

“Hybrid Institutions”: Applications of Common Property Theory Beyond Discrete Tenure Regimes

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Abstract:

Property rights theory has contributed a great deal to global understanding of the factors shaping the management, governance and sustainability of discrete property regimes (individual, State, commons). Yet as the commons become increasingly altered and enclosed, and management challenges extend beyond the boundaries of any given property / territory, institutional theory must extend beyond discrete property regimes. This paper argues that even within conventional natural resource management domains, crucial elements of the commons literature provide powerful explanatory frameworks for theory and practice outside the realm of pure common property resources. Building on common property resource and externality theories in general, and the Ostrom and Coasean traditions in particular, we pose an alternative use of the term “Hybrid Institution” to explore the governance of common or connected interests which cut across property regimes. Following a general introduction to a set of propositions for encompassing this expanded realm of analysis and application, we use the literature on integrated natural resource management to frame the scope of “commons” issues facing rural communities today. Empirical and action research from eastern Africa and logical arguments are each used to illustrate and sharpen the focus of our propositions so that they can be rigorously tested in future research. This analysis demonstrates the instrumental potential of the concept of Hybrid Institutions as a framework for shaping more productive engagements with seemingly intractable natural resource management challenges at farm and landscape scale. Our analysis suggests that central elements of the Ostrom and Coasean traditions can be complementary explanatory lenses for contemporary resource conflict and management.

Keywords: Common property; self-organization; hybrid institutions; externalities; tenure.

Introduction

The relative role of the state, individuals and collectivities in governing common property resources has long been a subject of debate. These debates have largely hinged on a concept of the commons that assumes their isolation from other property regimes. In this paper, we show that many contemporary natural resource management challenges fall neither within the classical conception of the common property, nor within other neatly inscribed property regimes (individual, state), but are characterized rather by

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interdependencies among property regimes. By their very nature, these challenges require collective solutions. We therefore explore the applicability of common property resource theory – namely, the properties of self-governing institutions – for fostering collective responses to these challenges.

Drawing on prior work, we show that a host of “commons-type” natural resource management problems persist despite widespread awareness and concern. We explore the nature of incentive structures behind the status quo, and explore alternative governance arrangements that would be required to produce equitable and economically efficient outcomes. We argue that a productive area of scholarship lies on the interface between two areas of scholarship: the governance of common property resources (Hardin, 1968; Ostrom, 1990) and the governance of externalities (Coase, 1960; Pigou, 1920). These scholars laid out detailed arguments in support of private vs. collective governance of the commons, and for autonomous (free market or contract-based) vs. intentional (state regulatory) governance of externalities. This paper introduces the concept of “hybrid institutions” to make a case for governance arrangements that build linkages among discrete property regimes and depend on the creative combination of autonomous (market), self-organizing, and state regulatory approaches to the governance of the interdependencies which characterize contemporary landscapes.

Following a theoretical overview of the key debates characterizing the governance of common property resources and externalities, we pose a series of propositions for testing through future research. We then use a set of logical arguments and empirical data to explore how these propositions hold up under scrutiny. We finish with a discussion of the implications for natural resource scholarship and governance.

Governing Common Property Resources & Externalities: Past Framing

The property rights literature in political science and economics describes open access resources as being governed by a *res nullius* property regime (ownerless and generally free to be owned). Two policy implications have been derived from the existence of such a regime: the need for privatization to facilitate exclusion, and direct government intervention and control of the resource in question to prevent the destruction of its value through overexploitation. These two scenarios are perhaps best embodied in the classical debates between Hardin and Ostrom on the one hand, and by Pigou and Coase on the other. The first may be described as a debate over the viability of individual vs. common property regimes, and the second the relative importance of market-based vs. regulatory approaches to governing property rights.

GOVERNING COMMON PROPERTY RESOURCE REGIMES (Hardin vs. Ostrom)

In discussing common property, it is important to differentiate between the resource and the institutions governing that resource. Berkes et al (1989) define common property resources as a class of resources for which exclusion is difficult and joint use involves

subtractability³. Common examples include rangeland resources, forests, fisheries, water and wildlife (Feeny et al, 1990). Feeny et al (1990), summarizing a deep tradition of property rights theory, define four basic property rights regimes that may be applied to these or other types of resources: (i) open access (lack of clearly defined property rights), (ii) communal property (which is held by a group of users), (iii) private property (where rights are vested in individuals or corporations) and (iv) state or public property (where rights are vested in government). Given the tendency to confuse the resource with the property rights regime in the case of common property resources, they adopt the term “common property” to refer to the resource and “communal property” to the governance regime.

According to Hardin’s seminal paper *The Tragedy of the Commons* (1968), the open access and unrestricted demand for a finite resource in common property resource regimes inevitably leads to over-exploitation, requiring enclosure or privatization of the commons. This fable has a remarkable impact on both policy debates and academic enquiry into natural resource management. While definition and description of the problem of managing resources characterized by non-exclusive property rights and conflict predates Hardin’s story by many years, his remains the central story by which the problem has been examined.

