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Privatizing the commons: New approaches need broader evaluative criteria for sustainability

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Abstract: Privatization is, since Hardin, often promoted as a solution to many natural resource management challenges, particularly in common-pool resource systems. However, novel forms of privatization are being implemented in unexamined ways. In this article we explore how privatization affects natural resource management from the perspective of multi-dimensional social-ecological systems. We critique the notion that privatization is desirable due to its pure efficiency, and argue that efficiency must be relative to achieving other normative societal goals, in particular, sustainability. While sustainability outcomes often cannot be fully actualized, the processes through which privatization attempts to achieve them are more tangible criteria. First, we draw on (1) distributional and

(2) procedural justice as normative societal goals to assess effectiveness of different forms of privatization. Second, we analyze the broader implications of privatization for social-ecological system functioning considering (3) path dependency and (4) spillover effects. We apply these four concepts to examine three different cases of privatization: eco-certification in fisheries, seed patents in agriculture and property rights in rangelands. We argue that the evaluative criteria for the success of privatization are often oversimplified, and highlight how privatization can influence social-ecological systems and the achievement of normative goals in largely unexamined ways.

Keywords: Ecological economics, governance, institutional economics, political science, public policy, sustainability

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1. Introduction

Privatization is a favored solution to many common-pool resource (CPR) management challenges in social-ecological systems, especially in CPRs subject to open access property regimes. Here we define CPRs by the two core challenges they present for management; high rivalry regarding resource appropriation (i.e. subtractability; the benefits of appropriated resources are captured only by the appropriator) and low excludability (difficulty in excluding resource appropriation). In the absence of effective governance (i.e. open-access), these two system characteristics often lead to the overconsumption of resources, conflict amongst resource users and the externalization of appropriation costs are not addressed through sufficient institutional arrangements (i.e. set of rules and norms for use) (Ostrom 1990; Poteete et al. 2010). Privatization is an effort to sidestep these challenges by altering the formal, and potentially informal, institutional arrangements that govern CPR systems through incentivizing restricted groups or individuals to resolve the challenges by giving them varying degrees of exclusive rights (Demsetz 1967; Ostrom 1990; Schlager and Ostrom 1992). Similarly for public goods (low rivalry and low excludability) such as clean air, investment costs and innovation fall to the individual if they are not provided by the group (e.g. government), but the benefits are shared across all resource users, leading to 'free riding', a lack of investment (e.g. lack of incentives) and slower gains in resource use efficiency that might be expected where both costs and benefits are internalized (e.g. Cornes and Sandler 1984).

Privatization (See Table 1 for a glossary of key terms) attempts to increase excludability in resource appropriation by instituting some form of property rights arrangements that shifts access rights exclusively to specific groups or individuals, and thereby aims to reduce, internalize or even monopolize, externalities (e.g.

investments, management costs, efficiency of use). In addition, privatization can alter the allocation of goods in a market to minimize rivalry. An example is individual transferable quotas (ITQs) in fisheries, where the right to fish a certain amount may be sold or traded as a form of resource appropriation (Soliman 2014; Pinkerton and Davis 2015; McCormack 2017). In a classical view, privatization attempts to shift the costs and benefits to individuals, to avoid a dilemma between individual and group interests (e.g. externalities). It was long assumed that privatization solves the so-called tragedy of the commons (Hardin 1968) as the rational extraction rate for each individual in a commons is where marginal private benefits equal average costs and not the marginal costs. In contrast, a private owner acting rationally will extract up to the point where the marginal private benefits equal marginal costs, avoiding externalities and overconsumption. Common property, which has been extensively studied in CPR systems (Agrawal 2001), is essentially a form of privatization at the group level. However, common property can be distinguished as a form of privatization because the potential for individuals or even the group to transfer or sell common property is usually not considered or impossible.

Privatization has proliferated as a policy for common-pool resource management worldwide, especially where open access conditions prevail. For example, many fisheries have privatized fishing grounds, spatial areas where specific individuals can exclusively fish. In the case of mobile fish species, percentages of the total fish catch for a given season are allocated (sold or licensed), as a form of property rights (Acheson 2006; Costello et al. 2008; Pinkerton and Davis 2015). Similarly, communally managed rangelands and other 'common' land, including forests are being brought under private property regimes; where traditional commons or common property regimes are being transferred to private individuals or more exclusive groups (e.g. Ning and Richard 1999; Mwangi 2007; Guéneau and Tozzi 2008). Assumptions of open access, and the need for privatization, are that they lead to overexploitation, driving much of the logic towards a need for enclosure. However, open access commons can be well managed and necessary in some cases such as with pastoralists (Moritz et al. 2013).

The appeal of privatization as a simple policy solution that fits the market-based policy mindset of the late 20th and 21st centuries has catalyzed its application in natural resource management (Polani 1944). Yet despite its obvious simplicity, privatization is a broad and, often, overgeneralized approach to the governance of complex social-ecological systems. The term privatization encompasses a broad suite of approaches that attempt to assign some degree of property rights to solve the rivalry and/or excludability challenges in CPRs subject to open access. However, the manifestations of privatization are evolving in new and largely unexamined ways (Foley and McCay 2014). This includes control over the distribution of resources in the market such as eco-labelling in fisheries or forestry (Pattberg 2005; Foley and McCay 2014), or control of information, technology or decision-making processes related to resource governance and the institutions they create, affect or operate within.

We examine how different forms of privatization interact with broader (social-ecological) system properties. We attempt to broaden the scope under which privatization can be evaluated as an appropriate institutional intervention to achieve societal goals. We begin by outlining a conceptual framework for evaluating privatization that focuses on notions of justice (distributive and procedural) and system dynamics (path dependency and spillover effects). We apply this framework to three diverse case studies where newly emerging forms of privatization are used as governance interventions. In the discussion we synthesize our analysis into key points for recognizing new diverse forms of privatization in SES, and how broadening the evaluative criteria for privatization can enhance these new governance approaches to match societal goals towards sustainability.

1.1. A sustainability lens for evaluating privatization

We interpret privatization as the transfer of the control over social processes related to the governance, use or distribution of resources from either open access or common property to private organizations, selected groups, or individual(s). Common property can be considered a form of group privatization (exclusive group rights), but typically does not permit individual or group transferability via market mechanisms as is typically associated with other forms of privatization (see Table 1). Privatization can often occur through assigning property, access or use rights to either some aspect of those social processes or to the direct appropriation of the resource(s). For example, traditional forms of privatization include controlling access to the physical space where resources are located, which can be done through a broad spectrum of property rights arrangements (Schlager and Ostrom 1992).

