Chapter 11: Putting Polycentric Governance into Practice

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Abstract. How can organizations cooperate? This chapter looks at practical implications of polycentricity for improving governance, focusing on opportunities for organizing collective action among multiple autonomous organizations. Putting polycentricity into practice may involve assessing the extent to which a situation is already polycentric, analyzing institutional options and feasible pathways for change, and crafting institutional arrangements for polycentric governance. Key activities include convening stakeholders, sharing information and experience, and creating or improving institutions that facilitate cooperation and help resolve conflicts, as well as developing enabling legal frameworks that facilitate self-organization and autonomous cooperation.

Introduction

As discussed in earlier chapters of this book, polycentricity offers a perspective that stresses the potential for effective cooperation among multiple autonomous decision centers, such as:

- states within a federal system of government;
- local governments and specialized service providers in a metropolitan area;
- water user organizations nested within irrigation systems and river basins; and
- co-management between communities and agencies managing natural resources such as forests or fisheries.

A practical approach to polycentricity helps to understand options for arranging cooperation among many organizations, in ways that may gain from their diversity in knowledge, skills, interests, and other characteristics, in order to facilitate coordination, manage conflicts, and organize other forms of collective action.

As discussed in earlier chapters of this book, concepts of polycentric governance are most relevant where multiple autonomous decision centers, such as government bodies or associations, cooperate to constitute overarching institutions. Polycentric governance thus differs from interactions mediated primarily through market exchanges, political competition, subordination to hierarchical control, or simple sharing of information and imitation; and instead concerns the deliberate creation of ways of working together cooperatively, including coordination and conflict resolution.

Research on polycentric governance has typically examined relationships among government entities or community organizations involved in governance of natural resources, infrastructure, or public services, though in principle the concepts should also be applicable to cooperation among private sector businesses or associations.

Institutions for polycentric governance may be embodied in the formal constitution of a federal government; associations joining together to form a federation; or in compacts, contracts, legal settlements, and other inter-organizational agreements; as well as in looser or less formal arrangements that enable autonomous cooperation, such as periodic meetings and networks of communication.

Polycentric systems may be assessed in terms of how well they perform in relation to various criteria, including specific indicators of service delivery (potholes in roads, police response time, reliable water service) as well as broader concepts such as equity, efficiency, adaptability, resilience, sustainability, or functionality. As discussed in earlier chapters, a key concern for research, and for the practice of polycentric governance, is how various aspects of institutional design may affect institutional performance in various situations. Institutional design includes constitutional-level decisions about who takes part, how rules are made, and how authority is distributed; as well as collective choices in making rules, and in the operational application of rules in use (V. Ostrom 1999; Kiser and Ostrom 2000).

Thinking poycentrically does not require assuming that polycentricity is always better than hierarchy, or that overarching governance institutions are always necessary. Instead the question is whether and how those engaged in solving social problems and devising institutional arrangements may structure various organizations and their relationships in ways that create fertile frameworks for providing collective goods (Vincent Ostrom, Tiebout, and Warren 1961; M. McGinnis 1999). In the case of natural resources, research has shown the extent to which local communities have sometimes succeeded in governing commons, in some cases for centuries, often using "nested" structures where local organizations are linked in wider networks of governance, cooperating, coping with conflicts, and sharing lessons from experience (Elinor Ostrom 1990). In recent decades, many policies have sought to decentralize governance, such as through greater involvement of local communities in governance of forests, fisheries, rangeland, irrigation systems, and other commons. While much research has focused small or medium scale governance, such as community level management of natural resources or metropolitan governance, polycentric governance also offers insights into ways of coping with global challenges, such as climate change (E. Ostrom 2011).

The literature on polycentric governance and related ideas has emphasized some core concepts, which appear as themes in this chapter and are summarized in Table 1. These include the need for multiple centers and linkages across scales, empowering people to govern themselves, crafting institutions to fit specific situations, and shared learning from diverse experiences and experiments.

Table 11.1 Some core concepts for putting polycentric governance into practice
Organize at multiple scales. Don't assume that bigger is always better, or that small is always beautiful, or that top-down hierarchies and institutional monocultures are the only answers. Link across scales through federations, compacts, co-management agreements, and other forms of cooperation between organizations, as well as through suitable overarching institutions for regulation and conflict resolution. In exploring the scale and scope of how organizations could constitute institutions for cooperation consider not just government jurisdictions but also resource boundaries, stakeholders, and problemsheds.
Embrace politics and empower self-governance. Accept and work with the necessary messiness, time-consuming processes, compromises, and trial-and-error of how self-governance with meaningful autonomy happens in practice. Acknowledge the importance of the consent of the governed, and the challenges and opportunities this brings. Empower citizens to work together in solving problems. Enable people to come together to make rules and put them into operation, through special districts, devolution of authority, court backing for binding agreements, and other mechanisms.
Go beyond panaceas. Don't pursue or impose oversimplified standard solutions. There is no "one best way" or unique set of "best practices" that is ideal everywhere. Institutional diversity is essential. Analyze specific action situations to understand problems and identify opportunities. Encourage those involved to act creatively as institutional artisans in crafting customized solutions for their situation.
Learn together. A core advantage of polycentric governance is the opportunity to learn from multiple experiences, for example different communities, states, and other jurisdictions trying different things to see what may work, and learning from each other as they proceed. Convene meetings, workshops, and other forums, as well as facilitating networks of communication, formal and informal, that promote social learning.

