



Sustainability and Land tenure: Who owns the floodplain in the Pantanal, Brazil?



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ABSTRACT

In seeking to achieve poverty alleviation and environmental conservation, public policy has often centred on guaranteeing land titles to local peoples. However, such approaches have brought unintended outcomes, replacing small-scale economies and natural areas by intensive exploitation of resources with no clear improvement in local people's wellbeing. To understand this, we go beyond a general political ecology framing to consider relations between sustainability and land tenure, focusing on the intersection of economics, ecology and anthropology to understand how land tenure, property and use play out on the ground. We draw together different concepts including bundle of rights, *de facto* and *de jure* resource use, property regimes, density-dependence and non-equilibrium theory. The significance of this three-discipline view is illustrated through a case study of the Pantanal wetland, Brazil, where conservationists, the government and the local population contest ownership of the Paraguay River floodplain. Government sought to address conflicts around tenure and access through a narrow view of property, which failed to encompass the overlapping layers of land tenure, property and use on the ground and only served to create further legal battles. This article concludes that a more complex view combining the three perspectives is needed in the case of the Pantanal, and in other cases of contested property rights, in order to resolve conflicting claims and foster sustainability. We dissect both the power plays involved between different groups competing for control of a valuable resource, and the legal frameworks which can and should provide checks and balances in the system. The more nuanced grasp that emerges of local systems of tenure and access, of how these diverge from western property concepts, and of their environmental implications favours a better understanding of local realities, allowing for better management policy and consequently contributing more effectively towards poverty alleviation and environmental protection.

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1. Introduction

Secure access to land and guaranteed property rights are assumed to be key elements in tackling poverty alleviation and environmental conservation (FAO, 2012). Insecurity of land tenure and lack of established property rights are singled out as the main causes of deforestation in the Amazon (Nolte et al., 2013), of failures to reduce poverty in Africa (Peters, 2004) and of the collapse of marine fisheries (Pauly, 2003). The main approach to deal with these challenges has been to grant property titles and to set up modern land registries (Zoomers and Haar, 2000). The conversion of collective and customary land rights into formal, individual rights,

and the creation of free land markets in principle gives poor people the ability to sell or rent land to third parties and to use land as a collateral for credit (De Soto, 2000). Moreover security of tenure is presented as a prerequisite for the establishment of protected areas, payment for ecosystem services projects and for most biodiversity protection schemes focused on specific sites (van der Ploeg et al., 2016). Since the 1990s, based on this view, a great international effort has gone into programs focused on providing land title to residents (Zoomers, 2010). In Afghanistan alone the US international development agency (USAID) invested \$56.3 millions on a program focused on Land titling between 2004 and 2009 (Manila, 2009). The Brazilian Government plans a similar investment, claiming that deforestation in the Amazon will only end when ownership is established across the area (MMA, 2013).

However, such approaches have precipitated outcomes rather different from their stated purpose. The liberalisation of land mar-

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kets led to land grabbing, with foreign investors buying land to expand forestry, mineral extraction and commercial plantation projects in and around the global south (Borras et al., 2011). In 2007, 500 billion USD was invested in developing countries; most of this went to those industries (Zoomers, 2010). Locally, the consequences involve replacement of small scale economies and natural areas by intensive resource exploitation (Nayar, 2012). Empirical evidence shows that in many cases far from improving local people's wellbeing, land titling has increased environment impact (Pinckney and Kimuyu, 1994; Sjaastad and Cousins, 2009; van der Ploeg et al., 2016). Therefore, although the link between sustainability and property regime is presented in official narratives as established, policymakers and management practices still fail to achieve sustainability in practice, leading rather to unanticipated outcomes. Understanding why land titling is failing is fundamental to proceed more effectively in poverty alleviation and biodiversity conservation. The first step in doing so is to unpack this assumed link (Von Benda-Beckman et al., 2006) to give a nuanced grasp of local systems of tenure and access, of how these diverge from western property concepts, and of the environmental implications of different systems. In doing so it is important to understand the political ecology behind the way the assumed link between property system and sustainability is used in the power plays between different groups competing for control of a valuable resource. It is also important to analyse the legal frameworks which can and should preclude silent violence towards marginalised groups on the one hand, and destructive environmental practices on the other. Even where in reality enforcement is currently weak, the law provides a foundation for ultimately more effective regulation.

1.1. Unpacking sustainability and land tenure

Economists, ecologists, and anthropologists have all theorised the relationship between property systems and sustainability. We first outline how each discipline has looked at these issues, and the intersections between them, then illustrate a more integrated interdisciplinary view in a case study from the Pantanal wetland, Brazil, where conservationists, local government and fishermen contest ownership of the floodplain. We conclude by exploring how one might better approach similarly contested property situations to foster sustainability in other ecosystems.

