Extractive Conservation

Peasant Agroecological Systems as New Frontiers of Exploitation?

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ABSTRACT: In view of the Aichi international policy targets to expand areas under conservation, we analyze to what extent conservation has become an inherent element of extraction. We scrutinize the Land Sparing versus Land Sharing debate by explicitly incorporating environmental justice issues of access to land and natural resources. We contend that dominant conservation regimes, embedded within Land Sparing, legitimize the displacement of local people and their land use to compensate for distant, unsustainable resource use. In contrast, the Land Sharing counternarrative, by promoting spatial integration of conservation in agroecological systems, has the potential to radically challenge extraction. Common ground emerges around the concept of sustainable intensification. We contend that if inserted in green economy's technocentric and efficiency-oriented framework, sustainable intensification will contribute to undermining diversified peasant agroecological systems by transforming them into simplified, export-orientated ones, thereby stripping peasant communities of the capacity to provide for their own needs.

KEYWORDS: agricultural intensification, agroecology, corporate conservation regime, food security, food sovereignty, green economy, neoliberal conservation

Our title may sound provocative. How can conservation, the purpose of which is to protect Nature from degradation, be associated with extraction, that is, the exploitation of natural resources? This statement is a paradox in a paradigm that conceives "Nature" as an entity intrinsically separated from humans, and whose existence is threatened by essentially destructive human activity (Robbins 2012). Conservation's mission, in the context of this dichotomy, is to prevent the destruction caused by expanding extractive frontiers and unsustainable land use through separating areas deemed "natural" from humans. Its mandate, which only applies within the boundaries of official protected areas, is to restrict land use, or to prohibit it as in categories IV to VI of the International Union for Conservation of Nature (IUCN) protected area classification (IUCN 2008). Therefore, fundamentally, conservation seeks to compensate for, rather than question, extraction. Further, conservation is a costly endeavor and, in the dominant neoliberal paradigm, it is typically asked to pay for itself through strategies that enable the financialization of Nature (McAfee 1999), based on the relabeling and marketing of what are acceptable, "non-consumptive" uses of "Nature" (Campbell 2002; Castree 2008).

With these initial reflections, we ask, "To what extent has conservation become an inherent part of ongoing policy and development pathways based on extractivism?" For Maristella

Svampa (2013: 34), (neo)extractivism is a "pattern of accumulation based on the overexploitation of mainly nonrenewable natural resources as well as the expansion of frontiers into territories, which were once considered 'unproductive.'"[1] Essentially, it reconfigures control over land in a top-down governance regime and provokes recurrent conflicts of access to natural resources (Gudynas 2009; Peluso and Lund 2011).

With regard to conservation and extraction, this piece focuses on the biodiversity-food nexus in which sustainable land management policies are debated to reconcile multiple, competing human demands on natural resources while respecting planetary boundaries (Glamann et al. 2015; Rockström et al. 2009). Different conceptualizations of land use and conservation are implicitly related to different understandings of "Nature" and its relations with humans. This is illustrated in the Land Sparing versus Land Sharing debate, which has taken a prominent place in the emergent land use sciences (Verburg et al. 2013). We argue that current dominant conservation and land use policies, embedded within a broad extractivist framework, reinforce the Human–Nature dichotomy, with profound implications for who may partake in land control, whose resources are to be extracted or protected, and for which purposes.

Recently, scholars have highlighted the futility of the Land Sparing versus Land Sharing dichotomy (Chappell et al. 2013; Fischer et al. 2014) and contenders from both sides have added nuance to their originally polarized views (Altieri et al. 2015; Grau et al. 2013; Kremen 2015; Phalan et al. 2016). Nevertheless, we argue that a critical re-evaluation of this debate needs to move beyond the disciplinary realms of agricultural, ecological, and land use sciences to explicitly address local demands for access to productive resources, distributive justice and transformation in governance regimes.

We first introduce the context in which the Land Sparing versus Land Sharing debate emerged. We then illustrate how Land Sparing conceptually drives new forms of enclosures (Peluso and Lund 2011), which under the explicit goal of protecting key ecological commons, displaces land use and people (Fairhead et al. 2012) in an emerging corporate conservation regime (based on Philip McMichael's concept of "corporate food regimes," 2009). We then turn to Land Sharing's counternarrative, which in principle rejects the Human–Nature dichotomy and fosters the spatial integration of conservation and environmentally friendly farming. Finally, we reflect on how the concepts of Land Sharing and sustainable intensification have been interpreted within the green economy discourse (see Barbier 2012) and related implications for peasant agroecological systems.