Organization of the chapter. The second section of this chapter looks at how putting a polycentric perspective into practice can start with assessing and appreciating the extent to which polycentricity is already present, and the opportunities that exist or might be created for pursuing polycentric pathways. The third section outlines some of the institutional tools available for those seeking to craft polycentric governance, including federal structures, good governance practices, and institutional design principles. The fourth section discusses ways of developing polycentric governance, such as through convening stakeholders; facilitating cooperation; providing research and other relevant information; and by enacting enabling legislation that empowers the creation of new institutions. Vignettes at the end of each section of the chapter illustrate some of the promise and problems involved in trying to make governance more polycentric: for communities commoning water in Rajasthan, attempts to integrate water resource management (IWRM) in river basins, and use of court-backed settlements to constitute groundwater governance in southern California.

Where are we? Assessing polycentricity

Various approaches may be useful in understanding the extent to which a situation is already polycentric and the opportunities this may create. Research related to polycentric governance and the Bloomington School has often drawn on the Institutional Analysis and Development (IAD) framework, as discussed in earlier chapters. IAD offers a set of concepts, methods, and examples for analyzing who the main actors are, how they are related, and how they fit within the larger institutional and environmental context; as a basis for understanding their strategic decisions and emergent results. However, there are a variety of other approaches that may also offer useful insights, from relatively simple forms of stakeholder analysis to more sophisticated methods for social network analysis (SNA). Particularly useful are approaches that emphasize appreciating and building on the strengths of existing institutions.

Stakeholder analysis and other analysis of polycentricity can be conceived and applied as a way to explore the extent to which there are multiple actors, how they are connected in various ways, with interests that may conflict or converge, and whether they already have a history of interacting with each other and are bound within larger sets of overarching rules. For institutional design, a key question is then how different stakeholders may be involved. Such analysis may be relatively informal, identifying those who are involved and what their concerns may be. Such an assessment might be simply summarized in tables listing stakeholders and their interests. Diagrams can show relationships between different organizations, either simple organization charts or more complex network diagrams.

Assessment of existing polycentricity should include recognition of the extent to which various government agencies, and different units and levels within agencies may have different interests and degrees of autonomy that would enable them to support or obstruct change. In practice, even situations that look highly hierarchical, as within government or corporate bureaucracies, may contain many actors who have considerable discretion to help or hinder change. Rather than "the state" as a unitary entity, governments are usually composed of a multiplicity of different agencies and interests. This creates the possibility for constructing coalitions to pursue particular goals.

The Institutional Analysis and Development framework (IAD) and Socio-ecological Systems (SES) may be applied to systematically to examine action situations (Elinor Ostrom 2005; Elinor Ostrom 2009). Research on metropolitan governance by Elinor Ostrom and colleagues helped to show that bigger was not necessarily better, and that smaller jurisdictions could offer services that were as a good or better, at similar or lower costs. A key part of the benefit of such a polycentric pattern of organization comes from the ability of local agencies to join together to obtain specialized services, where economies of scale or scope were relevant, such as emergency dispatch, training, crime laboratories, or larger water or wastewater plants, while retaining advantages of local knowledge, accountability, and responsive service delivery at a smaller scale. Such findings have practical implications, both appreciating the

advantages of current institutions, avoiding mistakes due to overoptimistic assumptions about the benefits of centralization, and for developing inter-agency cooperation in "local public economies."

Research has shown the ability of communities, in some cases, to sustainably govern local commons such as forest, fisheries, rangeland and water resources, as well as the disruption and damage than occur when such local institutions are ignored or displaced. Applied research has shown both the potential and difficulty of attempting to restore or increase local autonomy in activities such as community forestry and participatory irrigation management. Such reforms seek to create new organizations or strengthen the autonomy of existing ones, and form new linkages with resource management agencies. Change cannot simply be created by the "stroke of the pen" in new policies, nor simply implemented top-down, and instead depends crucially on the willingness of communities to engage, as well as the willingness of agencies to work in new ways, questions which may depend on the political structure of interests and power, as well as the characteristics of resources.

Conceptually, polycentricity may be analyzed in terms of the number of centers, and how they are linked within social networks, including the extent of autonomy, mutual adjustment, cooperation, conflict, and other interactions (Aligica and Tarko 2012; Lubell, Henry, and McCoy 2010). Concepts of network governance (Jones, Hesterly, and Borgatti 1997; Carlsson and Sandström 2008) may help to understand complex systems of interaction, with polycentric governance identifying a particularly interesting subset of network governance. Social network analysis (SNA)(Borgatti, Everett, and Johnson 2013) offers tools for mapping various patterns of nodes and links between individuals and organizations, and so seems to hold considerable potential for a systematic understanding of the options for designing polycentric governance. From a social network perspective, key questions for assessing the extent of existing polycentricity would include asking:
- How are organizations and individuals connected, in terms of communication, influence, flows of funding and other resources, authority, and other links?
- What patterns do these linkages form, particularly in terms of the number of centers (nodes, clusters, etc.) and how these are connected (tightly or loosely, hierarchy, mesh, etc.)
- What are the key linkages in terms of mutual adjustment (imitation, cooperation, competition, conflict resolution, etc.), and to what extent do these linkages allow or constrain autonomy?
- Are there major gaps or problems in the ways in which organizations are linked, particularly in terms of lack of overarching institutions, or in terms of lack of autonomy that would facilitate local learning and performance improvements?

