidenced by interviewee comments that there are ongoing revenue-generating activities initiated by the local government agency, which fosters regular interaction between community members and government actors. In V8 and V9, there are ongoing government-initiated projects over which a government agency has moderate influence on decision-making. For example, a member from V8 said that under the government MNREGA scheme, boundary walls in the forests were constructed and other restoration work in the forest was done by the community. Government actors did not monitor those projects well. As a result, the government had more influence on villages where there was an ongoing revenue-generating program than in other cases.

Type 3: The government’s impact on the group structure of Type 3 cases also follows no observable trend. As in Type 1 and 2 cases, variation was observed in the impact government actors have on decision-making. Government impact on decision-
making in Type 3 cases varied across cases from moderate to weak. In V10 the impact is weak, as one interviewee described:

Due to lack of leadership in V10 forest, they are unable to implement or initiate an activity. Their panchayat lacks interaction with government agencies. V10 is pretty much on its own and there is nothing they can do about it, because government agencies will not intervene unless [the community] approaches them. (NGO personnel)

In V11 the low impact is due to the area’s lack of accessibility. “V11 is located at a high elevation; there is no motorized road to the village. Therefore, it became hard for the agency personnel to access the village.” (NGO personnel)

Table 4.5: Impact of government on group structure and decision making

<table>
<thead>
<tr>
<th></th>
<th>Group Structure</th>
<th>Decision making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>High</td>
<td>High in V1, moderate/low impact in V2, V3, V4</td>
</tr>
<tr>
<td>Type 2</td>
<td>High</td>
<td>High in V5 and V8, moderate/low impact in V6, V7, V9</td>
</tr>
<tr>
<td>Type 3</td>
<td>High</td>
<td>Low in V10 and V11, moderate in V12</td>
</tr>
</tbody>
</table>
5.3.2 Role of NGOs

NGOs have a moderate to high impact on the van panchayats’ structure and decision-making processes. Interviewees made such comments as, “NGOs regularly visit the community and encourage them to form groups and meet regularly” (Van panchayat member, V2) and “NGO personnel are easily approachable and they are always willing to help us.” (Van panchayat member, V4)

Such influence comes largely through NGOs encouraging user group formation. These user groups consist of individuals who are interested in forest management-related issues and are actively engaged in the activities and decisions related to forest management, including how the van panchayats should be structured and make decisions. An NGO’s role is more of a facilitator; its staff stimulates and mobilizes communities to act on their own. As one interviewee described, “The NGOs never imposed their ideas on us; instead they organized several trainings, workshops and meetings to educate and train the community so that the community members are well aware and are in a better position to make their own decisions.” (Group Discussion, V5) A theme of one group discussion was: “What is the role of NGOs and is there any benefit in working with NGOs?”

The impact that the NGOs have on different cases primarily depends on the level of interaction that the NGO has with the community. For example, the impact on V2, V3, V7, and V9 is high, whereas the impact is moderate on the rest (see Table 4.6 and Appendix E). Cases V2 and V3 have active user group committees and van panchayat leaders and consistently seek guidance from NGOs to improve their resource
management and its governance. In the case of V7, some of the NGO employees are the residents of that village so they always provide information and guidance to the leader and other community members. In case V9, the van panchayat had very recently collaborated with the NGO and so the community was closely working with NGO personnel on some of the restoration projects in their forest.

NGOs vary in their impact on the internal functioning of the group, but they often encourage adoption of consensus during decision-making.

Table 4.6: Impact of NGOs on group structure and decision-making

<table>
<thead>
<tr>
<th>Type</th>
<th>Group Structure</th>
<th>Decision making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>High in V2 and V3 and moderate in V1 and V4</td>
<td>Moderate</td>
</tr>
<tr>
<td>Type 2</td>
<td>High in V7 and V9 and moderate in V5, V6, and V8</td>
<td>High</td>
</tr>
<tr>
<td>Type 3</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

5.3.3 Comparison of roles of government and NGOs

Results show that the government plays a direct, key role in group structure across all cases and a range of roles in decision making in many of the cases. NGOs, on the other hand, had an indirect impact on structure and decision making through facilitating interaction among members of the van panchayat and motivating them to engage in forest management activities. This helps communities become more aware of and interested in
their natural resources and, in consequence, the van panchayat is able to make more informed decisions.

5.4 Environmental and social outputs and outcomes

GIF lumps outcomes and outputs together in the same category. Recent studies have shown, however, that outcomes and outputs are distinct from each other, as outputs can be defined as “plans, projects, and other tangible items generated by collaborative efforts,” while outcomes can be defined as “effects of outputs on the environmental and social conditions” (Koontz and Thomas 2006). Therefore, it could be inferred that outcomes are preceded by outputs. I use “outputs” to describe accomplishments of the collaborative effort, which may eventually lead to the “outcome” of better resource conditions. Focusing on outputs and outcomes in this research made sense where I could measure some of the immediate outputs of the collaborative efforts and observe trends of those outputs to indicate possible outcomes.

5.4.1 Role of government

Government agencies play key roles in van panchayats by implementing projects related to restoration, planting, infrastructure development, and development of micro-plans. The impact of these projects has been mostly moderate. A key limit to the government’s ability to impact outputs and outcomes is the lack of monitoring and assessment of those projects by the agency personnel. As one interviewee described, “Government initiated projects lack proper monitoring due to which these projects are

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45 Environmental outputs included improved forest condition and water resource and social outputs includes increased trust in the community.
either incomplete or not properly carried out.” (NGO employee) After government money is spent, there is virtually no follow-up evaluation, as indicated during group discussions where the theme was roles that the government plays in aiding van panchayats with resource governance. As one Forest Officer said, “There are a lot of administrative departments at local, state, and federal levels that are involved in looking after van panchayats and it is often difficult for all these different administrative agencies to coordinate properly with each other.” Nonetheless, all the community-based projects and activities initiated by the government agency had significant social impacts, as they led to increased participation and trust among community members (see Table 4.7 and Appendix E). For example, one of the interviewees mentioned, “Whenever a project is implemented in the forest the villagers come together to contribute labor. That is the time when we all get a chance to get together and work together.” (Van panchayat leader, V6)

### Table 4.7: Impact of government in social and environmental outcomes

<table>
<thead>
<tr>
<th></th>
<th>Environmental Outcomes</th>
<th>Social Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type 1</strong></td>
<td>High in all cases</td>
<td>High</td>
</tr>
<tr>
<td><strong>Type 2</strong></td>
<td>High in V5, V7, V9 and moderate in V6 and V8</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Type 3</strong></td>
<td>Moderate in V11 and V12 and weak in V10</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
5.4.2 Role of NGOs

NGOs have played a key role across the van panchayat cases in the improvement of forest cover through plantations (saplings), flood control through constructing check dams, recharge of natural water sources, and preservation of native species. These projects were reported to have a positive impact on resource conditions. NGO activities also have an important impact on some communities. NGOs are involved in several activities like capacity building, network building, community education, youth development, women’s health programs, and other outreach programs. Interviews revealed that not only do these activities bring the community together, but they also increase levels of trust among community members (see Table 4.8 and Appendix E). I observed in some cases (such as V3, V4, and V6) that the condition of the forests seemed to be good as long as the NGO was involved. However, the conditions apparently deteriorated after the NGO withdrew its support. For example, one interviewee commented, “The NGO worked on a plot for a few years and they gave money for guards, but after they left the condition of the plot became worse.” (Guard, V12) This is because on the absence of a guard the rate of rule infraction increased.
Table 4.8: Impact of NGO on environment and social outcomes

<table>
<thead>
<tr>
<th>Type</th>
<th>Environmental Outcomes</th>
<th>Social Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Type 2</td>
<td>High in V5, V6, V7, and V9. Moderate in V8</td>
<td>High</td>
</tr>
<tr>
<td>Type 3</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

5.4.3 Comparison of role of government and NGOs

Most of the resources invested by government actors—financial, technical, and human—focus on improving van panchayat capacity and overall environmental conditions. In Types 1 and 2, communities are more aware of the resources available and work closely with the government agency to utilize resources to which they have access. For example, Type 1 villages that work closely with both the government agency and NGOs enjoy the best of both worlds.

