



# Fisheries' Property Regimes and Environmental Outcomes: A Realist Synthesis Review



Rebecca McLain<sup>a</sup>, Steven Lawry<sup>b</sup>, Maria Ojanen<sup>b</sup>

<sup>a</sup>Portland State University, USA

<sup>b</sup>Center for International Forestry Research, Bogor, Indonesia

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## SUMMARY

Our paper describes the application of a realist approach to synthesizing evidence from 31 articles examining the environmental outcomes of marine protected areas governed under different types of property regimes. The development of resource tenure interventions that promote sustainable management practices has been challenged by the difficulties of determining how contextual factors affect environmental outcomes given the complexity of socio-ecological systems. Realist synthesis is a promising evidence review technique for identifying the mechanisms that influence policy intervention outcomes in complex systems. Through a combination of inductive and deductive analysis of the links between context, mechanisms, and outcomes, realist synthesis can help clarify *when, how, where, and why* property regime interventions are likely to result in positive environmental outcomes. Our study revealed the importance of disaggregating property regimes into sub-categories, rather than treating them as homogenous categories. More importantly, use of a realist synthesis approach allowed us to gain a deeper understanding of the ways in which three mechanisms—perceptions of legitimacy, perceptions of the likelihood of benefits, and perceptions of enforcement capacity—interact under different socio-ecological contexts to trigger behavioral changes that affect environmental conditions. The approach revealed the multi-faceted and interactive nature of perceptions of legitimacy, in which legal legitimacy, social acceptability, and ecological credibility combined to create robust legitimacy. The existence of robust legitimacy in turn appeared to be an important contributor to the success of regulatory systems reliant on voluntary compliance. Our study contributes to the field of natural resources governance by demonstrating the utility of a systematic review method which has received little attention by property scholars but which has promise to clarify understanding of how complex systems work. Our study also highlights that achieving long-term sustainability requires paying greater attention to the mechanisms that support or undermine people's willingness to voluntarily engage in conservation behaviors.

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## 1. Why property regimes matter

Practitioners, planners, and policy makers increasingly consider the socio-ecological effects of property regimes in the design and implementation of sustainable development and other conservation-oriented policies and programs (Yin, 2016). Property regimes—configurations of rights, duties, and legal authority structures over land or natural resources (Cousins, 1992)—are a key aspect of natural resource governance systems, shaping how the costs and benefits of those resources are distributed. The allocation of costs and benefits, in turn, affects the incentives for individuals, households, communities, and other social actors to engage in ecologically sustainable resource use and management (Lawry, 1990).

Four decades of empirical work have shown that positive environmental outcomes for common pool resources (i.e., resources characterized by subtractibility and high exclusion costs) can be achieved under any type of property regime (Yin, Zulu, Qi, Freudenberg, & Sommerville, 2016). However, much property regime research consists of single case studies or relatively small-n comparative studies, making it challenging to evaluate the patterns that distinguish effective regimes from ineffective ones. Evidence reviews of empirical studies, such as meta-analyses, systematic reviews, and evidence syntheses are increasingly being used to address these shortcomings (Yin *et al.*, 2016). These reviews evaluate whether property regime interventions, such as rights devolution or formalization, are effective at improving environmental conditions (Halpern, 2003; Yin *et al.*, 2016).

Many evidence reviews on property regimes have examined the institutional design attributes associated with common pool resource systems managed sustainably under common property regimes (Brooks, Waylen, & Borgerhoff-Mulder, 2013; Cox, Arnold, & Villamayor Tomás, 2010). Identifying the socio-ecological contextual factors that influence whether property regimes are successful at achieving positive ecological outcomes has proved more challenging. When a particular set of contextual and institutional design factors will result in positive environment outcomes under a given property regime remains unclear (Brooks et al., 2013; Porter-Bolland et al., 2012; Robinson, Holland, & Naughton-Treves, 2014; Yin et al., 2016).

In the fields of public health and education, an evidence review approach known as realist synthesis is increasingly being used to identify the mechanisms that condition policy intervention outcomes when complex systems are involved. Realist syntheses seek to “develop middle-range theories that explain how the context (C) influences mechanisms (M) to generate outcomes (O), often called context-mechanism-outcome (C-M-O) configurations” (Durham & Bains, 2015, p. 3). Realist synthesis may prove equally useful for clarifying *when, how, where, and why* property regime interventions, which typically occur in the context of complex socio-ecological systems, are likely to result in positive environmental outcomes (Nilsson, Baxter, Butler, & McAlpine, 2016).