A polycentric perspective emphasizes the potential for self-governance, problem-solving arising from the initiative of people organizing themselves. In assessing the extent of existing polycentricity, and the potential for further changes, a variety of approaches are available which have potential for helping to understand how

different individuals and organizations may be interested in engaging pro-actively in developing polycentric governance:

- Participatory Rapid Appraisal (PRA) offers a variety of techniques through which people can assess their situation and the available options for change. PRA has been extensively applied in rural development, including situations where resources are shared between overlapping groups of users and as part of attempts to strengthen the roles of communities in natural resources management (Chambers 1994).
- SWOT analysis includes strengths and opportunities, as well as weaknesses (problems) and threats (risk), providing a framework that may start to go beyond the tendency to only frame issues reactively in terms of problems, dangers, and deficiencies.
- Appreciative inquiry (AI) asks people what they think is working well and how it could be made even better, emphasizing what they value and want more of. In contrast to a pre-occupation with problems, it concentrates on identifying positive options that are feasible and interesting for key stakeholders, which may include potential cooperation with other organizations (Cooperrider 2005; Mac Odell 2012).
- Asset-based community development (ABCD)(Cunningham and Mathie 2002) , and similar approaches also emphasize identifying the capacities that exist, and building on such strengths, often in the context of opportunities for partnering with external institutions.
- Positive deviance approaches emphasize looking at situations where things are "going right" and exploring what might be learned from them to improve things (Pascale, Sternin, and Sternin 2010).
- Albert Hirschman talked about "possibilism," building on what is already occurring and has been shown to feasible in some cases, in ways that can harness the "social energy" of citizen groups trying to better their lives (Hirschman 1971).
- While critical social science often emphasizes how social structures tend to serve existing interests and make change difficult, there are also approaches, including those cited above, that pay more attention to the degree of autonomy, "agency," or "room for maneuver," that various actors have. This may allow them to engage in initiatives and self-organize polycentrically, without necessarily subordinating themselves to a strict hierarchy.
- Citizens can be seen as "co-creators" of their worlds, in how they implicitly and explicitly create, recreate, and transform ideas and institutions. (Boyte et al. 2014).

The assessment of current polycentricity and the capabilities that may already exist provides a framework for thinking about what might be changed, and what changes may be most attractive for those involved. The number of centers could be expanded by establishing new centers. The scale and scope of collective action could be changed to involve more centers, or fewer, bringing in more stakeholders, or focusing on a smaller subset who are ready to act. The kinds of interactions could be changed by activities to share information, or encourage cooperation, for example by convening meetings or providing funding for joint activities, as well as by constituting new overarching institutions that create rules, resolve conflicts, or organize collective

efforts. Autonomy may be increased by devolution of authority and money, and by reducing regulations, requirements for approval, and other restrictions.

Starting from a particular set of circumstances, a specific configuration of existing institutions, there are multiple dimensions for changing the extent to which governance is polycentric, including who is involved, how they are linked, and the relative strength of overarching institutions and autonomy. These offer options for those involved to create new institutions, or change existing ones.

Vignette: Commoning Water: Polycentric Water Governance in Rajasthan

Rural communities in Rajasthan face the challenges of governing shared surface and ground water resources in the face of unreliable monsoon rainfall. New technologies such as tube wells and pumps may help improve livelihoods, but may also lead to depletion of aquifers and greater degradation of land and water resources. The Foundation for Ecological Security (FES) works with communities to pursue a "triple bottom line" of more inclusive and equitable governance, improved livelihoods, and environmental sustainability. Project activities help villagers organize inclusive democratic institutions for managing land and water resources, understand the flows of surface and groundwater, claim or reclaim commons, develop surface and groundwater storage, and balance productive water use with renewable supplies.

This context contains multiple forms of polycentricity, including organizations ranging from households to habitations on through panchayats (sub-district level assemblies), districts and states, and various government agencies, including forest and water agencies. In this case, a key element of a polycentric strategy for change has been establishing inclusive governance institutions at the habitation level, strengthening organized, autonomous decisionmaking, in way that is linked with a variety of other social actors and organizations. This is a key aspect of polycentricity, because habitations are the social villages of people who live close to each other and interact frequently, whereas the official "revenue villages" are much larger and less tightly connected. Earlier FES work showed the limitations of working with narrower groups of resource users, such as forest user groups, particularly the risk of excluding poorer and more vulnerable people who may own little or no land, but who rely on common lands for fuel, food, grazing, and other resources. Organizing at the habitation level strengthens a center of decisionmaking, which can then engage more effectively with other resource users, communities and agencies.

A participatory planning process, including PRA techniques, helps communities assess their own resources and priorities, enhancing their ability to engage with government programs pro-actively as partners, not just implementing activities imposed from outside, but using them as a means to pursue local goals, including selection and negotiation about when and how to cooperate with other organizations and programs. Project activities deliberately go beyond individual communities to link with neighboring communities that share land and water resources, such as ponds, aquifers, forests, and grazing land, as well as engaging with multiple levels of government jurisdictions and agencies involved in regulating land and water

resources. Federations and other forums facilitate information sharing and cooperation at multiple scales for forests and river basins.

What could we do? Crafting nested governance

When citizens, including community leaders and officials, decide on ways to work together, they act as institutional artisans (Vincent Ostrom 1980) and can create polycentric institutions. Institutional artisans may draw on a range of different mechanisms, from their own experience and policy recommendations. Some particularly relevant institutional options include federated organizational structures, forums for sharing information, and conflict resolution mechanisms. These may involve various forms of participation and co-management, decentralization, checks-and-balances, networking, and negotiation.

Starting from the current situation, one can think about the "adjacent possible" of feasible reforms (Kauffman 1995; Hirschman 1971). On the one hand, a polycentric perspective can help expand the "design space" of institutional options that are considered. Rather than assuming there is "one best way," a single standardized solution or panacea, only one form of modernity or even just one form of polycentric governance, an open polycentric perspective can instead look at the space for institutional diversity, with multiple possible solutions, customized to match particular circumstances and needs (Elinor Ostrom, Janssen, and Anderies 2007). On the other hand, thinking about the adjacent possible in terms of transactions costs of change may focus attention on the nearby and so more feasible options for arrangements that may attract sufficient initiative and support from stakeholders to overcome obstacles to collective action.

