



Centralization in the global avoided deforestation collaboration network



Caleb Gallemore^{b,*}, Darla K. Munroe^a

^a Department of Geography, The Ohio State University, 154 North Oval Mall, Columbus, OH 43210-1361, United States

^b Department of Geography and Environmental Studies, Northeastern Illinois University, BBH-346 A, 5500 North St. Louis Avenue, Chicago, IL 60625-4699, United States

ARTICLE INFO

Article history:

Received 7 October 2012

Received in revised form 29 March 2013

Accepted 15 April 2013

Keywords:

Earth system governance

Global governance

Reducing Emissions from Deforestation and

Forest Degradation

Networks

Polycentricity

ABSTRACT

Reducing Emissions from Deforestation and Forest Degradation projects currently cover an area approximately twice the size of Germany and challenge traditional concepts of centralization and decentralization in studies of environmental governance. Emerging from the interactions of a complex network of actors, Reducing Emissions from Deforestation and Forest Degradation demonstrates that transnational governance networks of organizations can become spatially centralized. Using a historical analysis of the development of Reducing Emissions from Deforestation and Forest Degradation, we argue that the evolution of Reducing Emissions from Deforestation and Forest Degradation policy has been directed primarily from donor countries, especially in North America and Europe. Adopting a social network analysis approach, we present findings from a new dataset of collaboration on 276 Reducing Emissions from Deforestation and Degradation, avoided deforestation, and sustainable forest management projects that began some on-the-ground operations between 1989 and June 2012, finding that organizations in donor countries have from the beginning been the central actors in the Reducing Emissions from Deforestation and Forest Degradation network. We conclude that Reducing Emissions from Deforestation and Forest Degradation exhibits spatial centralization within transnational governance architectures despite institutional fragmentation, raising important normative questions about participation in transnational forest governance.

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1. Introduction

In 2008, [Rudel \(2008\)](#) called for increased attention to forest policy in tropical countries in land change. At that time, Reducing Emissions from Deforestation and Forest Degradation (now REDD+, formerly avoided deforestation), a proposal to finance forest protection via climate change mitigation funds or carbon markets, was only emerging. In the few years since, REDD+ has witnessed explosive growth. In addition to numerous small-scale pilot projects ([Cerbu et al., 2011](#); [Center for International Forestry Research, 2012](#)), it is central to efforts to reform national forest policy, a core element of United Nations Framework Convention for Climate Change negotiations, and an organizing paradigm for many development agencies. Existing research provides insights into how REDD+ models are being or have been enacted in particular places ([Padwe, 2002](#); [Brown et al., 2000](#); [McElwee, 2011](#); [Beymer-Farris and Bassett, 2012](#); [Milne and Adams, 2012](#)), as well as how REDD+ is situated within the United Nations system ([Okereke and Dooley,](#)

[2010](#); [Schroeder, 2010](#)). There is, however, less understanding of the informal and quasi-formal relationships linking these two arenas. Because relationships like these may be important for flows of information and resources crucial to adaptive governance more broadly ([Holling, 2001](#); [Holling et al., 2002](#); [Adger et al., 2005](#); [Cash et al., 2006](#)), it is important for us to understand the structure of these informal and quasi-formal networks. Moreover, we are interested in what an understanding of these network structures might tell us about the way organizations engaged in transnational environmental governance interact and what these patterns of interaction might mean for opportunities for participation in the formation of environmental policy.

In this article we introduce a framework for answering these questions, using REDD+ as an example. We present an original dataset containing 276 avoided deforestation, sustainable forest management, and REDD+ projects that began on-the-ground operations between 1989 and June 2012, building on existing data by including information on organizations collaborating on each project. We create a network dataset consisting of organizations linked by common sponsorship of pilot projects ($N = 763$). Adopting a social network analysis approach ([Wasserman and Faust, 1994](#)), we calculate betweenness centrality, a measure of the degree to

* Corresponding author. Tel.: +1 6145894083.

E-mail address: gallemore.1@osu.edu (C. Gallemore).

which organizations connect different groups in a network (Freeman, 1977), presenting scores for organizations, as well as cities. We provide additional context for this analysis with a historical analysis of the development of REDD+ and an exploratory examination of 1547 organizations' involvement in consultation on major policy planning documents, membership on voluntary and governmental standards-setting committees, and co-authorship of "gray" literature. We find evidence of a spatially centralized system, with REDD+ policy development directed by organizations in relatively few places, despite the involvement of many.

We begin by presenting conceptual background drawing on work in Earth system governance and polycentric governance. These literatures provide a framework for studying the informal and quasi-formal dimensions of global climate policy, but, we argue, their conceptualization of centralization and decentralization suffers by conflating spatial centralization with formal, institutional centralization. This problem, we argue, can be addressed by combining a network and a spatial perspective on transnational environmental governance. We then begin our empirical discussion by providing background on the types of organizations most active in REDD+ policy development before explaining the ways these organizations have been active in developing REDD+. In the second part of our empirical analysis, we present detailed statistics from the pilot projects dataset, as well as more exploratory analysis from the other datasets mentioned above. We conclude with a discussion of the potential normative implications of spatial centralization and the need for further research.

