

Summary of Session 9 – Institutions for managing human-environment systems

Speaker: Elinor Ostrom

Moderator: Bill Clark

**Arizona State University Student Group: Marci Baranski, Karina Benessaiah, Arijit Guha, Chad Monfreda, Christina Wong, and Beth Mercer-Taylor (University of Minnesota)
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This summary for session nine covers Chapter 2.4 (previously Chapter 4) of *Sustainability Science: An Introduction*, key supplemental readings, remarks by Elinor Ostrom (Indiana University), Bill Clark (Harvard University), and Arizona State University student discussants, and responsive themes raised during the session and online. The summary focuses primarily on three questions raised by the Arizona State University student group on how knowledge of common pool resources can be applied to wider issues of sustainability (nature of the resource, scale of governance, and rapidly emerging problems).

Chapter 2.4, Supplemental Reading and Elinor Ostrom's Remarks:

The chapter examines the challenges of governing common pool resources (CPR), which are resources that have high subtractability and low excludability. Traditionally it was assumed that resources would be degraded unless property rights were designated and/or government regulation enforced. Collective action and self-organization were not considered effective options in dealing with resource overuse where users create rules to manage local resources. The chapter presented a list of resource and user attributes that when satisfied could enhance self-governance. Furthermore, in Ostrom (2010), Nobel Prize speech, the Institutional Analysis and Development (IAD) framework was examined in detail. The IAD framework is comprised of a general set of variables to help one analyze a diversity of institutional settings. At the center of the IAD is the action situation where external variables affect the internal working parts, which in turn impact system level interactions and outcomes. The IAD allowed researchers to identify long-surviving institutions. Subsequently, Ostrom created eight design principles, informed by a wealth of case studies, that reflect the core attributes known to impact the long term effectiveness of users to manage a resource.

The presentation gave an example of an international effort dedicated to understanding methods of user organization, their activities, and living conditions known as the International Forestry Resources and Institutions (IFRI). They found that active monitoring was more important than the type of ownership for long-term forest survival. Major findings were that people are boundedly rational and can learn through experience and trust is central to cooperation. Overall, resources in good condition have users with long term interests that invest in monitoring and trust building.

Arizona State University Student Group:

Prior to the session the ASU student group posed three topics (defined by three central questions):

1) Do the lessons learned from communal-management of extractable natural resources apply when examining management of other resources such as the oceans, atmosphere and knowledge? [Nature of the resource]

2) To what extent can the lessons learned from studying small-scale systems be applied to larger scales, regional or global? [Scale of governance]

3) How can the rules and norms which govern CPRs be given room to shift and change in the face of fast-moving global environmental change? [Rapidly emerging problems]

Nature of the resource (Karina Benessaiah/Christina Wong): The work of Ostrom draws on a diversity of CPR case studies in mostly small to medium scale extractable natural resource contexts. A key question for sustainability science is *whether insights from these CPR examples can be used under different conditions for other types of resources?* In the CPR literature the natural resources commonly considered are fisheries, groundwater, grazing lands and forestry, which at the local level, are extractable, predictable and in finite supply. However, how can this framework be applied to threatened public goods whose subtractability is not extraction, but the reduction of quality (i.e. pollution-atmosphere or publishers-libraries). For example, knowledge and ideas, public goods, can take the form of a CPR as a library or the internet when restriction threatens the knowledge base, thus under-provision not over-provision undermines the resource (Hess and Ostrom, 2003).

Furthermore, the group addressed how CPRs are an emergent property of the human-environment system, and are not merely determined by the biophysical conditions. When a public good is threatened subtractability becomes high, which leads to scarcity or pollution, causing the human system to create institutions and/or rules that create exclusion and reduce subtractability (club good) or increase both exclusion and subtractability (private good).

Scale of governance (Chad Monfreda): The challenges of cross scale governance of environmental resources through social institutions are myriad. Global governance can depend on international agreements that can depend on small scale CPRs, such as those in Ostrom's case studies, or global social institutions like the United Nations Framework Convention on Climate Change (UNFCCC). Small scale institutions are generally characterized by face-to-face interactions, shared norms, and development over a comparatively long time period. Large scale institutions are generally characterized as impersonal or bureaucratic, encompassing diverse cultures and interests, and are newly emergent. The increased cultural diversity and reduction in shared norms, of social institutions, combined with the greater uncertainty and more "regulatory" nature of the environmental services provided at a global scale, leads to greater difficulty for governance.