1.2. Economists' perspective

For most economists, land tenure and sustainability have long been grounded in ideas of private property, (Horsley, 2011). The nation state using the power of law can guarantee and enforce legal rights over property such as land, ensuring that the owner has the right to restrict use by others (Freyfogle, 2011). "Ownership" and the "right to exclude", came to be, for neoclassical economists, the defining features of a properly functioning property regime (Dagan, 2011), such that without them, there is no property (Blackstonian notion of property: Rose, 1998).

20th century neoclassical economists addressing anthropogenic impacts on common pool resources,¹ applied this western property concept to theorise sustainability. Hardin (1968), for instance, suggested that communities living on common pool resources such as grazing lands and fisheries lack regulated resource use. He saw the instinct for individual accumulation as inevitably driving resources to degradation: the "Tragedy of the commons". According to this

¹ For a more detailed definition: Common-pool resources (CPRs) are natural or human-made resources where one person's use subtracts from another's use and where it is often necessary, but difficult and costly, to exclude other users outside the group from using the resource (<https://dlc.dlib.indiana.edu/dlc/contentguidelines>)

idea, the only way to guarantee long-term use is to establish private ownership and the right to exclude through privatization or state control. More recently, building on multiple empirical examples, Ostrom pointed out that customary rules governing access to and use of common pool resources could function as collective ownership giving people the right to exclude outsiders and regulate use (Ostrom, 2009; Ostrom, 1999; Schlager and Ostrom, 1992); common property regimes (CPR), leading to sustainability in the absence of privatization or state control (Agrawal, 2001). Despite their opposing views, Ostrom and Hardin see "rules" on use (property regimes) as leading to sustainability and "lack of rules" (open access or non-property) to overexploitation (Behnke et al., 2016). Based on this view, property is commonly divided into four categories: private property (owned by an individual or corporate body), state property, common property (owned by a socially-defined group of individuals, often with flexible social and spatial boundaries), and finally, open access (no exclusive owners, "first-come-first-served"). Together these categories have become so widely accepted that they are known as the "Big Four" (Von Benda-Beckman et al., 2006).

However, empirical data suggest an even more complex reality underlying evolving notions of property (Rose, 1998). Places may have more than one owner, normally with different levels of ownership, and at each level a co-owner can share their rights within their own network, blurring the boundaries as to who is the owner and who can be excluded. Moreover, ownership is normally linked to a given time and place, changing according to external and internal factors (Freyfogle, 2011). Property, then, should be seen as evolving multiple layers of ownership perhaps best captured by the term "bundle of rights" (Klick and Parchomovsky, 2016). Some societies have very different notions of property and rights altogether. For instance, in some Amazonian groups, ownership may be attributed to a spirit world rather than to humans: access must be negotiated, and use propitiated (Brightman et al., 2016). Across a wide range of cases, defined ownership and the right to exclude are not clearly tied to any particular one of the given "Big 4" categories, and these categories do not map in any straightforward way to sustainability (Galik and Jagger, 2015).

In face of this more nuanced understanding of property, there have been many attempts to re-shape the so-called "Big 4", including suggestions for creating new categories of property (for example: "managed open access (MOA)": Moritz et al., 2014, 2013). However, we argue that just as for the "Big 4" categories, sustainability is not due to a specific property category but rather to multiple specific interacting factors (Dagan, 2011), as explored in more detail below. Creating new categories and labels will not help approximate theory to reality.

1.3. Ecologists' perspective

'Property' *per se* plays no formal part in ecological models, but these use related concepts of exclusion and territoriality to explain wildlife population dynamics and use of natural resources. Classical theories centred on the idea that species populations are auto-regulated around an equilibrium capacity by density-dependent mechanisms (May, 1974). Most ecological management actions focusing on sustainability build on key concepts of Optimal Foraging (OF: MacArthur and Pianka, 1966), Ideal Free Distribution (IFD: Kennedy and Gray, 1993) and Metapopulation (Hanski, 1998).

Optimal Foraging (OF) sees species' resource use as governed by underlying behavioural rules optimizing net energy gains. IFD postulates that individuals distribute themselves proportionally to resource availability because of OF, minimizing competition and maximizing resource access and use (Davies et al., 2012; Kennedy and Gray, 1993). IFD is in many ways equivalent to open access in economic theory. In ecological thinking, however, IFD leads to

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