The assumption of the inevitability of resource degradation under communal property regimes has been extensively critiqued by Eleanor Ostrom and colleagues. The Ostrom tradition has clarified how groups of users can create institutions to fulfill a set of functions required for managing resources sustainably – exclusion, allocation among users, and conditions of transfer – in situations where individuals fail to carry out these functions. By studying a large number of case studies from traditional common property resource (CPR) management regimes across the world, they have distilled a set of features common to institutions that have proved effective in ensuring the sustainable management of common property resources. These include a clearly defined community of resource users; a clearly defined resource; the presence of clearly defined rules clarifying rights, responsibilities and sanctions for non-compliance; “graduated” sanctions matched to the level of the offense; conflict resolution mechanisms; and systems for adaptive management (monitoring systems, ability to modify rules as the need arises) (Ostrom, 1990; Pandey and Yadama, 1990; Wittapayak and Dearden, 1999). Each of these factors plays an important role in influencing levels of mutual trust as well as expectations of what may be gained through cooperation (Blau, 1964; Burns et al., 1985). Determining what makes communal management solutions possible and effective – both in terms of the nature of the resource and the nature of human institutions – has been a fertile area of scholarship. What emerges out of this dialogue is an understanding of the institutional requirements of sustainability for different property regimes under “archetypal” natural resource management challenges (Table 1).

³ Subtractability is where the level of exploitation by one individual directly affects what is available for other users to exploit.

Table 1. Institutional Foundations to Sustainability under Diverse Property Rights Regimes for “Archetypal” NRM Challenges

Property Regime	Institutional Requirements for Sustainability
Private	The incentives of private ownership will ensure individuals invest in long-term returns on their property. State action is required only to regulate and protect property rights.
Public	The government will ensure resources are sustainably managed through the unambiguous allocation of use rights and enforcement of regulations.
Communal	<p>Strong local institutions regulating use are required to manage common property resources sustainably. Key institutional features include:</p> <ul style="list-style-type: none"> ▪ Collective choice rules (locally formulated rules governing the distribution of rights and responsibilities) ▪ Graduated sanctions (enforceable punishments for non-compliance with collective choice rules, matched to the level of the offense) ▪ User group (and resource) that is of manageable size and clearly bounded ▪ Anticipated benefits of self-organizing are equal to or greater than the costs ▪ Conflict resolution and adaptive management mechanisms

GOVERNING THE SOCIAL EFFECTS OF PRIVATE PROPERTY: EXTERNALITIES (Coase vs. Pigou)

The accepted economic model demands individualization of control over resources. This then requires individualized private property rights. But the imperative to divide control over resources among atomistic agents is, at the same time, the mechanism responsible for creating some of the limitations of that very same model. Through atomization, the number of borders among economic agents increases, thereby amplifying transaction costs and hence contributing to the generation of externalities.

– Vatn and Bromley, 1997: 146.

The second debate revolves around the realization that actions of one or more economic agents may cause uncompensated physical and/or economic effects (positive or negative) for others, giving rise to externalities. Standard examples are the harmful effects of a factory’s smoke on those occupying neighboring properties, stray cattle which destroy crops growing on neighboring land, or damage to surrounding woods caused by sparks from railway engines (Coase, 1960; Pigou, 1920). There are two main traditions which have defined the approach to externalities – the Coasean and the Pigovian. Both scholars concur that if self-interest does promote economic welfare, it is because human institutions have been devised to make it so (Coase, 1960). However, they differ on the institutional mechanism involved. Pigou, in the *The Economics of*

Welfare (1920), argues that governments can correct perceived market failures or “internalize externalities” by making the actor causing the negative effect liable for the damage caused. “Pigouvian taxes” – fees levied to correct the negative externalities of a market activity, which operate through compensation for damages and / or incentives for curtailing the activity – are named in his honor. Pigouvian taxes are just one of an array of potential policies that result from the central idea that government intervention in the functioning of markets is necessary to correct externalities.

Ronald Coase, in his 1960 article *The Problem of Social Cost*, argues that this approach ignores the “reciprocal nature” of the problem. His main concern is in regards to the presumptive entitlement of the party being harmed. Coase argues that avoiding harm to party B would also inflict harm on party A, and that the real problem is to avoid the more serious harm. In devising and choosing between social arrangements, Coase argues that one should have regard for the *total effect*. Coase and many influenced by his writing are convinced that government is likely to do a poor job of correcting externalities for many of the same reasons they exist in the first place – limited information about the valuation that heterogeneous individuals place on the resource, and a resulting inability to “correctly” impose incentive-driven or regulatory solutions. Take the example of a farmer whose chemical runoff affects a downstream neighbor. In order for government to impose an efficient corrective policy, the cost of controlling runoff to the farmer and the economic measure of the negative effects downstream must be known. Both parties in this example have incentives to misrepresent those costs. The government agency with responsibility must then craft, implement, and enforce a solution that affects the economic well-being of both parties. It has often been argued that the information and administrative burden can be large relative to the potential gains from correcting the externality. The path forward in the Coasean tradition lies in understanding how a set of individual property rights can be assigned and enforced in a way that minimizes the transaction costs of making decisions about the way a resource is used. Once these rights have been established, the argument goes, the natural logic of markets and self-interested profit maximization will result in an economically “efficient” management of the resource. Coase argues that economic efficiency “requires determining which party could change behavior most cheaply. On this view, the responsible party should be the one whose modified situation is cheapest for society to bear” (Vatn and Bromley, 1997: 139)⁴.