The rationale for privatization is typically based on an economic principle that scarce resources need to be efficiently allocated, and that private control is inherently more efficient than public control (e.g. Sheshinski and López-Calva 2003). However, efficiency as a normative goal (i.e. the goals of non-wastefulness or maximum output per unit input) only provides an instrumental means towards other societal goals related to the use of resources. Thus, efficiency must always be assessed in relation to the desired societal outcomes to which it is oriented (Baumgärtner et al. 2012). Such intrinsic societal goals can vary widely, from increased human well-being, the conservation of biological diversity, or economic growth. As such, the effectiveness of privatization (or any other alternative governance regime) must be conceptualized more broadly than more 'efficient' resource use. Such assessments must consider how any increases in efficiency help achieve some other clearly defined normative goal(s). Here we focus on the normative goals of sustainability comprising: (1) distributive justice, defined here as socially just allocation of resources within and across generations (Lélé 1991; Langhelle 2000; Loos et al. 2014), and (2) procedural justice defined here as participatory governance by and empowerment of individuals, communities, and societies to decide how their needs are met (Agyeman and Evans 2004; McDermott 2013; Loos et al. 2014). Certainly these are not the only criteria or normative goals related to sustainability, but they provide broad evaluative criteria.

Table 1: Definition of key terms.

Common-pool resource – a type of resource with high rivalry in consumption (i.e. subtractability of resources) and challenges for excludability; i.e. the ability to exclude other users from consuming the resource.
Open access – absence of governance rules for non-excludable resources (e.g. CPRs), where no form of property rights for access or withdrawal exist for a specific individual or group.
Privatization – the transfer of control in natural resource management from the public domain to a restricted entity, group or individual, and where the mechanisms for control of the use of the resource are based on market relations.
Common-property – Exclusive collective access, use and/or management rights to a defined resource or set of resources at the group level (typically inclusive of a whole community). Common property rights may be formally (e.g. legally from the state) or informally (e.g. through historical norms) established, defined and enforced. In practice, customary common property rights may be highly contingent and subject to constant negotiation and context-specific interpretation. Common property, in theory, can be viewed as a move on the spectrum towards privatization as a first step of enclosure. However, scholarship on common property has historically not considered it as a form of privatization because it is typically not transferable.
Social-ecological system – Concept that interdependencies exist between social and ecological functions and outcomes (Liu et al. 2007; Ostrom 2009; Fischer et al. 2015a).
Path dependence/lock-in – the limitations or dependency of future system states or changes on past system states and functioning. Once a track/path is started, the costs of reversal are very high and come with increasing returns, in that the probability of further steps along the same path increase with each move down that path (Pierson 2000).
Spillover/flows – externalities as direct or indirect effects outside the bounds of the intended resource management system or component being privatized.
Procedural justice – the participatory governance by and empowerment of individuals, communities, and societies to decide how their needs are met (Agyeman and Evans 2004; Loos et al. 2014).
Distributional justice – ensuring a socially just or fair allocation of resources within and between different generations (Lélé 1991; Langhelle 2000; Loos et al. 2014).

In addition, we consider the broader social and environmental processes impacted by privatization. Here, drawing on literature on social-ecological systems (SES) (Folke et al. 2005; Liu et al. 2007; Ostrom 2009; Partelow 2018) and system dynamics, we focus on how different forms of privatization may influence path dependency and spillover effects. These two, largely unintended, consequences of privatization may have profound effects on sustainable outcomes beyond the spatial or temporal scope of the intended privatization intervention and therefore should be considered alongside the issues of distributional and participatory justice when considering the suitability of privatization as a solution governing CPR problems in SES.

Path dependency is defined as the limitations or dependency of future system states or changes on past system states and functioning (i.e. institutional, economic, technological) (Arthur 1989; North 1990; Mahoney 2000). Path

dependency is not necessarily problematic with regards to achieving sustainability outcomes in CPR management; however, established institutional changes make it difficult to revert back to pre-existing institutional arrangements and may limit unforeseen future options or compromise adaptability. Privatization can create path dependencies, as may all institutional arrangements, and it is critical to examine those which are intentional as well as those which may be unaccounted for, indirect or undesired in relation to desired normative goals due to the nature of social-ecological systems. Spillover is interpreted as the effects or externalities incurred on system processes from interactions with or to other systems (Liu et al. 2015). Privatization typically aims to influence one particular property rights institution, but this may cause spillover effects resulting from the multidimensional character of SES, which the institution is embedded within (Schlüter et al. 2019).

We are aware that many criteria might be used to evaluate privatization; we have chosen spillovers, path dependency, procedural and distributive justice for the following reasons. Spillovers and path dependencies provide criteria for evaluation which exemplify the (context dependent) dynamic, spatial and temporal dimensions of SES where privatization may trigger changes. Dimensions of justice provide alternative evaluative criteria to the neoclassical focus on efficient resource allocation. Justice focuses on socially desired outcomes such as distributional justice, ensuring a socially just or fair allocation of resources within and between different generations (Lélé 1991; Langhelle 2000; Loos et al. 2014), as well as procedural justice, the participatory governance by and empowerment of individuals, communities, and societies to decide how their needs are met (Agyeman and Evans 2004; Loos et al. 2014). Through application of this conceptual framework to the case studies below, we argue that broadening the evaluative scope under which we assess privatization brings new insights to it as a suitable form of governance to achieve societal goals while managing CPR problems.

2. Case studies

Here we use our framework to analyze three cases: (1) Property rights in Mongolian rangelands, (2) Market-based governance and eco-certification in fisheries, and (3) Seed patents and privatized agriculture systems. Each case represents a different type of privatization in a different SES. The diversity of the three case studies is intended to reflect the diversity of the common-pool resource 'systems', and different types of privatization, that are applied as solutions to common-pool resource problems. In this sense, the following cases aim to portray context and conceptual diversity, rather than focus on a more systematic comparative analysis.

As we will examine, privatization is no longer limited to granting private property or access rights to specific resource users in previously commonly managed land (case study 1). Now we restrict access rights to particular characteristics by which goods extracted from common-pool resources can be marketed as a form of privatized natural resource governance (case study 2). The benefits that

Table 2: Overview of analytical sustainability lens on privatization and case studies examined.

Sector	Case	Normative dimension		Social-ecological dimension	
		Procedural justice	Distributive justice	Path dependence	Spill over
Rangelands	Mongolia		**X**	**X**	**X**
Fisheries	Marine Stewardship Council (MSC)	**X**	**X**	**X**	
Agriculture	Seed patents in agriculture	**X**		**X**	

can be accrued from using information previous considered a commonly held resource is also increasingly privatized (case study 3).

