GOVERNING THE COMMONS

The governance of natural resources used by many individuals in common is an issue of increasing concern to policy analysts. Both state control and privatization of resources have been advocated, but neither the state nor the market has been uniformly successful in solving common-pool resource problems. After critiquing the foundations of policy analysis as applied to natural resources, Elinor Ostrom here provides a unique body of empirical data to explore the conditions under which common-pool resource problems have been satisfactorily or unsatisfactorily solved.

Dr. Ostrom first describes three models most frequently used as the foundation for recommending state or market solutions. She then outlines theoretical and empirical alternatives to these models in order to illustrate the diversity of possible solutions. In the following chapters she uses institutional analysis to explore different ways – both successful and unsuccessful – of governing the commons. In contrast to the propositions of the "tragedy of the commons" argument, common-pool problems sometimes are solved by voluntary organizations rather than by a coercive state. Among the cases considered are communal tenure in meadows and forest, irrigation communities and other water rights, and fisheries.

Governing the Commons makes a major contribution to the analytical literature on institutions and to our understanding of human cooperation.

Elinor Ostrom is co-director of the Workshop in Political Theory and Policy Analysis and professor of political science at Indiana University.

Additional Praise for *Governing the Commons*:

"This is an important book that deserves to be read widely in the policy community as well as the scholarly community. . . . This analysis leaves us with provocative questions whose examination promises to broaden and deepen our understanding of human/environment relationships at many levels."
– Oran R. Young, *International Environmental Affairs*

"Cambridge University Press has published an impressive series called 'The Political Economy of Institutions and Decisions.' Elinor Ostrom, Professor of Political Science at Indiana University, has made an important contribution to the series with *Governing the Commons*. . . . In large part, the book is a fascinating and detailed examination of common ownership of various natural resources."
– Dean Lueck, *Constitutional Political Economy*

"Ostrom's book makes an important contribution to the emerging literature on analytical institutional economics. Her work reminds us that analysis of institutions and institutional change is an important aspect of a broader political economy that underlies meaningful economic policy advice."
– Daniel W. Bromley, *Journal of Economic Literature*

"This is the most influential book in the last decade on thinking about the commons. For those involved with small communities . . . located in one nation, whose lives depend on a common pool of renewable resources . . . *Governing the Commons* has been the intellectual field guide."
– *Whole Earth*

GOVERNING THE COMMONS

The evolution of institutions for collective action

ELINOR OSTROM
Indiana University

CAMBRIDGE UNIVERSITY PRESS

CAMBRIDGE
UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning and research at the highest international levels of excellence.

www.cambridge.org
Information on this title: www.cambridge.org/9781107569782

First published 1990
29th printing 2011
Canto Classics edition 2015

Printed in the United Kingdom by Clays, St Ives plc

A catalog record for this publication is available from the British Library.

ISBN 978-1-107-56978-2 Paperback

To Vincent
For his love and contestation

Contents

Preface

It is difficult to say when I began work on this study. If one asks when I first began to study problems of collective action faced by individuals using common-pool resources, then identifying the beginning is easier. In the early 1960s, I took a graduate seminar with Vincent Ostrom, who was to become my closest colleague and husband. The seminar focused on the development of institutions related to water resources in southern California. I began my dissertation focusing on the entrepreneurship involved in developing a series of public enterprises to halt the process of saltwater intrusion into a groundwater basin underlying a portion of the Los Angeles metropolitan area. A fellow graduate student, Louis Weschler, conducted a parallel study in an adjacent groundwater basin that adopted different institutional arrangements to cope with similar problems. As Weschler and I completed our studies, it appeared that both institutional arrangements had been successful in enabling the water producers to avoid the catastrophic economic loss that would have occurred if both basins had been inundated by the Pacific Ocean (E. Ostrom 1965; Weschler 1968).

In the late 1960s, Vincent and I participated in the Great Lakes Research Program initiated by the Batelle Memorial Institute (V. Ostrom and E. Ostrom 1977b), but most of my work as a young faculty member focused on problems of urban service delivery and public economies in metropolitan areas. In 1981 I was asked by Paul Sabatier, a colleague for a year at the Center for Interdisciplinary Research at the University of Bielefeld, to make a seminar presentation on "organizational learning." I used as my example of organizational learning the set of rules that groundwater producers had developed in the southern California groundwater basins. Paul then wanted to know why I was so confident that the systems I had studied

15 years earlier were still operating and performing well. At the time, I had no effective answer other than that the institutions had been so well crafted to fit local circumstances that I presumed they had survived and were faring well.