Setting the Scene

Current land use transformations are driven by complex, interrelated processes and intricate actor constellations over nested scales, such as global trade in primary products, national development policies and changing lifestyles (Anderson 2010; Lambin and Meyfroidt 2010). Salient trends include the loss of 2.74 million square km of primary forests between 1990 and 2015 (FAO 2015) and a corresponding expansion of agricultural land by 6.76 million square km between 1990 and 2013 (Worldbank 2016).[2] Productive land is becoming scarce (Lambin and Meyfroidt 2011). Increasing land grabs[3] (Cotula 2012), driven by transnational actors (especially the cereal–oilseed–cattle sector, Weis 2013), facilitate the virtual import of land and water and a renewed process of land concentration (Borras et al. 2011, 2012; Qiang et al. 2013). And land use regulations (for example, forest protection) often lead to the displacement of resource (over)exploitation rather than abating it (Meyfroidt et al. 2013). For some, the delocalization of intensive land use purposefully sacrifices specific populations (through expulsion) and

regions (through environmental degradation) for the benefit of importing countries (Sassen 2014; Svampa 2013). These considerations are not addressed in the core question driving the Land Sparing versus Land Sharing debate, namely, how to secure food for a growing population without further biodiversity loss (Godfray et al. 2010). This article addresses this gap and places access to land and resources at the center of our inquiry. Table 1 highlights key tenets of both concepts.

Table 1: Our synthesis of Land Sparing versus Land Sharing (adapted and expanded from de la Vega-Leinert et al. 2015)

	Land Sparing (segregated land use)	**Land Sharing (integrated land use)**
Goal	Optimization of land use	Coherent and diverse landscape matrix
Focus	Agricultural productivity / efficiency	Agroecological productivity
	Landscape monofunctionality	Landscape multifunctionality
Governance	Global / Top-down	Local-Regional / Bottom-up
Strategy	Landscape / land use specialization	Landscape / land use diversification
	Spatial segregation	Spatial integration
	Intensification of agriculture (in yield / work productivity - agricultural output per hour of labor)	Agroecological intensification (in total output / area)
	Abandonment of extensive land use (in yield / work productivity - output /h labor)	Landscape connectivity (migration corridors)
Desired objectives	Macro-efficiency in use of natural resources	Local-regional diversity in socio-environmental systems
	Food security through conventional, commercial / agriculture, export markets	Food sovereignty through biodiversity friendly farming, short food circuits and alternative (ethical / sustainable) markets
	Exclusive conservation	Inclusive conservation
	Rural-urban migration to free areas for conservation / ecological restoration	Maintenance of traditional cultural landscapes and communities
Critique	Top-down, technocentric, macro-economic approach: • overemphasizes the environmental impacts of local populations at agricultural frontiers and in / around protected areas • ignores the social, cultural, political complexity of local contexts and the diversity and resourcefulness of local agency	Bottom-up approach: • overemphasizes the capacity of traditional peasant systems to fulfill the food / energy needs of a growing world population • often relies on emblematic local case studies that cannot be generalized
	Productivist / growth-oriented approach neglects the impacts of intensive agriculture (ecological footprint / distant food landscapes) and overlooks environmental / distributive justice issues	
	Land Sparing implies islands of biodiversity in otherwise intensive, monocultures and may spread land use on natural areas	Biodiversity in extensive multiple land use systems is qualitatively and quantitatively not equivalent to biodiversity in natural areas under strict conservation
	Exclusive conservation spurs social-environmental conflicts, which may jeopardize its ecological successes.	Since inclusive conversation allows land use per se, it can lead to uncontrolled expansion of agriculture in protected areas

Land Sparing Exacerbates Socio-Ecological Inequity

Land Sparing as a Driving Force of Displacement

To resolve the issue of multiple, competing demands on scarce land, Paul Waggoner (1995: 17) theorizes that maximizing agricultural yields will minimize the agricultural land needed to quench worldwide food and energy demand, thereby "sparing land" for conservation. This strategy is embedded in a macro-scale approach to sustainability that emphasizes efficiency,[4] where spatial segregation enables landscape monofunctionality and a higher performance in agriculture (in terms of crop productivity) and conservation (in terms of biodiversity) (Green et al. 2005a; Phalan, Onial et al. 2011a) (table 1). Land Sparing is partly founded on the Forest Transition Theory, which hypothesizes that with intensification, agriculture concentrates on the most fertile lands, releasing more marginal, non-profitable lands for forest regeneration (Mather and Needle 1998). Developed from observations in temperate regions, this theory has since been transferred to the tropics (Grau and Aide 2008). To counter deforestation and enable forest transition, regional development policies should encourage the abandonment of extensively used land by preparing "rural migrants for an urban environment" (Aide and Grau 2004: 1915). Such a policy recommendation can be associated with Farshad Araghi's "accumulation by displacement," defined as: "(1) the massive dispossession of the world peasantries and the appropriation of the migratory surplus labor power and (2) the accumulation of (the spaces of) 'surplus nature'" (Araghi 2009: 114). In other words, displaced people lose control over their land (which provides for the needs of others) and over their productive activity (which becomes "estranged" labor *sensus* Karl Marx) (117).