There is sometimes a tendency to talk as if institutional changes can easily be deliberately designed, like starting from scratch with a blank slate, or at least with great scope for making major changes. Closer study of institutional change suggests that most changes are highly constrained by history (path dependence), politics (contesting interests), and by ideas and attitudes, by the language (discourse) people use to think about and discuss their situation, and attitudes about the potential for change (Vincent Ostrom 1997; Foucault 1984; North 1990). Efforts to institute polycentric reforms should be informed by an understanding of how differences in knowledge, power, wealth, and other characteristics may enhance or limit capabilities, and the options for exploring and expanding the potential for action within or despite such constraints. Institutional artisanship is embedded in ideas and attitudes about who is entitled to have a voice in decisions, how people may be able to shape their shared lives, and how changes in ideas and attitudes sometimes have the potential to open up new possibilities.

The design of polycentric governance may benefit from formal methods of institutional analysis and design (Elinor Ostrom 2005; Goodin 1998). However, while useful for analysts, frameworks such as IAD and SES often require more time to understand and apply than most participants have available. Those crafting new institutions often take a more informal, improvisational, "vernacular" approach to

institutional artisanship, applying and modifying available patterns of organization. Rather than creating totally new institutions, the tendency is often to adapt existing institutions and organizations to new tasks, in a process of institutional bricolage, recombining familiar ideas and institutions in new ways (Cleaver 2001; Cleaver 2003; Cleaver 2012).

Even when institutional artisans consider proposals from academic analysts, recommendations are likely to require translation into simple, easily-communicated messages that can survive the rough and tumble of political debate, and ideas may become transformed in the process. In turning changes in policy into practice, there are many opportunities for reinterpretation and contestation (Pressman and Wildavsky 1984). These provide additional illustrations of why policy changes, including efforts to make governance more polycentric, may be unlikely to go far if simply pushed from the top down. Instead change may be more successful if advanced by supportive policy coalitions, with negotiation and adjustment to respond to diverse interests, and continuing efforts by proponents that go well beyond just enacting legislation or having a new policy promulgated (Sabatier and Weible 2016; Andrews 2013).

While sometimes taken for granted, conventional institutional arrangements such as specialized roles for an organization president, secretary, and treasurer; or separation of executive, legislative, and judicial power, are part of an institutional heritage of ways to spread decision making authority among multiple centers. Such mechanisms may be particularly important for federations and other overarching institutions that link multiple organizations. These offer ways of arranging autonomy, mutual adjustment, and conflict resolution within a larger institutional framework. Similarly, good governance principles such as transparency and accountability increase the ability of those who are involved to monitor and engage with organizations. The concept of "checks-and-balances" involves distributing power, "using ambition against ambition" so that those who are dissatisfied have recourse to voice their objections and contest actions that might harm their interests.

The composition of the board of a federation or other higher-level organization often involves decisions about how various groups will be represented. It may incorporate decision rules designed to maintain the influence and autonomy of participating organizations, such as emphasizing consensus or requiring supermajorities for some decisions. Conventional organizational design concepts, such as span of control, the optimal number of participants for effective meetings, and the use of committees and subcommittees, may be important considerations in designing effective and efficient polycentric governance structures, as well as the ways in which sharing of information and decisionmaking may be affected by newer communications technologies such as cellphones and the internet.

The discussion of the design of the United States constitution contained in the Federalist Papers offers a series of essays, by institutional artisans, about ways of arranging power, including ways of distributing power between national and state governments, and choices and tradeoffs between faster versus more thorough

processes for making decisions (Vincent Ostrom 1987). For thinking about polycentric governance, an example of an important but possibly non-intuitive concept is that of concurrent jurisdiction between federal and state governments, in which the federal government has direct jurisdiction over citizens for some matters, while other matters are left for individual states (Vincent Ostrom 1987). This contrasts with the tendency to assume a simple choice between unitary central rule or independent local control, and instead offers an illustrative example of how overarching rules may be arranged, including their associated tensions, debates, and changes over time.

Elinor Ostrom synthesized a set of design principles for robust governance of local commons (1990; Cox, Arnold, and Tomás 2010), including the use of nested organizational structures. A crucial insight leading to the design principles was that while local rules for resource governance were incredibly diverse, and had been crafted locally to fit particular circumstances, there were nevertheless more general principles associated with long-enduring commons. The design principles do not offer a simple formula or checklist sufficient for success, but can be used to identify key considerations for institutional design. For potentially polycentric situations, relevant questions could include asking about:
- Overlapping sets of users from multiple communities, with shared and conflicting interests
- crafting rules to cope with the movement of water, livestock, fish, or other mobile resources across wider areas
- the potential gains and costs of wider scale cooperation, including higher transaction costs of organizing cooperation, and how these are shared
- how representatives may be chosen, and kept accountable; and large numbers of users kept informed and able to participate
- monitoring resource use at wider scales, not easily visible as part of everyday life
- resolving conflicts between communities and enforcing rules against "strangers," those less affected by local norms and social pressures
- whether and how government agencies may respect and empower local autonomy
- the options for arranging nested institutions, in terms of scale, types of linkages, conflict resolution mechanisms and other considerations.

