

# Jurisdictional approaches to sustainable resource use

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Tropical forests are under increasing pressure, but conservation interventions have had only limited success in mitigating deforestation and ecosystem degradation. Over the past decade, however, jurisdictional approaches to sustainable resource use have attracted increasing attention as a potential alternative to traditional conservation strategies. These approaches operate within formal administrative boundaries and seek to establish policies and practices that apply to all stakeholders. We compiled a global database of conservation initiatives and developed a definition and typology for jurisdictional approaches; of the 80 initiatives included in our database, 25 met this definition. We categorized these jurisdictional approaches according to two criteria: the focus of the intervention and the degree of government involvement. These jurisdictions encompassed approximately 40% of global tropical forests, with most experiencing higher-than-average deforestation rates. Although jurisdictional approaches harbor the potential to overcome the limitations of previous approaches, numerous challenges for implementation and operation remain. In addition, because most jurisdictional initiatives currently in operation are still early in their lifecycles, the long-term effectiveness of this strategy has yet to be proven.

*Front Ecol Environ* 2021; doi:10.1002/fee.2299

Although tropical ecosystems play a vital role in climate regulation, biodiversity conservation, ecosystem services provision, and human livelihoods and culture (Bonan 2008; Seymour and Busch 2016), they remain under threat from deforestation and degradation despite decades of conservation efforts (Hansen *et al.* 2013; Weisse and Dow Goldman 2019). Research on the effectiveness of both public and private land

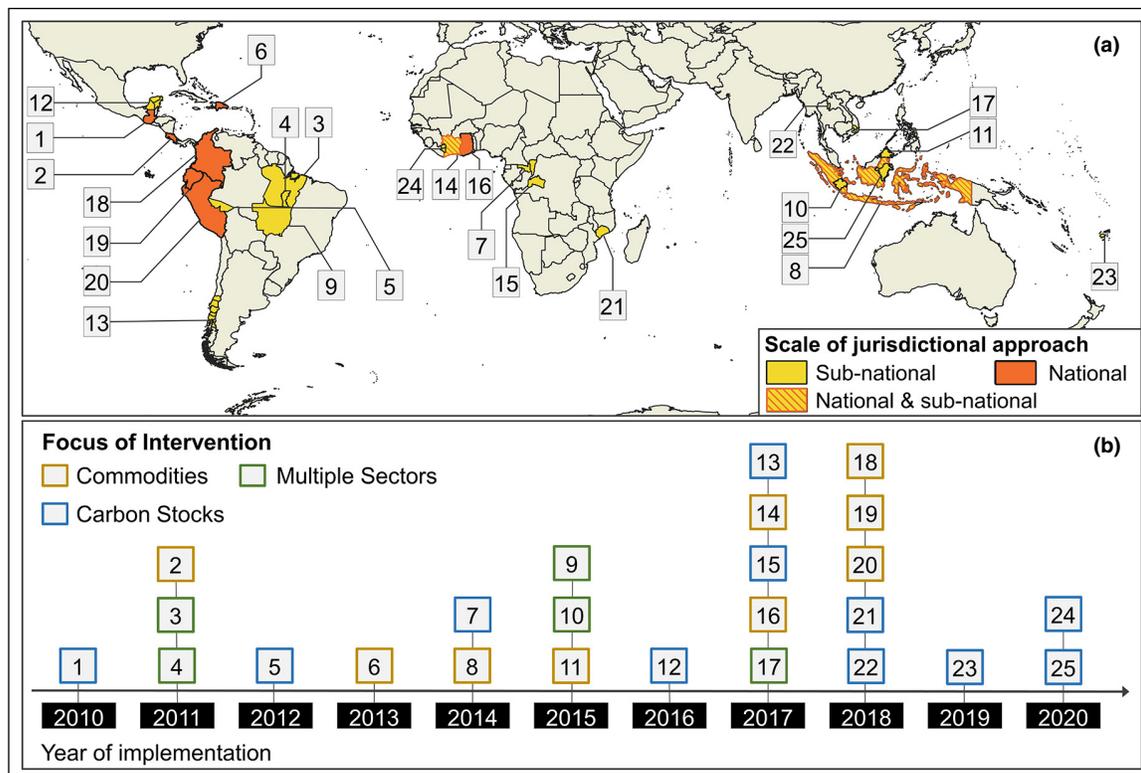
use policies reveals that only limited progress has been made in halting ecosystem destruction and deforestation in the tropics (Lambin *et al.* 2014; Weisse and Dow Goldman 2019). Over the past 10 years, jurisdictional approaches to sustainable resource use have emerged (Figure 1) and various initiatives have been implemented (Wolosin 2016; Fishman *et al.* 2017; Stickler *et al.* 2018). Jurisdictional approaches have received a considerable degree of political attention through such platforms as the Governors' Climate and Forest Task Force – a collaboration of 38 subnational governments to reduce greenhouse-gas (GHG) emissions from deforestation and degradation – and the California Tropical Forest Standard (Nepstad *et al.* 2013a; CARB 2019; GCFTF 2019). The wide diversity of these approaches necessitates the development of a general understanding of what exactly a “jurisdictional initiative” entails. Here, we propose a definition and typology of what constitutes a jurisdictional approach, and discuss the opportunities and challenges such approaches present.