The three case studies differ considerably in terms of system boundaries and the nature of the resources being exploited (from discrete physical spaces to spatially unbound information flows) and from specific interventions (cases 1 and 2) to more general societal trends (case study 3). This means making comparisons across cases problematic. We address this by focusing on one or more normative aspects (distributional or procedural justice) and one or more SES dynamic (path dependence or spillover) that arises with the form of privatization in the context of the particular case (see Table 2). Our intention is not to provide a complete typology of privatization interventions across differing SESs, although further work to do this would surely help situate the discourse. Instead, we seek to illustrate the importance of SES context, justice and system dynamics when considering if privatization represents a suitable intervention for sustainable CPR management.

2.1. Property rights in Mongolian rangelands

Rangelands cover roughly 80% of Mongolia's land area, support 73 million head of livestock (102 million sheep equivalents) and 153,000 herder households as of 2016, and provide livelihoods, directly or indirectly, to about a third of Mongolia's human population. In this low-input system, herders graze their livestock on natural vegetation year-round, moving among four seasonal pasture areas, and making occasional long-distance moves to fatten animals or escape drought or harsh winters. Mongolia's rangelands are common-pool resources where exclusion of potential users is difficult and grazing by one individual's animals leaves less forage for others. In the 20th century, Mongolia's rangelands witnessed several major changes in governance. A quasi-feudal system characterized the early 20th century, where nobles controlled defined territories, allocated pastures within these territories to groups of herders, and regulated large-scale seasonal movements and grazing reserves, and livestock were owned both by nobles and their subjects. Smaller-scale movements and allocation of pasture within seasonal pasture areas were informally governed by herders in a local area (Fernández-Giménez 1999). Patron-client relationships between

wealthy herders and poorer relatives or neighbors were common (Humphrey and Sneath 1999). After the 1921 Revolution and a prolonged period of transition marked by several failed attempts at collectivization, a socialist system of herding collectives (*negdel*) was fully established by 1960. Under the collective system, herders tended state-owned livestock for a salary and were allowed to own a limited number of animals for personal consumption. Rangelands became state property and pasture management, including herd movements and grazing reserves, was regulated by the *negdel,* which also provided veterinary services, emergency fodder, and assistance with seasonal movements (Fernández-Giménez 1999).

Following Mongolia's democratic transition in 1990 and the opening of markets, a second major transition in rangeland governance and livestock ownership took place. The collectives were abruptly dismantled, leaving an institutional void with respect to rangeland governance (e.g. setting stocking rates, regulating seasonal herd movements and protecting emergency forage reserves). Collective assets were privatized, including buildings, machinery and livestock. Collective members were entitled to a share of the collective's livestock and many nonmembers used their privatization vouchers to purchase livestock. As Mongolians in cities and towns lost government jobs, they returned to the countryside to claim or purchase livestock and try to make a living as herders, leading to an initial increase in the number of herder households after privatization (Fernández-Giménez 2001, 2002).

Following livestock privatization, the national herd size grew rapidly. Rangelands remained state property, to be used in common by the herders in each county. Privatization of pastures is unconstitutional in Mongolia; however, several laws were passed in an attempt to strengthen the legal framework governing rangelands and to clarify the responsibility and authority of local government to regulate herd numbers and movements (Fernández-Giménez and Batbuyan 2004; Upton 2009). The 2002 update of the Law on Land provides for long-term leases of nomadic winter and spring campsites, and use contracts for winter and spring pasture. However, most local officials were initially unaware of the laws, and to date many lack the capacity, resources or political will to enforce them (Fernández-Giménez and Batbuyan 2004). Further, wealthy and socially powerful herders were privileged in the process of gaining formal possession of campsites, leaving poor and marginalized individuals, including many single women, to seek access through their relationships with wealthier or more powerful male relatives or patrons (Murphy 2014a). Weak institutions for pastureland governance coupled with the growing number of livestock contributed to declining herd mobility, increased year-round grazing of key resources, increased competition and conflict over pasture and water, and growing concerns about pasture degradation and herder vulnerability (Mearns 1996). A growing wealth gap was observed between relatively few very successful herders, and a much larger number of poor herders with marginal herd sizes (Griffin 2003; Nixson and Walters 2006; Murphy 2014b).

A series of dry summers and extremely harsh winters in 1999–2002 killed 30% of the national herd and left thousands destitute (Fernández-Giménez et al. 2012). This disaster served as a "wake up call" for international donors and NGOs, who, seeing little progress in government regulation began to invest in formal community-based rangeland management organizations, providing technical assistance and training to herders to organize into groups to self-manage their pastures, with the aim to improve rangeland conditions and livelihoods simultaneously. By 2006, over 2000 such groups had formed across Mongolia (Mau and Chantsalkham 2006). While CBRM groups have demonstrated positive social outcomes (Ulambayar et al. 2016), they also create new mechanisms for excluding some households from access to pastures (Upton 2009; Murphy 2014a). A second drought-winter disaster in 2009–2010 again led to massive livestock mortality, affected 28% of Mongolia's human population and left 44,000 herder households with no animals (Fernández-Giménez et al. 2012). The number of herders declined by 30% between 2000 and 2014 (Fernández-Giménez et al. 2017). However, the number of animals rebounded and continued to grow, reaching 102 million sheep unit equivalents in 2016, the highest number in recorded history (Mongolian National Statistical Office).

As of 2018, the Mongolian Parliament continues to debate proposed pastureland legislation, with advocates arguing that providing herder groups with exclusive rights to defined winter and spring pasture areas is essential to incentivize sustainable grazing behavior, such as enforcing stocking rates in line with rangeland carrying capacity (Enkh-Amgalan 2009; Hannam 2014). Others argue against tenure formalization for rangelands, pointing out that secure rights for some will limit the flexibility of others, and that flexibility and mobility are the hallmarks of sustainability in low-productivity, high-variability rangeland systems such as Mongolia (Kamimura 2013). This tension between the need for secure rights to pastures and flexible access in emergencies, dubbed the "paradox of pastoral land tenure" (Fernández-Giménez 2002), played out in the 2009–2010 winter disaster where formal community-based groups with healthy pasture reserves became targets for herders from other districts moving to escape disaster (Fernández-Giménez et al. 2012). The strong cultural norm of reciprocity that underlies pasture sharing with neighbors is essential for survival even as it also increases vulnerability for some herders. Careful ethnographic accounts of cross-boundary negotiations for reciprocal pasture use point to the inequities in who is able to gain access to pastures in other districts during disasters, based on social networks and political ties (Murphy 2011).

