Part I Introduction

ÖRJAN BODIN, SAUDIEL RAMIREZ-SANCHEZ, HENRIK ERNSTSON, AND CHRISTINA PRELL

1

A social relational approach to natural resource governance

1.1 THE SOCIAL DIMENSION OF SUSTAINABLE DEVELOPMENT

The magnitude of the impact of human activities on the natural environment is now on a planetary scale (Vitousek *et al.*, 1986; Rockström *et al.*, 2009). The growth of the human population and the growth in amount of natural resources used are altering the Earth in unprecedented ways (Lubchenco, 1998), while humanity at the same time is fundamentally dependent on Earth system processes for a prosperous societal development (Rockström *et al.*, 2009). Hence, natural resource extraction and environmental impact have a deeper meaning than simply correcting for externalities. People are embedded in Earth system processes, dependent on the capacity of ecosystems to generate ecological services for societal development. Therefore, the very notion of "natural resources," as the term is being used in this book, does not only include single extractable resources such as, for example, fish, timber, and minerals; instead natural resource are also perceived in the much broader context of biophysical processes and ecosystem services (see Daily, 1997; Chapin *et al.*, 2010).

Given these insights, it is clearly getting more difficult to justify a dichotomy between social and natural systems. Instead, the intimate connections between our biophysical environments and human health, the economy, social justice, and national security are gaining acceptance across societies (Lubchenco, 1998; Liu *et al.*, 2007). This intimate coupling between the biophysical environment and human

Social Networks and Natural Resource Management: Uncovering the Fabric of Environmental Governance, ed. Ö. Bodin and C. Prell. Published by Cambridge University Press.

societies makes it virtually impossible to perceive the huge, far-reaching, and enormously difficult challenge in accomplishing sustainable management and governance of the world's natural resources only as a consequence of our limited understanding of our biophysical environment and the inherent uncertainties associated with complex systems such as ecosystems (Levin, 1998; Checkland and Scholes, 1999). Although our understanding and knowledge of the complex biophysical environment upon which societal development fundamentally depends is surely increasing, our ability to predict biophysical outcomes of future and ongoing human activities is inevitably and inherently limited (cf. Levin, 1998). To meet the challenge, we need to get a better understanding on how we can change and transform the way we govern our natural environment, and we will need to devise flexible institutions and adaptive governance structure that not only try to sustain and enhance the capacity of ecosystems to generate natural resources and ecosystem services, but also are able to respond to complex dynamics and cope with unpredictabilities (Folke *et al.*, 2005; Duit and Galaz, 2008; Chuenpagdee and Jentoft, 2009; Ernstson *et al.*, 2010).

Accordingly, the quest of accomplishing sustainable management and governance spans over various scientific disciplines, and research engaging both the natural and the social sciences is needed (see Lubchenco, 1998). This clearly poses a tremendous challenge for the research community since that insight cuts across the traditional and well-rooted division between the natural and social sciences. Around the world researchers, practitioners, and policy makers are doing their best to tackle this challenge and significant progress is being made. Research on resource management and governance is increasingly drawing from interdisciplinary/multi-disciplinary teams composed of both social and natural scientists. This development has actually been ongoing since the early 1960s, and has, among other things, led to the establishment of large international research programs focusing on human and social aspects of natural resource-related issues and challenges. The recent global program Millennium Ecosystem Assessment (MEA, see www.millenniumassessment.org), initiated and led by the United Nations during 2001–2005, gathered the largest body of social and natural scientists ever assembled to provide a state-of-the-art scientific appraisal of the condition and trends in the world's ecosystems, the services they provide, and how this links to human wellbeing and societal development. Even more recently, the International Council for Science (ISCU, see www.icsu.

org) has established the Program on Ecosystem Change and Society (PECS) as a follow-up to MEA. A final example of a transdisciplinary research program is the global networked research organization the Resilience Alliance (www.resalliance.org), which engages scientists and practitioners from many disciplines in collaborative research on natural resource governance with a particular emphasis on complexity and the resilience of interdependent social-ecological systems.

In addition to the above-mentioned international initiatives, national research funding agencies are refocusing their funding programs embracing inter- or transdisciplinary approaches as a response to the demand for better understanding of social-ecological systems (see Castán Broto *et al.*, 2009; Stafford *et al.*, 2009). Examples include the Rural Economic and Land Use Program in the UK (www.relu.ac.uk), which is funded by the UK Research Council with the prime aim of supporting research that is interdisciplinary and aimed at knowledge transfer to end-users and policy makers. The newly founded transdisciplinary Stockholm Resilience Centre received one of the largest research grants ever in Sweden, and similar research centers integrating various scientific disciplines are continually being established. For example, two recent initiatives are the Global Institute of Sustainability at Arizona State University in the USA (www.sustainability.asu.edu) and the ARC Centre of Excellence for Coral Reef Studies at James Cook University in Australia (www.coralcoe.org.au).