In contrast to a simple focus of pushing all management down to the lowest level or centralizing everything under a single agency or czar, many of these questions are likely to lead to considerations about how to appropriately combine and customize the roles of local communities and specialized organizations, public and private, in order to efficiently provide services. A polycentric perspective would not only pay particular attention to the potential for nested organizational structures, but at specific options for configuring autonomy and overarching institutions to fit particular circumstances and objectives.

Vignette: Watersheds, problemsheds, and Integrated Water Resources Management

One example of the limitations of reforms that, at least in theory, are intended to be somewhat polycentric, is shown by the mixed results of attempting to apply concepts of integrated water resources management (IWRM). In theory, IWRM offers ways of incorporating the hydrological linkages of water within basins, competing uses, multiple government agencies and user organizations, and academic disciplines. The principles of IWRM explicitly include participation of stakeholders, and subsidiarity, putting decision-making at the lowest possible level. However, in practice, attempts to implement IMWRM have often had limited impact (Biswas 2004; E. Schlager and Blomquist 2008).

The ways in which water is linked within larger basins can become a justification for approaches that emphasize large scale formal organization at the river basin level, pushed by national-level agencies, hierarchically arranged in terms of basins and levels of government jurisdiction. The principle of organization along the lines of basin hydraulic boundaries may also become an excuse to ignore or bypass key stakeholders, such as cities and their mayors. A too rigid emphasis on organizing water users solely along hydraulic lines of canals and catchments can fail to take advantage of the social capital of how people are already organized in villages, districts, cities, and associated patterns of settlement and political jurisdiction. Hydrologically-based approaches to organization may also be used or abused to try to expand the authority of water agencies, while failing to build effective coalitions needed to enact and implement policy changes.

IWRM efforts often end up emphasizing formal planning mechanisms, reliant on expert analysis, rather than self-organized problem-solving initiated by ad hoc coalitions of organizations, that would depend on lots of messy trial-and-error. So, while in principle IWRM is quite compatible with subsidiarity, participation, federated structures, and polycentric organization at multiple scales in river basins, in practice IWRM efforts often emphasize formal organization and planning efforts in large river basins, in ways that provide limited space for autonomous action.

It has often proven possible to convene multi-stakeholder platforms, for example in river basins (Sabatier, Weible, and Ficker 2005; Boelens et al. 1998; Steins and Edwards 1998). There is a risk that such efforts may be ineffective, especially if driven more by outside interests than local initiative, and may lead to time wasted on "talk shops," agreements without substance, or plans that do not get put into practice. Nevertheless, even where there are strong conflicts, a process of continuing dialogue, including relevant fact-finding and exploration of options, has often turned out to be surprisingly effective in building shared understanding, some consensus on ways to move forward, and practical impacts.

In contrast to comprehensive planning, efforts at addressing specific problems and conflicts may offer fertile opportunities for bringing together effective coalitions. Despite contentious debates about dams, and limited impacts from comprehensive approaches to basin planning, there are a variety of interesting results that have been achieved through working to adjust releases from large reservoirs to better serve the needs of downstream habitats and users. Such reservoir reoperation often requires

only minor costs in terms of energy income in comparison to the broader benefits downstream (Richter and Thomas 2007).

A polycentric perspective does not necessarily require rejecting the potential for management in accordance with resource boundaries and use of formal planning mechanisms. It does raise questions about how to encourage problem-solving initiatives at appropriate scales, in ways that can mobilize support from those involved, which may offer more feasible and appropriate pathways for change. In the context of IWRM this may involve looking at *problemsheds* rather than only watersheds, and a more pragmatic or expedient approach to addressing priority opportunities (Lankford et al. 2007; Moriarty et al. 2010; World Bank 2003).

How to develop polycentric governance? Networks, knowledge, and power

A polycentric perspective tends to be particularly interested in ways in which people and organizations can act on their own initiative, self-organizing to cope with shared problems. Fertile opportunities to facilitate the formation of polycentric institutions include convening forums, improving shared knowledge, and enabling the constitution of self-governing organizations.

Networks. As discussed above, bringing representatives of different water users and areas in a river basin has sometimes been an effective way to create agreement, even in the presence of many conflicting interests. For local natural resources management, a key intervention has sometimes been to provide community organizers to facilitate collective action at the local level, and in some cases, to also assist in the formation of higher level federations of associations. Examples include water user federations at the secondary or scheme level, and forest user federations encompassing multiple villages, as well as wider forums at river basin, state/provincial, or national levels.

A variety of techniques are available for helping people get to know each other and learn to work together, including those developed in terms of facilitation, public participation, community engagement, and alternative dispute resolution, as well as more specialized processes such as multi-stakeholder dialogue that may be particularly suitable for facilitating cooperation among diverse interests and organizations. Where adequate funding is available, it can be useful to hire specialized facilitators, especially in cases where there are severe and long-standing conflicts. However, this does not mean that complicated methods are always essential or effective: even in cases such as international negotiations, among highly skilled professionals with abundant resources, simple activities such as an informal "walk in the woods" can play a crucial role in opening up solutions.

Knowledge. Availability of information, and additional research may help to understand resource characteristics, especially where resource availability and dynamics are not easy to see and understand, such as fisheries or groundwater (Edella Schlager, Blomquist, and Tang 1994; Edella Schlager 2003). Understanding resource characteristics such as whether the resource highly localized or widely

dispersed, rapidly renewable or vulnerable to degradation, easily observed or hard to understand without systematic analysis, very important (salient) for user livelihoods or not, and so forth may be crucial in figuring out whether and how polycentric cooperation might be organized. Joint fact-finding can also be important as a process for building common understanding among those involved in trying to resolve disputes and craft cooperation in a river basin, forest, or other shared resource.