When NGOs approach van panchayats and make resources available to them, they also inform the community about the government resources that van panchayats can access. In the past, the implementation of the forest management plans and projects has led to increased forest cover and repair of flood-damaged and dilapidated forest infrastructure (boundary wall, trenches, contours, etc.) (Forest Management Plan 2008).

My research also revealed that the impact of government agencies tends to be based more on funding community activities than on helping communities to organize. NGOs, on the other hand, are reportedly more efficient, not only by providing a source of
funding to the community but especially by helping communities organize themselves to improve forest conditions. In the case of van panchayats, NGOs appear to play a significant role in improving resource conditions—a role that is different from the role of a government agency. But, they do not reach all van panchayats because of their location (distance from some communities) and transportation difficulties.

6. Discussion

In this chapter, I discussed my use of the Governmental Impacts Framework for analyzing interrelationships among government entities (at the federal, state, and local levels) and nongovernmental organizations and to understand how both types of entities/organizations impact natural resource management. The framework helped me to break down the process into its components and enabled me to analyze the impacts of external agents through a focus on the various factors discussed above. This framework, originally based on U.S. cases, was developed to analyze the impact of government actors and institutions on a community’s efforts in NRM; the framework emerged to document how government entities in the US have been collaborating increasingly with communities in their resource management and conservation efforts. Given the important role that NGOs play as external agents in NRM outside the US—especially in the so-called developing countries—the GIF can be applied outside the US to promote understanding of how NGOs’ collaborations may affect a community’s NRM activities.

My research has extended the framework’s application by utilizing it to understand the influence that both government agencies and NGOs have on community-
based NRM in the research setting (see Fig 4.3). By implementing the GIF, I also have been able to shed light on the interactions between NGOs’ roles and government entities’ roles. The results suggest a pattern in how government and nongovernmental participation (or lack of) affects the functioning of van panchayats. While government agencies/actors and NGOs both can play important roles, their impacts on community efforts in NRM are different. Government agencies serve more as a source of funding for management projects/plans/other activities, while the NGOs help communities organize and identify government resources available to them (see Section 5.2.2 for more details).

Although the GIF does not focus on how an external entity becomes engaged with a community effort in the first place, data from my research provide some insight. In the case of the 12 van panchayats, I observed that NGOs tend to work with communities only once they seem to have overcome their collective action dilemma or only when the community expresses its interest in working with NGOs and has shown a willingness to organize. A government agency does not have any choice in the matter. The Van Panchayat Act requires their involvement with every van panchayat. I also observed that the impact that a government agency or NGO had on different Types of van panchayats (1–3) varied somewhat based on the institutional setup of the van panchayat and its level of engagement with the government, NGOs, and/or user group members and also the level of engagement increased with the vicinity of the NGO.
Apart from the institutional setup, I also observed that factors like age of the institution, leadership, and previous history of collaborative activities performed by a community also affected the impact that external agents have on a community’s efforts in NRM. For example, cases of van panchayats in Type 1 are comparatively older than other cases, their leaders are more actively involved, and they have more experience working under external influence.

Type 3 cases provide an important contrast to the other types, as these cases did not have any active NGO involvement. The NGOs extend their support to communities that are organized, and show a willingness to overcome collective action problems. Van
panchayats in Type 3 faced serious challenges for successful resource management because these van panchayats are not active and community members are not that motivated. In addition, these van panchayats also have logistical problems. Therefore, these van panchayats are not able to organize themselves to collaborate with NGOs. Although the leaders of V11, V12, and V13 reported that they had developed proposals for forestry-related work in the past, its impact was not longstanding either because of inadequate/or funds or lack of human and technical resources. In sum, the causal arrow goes in both directions; more successful van panchayats attract NGO collaboration and NGO involvement promotes van panchayat success.

My research suggests some interdependency between NGOs and the government agencies, it emphasizes on the importance of this interdependent nature of NGOs and government agencies. A government interviewee discussed this interdependency in the following terms: “NGOs are crucial in the functioning of van panchayats when the government agencies are inept or incapable of fulfilling their functions.” Additionally, although a government agency has a fixed mandate and policies that are applicable to and implementable in all van panchayats, its plans and policies are not equally implemented across different van panchayat group Types.

7. Conclusion

My research on the roles of governmental entities and external NGOs in community-based natural resource management across 12 van panchayats in the central Himalayan region of India dispels a common idea in the literature that ascribes a limited
role to government agencies in local self governance of natural resources. For example, Ostrom (1990) suggested that successful community-based natural resource management should have external governments serving as a *backdrop* for conflict resolution if needed, but they should not interfere with local users’ governance. Furthermore, Ostrom does not discuss a possible role for external NGOs in fostering successful community governance. Other scholars have identified both positive and negative roles for governments and NGOs (Gibson 2005; Barnes and Leaerhoven 2013; Andersson 2014). But little has been written about *how* governments and NGOs interact with or affect community-based natural resource management. My research can contribute to understanding of possible roles and impacts and, importantly, collaborations for NRM in my research setting.

My analysis revealed that both government entities and NGOs have a substantial impact on issue definition, resources, group structure, decision making, enforcement, and outcomes--but not uniformly so. Cases of the same Type category (1-3) exhibit differences in impact; for example, the government’s impact on issue definition was observed at high, moderate, and weak levels within Type 2 cases. Moreover, government and NGO impacts are interactive, especially for issue definition, resources, group structure (van panchayats) and decision-making, rule enforcement, and outcomes. In my research setting the government provided mainly technical and financial support, while NGOs, in addition to training and empowerment, help to direct community leaders to the resources made available by the government, and work to empower the van panchayats to govern their resources more effectively.
Like any study, mine has limits. Perhaps the most important limitation is that while considering the dynamics in relationships among government agencies, NGOs, and the community, it was difficult to determine to what extent the external entities need to be involved to ensure that they facilitate, rather than hamper, self-governance. While I was able to analyze and compare the varying levels of impact that the government agencies and NGOs have on issue definition, group structure, environment, and social outcome levels, there is still a gap in clear understanding of what works when and why. Nonetheless, my research makes a contribution to understanding the role of government agencies and NGOs, and how they function separately and together in each other’s presence (or absence).

Collaborative and community-based approaches to natural resource management are not likely to diminish in importance. Given the increasing emphasis placed on these approaches and the potential impacts of government agencies and NGOs, more research is required in other settings. Of particular interest is the potential contribution of research to improving policies and practices. Analyzing empirical cases via the GIF, with attention to interactions among local communities, NGOs, and government agencies can provide evidence to explain theoretical links and guide policy makers.
Chapter 5: Conclusion and the Way Forward

In this dissertation, I have examined how communities organize themselves to govern their Common Pool Resources (CPRs), which, in my research setting, are forests. My choice of topic was, as explained in Chapter 1 Section 2.3, a response to shortcomings in CPR studies and theorizing that were identified by others. My research focused on two of these shortcomings:

1) lack of adequate attention to collaborative partnerships, and

2) lack of information on specific rules or strategies in CPR management plans--for example, monitoring and sanctioning (M&S)--that some researchers suggest may be necessary for successful and sustainable natural resource governance (Ostrom 1990; Gibson et al. 2005; Coleman 2009; Andersson et al 2014; Ostrom & Nagendra 2006; Fehr & Gacher 2002; Ostrom, Walker & Gardner 1992).

There is a gap in the literature regarding collaborative CPR partnerships. Most theorists limit collaboration to the role played by “government.” There also is a gap in understanding of the causal pathway of M&S. For example, theories are vague as to what roles the “cooperators” and “willing punishers” play, the challenges that are involved, and the impact that external entities like government agencies and non-government organizations may have on the M&S process (Coleman 2009; Persha et al. 2011; Andersson et al. 2014). My research suggests that addressing all collaboration and causal
process related issues are crucial both to improve theories and models pertaining to common pool resource management and also to produce empirically based practical advice that could be useful for natural resource management.

My research was designed to address these and other specific gaps in knowledge. As discussed in Chapter 1, three general questions guided my research design and fieldwork:

1. What are the circumstances under which government agencies seek collaboration with the local community for the purpose of M&S?

2. Who participates in CPR management, how, why, and with what results?

3. How do the approaches to CPR management of the forest agencies and NGO staff differ from each other and from the approaches of community members?