Conclusively, the sheer presence of humans in all of the world's different ecosystems makes it virtually impossible to find pristine natural environments, and humans are often the dominating factor in shaping the processes and structures of the biophysical environment (Vitousek *et al.*, 1997). Hence, human activities are increasingly harder to disregard in any kind of scientific inquiry about the functioning of the natural environment. Likewise, the fact that societies are inherently embedded in Earth system processes makes it equally unfeasible to perceive and abstract societies as if they were independent of the natural environment. Therefore, we strongly argue that if the inevitable linkages between the social and the natural dimensions are not taken into account in framing scientific inquiries, our ability to gain knowledge and understanding of how we can sustain societal development will be inherently limited. Using this insight as our overarching baseline, our focus in this book is primarily on using a social relational approach to gain a deeper understanding of the social dimension of natural resource governance. This approach is further explained and elaborated below.

1.2 A NEED FOR A SOCIAL RELATIONAL APPROACH IN STUDYING NATURAL RESOURCE GOVERNANCE

Ecological processes typically operate across various spatial and temporal scales, which often make it difficult to conceptually, jurisdictionally, and economically separate different ecological elements from each other in any meaningful way (Cumming *et al.*, 2006; Folke *et al.*, 2007). In other words, ecosystems stretch across human-made jurisdictions and administrative borders such as municipalities, provinces, and states. As a result of this and other factors, natural resources are often characterized by ineffective institutional arrangements and with multiple actors and stakeholders competing for resource use and extraction often leading to overexploitation and the inability to account for dynamic ecosystem processes. As a consequence, scholars nowadays typically refer to *governance* of natural resources instead of *management* or *government*. The very meaning of the term governance implies that the managing process, whatever is being managed, is less formalized, more difficult to control, and involves a multitude of different type of actors (Duit and Galaz, 2008). It is quite recently that the notion of governance made its entrance into the research on natural resources, and the reason it did is to further emphasize the multi-actor and multi-purpose context characterizing use and extraction of resource governance (Folke *et al.*, 2005). Governance should be contrasted with *government* where one designated actor (typically the state in political science) is the one and only actor being in charge, and *management* where focus often is on how to manage the resource from a biophysical perspective only.

Given the multi-actor and multi-purpose context characterizing resource use, effective natural resource management and governance largely rely on the knowledge, expertise, and the willingness/possibilities for negotiation, conflict resolution, collaboration, and coordinated actions among various stakeholders. Social issues of natural resource governance thus range from questions related to designing flexible and adaptable institutions that can handle uncertainties and facilitate stakeholder cooperation to more complex and subtle questions pertaining to issues of class, power, discourse, conflicts, and consensus; and how these aspects shape the way natural resources are governed. Social factors affecting resource governance have, for example, been studied from theoretical perspectives such as social learning (Bandura, 1977; Wenger, 1998), collaborative management (Carlsson and Berkes, 2005; Armitage *et al.*, 2007), and social capital

(Portes, 1998; Pretty and Ward, 2001; Krishna, 2002; Bodin and Crona, 2008), as well as more pragmatic approaches such as stakeholder selection (Maiolo *et al.*, 1992; Prell *et al.*, 2006). Political ecologists, geographers, and anthropologists have also contributed with more critical perspectives and increased the sensitivity by which to approach concepts like "knowledge," "scale," and "resource" to better account for issues of power, equity, and social justice. For instance, what is to be perceived as "proper" knowledge of the natural environment is contested and influenced by power asymmetries (Blaikie, 1985; Nadasdy, 2007) and that resource governance rests upon a "politics of scale," which is not just a reflection of the biophysical scale, but a negotiated product of socially and politically embedded knowledge and moral claims made by scientists, resource managers, and interest groups (Swyngedouw and Heynen, 2003; Ernstson and Sörlin, 2009). Following this, perceptions of what is to be considered as a "natural resource" (or an ecosystem service) can be seen as social constructs, or hybrids (Ernstson, 2008). Furthermore, these fields of research explore how the distribution of environmental benefits are embedded in socio-spatial structures (Harvey, 1996) and world systems (Hornborg, 2009), which influence resource governance in several ways.

In considering social factors that significantly affect the way we succeed or fail in governing the biophysical environment, a fundamental question is: how do we study all these various factors without falling into the traps of either being too narrow in scope, thus risking missing the big picture, or too broad and therefore losing scientific depth and precision? In this book, we propose a social relational approach as both a conceptual and analytical framework for uncovering how social factors affect natural resource governance. In short, this approach seeks to explain and shed light on human and systems behaviors by investigating how patterns of social relations among actors within a system enable and constrain actors and processes. Thus, the approach we advocate here primarily focuses on the social dimensions of natural resource governance in complex social-ecological systems, although it could be extended into a larger modeling framework also involving models of the natural environment (as will be discussed further in the final chapter of this book). Just as understanding of the environment has moved towards a systems' perspective of interacting parts and emergent wholes, so has the notion of understanding human and social behavior moved from an atomist model, where individuals are studied in a case-by-variable format, to one of seeing individuals in the context of their relationships with others (Wellman, 1988). Gaining

insight into those relationships, and how the pattern and structure of those relationships influence attitudes, perspectives, and behaviors towards resource governance outcomes is what this book is about.

