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Moving forward in collaborative forest management: Role of external actors for sustainable Forest socio-ecological systems

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ABSTRACT

Collaborative Forest Management (CFM) of local forest users and governments promoted to achieve sustainable forest Social-Ecological Systems (SESs) by consolidating strengths of these actors. Although much of the writings on CFM acknowledge its potential to deliver sustainable SESs, knowledge about what specific role of government can strengthen local forest management and utilization is still poor at best. This study aims to fill the gap by analyzing meta-data from International Forestry Resources and Institutions (IFRI) database for 77 SESs (IFRI sites) in seven countries. We used Ordinal logistic regression to model association between government's Forester Department involvement in important forest management activities and sustainability of forest SES. Our result shows that Forester Department involvement in planting, forest maintenance activities and forest benefit sharing among forest users are associated with sustainable SESs while their involvement in monitoring, sanctioning and transfer of local people harvest right are associated with unsustainable SESs. Our finding has important implications for the ongoing local to global level discourse on how to structure appropriate government interventions to achieve positive social and environmental outcomes from local forest management. However, we suggest precaution not to overstretch the implication of our findings as a panacea for CFM.

1. Introduction

Forests in tropical developing countries, especially those inhibited by local people, are characterized by interaction and interdependence among the local people (social system) and the forest (ecological systems) and hence they are coupled Social-Ecological Systems (SESs) (Hukkine, 2014). The livelihood of local people in these countries is intricately connected to forests (Sunderlin et al., 2005; Mohammed and Inoue, 2013). For millions of people living in and around these forests, the forest constitutes a dominant part of their physical, material, economic, and spiritual lives (Salafsky and Wollenberg, 2000; Sunderlin et al., 2005). On the other hand, it is also accepted that local people are the most appropriate caretakers of tropical forests (Armitage, 2005; Balooni and Inoue, 2007). Communities living nearby have intimate knowledge of the forest, are able to monitor and police access, and respond rapidly to threats such as wildfires (Carter and Gronow, 2005).

Acknowledging the interaction and interdependence among local people and tropical forests, as well as failure of the traditional state-managed top–down approach which has resulted in massive degradation of natural resources and local livelihood systems, formalizing local people forest governance has been promoted (Balooni and Inoue, 2007). Proponents of local people forest governance have argued that local forest management results in improved livelihood of the forest dependent people as well as forest condition (Smoke, 2003; Banana et al., 2007; Pulhin and Inoue, 2008; Maryudi et al., 2012; Schusser, 2012). Currently, local and indigenous people are estimated to hold and manage as much as 15.5% of the forest through customary and community-based tenure systems (RRI, 2015).

Despite optimism about local forest management and a subsequent increase in local control of forests (Agrawal, 2007; RRI, 2015), outcomes from it, at best, have been mixed (Berkes, 2004; Blaikie, 2006; Lund and Treue, 2008; Mohammed and Inoue, 2012, Mohammed and Inoue, 2014, Schusser et al., 2016), implying that local forest management is not always a guarantee for positive social and environmental outcomes (Balooni et al., 2010; Green and Lund, 2015; Baynes et al., 2015). In Indonesia, for example, devolution of rights to local people has resulted in disastrous outcome for the forest with local people opting to maximize income from the forest (Larson, 2005). In addition, there are concerns on ability of local people to sustain their management regime when faced with ecological or social changes (Terborgh, 2000; Smith, 2001; Bremner and Lu, 2006); to cope up with elite capture within the community (Arnold, 2001; Thoms, 2008; Mahanty et al., 2009; de Blas et al., 2011; Mohammed and Inoue, 2012; Persha and Andersson, 2014) and to resist pressure from outsiders such as companies that have stake to extend other land uses into the forest (Sunderlin et al.,

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2008; de Blas et al., 2011). Overall, human inhibited tropical forest SESs are often too complex to be managed effectively by a single actor such as local people (Carter and Gronow, 2005; Berkes, 2009; Andersson, 2013). Consequently, consolidating strengths of different actors, especially that of governments and local communities, has been considered as a rational response to the challenges of sustainable forest SESs (Castro and Nielsen, 2001; Carter and Gronow, 2005).

Collaborative Forest Management (CFM) is a working partnership between local communities and external actors (World Bank, 1999; Carter and Gronow, 2005; Kothari et al., 2013; Akamani and Hall, 2015). In most cases, it involves government's forestry department (FD hereafter) and local people that derive direct benefit from the forest (Forest Users hereafter) (Castro and Nielsen, 2001; Carlsson and Berkes, 2005; Schusser et al., 2016). It has been promoted in the last couple of decades embracing the philosophy of forest conservation and livelihood improvement through cooperation between the two stakeholders (Bhattacharya et al., 2010) and has attracted the attention of forest managers, environmentalists, donors, policy makers and researchers including economists and social scientists worldwide (Misra and Kant, 2004). CFM is an appealing arrangement for sustainable SESs because of its potential to combine strengths of different management approaches (Carter and Gronow, 2005; Carlsson and Berkes, 2005; Mahanty et al., 2009; Kothari et al., 2013; Akamani and Hall, 2015).

