

## ***Assessing the effectiveness of community-based management strategies: Conditions for self-enforcement and effective co-management***

*Jetske Bouma, Dave Huitema and Erik Ansink*, Institute for Environmental Studies (IVM), VU University, the Netherlands

The literature on community management has long circled around questions of effectiveness (Mansuri and Rao 2004, Hayes 2006), enforcement mechanisms (Ostrom 1990, 2009) and the organization of community involvement and participation (Danielsen et al. 2009, Kubo and Supriyanto 2010). More recently, studies have started appearing that consider communities in their institutional context, arguing that effective community management requires linking with higher governance levels (Armitage et al. 2008) and collaboration with authorities at other governance scales (Carlsson and Berkes 2005). Especially since (indigenous) communities are often not well represented in the formal decision-making processes that affect their livelihoods and management practices (Bawa et al. 2010) it is important to analyze the embeddedness of community based management in its wider institutional and socio-economic context to understand the conditions for effective community management.

The Combioserve project focuses on the effectiveness of indigenous community biodiversity conservation in Mexico, Bolivia and Brazil. In each country the position and rights of indigenous communities will differ, which affects the position and role of indigenous communities in biodiversity conservation as well. Also, even when community management of biodiversity is relatively autonomous, communities are affected by developments in the region surrounding their land, and their livelihoods usually depend on market developments and external factors too (Berkes 2007). For effective management it is important that the community can influence these developments and anticipate what is happening. We are interested in this interface between the community and its wider institutional and socio-economic environment and how this influences cooperation at community scale.

In the analysis we will assess both the relationship of the community with formal and informal governance actors (both governmental and non-governmental) and the impact this has on the willingness and capacity of the community to self-enforce sustainable resource use. Most studies either focus on the community's capacity to self-enforce sustainable resource use, or on the linkages of the community with higher governance scales, but not on the relations between the two. We believe that addressing both adds to the understanding of whether community based management can effectively conserve natural resources, protect cultural identity and enhance local livelihoods. Given that we won't be comparing community based management with other approaches we will not be able to say much about the effectiveness of community based biodiversity protection *per se*, but we will assess how perceptions of the role of community based management and the legitimacy of nature conservation influence local self-enforcement and analyze the extent to which communities participate in and influences decision-making at higher governance scales.

In focusing on self-enforcement we focus on the question how communities overcome free-riding problems without external enforcement mechanisms. Ostrom (1990) famously showed that communities do this by defining and establishing local institutions for enforcement and control.

Community characteristics also play an important role in effective management (Bouma et al. 2009), but key factor is the availability of local institutions for enforcement and control (Agarwal and Gibson 1999).

Coalition theory addresses these same questions but from a game theoretical perspective where agents are self-interested and no informal institutional arrangements exist. Still, sustainable outcomes are possible when cooperation is profitable, when actors succeed in reaching agreement about the sharing of costs and benefits and when the self-enforcement condition can be met (Finus 2003). Assessing how community actors define and update cost and benefit sharing agreements and how the external context influences the profitability of cooperation can help understand how external factors influence local self-enforcement (Ansink and Bouma 2011). Also, the institutional context influences local willingness to collaborate in community cooperation by affecting individual preferences and expectations, and changing the willingness to self regulate and refrain from over extracting resources and/or under contributing to sustainable use (Bouma and Ansink 2011, Dufwenberg et al 2011).

Policy networks are networks of actors that are expected to play a role in the creation of a response capacity and have subsequently drawn much interest (see e.g. Rydin and Falleth, 2006; Janssen et al., 2006). Such networks are sometimes assumed to be 'self organizing' and 'scale free', which refers to the contention that they emerge spontaneously, are flexible in which issues they choose to address, and can tailor their interventions to the scale of the problem at hand. Both such rosy assumptions can be intensely questioned. There are serious collective action problems in organizing networks, networks differ greatly in terms of their characteristics such as centrality and connectivity (see Janssen et al., 2006), and some of better suited for the local level than for the global level. In relation with this issues of accountability, leadership and 'entrepreneurship' loom large (see e.g. Rydin and Falleth, 2006; Huitema and Meijerink, 2009; Westley and Antadze, 2009).

The methods we propose for analyzing these issues are case study analysis and field experiments, apart from more preparatory studies like literature reviews, focus group meetings and conceptual-theoretical work. In focus group meetings we would like to collect information about local rules and enforcement mechanisms, perceptions of community management and of the relation with the formal authorities. We might also add some questions to the Combioserve household survey to collect information about household characteristics and perceptions of community based biodiversity protection, including the perceived representation of individual and household interests at different governance scales. The case study analysis would focus on assessing the linkages of the community with policy networks. For this, we would like to interview leading community members to assess how the community interacts with and influences higher jurisdictional levels, and interview representatives of the formal authorities about the effectiveness of community co-management. Finally, we would like to conduct field experiments to test the impact of changes in the economic and institutional context on the willingness to self-enforce sustainable resource use. Field experiments create an, usually artefactual, experimental setting to test behavioral assumptions regarding individual decision-making (Harrison and List 2004), or to analyze how internalized norms affect behavior in culturally different groups (Henrich et al 2005). Depending on the local interest in this methodology, we would like to experimentally test some of the behavioural assumptions associated with self-enforcement with indigenous communities in the field.

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