Why telecoupling needs to account for environmental justice

Engaging with normative questions in land system science is a key challenge. This debate paper highlights the potential of incorporating elements of environmental justice scholarship into the evolving telecoupling framework that focuses on distant interactions in land systems. We first expose the reasons why environmental justice matters in understanding telecoupled systems, and the relevant approaches suited to mainstream environmental justice into telecoupled contexts. We then explore which specific elements of environmental justice need to be incorporated into telecoupling research. We focus on 1) the distribution of social-ecological burdens and benefits across distances, 2) power and justice issues in governing distantly tied systems, and 3) recognition issues in information flows, framings and discourses across distance. We conclude our paper highlighting key mechanisms to address injustices in telecoupled land systems.

Keywords: telecoupling, environmental justice, ecosystem services, power, governance, decolonial thought

Word count: 2999 words

Introduction

The expansion of socio-economic globalization has widened the distance between the benefits and costs of land use change. For example, soybean imports have enabled China to avoid domestic agricultural expansion and spare land for afforestation (Torres, Moran, & Silva, 2017), but have led to deforestation in exporting countries including Brazil and Argentina (Garrett, Lambin, & Naylor, 2013; Vallejos et al., 2015). In Argentina, soybean expansion in the Chaco region has displaced indigenous peoples and small-scale farmers (Cáceres, 2015; Leguizamón, 2016), and exposed them to flooding and reduced availability of forest products (Camino, Cortez, Altrichter, & Matteucci, 2018). Furthermore, the conversion of soybean fields to corn and paddy increased nitrogen pollution in former soybean production areas in China, such as the

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Heilongjiang province (Sun et al., 2018), affecting vulnerable social groups such as children (Zhai et al., 2017).

This example shows how land use change generates social-ecological impacts across distance and scales. The concept of telecoupling helps to explore these effects by linking globalization with land use change (Eakin et al., 2014; Friis et al., 2016; Lenschow, Newig, & Challies, 2016; Liu et al., 2013). Telecoupled systems are distantly connected social-ecological systems sending and receiving goods and services, energy matter, information and living species through their enabling agents (Liu et al., 2013). The connected systems (in the example above, deforested lands in Argentina and Brazil and spared land in China) can also directly or indirectly affect additional "spillover" systems (in the example above, Canada, Russia, Belarus and Germany as fertilizer producers [Liu et al., 2018], and nitrogen pollution sources in China). The novelty and analytical potential of a telecoupling lens is to reveal such distant ties from a social-ecological perspective, while earlier approaches have focused either on ecological or socio-economic aspects (Liu et al., 2013). Nevertheless, telecoupling studies still need to engage with normative questions in order to deal with the moral consequences of decision-making (Nielsen et al., 2019). This has not happened systematically yet (Corbera, Busck-Lumholt, Mempel, & Rodríguez-Labajos, 2019). We contend that an environmental justice lens can contribute significantly to critically reflect and operationalize the normative dimensions of telecouplings.

In what follows, we first explain why environmental (in)justices are fundamental features of telecoupled systems. We demonstrate why telecoupled systems produce social and environmental inequalities qualified as unjust, and which approaches of environmental justice are most suited for analysing these situations. Secondly, we explore which elements of environmental justice can and should already be incorporated

in telecoupling research, and which new research domains and questions arise as a result. We conclude by highlighting possible mechanisms towards achieving greater environmental justice in telecoupled systems.

Why telecoupling needs environmental justice

Because sending and receiving goods through distance implies a redistribution of the environmental costs of their production, environmental inequality is prominent in telecoupled systems. In the introduction example, soybeans are consumed in Europe and China while the environmental burdens concentrate at the producing locations in South America. There is wide empirical evidence that more affluent people and economies can shift the environmental costs of their consumption, such as carbon emissions (Xiong, Millington, & Xu, 2018) or deforestation (Jorgenson, 2006) to distant places. In these places, land use changes due to the production of global commodities have strong negative impacts on socio-economically disadvantaged and disempowered social groups (Borras, Franco, Kay, & Spoor, 2011; Peluso & Lund, 2011).