It is important to note here that even though resources used in the creation of externalities may be owned exclusively by a single entity, externalities appear *outside* the sphere of defined property rights. The clearly bounded property rights regimes in Table 1 seem to break down. Recognition of the reciprocal nature of externalities would seem to require a qualification in the institutional requirements to sustainability for

⁴ The lack of universal applicability of Coasean solutions to large externality problems has been well-established – problems of free ridership and high transaction costs create insurmountable barriers to spontaneous efficiency improving agreements for externality problems involving large numbers of people and complex chains of causation. Our intent is not to idealize Coasean solutions, but to emphasize the positive aspects of the paradigm in situations where resource conflict takes place on a political and geographical scale where negotiation is possible – which includes many contemporary conflicts in the developing world.

private property (Table 1). Namely, that self-organization (or in economics parlance, “bargaining”) among the involved property owners is required in the management of social costs or externalities, due to the limitations faced by government in correctly imposing incentive or regulatory solutions.

IMPLICATIONS FOR PROPERTY RIGHTS AND INSTITUTIONAL THEORY

By restricting property rights theory to discrete property regimes, a whole array of “commons” type problems associated with the relationships between (like and unlike) property regimes is missed. Furthermore, we risk losing the explanatory power of common property resource theory for a whole set of problems characterizing contemporary landscapes – where externalities and economic inefficiencies resulting from non-cooperation and aversion are the norm. As a result, opportunities for theory of the commons to contribute toward socially-optimal (“just”) and economically logical (“efficient”) solutions are largely lost. We argue that the in-depth understanding gained from the common property resource literature on the institutional requirements for sustainable natural resource management (e.g. the underpinnings of individual incentives to cooperate) has a great deal to offer problems defined by the interactions among discrete property regimes and the move toward more equitable and economically efficient outcomes.

In the next section, we pose a set of testable propositions that can help capture the opportunity for synergy among Ostrom and Coasean traditions and the realm of theory that lies in the interaction among discrete property regimes. In order to operationalize these propositions, we introduce the concept of “hybrid institution” as it applies to property rights theory. The predominant use of the term “hybrid” is by the economist Williamson, who defines three generic forms of governance within the private sector: spot market, hybrid and hierarchy or firm (Williamson, 1991a; 1991b; 2002). Spot markets, characterized by “faceless transactions and spontaneous order in the market” (Williamson, 2002:6), are the least cumbersome. However, they are ineffective for addressing conflict between bilaterally dependent parties, for which intentional support via hierarchy (internal organization in the form of firms) or hybrid contracting (contractual frameworks that may be interpreted adaptively as learning and change occur) is warranted. Given the transaction costs associated with heavy administrative requirements, “the efficient governance response to added needs for cooperative adaptation is to first move transactions from spot markets to hybrid contracting and, if unmet needs for added coordination persist, to hierarchies” (Williamson, 2002: 12).

The notion of hybrid proposed in this paper is not the middle ground between markets and hierarchically structured transactions (“internal” organization in the form of firms). Rather, it is defined as an *institutional arrangement*⁵ governing the interdependencies among discrete property regimes, whether defined by structure (linkage among entities with jurisdiction over discrete property regimes) or mode of governance (balance between self-organization and formal regulation as complementary instruments of

⁵ Davis and North (1971) define institutional arrangement as “an arrangement between economic units that governs the ways in which these units can co-operate and/or compete”.

WHAT IS GOVERNED

As discussed above, the conventional definition of common property resources is a class of resources for which exclusion is difficult and joint use involves subtractability (Berkes et al, 1989). In other words, the “commons” are generally considered as *communally-owned* and managed *natural* resource or territory. We argue that the definition of the commons must expand to include common or connected interests within other types of property regimes (public, private); the interdependencies among discrete property regimes (public-private-communal), including externalities; and public services.

Proposition 1 – The current framing of the “commons” unnecessarily restricts the applicability of common property resource theory to a much smaller range of natural resource management challenges than that which characterizes contemporary landscapes.

Proposition 2 – Crucial elements of the commons literature – most notably, the principles of self-governing institutions for sustainable management of resources where conflict (or the potential for conflict) exists – provide valuable contributions to conceptualizing and addressing contemporary resource and environmental problems outside the realm of common property resources.

WHO GOVERNS IT

The standard analysis of governance arrangements from the property rights and economics literature places emphasis on singular entities in the management of natural resources. While for Hardin the solution to common property resource management lay in the individual or the State, the work of Ostrom and colleagues emphasizes the potential of self-governing institutions (communal governance). Similar debates have characterized the literature on governance of externalities, with the Pigouvian tradition arguing for government regulation and Coase inspiring support for private or market-driven solutions. While government has a crucial role to play for Coase (assigning and enforcing individual property rights), the focus is rather on the limitations of government knowledge and foresight in designing effective incentives or regulations to guide individual behavior. We argue that the nature of certain “commons” problems (broadly defined), as well as the deficiencies of unitary institutional arrangements in many contexts, often require compound or “hybrid” governance regimes involving complementary roles of the individual, the State and communal governance. In other words, too doctrinaire a commitment to self-organization or unitary forms of governance may overlook other governance arrangements that in combination might work better.