With regard to livestock ownership, while the national herd size continues to climb, herders are leaving the countryside for the city. Large herds are concentrated in the hands of a few wealthy herd owners, who increasingly rely on contract labor to herd their animals (Murphy 2015). The dynamics of these arrangements vary. In some cases, they allow poor herders to build their own herds to a viable size, especially when the contract allows them to keep a certain percentage of the young females of the year. In others, they result in a more exploitive relationship that traps herders in poverty.

The combined effects of livestock privatization, incremental quasi-privatization of pastoral resources such as nomadic campsites, and weak governance of Mongolia's state-owned rangelands triggered distinct inequities in livestock ownership and access to pastoral resources, as well as spillover effects and path dependence. Two types of path dependence are visible. First is the poverty trap poor herders find themselves in when they lack a viable herd size and typically must consume too many productive animals to allow their herd to grow. Contract herding can sometimes allow herders a path out of poverty but patron-client relationships based on exchange of herding labor often trap poor herders in a servile relationship to more wealthy and powerful households. A second and related trap is the lack of access to campsites, good pastures and the transportation to reach them, which leads herders with small herds to camp continually in one place, degrading pastures and further limiting options for herd growth, wealth accumulation, access to transportation and better pastures. Both of these traps stem in part from failures of distributional justice. The most notable spillover effect is the pattern of unregulated, or more accurately, unfairly and inconsistently regulated cross-boundary movement of herds, which also leads to more intense ecological degradation. While this movement is in accordance with cultural tradition of reciprocal pasture use during disasters, it increases vulnerability of the host community and undermines efforts to strengthen community-based rangeland management institutions. According to accounts by Murphy (2011), the ability to negotiate cross-boundary access is highly dependent on political connections and local power dynamics.

2.2. Market-based governance and eco-certification in fisheries

Fisheries are severely challenged with rivalry and excludability dilemmas (Pauly and Zeller 2016), and the social-ecological conditions between fisheries vary extensively across the world. Fisheries can range from low income subsistence-based, targeting local low value non-migratory species, to industrial-scale vessels chasing highly valued mobile species for many months or years without going to port (Jacquet et al. 2010; FAO 2016). Finding reliably effective governance solutions for fisheries with diverse conditions has been, and continues to be, a considerable challenge (Jentoft and Chuenpagdee 2009; Basurto and Nenadovic 2012). Privatization of appropriation rights, has been used extensively in fisheries policy in the forms of individually transferable quotas (Bromley 2016; McCormack 2017), often filling the governance gaps as a simple panacea approach to address resource management problems for fisheries.

Conceptually, eco-certifications are neither privatizing the resources (e.g. the fish) nor the appropriation right, but the governance of fisheries itself, or at least certain influential aspects (Foley and McCay 2014). This might be either motivated by a failure of the state or group of states to govern the resource in a sustainable way (e.g. the NGO motivation) or by the desire to earn an extra premium in a competitive market (e.g. the private sector motivation). Eco-labels have created

a new consumer market for sustainable seafood as well as standards for how to define and evaluate the sustainability of fisheries. The ability to gain certification and to sell certified products is typically managed by a private organization.

The Marine Stewardship Council (MSC) was founded as an organizational partnership between Unilever and World Wildlife Fund (WWF), which is the largest private eco-certifier for seafood worldwide (www.msc.org). MSC nearly has a monopoly on eco-certified fish products, with over 300 wild-caught fisheries engaged, MSC controls access to the eco-labelled market for over 10% of all fish caught globally, which is worth an estimated $4.8 billion USD annually (Marine Stewardship Council (MSC) 2014). For a fishery to gain access to the MSC market, compliance with governance standards is necessary and fees for certification need to be paid. All fishery evaluations for MSC are conducted by third-party organizations. The certification process can take up to 5 years and costs range between $20,000 and $300,000 USD annually per fishery (Goyert et al. 2010; www.msc.org).

The concept of MSC can be described as non-state market-based governance, where success is driven by the voluntary participation and evaluation of the stakeholders involved, including fishers, seafood suppliers, consumers, the scientific community and environmental advocacy groups (Hadjimichael and Hegland 2016). Despite the idea that a fishery which is operating sustainably should be willing to apply for certification, clear economic, institutional and motivational barriers exist in the ability or willingness to participate in certification. These barriers restrict who can decide the costs and benefits of 'sustainable' fisheries governance to specific groups of stakeholders who can and do participate in certification. Nonetheless, it is assumed that market incentives (either through price premiums or access to large buyers or retailers) are an efficient solution for motivating such fishery participation.

Thus, the MSC model is based on the idea that private market-based incentives to participate in certification schemes are a viable mechanism to promote more sustainable fisheries governance. Despite limited participation, this MSC model now influences the global fisheries market for both participating, and importantly, non-participating fisheries. Many issues of justice remain regarding the distribution of costs and benefits from the certification market, in which only a few can participate, but many are affected by.

Can market-based governance with MSC provide sustainable governance solutions? Considerations are needed for dimensions of justice, such as who and what is being governed through MSC. An evident distinction can be observed in the disparity between large and small-scale fisheries. The process of MSC certification requires existing institutional capacity such as financial resources, knowledge and familiarity with administrative and bureaucratic processes, existing connections to markets with demand for labelled products as well as existing institutions for communication, trust and transparency within the fishery and between the involved certifying organizations. Before a MSC certificate is handed out, a third party must assess whether the fishery qualifies as sustainable under

their guidelines. These conditions are barriers to entry for most small-scale fisheries, which account for ~90% of the livelihoods in the capture fishing sector and ~50% of the total fish catch worldwide (Kittinger et al. 2013; FAO 2016). As a result, the majority of fisheries cannot participate in the process of sustainable fisheries governance under the MSC model, despite substantial spatial overlap in where many potentially certified industrial fisheries and small-scale fisheries operate as well as competition in market access between them. Access to benefits is restricted to participating large-scale fisheries, and thus the incentives to maintain 'sustainable' MSC fishing practices.

However, in contrast, certification can be viewed as a mechanism to increase livelihood security for fishers and stakeholders who can and do participate. But who participates? There are preconditions for being considered a sustainable fishery, which small-scale fisheries have little or no access to despite often equal or less harmful fishing practices and often greater needs for governance solutions that can enable sustainable social welfare (Ponte 2012; Bush et al. 2013). The question then becomes, who benefits from market-based governance in fisheries (Mace 2014)? The distribution of benefits and the assurance of a sustainably sourced food supply and livelihood are primarily European and North American large commercial fisheries. These fisheries sell to populations who are not dependent on food from that fishery for survival, but who have the purchasing power to influence the success of eco-certification schemes through individual choices. Buying sustainable seafood, and supporting the sustainable governance of fisheries through purchasing power, can become a privileged endeavor.