The idea of applying practices or policies at the jurisdictional scale to reduce deforestation and degradation in the tropics originated primarily from two sources: REDD+ and sustainable commodity production. First negotiated by the UN Framework Convention on Climate Change in 2005, REDD+ (“Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries”; UNFCCC 2008) is a forest conservation framework based on payment-for-ecosystem-services schemes that creates financial incentives for conservation projects through the sale of certified emission reductions (Parker *et al.* 2009). REDD+ programs were initially implemented at the project level but attention has now shifted to up-scaling REDD+ to the jurisdictional level (Fishbein and

## In a nutshell:

- Jurisdictional approaches have gained in popularity over the past decade as strategies for tackling unsustainable resource use, deforestation, and forest degradation in the tropics
- We compiled a database of 80 conservation initiatives from which a definition and typology of jurisdictional approaches were derived
- Jurisdictional approaches are distinct due to multistakeholder involvement, operation within formal administrative boundaries, and wide applicability to stakeholders
- Twenty-five initiatives met our definition, encompassing more than 840 million hectares, with an average annual rate of tree cover loss (0.64%) that exceeded the global average (0.49%)
- Jurisdictional approaches have the potential to overcome the limitations of previous policy approaches to sustainable land use, if several challenges can be surmounted

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**Figure 1.** (a) Location and (b) timeline of 25 jurisdictional initiatives for improving sustainable resource use. (1) Emissions reduction through the strengthening of forest governance in vulnerable communities (Guatemala); (2) National Initiative for Sustainable Pineapple Production (INSP; Costa Rica); (3) Green Municipalities Program (Pará, Brazil); (4) Municipal Pact for the End of Illegal Deforestation (São Félix do Xingu, Brazil); (5) State System of Incentives for Environmental Services (SISA; Acre, Brazil); (6) Sustainable cocoa production in the Dominican Republic; (7) Emission Reductions Program (Sangha-Likouala, Republic of the Congo); (8) Indonesian Sustainable Palm Oil Forum (FoKSBI; Indonesia); (9) Produce, Conserve, and Include (PCI; Mato Grosso, Brazil); (10) Eco-Region Alliance (South Sumatra, Indonesia); (11) Sabah 100% Roundtable Sustainable Palm Oil (RSPO) by 2025 (Sabah, Malaysia); (12) Yucatán Peninsula Sustainability Agreement (ASPY 2030; Mexico); (13) REDD+ Emissions Reductions Program Temperate Forest Jurisdictions (Chile); (14) Cocoa and Forest Initiative (Côte d'Ivoire); (15) Emission Reductions Program (Mai-Ndombe, Democratic Republic of the Congo); (16) Cocoa and Forest Initiative (Ghana); (17) Initiative for Sustainable Landscape Approach (ISLA; Lâm Đồng and Đắk Lắk, Vietnam); (18) Cocoa, Forests and Peace Initiative (Colombia); (19) Interinstitutional Committee for Sustainable Palm Oil (CISPS; Ecuador); (20) National Coffee Action Plan (Peru); (21) Integrated Landscape Management Program (Zambézia, Mozambique); (22) Nan Sandbox (Thailand); (23) Reducing Emissions and Enhancing Livelihoods (Fiji); (24) Emissions Reduction Program (Taï National Park, Côte d'Ivoire); (25) Jurisdictional Emission Reductions Program (East Kalimantan, Indonesia). Map made with Natural Earth.