To address these questions, I carefully selected 12 communities in a region with a long history of CPR management of forests. The sites varied on key characteristics in terms of number of households compared to the size of forest resources, length of time the van panchayat had been functioning (Chapter 1, Table 1.2), and forms of collaboration (or lack of) with government agencies and/or local NGOs. My decision to include different Types of communities and van panchayats (including some that were not functioning as intended) was fruitful as I was able to examine differences in collaborative arrangements, differences in CPR management practices, and a range of challenges to successful M&S approaches across and within the different types. That is, my multiple case study approach supported my goal of analyzing how and why M&S practices and collaborations varied or were consistent across cases. As a result, I was able
to evaluate causal factors related to similarities and differences across cases in the implementation of CPR rules and monitoring and sanctioning of infractions.

As discussed in the preceding chapters, my research and analyses were based primarily on implementation of theoretical principles and frameworks developed and widely-accepted by other CPR scholars. I used Ostrom’s eight design principles to highlight M&S as one of the important principles. The three frameworks that were most important to this dissertation are:

1. Ostrom and colleagues’ (1994) Institutional Analysis and Development Framework (for identifying variables affecting the outcomes arising from human interactions with CPRs);
2. Ostrom and colleagues’ SES framework (for identifying and creating a set of the variables that are likely to affect users’ ability to overcome collective action problems in monitoring and sanctioning);

Contributions to Empirical Knowledge and CPR Practice and Policy Making

An important contribution of my research to empirical knowledge and to future research design is that CPR practices are best understood when all categories of relevant actors are consulted, including external as well as local actors and institutions. This is particularly important to understand challenges to successful M&S from the different
perspectives and experiences of the relevant actors. Relevant actors and institutions include diverse van panchayat and community members (leaders, guards, user group committees, etc.); government agencies and the government personnel who monitor CPR; and outsiders such as NGO staff who also were operating in my research area.

As discussed in preceding chapters, an important empirical contribution of my research is my finding that van panchayats operate in diverse partnerships with government agencies and, in some cases, with NGOs in my study setting. Through multi-level analysis of these collaborations I found that government agencies and personnel play key roles in formulating rules for CPR, designing plans for restoring and preserving forests, providing grants and funds for related projects, and monitoring community compliance with rules. NGOs also collaborate with some communities and they provide training, resource and materials (such as saplings), sometimes labor/assistance (for planting), and they help interpret government rules and explain to community members how to access grants and funding. The role of NGOs in local CPR management has not been studied adequately by other researchers; as a result, this is an important contribution to the literature.

Another contribution to knowledge is the importance of time and place for analyzing CPR. History is very important in the case of van panchayats, as discussed in Chapter 1. The reason that government agencies developed forms of collaboration with community members was a response to violent protests by members of communities that were being denied access to the forests on which they depended (as part of government programs to “develop” those areas and exploit natural resources for economic benefit.
The government of India had to address citizens’ demands and seek a solution that satisfied the needs of both the government and forest communities. Since all van panchayat forests are publicly owned, the government continues to have greater control over forest use through its development of rules and plans for forest management. As a result, government and van panchayat rules and actions are interdependent—van panchayats are in charge of developing local rules and strategies to implement government plans. Although this situation may be unique to India, future researchers should consider the broader legal, institutional and historical context within which CPR evolved.

Another empirical contribution of my research is that I found that both government officials and van panchayats play important roles in sanctioning of rule violations. The government has reserved for itself the power to sanction more important violations—those that result in the highest fines. The government delegates power to van panchayats to develop sanctioning mechanisms for smaller offenses and to collect smaller fines. I also found that van panchayats sometimes seek guidance from government officials regarding how to engage in more effective sanctioning. While investigating the ways that communities engaged in M&S, I also found that there are two types of monitoring methods that were adopted by the van panchayats: Mutual monitoring (local residents) and Third party monitoring (hired guards) (see Chapter 2 for more details). From my research, and given the challenges that van panchayats face for M&S (Chapter
4), I concluded that third-party monitoring seems to work best in situations where forest size is smaller and the forest is within the village limits.46

Other authors have commented on the possible importance of paying attention to the role of gender in effective monitoring (Mwangi et al. 2011; Agarwal 2000). Based on my observations and the interviews, my research confirmed that gender plays an important role in monitoring and in rule violations in this setting. In the interest of improving policies and M&S practices, I suggest that there is a need to foster the participation in M&S of both men and women in order to devise more effective monitoring mechanisms for each particular CPR context. This observation also makes a useful contribution to existing CPR research. Although research has been successful in highlighting the importance of local “people” in M&S, it does not adequately account for the specific role that gender plays and the different impacts that both genders may have on the overall CPR process. Hence, future research is required to explore specific roles, motivations, and challenges of both men and women and to develop a more effective monitoring system.

Another important finding from my research pertains to the challenges involved in implementation of M&S. As discussed in Chapter 3, my research makes an important contribution because I obtained information about the challenges to monitoring and sanctioning through fieldwork with resource users and monitors themselves. This information highlights the importance of inquiring into issues regarding how to reduce social pressures on monitors (to look the other way and not report infractions) and

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46 As discussed in Chapter 2, each village has its own forest, but there are some villages whose forests are located several miles away from the village.
improve the efficiency of M&S in community based natural resource managing institutions such as the van panchayats. More research is needed since this is likely to be a challenge for M&S in other settings. I also found that the efficiency of M&S was improved in some villages by mobilizing most or all community members to cooperate in M&S activities and by promoting mixed monitoring methods (i.e. having both paid, assigned guards and citizen-based mutual monitoring) and by rewarding the outcome of effective M&S.

The reward mechanism that some van panchayats (Type 1) I studied responded to was the incentive represented by a competition for a “best kept forest” award. The community members that have won the prize take pride in the accomplishment. This has led to continued efforts by van panchayats to encourage full community participation. My identification of the importance of an “incentive system” (as opposed to punishment for rule breaking) is another important empirical contribution that my research makes. Most of the CPR literature deals with negative sanctions; the impact and importance of positive sanctioning is still understudied. This finding is relevant also to future policies and programs in other settings that could use positive sanctions and to strengthen cooperation in collective action situations.

Finally, I must return to my finding in Chapter 4 that both government agencies and NGOs play an important role in M&S and that I propose that their roles are interactive or interdependent to some extent. The government provides mainly technical and financial support to van panchayats, while NGOs focus on increasing awareness and empowerment. But importantly, NGOs also help communities with training and in
formation that include directing a community to the resources made available by the government. They also help van panchayats learn how to govern their natural resources successfully. This is an important finding, as it advances understanding not just the impacts that government (at federal, state, and local levels) and NGOs have on community action, but also in understanding how NGOs function in the presence of government agencies. This finding is an important contribution to the CPR management scholarship as most CPR scholarship endorses self-governance and decentralization. It is important to understand the reality that “pure self-governance” in countries like India might not be the best solution. It also is important to understand the roles that ALL external entities like government agencies and NGOs can or do play. In policy making, accurate information regarding capacities of external entities could lead policymakers to possibly advocate for diverse partnerships that could facilitate a more efficient M&S system.

Theoretical Findings and Contributions

In my research, I applied theoretical frameworks developed by the foremost CPR scholars. As discussed in preceding chapters, the frameworks that I found most useful for my researches are: 1. The Institutional Analysis and Development (IAD) Framework (Chapter 2); 2. The Socio-Ecological Systems (SES) Framework (Chapter 3); and 3. The Governmental Impacts Framework (GIF) (Chapter 4).

During research, I identified specific aspects of two frameworks that were not relevant to my research setting and I identified other features that would be important to
understand M&S that were not included in the frameworks I applied. My experience places me in a good position to propose revisions to two of those frameworks: the Socio-Ecological Framework and the Governmental Impacts Framework. I had to make adaptations to these frameworks to improve their usefulness for my research. Below, I propose certain adaptations below that may be equally useful for future research on M&S that implements these frameworks. I also will identify some specific features of these frameworks that were most helpful for my research setting.

I used the Institutional Analysis and Development Framework to guide multi-level rule analysis into how rules pertaining to M&S in my research setting emerged and changed over time. I was aware that government agencies played a crucial role in areas such as establishing resource use limits. The multi-level rule analysis helped me to clarify the kind of interaction that government agencies and the van panchayats have at operational, collective-choice and constitutional-choice levels. The IAD Framework defines how rules at one level can be changed and influenced by other levels. The framework was useful for deconstructing the process of formation of M&S rules in my research setting and for comparing government and van panchayat roles across the three levels.

