

Social Networks and Natural Resource Management

Uncovering the Social Fabric of
Environmental Governance



Edited by Örjan Bodin
and Christina Prell

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Uncovering the Social Fabric of Environmental Governance

Social network analysis (SNA), a quantitative approach to the study of social relations, has recently emerged as a key tool for understanding the governance of natural resources. Bringing together contributions from a range of researchers in the field, this is the first book to fully explore the potential applications of SNA in the context of natural resource management.

Topics covered include the role of SNA in stakeholder selection; improving fisheries management and conservation; the effect of social network ties on public satisfaction with forest management; and agrarian communication networks. Numerous case studies link SNA concepts to the theories underlying natural resource governance, such as social learning, adaptive co-management, and social movement theory.

Reflecting on the challenges and opportunities associated with this evolving field, this is an ideal resource for students and researchers involved in many areas of natural resource management, conservation biology, sustainability science, and sociology.

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Foreword

Clearly, successful natural resource management can no longer be constrained to single resources like mineral ore, timber, or food, governed in a sectoral fashion. Humanity is at a stage where we are challenging the biophysical foundation of our own future at the global level. Environmental issues are shifting from a focus on saving the environment as if we were independent of it to finding pathways of sustaining our own development and even existence on a finite planet. How do we adapt to the new situation of global human imprint, in a democratic and respectful manner, sharing ecological, social, and economic burdens and benefits justly among people and nations? The challenge is broader than the climate issue and encompasses an active stewardship of critical processes of people and nature in dynamic landscapes and seascapes in a global context, and in a situation where more than 50% of the human population is living in urban areas.

The social sciences play a central role in the current era of turbulent global dynamics with unprecedented social, ecological, and technological change. The social sciences, although still to some extent suffering from a lack of a common framework in approaching these issues, is rapidly gaining ground in climate and global environmental change research, in resilience thinking and sustainability science. In August 2010, the UN Secretary-General's High-level Panel on Global Sustainability was launched with the objective to reflect on and formulate a new vision for sustainability in the context of planetary boundaries, and research on governance and institutions for collective action to deal with common-pool resource dilemmas characterizing natural resource governance was awarded the 2009 prize in economic sciences in memory of Alfred Nobel.

Clearly, there is tremendous scope for drawing on insights from diverse fields of the social sciences and for generating new

understanding of truly integrated systems of people and nature for stewardship of our own future within the biophysical boundaries set by the life-support systems of our planet. The ecosystem approach to natural resource management aims at integrating the social and the ecological but so far mostly in terms of management of dynamic ecosystems. Research that contributes to a deeper understanding of the social dimension that allows for ecosystem stewardship and natural resource governance within the framework of interdependent social-ecological systems is a frontier of great significance. It certainly is important to broaden the social domain from investigating human action in relation to a specific natural resource, like dairy or fruit production, or environmental issue, like climate change, to the challenge of multi-level collaborative societal responses to a broader set of feedbacks and thresholds in social-ecological systems. For example, governance in catchments of the Murray Darling river, Australia has been successful in solving problems, adapting to change and connecting the region to global markets. Dryland cropping, grazing, irrigated dairy and fruit production is widespread and economically lucrative activities are thriving. But, if the analysis is broadened to a social-ecological approach to account for the capacity of the landscape in sustaining the values of the region the picture looks quite different. Widespread clearing of native vegetation and excessive water use for irrigation have created severe salinization problems, so severe that the region seems to be facing serious social-ecological thresholds with possible knock-on effects between them. Crossing such thresholds may result in irreversible changes in the region. Hence, strategies for adaptability that are socially desirable may lead to vulnerable social-ecological systems and persistent undesirable states such as poverty traps or rigidity traps. Similarly, scientists dealing with the environmental domain may conclude that the environment is in a hopelessly degraded state, but if analyzed from a social-ecological perspective, there may be adaptive capacity to turn the situation around, to get out of the trap and start a new pathway of development.

It is in this context that this volume *Social Networks and Natural Resource Management: Uncovering the Social Fabric of Environmental Governance* becomes very relevant. Recent studies have revealed the crucial importance of social, often informal, networks in natural resource governance. Informal networks of resource users and beneficiaries, actor groups, leaders, agencies, knowledge carriers, and institutional entrepreneurs, seem instrumental in trust building and conflict resolution, in mobilizing key resources, in navigating social-ecological

transitions when responding to crises, and in transforming unsustainable governance regimes towards adaptive and multi-level stewardship of whole landscapes and seascapes. Social networks are often the glue that ties together the individual with the organizational and the institutional and with key actors operating in networks that span multiple scales and governance levels.

Reading this book will enable more focus, and more precision, in understanding how social networks, and their internal and external characteristics, affect natural resource governance outcomes. Many valuable approaches and tools are presented for how to unravel functions and processes of social networks, what they look like, how they are structured, who participate and their positions, and in what ways all this relates to sustainable ecosystem stewardship. The reader will have the pleasure of further learning and understanding social relations of natural resource governance through applications of methods, tools, and theories that draw on and combine competences and insights from many different research fields within the social sciences with interdisciplinary research on adaptive management, common-pool resource management, and adaptive co-management. The different chapters and studies in the book will take us to a plethora of places and contexts around the world. This journey stretches through contexts such as agro-forestry in Ghana and artisanal fisheries in Kenya and Mexico, through forest management in British Columbia in Canada to the governance of a large urban park in Stockholm, Sweden. The chapters assemble new insights for how interactions and collaborations among different actors in networks contribute to ecosystem stewardship. A true pleasure to read and an important step towards improved understanding of the social dimension of natural resource governance. Read on and enjoy!

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Part I Introduction

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

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.