Displacement of land use is not a new phenomenon. Navin Ramankutty and colleagues (2010) argue that it was deforestation in the American West during the first half of the twentieth century that enabled forest transition in the East. Today, a substantial part of China's celebrated reforestation relates to imports of timber, pulp, and other wood products (Mayer et al. 2005). Patrick Meyfroidt and Eric Lambin (2011) identified other countries[5] where reforestation of up to 22 percent in areas formerly under exploitation was permitted by the displacement of wood production. Such observations were confirmed by Julianne Mills Busa (2013), who analyzed global timber trade and the national wood production of 176 countries between 1972 and 2009, and by Jan Weinzettel and colleagues (2013), who documented how export-oriented land use strains the ecosystems of low-income countries. The so-called flex crops (that may be sold as food, feed, or agrofuels, Borras et al. 2014) have spurred further land use displacement. For example, Mads Markussen and Hanne Østergård (2013) calculated that imported animal feed constitutes 23 percent of the food calories ingested indirectly through animal protein consumption in Denmark.

Historically, forest transition has also led to the forced displacement of people. For example, in nineteenth-century France, up to 60,000 soldiers were needed to protect the newly privatized forests, while "surplus" rural populations joined the urban poor (Mather et al. 1999). Privatized forests and conservation areas can be seen as a new form of enclosures, reminiscent of the hunting grounds of past nobility and colonial elites (Adams 2003). This has been legitimized by the social construction of areas of outstanding "natural" beauty as devoid of humans (thereby denying the territorial claims of local populations), and in need of protection from threatening local human activities (Robbins 2012). In keeping with the Human–Nature dichotomy embedded in Land Sparing (Fischer et al. 2008), the process of emptying "Nature" continues today as part of a globally accepted conservation model (Brandon et al. 1998; Watson et al. 2014), with protected areas worldwide currently covering approximately 15.4 percent of the global terrestrial surface (Juffe-Bignoli et al. 2014). The forced eviction and resettlement of local populations to make room for protected areas (Geisler and de Sousa 2001; Schmidt-Soltau 2005) is a phe-

nomenon that conservation shares with traditional extractive projects (mining, hydroelectric dams, and agro-industry). It is this striking parallel that we emphasize in the term "extractive conservation." Though the fate of "conservation refugees"[6] (*sensus* Dowie 2006) has scarcely been investigated (Brockington and Igoe 2006), for Michael Cernea (1997) forced displacement as such implies multiple risks that lead to the impoverishment of already marginalized populations. The establishment of protected areas creates winners and losers (West et al. 2006) and reinforces existing social inequalities (Adams and Hutton 2007). With buzzwords, such as poverty reduction, job creation, and economic development, conservation projects create a virtual reality that promises wealth and modernization, and may hide substantial losses for local populations (Holmes and Brockington 2013; Ndaskoi 2001) such as restricted access to resources (Sigalla 2013) or crop raiding by wildlife (Vedeld et al. 2012). "Primary forests," which are often key natural resources for local populations, are redefined as universal commons in urgent need of protection in a moral argument that justifies small losses (small in the context of global scale, though quite significant to local populations) for the greater good (for example, climate change mitigation) (Corson et al. 2012). This has been interpreted as a discursive "purification strategy" of critical voices on strict conservation (Büscher et al. 2012; Schouten and Glasbergen 2011).

To compensate for expanding extractive frontiers, large-scale set-asides have become simultaneously a goal and an indicator for conservation success (Juffe-Bignoli et al. 2014). Protected areas have multiplied and expanded, but not uniformly and they show an important bias in the representation of habitats "towards higher elevations, steeper slopes, and lands of lower productivity, lower economic worth and low human density" (Watson et al. 2014: 69). Certain eco-regions and key biodiversity areas remain underrepresented, while for Enrico Di Minin and Tuuli Toivonan, "85 percent of all threatened species are still not adequately protected" (2015: 1). The protection of "charismatic" species as a path toward self-financing of conservation through ecotourism may have contributed to this bias (Holmes 2013). This, however, might be symptomatic of a more worrying trend. Strict protection areas, especially in the Global South, are often designated in regions that typically have preserved a high degree of "natural" biodiversity and "primary forests," which, coincidently, are at the periphery of modern centers of settlement and land use. Climate, altitude, remoteness and difficult conditions or simply the plentiful supply of more accessible land elsewhere have contributed to create those areas today popularly conceived as "wilderness." These areas, however, are far from being empty of humans (Robbins 2012). For example indigenous agroecological systems are refuges for both cultural and biological diversity, a richness that depends on the continuation of traditional land use (Harvey et al. 2008; Pretty et al. 2009). The process of colonization and appropriation of land has displaced indigenous populations from their customary territories to the very same areas they might today be forced to leave to make room for conservation (Agrawal and Redford 2009; Chatty and Colchester 2002; Patel 2013). Multiple forced displacements have affected, for instance, the Massai in Tanzania (Neumann 2000) and indigenous people in southern Mexico (Legorreta Diaz et al. 2014). Current international conservation policy is, in this respect, the continuation of a historical process of forced displacement. The Aichi target of expanding protected areas to 17 percent of the global terrestrial surface (CBD 2016a) and the REDD+ framework (compare Beymer-Farris and Basset 2012) are developments in this direction.