Proposition 3 – “Hybrid” governance arrangements involving two or more entities (individuals, the State, local institutions) and integrating self-organization with more regulatory approaches can be more effective than self-organization within any given property regime for governing contemporary environmental challenges under conditions of weak governance in large areas of the developing world.

This “compound” proposition highlights the need to bridge institutions governing discrete units of property in order to address the expanded scope of commons problems, while also recognizing that self-organization may not be effective under all circumstances. The insight that cooperative governance negotiated within a group can lower cost of exclusion and enforcement, produce specialized knowledge about the resource being governed, arrange effective compensation, and develop compromises effectively is necessary but not sufficient for (many) contemporary resource conflicts. State participation may be needed to aid in exclusion, provide technical assistance and legal certainty to self-governance solutions, or provide clarity on the governance regime that the state will recognize if no common management solution can be found. As stated by Vatn and Bromley (1997: 137), “a common authority like the state – a power at a level above the atomistic agents – is a prerequisite for breaking the circularity about rights and efficiency.”

HOW IS IT GOVERNED?

Our analysis points in directions other than those we as economists normally follow... issues such as moral commitment, collective standards, social norms, and network processes may attain a higher position in the understanding of externality policy. – Vatn and Bromley, 1997:148.

As specific governance outcomes must be adapted to context, the next proposition focuses on the generic *properties* of governance arrangements to ensure sustainable management of an expanded set of “commons” challenges. Well-known governance requirements for common property resources include a clear set of property rights to regulate use and users (sanctioned by the group or the State) and ability to exclude others (operationalized by individual, group or State action) (Feeny et al., 1990). We argue that additional governance features must be creatively integrated into new governance arrangements in order to ensure their feasibility for managing new types of “commons” challenges.

Proposition 4 – “Hybrid” approaches that build upon the principles of self-governing institutions⁶, but link discrete units of (like or un-like) property and combine self-organization with more formal regulatory approaches, hold more promise for addressing contemporary “commons” problems than self-organization within discrete property regimes.

Incentives contributing to undesirable outcomes might include perceived or real costs associated with shifting to alternative management scenarios and the resulting outcomes in the control and use of resources; or the absence of effective enforcement mechanisms to support existing or new rules and regulations. There is a need to minimize the economic costs of governance arrangements to enable feasible solutions to relatively intractable natural resource management challenges. These costs could be in the form of transaction costs (Vatn and Bromley, 1997) or the economic losses

⁶ For example, rules clarifying rights and responsibilities, graduated sanctions, keeping costs within the scope of anticipated benefits.

associated with alternative resource management arrangements (Coase, 1960; German et al, 2006). Considering the reciprocal nature of “social cost” in the governance of externalities (Coase, 1960) could be one way of addressing the perceived cost of improved governance. Hybrid solutions may have an important role to play in minimizing transaction costs or enhancing enforceability of State laws or collective choice arrangements. They also have the potential to facilitate compromise in the form of (full or partial) compensation for parties who may lose from a move to more fair or efficient governance.

Testing Propositions: Empirical and Logical Arguments

PROPOSITIONS 1 AND 2 (WHAT IS GOVERNED)

We explore the first proposition related to “what is governed” through analysis of the results of a participatory diagnosis of landscape-level natural resource management problems carried out by one of the authors in sites distributed throughout the eastern African highlands (German et al, 2006b; in press b). Posing a common set of questions to socially-disaggregated focus groups of farmers (selected on the basis of gender, wealth, age and location of their plots on the landscape), landscape-level NRM concerns of local residents in select sites of Ethiopia, Kenya and Tanzania were identified (see German et al. 2006c for the methodology). From this analysis, it is clear that there are many natural resource management challenges which remain unaddressed *despite* widespread local concern and understanding about these issues. In other words, lack of knowledge or awareness of natural resource degradation is *not* the fundamental problem – despite the abundance of literature suggesting this to be the case.

While the host of issues identified may be classified in any number of ways, it is clear that the following categories of natural resource challenges are common:

1. *Problems associated with common property resources.* Examples include degradation of springs and waterways (affecting both water quality and quantity); degradation of communal rangelands from overgrazing; poor distribution and theft of irrigation water; failure to maintain irrigation infrastructure; failure to maintain village roads; loss of biodiversity (indigenous trees, crops and fodder); and fires and theft in community forests.
2. *Problems associated with common or connected interests within other types of property regimes (public, private).* Examples include the effects of neighbors’ land use practices on the prevalence pests, diseases and weeds (which easily spread across farm boundaries); destruction of property from uncontrolled burning on neighboring plots; loss of soil, seed, fertilizer and property from excess run-off from upslope plots; negative effects of fast-growing boundary trees on adjacent farmers’ fields; crop destruction from freely grazing livestock (in areas where livestock are otherwise zero grazed); lack of respect for farm boundaries; and theft of private property (crops, fodder) from neighbors’ fields.