Following the idea of purchasing power as a mechanism for supporting sustainable fisheries governance, questions remain regarding who decides the suitability and direction of MSC. Market-based governance institutions leave the task of defining and 'voting' for sustainability to the economic market. Decisions on the evaluative criteria for governance are restricted to a specific group, rather than including the wide variety of stakeholders who will be affected on the global market for fish, both directly (e.g. fishers; seafood consumers) and indirectly (e.g. other marine users such as SCUBA divers; non-seafood consumers). However, one of the main reasons why certification schemes emerged is that governments around the world have often failed to provide solutions to meet marine and fisheries sustainability goals (Meidinger 2002). This nonetheless grants substantial power to those who have dominant influence in and knowledge about how economic markets function and who can participate in them. This restricts whose normative goals are achieved and the motivations for achieving them (i.e. those who can and do purchase or consume seafood products). This is particularly visible in the case of MSC, the dominant certification scheme for fisheries (Ponte 2012). This leaves few other options for consumers who want to use their purchasing power as a 'vote' for governance, or for non-consumers to influence fisheries governance in other ways (i.e. to support sustainable fisheries governance you have to buy fish products; you can't vote without buying). Such a market-driven ideology creates concerns regarding procedural justice for those who are less powerful in

making financial decisions that reflect their governance ideology (i.e. having the financial means to pay more for sustainable seafood) or are simply not integrated into a globalized market-based worldview.

The means through which privatized fisheries governance can achieve just and equitable policies for the sector, through a globalized market-based economic framework, remain to be seen. This is particularly problematic when the same globalized market-based framework has created rapid exploitation of many fisheries worldwide (Eriksson et al. 2015) and created many gilded social-ecological traps of rapid resource exploitation (Steneck et al. 2011; Kittinger et al. 2013). Utilizing existing system structures to find sustainable governance solutions, instead of attempting to change those underlying structures which led to the challenges, could be referred to as a 'weak' sustainability approach (Ziegler and Ott 2011; Holden et al. 2014; Stumpf et al. 2015). Global purchasing markets are used to actualize normative sustainability values into governance, arguably the same markets which have driven nearly catastrophic fisheries decline around the world through globalization (Berkes et al. 2006; Pauly and Zeller 2016). Even if the aim of MSC is to fill the governance gaps in the absence of the state or industry self-organization, relying on market-based governance hedges the potential for sustainability in the fisheries sector on consumer purchasing power, and voting through buying, where issues of justice become evident concerns for who decides and who benefits.

Two points can be discussed about how market-based certification schemes can create institutional path dependencies in fisheries governance. First, they are influenced by oligopolistic actors, in the food market (i.e. Unilever) or NGO "market" (i.e. WWF). Once governance becomes influenced by a few private organizations, they have a vested interest to keep their niche alive. It is their business, and they do not have an interest in handing over governance of the fishery sector back to the state. Second, it is the consumer with high purchasing power who drives the positive feedback that reinforces these institutions. The social and cultural drivers of what is considered a sustainable consumer choice, given the options a consumer has, can become institutionalized on a spectrum from personal consumer purchasing strategies (how to choose), to personal or social norms (what choice is expected), to formal rules for the large scale purchasing of food (Schlüter and Theesfeld 2010). Consumers can ideally determine, or rather reinforce, what is classified as sustainable by their consumption choices. However, consumption choices are often guided by labeling, which lacks transparency regarding the criteria of sustainability for consumer choice. It is rare that information is directly provided to consumers regarding ecological, economic or social dimensions. For example, MSC focuses substantially on ecological sustainability but does not consider the social conditions on the fishing vessels or in the processing industry as extensively, e.g. (Stringer et al. 2016). It could be argued that most consumers are reliant on the certifying organization to provide the rigorous knowledge to support the claims of certification. In most cases consumers trust that the certifying organization is following rigorous sustainability criteria, both

social and ecological. Secondly, it is those consumers who are empowered who have the opportunity to choose, leaving it to those who have access to or who can afford purchasing eco-certified seafood to dictate what is sustainable through consumption choices. In addition, market mechanisms assume that current paradigms of purchasing power and patterns of seafood consumption will continue to be a foundational aspect of sustainable fisheries governance in the sector's future. For example, those who choose not to purchase seafood due to the challenges facing its sustainability are not directly influencing market mechanisms for governance.

Eco-certifications can institutionalize and create path dependencies, often setting the conditions for reinforcing the behavior of consumer choices, and thus the effects that those choices have on the market and the fishery. Path dependency in consumer choice can also make new approaches to governance difficult to implement, particularly if a certifier dominates the market. For example, purchasing an eco-certified product is also a choice not to purchase or support a non-certified product, which may be a fishery regulated by a local small-scale fisher who cannot afford certification but catches fish in local waters only, uses non-industrial gears and/or is more livelihood dependent on selling the catch. Who is better to support on the market in terms of sustainability? This will differ widely between context, but the purchasing norms of supporting what is certified as 'sustainable' creates dependencies on consumer expectations and purchasing norms. The link between how institutional path dependencies affect consumer choices may have distributive social-ecological effects on other fisheries which do not, cannot or will not participate in a globalized market-based governance approach, creating the need for further inquiry on whether privatizing governance can pave the way for distributional or procedural justice in order to achieve normative goals in the fisheries sector.

2.3. Seed patents and privatized agriculture systems

Farmers are not completely dependent on private goods for production. Of course, many farm inputs are sourced from private actors (e.g. fertilizers, biocides, machinery) but a vital input of production – seeds – have been saved by farmers historically (e.g. seed exchange networks (Delêtre et al. 2011; Pautasso et al. 2013)). For millennia a vital input, crop varieties, which determine very much the success of the farmer, have been in the public domain. Once more productive varieties were developed, they could be easily reproduced by any farmer, saving seed grown from the previous year. Farmers could therefore exercise a large degree of control over their production systems and livelihoods without depending on private goods, providing they had access to land. The excludability problem has, until now, limited the ability of private actors, who have created seed innovations, to control and extract profits from such an improvement (Kloppenburg 1988; Mascarenhas and Busch 2006).

Three major factors have coalesced, over the last three decades, to facilitate increasing levels of privatization in agricultural systems and the ability of private

actors to exclude others from access to the resources, other than land, needed for production. Here we focus almost exclusively on 'western' agricultural production systems typical of Europe, North America, Australia, and increasingly in the South American countries of Brazil and Argentina.