The spatial segregation between conservation and land use in Land Sparing reinforces a pervasive Human–Nature dichotomy that permeates the still dominant conservation paradigm. We consider this a fundamental flaw. We contend that the observed bias in the location and ecological representativeness of existing protected areas has much to do with considerations related to the political feasibility of imposing a land use prohibition and the (in)capacity of specific populations to defend their right and access to land.

Against a backdrop of poverty and structural deficiencies in development, conservation efforts that aim to keep out "intruders" are, nevertheless, doomed to fail, since local populations do have means to resist and sabotage conservation projects (Adams and Hutton 2007; Holmes 2007). A paradigm shift toward more participatory conservation (Stoll-Kleemann et al. 2010) is incorporating wider socio-ecological issues (Lele 2010; Watson et al. 2014) and showing positive outcomes when co-management regimes ensure local empowerment, reduction of economic inequalities, and maintenance of cultural and livelihood diversity (Oldekop et al. 2016). More radical approaches reinterpret conservation as the maintenance of basic natural resources toward subsistence (Martínez-Alier et al. 2002) and will be considered later. Before this, we turn to the second dimension of Land Sparing, namely: the need for agricultural intensification.

A Focus on Agricultural Production Does Not Lead to Food Security

Land Sparing's second main argument is the contention that agricultural intensification in monofunctional landscapes is the key to world food security. This assumption is problematic, since: (1) it derives future food needs from business-as-usual projections; (2) it considers expected changes of food habits as given; and (3) it lacks a balanced consideration of risks and opportunities.

According to Nikos Alexandratos and Jelle Bruinsma's (2012) frequently cited projection, a 70 percent increase in agricultural production (not food consumption) will be needed to satisfy projected market demand by 2050. Though essentially an aggregate indicator measuring global food market demand in economic terms rather than in production volume or nutritional value (Boucher 2015), it has "assumed a life of its own" (Wise 2013: 3). This substantially contrasts with a UN estimate of population growth of only 47 percent by 2050 (compared to the 2006 baseline), with the discrepancy being related to projected income-based changes in food habits (United Nations 2015). Increased consumption of meat, dairy, and industrially produced horticultural crops are important drivers of land use (Lambin and Meyfroidt 2011; Stoll-Kleemann and O'Riordan 2015) and should be critically addressed in future food demand projections. Stefan Wirsenius and colleagues (2010) thus argue that a 25 percent decrease in per capita meat consumption in high income regions could release 3 to 4 percent of agricultural land (170 million hectares), while for David Tilman and Michael Clark (2014) the wider adoption of "Mediterranean" or vegetarian food by 2050 would save 540 million hectares. Important constraints include future climate change impacts on food productive systems (Porter et al. 2013) and the displacement of subsistence agriculture and "primary forests" by agrofuels (Alonso-Fradejas 2013; Selfa et al. 2015).

Although Land Sparing supporters generally condone agricultural intensification to close the so-called yield gap, their positions regarding which form of intensification vary. Some (Ausubel et al. 2013; Grau and Aide 2008) argue for a conventional intensification (based on commercial seeds, chemical inputs, irrigation, and genetically modified crops) despite much published evidence on its profound environmental impacts (Gerber et al. 2013; Phelps et al. 2013; Rockström et al. 2009; Tscharntke et al. 2012). Such a model of intensification stresses planetary boundaries and could generate the Jevons paradox, whereby gains in technological efficiency further drive the expansion of agricultural frontiers (Ceddia et al. 2014). For others, yield increases should be achieved in more sustainable (that is, without agrochemicals), labor-intensive agricultural systems, using context-specific knowledge (Phalan, Onial, et al. 2011a), though Ben Phalan, Andrew Balmford, and others (2011) question their capacity to satisfy global food needs.