When I returned from Bielefeld, I suggested to one of my doctoral students, William Blomquist, that he answer Sabatier's question as his dissertation. Blomquist (1987b) found that the institutions that the water producers themselves had designed were still in place and operating effectively. The physical condition of the basins had improved substantially. The very substantial "success" involved in these cases led us to undertake a study, funded by the U.S. Geological Survey (grant number 14-08–0001-G1476), of a larger set of groundwater basins in southern California and a limited set in northern California to ascertain what factors were associated with the successful evolution of new institutions and with the efficiency and equity of those institutions. Eventually, we will have completed a comparative study of institutional, economic, and physical changes in 12 groundwater basins over a 30–50-year period.

Although I have been excited about what one can learn from a concentrated effort to study a dozen groundwater basins and the institutions that have evolved for their governance and management over time, such studies alone are not sufficient for the development of a broader theory of institutional arrangements related to the effective governance and management of common-pool resources (CPRs). One needs similar information from many other settings to begin to gain the empirical base necessary to improve our theoretical understanding of how institutions work and how individuals change their own institutions.

My awareness of the possibility of using detailed case studies written by other authors to obtain a sufficiently rich empirical base for understanding CPRs came about as a result of joining the National Academy of Sciences' "Panel on Common Property Resource Management" in 1985. By the time I was asked to join the panel, its members had commissioned a series of papers to be written by field researchers. The authors were all asked to organize their papers using a framework prepared by Ronald Oakerson (1986). That meant that all of the papers would address not only the physical properties of the resource systems but also what types of rules were used to regulate entry and use of these systems, what types of interactions resulted, and what types of outcomes were obtained. The papers were presented at an international conference in Annapolis and were published by the National Academy Press (National Research Council 1986). Some of those papers and some new chapters have been brought together in a new volume (Bromley in press).

Reading those studies, as well as some of the studies cited by those authors, made me aware of two major facts: First, an extraordinarily rich case-study literature already existed, written by field researchers who had invested years of effort in obtaining detailed information about the strategies adopted by the appropriators of CPRs and the rules they used. Second, that literature had been written by authors in diverse fields and frequently had appeared in obscure publications. Almost no syntheses of the findings from that literature had been undertaken.

Several colleagues at Indiana University began to collect citations to relevant cases, and within a short time Fenton Martin, who compiled the resultant bibliography, had identified nearly 1,000 cases. More recently, the number was approaching 5,000 (Martin 1989). The disciplines represented in the bibliography include rural sociology, anthropology, history, economics, political science, forestry, irrigation sociology, and human ecology; included also are area studies, such as African studies, Asian studies, West European studies, and so forth. Scholars had cited primarily studies conducted by others in their own disciplines and perhaps others focusing on the same resource sector or geographic region. Few citations had come from outside each author's disciplinary, sectoral, or regional frame of reference. Consequently, a vast amount of highly specialized knowledge had been accumulated without much synthesis or application of the knowledge to the policy problems involved.

Given the importance of understanding how institutions help users cope with CPR problems, and given the existence of a rich theoretical literature concerning these problems, it seemed to me that it was important to use these case studies as an empirical basis for learning more about the effects of institutions on behaviors and outcomes in diverse field settings. With the help of a grant from the U.S. National Science Foundation (grant number SES 8619498), several colleagues and I have been able to gather many of these cases into an archive. We have systematically screened these cases and selected a much smaller subset for further scrutiny, coding, and analysis. Our selection criteria required that the case be written as a result of extended fieldwork and that information be provided about (1) the structure of the resource system, (2) the attributes and behaviors of the appropriators, (3) the rules that the appropriators were using, and (4) the outcomes resulting from the behaviors of the appropriators. We have now developed a structured coding form that enables us to transform the in-depth qualitative data into a structured data base amenable to quantitative analysis.

The development of the coding forms was itself an exercise in theory development. We used the method of institutional analysis that had grown

out of our earlier work (E. Ostrom 1986a,b) as the organizing framework for the design of these coding forms. In addition, we paid serious attention to the hypotheses stated by field researchers who had conducted multiple studies or were themselves reviewing findings from multiple studies. We tried to include ways of measuring their concepts and proposed relationships in our coding forms. Because we were working with qualitative data, most of our concepts had to be formulated as variables with ordinal or nominal values. Some years of hard work were required simply to read sufficient numbers of cases, study earlier efforts to synthesize findings from specialized fields, and develop the coding forms.