First, private actors have used genetic and 'traditional' breeding technology to produce agricultural plant varieties from publically owned natural capital – naturally occurring germplasm and plant varieties selected by farmers over millennia (Brown and Darrah 1985). In particular, the genetically modified varieties, protected by patent law, have been very successful at replacing plant varieties bred from traditional selection methods and have increased farmer's dependence on private seeds. Before genetically modified varieties were available, many farmers used plant varieties bred from government programs, saved seeds for future sowing, and exchanged seeds with other farmers. For example, since the 1950s the percentage of US soybean farmers saving seed has declined from 60% to less than 5%. The rate of decline doubled after the introduction of genetically modified, patent protected, soya varieties (UDSA 2017). Farmers in the United States of America, Brazil and Argentina have been strong adopters of patented and protected plant varieties, mostly maize and soya. Maize and soya are the most economically successful varieties of genetically modified crops. Monsanto's RoundUp Ready soybean varieties now constitute more than 90% of the total soybean plantings in the USA (UDSA 2017). A similar situation exists for maize, used as a source of animal feed, biofuel, and other industrial applications.

It is important to make the distinction between *protected varieties* and *patented varieties* of agricultural plants because their distinction under law dictates how farmers can acquire and use the seeds and products of the farm production. In the USA, it is illegal for anyone to sell seeds of protected plant varieties (*Plant Variety Protection Act 1970* (USDA 1973)) i.e. plant varieties developed through sexual reproduction and selection, over the amount that would be required to sow the seller's own fields (see Asgrow Seed Co. v. Winterboer (US Court of Appeals 1994)). Farmers using these types of varieties can therefore still engage in seed saving, in a limited capacity, and not rely completely on purchasing new seeds each year. Patent protected varieties, on the other hand, often do not allow farmers to save seed (Howard 2009; Ikuta 2009). Plant patents in the USA explicitly deny farmers the right to save seed because it constitutes a breach of the patent act that prohibits replication of patented technology. While this form of privatization is intended to increase investment in the development of new crop varieties, e.g. (Brush 2003), it can have unintended consequences for dimensions of justice.

Agricultural plant varieties developed by private actors have been recognized as private property by plant protection and patent laws, further entrenching the privatization of agriculture systems. All parties of the World Trade Organization (WTO) are required to provide legal protection, in some form, to entities that develop commercial varieties of plants. However, the form and extent of protection provided by a country's law is not explicitly defined in the WTO trade agreements. Therefore, the nature and level of legal protection granted by a party's

legal system can be highly variable. For example, differences can be seen between the laws of India and the USA, taking quite different approaches to plant protection laws. India responded to WTO requirements by developing unique legislation compared to the rest of the world and lies in stark contrast to the laws developed by the USA. Indian law recognizes the centuries-old contribution of farmers and other entities to the production and maintenance of agricultural biodiversity, and their inherent legal right to continue using those resources, and where appropriate, to gain financially from private development of plant varieties for profit. Indian law even allows farmers to use and sell seeds of 'protected' varieties – i.e. the product from their previous crops – as long as they are not branded as such during sale e.g. (Kochupillai 2011). In contrast, laws in the USA provide strict patent protection – in the case of genetically modified organisms – and protection for entities that develop plant varieties bred using 'traditional' strategies (i.e. non-recombinant DNA technologies). Plant variety and patent holders are vigorous defenders of their rights under US law. One notable case concerns Monsanto's litigation against Vernon Hugh Bowman, a farmer from Indiana, USA. Bowman was sued by Monsanto for planting soybean seeds he purchased from a grain elevator, seeds from surplus harvest that were sold to other farmers under Monsanto's user agreement. The Court found that Bowman had infringed on Monsanto's patent because he had violated a provision of the law relating to the replication of patented products. Because the plant had produced seeds this constituted replication of the patented product and a violation of both the terms of authorized sale and the patent. This contrasts with other types of patents that allow the sale of products containing patents but prohibit the manufacturing – replication – of that product's patented components.

In addition to the changing relations between farmers and the owner of the genetic information of the varieties those farmers grow, this novel form of knowledge privatization feeds into a form of path dependency known as the 'technology treadmill'. The technological treadmill refers to farmer's adoption of technology to increase farm yields (Cochrane 1979). Mechanization is one example of the technology treadmill. Adopting a particular technology usually involves a farmer taking on debt in order to increase yields and generate a profit from increased production, and reduced costs associated with the efficiency gains from technology adoption. This system dynamic leads to the continual search for efficiency gains to offset depressed prices resulting from increasing supply due to previous increases in efficiency. As farmers pursue greater efficiencies to offset productivity gains and lower real prices from increased yields, they need to adopt further technology produced by private actors (Abson 2019). The technology treadmill quickly becomes a strong positive feedback loop which is difficult to escape given the typical high capital requirements and levels of debt held by farming households using these systems of production e.g. (Stone and Flachs 2017).

Technologies, other than GM plant varieties, reinforce the treadmill (technology and knowledge dependence) of agricultural production held by private actors. In addition to privatizing plant varieties, private actors are also allowed to

patent the equipment that is essential for the optimum production of the protected plant variety. In order to gain maximum economic benefit from the plant variety, farmers must also purchase equipment and materials to grow the crop and follow strict rules about the use of the technology (Monsanto 2015). These legal provisions essentially compel farmers to purchase whole new farming systems that are controlled by the patent holder (private actor) instead of the farmer. Once farmers adopt a new growing system it is then difficult to revert back to older, presumably less productive, agricultural systems, hence pushing them further along the technical treadmill and reinforcing path dependency. Goe and Kenney (1988) provide a succinct description of this process of resource capture: "This privatization process is transforming agricultural information into a purchased farm input". Although their description relates to the capture of 'agricultural information' it can be logically extended to describe the process of private entities capturing genetic information, in this case knowledge commons, or any public goods for private gain.

Some protected plant varieties have infiltrated the Indian agriculture sector, particularly cotton, bringing economic benefits in the short-term to a farmer but sometimes with negative consequences for farmers in the long-term, they become trapped in path dependencies on certain sellers and products. Genetically modified cotton – containing genetic material from the bacterium *Bacillus thuringiensis* that express proteins toxic to lepidoptera (moths and butterflies) – commonly known as Bt cotton was introduced to India in 2002. Bt cotton was developed by Monsanto Corporation to reduce crop damage by the bollworm complex, a group of moths whose larval forms bore into cotton flowers causing devastating crop losses. The environmental and economic costs of reducing bollworm impacts are very high. In 2001 India used more than 21,000 tons of pesticides to reduce bollworm damage to cotton, approximately half the total amount of pesticides used across all agriculture in India (Karihaloo and Kumar 2009). Early studies of agronomic and economic impacts were very favorable, as profits increased through a combination of reduced applications of pesticides and fertilizer with higher yields. Bt cotton adoption has also decreased the rate of poisoning events from pesticides (Kouser and Qaim 2011). The seeds cost more than three times that of 'local' varieties and require more labor, but farmers' profits increased by as much as 50% (Fischer et al. 2015b). During 2009, a mere seven years after the introduction of the first generation of Bt cotton Bollgard I (Monsanto 2015), Monsanto confirmed that pink bollworm (*Pectinophora gossypiella*) resistance was found in cotton crops across four states of western India. This necessitated the adoption of Bollgard II, the next generation of cotton that expressed two proteins (Cry1Ac and Cry2Ab2) from *Bacillus thuringiensis*, which are toxic to bollworms. In the United States of America, bollworm resistance to Bolgard II was already apparent (Ali and Luttrell 2007). In India, however, the technology was adopted with success until resistance was detected as early as 2010 (Tabashnik and Carrire 2010) creating subsequent problems. Farmers in major cotton growing districts are reporting high levels of damage to their crops by pink bollworm. This example