At first, categorizing institutional rules across the three levels of analysis seemed straightforward. However, when I applied the framework to specific cases, I found that the results indicated that the situation was more complicated. For example and as discussed in Chapter 2, van panchayat committees do not have much of a role to play at the constitutional level, yet in some instances they act at the constitutional-choice level.
when they adopt a monitoring mechanism and appoint guards for M&S. Through multi-level rule analysis, I also was able to identify overlap across what the framework identifies as discrete levels. This overlap across levels is an important finding because for my research setting (and potentially for other settings), it was primarily the process of enforcement that led to the overlap. Using multi-level rule analysis allowed me to distinguish between the government’s primary responsibility for establishing forest management plans and the van panchayats’ responsibility for implementing those plans. Although CPR management often is lauded as an example of decentralized resource governance, the van panchayats are nested within a system in which government entities and local actors interact with each other at varying levels and with differing degrees of authority. My research revealed that this authority is hierarchical (see Chapter 2 section 6).

The Socio-Ecological Systems Framework (Chapter 3) recognizes M&S as an important variable for natural resource governance. I used this framework to explain how M&S relates to other (first tier and second tier) variables that also are part of the SES framework. It was by relating M&S to other variables in the framework that I was able to identify particular challenges to effective M&S and some factors that help individuals to engage in M&S activities.

As I was applying the framework, I became aware of and highlighted in my work some factors that do not directly match the components of the framework. For example, the framework does not address challenges that my research uncovered such as guards losing interest, social pressure, lack of training, and threats from wildlife. As a result, my
research leads me to suggest that future research should address these and other context-specific factors. Further, I suggest that including attention to context-specific variables in the SES framework could enhance its usefulness and contribute to making it more easily applicable to a broader range of contexts and CPR management challenges.

Finally, I found the Governmental Impacts Framework helpful for understanding the role of external factors in M&S, including government agencies and NGOs. As the name suggests, GIF was developed with the intention to analyze the impact of the government (i.e., agencies) on CPR management (see both Chapters 1 and 4 for details). As discussed earlier in this chapter, NGOs play an important role in my research setting and yet they are not included in the GIF. My research, therefore, can make a unique contribution to the framework. I propose that the GIF should be expanded to include the roles of NGOs and possibly other institutions that might be identified in other research contexts. I applied the framework to both government agencies and NGOs and doing so not only helped in understanding the separate impacts that government and NGOs can have on M&S, but it also helped to identify instances when NGOs and certain government agencies intersect in ways that benefit some communities. This can be an important contribution for future research in settings where both operate, particularly given the increased role and influence that local, national and international NGOs have had on resource governance and citizen organizing, especially in the so-called developing countries.
Limitations of the Study

Results from my research are affected by several limitations. First, the selection of 12 cases, while they are diverse, cannot be a basis for generalizing to all the nearly 12,000 van panchayats, or to all cases of community-based natural resource management. Rather, the cases where I conducted research should be used to provide insights into particular mechanisms and processes, should be linked to other studies, and should be used to reconsider and expand on certain details of theories of CPR management.

Second, attempts to obtain quantitative data on rule violations and sanctions were unsuccessful due to lack of availability of such data. The results of research rely largely on interviews, which can be subject to bias and possibly faulty recollection of facts and events. Although I tried to control for this through the use of multiple interviews for each case, the number of interviews in each van panchayat also was small. Therefore, findings may be selective and not representative of a range of perspectives (though group interviews were used to control for this.)

Third, perhaps the most important limitation became clear as I considered the dynamics in the relationships among government agencies, NGOs, and the communities. It was difficult to determine to what extent these external entities should or need to be involved to ensure that they facilitate rather than hamper self-governance. (And not all communities had access to both governmental and NGO involvement.) While my research analyzed and compared the varying levels of impact that the government and NGO entities have in selected communities on issue definition, group structure and
environment, and social outcome levels, there remains an important gap in knowledge regarding what works when and why.

These limitations are important if research such as mine is to contribute suggestions for needed amendments to the Van Panchayat Act and other aspects of government rules and interventions in order to help improve the effectiveness of monitoring and sanctions at the community/government agency/non-government organization level.

These limitations also open new avenues for further research. My research raises important questions regarding which community characteristics and institutional designs are more conducive to successfully overcoming collective action problems. Pursuing such issues can help scholars and practitioners to better understand how communities might successfully meet the challenges of the second-order collective action dilemma of M&S.

**Directions for Future Research**

Research on the commons is proliferating as increasing numbers of scholars are realizing the importance of sustaining CPRs and the complexity that is involved in doing so. New approaches and research designs are being adopted to examine factors that help in sustaining the commons or that create obstacles (for example, see Liu et al. 2007; Folk et al. 2002; Binder et al. 2013).

Current knowledge and theory help us understand institutional factors, different sets of rules, and partnerships that affect collaborative natural resource management.
Future research should build on this research while developing or revising approaches in order to contribute information that would sustain and strengthen community-based institutions.

There are several policies and plans that are being implemented that have manipulated the structure of the institutions in the past thereby contributing to the institutional weakening. Therefore, I suggest that there is a need to thoroughly assess such plans and policies for the possible long-term impacts that they might have on institutions. For example, when a Joint Forest Management (JFM) program was introduced in Kumaon region, it required the formation of a separate forest managing committee. Having another committee in addition to the van panchayat diminished the importance of van panchayats in those villages, thereby leading to weakened institutions due to competing forest management systems. This was predictable. An impact assessment or preliminary research in the area would have identified the potential conflict and measures could have been taken to avoid the confusion and competition. More research is also needed to further document the roles that external entities play in community-based natural resource management. Uncovering the strengths of the communities and community institutions is important, but there may be opportunities for identifying scaling up lessons. I suggest that the commons literature should expand possibilities to accommodate possible roles (the actual roles that the external entities play/might play) for external entities and to recognize the reality in which communities and external entities operate.
Finally, more research is needed to improve understanding of the dynamic nature of socio-ecological systems and incorporate that understanding into building more robust and adaptive institutions that can promote adaptive governance practices. My research provides some initial insights into the nature of dynamic systems and adaptive governance, specifically how effectiveness of M&S (viewed through the SES framework) was found to depend on diverse factors that include technical and financial resources, frequent face-to-face interactions, and clarity of boundaries. My research also points out how the level of M&S effectiveness is related to solving the first order dilemma related to resource governance (see Chapter 3).

My research also highlighted how institutions vary across and adapt to local circumstances. For example, multi-level rule making involved government mandates at the constitutional level that affected collective choice action and, subsequently, van panchayats created operational rules based on their local contexts (size of the forest, status of the forest, number of households, number of cattle in a village). At the same time, I found that local van panchayats were able to adapt collective choice rules when they created the new role of third-party monitor, the guard. Such examples of adaptive institutions suggest that M&S may play a role in promoting necessary adaptations; but more research is needed to better understand these and other aspects of adaptation.
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Appendix A: Field Data Collection Schedule

The following table has information about interviews and group discussions that were conducted during fieldwork. There are four categories based on the source type: 1. Van Panchayats, 2. NGOs, 3. Government Agencies, and 4. Other. The Other category involves researchers, social activists and events attended to increase/improve knowledge about van panchayats and their operation in the region.

The van panchayat interviewees are broken down based on whether they are leaders, members of the van panchayat, guards, ex-members or an elderly resident of a village. Information about the gender is an important part of the data therefore, gender of the interviewees of V1-V12 is coded as M for Male and F for Female.