3. *Problems associated with interdependencies among “un-like” property regimes (public-private-communal).* Examples include encroachment of individual property on the commons (rangelands, forests, paths, roads); relationships among property regimes linked temporally (e.g. open access grazing and dung collection on communal land that becomes private cropland during the rainy season, affecting crop productivity); degradation of common property resources from practices carried out on individual land (e.g. spring degradation from use of pesticides or cultivation of ‘thirsty’ trees); crop destruction from freely grazing livestock (in areas where livestock are otherwise grazed in communal areas); “illegal” use of protected area resources and conflict between protected area officials and local communities; negative effects of trees used for road stabilization on adjacent cropland; conflicts associated with paths or cattle tracks passing through individual property; deliberate destruction of water sources located on private property; and problems associated with land privatization (e.g. inequitable access by women and the poor).
4. *Opportunities lost through failure to cooperate in governing other types of resources.* While most of the above challenges may be said to represent opportunities lost through failure to act collectively, there are a host of issues that do not reflect problems *per se* – but for which greater benefit or efficiencies would be achieved by acting collectively. Many of these apply not to land (natural capital), but to other forms of capital that help to capture value from property rights associated with land and natural resources. These include collective investments in infrastructure which would save time or money or raise productivity (e.g. community mills, irrigation canals and dams, terracing, community bull centers); cooperation in accessing input or output markets; cooperation in community works (schools, roads); collective governance of exogenous development resources for more widespread benefit (e.g. and managing the bias toward wealthy, male farmers exhibited by agricultural extension).

Clearly, the “commons” – in the sense of common interests linked to property regimes – are considerably broader than how they are commonly conceived of in the literature, encompassing concerns about *diverse property regimes* (individual, public and communal); common or connected *interests which connect diverse property regimes*; and the *governance of other forms of capital* (human, financial, physical) that serve as complementary development resources to natural capital.

We argue that many of these challenges exist not due to farmer ignorance, but rather due to the absence of governance arrangements that help translate concern into behavioral change (Proposition 2). Support for this argument is indirect. In other words, the very fact that these problems were identified by farmers suggests awareness and concern about them; the fact that they remain unaddressed *despite* this concern suggests an absence of collective choice or formal regulatory arrangements to enable solutions. Support for Proposition 1 – that common property resource theory has something to offer to this broader set of “commons” challenges – can only be addressed by exploring the incentives underlying the status quo and the institutional requirements

for solving these problems. The first part of this will be addressed here, and the second part in the sections which follow.

As the first set of “classical commons” challenges has received the bulk of scholarship on the commons, we focus our discussion instead on the last 3. If we look at the nature of incentives underlying inaction or avoidance in “other” types of commons challenges (e.g. those highlighted in #2 through 4, above), we see that often times, one or more actors is benefitting from a status quo that is otherwise harmful to others. In other words, externalities in these densely settled rural landscapes are rife. These benefits can be derived from *not having to invest* in activities that would primarily benefit others. Examples include reducing or channeling excess run-off from one’s fields; adjusting agricultural practices to reduce damage to neighboring plots from fire, pests or disease; or use of paths that cause one to walk further but do not bring negative effects on cropland. Benefits can also be derived from the *economic advantage* associated with the status quo. This may be seen in the greater economic returns derived from Eucalypt plantations when cultivated near springs; reduced damage to one’s own crops when Eucalypts are pushed to farm boundaries; the economic efficiency associated with freely grazing livestock (e.g. access to cheap fodder, reduced labor invested in feeding); or the benefits derived from hoarding public services for oneself. Finally, a few of these problems may be associated with simple *failure to communicate* and understand the interests of other parties. An example may be seen in the use of “harmful” trees to line public roads, where other trees may be equally suited to road stabilization but minimize harm to farmers’ fields.

PROPOSITION 3 (WHO GOVERNS)

While results of empirical research were leveraged in support of Propositions 1 and 2, here we use a set of logical arguments to support the propositions related to “who governs”. As one moves from conventional definitions of the commons to an expanded scope of analysis of common and connected interests related to diverse property regimes, those responsible for different property regimes must ultimately come into play. In other words, the State, individual property owners, and self-organizing local institutions responsible for common property resource management are among those responsible for governing “the commons”. For “Type 2” commons characterized by common or connected interests within any given property regime (public, private), we can no longer talk of single management entities as we are now dealing with the interconnectedness of discrete units of property of the same type (e.g. the interactions among adjacent units of private property). The same may be said for “Type 3” commons, which are characterized by similar interdependencies but between different types of actors (the State, individual, collectivity).

