Part 3
Field Studies

In the next five chapters, we shift from the laboratory setting of part 2 to an empirical analysis of data obtained in field settings. These chapters provide an overview of some of the forms of self-organization observed in CPR field settings in four sectors: irrigation, inshore fisheries, forestry, and groundwater. The first four chapters describe settings where CPR appropriators have relied to some extent on patterns of reciprocity but have also devised rules backed by sanctions to cope with the problem of punishing noncooperators. These chapters illustrate the capabilities of appropriators facing CPR problems to craft rules that change the structure of the situations they face, fostering more effective use of the CPR. On the other hand, examples are also given where self-organization has clearly not been successful.

Evidence from previous field studies can be classified into four broad categories.

1. Clearly suboptimal outcomes—appropriators’ behavior has led to high levels of conflict, overuse, and, in some cases, to the destruction of the resource upon which appropriators’ livelihood depends.¹
2. Long-lived, endogenous monitoring and sanctioning systems—appropriators have designed rules regulating the entry and appropriation from a CPR that are enforced by the appropriators themselves.² Outcomes may not achieve optimality, but come close enough for appropriators to continue investing in costly monitoring and sanctioning.
3. Short-lived, endogenous monitoring and sanctioning systems—appropriators cease to monitor and sanction after an exogenous shock, such as a major change in factor prices, a dramatic increase in popula-

¹ See Christy and Scott 1965; Bell 1972; McHugh 1972; and Sandberg 1991a.
tion, or declaration by an external government of its jurisdiction over the resource.  

4. Short-lived, exogenous monitoring and sanctioning systems—external authorities impose rules regulating entry and appropriation but fail to enforce these rules.  

Evidence from the first category is not surprising. This evidence is consistent with predictions derived from widely accepted theories of collective action, particularly applied to natural resource settings. The evidence from the other three categories is, on the other hand, surprising, but for different reasons. Evidence from the second category illustrates the capability of appropriators to design their own institutions and willingness to invest time and effort in monitoring and sanctioning. This is the type of behavior exhibited in most of the experimental CPRs where a choice of rules was made available to subjects. This is not, however, the typical result predicted by most current theories. Evidence from the third category illustrates that endogenously designed systems can collapse. This is not so surprising, given the catastrophic nature of the shocks involved in many of these settings. What is surprising from a theoretical perspective is that such endogenous institutions existed without external enforcers for substantial periods of time prior to collapse. Evidence from the fourth category illustrates that the remedies so often prescribed for solving CPR problems are frequently ineffective.

The results in the next four chapters are consistent with evidence from categories 1, 2, and 4 above. In chapters 12 and 13, respectively, Agrawal and Blomquist identify CPRs where appropriators do not cope effectively with CPR dilemmas (category 1). All four chapters, however, document the existence of long-lived monitoring and sanctioning systems (category 2). In chapter 10, Tang’s analysis of the difference in performance between farmer-owned and government-owned irrigation systems strongly finds that rules devised by external authorities are frequently ineffective (category 4). None of the chapters identify short-lived endogenous monitoring and sanctioning systems (category 3). However, there is no doubt that such systems exist in field settings. We now provide a short preview of the next four chapters.

In chapter 10, Shui Yan Tang focuses attention on the CPR problems faced by those who provide, maintain, and utilize irrigation systems around the world. He develops a performance measure related to both the provision


and appropriation of CPRs. He uses this measure to evaluate the effectiveness of different boundary and allocation rules used by government-owned and farmer-owned irrigation systems. He also investigates the provision of rules, the monitoring of rules, and the enforcement of rules. He finds that irrigation systems where farmers have provided their own rules tend to perform better than systems owned and operated by central government authorities.

In chapter 11, Edella Schlager examines three types of problems faced by inshore fishers. She develops a conceptual argument for why endogenous solutions to assignment problems and technological externality problems are more likely to develop than endogenous solutions to appropriation externalities. She examines the types of rules used by 33 organized subgroups of fishers, illustrating how most of them relate to the allocation of space rather than to the allocation of quantity of fish. She also finds strong evidence that fishers monitor rules they themselves create.

In chapter 12, Arun Agrawal explores self-organization in the context of several Indian forests. He focuses primarily on the problem of time-independent appropriation externalities and assignment problems. Documenting several different institutional arrangements that have evolved, he shows how successful arrangements involve a very major investment in sanctioning and monitoring. In contrast, those villages not investing heavily in monitoring and sanctioning have forests that are characterized by a higher level of degradation.

In chapter 13, William Blomquist focuses on single-period and time-dependent appropriation externality problems in the context of four groundwater basins in southern California. These appropriation externality problems are ever present in the use of a groundwater basin when the demand for water approaches or exceeds the average natural recharge of water to the basin. Blomquist illuminates the process of crafting new rules in a complex setting where large groups cope with complex CPRs. Here, the design of new institutions is facilitated (but not guaranteed) by the presence of government agencies that can provide reliable information and arenas for the enforcement of contracts.

The final chapter in this section identifies the commonalities that occur in the self-organized CPRs described in chapters 10–13. Most of these commonalities relate to the presence or absence of key rules, in particular boundary rules and authority rules. This chapter explores the crucial interaction between physical and institutional variables that affects the ability of CPR appropriators to devise and maintain their own rules.