Lee 2015; Hovani *et al.* 2018; Stickler *et al.* 2018), which is perceived to be the more suitable scale for implementing holistic “wall-to-wall” approaches with government support (Boyd *et al.* 2018). One of the most widely recognized jurisdictional approaches to REDD+ is located in the Brazilian state of Acre, which, in 2012, was the first state to receive funding from the REDD Early Movers program (KfW Development Bank 2017).

Private sector actors and commodity roundtables were instrumental in introducing the idea of jurisdiction-wide environmentally sustainable production. As such, ecocertification is a precursor to jurisdictional approaches (Kissinger *et al.* 2015), the motivation being to establish sustainable production of commodities within a clearly defined area, such as an ecoregion (eg Initiative for Sustainable Landscapes South West Mau Forest, in Kenya; Denier *et al.* 2015) or a political region (eg Central Kalimantan Sustainable

Sourcing, in Indonesia; Unilever 2017). This strategy is of value for companies with sustainability commitments because verified sustainable areas enable secure and potentially cost-saving sourcing (Wensing 2018). The effectiveness of voluntary sustainability standards adopted by private actors largely depends on supporting policies and enabling conditions created by local public authorities, such as law enforcement, clear land property rights, and support for marginal producers (Lambin *et al.* 2018). Commodity roundtables are multistakeholder initiatives organized around a sector and typically do not include government actors. Ecocertifying an entire jurisdiction rather than a farm or concession may enable the integration of more stakeholders, including smallholders, and prevents the creation of a sustainability patchwork in an unsustainable landscape (Auld *et al.* 2008; Proforest 2016). An example of jurisdictional-level ecocertification is the Sabah 100%

Roundtable Sustainable Palm Oil (RSPO) by 2025 program, the goal of which is to ensure that all palm-oil producers in Sabah, Malaysia, are certified according to the RSPO standard by 2025 (Ong 2017). Another mechanism of linking products to a defined geographic area is geographic indication (TRIPS 1994). Geographic indication identifies a product as originating from a certain region where a given quality, reputation, or other characteristic is attributable to its geographic origin (Lamarque and Lambin 2015).

The term “jurisdictional approach” is used to describe a range of initiatives that vary in their objectives, policies, and practices, as well as stakeholder composition. This variation raises several questions, including: what attributes are common to all initiatives? How do jurisdictional initiatives differ from one another? And how do they differ from more traditional approaches to environmentally sustainable resource use?

## ■ Methods

To address these questions, we generated a database of multistakeholder initiatives to sustainable resource use in the terrestrial tropics that operate at landscape, jurisdictional, or ecoregional scales. We obtained information based on the authors’ prior knowledge, online searches, and from the scientific and gray literature. For online searches, we used variations and combinations of search terms related to jurisdictional, ecoregional, and landscape approaches to conservation, sustainable agriculture, development, and commodity production. We first compiled a database of initiatives that (1) operated at landscape, ecoregional, or jurisdictional scales; (2) involved both government and private and/or civil society actors; and (3) pursued sustainable development by reducing tropical ecosystem degradation. A total of 80 initiatives met these criteria. Characteristics pertaining to jurisdictional approaches were identified using inductive and qualitative reasoning to analyze the initiatives’ objectives, operational scales, stakeholder compositions, funding sources, applications, and governance styles; the resulting characteristics were then condensed into a subset from which our definition of “jurisdictional approaches” was derived. We then assessed each of the 80 initiatives in our database to test whether they qualified as a jurisdictional approach according to this definition.

Next, we devised a typology to categorize jurisdictional initiatives. We used an inductive and iterative approach to identify the most relevant variables, beginning with several candidates taken from the literature: *inter alia* governance approach, initiating actors, objectives of initiatives, funding sources, geographical scale, targeted industries, and stakeholder involvement. We then qualitatively identified the variables that would best capture the relevant variation among the initiatives in our database.

Finally, we conducted a tree cover loss analysis based on a Landsat-based global map at 30-m resolution, using a 30% canopy cover threshold (Hansen *et al.* 2013). We extracted tree cover and tree cover loss values over the period 2000–2010 for the selected jurisdictions and compared them to global forest cover and forest cover change (Achard *et al.* 2014). We accounted for nested initiatives (eg a subnational initiative located in a country with a national initiative) to avoid double-counting of tree cover extent and loss.