2. Theory: centralization in governance architectures

Despite nearly three decades of decentralization of natural resource governance in many tropical forest countries, national agencies have incentives to maintain control over forests, and decentralization can often be incomplete (Larson and Soto, 2008). Phelps et al. (2010) and Sandbrook et al. (2010) warn that REDD+ might promote further recentralization of forest governance in tropical forest countries by empowering national forest ministries and increasing the value of forest control. While this outcome is uncertain (Toni, 2011), these concerns are raised in a growing literature, exemplified by debates on the relative merits of national, project-based, or "nested" approaches to REDD+ (Chagas et al., 2011; Pedroni et al., 2009). The consolidation of decision-making authority in higher levels of state bureaucracies, however, is only *one* way centralization might take place. Given that REDD+ is a predominantly transnational governance system, centralization could also take place within the less formal transnational networks that act as conduits for knowledge, advice, and resources.

Recent discussions of Earth system governance provide a conceptual framework for thinking about centralization and decentralization beyond the state. Earth system governance is "the interrelated and increasingly integrated system of formal and informal rules, rule-making systems and actor-networks at all levels of human society" dealing with human–environment interactions (Biermann et al., 2010, p. 203). Research on Earth system governance extends institutionalist studies of global environmental politics to complex networks of public and private organizations that collaborate (and sometimes clash) in implementing environmental governance (Biermann, 2008). From this perspective, environmental governance does not happen just within the territory of states but takes place *across* borders, carried out by non-governmental organizations, development agencies, and private firms undertaking projects in multiple places simultaneously. Students of Earth system governance refer to these middle-range phenomena, the networks or clusters of organizational relationships and activities that connect concrete

projects on the ground with more generalized discourses and norms, as "governance architectures" (Biermann et al., 2009).

Within the Earth system governance and related literatures, there is an emerging consensus that global environmental governance is "fragmented" (Biermann and Pattberg, 2008; Biermann et al., 2009) in the sense that many environmental issue areas are governed via a diversity of institutional types (such as treaties, international organizations, or customary rules) with differing spatial scopes and emphases. These fragmented architectures are sometimes described as "polycentric" (Abbott, 2012). As outlined by Ostrom et al. (1961), polycentric systems consist of formally separate governing bodies which, despite their autonomy, are in regular consultation with one another. The relationships between the governing bodies are flexible and may vary from issue to issue, depending on the degree to which events taking place within one administrative area affect others. Ostrom (2010, 2012) and Nagendra and Ostrom (2012) advocate a "polycentric" approach to global environmental policy as a way to balance local knowledge and innovation with coordination (Ostrom, 1998) by combining experimentation with "mechanisms for mutual monitoring, learning, and adaptation" (Ostrom, 2010, p. 552).

Several writers suggest that REDD+ is already an emerging multi-level governance project (Skutsch and Van Laake, 2008; Thompson et al., 2011; Korhonen-Kurki et al., 2012), embedded within a fragmented or polycentric governance architecture (Kanowski et al., 2011; Nagendra and Ostrom, 2012). As such, REDD+ offers an opportunity to advance our understanding of Earth system governance. Here, in particular, we address two emerging questions. First, how does interaction take place within fragmented architectures (Zelli, 2011)? In our analysis, this is essentially a question of network structure: what are the patterns of key relationships between organizations engaged in REDD+? Second, how might the patterns of these interactions affect the potential for participation (Biermann and Pattberg, 2008) and accountability (Biermann and Gupta, 2011)? As Biermann and Gupta (2011) argue, transnational spatial interdependence can pose significant challenges for accountability, as the weakness of international institutionalization offers limited opportunities for redressing grievances. As a result, accountability can depend heavily both on patterns of inclusion of stakeholders and the degree to which included stakeholders are able and willing to maintain a "critical distance" from decisions (Dryzek and Stevenson, 2011). To maintain accountability, Dryzek (2009) argues, governance systems should be noncoercive, so people's authentic perspectives can be expressed; inclusive, so all people affected by decisions are involved in decisionmaking; and consequential, in that participation can affect decisions.

The ability of the Earth system governance and polycentric governance frameworks to answer questions about interaction and accountability, however, is compromised by conflating spatial and institutional centralization. It is uncontroversial to consider a social system centralized if a single governing body creates policy or a single organization acts as a "hub" in a network of interorganizational relationships. In the absence of such a structure, it is generally presumed systems are polycentric or fragmented. The problem with this assumption is that systems may be centralized spatially without corresponding institutional centralization. In this case, there might be no single hub or authority, but several key organizations might be located in roughly the same area, facilitating access to information and resources for some and raising barriers to others, potentially limiting both the inclusiveness and consequences of participation. At the time of writing, for example, California is developing a REDD+ offsetting program with the states of Chiapas, Mexico, and Acre, Brazil. Having recently published a set of draft recommendations for the system, the REDD Offset Working Group has

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