The data were collected between December 2011-June 2012 and took place in the state of Uttarakhand, India. The state is divided into two administrative units: 1. Kumaon and 2. Garhwal. I worked in the Kumaon region. The Kumaon region is subdivided into several districts. I worked in the Nanital district (the largest district). In addition to villages where was working, I also travelled to Dehradun, the capital of the state of Uttarakhand to meet with government officers that are involved in decision making pertaining to van panchayats.
Table A.1: Field Data Collection Schedule

<table>
<thead>
<tr>
<th>Source by type</th>
<th>Dates</th>
<th>Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Van Panchayats</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V1</td>
<td>Tuesday, Dec 27th, 2011</td>
<td>Group meeting of women of a user group</td>
</tr>
<tr>
<td>V1</td>
<td>Wednesday, Dec 28th, 2011</td>
<td>Van panchayat member (M) and User group member (F) (Total =2)</td>
</tr>
<tr>
<td>V1</td>
<td>Thursday, May 3rd, 2012</td>
<td>Van panchayat leader (M)</td>
</tr>
<tr>
<td>V1</td>
<td>Friday, May 4th, 2012</td>
<td>Van panchayat member (M), user gp member (M and F) (Total = 3)</td>
</tr>
<tr>
<td>V2</td>
<td>Monday, Jan 2nd, 2012</td>
<td>Van panchayat members and guard (Total =4)</td>
</tr>
<tr>
<td>V2</td>
<td>Wednesday, Jan 4th, 2012</td>
<td>User group and van panchayat members (Total =5)</td>
</tr>
<tr>
<td>V2</td>
<td>Friday, February, 24th, 2012</td>
<td>Leader of van panchayat (F)</td>
</tr>
<tr>
<td>V3</td>
<td>Tuesday, Jan 17th, 2012</td>
<td>Group discussion (guard (M), President Van Suraksha Samiti(^1) (F) and user group members (2F) (Total = 4)</td>
</tr>
<tr>
<td>V3</td>
<td>Friday, Jan 20th, 2012</td>
<td>Leader of van panchayat (M)</td>
</tr>
<tr>
<td>V4</td>
<td>Wednesday, Jan 18th, 2012</td>
<td>Leader (M), van panchayat members (2F) and guard (F) (Total =4)</td>
</tr>
<tr>
<td>V4</td>
<td>Saturday, Jan 21st, 2012</td>
<td>Ex leader of the van panchayat (M), ex-leader of gram sabha(^2) (M) and user group members (2F) (Total=5)</td>
</tr>
</tbody>
</table>

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\(^1\) Van Suraksha Samiti (VSS) also is a forest managing council. It was an effort initiated by the state government in the late 1990s where villages that did not have van panchayats were encouraged to form VSS.

\(^2\) Gram Sabha is the village council that takes care of the overall village administration.
<table>
<thead>
<tr>
<th>V5</th>
<th>Thursday, Dec 29th, 2011</th>
<th>Leader (F), Guard (M) and Van panchayat member (M) (Total =3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V6</td>
<td>Tuesday, Jan 3rd, 2012</td>
<td>Leader (M); van panchayat members (M&amp;F); ex-member of the van panchayat (M) (4)</td>
</tr>
<tr>
<td>V7</td>
<td>Friday, Jan 13th, 2012</td>
<td>Van panchayat members (1M&amp;2F) (Total =3)</td>
</tr>
<tr>
<td>V7</td>
<td>Tuesday, February, 27th, 2012</td>
<td>Member of VSS (F) and ex-van panchayat member (M)</td>
</tr>
<tr>
<td>V7</td>
<td>Wednesday, February, 28th, 2012</td>
<td>Member of Van Suraksha Samiti (F) and Leader of van panchayat (M) (Total =3)</td>
</tr>
<tr>
<td>V7</td>
<td>Friday, February, 24th, 2012</td>
<td>Leader van panchayat (M)</td>
</tr>
<tr>
<td>V8</td>
<td>Friday, February, 24th, 2012</td>
<td>Van panchayat leader (M), Guard (F) (Total =2)</td>
</tr>
<tr>
<td>V8</td>
<td>Saturday, February, 25th, 2012</td>
<td>Van panchayat member (F) and user group members (2F) (Total =3)</td>
</tr>
<tr>
<td>V9</td>
<td>Tuesday, Jan 24rd, 2012</td>
<td>Van panchayat meeting</td>
</tr>
<tr>
<td>V9</td>
<td>Thursday, Jan 26th, 2012</td>
<td>Leader of van panchayat (V9)</td>
</tr>
<tr>
<td>V10</td>
<td>Tuesday, Jan 3rd, 2012</td>
<td>Leader of van panchayat (F); Member of van panchayats (M&amp;F) and guard (F) (Total =4)</td>
</tr>
<tr>
<td>V11</td>
<td>Saturday, February 4th, 2012</td>
<td>Guard (F), Senior resident of the village (M) (Total =2)</td>
</tr>
<tr>
<td>V11</td>
<td>Saturday, February 4th, 2012</td>
<td>Van panchayat leader (M), Van Panchayat members (2F) (Total =3)</td>
</tr>
<tr>
<td>V12</td>
<td>Thursday, Jan 19th, 2012</td>
<td>Leader (M), van panchayat members (1M&amp;2F) and guard (F) (Total =5)</td>
</tr>
<tr>
<td>V12</td>
<td>Monday, Jan 23rd, 2012</td>
<td>Group discussion (5M&amp;1F) (Total =6)</td>
</tr>
</tbody>
</table>

Continued
Table A.1 continued

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Van Panchayat in the Upper Himalayan region</td>
<td>Tuesday, June 5th, 2012</td>
<td>Van panchayat leader (F), member of the user group committee (F), village community member (M) (Total = 3)</td>
</tr>
<tr>
<td>Van Panchayat, Almora</td>
<td>Wednesday, June 6th, 2012</td>
<td>Van Panchayat Leader (M)</td>
</tr>
</tbody>
</table>

**NGOs**

<table>
<thead>
<tr>
<th>NGO</th>
<th>Date</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHIRAG, Orakhan</td>
<td>Friday, Dec 30th, 2011</td>
<td>Meeting with 2 NGO employees: 1. Director and 2. Forestry expert</td>
</tr>
<tr>
<td>CHIRAG, Orakhan</td>
<td>Thursday, February 22nd, 2012</td>
<td>Group discussion with NGO employees (Total = 6)</td>
</tr>
<tr>
<td>CHIRAG, Orakhan</td>
<td>Monday, April 23rd, 2012</td>
<td>NGO employee</td>
</tr>
<tr>
<td>AMAN, Almora</td>
<td>Wednesday, June 6th, 2012</td>
<td>Meeting with members of Aman Trust (Social activist group) (Total = 3)</td>
</tr>
</tbody>
</table>

**Government Agencies**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Date</th>
<th>Officer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Department Office, Dehradun</td>
<td>Friday, Feb 19th, 2012</td>
<td>Senior Divisional Officer</td>
</tr>
<tr>
<td>Forest Department Office, Dehradun</td>
<td>Wednesday, April 4th, 2012</td>
<td>Chief conservator of forests</td>
</tr>
<tr>
<td>Bureaucrat, Dehradun</td>
<td>Saturday, May 19th, 2012</td>
<td>Retired Indian Administrative Officer (IAS), Nanital district</td>
</tr>
<tr>
<td>Forest Training Office, Haldwani</td>
<td>Monday, April 16th, 2012</td>
<td>Indian Forest Officer</td>
</tr>
<tr>
<td>Forest Training Office, Haldwani</td>
<td>Tuesday, April 17th, 2012</td>
<td>Indian forest officer</td>
</tr>
<tr>
<td>Bhowali</td>
<td>Saturday, April 21st, 2012</td>
<td>District Forest Officer</td>
</tr>
<tr>
<td>Satkhol</td>
<td>Sunday, April 22nd</td>
<td>Indian forest officer, Manipur cadre</td>
</tr>
<tr>
<td>Nanital</td>
<td>Friday, April 20th, 2012</td>
<td>Chief Forest Officer</td>
</tr>
<tr>
<td>Nathuwakhan</td>
<td>Friday, March 2nd, 2012</td>
<td>2-Range officer and forest guard (Total = 3)</td>
</tr>
<tr>
<td>Other</td>
<td>Wednesday, April 18(^{th}), 2012</td>
<td>Research scholar</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Haldwani</td>
<td>Wednesday, April 18(^{th}), 2012</td>
<td>Research scholar</td>
</tr>
<tr>
<td>Nanital</td>
<td>Friday, April 20(^{th}), 2012</td>
<td>Workshop of van a strengthening</td>
</tr>
<tr>
<td>Dehradun</td>
<td>Thursday, April 6(^{th}), 2012</td>
<td>Research scholar</td>
</tr>
<tr>
<td>Bhowali</td>
<td>Tuesday, March 14(^{th}), 2012</td>
<td>Social activist fighting for rights of van panchayat</td>
</tr>
</tbody>
</table>
Appendix B: Agency Interview Protocol

Questions for agency/NGO personnel:

On duties:
1. What are your duties and responsibilities with regards to managing the Van Panchayat forests?
2. What do you think are the problems in managing panchayati forests? How do you think you can help?
3. What are the benefits of having a Van Panchayat? How will it be helpful in future?