Two examples of institutional interaction between small scale institutions and global scale governance structures are Reducing Emissions from Deforestation and Forest Degradation (REDD) and the Convention on Biological Diversity (CBD). REDD is framed as an economically efficient way of reducing emissions, however there is no consensus on how large scale institutions will interact with local scale institutions on issues like land tenure, social benefits, and market extensions. CBD is designed to be a global monitoring system with bottom-up contributions, but has fallen short of meeting 2010 targets on shrinking biodiversity loss. A key concern is the lack of good understanding of rates of biodiversity loss. Globally it is in our common interest to collaborate and utilize information collected by local sources, so the CBD can become a legitimate and effective decision-making structure.

Rapidly emerging problems (Marci Baranski/Arijit Guha): Rapidly changing systems represent challenges in resource management, such as climate change impacts on wildlife, specifically reindeer, in the Russian Arctic leading to significant economic impacts on indigenous reindeer herders. Adaptation to the environment and development of new approaches to resource management are needed, and the implications of rapidly changing systems to governance are not yet clear. A fundamental question exists, of whether developed countries have an obligation to act and commit to solving rapidly emerging problems.

Social “tipping points” caused by environmental pressures result in localized conflicts, for example the movement of climate change refugees across borders in socially and environmentally vulnerable regions. Such movements place populations into social situations in which no long term trust or shared cultural norms exist. The social adaptation required to respond to these tipping points may be beyond the capacity of many institutions.

Question & Answer Session/Online Discussion:

Nature of the resource: Ostrom’s response to topic #1 was that we cannot take lessons from one environment and automatically apply them to others. However, this does not mean we cannot create general knowledge systems about CPRs that can be applied to other resources. Regarding the nature of the resource, we need to ask how large is the resource, how predictable are the interactions, are people pulling things out or putting something in, etc.? Leah Stokes (Massachusetts Institute of Technology) asked about new technologies in developing countries, and Ostrom responded by noting how software programs, developed by global collaborators, have created freeware. Programmers are discussing rules and building trust by working in teams that build knowledge that is available to the world through software. Steve Polasky (University of Minnesota) asked how lessons from traditional CPRs can be translated to cases of pollution, in particular when the asymmetry of those who benefit differ from those who suffer. Also how can repeated interactions amongst players or with the resource improve the situation? Ostrom responded by stating that all CPRs possess some degree of asymmetry, for example when one person’s basket contains fish then no one else can use the same fish. At the margin, one fish extracted reduces the benefits for others, thus the question between pollution and extraction is temporal due to the time-lag of when costs are felt. Repeated interactions can help improve our chances of moving towards long-term sustainability through continued obligation and/or contribution.

Scale of governance: On topic #2 Ostrom noted that there is much we can learn from small scale systems, and that global governance is often seen as the answer, but more focus must be placed on polycentric governance. We should not feel helpless if we do not have a global answer. In addition, adaptability can be increased when networks are created that foster cooperation between different governance levels. There is no optimal scale but we should strive to have information exchange among smaller and lower scales. The students from Minnesota and Cambridge asked how we can deal with situations in which the authority of a resource does not match the community and/or when a resource is subverted by a group of people. Ostrom responded by saying that in high caste societies, such as in India, there can be group consensus, but group decisions can be overturned by a high caste person. Equity and sustainability are not synonymous, but equitable institutions can increase the likelihood that a resource is sustained over time.

However we cannot fall in the trap of romanticizing the local or the global, thus we need to use modes of analysis, such as the IAD.

The discussion online was centered around whether or not more questions would emerge when the “design principles” and “user and resource attributes” are applied to the global system than resolved. Tara Grillos (Harvard University) subsequently asked, “how may we influence the characteristics of self-organization to help a community self-organize.” The response was that we need to remember the fine line between assistance and autonomy, and it was mentioned that education could be an important tool toward empowerment.

Rapidly emerging problems: Todd Schenk (Harvard University) on the online discussion board mentioned that many of these local institutions are inherently conservative since they are products of long-term relationships. Therefore, success during a steady state is due to established cultural norms that promote people living within the current system boundaries. This conservatism may be useful when the system is in equilibrium, but can be problematic under rapidly changing conditions. Hence, we must begin considering how we can “help local institutions survive and thrive in a changing environment if we believe that they are ultimately the key to successful management of CPRs.”

Closing Remarks:

Bill Clark closed by saying that sustainability science must recognize that solutions are context specific, but we cannot retreat and say that everything is different from everything else. We need modes of analysis that can be applied generally to explain successes and failures to create shared understanding.