Academic disciplines and professional societies contribute to the exchange of ideas and creation of consensus within epistemic communities, particularly among academics and experts, that help define how problems are framed and what kind of solutions are considered (Haas 1993). Such organizations may also engage in deliberate setting of standards. Advocacy of new ideas, and relevant research, can help to shift understanding and agendas for action within epistemic communities and broader publics. Thus, changes in professional networks and knowledge may play a crucial role in the construction of polycentric governance.

A key argument for polycentricity is that it offers more opportunity for experimentation and learning, generating useful new knowledge. Thus, the fifty US states are sometimes referred to as "laboratories for democracy." Different states try out different approaches, see what happens, and then can learn from each other's experience. A key opportunity for crafting polycentric governance is to allow such local experimentation, and shared learning. Conversely, approaches that ostensibly decentralize, but impose standardized approaches, panaceas (Elinor Ostrom, Janssen, and Anderies 2007), and emphasize one-way top-down implementation thereby miss a major opportunity for learning and potential avenue to success.

Power. Laws and policy may facilitate or impede the creation of polycentric governance. In many cases, an important way to "develop" polycentric governance may well be to interfere less, to leave more space for self-organization by citizens and their organizations. Beyond that are questions of what may be done, particularly by governments to strengthen autonomy, promote fruitful interactions, and develop overarching rules that make things better. There are multiple mechanisms through which governments can encourage self-organization (Sarker 2013). Legislation can help empower polycentric governance if it enables organizations at different scales to obtain legal status, enter into binding contracts, protect their interests in court, and mobilize money and other resources, and to work together to create overarching institutions for cooperation and conflict resolution.

For natural resources governance, a key recommendation has often been to enable the creation of "special districts," bodies with a degree of governmental authority, focused on a particular task, such as an irrigation district, essentially a specialized form of local government. After being properly established, such an authority may have power to make and enforce rules, including compulsory payment of fees and enforcement of sanctions. This contrasts with the frequent tendency to assume that user groups for those sharing a natural resource can simply be organized using existing legislation for cooperatives or other voluntary associations, where people are free to join or leave as they wish. Instead, the ways in which each person's actions

affect others mean that effective cooperation may depend on the ability to make enforceable rules about resource use, for example to exclude those who do not cooperate or contribute, and to punish those whose actions harm others or damage the shared resource. In some cases, local social solidarity, especially within small face-to-face communities, and with backing from local authorities may be able to overcome the lack of explicit legal authority, but this becomes less effective as the scale and scope of governance become larger, and as people are less embedded in a web of overlapping social relationships. Special districts with legal authority can act as a crucial building block for polycentric governance, able to engage in co-management agreements with resource agencies, and to cooperate among themselves.

A polycentric perspective should go beyond a one-dimensional concern with centralizing or decentralizing to look at the options for horizontal (peer-to-peer) and cross-scale linkages, including conflict resolution and other specialized services. Rather than assuming that bigger is always better or small is always beautiful a polycentric perspective would consider that there may be many opportunities for organizing at intermediate, "meso" scales. In many cases, the subsidiarity principle of organizing at the "lowest possible level" may only be practicable if embedded within arrangements for wider scale linkages, including conflict resolution, recourse against local injustice, technical support, and regulation to protect broader interests, in other words, a polycentric network of institutional arrangements.

Power is often oversimplified into a matter of control, "power over," while a polycentric perspective is very concerned with enabling the capacity for self-governance of communities and other organizations, "power to" (power as freedom, capacity to act) (Sen 2000), and with the opportunities for making things better through cooperation, "power with" (Vincent Ostrom 1997). A polycentric perspective can aid in identifying the multiple opportunities that may exist for creating "power with," capacity for constituting cooperation between organizations that can retain autonomy while becoming better able to coordinate their actions and resolve conflicts.

While self-organization among organizations may emerge on its own, there are a variety of ways to make conditions more favorable, as mentioned earlier, including community organizing, convening stakeholders, providing information, enacting legislation, and transforming ideas and attitudes about citizenship. Laws and regulations can facilitate decentralization and enable diverse organizations to establish themselves and craft agreements to cooperate. Research can contribute to better informed decisions. Interventions may encourage the formation of organizations at multiple scales, as well as shared learning and other kinds of cooperation. On a more basic level, citizens can be considered and treated not simply as occasional voters and passive beneficiaries, but instead as people empowered to engage in improving their lives, including constituting new arrangements for cooperation between autonomous organizations.

Vignette: Enabling Groundwater Governance in California

Groundwater basins in southern California face challenges including depletion and seawater intrusion. They offer an instructive example of polycentric governance where irrigation districts, urban water utilities and other specialized government agencies have cooperated, sometimes (but not always) successfully, to replenish aquifers and reverse seawater intrusion (W. Blomquist 2009). California's state government has not tried to take over full control over local governance of surface or groundwater. Instead the state has provided a legal framework that allows water user organizations to work together, and supported research to better understand local conditions.

In many cases, disputes are taken to court, for example to assert or protect rights to water. Rather than a judge making a final decision, the judge instead encourages and provides legal backing for a negotiated settlement agreement. A dispute settlement agreement can thus establish a new institution with the legal authority to carry out tasks such as monitoring groundwater use, contracting for technical analysis and design, pursuing funding, and carrying out works such as recharging aquifers. Equity courts that can approve settlement agreements are one example of many possible enabling mechanisms to facilitate polycentric self-governance.