Hornborg (1998) explains the mechanisms that lead to global environmental inequalities through the theory of ecological unequal exchange (EUE). EUE postulates that though raw materials have a greater productive potential and that their extraction has high environmental impacts, their monetary value is lower than processed goods (Givens, Huang, & Jorgenson, 2019). In a connected global system where nations have historically unequal positions (Wallerstein, 1984), centres of consumption concentrate exchange value while they undermine the productive potential that they absorb through trade from their peripheries. This accumulation of exchange value allows centres to further extract raw materials and cheap labour at their periphery (Martinez-Alier, 2009) and systematically shift environmental burdens and social costs onto those who have less access to consumption of goods and services (Fitzgerald & Auerbach, 2016; Rice,

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2007). Though the periphery often corresponds to the Global South, unequal exchange and core-periphery dynamics work both within and between nations (Dunaway & Clelland, 2016; W. Zhang et al., 2018), as the nitrogen pollution in China in the soybean example shows.

Why is justice an appealing concept for analysing such unequal social-ecological exchange? Justice is a fundamental evaluative criteria in moral philosophy (Rawls, 1971; Sen, 2009). John Locke (2005 [1690]) showed that justice has an intrinsic value ensuring people the opportunities for a life worth living, as well as an instrumental value (as a 'social contract' in Locke's terms) because justice is considered to be a condition that enables collective action towards goals such as sustainability (Martin, 2013: 99). This bivalent intrinsic/instrumental notion of justice is visible in sustainability literature. For example, the concept of a *safe and just* operating space postulates that ending poverty while staying within earth's limits should only be achieved by greater equity besides greater efficiency (Dearing et al., 2014; Leach, Raworth, & Rockström, 2013).

In telecoupled systems, nevertheless, sustainability and justice might not be two separate conditions as usually framed. EUE suggests that unsustainable and unjust conditions tend to be causally inter-linked. Empirical evidence shows that more unequal societies tend to have more degraded environments, in particular air and water (Cushing, Morello-Frosch, Wander, & Pastor, 2015). Inversely, socially just environmental measures and policies are more likely to be effective (Brondizio & Le Tourneau, 2016; Pascual et al., 2014). Boyce (2018) explains this link through the power-weighted social decision rule: powerful people and nations are less likely to address environmental costs when they can shift them to others who lack sufficient economic and political power to take environmentally relevant decisions.

We postulate that environmental justice provides the most developed framing to understand environmental inequalities and their causes in telecoupled systems. Environmental justice has expanded its initial focus on characterizing environmental burdens among disadvantaged groups (Bullard, 1994) to understand the causes of these inequalities as well as justice claims, discourses and practices in environmental issues (Holifield, Porter, & Walker, 2009). Schlosberg (2007, 2013) has shown that environmental justice issues and claims work along three dimensions: 1) the distribution of environmental burdens and benefits, 2) procedural justice, the fairness and autonomy of environmental decisions-making and 3) recognition justice including issues of rights, power, and respect for cultural differences in knowing and shaping the environment (Martin, 2013).

This framing is particularly relevant for telecoupling research. A distributive environmental justice lens can help to identify the telecoupling dynamics and flows that matter from a normative point of view. Procedural and recognition justice contribute to integrate a power perspective in telecoupling research. Finally, incorporating the study of environmental justice movements can enhance the understanding of feedback processes and their potential to make telecoupled systems more just and sustainable.

Despite the relevance of environmental justice issues in telecoupling, few studies have addressed it explicitly. A recent review of 48 telecoupling studies (Corbera et al., 2019) found only three contributions that integrate justice explicitly, and also found that those studies that do integrate justice implicitly generally concentrate on distributive equity aspects. This suggests that environmental justice and telecoupling have remained largely disconnected in the global land systems and sustainability science literatures, with few exceptions (e.g. Boillat et al., 2018; Lundsgaard-Hansen et al., 2018; Oberlack et al., 2018; Schröter et al., 2018; Zimmerer, Lambin, & Vanek,

2018). In the next sections, we discuss each dimension of environmental justice and which related questions and empirical approaches could help enriching the study of telecoupled systems. The table in supplementary material summarizes these questions.