As illustrated by Coase and Pigou, such interdependencies require action by either the State (a regulation governing how damage will be curtailed or compensated) or by the landowners involved (to negotiate the most economically efficient outcome). Where self-organization among different property owners is possible, institutional parallels emerge with self-organizing institutions governing common property – suggesting that the properties of self-organizing institutions governing common property might also

apply to the broader set of “commons” issues. This supports the applicability of common property theory to a much broader set of NRM challenges (Proposition 1). Where regulation by State actors is involved, “hybrid” governance arrangements will clearly be required (e.g. State – private; State – private – public), supporting Proposition 3. Even where self-organization is possible to govern relations among discrete property regimes, the State will often have a role to play in providing legal backing to negotiated agreements or contracts. One example of this is in the key function of exclusion; in cases where collective solutions set limits on the individuals who can make use of a natural resource or an environmental sink, state participation is increasingly required to enforce those limits. In other words, “conflict between bilaterally dependent parties can now arise for which intentional (sometimes hierarchical) support is warranted” (Williamson, 1992:6). This again supports the need for hybrid forms of governance integrating self-organization with more formal regulatory approaches (Proposition 3).

It is clear that “Type 4” commons issues characterized by opportunities lost through failure to act collectively require some form of cooperation among actors – whether spontaneous or regulated. While this supports Proposition 3 in part (the need for hybrid institutions to link individual, communal or State actors), support for “hybrid” approaches linking self-organization with regulation can be less easily supported through logic alone. The vast literature on the effectiveness of self-governing *customary* institutions and the paucity of case studies illustrating how these institutions have been built where previously absent does, however, allude to the challenges associated with building such institutions. Further evidence is needed on the conditions under which self-governing institutions can emerge when faced with contemporary challenges. The increasing impingement of the state and the market on traditional economies, as well as heightened pressure and conflict over scarce resources (e.g. water), make the spontaneous formation of collective solutions increasingly challenging.

PROPOSITION 4 (HOW IS IT GOVERNED?)

In order to explore solutions to the problems which are prevalent despite widespread local awareness and concern, contexts in which solutions to these problems have been found or processes in which they are sought can be instructive. The Ostrom tradition provides both the intuitive story and the intellectual underpinnings for action research into governance institutions for managing natural resources in situation of conflict or lost opportunity among user groups. The idea that effective governance requires both the specialized information that user groups possess and the negotiated agreement on rules from participants has been productively built into the design of governance arrangements for addressing landscape-level NRM challenges that remain despite widespread local awareness and concern. Case studies from action research involving efforts to address challenges associated with each type of commons issue are presented below as a means to distill some generic properties of governance arrangements for the expanded set of “commons” challenges (German et al, in press b; Waga, 2006).

Problems associated with common or connected interests within other types of property regimes (public, private)

As illustrated above, a host of landscape-level NRM issues may be characterized by common or connected interests associated with other property regimes – whether private or public. Most of those identified in the eastern African highlands were associated with common or connected interests which create interdependencies among discrete units of private property. One such class of issues concerns pests, disease and weeds which move across farm boundaries. As the land use practices of one farmer may affect the prevalence of pests on other farms, many of these issues may be classified as classical “externality” problems. However, in other cases, the problem may persist due to the simple absence of collective action and governance. A case study on porcupine from the Wolaita region of southern Ethiopia helps to illustrate the nature of incentive structures in inaction and elements of effective solutions (Begashaw et al, 2007; German et al, in press b).

The primary objective of action research was to identify effective approaches for mobilizing collective action for porcupine control. As much learning in action research takes place during implementation, distilling the critical ingredients to success can often be best done in retrospect – once a problem is solved. In the case of porcupine, the critical ingredients included:

- The sharing and collective application of previously specialized local knowledge on porcupine control methods;
- Identification of local institutions effective in mass mobilization, and engaging them in a leadership role for mobilizing collective action on specified days; and
- Development of collective choice rules through: (i) facilitated negotiations between different interest groups to generate solutions acceptable to all (with an emphasis on highly affected farmers and farmers less affected by porcupine); and (ii) development and formal state endorsement of local by-laws to ‘give weight’ to local agreements and provide an additional avenue for dispute resolution.

Monitoring and data collection were also used to evaluate the effectiveness of the approach. Review of legislation to ensure there are no regulations on porcupine capture or culling was also done, but was not an essential ingredient to local problem-solving per se. Results included capture of 958 porcupine in a small area, reduction of yam and sweet potato damage by 400 to 500%, and improved health and welfare from reduced efforts in policing fields at night (Begashew et al, 2007). It is important to note the role of collective choice rules for addressing issues connecting private property, and the role of government in endorsing and supporting the application of these rules.

Problems associated with interdependencies among “unlike” property regimes (public-private-communal)

A second set of landscape-level NRM issues is characterized by common or connected

interests (“interdependencies”) among “unlike” property regimes. While this set of issues shares many of the features of the above set of issues connecting “like” property regimes, the differences in how each party is defined (whether in terms of numbers or level of influence) may shape the institutional requirements – whether in terms of process or outcomes. Two case studies are discussed here: one connecting private and common property, and the other connecting individual and public property.