According to the Food and Agricultural Organization (FAO) database (FAOSTAT), the current large-scale, conventional agricultural systems, often justified by a belief in Land Sparing, have succeeded in tripling food production since 1961, while world population only increased

by a factor of 2.39, maintaining an "excess" of calories available at global level, compared to food security needs. It nevertheless failed to reverse hunger (Friedmann 2005), with an estimated 795 million people remaining chronically undernourished (FAO, IFAD, and WFP 2015), an estimate Jason Hickel (2016) considers a "targeted statistical manipulation" to conceal that effectively close to 2 billion people remain hungry (see also Moore Lappé et al. 2013). Instead, through pervasive concentration and financialization, the current corporate food regime encourages speculation on food staples[7] and exacerbates recurrent food crises worldwide (Clapp 2014; Fairbairn 2014; Holt-Giménez and Shattuck 2011). Hunger and food insecurity are, indeed, not related to insufficient global supplies, but to structural inequalities and deficits that keep people in poverty, impair their capacity to produce or access nutritionally diverse food and undermine health (De Schutter 2010; Headey and Ecker 2013; Smith and Haddad 2015).

Land Sharing as a Counternarrative

In contrast, Land Sharing rejects the Human–Nature dichotomy embedded in Land Sparing and emphasizes the importance of a coherent, diverse landscape matrix in biodiversity-rich agricultural systems (table 1). This is based on two fundamental arguments. First, biodiversity is not "just" "primordial Nature" that should be separated from humans, but part of interconnected socio-ecological systems that are characterized by complex interactions over nested spatial and temporal scales (Perfecto, Vandermeer, and Wright 2009). Land Sharing emphasizes the role of traditional peasant systems and cultural landscapes[8] in co-producing biodiversity and providing key mechanisms, such as ecological connectivity, reservoirs, and corridors, which enable biodiversity to migrate and reproduce itself in fragmented landscapes (Harvey et al. 2008; Perfecto and Vandermeer 2010). Second, agroecological systems (Levels 3 and 4 *sensu* Gliessman 2015) are seen as efficient, sustainable, and resilient, since they: (1) maintain socio-ecological diversity; (2) adapt iteratively to changing local conditions; (3) contribute to food security;[9] and (4) foster food sovereignty by minimizing dependence on external (synthetic) inputs (Altieri and Toledo 2011; Altieri et al. 2015; Chappell et al. 2013).

Land Sharing's starting point is the spatial and social integration of agriculture and conservation that are perceived as mutually reinforcing components of a single, multifunctional system. Conceptually, the latter may achieve a dynamic equilibrium, provided: (1) all living components share the system's resources, and (2) resource use is driven primarily by reproductive needs. This implies the alignment of agricultural and food policies to food sovereignty goals by fostering diversified, agroecological systems that can satisfy regional food needs through short production and commercial circuits (Chappell et al. 2013; Torres Salcido et al. 2012). Land Sharing does not involve the displacement of populations, or of land use, and "Nature" does not need to be fenced off. In principle, Land Sharing supports a decentralized land governance and participatory conservation approach that has affinities to Joan Martínez Alier's "Environmentalism of the Poor" (2002) in which local communities preserve natural resources and biodiversity as a basis for their own reproduction. Land Sharing embedded in the food sovereignty approach supports local-regional autonomy under a framework of strong sustainability (*sensu* Ott et al. 2011) and, arguably, provides a conceptual basis for a counternarrative to extractivism.

Since modeling results consistently appear to demonstrate higher agricultural productivity (of individual crops) and conservation efficiency (at species or biome scale) under Land Sparing, Land Sharing is criticized as a bottom-up approach based on successful emblematic, but not representative, local case studies (Green et al. 2005b; Phalan, Onial et al. 2011b). Land Sharing is said to fail on three accounts (Balmford et al. 2005; Green et al. 2005a; Phalan, Balmford, et

al. 2011): (1) traditional peasant systems cannot fulfill world population needs and substantial intensification is needed to close the yield gap; (2) uncontrolled expansion of extensive agriculture puts "natural" biodiversity at risk, and (3) extensive agricultural land may have a high species richness, but may not support the maintenance of scarce specialized species of high conservation value over the long term.

Toward a Consensus?

Recently, the growing polarization of Land Sparing and Land Sharing arguments and entrenched positions on their respective methodological successes or caveats, have been deemed fundamentally inadequate to resolve the core question of how to counter hunger and environmental degradation (Fischer 2015; Tscharntke et al. 2012). Consensus seems to be emerging that both approaches are needed, with the real challenge being to foster a continuum between strict protection and intensive land use through gradual land use restrictions and sustainable intensification (de la Vega-Leinert 2014; Grau et al. 2013; Kremen 2015; Phalan et al. 2016). We focus on the latter; the premise being that sustainable intensification can limit the ecological impact of intensive land use and increase the productivity of low-input peasant systems.[10]

