



Integrating food security and biodiversity governance: A multi-level social network analysis in Ethiopia

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ABSTRACT

Integrating food security and biodiversity conservation is an important contemporary challenge. Traditionally, food security and biodiversity conservation have been considered as separate or even incompatible policy goals. However, there is growing recognition of their interdependence, as well as of the need to coordinate solutions across multiple policy sectors and levels of governance. Despite such recognition, there has been no empirical analysis of governance networks that specifically integrates food security and biodiversity. Focusing on south-western Ethiopia, this paper used social network analysis to investigate three main questions: how stakeholders interact in the governance of food security and biodiversity in a multi-level governance context; how the goals of food security and biodiversity are integrated in such a multi-level governance context; and which stakeholders are popular and play connecting roles between stakeholders in the governance network. The study was conducted in a subsistence dominated farming landscape, where we interviewed 244 stakeholders ranging from local to national levels. We found that the governance of food security and biodiversity conservation was strongly hierarchical, with virtually no horizontal linkages between adjacent districts, and very few vertical direct interactions of stakeholders spanning two or more levels of governance. Introducing a novel analytical distinction of collaborative vs individual integration, we found that only a minority of the collaborations between stakeholders took both food security and biodiversity into account, despite the majority of actors being individually involved in both sectors. Stakeholders with positional power, sociological power (popularity) and formal authority played a liaison role in the governance network. To further improve integration of food security and biodiversity conservation, a governance network that harnesses stakeholder collaboration across sectors and governance levels is essential. However, given the central role of many government administrative organizations, possible problems of power capture by some stakeholders need to be carefully managed.

1. Introduction

Ensuring universal food security and halting biodiversity decline are two of the biggest contemporary global governance challenges. Food security exists when all people have access to sufficient, safe, nutritious and preferred food, such that they can lead a healthy and productive life (FAO, 2014). Biodiversity refers to the variability among living organisms including diversity in genes, species, and ecosystems (Convention on Biological Diversity, 1992). Agricultural production – one aspect of food security – poses a threat to biodiversity through agricultural area expansion (Balmford et al., 2005; Smith, 2013), and agricultural intensification (Pimentel et al., 2005). Loss of biodiversity, in turn, may have negative short-term and long-term effects on agricultural production and thus also on food security (Sunderland, 2011;

UNEP, 2013).

Historically, food security and biodiversity conservation have been governed separately (Sunderland, 2011; Chitakira et al., 2012). More recently, with the introduction of the Sustainable Development Goals (SDGs), there has been increased recognition that the integration of food security and biodiversity conservation is necessary to ensure sustainable outcomes in both (Brussaard et al., 2010; Chappell and LaValle, 2011; Mark et al., 2017). With the aim of managing trade-offs and ensuring a synergistic outcome, programs around the implementation of the SDGs seek to integrate social, economic and environmental aspects. One way to harmoniously achieve these goals is to foster a governance network that enhances integration of multiple sectors and stakeholders across different governance levels (Mark et al., 2017), as well as a coordinated policy process and coherent policy goals

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(Tosun and Leininger, 2017). Here, a key goal is to minimize possible trade-offs between food production and conservation, and maximize synergies through appropriate governance (Carlsson and Sandström, 2007; Tschamtko et al., 2012).

Governance comprises both the structures (actors and their linkages) and processes (rule making and enforcement process) influencing food security and biodiversity conservation outcomes (Hill, 2013; Mertens et al., 2015). Governance structures reflect how different stakeholders are arranged or the structural pattern of relation between stakeholders to bring about certain outcomes (Bodin and Crona, 2009). In social-ecological systems governance, structure could range from a strictly hierarchical – a top-down or a bottom-up governance structure – to a governance network – that is, a structure that supports stakeholder interaction across multiple geographical jurisdictions, policy sectors and governance levels (Cumming, 2016).

The focus of this paper is on the governance network influencing food security and biodiversity conservation, that is, on the interactions between agencies and other stakeholders from various districts and governance levels through which decisions are made and actions are taken that affect food security, biodiversity or both (Alexander Steven et al., 2016). A stakeholder, in this context, is any actor who affects or is affected by a decision, including government agencies, community groups, and non-governmental organizations with diverse interests, positions and power (Freeman, 1978; Lemos and Agrawal, 2006). Understanding the pattern of interactions among stakeholders is crucial for governance in any context, but especially when there are multiple objectives across different domains such as in the context of food security and biodiversity conservation. Despite abundant literature on the governance of food security as well as biodiversity, to the best of our knowledge, no study has specifically addressed how existing governance arrangements help or hinder the integration and harmonization of food security and biodiversity. This is a major shortcoming because many developing countries are both highly biodiverse and food insecure.