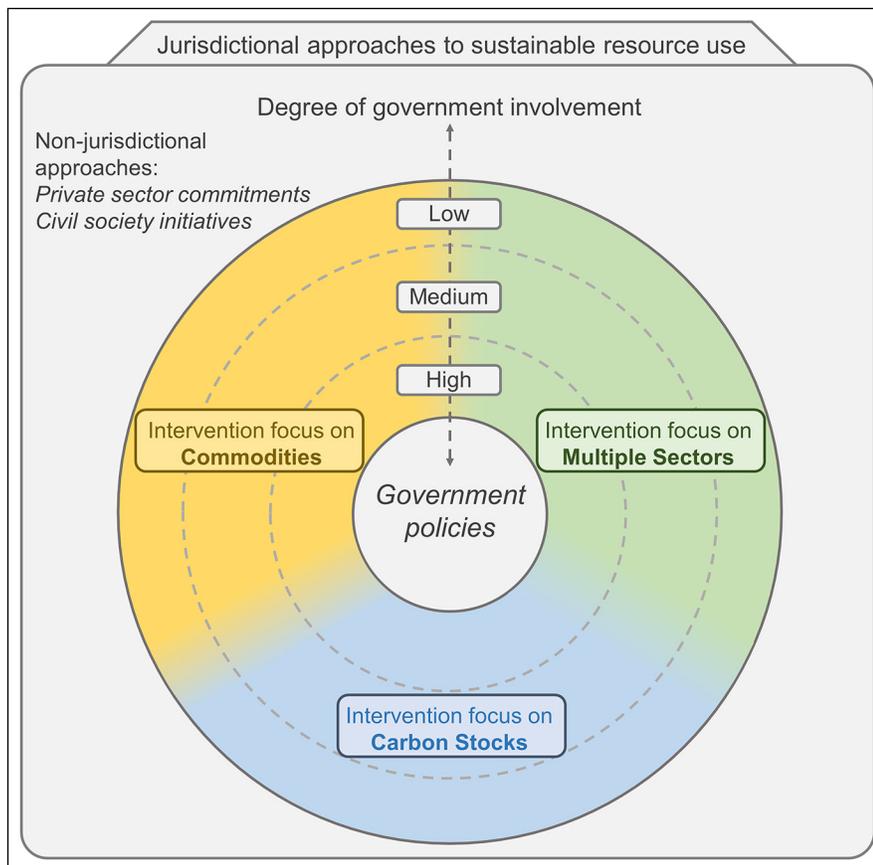
## ■ Results

### Definition

We defined jurisdictional approaches as governance initiatives that promote sustainable resource use at the scale of jurisdictions through a formalized collaboration between government entities and actors from civil society and/or the private sector, based on practices and policies intended to apply to all affected stakeholders within the jurisdiction. A formalized collaboration is one that is consciously designed and clearly specified, and that can be expressed in organizational form (Lownpes 1996). The jurisdictional scale can be national or subnational, depending on the condition that the participating government has considerable authority and autonomy to implement and enforce resource use policies; for example, in many political systems, villages and municipalities lack sufficient autonomy and capacity to design and implement such policies. Our definition is sufficiently broad to capture the diversity of jurisdictional approaches.

Of the 80 initial initiatives, 25 fit our definition. Together, these initiatives covered over 840 million ha in 19 countries across all tropical regions of the planet (Figure 1); of these 25 initiatives, 15 operated at the subnational scale and ten operated at the national scale. One initiative of particular note is the Produce, Conserve, Include (PCI) project in the Brazilian state of Mato Grosso. Established in 2015, the goal of the PCI project is to increase production of key commodities essential to local economies (eg beef, soy, corn, timber) while at the same time preserving existing forests, encouraging reforestation, and including marginalized stakeholders (EDF 2019). The PCI program benefits from a supportive state government, pre-existing national environmental policies and legislation, and robust civil society engagement. Mato Grosso experienced a 19% loss in tree cover over the period 2001–2018, and forest conservation programs tend to be more effective in areas where little natural vegetation remains (Garrett *et al.* 2019; GFW 2019).