The first case study comes from the Galessa highlands of central Ethiopia, where water for domestic consumption is sourced from unprotected springs. According to local residents, they face problems of declining water quantity *and* quality. This case study deals with the former; in particular, excessive water consumption by a Eucalypt wood lot cultivated on private land just adjacent to the spring. Refusal of the landowner to accommodate the needs of the larger community was a source of conflict for more than a decade. The entrenched nature of the conflict meant that the project team was unable to encourage the landowner to come to the negotiating table. Local elders were therefore called upon to use moral persuasion to encourage dialogue. A large community meeting was held in which the mediator ensured the views of both the landowner and the community were listened to. Negotiations proved difficult at first, but the landowner finally offered a concession to protect his relationship with his neighbors: that if all households in the village cultivate one seedling and plant it elsewhere on his farm, he will remove the woodlot from the spring. An agreement had effectively been reached. Yet implementation proved more difficult. While the landowner did harvest a large part of the woodlot nearest the spring, these trees eventually began to coppice. Failure to translate the original agreement into a detailed implementation plan (the “what”, “who”, “where” and “when”) meant that the expectations on both sides had not been effectively voiced or reconciled. During follow-up negotiations, the landowner demanded more from the community while offering less, demanding: (i) that others invest all the labor and materials for fencing and establishing the new woodlot; (ii) that he only eliminate the Eucalypts once the new trees are mature; and (iii) that he remove only a portion of the woodlot closest to the spring. Local authorities were brought in to support negotiations drawing on national laws on riparian zone protection, and gestures of reconciliation were again forthcoming. However, the negotiations eventually broke down due to the landowner’s discovery of another law requiring full financial compensation for land investments.

In this case, lessons on what is required to address the problem are learnt by the hurdles faced rather than by what worked. First, negotiation among the different interest groups proved to be an effective mechanism for the development of collective choice rules and for sharing the costs of sustainable management of the resource. Moral persuasion also helped to move the parties toward dialogue. Yet dialogue and collective choice rules alone could not ensure that agreed solutions were implemented in practice. While by-laws were never formulated to give legal weight to resolutions, this oversight was later compensated for through state involvement in the application of national laws. State involvement was therefore necessary not only to clarify property rights, but for supporting the application of collective choice rules. The latter is most crucial where interests of the two parties are highly divergent.

The second case study comes from eastern Uganda, where expulsion of the indigenous Benet from their customary lands for the establishment of what has come to be known as the Mount Elgon National Park has sparked decades of hardship and resentment between the Benet and government officials. The objective of this action research case study was to identify an effective approach for improving livelihood and environmental outcomes through improved cooperation between local communities and the state conservation authorities (Uganda Wildlife Authority). A second objective was to provide a model for protected area co-management that addresses the slide of public property into the “open access regimes” which commonly result when the state lacks resources for enforcement and levels of resentment by local people are high. While early in its evolution, a number of early successes were achieved – such as re-negotiating the suite of “legal” and “illegal” practices (expanding the number of days allowed into the park and resources that can be harvested) in exchange for community commitment to policing the park against those lacking customary rights (Tanui et al, 2007). The following elements may be seen as key to enabling rapprochement following decades of conflict:

- Early gestures of reconciliation (UWA supporting the Benet with technologies to replace resources that had been lost through park establishment, and an agreement by the Benet to respect UWA’s “bottom line” of biodiversity conservation); and
- Balanced concessions for the common good (increased access rights in exchange for Benet support to policing the park against outsiders).

Opportunities lost through failure to cooperate in governing other types of resources

The final action research case study illustrates the application of common property resource theory to the management of other types of resources – in this case, those that provide complementary values to land. This case study is again derived from work done in the Wolaita region of southern Ethiopia, and came about through an inquiry into how local and external institutions shape the distribution of resources within the population. It concerns the strong bias observed in extension agencies toward working with wealthy male farmers.

The main objective of the action research was to develop an effective approach for enhancing equitable access to seed by gender and wealth. As a success case, the key ingredients to improved governance of technologies as exogenous development resources can be distilled in retrospect. These included:

- A shift to low-risk forms of credit in the form of seed repayable in-kind (at harvest);
- Development of collective choice rules through: (i) facilitated negotiations between different interest groups (by gender and wealth) to generate solutions acceptable to all; and (ii) development of local by-laws to ‘give weight’ to local agreements; and

- Use of moral persuasion by local leaders at the time of credit repayment to hold people accountable to their prior agreements.

Results included improved access to technologies by women and poorer households, improved rates of repayment of credit as compared to the national extension system, and livelihood improvements linked to the specific technologies being disseminated (Waga et al, 2006). Once again, we see the role of collective choice rules (producing socially-balanced solutions), moral persuasion (as complementary to formal by-laws) and state support to local agreements (in the form of extension reforms and rule enforcement) as critical ingredients to success.

Each of these action research case studies illustrates the need for “hybrid” governance arrangements among individuals, collectivities and/or the state. They also illustrate the applicability of principles of self-governing institutions – previously theorized in the context of common property – to a larger suite of commons-type problems. These include resource users participating in setting rules that affect them, the need for sanctions in support of collective choice rules and the need for these sanctions to be graduated or matched to the level of the offense (Ostrom, 1999). These principles are seen in these case studies in the form of the negotiation process, in the resulting by-laws (which specify rights, responsibilities and sanctions for non-compliance), and in the tendency to ignore rules that are either too strict or too loose to be meaningful. In short, these case studies provide support to Proposition 4.