To harmonize food security and biodiversity conservation, understanding the governance network is important because structural linkages between actors lay the foundation for how different interests, policies and strategies are integrated and implemented. For example, collective action, integration of diverse interests, learning and sharing of experience, effective interaction of stakeholders across governance levels, and appropriate implementation can all be fostered or hindered by the established governance structure (Leventon and Antypas, 2012; Berkes and Ross, 2013; Cumming, 2016). The nexus between food security and biodiversity is part of a social-ecological system that is characterized by complexity, interconnectedness and dynamism (Berkes et al., 2003; Folke, 2016). For such complex systems, it is widely agreed that the governance network should involve different stakeholders in decision-making, promote collaboration across governance levels, and foster horizontal interaction among actors (Berkes et al., 2003; Bodin and Crona, 2009; Bodin, 2017). Related to this is the notion of collaborative governance, which describes a governance network where multiple stakeholders involving public, non-governmental and civil society collaborate and interact, across geographical and jurisdictional boundaries, governance scales, levels and units (Emerson et al., 2016; Bodin et al., 2017). Although there is no governance panacea (Ostrom, 2007), collaborative governance is likely to be more effective in complex systems than a strictly hierarchical, linear governance structure (Bunderson et al., 2016), which may be more efficient for more clearly defined problems associated with broader consensus (Cumming, 2016; Bodin, 2017). A collaborative governance network is recommended for complex social-ecological systems since it is flexible, inclusive and adaptive and facilitates learning (Bodin, 2017). Nevertheless, collaborative governance network can also generate conflict, delay action, or may be used by influential stakeholders to

collaborate purely to pursue their own interests (Koontz and Thomas, 2006; Cumming, 2016). Furthermore, we must remain critical of where in a governance network collaboration occurs; it is possible that the stakeholders that are tasked with bringing together diverse interests may not have the capacities or powers to do so effectively (Leventon and Antypas, 2012). Thus, to assess the effectiveness of a governance network one must investigate the characteristics of stakeholders, the position and interest of individual stakeholders in the collaborative network, and the nature of collaboration between the stakeholders (Bodin and Norberg, 2007; Cumming, 2016; Bodin, 2017). One suitable method to study the different types of collaborative governance network – including in the integration of food security and biodiversity conservation – is social network analysis (Bodin and Crona, 2009).

Governance of multiple policy domains can be integrated in various ways. To distinguish how different integration processes may relate to the governance network, we introduce a new conceptual distinction of ‘collaborative’ versus ‘individual’ governance integration, which we analyze using network analysis. We define individual integration as when a stakeholder collaborates on food security with one partner, and on biodiversity with another partner. Collaborative integration, on the other hand, occurs when two stakeholders integrate both policy goals in a single collaboration. The individual integration approach may help an individual stakeholder to harmonize the two policy goals in its individual governance activities, for example by learning from different collaborations. However, the individual approach to integration cannot guarantee that integration will improve at the system level, since each stakeholder deals with the two policy goals separately, and with different partners. In addition, it can increase misunderstanding between stakeholders, hamper system level coordination, create institutional misfits and hamper broader goal attainment at a system level. In contrast, collaborative integration is a more direct approach to integration and thus more likely to improve integration at a system level, since it means that two stakeholders are in position to simultaneously discuss potential conflicts and synergies between the two goals.

Possible synergies and trade-offs between food security and biodiversity conservation play out most prominently in smallholder-dominated rural landscapes, which play a major role in global food security (Graeub et al., 2016). We applied social network analysis to study the governance structures affecting food security and biodiversity in a rural landscape of southwestern Ethiopia. The landscape is part of an internationally recognized biodiversity hotspot, but biodiversity is under pressure from forest clearing (Aerts et al., 2017; Gove et al., 2008), agricultural intensification (Eshete, 2013), and population growth (Oromiya Bureau of Finance and Economic Development, 2012). Food security in southwestern Ethiopia is relatively high by national standards, but very low by international comparisons. Given the simultaneous and interconnected challenges related to food security and biodiversity conservation in this system, the integrated governance of food security and biodiversity conservation is particularly important. Our study aimed to: (1) identify and map the interactions (including individual and collaborative integration) of stakeholders involved in food security and biodiversity conservation in a multi-level governance context; (2) examine how food security and biodiversity goals are integrated at the stakeholder and system levels, respectively; and (3) identify and characterize key stakeholders who play connecting (linking) roles between different stakeholders, and those who are otherwise particularly prominent in the governance of food security and biodiversity. Connecting stakeholders are those who are structurally positioned to connect or bridge between different stakeholders or groups of stakeholders, whereas irrespective of their structural position, prominent stakeholders are those stakeholders ranked as most important by other stakeholders. Prominent stakeholders, although structurally not necessarily found between other stakeholders, still play an important role in ensuring food security and biodiversity.

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