demonstrates the negative consequences of path dependency induced by privatized seed providers. Farmers, once locked-in to these systems of production become reliant on privatized inputs and the continual development of new varieties by private actors holding they are dependent on. Farmers in these small-holder systems once relied on local adapted agricultural varieties, or varieties that were developed by their governments and NGOs usually at much lower cost and input requirements (Pearse 1980; Shiva 1991). In turn farmers who choose not to, or cannot, adopt these new farming systems often find themselves marginalized and their traditional forms of livelihoods threatened (Pearse 1980).

The agricultural sector is expanding the scope of what types of public goods can now be privatized and legally protected. National and international legal frameworks now provide that right to privately own genetic resources, often undermining traditional farming institutions based on seed sharing and saving. In addition seed patents may increase the homogenization of agriculture plant varieties made available and sold to farmers by private actors (Hoisington et al. 1999). Homogenization or mono-cropping may bring efficiency gains, but at the cost of increasing pest resistance, decreasing farmland biodiversity (Hooper et al. 2012) and decreasing nutritional diversity of the food produced (Frison et al. 2011). While many gains have been stated from technologies advancing enhanced seed varieties, these gains often incur substantial social costs (e.g. financial risk for farmers; loss of biodiversity) requiring broader evaluative criteria to assess their sustainability. The procedural justice challenges exist in the access to seed resources regarding who can decide what gets privatized and how it can be accessed. Farmers who participate in privatized agricultural systems can become path dependent on continually buying seeds and equipment from companies who now control access to the next year's harvest and the necessary technologies for pest control.

3. Discussion

3.1. Privatization now exists in new, diverse and hybrid forms

We have highlighted three forms of privatization, using three diverse case studies as examples of how each form of privatization is manifesting in a diverse and largely unexamined way within social-ecological systems. The three forms include: (1) privatization of a physical resource (property rights in rangelands), (2) the privatization of governance processes (eco-certification in fisheries), and (3) privatization of intellectual property (seeds patents). Below we discuss the broad context of emergence for new forms of privatization and how each manifests in our cases.

The institutional legacy of economic privatization policies is premised on the assumption that such policies provide effective and efficient solutions to the often costly, but not impossible to solve, rivalry and excludability challenges faced in the management of open access common-pool resources, e.g. (Hardin 1968). These policies have carved out the institutional landscape of natural resource

management in the Western world for the last half-century (Villalonga 2000; Carothers and Chambers 2012). However, the rationale for using a privatized approach to governance is now manifesting into new, often hybridized and difficult to recognize approaches. What is actually being privatized, the drivers behind emerging institutions and the mechanisms for how privatization is implemented, suggests a need to re-conceptualize the newly emerging institutional landscape of commons governance and examine whether the legacy of traditional privatization policies is suitable for sustainably governing globalized commons challenges within what we now understand as multidimensional SES. Thus, there is an evident need to rethink and broaden the definition of what can be, and what currently is, being privatized. Also, how the singular good being privatized (e.g. space, individual resources, governance, intellectual property) is really introducing multidimensional interactions and outcomes within SES that are often unforeseen, unpredictable and undesirable.

Simultaneously, reflection on the different property regimes existing, managing CPRs or public goods, may require re-conceptualizing what 'commons' in the 21st century are. In addition, the types of governance challenges they may face, and if privatization is a desirable solution given the multidimensional interactions that occur within SES that the actual privatized goods are nested within. Many commons are now global in their scope regarding who can access them, broadening the scale at which rivalry and excludability become difficult to solve, and externalities more difficult to internalize or account for in a complex system. In addition, numerous commons are non-physical, such as information and market access (power structures). Excludability challenges are now about who knows what, or who has specific information, rather than simply who can access a physical resource at a specific place and time. Nonetheless, these new commons are being privatized, suggesting the need for broader criteria to evaluate privatization from a SES perspective and as a desirable governance approach for achieving societal goals related to sustainable resource management.

Although the analysis and comparison between common property and private property has been examined for decades in the literature (Agrawal 2001), the binary categorization of policy approaches that fall on the spectrum between them can be revisited, because in many cases there are mixes of both. Because it allocates exclusive use and management rights to a defined group, common property could be viewed as the first step towards enclosure, and is sometimes conceptualized as "group private property." Common property differs from private property primarily in its lack of transferability. Many diverse institutional arrangements exist, and common property scholars may benefit from a broader conceptualization of the different types of common property, and how they are differentiated and interact with privatization in practice or through further conceptual understandings. In this paper, we argue that broader criteria are needed to evaluate the influence of privatization on SES outcomes, but that conceptualizing what is being privatized, and how, also needs expansion. This work would be closely linked to literature on common property.

We can observe that property rights systems continue to be used around the world to manage CPRs. Rangeland systems in Mongolia exemplify this, where quasi-private long-term lease rights can create barriers to the access of campsites and some seasonal pastures to specific individuals or groups. However, privatizing land access for camping and especially for grazing in an ecosystem with high spatial and temporal heterogeneity in rangeland productivity creates large inequities among herders. This ultimately centralizes gains to a few individuals who are more resilient to changes in social-ecological conditions. While distributing individual and group leases was a quick and efficient way to allocate campsites to herders in a country transitioning from state control to a newly emerging democracy, quasi-privatization of pastures via a leasing system may not fit the ecological system dynamics, and risks reinforcing existing socioeconomic inequities and accelerating land degradation. In the Mongolian context, if leases are distributed to pasture user groups rather than individuals, and provisions exist to protect pastoralists' right to transit (reducing degradation), allow flexibility and coordinated reciprocal use among groups (reducing spillover effects), and protect the rights of poor and marginalized herders (addressing distributive justice), this form of quasi-privatization could potential help to solve the current CPR dilemma. Although private property rights systems have existed as a mainstream approach to manage CPRs in fisheries, forestry and rangelands for decades, the evaluation criteria for analyzing the effects of privatization on system dynamics and the role private institutions play in influencing the achievement of normative sustainability goals receives less focus (Ostrom 1990; Agrawal 2001; Wollenberg et al. 2007).