In some context, the CFM has resulted in disastrous outcome for local communities as well as forests. In Ethiopia, patronage network between FD and wealthy outsiders resulted in clearance of the forest for income much lower than the market value which in turn diminished the share that Forest Users would have derived as a compensation for restricted withdrawal right on the forest (Mohammed and Inoue, 2012). In their study in Uganda, Turyahabwe and his colleagues reported that compartments under CFM had more live stems of both timber and pole tree species, more trees with harvestable logs and significantly higher merchantable volume as compared to non-CFM compartments because of FDs role in monitoring harvesting rules of local communities (Turyahabwe et al., 2013). However, the same research also found out that strict restriction of the FD resulted in decline of Forest Users' livelihood.

The puzzle of what CFM arrangement between Forest Users and FD can lead to synergy social and ecological outcome remains open. Scholars such as Barnes and van Laerhoven (2015) advised future research to advance our understanding of the extent to which external agents can support local level forest management. Previous studies on CFM have emphasized on power sharing among actors in CFM (Carlsson and Berkes, 2005; Mohammed and Inoue, 2013), knowledge generation and social learning through CFM (Armitagea et al., 2008; Fernandez-Gimenez et al., 2008; Berkes, 2009), CFM as trust building strategy between different actors (Carr et al., 1998; Fernandez-Gimenez et al., 2008) and relationship between co-management and community resilience (Berkes and Jolly, 2001; Akamani and Hall, 2015). Our study divert from these works by taking a pragmatic approach to diagnosing CFM and examining it as a problem solving strategy (Berkes, 2009). Hence, we inquire in this study what role or function of actors in the partnership can lead to synergy between forest and livelihood outcome. The earlier works precluded the development of an association between sustainable SES and FDs involvement in local communities' forest management activities. This paper goes one step further by modeling association between FD involvements in six major forest management activities; i.e. forest planting, forest maintenance, forest benefit sharing, forest monitoring, Sanctioning rule breakers and local communities 'harvest right transfer (Mogoi et al., 2012); and suitability of SESs for diverse forest sizes in eight countries comprising of 77 SESs.

1.1. Multi-level governance

Forest conservation is costly. It requires investments in time and money. For example, new trees must be seeded, nursed, and planted while existing forests must be guarded. All these actives need labor and money. However, many of the benefits of forest conservation are felt outside of the local area, and therefore, relatively small local benefits of forest conservation are outweighed by conservation's costs (Wright et al., 2015). Hence, achieving sustainable forest management is a collective responsibility since all of us face the likelihood of extremely adverse outcomes of deforestation and forest degradation (Ostrom, 2010). Furthermore, human-induced causes of forest change occur at multiple scales. Yet, most governance mechanisms are designed at a single level – whether national or local – and do not provide effective solutions for the overarching challenge of forest governance (Nagendra and Ostrom, 2012).

Considering its complexity and multi-scale nature, governing the deforestation and forest degradation problems requires institutional diversity embodied in multi-level, multi-purpose, multi-sectoral, and multi-functional units of governance (Araral and Hartley, 2013). Hence, it is critical to facilitate effective multi-governance governance of forests. Multi-level governance can be defined as *the processes and structures of public policy, decision-making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished* (Emerson et al., 2012). Multi-level governance is based on the notion of positive role of interactions and collaborative effort among actors to solve public problems (Inoue et al., 2015). In multi-level governance, citizens and their officials may establish organizations with the authority to decide how to manage a resource, what time and monetary contributions are required, as well as the authority to sanction those who do not contribute resources (Nagendra and Ostrom, 2012).

An example of multi-level forest governance is Collaborative Forest Management (CFM). The central feature of all effective CFM approaches is sharing control over the management of forests among Forest Users and FD (Carter and Gronow, 2005). In fact, the term CFM refers to generic descriptor of a range of participatory approaches involving some form of forest co-management between Forest Users and external actors (Petheram et al., 2004). Such governance scheme will enable tap the advantage of actors at various level. For example, a review by Barnes and van Laerhoven (2015) have showed external actors role in strengthening both the internal capacities of communities through forest and technical management trainings and their relations with the external environment through explaining government policies).

The extent to which external actors involves in local forest management in CFM arrangement ranges from relatively conservative in which Forest Users are hired and shared benefits to genuine partners in which external actors only involves as a facilitator in local forest governance (Turyahabwe et al., 2013). In the case of tropical forests where dissatisfaction and conflict between Forest Users and the forestry department has become the norm under centralized forest governance undermining sustainable forest management, governments perceived collaboration with local communities as an opportunity to optimize positive outcome for the forest and local people (Castro and Nielsen, 2001). Such collaboration is also conceived to minimize government cost for the forestry sector by sharing the responsibilities of forest management to local people. On the other hand, the possibility of tenure security, economic incentives as well as empowerment is key incentives for Forest Users to be a partner in CFM (Carter and Gronow, 2005). Overall, well designed and carefully implemented interventions by governments can play an important role in forest conservation (Nagendra and Ostrom, 2012). An important theoretical contribution of this article will be a careful quantitative study of the role of forestry department in encouraging sustainable local forest management.

2. Research methods

The analysis draws on a global data set of social and ecological parameters from a range of representative SESs in tropical forest landscapes. For