For Jules Pretty (1997), sustainable intensification enables low-input agriculture to become highly productive by giving farmers full access to all stages of technology development and agricultural extension. Though rapidly transforming, peasant systems consistently play a key role in global agricultural and food markets, in spite of chronic underfunding and constant assaults from trade policies that privilege large-scale, export farming (ETC 2009; van der Ploeg 2014). Several reviews have compared conventional and agroecological production systems, focusing on Global South farming conditions and demonstrating the potential of agroecological systems to supply enough food and increase rural incomes. Jules Pretty and colleagues (2006) identified an average crop yield increase of 79 percent based on the comparison of a total of 286 agroecological projects covering 37 million hectares and twelve different crops (including maize, potato, rice, wheat, and vegetables). Likewise, based on 293 examples (160 in the Global North; 133 in the Global South), Catherine Badgley and colleagues (2007) analyzed the yield proportion for conventional versus organic farming for ten different food categories (including meat, eggs, and milk). Overall organic output in the North was 9 percent lower than conventional, but it was 74 percent higher in the South, where increase is most needed. For Latin America, a vast body of evidence illustrates the potential of agroecological farming systems (Altieri and Toledo 2011). Meta-analyses of comparisons between conventional and organic production demonstrated yield gaps in favor of conventional farming (Seufert et al. 2012). However, for Lauren Ponisio and colleagues (2014) these studies are flawed with a number of methodological issues (that is, statistical biases toward conventional production and atypical conventional yields). This deficiency indicates that such comparisons are ill-suited for projections into the future. Derek Headey and Olivier Ecker (2013) moreover point out that dietary diversity indicators rather than caloric supply are best suited to measure adequate nutrition and (absence of) hunger, a view that is supported by Lisa Smith and Lawrence Haddad (2015), who identified dietary diversity as an important factor to avoid stunting in children.

Another point of contention lies on whether agroecological systems may be reproduced at large scale. For some, with positive institutional support, policy change and appropriate modern technologies, agroecological systems may be successfully upscaled (Parmentier 2014). Also, under a shallow interpretation of sustainable intensification (articulated in terms of agricultural extension, ecological engineering, environmental economics, and apolitical ecology), Land

Sharing components (such as wildlife-friendly farming) can be mainstreamed within a Land Sparing framework. For example, large-scale monocultures may be cultivated sustainably (Jordan et al. 2016) and agroforestry systems for export commodities can be planted on degraded deforested land (Schroth et al. 2016). This certainly constitutes an environmental improvement. Nevertheless, this is effectively stripping sustainable intensification and Land Sharing of their potentially most far-reaching political aspects, namely those embedded within the ideological foundation of agroecology (*sensu* Altieri and Toledo 2011; Wezel et al. 2009) and food sovereignty (Wittman 2009). Both approaches clearly position themselves in defense of peasant agriculture, its territories and rights (to autonomy and self-determination), and foster the sharing of experience and collective action through capacity building, social networks, political literacy, and advocacy (Holt-Giménez 2006; Rosset and Martínez Torres 2012).

For some authors, therefore, sustainable intensification is becoming an empty buzzword (Loos et al. 2014; Scoones and Thompson 2011), which is being mainstreamed in international policy as a win-win solution to green wash intensive agriculture systems (Cook et al. 2015). Effectively, we argue, the debate on Land Sparing versus Land Sharing has simply been displaced rather than resolved. This is not surprising, since it essentially rests on very different conceptualizations of what agriculture should do (feed the world versus feed one's community) and how (agro-industry versus peasant agriculture), of what "Nature" is ("pristine" versus co-produced by people) and what conservation should be about (fence off "natural" biodiversity versus allow landscape connectivity and dynamism). The Land Sparing versus Land Sharing debate is not just an abstract dichotomy, but alludes to different systems of understanding, world views, values, and convictions. It thus seems sterile to reduce it to the narrow world of land use sciences, since it is inevitably related to the much broader issues of who should have access to land and natural resources, for what purposes, and on which terms.

Peasant Systems: A New Frontier for the Green Economy?

The FAO (2014) estimates that globally 85 percent of farmers are smallholders working on plots of less than two hectares, though recent research has refined classifications of farmers beyond simple area-based definitions (Graeub et al. 2016). Peasant systems are often located in peripheral regions at the margin of expanding extractive frontiers, and as mentioned above, often coincide with areas that have been earmarked for conservation to preserve in situ ecological diversity and/or compensate for environmental degradation elsewhere. Under Land Sparing's rhetoric, since peasant communities are often an obstacle (to intensification, extraction, or conservation), they can be legitimately displaced to suit what are articulated as higher societal needs (such as progress, development, climate mitigation, conservation, and more). Under a narrow perception of Land Sharing, peasant systems can be transformed and instrumentalized for the same reasons. The very reductionist term of "peasant farmer" is all too often associated with the Chanyanovian subsistence farmer, which ignores the diversity and hybridism of peasant communities worldwide (van der Ploeg 2014) and the range of (non)agricultural activities and commodity chains they are engaged in (Winter et al. 2002). Despite the 2014 International Year of Family Farming, peasant farmers are still portrayed as deficient and in need of external help to exit subsistence and climb up the idealized pyramid to successful integration into global agricultural commodity chains (FAO 2014: 25), although autonomous, multifunctional peasant farming may be less debt-prone than industrial farming (McKeon 2015). Within a narrow understanding of the green economy (Brand 2012), sustainable intensification may be reduced to making current market-oriented agricultural policies "environmentally friendlier," while conservation efforts may become tradable commodities that reinforce rather than ques-