On actual collaborative activities:
1. What types of assistance does your state forest department program offer for collaborative forest management?
2. What are the incentives of the agency/NGO to collaborate with local community?
3. What are some of the direct benefits of collaboration with community?
4. What roles do both you and the community respectively play in collaboration?
5. Van panchayat has its formal rules, how does the Govt. make sure that those rules are properly enforced?
6. How are those rules enforced in reality? Is it the right way? As a Govt/NGO personnel, do you see anything lacking in the way these rules are enforced? What should be done to make sure the rules are enforced properly?
7. What is the role played by the community in enforcement of those rules? How effective do you think it is? Does it have any impact on the condition of the forest? If yes, what and how?
8. Is there any sort of professional training provided to the community to carry out enforcement activities in the forest area? If yes, how?
9. What else is the Govt./NGO doing to make sure the rules are properly enforced?
10. Do you think there has been any success in this process? If yes, how would you measure the success in the process?
11. What are the challenges incurred in the process of enforcement of Van Panchayat rules? How can these challenges be overcome?
12. What do you think will be the future of Van Panchyats? Do you think they will survive in the future?
Appendix C: Community Interview Protocol

I. Ice-breaker questions
1. What is the first thing that comes to your mind when you think of forests? Anything else?
2. Why do you think forests are important?
3. What are the benefits provided by forests?
4. What are the factors important for healthy forest?

II. Demographic:
1. How often do you go to the forest?
2. What do you go to the forests for?
3. How far do you have to walk to get to the forest? How long does it take you?
4. What do people use the forest for?
5. How big is the forest?
a. Number of households:
b. Livestock population:
c. Cattle grazing months:
d. Grass cutting months:

III. Gender role:
1. Do you prefer women leaders? Yes/No
   If you do, why? If you do not, why?
2. Is there conflict during selection of women leaders? 1-3 code (more info)

IV. Management activities:
1. What management activities are performed in your forest? Who is involved? In what capacity?
2. Are you satisfied with it? What other management activities do you think should be done?
3. What are the challenges faced in the management of forests? How do you overcome those challenges?
4. Do you see any difference in the forest now and 5 years before? What differences do you expect to see in the coming 5 years?

V. Motivation:
1. What is your motivation to contribute towards management of forests? How did you get motivated?
2. Have you ever developed a proposal to apply for government funding?
3. Have you received any govt. assistance in any form-scheme or funds?
4. What scheme and what task were carried out? Were you satisfied? Can you provide more details?

VI. Monitoring and Enforcement:
1. Are there any provisions for guarding the forests?
2. How important do you think it is to have a guard?
3. Who is selected to perform the duty of guarding the forests? What is the basis of their selection (education, gender, caste, age)?
4. What are the duties he/she is supposed to perform? What are the challenges involved? What do you think could be motivation/incentives to guard the forests?
5. Are there any legal actions taken against a rule-breaker?
6. Are they trained to deal with rule breakers? How are they informed about the rules?
7. What is your royalty and penalty system? Is it effective? Where does the money go?
8. What would you prefer, a paid guard or an unpaid one? Do you think it is better to delegate responsibilities to community members to guard?
9. Who do you think is more suitable for guarding the forest--local community member or a Govt. guard? Why?

VII. Bio-physical:
1. Do you know what species are in your forest area?
2. Do you know the frequency of each of the species? You can just give an approximation? How do you get that idea?
3. Have you noticed any changes in the number of species in the matter of 5 years?
4. Have you experienced change in the climate in the region? Has it affected you in certain ways?
5. Do you think it has affected the forests in some way? If yes, how?
6. What do you think about the declining Oak trees?

VIII. Collaborative activities:
1. What are the instances when a consensus is required? Is it hard to reach a consensus?
2. In case of conflicting thoughts (vaad vivaad), how is compromise (samjhota) made?
3. What are the measures of collaboration adopted by the community with the agency? Do you think they have been successful?
4. What are the motivations for a community to collaborate with the agencies? Are there any incentives? If there are, what are they?
5. In what way has the collaboration helped the community in managing the forests?
6. How does the community operate (decision rules, meeting times, agenda, committees, etc.) and who all are invited?
7. Do you think there has been any success in this process? If yes, how would you measure the success in the process?
8. Does the community organize meetings to discuss their plans regarding enforcement of forest management policies? Who all attend these meetings? Did this change over time?
9. How often did the group meet to work on the plan?
11. Did the community involvement help in regenerating the degraded forest area? How? Would these things have been done without the group effort?
12. Did the community influence governmental decisions about anything? Explain.

IX. Institutional:
1. How old is your Van Panchayat? How was it constituted?
2. Do you have Van Panchayat meeting? How often do they meet? How do you inform people about the meeting?
3. What do you usually talk/discuss about in the meetings?
4. Are there user groups or other groups also involved in the meetings? How do they contribute?
5. Do you use the Van Panchayat rule-book? How often do you use that?
6. Do you make your own rules? If you do, how do you go about that? How do you inform people about those rules?
7. Do you think people comply with those rules? If yes, why? If no, why?
8. What do you think are the challenges involved in enforcing those rules?
9. How do you think you can overcome those challenges?
10. Given a choice, whom would you prefer to work with-NGO or Government? Why?
11. Do user groups also have their own rules to protect their hamlets or do they share the Van Panchayat rules?
12. How are hamlets demarcated? Do you think you need boundary wall? Why?
13. Do you think that Van Panchayats have changed over a period of time? If so, what changes have you observed?

X. Perception about Government’s role:
1. What is the role of government in forest management? What is the role of government in Van Panchayats? Do you think they have an important role to play? If so, why?
2. How often does a government officer visit the village? What do they do during their visit?
3. Do you feel you are benefitting in any way from the Govt.?
4. Would you like any sort of interference from Govt.? What do you think should be the role of Govt. in Van Panchayats?
5. What are the challenges of working with the government?
6. What do you think about government owned reserved forests? Do you think they should be there?
7. What role do you think the government agency plays in rule-enforcement?

XI. Perception about role of NGOs:
1. What is the role of NGOs? How often does somebody from the NGO visit? What do they do during their visit? Do you feel there is any benefit of having the NGO?
2. Would you like any sort of intervention from NGO? What do you think should be the role of NGO in management of Van Panchayat forests?
3. Do you think there are any challenges associated with working with the NGOs, if so, what are those challenges?

Wrap up questions:
1. In future, what could be the challenges involved in managing forests?
2. In future, what could be the status of Van Panchayat? Do you think it will be effective?
Appendix D: Type of data collected during interviews at the community level

Table D.1: Type of data collected during interviews at the community level

<table>
<thead>
<tr>
<th>Type of Data</th>
<th>Measurement</th>
<th>Rationale</th>
</tr>
</thead>
</table>
| Demographic Data      | Area of village  
                        | Area of VP forest  
                        | Number of households  
                        | Human population  
                        | Livestock population | Demographic process  
                        | influence on forest  
                        | condition.  
                        | Demographic indicators  
                        | take into account both  
                        | human and livestock  
                        | population pressures.  |
| Biophysical Data      | Type of Vegetation  
                        | Change in Vegetation pattern | Biophysical data give  
                        | information about the  
                        | factors influencing change  
                        | in the forests.  |
| Socio-political Data  | Gender relations  
                        | Gender politics |  |
| Utility               | Benefits that villagers get from forest | Higher the utility better is  
                        | the condition of the forest  
                        | because the villagers would  
                        | be more interested in  
                        | protecting the forests with  
                        | greater utility.  |
| Forest condition      | Response for forest  
                        | condition from villagers,  
                        | forest staff, NGO personnel |  |
| Institutional data    | Type of institution  
                        | Age of institution  
                        | Collaborative measures  
                        | adopted by the institution  
                        | Management activities  
                        | Monitoring and sanctioning  
                        | Guards, Fines  
                        | Challenges, Factors that  
                        | promotes cooperation | Institutional variables help  
                        | in examining longevity of  
                        | community institutions-  
                        | differences in their  
                        | functioning- strictness in  
                        | their enforcement are  
                        | related to condition of the  
                        | forest.  |

Continued
| Institutional data | Type of institution  
| Age of institution  
| Collaborative measures adopted by the institution  
| Management activities  
| Monitoring and sanctioning  
| Guards, Fines  
| Challenges, Factors that promote cooperation | Institutional variables help in examining longevity of community institutions- differences in their functioning- strictness in their enforcement are related to condition of the forest. |
| Utility | Benefits that villagers get from forest | Higher the utility better is the condition of the forest because the villagers would be more interested in protecting the forests with greater utility. |
| Forest condition | Response for forest condition from villagers, forest staff, NGO personnel |  |
### Appendix E: Application of GIF

Table E.1: The following table explains the application of Governmental Impacts Framework in all the van panchayats studied during this study (V1-V12).