Elements of environmental justice to incorporate into telecoupling

Distributive justice: benefits and burdens across distances

In telecoupled systems, distributive justice is about the benefits and burdens generated by social-ecological flows across distances. This includes "embedded" natural resources and emissions in commodities, such as virtual water (Hoekstra & Mekonnen, 2012), land (Yu, Feng, & Hubacek, 2013; J. Zhang, Zhao, Liu, & Liu, 2016), and greenhouse gases (Xiong et al., 2018). Schröter et al. (2018) conceptualize environmental benefits in telecoupled systems as benefits from interregional flows of ecosystem services, including trade of goods, active and passive biophysical flows and information flows between systems. Pascual et al. (2017) identify negative impacts through ecosystem service burdens that can be distant but also delayed and spatially diffuse.

Assessing cultural and regulating ecosystem services involves dealing with complexity and uncertainty (Schröter et al., 2018) and requires choices (such as scale parameters) that cannot be innocent of politics or other values. The ecosystem service framing in itself represents a utilitarian conception of nature and justice that cannot be assumed to be shared among the actors involved (Díaz et al., 2018; Sikor, 2014). Assessing distributive justice in telecoupled systems should therefore include knowledge co-production methods that combine accounting of the diversity of perceptions about nature's contributions to people's quality of life (beyond a utilitarian ecosystem service flow framing) (Ellis, Pascual, & Mertz, 2019) with empirical,

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bottom-up accounts from involved actors (Sikor, Martin, Fisher, & He, 2014; Zaehringer, Schneider, Heinimann, & Messerli, 2019).

Ecosystem services also often focus only on those social outcomes that arise from ecological change (Lele, Springate-Baginski, Lakerveld, Deb, & Dash, 2013) and would thus miss the effects of telecouplings that directly affect social outcomes, for example when distant trade flows affect the labour practices in connected systems (Li, 2011). The distribution of labour, terms of trade, entitlements and the control of land and natural resources in telecoupled systems needs to be investigated. In turn, the distribution of these assets can feed back into how environmental benefits and burdens affect differentiated social groups. For example, a narrow ecosystem service framing focusing on landowners may overlook service providers who lack formal recognition such as land tenants, informal users and women. Social differentiation must therefore be examined carefully in its multi-dimensional forms (Daw, Brown, Rosendo, & Pomeroy, 2011; Dawson & Martin, 2015).

Procedural justice: decision-making spaces, actors and power

Procedural justice is about the extent to which legitimate voices and interests of individuals and social groups are represented in decision-making. One first needs to identify the relevant decision-making spaces, namely the set of collectively binding, coordination and steering decisions gathered under the broad concept of governance (Newig, Lenschow, Challies, Cotta, & Schilling-Vacaflor, 2019). In telecoupled systems, these governance spaces can concern focal or distant territorial systems as well as flow-based governance between these systems (Oberlack et al., 2018; Sikor et al., 2013) Researching flow-based governance implies to pay more attention to the network of vertical and horizontal norms, institutions and power relations governing production

networks, contract farming, commodity and value chains (Adams, Gerber, Amacker, & Haller, 2018; Gibbon, Bair, & Ponte, 2008).

Second, one needs to inquire about who is potentially affected by decisions under governance spaces that favour telecoupling. This refers to distributive justice, but also considers how the different actors involved define the subjects of justice, namely those considered legitimate holders of claims to land, ecosystem services and benefits (Sikor et al., 2014). In telecoupled systems that typically cross borders, subjects of justice cannot be restricted to members of a sovereign nation-state as Rawlsian theory does (Fraser, 2010a). They may be defined through the all-subjected principle (Fraser, 2010b) which posits that all people that are affected by governing decisions taken in relation with a telecoupling process or a telecoupled system are subjects of justice.

We finally need to look at the relation between the relevant governance spaces, and the participation and power of potentially affected subjects across distant places. From an institutional analysis perspective (Ostrom, 2005), the social spaces in which actors interact and make decisions are called action situations (Ostrom, 2011). In telecoupled systems, local, distant and flow-centered action situations interact in networks and constitute polycentric governance systems (Oberlack et al., 2018). We hypothesize that the position of actors across action situation types and their ability to bridge physical, social or institutional distances has a strong relation with their power (Boillat et al., 2018; Eakin, Rueda, & Mahanti, 2017; Kashwan, 2015).