tion the exploitation of Nature (Barbier 2012; Büscher et al. 2012; Cook et al. 2015; Loos et al. 2014). Peasant systems are consequently being repackaged as providers of multiple, high-quality primary products. Traditional subsistence staples are rapidly being replaced by commercial crops (Carletto et al. 2011). Some neglected and underutilized crops, for example quinoa, can be transformed into niche products (Laguna et al. 2006; Rojas et al. 2009) and shaded polycultures provide praised exotic, non-timber commodities (Schroth et al. 2016). The Fair Trade movement, which originally intended to avoid conventional market rules by creating solidarity networks between consumers and producers,[11] has contributed to opening new markets for peasant crops (Ruben and Fort 2012). Paradoxically, market integration may also lead to crop simplification, agricultural intensification, and overexploitation of fragile systems (see Jacobsen 2012 and Kerssen 2015 on quinoa). Though Fair Trade has helped improve living standards in marginalized communities (Calo and Wise 2005), rapidly increasing volumes of certified products and dwindling consumer demand have led to market saturation, so that many farmers are facing mounting debts, fluctuating prices, precariousness, and hunger (Wilson 2010). For Bob St. Peter (2013), peasant farmers are becoming captive labor forced to satisfy urban food preferences, which strongly undermines the capacity to satisfy their own needs. Finally, peasant farmers are being transformed into commercial Nature stewards, for example through incorporation in agroforestry certification schemes and payment for ecosystem services (PES) programs (see Tscharnkte et al. 2015). Nevertheless, PES, particularly REDD and REDD+ have resulted in financial influx, which reconfigures local politics, and encourages political clientelism and corruption, while land scarcity caused by expanding strict protection regulations exacerbates conflicts over access to land (Fairhead et al. 2012; Legorreta Díaz et al. 2014). Peasant communities are therefore incited to participate in global climate mitigation efforts through a dual focus: by avoiding deforestation and enhancing forest conservation, but also through the Climate Smart Agriculture (CSA) policy framework (FAO 2013). This approach has been much criticized for several reasons (CIDSE 2014; Vía Campesina 2014),[12] including: (1) the indiscriminate bundling of all forms of agriculture, which masks the main responsibility of the intensive agriculture model for greenhouse gas emissions; and (2) the focus on enhancing the climate mitigation potential of peasant systems, which though disproportionally vulnerable to climate impacts bear comparatively little weight in the global carbon balance. Further, we note with concern that discussions on paths to reduce agriculture's climate footprint are reviving the Land Sparing approach. For example, Anthony Lamb and colleagues (2016) argue for climate mitigation in agriculture principally through ecological restoration on land spared, although they also propose considering "demand-side strategies" (for example, reducing meat consumption and food waste). In this context "land spared" is a sanitized and neutralized phrase that conceals that much of this land is occupied and worked on by peasant communities. These trends are worrying since, we argue, they reinforce the process of disappropriation of peasant communities of their land and resources to make way for the trends in extraction and conservation we analyzed in this article.

Conclusions

Strong voices emphasize the limits of the Land Sparing versus Land Sharing dichotomy and even recommend refraining from further use of this framework (Fischer 2015). Key for Claire Kremen (2015) is to explicitly consider critical dimensions, such as market dynamics, governance, land tenure systems, and the bundle of policies that affect land use. Ben Phalan and colleagues (2016) sketch out different strategies to better regulate land use (through zonation), convert to more profitable and sustainable land use (such as converting pasture into agroforestry plantations), improve yields (through agricultural extension), and provide economic incentives

(for conservation through PES and wildlife-friendly cultivation through certification). This approach can be related to an understanding of the green economy under a neoliberal framework (Brand 2012). This is well illustrated in "the other frontier" policy guidelines developed in Bolivia (PNUD 2008), which essentially seeks to tie peasant communities in ecologically rich areas to international (organic) commodity chains as an avenue to improve livelihoods and further national development. Nevertheless, export-oriented, organic farming essentially maintains farmers' dependence on input suppliers, certification institutions, and volatile international markets while it does little to secure local food sovereignty (Altieri and Toledo 2011). With alternative markets remaining marginal, global food trade masks the large environmental and social externalities involved in ever-increasing distances between food production and consumption (Clapp 2014).