<table>
<thead>
<tr>
<th>Van Panchayat</th>
<th>Forest area (Ha)</th>
<th>Number of households</th>
<th>Issue definition (State forest department’s influence in 1. Regulatory compliance, and 2. Environmental Stewardship in V1-V12)</th>
<th>Biophysical scale (Forest boundaries defined by the revenue department (District level government agency))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V1</td>
<td>74</td>
<td>50</td>
<td>1. High 2. High</td>
<td>High</td>
</tr>
<tr>
<td>V2</td>
<td>20</td>
<td>52</td>
<td>1. Moderate 2. Moderate</td>
<td>High</td>
</tr>
<tr>
<td>V3</td>
<td>75</td>
<td>75</td>
<td>1. Moderate 2. Moderate</td>
<td>High</td>
</tr>
<tr>
<td>V4</td>
<td>90</td>
<td>40</td>
<td>1. Moderate 2. Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Type 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V5</td>
<td>92</td>
<td>70</td>
<td>1. High 2. High (government guard + leesha)</td>
<td>High</td>
</tr>
<tr>
<td>V6</td>
<td>10.98</td>
<td>35</td>
<td>1. Weak 2. Weak</td>
<td>High</td>
</tr>
<tr>
<td>V7</td>
<td>1.078</td>
<td>65</td>
<td>1. Moderate 2. Moderate</td>
<td>High</td>
</tr>
<tr>
<td>V8</td>
<td>415</td>
<td>350</td>
<td>1. Moderate 2. Moderate</td>
<td>High</td>
</tr>
<tr>
<td>V9</td>
<td>113</td>
<td>250</td>
<td>1. High to moderate 2. High to moderate</td>
<td>High</td>
</tr>
</tbody>
</table>

Continued
Table E.1 continued

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95.8</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V10</td>
<td></td>
<td></td>
<td>1. Moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Weak</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V11</td>
<td>24</td>
<td>80</td>
<td>1. Moderate to weak</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Moderate to weak</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V12</td>
<td>193.926</td>
<td>250</td>
<td>1. Moderate to weak</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Weak</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Existence of policy created government role in issue framing.
Table E.2: NGO’s role in issue definition

<table>
<thead>
<tr>
<th>Van Panchayat</th>
<th>Forest area (Ha)</th>
<th>Number of households</th>
<th>Issue definition</th>
<th>Biophysical scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Local NGOs’ play a role in communicating the frame by supporting community in:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Liaising with government officials and understand the language of officials, policies and official documents.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Actively discuss institutional aspects with the van panchayat committee in V1-V12</td>
<td></td>
</tr>
</tbody>
</table>

**Type 1**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>74</td>
<td>50</td>
<td>1. Moderate</td>
<td>No impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Moderate</td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>20</td>
<td>52</td>
<td>1. High</td>
<td>No impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. High</td>
<td></td>
</tr>
<tr>
<td>V3</td>
<td>75</td>
<td>75</td>
<td>1. High</td>
<td>No impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Moderate</td>
<td></td>
</tr>
<tr>
<td>V4</td>
<td>90</td>
<td>40</td>
<td>1. High</td>
<td>No impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Moderate</td>
<td></td>
</tr>
</tbody>
</table>

**Type 2**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>V5</td>
<td>92</td>
<td>70</td>
<td>1. High</td>
<td>No impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. High</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(student scholarship and NGO vicinity)</td>
<td></td>
</tr>
<tr>
<td>V6</td>
<td>10.98</td>
<td>35</td>
<td>1. High</td>
<td>No impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. High</td>
<td></td>
</tr>
</tbody>
</table>

Continued
Table E.2 continued

<table>
<thead>
<tr>
<th>Type 3</th>
<th>V8</th>
<th>415</th>
<th>350</th>
<th>1. Moderate</th>
<th>2. Moderate  (inefficient leader)</th>
<th>No impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>V9</td>
<td>113</td>
<td>250</td>
<td>1. High</td>
<td>2. High New partnership hence higher enthusiasm</td>
<td>No impact</td>
<td></td>
</tr>
<tr>
<td>V10</td>
<td>95.8</td>
<td>40</td>
<td>No impact</td>
<td>No impact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V11</td>
<td>24</td>
<td>80</td>
<td>No impact</td>
<td>No impact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V12</td>
<td>193.926</td>
<td>250</td>
<td>No impact</td>
<td>No impact</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table E.3: Government agency role on resource distribution

<table>
<thead>
<tr>
<th>Van Panchayat</th>
<th>Human resources</th>
<th>Technical resources</th>
<th>Financial and material resources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>State and local government actors provide information and expertise. (For V1-V12)</td>
<td>Federal programs and state agencies were key funding sources. They provided seeds and saplings for plantation.</td>
<td></td>
</tr>
</tbody>
</table>

Type 1

| V1 | Weak participation of federal and state but high participation of local agency personnel in local forest governance activities. | High | High |

Continued
Table E.3 continued

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Weak participation of federal, state, but high participation of local actors in local forest governance activities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>V2</td>
<td></td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V3</td>
<td>Local governmental actors conduct van panchayat elections.</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V4</td>
<td>Local governmental actors conduct van panchayat elections.</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

**Type 2**

| V5 | Local governmental actors conduct van panchayat elections. | High | High |
| V6 | Local governmental actors conduct van panchayat elections. | High | High |
| V7 | Local governmental actors conduct van panchayat elections. | High | High |
| V8 | Local governmental actors conduct van panchayat elections. | High | High |
| V9 | Local governmental actors conduct van panchayat elections. | High | High |

**Type 3**

| V10 | Local governmental actors conduct van panchayat elections. | High | High |
| V11 | Local governmental actors conduct van panchayat elections. | High | High |
| V12 | Local governmental actors conduct van panchayat elections. | High | High |
### Table E.4: NGOs role on resources

<table>
<thead>
<tr>
<th>Van Panchayat</th>
<th>Human resources</th>
<th>Technical resources</th>
<th>Financial and material resources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NGO personnel act as facilitator and provide information, training, awareness. Actively involved with the community in restoration work in V1-V12</td>
<td>NGO’s role in providing science based information and training on forest rehabilitation and regeneration activities in V1-V12</td>
<td>NGOs funds projects they initiate in the villages in V1-V12</td>
</tr>
<tr>
<td></td>
<td><strong>Type 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V1</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V2</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V3</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V4</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td><strong>Type 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V5</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V6</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V7</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V8</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V9</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td><strong>Type 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V10</td>
<td>No impact</td>
<td>No impact</td>
<td>No impact</td>
</tr>
<tr>
<td>V11</td>
<td>No impact</td>
<td>No impact</td>
<td>No impact</td>
</tr>
<tr>
<td>V12</td>
<td>No impact</td>
<td>No impact</td>
<td>No impact</td>
</tr>
</tbody>
</table>