Conclusions: Practicing polycentricity

As discussed in this book, polycentricity is not just a type of governance but also a perspective on how organizations can cooperate. Polycentric governance offers a variety of alternatives to vertical hierarchies or flat decentralization. A polycentric perspective focuses on the opportunities to organize governance arrangements that match the scale of particular problems and highlights the potential for action by those who are ready to cooperate in improving a situation. Polycentricity is made more effective by ideas and attitudes of citizens who feel able to associate and act together to constitute new or improved organizations and inter-organizational structures.

For a particular situation, it is important to assess the extent to which polycentricity already exists, or may be created. That involves looking at the extent to which there are multiple centers for decision making, what kinds of interaction exist between them, including how much (or how little) autonomy each has, and how these dimensions of polycentric governance might be changed.

Research reported in Section 3 of this book offers insights into different polycentric ways in which people organize themselves to govern natural resources, and how such institutional arrangements perform. Such research can contribute to a better understanding of the options available for designing or improving polycentric governance structures, such as nested federations of user groups, co-management between resource users and government agencies, and contracting to provide specialized services in local public economies. There is much scope for better understanding of the diversity of potential polycentric arrangements, and how different arrangements may be related to resource characteristics and to performance results.

Organization leaders, government officials, applied researchers, and others act as institutional artisans as they engage in discussion and decisions at the constitutional level to establish new institutions for polycentric governance, and at the collective choice level in making specific rules, and then act operationally to put those rules into use. The design of polycentric institutional arrangements is not a neutral technical exercise, but instead is inescapably political, part of larger processes of societal contestation over how power and benefits are created and distributed. In assessing institutional options, political feasibility is thus as important a constraint as technical feasibility. In contrast to the tendency to assume that solutions must be imposed through top-down control, a polycentric perspective highlights the potential for creating "power with" through negotiation and cooperation.

Polycentricity may be promoted by providing information about polycentric possibilities, as this book does, and through policies and legislation that facilitate the creation of cooperation among those who want to work together. More specific efforts may also be made to bring people together, to share information and experience and explore opportunities for cooperation at wider scales, making it easier to put polycentricity into practice.

References

Aligica, Paul D., and Vlad Tarko. 2012. 'Polycentricity: From Polanyi to Ostrom, and Beyond'. *Governance* 25 (2): 237–262.

Andrews, Matt. 2013. *The Limits of Institutional Reform in Development: Changing Rules for Realistic Solutions*. Cambridge: Cambridge University Press.

Biswas, A. K. 2004. 'Integrated Water Resources Management: A Reassessment.' *Water International* 29 (2): 248–56.

Blomquist, W. 2009. 'Crafting Water Constitutions in California'. *The Practice of Constitutional Development: Vincent Ostrom's Quest to Understand Human Affairs,* 105.

Boelens, Rutgerd, Axel Dourojeanni, Alfredo Duran, and Paul Hoogendam. 1998. 'Water Rights and Watersheds: Managing Multiple Water Uses and Strengthening Stakeholder Platforms'. In *Searching for Equity: Conceptions of Justice and Equity in Peasant Irrigation*, edited by Rutgerd Boelens and Gloria Davila. Assen, Netherlands: Van Gorcum.

Borgatti, Stephen P., Martin G. Everett, and Jeffrey C. Johnson. 2013. *Analyzing Social Networks*. SAGE Publications Limited.

Boyte, Harry, Stephen Elkin, Peter Levine, Jane Mansbridge, Elinor Ostrom, Karol Soltan, and Rogers Smith. 2014. 'The New Civic Politics: Civic Theory and Practice for the Future'. *The Good Society* 23 (2): 206–211.

Carlsson, L., and A. Sandström. 2008. 'Network Governance of the Commons'. *International Journal of the Commons* 2 (1): 33–54.

Chambers, R. 1994. 'Participatory Rural Appraisal (PRA): Analysis of Experience'. *World Development* 22 (9): 1253–1268.

Cleaver, Frances. 2001. 'Institutional Bricolage, Conflict and Cooperation in Usangu'. *IDS Bulletin* 32 (4): 26–35.

———. 2003. 'Reinventing Institutions: Bricolage and the Social Embeddedness of Natural Resource Management.' Edited by T. A. Benjaminsen and C. Lund. *Securing Land Rights in Africa,* 11–30.

———. 2012. *Development Through Bricolage: Rethinking Institutions for Natural Resource Management*. 1st ed. Routledge.

Cooperrider, David L. 2005. *Appreciative Inquiry: A Positive Revolution in Change*. 1st ed. Berrett-Koehler.

Cox, Michael, Gwen Arnold, and Sergio Villamayor Tomás. 2010. 'A Review of Design Principles for Community-Based Natural Resource Management.' *Ecology & Society* 15 (4). http://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=17083087&AN=66785194&h=8qXtZWJg%2FC9TLQc2UHFOT%2F1Ro3BR99N21ZEGj%2FEY%2BRa8FM7NxUPl9lKhJLEGWqvBWMW64zv9pXXQFpBolyetxw%3D%3D&crl=c.

Cunningham, Gord, and Alison Mathie. 2002. 'Asset-Based Community Development: An Overview'. *Coady International Institute. Retrieved February* 4: 2009.

Foucault, M. 1984. *The Foucault Reader*. Pantheon Books.

Goodin, Robert E. 1998. *The Theory of Institutional Design*. Cambridge University Press.

Haas, Peter M. 1993. 'Epistemic Communities and the Dynamics of International Environmental Co-Operations'. In *Regime Theory and International Relations*, edited by Volker Rittberger with Peter Mayer, 168–201. Oxford: Clarendon Press.

Hirschman, Albert. 1971. 'Introduction: Political Economics and Possibilism'. *A Bias for Hope: Essays on Development in Latin America*.