Recognition justice: information flows, framings and discourses

Recognition injustices involve harms linked to discrimination and domination, produced through formal rules (e.g. tenure rules that discriminate against women) as well as informal norms (e.g. prevailing traditional institutions that prevent women controlling land) that disregard some people to make legitimate claims. Structural inequalities are

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expressed at multiple scales through institutions, practices, language and symbols, producing problem framings that strongly influence distributive and procedural outcomes (Fraser, 2000; Schlosberg, 2007; Young, 1990).

At a global scale, there is particular attention in environmental justice literatures to the recognition injustices linked to coloniality (Álvarez & Coolsaet, 2018; Martin et al., 2016; Rodriguez, 2013; Rodríguez & Inturias, 2018). Coloniality postulates that environmental injustices arise because governance spaces are driven by dominant knowledge and values, which in turn shape both problem analysis and solutions in ways that reflect and reproduce colonial power asymmetries and reinforce social distance (De Sousa Santos, 2010). From a telecoupling perspective, these spaces embody and project dominant conceptions of nature in distant places. Safeguards to 'recognise' local or indigenous community rights might exist, but within a colonial politics of recognition that requires to assimilate dominant values that are in turn sedimented by legitimized epistemic communities, e.g. by entering into compensation or benefit-sharing schemes that are rooted it the same imposed knowledge system (Martin et al., 2016).

We thus propose to integrate recognition justice concerns into telecoupling through an examination of discourses, scale choices, evidence framing, views on nature and views of justice expressed in information flows from a decolonial or more generally critical perspective on dominant values. This focus emphasizes that 'information flows' are rarely if ever innocent of injustice. Information is entangled with issues of 'whose knowledge', 'whose values' and ultimately 'whose justice' is made visible or invisible. Such questions are relevant to everyday practices that are presented as neutral but are in fact deeply political, such as choices over appropriate scales of analysis (Towers, 2000), what subjects of justice are considered (Sikor et al., 2014), what kind of evidence is admissible, and so on. To enhance recognition justice, our analysis of telecoupled

systems should therefore employ a 'thickened' sense of information flows that asks

whose knowledge, values and interests are considered, and whose are rendered

invisible.

Addressing injustices in telecoupled systems

Overall, telecouplings do create the conditions for some people to bear adverse effects

(burdens) in both social and ecological terms. We postulate that these people – often

disempowered, marginalized and invisibilized communities – can be key allies for

sustainability. What are then the possible mechanisms to address these injustices?

First, environmental injustices often trigger social movements (Martinez-Alier,

Temper, Del Bene, & Scheidel, 2016), that are increasingly interconnected around

common values, concerns and interests (Anguelovski & Martínez Alier, 2014; Temper,

Demaria, Scheidel, Del Bene, & Martinez-Alier, 2018). Through the *boomerang*

mechanism (Keck & Sikkink, 1998: 12-13), local activists can purposefully seek

transnational allies to draw attention to the existing injustices, mobilize international

leverage and eventually reshape power asymmetries (Keck & Sikkink, 1998; Veuthey &

Gerber, 2012). These allies can include foreign and international NGOs (Carruthers,

2008; Keck & Sikkink, 1998), financial and trade organizations (Nelson, 2002), courts

and tribunals (Spalding, 2017) or company shareholders (McAteer & Pulver, 2009).

This mechanism can potentially empower marginalized subjects of justice, defend

community rights and resources, reinvigorate local identities and better recognition of

local ecological knowledge (Oberlack, Tejada, Messerli, Rist, & Giger, 2016;

Villamayor-Tomas & García-López, 2018).

The *catapult mechanism* describes the inverse setting, in which transnational

actors such as international NGOs initiate alliances with local actors. They can

harmonize their own agenda with local environmental justice struggles (Temper, 2019)

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and proactively support the agency of local resource users (Lundsgaard-Hansen et al., 2018). Resistance movements can also scale of their effects through the *minefield mechanism*, through which highly conflictive projects can change the overall perception of similar projects (e.g. in terms of risk and profitability), leading to alterations in investment behaviour, legal action, or regulatory changes (Temper, 2019). For example, wide-spread citizen resistance enhanced the open pit mining ban in Costa Rica in 2010 (Broad & Fischer-Mackey, 2017).