Discussion

The case studies illustrate that employing hybrid institutions for the resolution of conflict over resources can simultaneously address issues of fairness and efficiency. Fairness is enhanced by providing a framework within which actors may negotiate self-governance arrangements – solutions arrived at through participation and negotiation are seen as legitimate. The participation of the state as a means of enforcing negotiated agreements is more likely to be seen as protecting fair outcomes than as external imposition of rules under these circumstances.

Efficiency – enhanced sustained economic value of the resource – can be substantially improved through hybrid solutions linking individual property, state regulatory functions and common property type institutions. This is shown in the porcupine example, where principles of self-governing institutions (e.g. collective choice rules for sharing and application of indigenous knowledge and coordinated actions to enhance economic efficiency) were employed to address problems cutting across discrete units of private property and supported through state regulatory functions. Here, successfully avoiding free rider behavior was the key to successful management. The participation of the state provided assurance and enforcement in the form of legal institutions, allowing the collectively efficient behavior to manifest itself through increased credibility of collective choice rules. Efficiency is also enhanced in cases where elements of private property and compensation are involved. In the case study on Uganda’s Mt. Elgon National Park,

providing the Benet compensation in the form of increased rights to resource use served as effective compensation for their support of, and participation in, the exclusion of outside users of the park’s resources.

The case studies and discussion suggest a number of important implications for the institutional foundations to sustainability under diverse property regimes (Table 2). The most important is the need nuance our understanding of the nature of challenges affecting different property regimes, and the need for hybrid-type solutions to a suite of common NRM challenges affecting multiple property units, regimes and users.

Table 2. Institutional Foundations to Sustainability under Diverse Property Regimes for an Expanded Set of “Commons” Challenges

Property Regime	Theory	Reality	Implication
Private	Individual landowners will ensure resource is managed sustainably, either because cooperation is not required (management concerns are internal to the property unit) or is negotiated voluntarily.	Trans-boundary effects and inefficiencies and inequities of individualized solutions make collective action essential.	“Hybrid” governance regimes among interdependent private property owners (self-organized but supported by the state where needed to ensure compliance with negotiated solutions).
Public	The state will ensure sustainable natural resource management through effective allocation of use rights.	Corruption; conflict; management with inadequate information; resentment by holders of customary rights; de facto open access where enforcement is weak.	“Hybrid” governance regimes between individuals or communities and the state (self-organized or supported by government regulation).
Communal	Effective self-governing institutions are required for sustainable NRM. Local institutions, if strong, will manage alone.	Rapid change introduces new drivers and challenges, connecting common property resources to other actors and exogenous drivers.	Support to institution-building (‘horizontal’ multi-stakeholder processes supported by a neutral party) and use of contracts and compensation (with formal endorsement where necessary) to support the formation of common institutions to govern competing interests.

Yet despite these common principles, there is no formula for hybrid institutions – this is not a case of including elements of all property regimes as a universal solution to resource conflicts. The value of this concept is that it provides a framework for creative approaches that combine the strong points of particular regimes in order to address and overcome the weaknesses of discrete property regimes and institutions. The government’s power lies not in its ability to “correctly” impose incentive-driven or regulatory solutions (a weakness pointed out by Coase), but in its ability to sanction locally-crafted solutions more likely to derive economically efficient and socially just outcomes. Reciprocally, the lack of ability to enforce collective agreements and exclude outsiders that can plague self-governing institutions (for common property resources and interdependencies among like and un-like property regimes) can be ameliorated by the state’s authority and resources. The ability to use compensation to make outcomes fair and acceptable to groups that would otherwise be unwilling to support cooperative arrangements can be a key element in crafting economically efficient and socially acceptable solutions to conflict, lost opportunity and unsustainable use of natural resources. None of these approaches is essential in every application, and the way that they are combined will depend idiosyncratically on the people involved, the history of resource conflict, and the characteristic of the natural resource itself.

Conclusions

Our main conclusions relate to the set of propositions that have been highlighted and prioritized for further research. First, a much broader set of issues may be productively encompassed within the definition of the “commons,” namely externalities (social costs) associated with management of individual property (Coase, Pigou) as well as other property regimes (communal, public) and opportunities lost through failure to act collectively in management of property or other types of resources. Ability to find solutions to a host of relatively intractable natural resource management challenges through simple application of principles of self-governing institutions suggests that the fundamental gaps are not ones of knowledge and awareness, but of governance. Several of the case studies illustrate the potential of extending the principles of self-governance to a larger suite of “commons-type” problems, and the potential role of “hybrid” governance arrangements linking institutions with jurisdiction over discrete property regimes. This was seen in the need to foster governance arrangements among discrete units of private property (as in the case of porcupine control), different types of property regimes (as in the case of private woodlots affecting a communal resource) and among individuals with common interest so as to maximize collective benefit (as in negotiated access to technologies). They also show the promise of linking spontaneous with regulatory approaches, as seen by the need for formal by-laws and/or other forms of state support to local agreements to translate agreements into action. While inconclusive, this remains a potentially productive area of future scholarship and practice.

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