MSC is a new form of privatization which deals with a global commons and uses market-based mechanisms in an attempt to incentivize sustainable fisheries governance. The right to govern and be governed, can also be considered commons. In theory, anyone can access the institutional space and influence it. In the classic notion of a democratic state, you have to be a citizen who can vote in democracies about what you want the state to do, but foreign private actors can also access the institutional space, and dictate what is being governed, how, and by who. Usually there are combinations of both, and the MSC example shows how private actors can govern through accessing the common institutional space. This occurs in fisheries by gaining increasing influence over how fisheries actors interface with resource use behavior incentives and how consumers drive such changes through markets. The reality of what influences governance through institutional development and change extends substantially into both private actors and markets, as evident in the fisheries sector.

Despite the fact that MSC has emerged to fill the governance void left by states who have in large part failed to mitigate rivalry, subtractability and the roving banditry of many industrial fishing fleets (Berkes et al. 2006), the market mechanisms driving potential success for MSC are the same that have undermined the ability of state interventions (i.e. the integration of fish into global markets (Eriksson et al. 2015)). The success of eco-certified products is beholden

to purchasing power, and relies largely on the imagery of sustainable branding and the goodwill of consumers to purchase products to effectively motivate governance changes by making value-oriented sustainable choices. In this scenario, fisheries sustainability is then left to the goodwill of, mostly wealthy and Western/Northern consumers. In addition, only compliant fisheries are eligible for the market gains received from certification, and this is almost exclusively limited to a small subsection of the fisheries sector, excluding, often far more sustainable, small-scale fisheries. There is an evident mismatch in the distributional and procedural justice of costs and benefits resulting from such market-driven governance approaches, where wealth directly equates to power in market-based governance. Large corporations, both distributors of seafood products and fishing companies, are wealthier.

The inputs to global agricultural systems are transitioning from traditionally held public goods, where seeds and farming technologies were once held as the common property of people and cultures around the world, into privatized goods. Seed patents, pest control and harvesting equipment now receive legal protections creating a private market for entire farming systems, often creating path dependencies on private technologies for farmers using them and questions of procedural justice relating to who has access and control over farming resources. A broader lens is needed to evaluate the sustainability of privatized agriculture systems as the legal protections for both corporations and farmers differs by country, and concerns are not only related to efficiency in access and production of resources, but justice and the functioning of agricultural systems in relation to farming livelihoods, biodiversity and public health.

3.2. Evaluating privatization from a social-ecological systems perspective

Taking a SES perspective can enhance how commons governance is evaluated and can meet normative societal goals in relation to sustainability. SES research has broadened the scope for evaluating human-environment relationships, and two aspects of an SES perspective can be highlighted in relation to evaluating privatization more comprehensively. (1) System interconnectivity (Liu et al. 2007; Garmestani 2013; Barnes et al. 2017; Bodin 2017) and (2) the plurality of, and trade-offs between, different understandings of normative goals in SES (Miller et al. 2008; Audouin et al. 2013; Partelow and Winkler 2016). System interconnectivity realizes that changes to one part of a system may bring unforeseen or unpredictable changes across time and space to other parts of a linked system (i.e. spillovers and path dependencies). This creates challenges for governance approaches which are not adaptive to changes in a system or which do not consider broader scale interactions such as regional or institutional connectivity (Folke et al. 2005; Armitage et al. 2009).

Privatization polices that are able to adapt to social-ecological changes are more likely to manage commons challenges effectively. For example, quota systems in fisheries limit the number of permits and amount of fish that can be caught

each year based on fish population data, showing how privatization can address rivalry in fish harvesting through creating a market for quotas which can adapt to changes in ecosystem conditions (Costello et al. 2008). However, normative goals may also change in a system or present trade-offs for governance. Taking a SES perspective can help to identify which interacting system components affect goal achievement and which parts may create trade-offs or undermine goals. In the same fisheries example, quotas in fisheries may address rivalry in consumption with market trading scheme for catch shares, but establishing a catch share market creates economic competition among fishers for access to resources, which favors larger industrial fishers and corporations with more capital (Pinkerton and Davis 2015). The goal of addressing rivalry in the commons may be misaligned with broader goals in the fisheries sector to increase equitable access and maintain livelihoods. We argue that analysis adopting a SES perspective can help to better evaluate privatization, from an integrated systems perspective, as an effective governance approach.

3.3. Broadening the evaluative criteria of privatization

Evaluating new forms of privatization with a SES perspective requires broadening the evaluative criteria in relation to sustainability. Sustainability is not just finding governance approaches to solve rivalry and excludability dilemmas in the commons; these approaches must also do so in a way which achieves broader normative societal goals such as social justice and environmental sustainability. Inclusion of such normative criteria has been featured in commons scholarship for decades. However, as privatization policies continue to have practical impacts on the reality of these criteria, and new forms of privatization are emerging, it is important to revisit and reiterate these criteria as part of the normative basis trying to be achieved by such policies. Efficiency is not a sufficient normative goal itself, the aim should be to be efficient for a broader purpose such as for dimensions of justice or environmental sustainability. Of course, who is to decide that dimensions of justice are the 'right' normative goals to have? If we are to take internationally agreed upon definitions of sustainability seriously such as the Brundtland Commission's (1987) emphasis on intra- and intergenerational equity, international human-rights advances (Pogge 2005) as well as secular moral frameworks such as humanism (Norman 2004), dimensions of justice play a central and generalizable role for broadly analyzing societal progress in different contexts. For example, even if MSC addresses excludability by creating governance institutions for fisheries management with a market for eco-certification, if the mechanisms through which MSC is implemented are not distributive and procedurally just, then the mechanisms for implementing a market-driven approach to fisheries governance may fail when broader evaluative criteria are applied. Similarly, if patent systems incentivize the innovation of agriculture systems but create strong path dependencies, they can undermine the resilience of farming

communities. Especially those who have established cultural practices and livelihood dependence on the basis of access to what was always considered to be public goods, with minimal autonomy to change, may be most vulnerable. Ultimately, the sustainability of privatizing access to information needs further examination with broader evaluative criteria.

4. Conclusion

Ultimately, common-pool resource governance approaches must consider how resource management policies address context specific system dynamics (Ostrom 2007). We argue that CPR governance must also consider the broader societal goals that may be affected by that resource management. Broader evaluative criteria for privatization policies would benefit the assessment of privatization as a useful tool in its continued implementation, and provide insight into how and when privatization approaches can best be applied as a governance approach for achieving societal sustainability goals.

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