In this article, we adopt a realist synthesis approach to synthesizing evidence from a subset of articles included in a systematic review that examined relationships between property regimes and environmental outcomes for forestry, fisheries, and rangelands (Ojanen et al., 2014, 2017). Due to limitations in time and resources available, we limit our synthesis to the fisheries’ cases covered by that review. We selected to focus on fisheries’ regimes because they have received less attention than forest regimes. Our synthesis had two objectives. The first objective was to gain a better understanding of the social mechanisms that influence the environmental outcomes of marine protected areas. An additional objective of our synthesis was to determine whether marine protected areas (MPAs) governed under different types of property regimes—state, community, and hybrid—differed in their environmental outcomes, and if so, whether it was possible to discern what factors contributed to those differences in outcomes. For the second objective, we did not assume a priori that any of the regime types would be more effective than the others. Using a realist synthesis to evaluate these fisheries’ cases revealed the importance of disaggregating hybrid property regimes, which are characterized by the sharing of property rights between more than one institution, into sub-categories rather than treating them as one category. It also allowed us to reach a better understanding of three social mechanisms—perceptions of legitimacy, perceptions of the likelihood of benefits, and perceptions of enforcement capacity—that condition conservation behaviors. Improved understanding of these mechanisms will facilitate progress toward achieving the Sustainable Development Goals (United Nations, 2015), including SDG 1,<sup>1</sup> No Poverty; SDG 12,<sup>2</sup> Responsible Consumption and Production; and SDG 14,<sup>3</sup> Life Below Water. Additionally, our study

contributes to the resource governance field by demonstrating the utility of an alternative approach to systematic reviews that has promise for yielding insight into the workings of complex socio-ecological systems.

#### (a) Rationale for a realist synthesis

A realist synthesis focuses attention on outcomes, the mechanisms that lead to them, and the contextual factors that trigger particular outcomes (Durham & Bains, 2015; Pawson & Tilley, 1997). A key assumption of realist synthesis is that social change is a function of individuals interacting with the social structure in which they are situated. Policy interventions work by changing the resources and opportunities available to people affected by the interventions, leading to changes in their decisions (Wong, Westhorp, Pawson, & Greenhalgh, 2013). Another assumption of realist syntheses is that policy interventions do not produce outcomes in and of themselves. Rather, it is the mechanisms that underlie interventions that result in outcomes (Durham & Bains, 2015). Astbury and Leeuw (2010) define mechanisms as the “underlying entities, processes, or structures which operate in particular contexts to generate outcomes of interest” (p. 368). Drawing on Pawson and Tilley’s (1997) work, Dalkin, Greenhalgh, Jones, Cunningham, and Lhuissier (2015) describe mechanisms as “a combination of resources offered by the social programme under study and stakeholders’ reasoning in response” (p. 3). In realist synthesis parlance, policy interventions are not mechanisms. Instead, interventions provide (or limit) resources or opportunities, leading to particular sets of responses as a result of the affected individual’s reasoning (Dalkin et al., 2015).

The context-mechanism-outcome (CMO) configurations identified during a realist synthesis make explicit the theories of change that underlie the intervention being evaluated (Durham & Bains, 2015). Because mechanisms are functions of the interactions that take place between participants and their context, interventions implemented across different social contexts may result in different outcome patterns (Wong et al., 2013). A realist synthesis relies on a combination of inductive and deductive analysis to study CMO configurations (Rycroft-Malone et al., 2012). Each of the cases included in the synthesis is examined to identify themes relevant to the observed interactions between the theoretical framework components (i.e., context-mechanisms-outcomes). Counterexamples are looked for as themes are identified, and the theoretical framework is modified accordingly.

#### (b) Our theory of change

Figure 1 depicts the theory of change that guided our realist synthesis. Our theory of change is an adaptation of the SES framework (McGinnis & Ostrom, 2014), itself a variant of the IAD framework (Ostrom, 2011). As described by Ostrom (2007, p. 15182), the SES framework enables one to examine how the attributes of a resource system, the resource units it generates, the system’s users, and its governance “jointly affect and are indirectly affected by interactions and resulting outcomes at a particular time and place”. Following Ostrom (2007), our theory of change posits that property regimes are situated in socio-ecological systems, and many contextual factors can affect their outcomes. In keeping with the SES framework, we grouped the external factors that could affect property regime outcomes into three major categories—socio-economic, political, and biophysical. However, we added time elapsed since the property intervention occurred as a fourth external factor to account for the lag that may occur before impacts are visible. Institutional design attributes of the property regime are included in our theory of change as proximate contextual factors.

<sup>1</sup> Specifically sub-goal 1.4, “By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.”

<sup>2</sup> Especially sub-goal 12.2, “By 2030, achieve the sustainable management and efficient use of natural resources.”

<sup>3</sup> Sub-goal 14.B encourages parties to, “Provide access for small-scale artisanal fishers to marine resources and markets.” Progress toward achieving the sub-goal would be measured based on Indicator 14.B.1, “Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access.”

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