The Jurisdictional Emission Reductions Program in East Kalimantan, Indonesia, is another noteworthy example. The primary goals of this project are to reduce GHG emissions generated by forest loss and ecosystem degradation, and to protect habitat of vulnerable and endangered species while enhancing local-community livelihoods. In addition to the East Kalimantan



**Figure 2.** Typology of jurisdictional approaches to sustainable resource use.

government, the program includes stakeholders from civil society (eg The Nature Conservancy, Kawal Borneo Community Foundation), the private sector (Indonesian Palm Oil Association), and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ, a development agency of the German government).

### Typology

The selection of criteria to develop a jurisdictional-approach typology resulted in two variables: (1) the degree of government involvement and (2) the focus of the intervention (Figure 2). The degree of government involvement in a conservation intervention is a key attribute of jurisdictional approaches given the importance of the government's role in achieving sustainable resource use (Gibbs *et al.* 2015; Lambin and Thorlakson 2018; Lambin *et al.* 2018). We ranked government involvement as low, medium, or high for each of the initiatives based on the degree of government participation in agenda setting, policy design, funding, administration of funding, communication, and operation of the initiative. Note that, for any government, the objectives of the various ministries involved in land and resource governance do not always align, as sustainability necessarily requires trade-offs. This variable also defines the boundaries of the typology (Figure 2), in that initiatives in which government involvement is at very low or very high levels

fall beyond jurisdictional-approach parameters. For example, the Indian state of Sikkim launched the Organic Mission program in 2003, with the goal of converting much of Sikkim's agricultural sector to organic farming by 2015 (Government of Sikkim 2010); although this initiative promoted sustainable resource use at a jurisdictional scale by applying a production standard to all stakeholders within the jurisdiction, the lack of a formalized multistakeholder process makes the Organic Mission a government policy. Conversely, many supply chain initiatives led by private companies and/or non-governmental organizations do not include government involvement (Lambin *et al.* 2014, 2018), and as such fail to qualify as jurisdictional approaches.

The second variable – focus of the intervention – captures the origins of jurisdictional approaches (ie REDD+ and sustainable commodity production) and the nature of the interventions. Through our qualitative approach to distinguishing differences and commonalities between intervention strategies, we identified three main intervention focus areas: commodities (nine of 25 cases), multiple sectors (five of 25 cases), and carbon stocks (11 of 25 cases). Initiatives that focus on commodities were designed around interven-

tions promoting environmentally sustainable production of one or several commodities, such as palm oil, cocoa, or coffee. These initiatives were frequently found to have strong private sector involvement, often used ecocertification as a verification tool, and usually evolved from local ecocertification and corporate sustainability projects (eg the Sabah 100% RSPO by 2025 project in Malaysia, the Central Kalimantan Sustainable Sourcing project in Indonesia; Unilever 2017). The targeted commodity typically accounts for a large share of the jurisdiction's overall commodity production and has a substantial impact on land use and livelihoods. Prominent examples include the Cocoa and Forest Initiatives in Ghana and Côte d'Ivoire, which promote sustainable cocoa at the national scale and aim to end cocoa production in protected areas (WCF 2019). Commodity-oriented initiatives are of particular interest to private actors with supply chain sustainability commitments because these approaches can lead to the creation of sustainable sourcing areas (Arts *et al.* 2017; Unilever 2017). In theory, all producers of a targeted commodity in these “sustainability havens” adhere to sustainability standards, thereby ensuring compliance with company commitments and reducing transaction and verification costs while mitigating risks to and volatility of commodity supply (Arts *et al.* 2017; IDH 2018).

Initiatives that focus on multiple sectors are often located in heterogeneous landscapes featuring a diverse use of natural