1.3 A SOCIAL RELATIONAL APPROACH

An old debate in the social sciences has been the part–whole relations, or individual agency and social structure linkages. In the social sciences the study of such connections has more or less adopted one of two philosophical views, individualism or holism. The former puts less emphasis on the social constraints on agency and attempts to analyze and account for social facts in a bottom–up fashion, i.e. from the individual. The latter adopts a top–down approach to the analysis and account of social facts, putting less emphasis on individual interests and initiative (Bunge, 1999). A practical solution to this problem is to use both perspectives. However, such aggregation is always at risk of producing irreconcilable explanations. A more viable approach will seek to merge these perspectives rather than simply aggregating them. A merger requires a referent that is neither isolated individuals (e.g. rational self-interested individuals) nor organic wholes, but related individuals who collectively give rise to emergent properties or qualitative novelty, above all, social structure. Such is one of the main assumptions of a social relational approach (Emirbayer, 1997).

The social relational approach discussed here can be described as using a framework consisting of four elements (Bunge, 1996). This framework consists of the body of background knowledge, problems, aims, and methods advanced by a particular approach. These are briefly described below. Please also note that there are various approaches within the humanities and social sciences that could be labeled under a relational approach. The social relational approach used here is however centered on using quantitative social network analysis.

1.3.1 Body of background knowledge

There are two main philosophical ideas that underpin a social relational approach. First, it conceives cultural, political, and economic facts as relational in nature rather than an aggregate of individual actions. Second, it recognizes that from these relations greater wholes are formed that display emergent or novel properties, above all, social structure (see Blitz, 1992; Schweizer, 1997; Sawyer, 2001 on the issue of emergence). More recently, these two philosophical notions have been

articulated in a theoretical movement in sociology called "relational sociology," which stipulates that the structure of relations among actors and their location in this structure have important behavioral, perceptual, and attitudinal consequences for both the actors and the entire social system (Emirbayer and Goodwin, 1994). Relational sociology stipulates that social relations are not completely random, but that they show patterns or particular configurations, which are important features of the lives of the actors who display them. Therefore, how a person lives depends in large part on how s/he is tied into the larger web of social connections. Furthermore, relational sociology notices that categorical affiliations (e.g. race, social status, and social class) alone rarely partition people in a way that confirms with observed action. Thus, social relational analysts argue that human action is organized through categorical affiliations (e.g. race or social classes), but it is motivated by the structure of social relations in which actors are embedded (Emirbayer, 1997).

1.3.2 Problems addressed

All social cognitive problems (economic, cultural, and political) can be addressed through a social relational approach given one condition. The cognitive social problem has to be formulated in relational terms (Emirbayer and Goodwin, 1994; Emirbayer, 1997). For example, social institutions can be conceptualized as the emergent patterns of social activity generated by actors embedded in the structure of social networks (Schweizer, 1997; White, 2008), and power emerges out of the pattern and operation of socio-cultural and socio-psychological relationships among members of a social system (Emirbayer, 1997). A social relational approach can deal with practical problems, but in an indirect way, i.e. by scientifically uncovering the role of political, cultural, and economic relations in social systems and providing this information for designing social policies. In this sense, a social relational approach distinguishes between science and socio-technologies such as policies and management.

1.3.3 Aims

A social relational approach seeks to explain, at least in part, the behavior of human actors and of the system as a whole by appeal to specific features of the connections (structure) among the elements. More specifically, the social relational approach discussed here

investigates how patterned relationships among actors within a system enable and constrain human action. Conceiving human actors as part of rather than just as elements of social systems, a social relational approach acknowledges the social embedded condition of human actors and avoids the problems of micro-reduction (which focuses on individuals) and macro-reduction (which focuses on the larger structure) approaches to explain the behavior of systems: it eschews the individualist and holist pitfalls.

1.3.4 Methods

One of the best-developed sociological methods for studying social relations is organized under the rubric of social network analysis (SNA) (Emirbayer and Goodwin, 1994; Wasserman and Faust, 1994; Degenne and Forsé, 1999; Freeman, 2004). Social network analysis focuses on "relationships among entities, and on the patterns and implications of these relations." Social network analysis comprises diverse methods for the study of how resources, goods, and information flow through particular configurations of social ties. From the outset, the network methods of studying human behavior involve two commitments: (1) they are guided by formal theory organized in mathematical terms, and (2) they are grounded in the systematic analysis of empirical data. Thus, fuzzy concepts such as social cohesiveness and social prestige can be formalized and quantified, allowing systematic quantification and comparative studies. Social network data consist of at least one structural variable measured for a set of actors. Structural variables refer to the social relations (measured on pairs of actors) of interest, and are the primary concern of network analysis. However, attributes of individuals such as age, education, work position, place of residence, and so on, can also be used creating a composition-structure framework of explanation. The relations among actors define the structural data, while the attributes of individuals refer to the composition of the social network. The tools for obtaining social network data are similar to the traditional methods used in the social sciences (e.g. interviews, surveys, participant observation, and archival records).

Finally, it is necessary to make some conceptual distinctions between (social) system and (social) network and between network analysis and social network analysis, if only because they are closely related. The similarity and difference between (social) system and (social) network are these: every social network is a social system, but