220
Table E.5: Government’s role in structure and decision-making

<table>
<thead>
<tr>
<th>Van Panchayat</th>
<th>Structure</th>
<th>Decision making</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Local government actors are in leadership positions and they make important group structure decisions during election of the van panchayat committee.</td>
<td>1. Government officials encourage community to follow government laws and policies and make decisions in accordance with laws.</td>
</tr>
<tr>
<td></td>
<td>2. Federal government makes decision about group structure.</td>
<td>2. State forest department makes sure van panchayat drafts rules pertaining to major forest use in accordance with formal rules and that those rules are enforced accordingly in V1-V12.</td>
</tr>
<tr>
<td></td>
<td>There is a policy for the number of people to be elected to Van Panchayat Committee, strategy of election. Seats reserved for women. All these conditions have been set by the Van Panchayat Act. The revenue office that conducts the election makes sure that election of the committee takes place as per the rules.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. State and local actors share responsibilities for implementing federal policies and projects</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type 1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>1. High</td>
<td>1. Moderate</td>
</tr>
<tr>
<td></td>
<td>2. High</td>
<td>2. High</td>
</tr>
<tr>
<td></td>
<td>3. High</td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>1. High</td>
<td>1. Weak</td>
</tr>
<tr>
<td></td>
<td>2. High</td>
<td>2. Moderate</td>
</tr>
<tr>
<td></td>
<td>3. Moderate to weak</td>
<td></td>
</tr>
<tr>
<td>V3</td>
<td>1. High</td>
<td>1. Weak</td>
</tr>
<tr>
<td></td>
<td>2. High</td>
<td>2. Moderate</td>
</tr>
<tr>
<td></td>
<td>3. Moderate to weak</td>
<td></td>
</tr>
<tr>
<td>V4</td>
<td>1. High</td>
<td>1. Weak</td>
</tr>
<tr>
<td></td>
<td>2. High</td>
<td>2. Moderate</td>
</tr>
<tr>
<td></td>
<td>3. Moderate to weak</td>
<td></td>
</tr>
</tbody>
</table>

Continued
Table E.5 continued

| Type 2 | V5 | 1. High  
| 2. High  
| 3. Moderate to weak | 1. Moderate  
| 2. High  |
| V6 | 1. High  
| 2. High  
| 3. Moderate to weak | 1. Weak  
| 2. Moderate |
| V7 | 1. High  
| 2. High  
| 3. Moderate to weak | 1. Moderate  
| 2. Moderate  
| Due to water preservation project and because it is a VSS. |
| V8 | 1. High  
| 2. High  
| 3. Moderate to weak | 1. Moderate  
| 2. High  
| (Higher visibility of the forest and easily accessible) |
| V9 | 1. High  
| 2. High  
| 3. Moderate to weak | 1. Moderate  
| 2. Moderate |

| Type 3 | V10 | 1. High  
| 2. Weak (no elections since last two consecutive sessions)  
| 3. Weak | 1. Weak  
| 2. Weak |
| V11 | 1. Moderate  
| 2. High  
| 3. Moderate (accessibility of the VP) | 1. Weak  
| 2. Weak (accessibility) |
| V12 | 1. High  
| 2. High  
| 3. Moderate | 1. Moderate  
| 2. Moderate |
Table E.6: NGO’s role in structure and decision-making

<table>
<thead>
<tr>
<th>Van Panchayat</th>
<th>Structure</th>
<th>Decision making</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(No impact on Van Panchayats, but NGOs encourage formation of informal groups that help improve effectiveness of van panchayats)</td>
<td>(Community mobilization, capacity building, empowerment)</td>
</tr>
<tr>
<td><strong>Type 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V1</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>V2</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V3</td>
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<td>High</td>
</tr>
<tr>
<td>V4</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Type 2</strong></td>
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<td></td>
</tr>
<tr>
<td>V5</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>V6</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>V7</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V8</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>V9</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td><strong>Type 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V10</td>
<td>No impact</td>
<td>No impact</td>
</tr>
<tr>
<td>V11</td>
<td>No impact</td>
<td>No impact</td>
</tr>
<tr>
<td>V12</td>
<td>No impact</td>
<td>No impact</td>
</tr>
</tbody>
</table>

*NGO’s role is more of a facilitator; they stimulate and mobilize the communities to act on their own.
Table E.7: Government’s role in environmental and social outcomes

<table>
<thead>
<tr>
<th>Van Panchayat</th>
<th>Environment Outcomes</th>
<th>Social Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Government implemented projects related to restoration, plantation, infrastructure development. And development of micro-plans.</td>
<td>Implementation of government programs and projects spurred interest in the community in the beginning, but it dies soon due lack of proper monitoring and assessment of the projects.</td>
</tr>
<tr>
<td></td>
<td><strong>Type 1</strong></td>
<td></td>
</tr>
<tr>
<td>V1</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V2</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>V3</td>
<td>High</td>
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</tr>
<tr>
<td>V4</td>
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<td>Moderate</td>
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<tr>
<td></td>
<td><strong>Type 2</strong></td>
<td></td>
</tr>
<tr>
<td>V5</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>V6</td>
<td>Moderate</td>
<td>Weak</td>
</tr>
<tr>
<td>V7</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>V8</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>V9</td>
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<td>Moderate</td>
</tr>
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<td></td>
</tr>
<tr>
<td>V10</td>
<td>Weak</td>
<td>Weak</td>
</tr>
<tr>
<td>V11</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>V12</td>
<td>Moderate</td>
<td>Weak</td>
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Table E.8: NGO’s role in environmental and social outcomes

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<tr>
<th>Van Panchayat</th>
<th>Environmental Outcomes</th>
<th>Social Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Improvement of forest cover</td>
<td>Network building</td>
</tr>
<tr>
<td></td>
<td>Flood control</td>
<td>Community education</td>
</tr>
<tr>
<td></td>
<td>Recharge natural water sources</td>
<td>Forestry literacy</td>
</tr>
<tr>
<td></td>
<td>Preservation of native species</td>
<td>Community outreach</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Citizen participation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>increased</td>
</tr>
<tr>
<td>Type 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V1</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V2</td>
<td>High</td>
<td>High</td>
</tr>
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<td>V3</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>V4</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Type 2</td>
<td></td>
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<tr>
<td>V5</td>
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<td>High</td>
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<tr>
<td>V6</td>
<td>High</td>
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<tr>
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<tr>
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<tr>
<td>V9</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Type 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V10</td>
<td>They had some interference from NGOs earlier, which led to the formation of women’s user group, but with the withdrawal of support the effectiveness of those groups died with time. As of now there is no NGO working, hence there is no impact of the NGO observed.</td>
<td>No impact</td>
</tr>
<tr>
<td>V11</td>
<td>No impact</td>
<td>No impact</td>
</tr>
<tr>
<td>V12</td>
<td>No impact</td>
<td>No impact</td>
</tr>
</tbody>
</table>

V10: They had some interference from NGOs earlier, which led to the formation of women’s user group, but with the withdrawal of support the effectiveness of those groups died with time. As of now there is no NGO working, hence there is no impact of the NGO observed.
Appendix F: IRB Approval Letter
December 13, 2011

Protocol Number: 2011E0668
Protocol Title: COMMUNITY PARTICIPATION IN FOREST MANAGEMENT: EXPLAINING ENFORCEMENT MECHANISMS, TOMAS KOONTZ, DIVYA GUPTA, SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES
Type of Review: Request for Exempt Determination

Dear Dr. Koontz,

The Office of Responsible Research Practices has determined the above referenced protocol exempt from IRB review.

Date of Exempt Determination: 12/09/2011
Qualifying Exemption Category: 2

Please note the following:

- Only OSU employees and students who have completed CITI training and are named on the signature page of the application are approved as OSU investigators in conducting this study.
- No changes may be made in exempt research (e.g., personnel, recruitment procedures, advertisements, instruments, etc.). If changes are needed, a new application must be submitted.
- Per university requirements, all research-related records (including signed consent forms) must be retained and available for audit for a period of at least three years after the research has ended.
- It is the responsibility of the investigator to promptly report events that may represent unanticipated problems involving risks to subjects or others.

This determination is issued under The Ohio State University’s OHRP Federally Assured 

All forms and procedures can be found on the ORRP website – www.orrp.osu.edu. Please feel free to contact the ORRP staff contact listed below with any questions or concerns.

Cheri Pettay, MA, Certified IRB Professional
Senior Protocol Analyst—Exempt Research
Office of Responsible Research Practices
Ohio State University
1960 Kenny Road
Columbus, OH 43210
Phone: 614.688.0389
Fax: 614.688.0366
email: pettay.6@osu.edu

Exempt Determination
Version 1.2