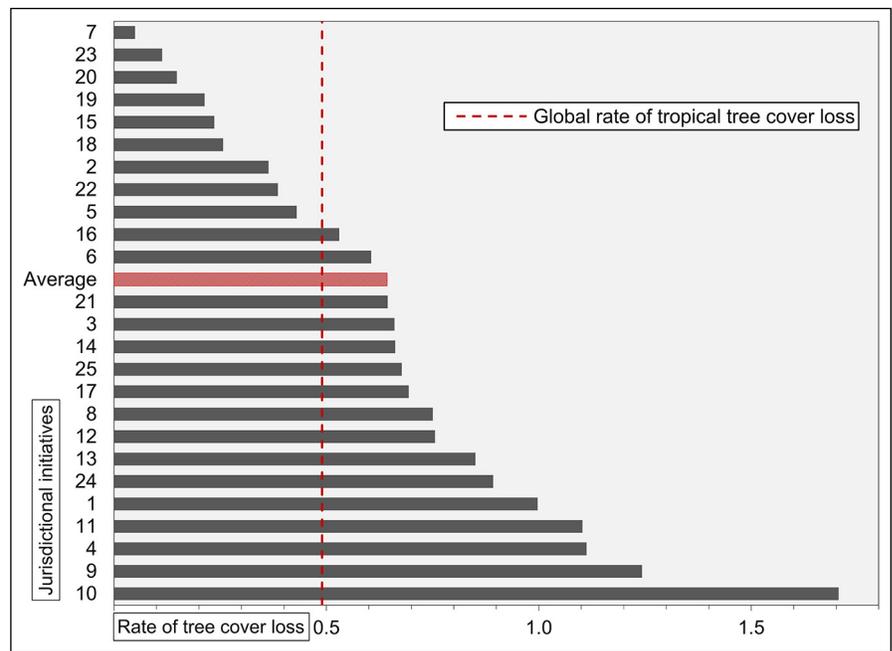
resources and multiple stakeholder groups. Sectors can include commodity production, conservation of standing carbon stocks, livelihood improvement, and/or development of “green” infrastructure. Historically, such initiatives often embraced a socioeconomic development objective, received support from foreign development agencies (eg US Agency for International Development, GIZ) and multilateral organizations (eg The World Bank, various UN agencies and programs), and included low to medium levels of government involvement. For example, South Sumatra’s EcoRegion Alliance was implemented through a multistakeholder process initiated by the Governor of South Sumatra and is predominantly funded by international donors, including Norway’s International Climate and Forest Initiative, the UK Climate Change Unit, and the David and Lucile Packard Foundation. The goals of this program consist of reducing deforestation and peatland degradation, addressing wildfire issues, enhancing local livelihoods, and promoting green growth and development.

Multiple-sector initiatives resemble traditional development projects and share similarities with integrated landscape approaches (Reed *et al.* 2016). Landscape approaches, as “collaboration[s] among multiple stakeholders, with the purpose of achieving sustainable landscapes” (Denier *et al.* 2015), do not necessarily apply to an entire jurisdiction because they are implemented for a specific landscape or ecozone. Their governance structures, stakeholder types, and level of stakeholder cooperation tend to vary more than those of jurisdictional approaches.

The third group of initiatives consists of programs for which objectives and interventions focus on conserving carbon stocks (eg forests), reducing GHG emissions, and slowing deforestation. Many of these initiatives, such as the Yucatán Peninsula Sustainability Agreement (Mexico) and the Mai-Ndombe REDD+ Integrated Project (Democratic Republic of the Congo), either incorporate a REDD+ project or have evolved directly from REDD+ projects. Most carbon stock-focused initiatives exhibit medium to high degrees of government involvement and are often linked to national REDD+ strategies. REDD+ plays an important role in the emergence of jurisdictional approaches, as small-scale projects attempt to increase their impact by scaling up to a jurisdictional level. For example, the State Carbon Incentive Program in the Brazilian state of Acre is among the oldest jurisdictional initiatives and has been scaled up from a grassroots project to a state-level initiative (Nepstad *et al.* 2013b; Fishbein and Lee 2015; Boyd *et al.* 2018).

### Tree cover and tree cover loss per jurisdiction

The 25 jurisdictional initiatives included in our database encompassed nearly 40% of global tropical tree cover in 2010 (Hansen



**Figure 3.** Average annual tree cover loss by tropical jurisdiction for 2000–2010; the 25 initiatives are the same as those listed in Figure 1.

*et al.* 2013; Achard *et al.* 2014), excluding those located outside of the tropics (eg REDD+ Emissions Reductions Program Temperate Forest Jurisdictions, in Chile) and nested jurisdictions (eg Municipal Pact for the End of Illegal Deforestation, São Félix do Xingu, Brazil; Eco-Region Alliance South Sumatra, Indonesia; Emissions Reduction Program in Tai National Park, Côte d’Ivoire; Jurisdictional Emission Reductions Program East Kalimantan, Indonesia). Annual tree cover loss in tropical jurisdictions in our dataset averaged 0.64% over the period 2000–2010, with 16 jurisdictions exceeding the global annual average for the tropics (0.49%) (Figures 3 and 4); for instance, rates of tree cover loss in South Sumatra, Indonesia; Mato Grosso, Brazil; Pará, Brazil; Sabah, Malaysia; and Guatemala were twice the global average (Figure 3). As such, jurisdictional approaches could potentially slow tropical deforestation because additionality – environmentally sustainable outcomes beyond what is expected from current practices and policies – is more easily achieved in areas with high land-use conversion rates (Wunder *et al.* 2008; Garrett *et al.* 2016, 2019).