During this process, several papers were written in an attempt to elucidate a theory that would help us understand the patterns we were beginning to see in reading these diverse materials (Gardner and E. Ostrom 1990; Gardner, E. Ostrom, and Walker 1990; E. Ostrom 1985b, 1987, 1989; Schlager and E. Ostrom 1987; Walker, Gardner, and E. Ostrom 1990). It is my conviction that knowledge accrues by the continual process of moving back and forth from empirical observation to serious efforts at theoretical formulation. This book can thus be viewed as an intermediate "progress report" for an ongoing research effort. Given the complexity of the empirical phenomena being studied and the type of theory that is needed to explain these phenomena, the effort may well continue for another decade.

The stimulus to write this volume came from James Alt and Douglass North after I presented a lecture at Washington University in St. Louis during the fall of 1986. Given that the CPR project was still "in process," I would never have dreamed of writing a book without their continued prodding. When Kenneth Shepsle and James Alt asked me to present a series of lectures at Harvard University, during a semester of sabbatical leave, the die was cast.

Actual work on the manuscript began in January 1988, when again I was fortunate to spend a sabbatical semester at the Center for Interdisciplinary Research at the University of Bielefeld. During that time I participated in a Research Group on Game Theory and the Behavioral Sciences organized by Dr. Reinhard Selten, Department of Economics, University of Bonn. I benefited greatly from the opportunity to participate in that research group. Although only a few game-theoretical examples are used in this book, the way that game theorists think about strategic possibilities in social settings strongly influences the way I analyze the central questions addressed here. Working with Roy Gardner and Franz Weissing on two game-theoretical analyses of CPR situations greatly increased my apprecia-

tion for the power and utility of game theory as a general theoretical tool for scholars interested in studying the consequences of diverse institutions.

The writing of this book was undertaken in tandem with participation in the "Decentralization: Finance and Management Project" sponsored by the Office of Rural and Institutional Development of the Bureau for Science and Technology (ST&RD) of the U.S. Agency for International Development. The challenge of making theoretical ideas relevant for application, the support for fieldwork in Nepal, Bangladesh, and Pakistan, and the opportunity to discuss these ideas with Larry Schroeder, Susan Wynne, Jamie Thomson, Louis Siegel, James Wunsch, Ed Connerley, Jerry Miner, Ken Kornher, and Eric Chetwynd, as well as mission personnel and host-government officials, have been of considerable value to me, and I hope that this volume is of value to the project.

I have also benefited greatly from the opportunity to present lectures based on parts of this work while the manuscript was in process. Besides the lectures at Harvard in April 1988, I have made presentations based on one or more chapters at the following places: the Sociology Department at the University of Bielefeld; the first Udall Lecture at the University of Arizona; a conference on "Democracy and Development" organized by the Sequoia Institute; a Liberty Fund summer series held in Victoria, British Columbia, May 15–20, 1989; and several different occasions at the Workshop in Political Theory and Policy Analysis at Indiana University.

Many people have commented on earlier papers or draft copies of this book, and I am deeply appreciative of their frank and helpful critiques. I hope I have responded adequately to their suggestions. Readers of the whole manuscript included Arun Agrawal, James Alt, Oliver Avens, Fikret Berkes, Elizabeth Case, David Feeny, Roy Gardner, Larry Kiser, Hartmut Kliemt, Robert Netting, Douglass C. North, Vincent Ostrom, Christine Picht, Russell Roberts, Edella Schlager, Jane Sell, Michael Taylor, Norman Uphoff, James Walker, Franz Weissing, and Rick Wilson. Readers of the individual chapters, drawing on their own prior research, included Paul Alexander, Fikret Berkes, William Blomquist, Peter Bogason, Thomas F. Glick, Arthur Maass, Robert Netting, and Norman Uphoff. Readers of prior papers that were drawn on in preparing the manuscript included Wulf Albers, Christi Barbour, William Blomquist, James Coleman, James Cooper, David Feeny, Margaret McKean, Fritz Scharpf, Kenneth Shepsle, Rick Wilson, and James Wunsch. I extend a special note of appreciation to those colleagues who have been associated with the CPR project from the beginning – William Blomquist, Roy Gardner, Edella Schlager, S. Y. Tang, and James Walker – and have spent hours refining concepts, developing models, designing instruments and experiments, and discussing how we

can better search out variables from what we are reading and gathering. The help of Elizabeth Case, associate editor for this series, Sophia Prybylski at Cambridge University Press, and Emily Loose, editor at Cambridge University Press, is gratefully acknowledged. Patty Dalecki has, as always, provided professional editorial and production support that has greatly improved the quality of the manuscript. Her cheerful spirit has relieved pressures on many occasions.