Finally, an increasing number of initiatives attempt to transform justice conflicts in natural resource use through *enhanced transparency* (Anseeuw, Lay, Messerli, Giger, & Taylor, 2013; Gardner et al., 2019). Better public access to information, including environmental data, can constrain elites to extract resource rents and to form patronage networks (Corrigan, 2014; Dillon et al., 2017). Transparency initiatives may provide new means of participation and accountability in land and resource governance (Mejía Acosta, 2013; Vijge, Metcalfe, Wallbott, & Oberlack, 2019). Taken together, these mechanisms can co-occur and interact. More mechanisms to transform injustices in telecoupled systems exist for instance through global institutions or states (Lenschow et al., 2016). Future research needs to delineate them clearly and to identify the precise conditions under which particular mechanisms do and do not operate effectively.

Conclusion

In this article, we have advocated for the inclusion of a justice perspective in telecoupling research. We have shown how social-ecological flows across distances create winners and losers, how to assess them and under which conditions injustices can be reduced. Because telecouplings are social-ecological interactions, some people in some contexts are likely to bear adverse effects in both social and ecological terms while, in other contexts, telecouplings might not necessarily translate into subjectively

felt injustices. In this regard, we would refer to the Rawlsian principle that only

processes which do achieve better conditions for the worst off can be labelled as just.

Specifically, we have argued for the incorporation of procedural and recognition

perspectives in telecoupling research, which pays increased attention to governance

systems, power, discourses and values. Such perspective can contribute to a richer

understanding of which mechanisms create and reproduce injustices at different scales

for different actors in telecoupled systems. This will also complement other existing

approaches that explain environmental injustice through a socio-metabolic, global

perspective (Martinez-Alier et al., 2016).

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Supplementary material: Environmental justice aspects for integration into telecoupling research.

Dimension	Key research questions	Possible approaches and methods
1. Distributive justice	1.1. What is the distribution of the benefits and burdens of social-ecological interactions across distant regions?	Ecological benefits: interregional flows of ecosystem services (Schröter et al., 2018) Ecological burdens: off-stage ecosystem service burdens (distant, delayed and diffuse negative effects on ecosystems) (Pascual et al., 2017) Direct social effects of telecouplings: distribution of labour, terms of trade and entitlements
	1.2. How are these benefits and burdens felt and perceived by affected people?	"Bottom-up" accounts on felt benefits and burdens in terms of perceptions (Daw, Brown, Rosendo, & Pomeroy, 2011; Dawson & Martin, 2015)
	1.3. How are these benefits and burdens distributed among differentiated social groups?	Social differentiation of burdened/benefited people: capabilities and well-being (Dawson & Martin, 2015)
2. Procedural justice	2.1. What are the relevant decision-making spaces in telecoupling processes?	Spaces and scales that induce, coordinate and respond to telecouplings (Newig, Lenschow, Challies, Cotta, & Schilling-Vacaflor, 2019) Spaces that govern focal and distant territories and flows between them (Oberlack et al., 2018)
	2.2. Who are affected by these decision-making spaces?	All-subjected principle (Fraser, 2010) Social connection model (Young, 2006)
	2.3. To what extent can those affected take autonomous decisions?	Compare actors with decision-making power with those affected (Lundsgaard-Hansen et al., 2018)
	2.4. What is the decision-making power of those affected and left aside?	Observable, hidden and invisible power forms (Gaventa, 2006) Networks of action situations (Oberlack et al., 2018) Policy resources analysis (Knoepfel, Larrue, Varone, & Hill, 2011)
3. Recognition justice	3.1. What are the implicit framings and value systems embedded in the	Qualitative assessment of information flows: discourses, scale choices, evidence framing, views on nature and

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	governance of telecoupling processes?	views on justice expressed in decision-making (Martin, Akol, & Gross-Camp, 2015)
	3.2. To what extent do telecoupling governance systems reframe and reproduce domination patterns?	Decolonial analysis: whose knowledge', 'whose values' and 'whose justice' prevail in framings and discourses? (Álvarez & Coolsaet, 2018; Rodríguez & Inturias, 2018)

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