## Discussion

### Opportunities associated with jurisdictional approaches

The limited success of previous approaches to slowing tropical deforestation and ecosystem degradation prompts the question of whether the differentiating features of jurisdictional approaches enable them to overcome the shortcomings of their precursors. These limitations include marginalization of stakeholder groups such as smallholders, poor enforcement of regulations associated with low levels of compliance, selection bias for voluntary measures (and



**Figure 4.** Land-use dynamics in Nan Province, Thailand; the Nan Sandbox program was one of the jurisdictional initiatives included in our database. (a) Primary and secondary forest; (b) forest clearing using fire; (c) landscape mosaic of forests and fields; (d) tea agroforestry system.

therefore low additionality), inadequate geographical scale leading to undesired leakage of unsustainable practices into other regions, restriction to a specific supply chain (and consequently failure to address issues related to multifunctional landscapes), lack of incentives for producers, mismatches of scale, and inadequate monitoring of outcomes (Meyfroidt and Lambin 2009; Kanowski *et al.* 2011; Lambin *et al.* 2018). Many of the initiatives we identified were in early stages. While assessment of their effectiveness can only be performed several years after implementation and by controlling for confounding changes in policies and macroeconomic conditions, jurisdictional approaches have the potential to surmount several of their precursors' challenges.

First, an inclusive multistakeholder process can prevent marginalization of certain groups and reconcile diverging viewpoints as well as the interests of private, public, and civil society actors (Lambin *et al.* 2014). In theory, all actors could

benefit from engaging in a jurisdictional approach: the private sector through sustainable and secure sourcing opportunities to meet commitments and safeguard corporate reputations; jurisdictional governments by positioning themselves as front-runners in sustainability to attract investments and secure access to European and North American markets; and producers and members of civil society through socioeconomic and environmental policies that apply to all actors, and that are legally supported and enforced by the jurisdictional government. Furthermore, inclusion of government entities in the regulatory process (ie agenda setting, negotiation, implementation, monitoring, and enforcement) can increase the likelihood of policies and regulations being enforced appropriately and can increase the legitimacy of the initiative as a whole (Schouten and Glasbergen 2011).

Second, because jurisdictional approaches operate at policy-relevant boundaries, government has authority over the area covered by the jurisdictional approach, allowing for

better monitoring and enforcement as well as addressing the problem of institutional mismatch (Cumming *et al.* 2006). This helps to address issues of additionality and leakage, as practices and policies are not restricted to a select few high-potential areas but are applied to the jurisdiction in its entirety. Leakage, however, might still occur to neighboring jurisdictions with lower levels of protection when underlying drivers of illicit activity and environmental degradation are ignored (Meyfroidt and Lambin 2009). Another challenge for environmental governance is to identify the appropriate scale of policy implementation (Cash *et al.* 2006); whereas the national scale is often deemed too large given the heterogeneity of contexts and divergence between stakeholders and loose social networks, local initiatives are often perceived to be ineffective and difficult to scale up (Young 2002; Lambin and Thorlakson 2018). Midsize scales, such as at the state or provincial level, might therefore represent a “sweet spot” wherein solutions can be adapted to the local context and local actors can be included while achieving outcomes at a large scale to contribute to a system-wide transformation.

Third, the policies and practices associated with jurisdictional approaches are applicable to all concerned actors within the jurisdiction. This minimizes selection biases in which only actors that can easily comply with regulations due to their favorable location or pre-existing sustainable practices engage in sustainable resource use (Lambin *et al.* 2014, 2018). Moreover, all resources relevant to a jurisdiction can be incorporated into the policies and practices of jurisdictional-approach interventions focusing on multiple sectors and/or C stocks, thereby enabling the inclusion of multiple supply chains and resources.