Jones, Candace, William S. Hesterly, and Stephen P. Borgatti. 1997. 'A General Theory of Network Governance: Exchange Conditions and Social Mechanisms'. *Academy of Management Review* 22 (4): 911–945.

Kauffman, Stuart. 1995. *At Home in the Universe: The Search for Laws of Self-Organization and Complexity*. New York: Oxford University Press.

Kiser, Larry L., and Elinor Ostrom. 2000. 'The Three Worlds of Action: A Metatheoretical Synthesis of Institutional Approaches'. *Polycentric Games and Institutions* 1: 56–88.

Lankford, Bruce A., Douglas J. Merrey, Julien Cour, and Nick Hepworth. 2007. *From Integrated to Expedient: An Adaptive Framework for River Basin Management in Developing Countries*. International Water Management Institute.

Lubell, Mark, Adam Douglas Henry, and Mike McCoy. 2010. 'Collaborative Institutions in an Ecology of Games'. *American Journal of Political Science* 54 (2): 287–300. doi:10.1111/j.1540-5907.2010.00431.x.

Mac Odell. 2012. 'Appreciative Planning and Action : Mission Statement'. Accessed September 2. http://www.macodell.com/page-Appreciative-Planning.

McGinnis, Michael, ed. 1999. *Polycentric Governance and Development: Readings from the Workshop in Political Theory and Policy Analysis*. Ann Arbor: University of Michigan Press.

Moriarty, Patrick, Charles Batchelor, Peter Laban, and Hazem Fahmy. 2010. 'Developing a Practical Approach to 'Light IWRM'in the Middle East'. *Water Alternatives* 3 (1): 122–136.

North, Douglass C. 1990. *Institutions, Institutional Change and Economic Performance*. New York: Cambridge University Press.

Ostrom, E. 2011. 'A Polycentric Approach for Coping with Climate Change'.

Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.

———. 2005. *Understanding Institutional Diversity*. Princeton, NJ: Princeton University Press.

———. 2009. 'A General Framework for Analyzing Sustainability of Social-Ecological Systems'. *Science* 325: 419.

Ostrom, Elinor, Marco A. Janssen, and John M. Anderies. 2007. 'Introduction: Going Beyond Panaceas'. *Proceedings of the National Academy of Sciences* 104 (39): 15176–78. doi:10.1073/pnas.0701886104.

Ostrom, V. 1999. 'A Forgotten Tradition: The Constitutional Level of Analysis'. In *Polycentric Governance and Development: Readings from the Workshop in Political Theory and Policy Analysis*, edited by M. D McGinnis, 151. University of Michigan Press.

Ostrom, Vincent. 1980. 'Artisanship and Artifact'. *Public Administration Review*, 309–17.

———. 1987. *The Political Theory of a Compound Republic: Designing the American Experiment*. Lincoln, Nebraska: University of Nebraska Press.

———. 1997. *The Meaning of Democracy and the Vulnerability of Democracies*. Ann Arbor: University of Michigan Press.

Ostrom, Vincent, Charles M. Tiebout, and Robert Warren. 1961. 'The Organization of Government in Metropolitan Areas: A Theoretical Inquiry'. *The American Political Science Review*, 831–842.

Pressman, Jeffrey L., and Aaron B. Wildavsky. 1984. *Implementation: How Great Expectations in Washington Are Dashed in Oakland: Or, Why It's Amazing That Federal Programs Work at All, This Being a Saga of the Economic Development Administration as Told by Two Sympathetic Observers Who Seek to Build Morals on a Foundation of Ruined Hopes*. Univ of California Press.

Richter, Brian D., and Gregory A. Thomas. 2007. 'Restoring Environmental Flows by Modifying Dam Operations'. *Ecology and Society* 12 (1): 12.

Sabatier, Paul A, Chris Weible, and Jared Ficker. 2005. 'Eras of Water Management in the United States: Implications for Collaborative Watershed Approaches'. In *Swimming Upstream: Collaborative Approaches to Watershed Management*, edited by Paul A Sabatier, Will Focht, Mark Lubell, Zev Trachtenberg, Arnold Vedlitz, and Marty Matlock, 23–52. Cambridge, MA: MIT Press.

Sabatier, Paul A., and Christopher M. Weible. 2016. 'The Advocacy Coalition Framework: Innovations and Clarifications'. *In: Sabatier, PA (Ed.). Theories of the Policy Process, Second Edition, 189-217*. https://vtechworks.lib.vt.edu/handle/10919/68212.

Sarker, Ashutosh. 2013. 'The Role of State-Reinforced Self-Governance in Averting The Tragedy of The Irrigation Commons In Japan'. *Public Administration*. http://onlinelibrary.wiley.com/doi/10.1111/padm.12011/full.

Schlager, E., and W. A. Blomquist. 2008. *Embracing Watershed Politics*. University Press of Colorado.

Schlager, Edella. 2003. *The Political Economy of Water Reform*. Hanoi, Vietnam.

Schlager, Edella, William Blomquist, and Shui Yan Tang. 1994. 'Mobile Flows, Storage and Self-Organized Institutions for Governing Common-Pool Resources'. *Land Economics* 70 (3): 294–317.

Sen, Amartya. 2000. *Development as Freedom*. New York: Anchor Books.

Steins, Nathalie A, and Victoria M Edwards. 1998. 'Platforms for Collective Action in Multiple-Use CPRs'. *Presented at Crossing Boundaries, the Seventh Annual Conference of the International Association for the Study of Common Property*.

World Bank. 2003. 'World Bank Water Resources Sector Strategy: Strategic Directions for World Bank Engagement'. *World Bank, Washington, DC*.