Land Sparing and Land Sharing narratives, when embedded in a discourse that constructs green economy as the catalyst of a transition to sustainability, may have the potential to improve specific forms of agricultural production and preserve a certain kind of "natural" biodiversity. However, they remain inserted in a paradigm of growth, which exacerbates rather than resolves the Human-Nature dichotomy and legitimizes old and new forms of extraction. These seductive visions fail to address what we understand as the root causes of socio-ecological conflict related to conservation, namely: the unequal control on, and access to natural resources, while they bypass thorny political issues of rights to autonomy. This has echoes of the "old" Green Revolution, where redistributive land reform was avoided with the promise of prosperity for all through development and growth (Patel 2013). In this respect Thomas Jayne and colleagues (2014) emphasize that "ultimately a farm structure that is egalitarian enough to support broad-based income growth from agriculture is decisive." Forging broad political alliances and social movements that make the interconnections between food systems, poverty, labor and migration patterns, resource depredation, armed conflicts, and climate change visible could challenge the legitimacy and hegemony of the corporate food regime (Holt-Giménez and Shattuck 2011) and thus contribute to the more egalitarian farm structures needed. The convergence of farmers, food activists and concerned scientists endorsing agroecology (*sensu* Wezel et al. 2009) instead of a "technocratic" sustainable intensification[13] is one step in this direction.

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NOTES

1. Authors' translation from the original Spanish text.
2. Primary forests are defined as forests that have never been logged and have developed following natural disturbances and under natural processes, regardless of age (CBD 2016b). The estimate based on the World Bank database considers only countries for which data were available for 1990 and 2013.
3. The literature distinguishes between "land grab" and "land acquisition." The former term stresses the illegitimacy of the process of access to land. The latter is a deliberately neutral term. For the FAO, land grabs are land acquisitions that are: (1) large-scale, (2) foreign driven, and (3) endangering local food security. For Borras et al. (2012) these criteria do not encompass the complexity and polymorphy of land grabs worldwide.
4. Weak sustainability emphasizes the substitutability of natural capital and efficiency (the capacity to maintain and replace natural capital), while strong sustainability fundamentally questions substitutability and favors approaches geared toward maintaining natural capital (resilience) and reducing its use (sufficiency) (Ott et al. 2011).
5. Specifically, Bhutan, Chile, China, Costa, Rica, El Salvador, India, and Vietnam.
6. Dowie (2006) distinguishes "conservation refugees," who were forcefully evicted to make room for conservation projects, from "ecological refugees," who are displaced as a result of drought, desertification, flooding, and so forth.
7. Speculation on food is also closely related to the emergence of flex crops and the increasing use of food crops for energetic purposes. In this respect, Jean Ziegler, former UN Special Rapporteur on the Human Right to Food denounced agrofuels as a crime against humanity (McMichael 2012).
8. Though in developed countries cultural landscapes are central to conservation approaches (Plieninger et al. 2006), in the Global South traditional land use (such as slash and burn agriculture) are often not valued or are explicitly condemned as destructive (Robbins 2012), while few have been designated cultural landscapes by UNESCO. Cultural landscapes are "representative of the different regions of the world [and c]ombined works of nature and humankind, [that] express a long and intimate relationship between peoples and their natural environment" (UNESCO 2016). That the UNESCO list includes Mexican Agave "monocultures" but ignores the Mesoamerican milpa or coffee gardens reflects the lobbying capacity of specific sectors.
9. The literature on food security and sovereignty illustrates the evolution and emergence of these terms and diversity in interpretations (Edelman et al. 2014). We define food security as a state, where adequate food (in quantity and quality) is available to satisfy human needs, while food sovereignty emphasizes the capacity of a household, community or country to produce the food necessary to satisfy these needs.

10. Several terms are used in the literature to refer to small-scale agricultural systems that have not (or only marginally) incorporated Green Revolution approaches, and are based on alternative bodies of traditional and current ecological knowledge, including low-input, peasant/smallholder, subsistence, agroecological, organic, wildlife-friendly, and others. Each emphasizes specific aspects, so that they are not necessarily synonymous. We use the terms chosen by the authors quoted.
11. Many references cited refer to coffee, but apply to other Fair Trade commodities.
12. See Vía Campesina (2014), CIDSE (2014), and a 2016 position paper on CSA by 20 German NGOs: *Klimasmarte Landwirtschaft Nein Danke!* www.oxfam.de/system/files/20160608-ngo-positionspapier-climate-smart-agriculture.pdf (accessed 15 June 2016).
13. Nyéleni Declaration of the international forum on agroecology: www.foodsovereignty.org/forum-agroecology-nyeleni-2015; Scientists' Open Letter to FAO Director General Graziano da Silva in Support of the February 2015 Declaration of the International Forum for Agroecology: www.iatp.org/documents/scientists%E2%80%99-open-letter-to-fao-director-general-graziano-da-silva-in-support-of-the-februa#sthash.MQoKZ8yF.dpuf (accessed 15 June 2016).

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