Finally, incentives for producers are more likely to be generated in jurisdictional approaches as, in relatively homogenous jurisdictions, agglomeration economies reduce input prices due to shared suppliers, investments are made in supply chain infrastructure, knowledge and labor are shared through local social networks, and producers gain access to new markets thanks to the reputation of the jurisdiction as a sustainability haven (Garrett *et al.* 2013).

### Challenges to jurisdictional approaches

The success of jurisdictional approaches will depend on how decision makers and stakeholders navigate several governance challenges. The governance landscape in the post-UN Framework Convention on Climate Change Paris Agreement era has become more polycentric, with non-state actors now playing important roles in achieving sustainability targets (van Asselt 2016). As a result, vertically aligning jurisdictional approaches with local and national initiatives is problematic (Hsu *et al.* 2017), particularly when national and jurisdictional governments have differing visions for resource use (van Asselt and Zelli 2014). In addition, jurisdictional approaches are

typically inserted within a network of initiatives and policies, requiring horizontal alignment between initiatives (Hsu *et al.* 2017). Political turnover is another challenge, as jurisdictional approaches depend on political willingness and support of local governments, which may change with elections or shifts in political strategy, as occurred following the election of Brazilian President Jair Bolsonaro (Fishbein and Lee 2015; Barlow *et al.* 2019; Escobar 2019). Furthermore, bureaucratic turnover and the associated loss of institutional knowledge and capacity are particularly troublesome for small administrations with few skilled individuals (Fishbein and Lee 2015).

Ensuring equity, inclusiveness, participation, and fair representation of small producers poses major challenges for most environmental sustainability programs (González and Nigh 2005; Chemnitz *et al.* 2007; Glasbergen 2018). Often, insufficient attention is paid to the social dimensions of these interventions, including how to ensure social justice, and how to avoid further power accumulation and marginalization of poor or small-scale farmers. Jurisdictional initiatives carry the risk of imposing external or local-elite values and management systems on local stakeholders in a top-down manner, but these initiatives will only succeed if the vulnerability of marginal local stakeholders and their importance for sustainable commodity production and biodiversity conservation are recognized (Lambin *et al.* 2018; Zimmerer *et al.* 2018). Mechanisms must be created to ensure that all stakeholders are given the opportunity to provide input into the design, implementation, and evaluation of jurisdictional initiatives. Governments should also undertake legal reforms to improve land tenure and smallholder access to local resources to facilitate social and environmental sustainability (Angelsen 2010; Robinson *et al.* 2014; Putzel *et al.* 2015). Addressing the different priorities of stakeholders (eg private sector, smallholders, government bodies) is particularly challenging for jurisdictional approaches, as they seek to implement integrated policies and practices across an often socially and ecologically diverse jurisdiction (Glasbergen 2018). When contributing to jurisdictional initiatives, external stakeholders must be willing to adapt to local socioeconomic, cultural, and ecological realities, and refrain from imposing idealized, often Western structures on local policies and practices (Evans 2004; Putzel *et al.* 2015; Glasbergen 2018).

Jurisdictional initiatives also require substantial financial resources, and attracting and sustaining sufficient funding can be a major challenge (Fishman *et al.* 2017; Hovani *et al.* 2018). Depending on the location and political system, levels of financial support from government versus reliance on external sources can vary considerably. Public agencies are often perceived to be bureaucratic and slow, whereas private funding is typically more short-term and dependent on competitive return rates and therefore conditional on performance (Fishman *et al.* 2017).

## Conclusions

An array of private sustainability commitments, public pledges, and multilateral declarations has come into effect over the past decade, and jurisdictional approaches can play important roles in delivering on their ambitious objectives. Conceptually, jurisdictional approaches have the potential to overcome the deficiencies of previous policy approaches to reducing deforestation, including such limitations as selection bias, leakage, and poor enforcement of policies and regulations. The growing role of non-state actors in climate-change mitigation and biodiversity conservation, as well as the momentum surrounding implementation and funding, can help to realize this potential. However, challenges to successful implementation are substantial as well, particularly the inclusion of smallholders and acquisition of sustained financial support. Given the central role of governments in jurisdictional approaches, local, national, and international political support is crucial. Whether jurisdictional approaches can be the missing piece in the sustainable resource use puzzle will depend to a large extent on the ability and willingness of decision makers to acknowledge and address the inadequacies of previous interventions.

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