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Jurisdictional approaches to sustainable agro-commodity governance: The state of knowledge and future research directions

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1. Introduction

The production and trade of primary agro-commodities drive significant land use change, with profound consequences for the planet and people. In a special report on climate change and land, the International Panel on Climate Change (2019) warned that any pathway aimed at limiting global warming to within 2 °C requires reduced carbon emissions and land use change. The destruction of natural ecosystems also carries significant implications for the economic livelihoods and traditional ways of life of the approximately 1.6 billion rural people, including many indigenous communities, who reside in and around forests (Newton et al., 2020).

To address such urgent challenges linked to primary commodity production, 'jurisdictional approaches' (JAs) have emerged over the past decade as a "new" mode of sustainable agro-commodity governance, promising significant potential to promote more sustainable forest and land management in zones of agro-commodity production, particularly in those tropical forest countries in which much global biodiversity is concentrated. One pioneering effort to trial the jurisdictional approach took place in Berau district in Indonesia's East Kalimantan province (Seymour et al., 2020, p. 6). In 2008, the governor of Berau and The Nature Conservancy, a non-governmental organisation (NGO), discussed a low-emissions economic development plan for the entire district. A multistakeholder group was formed to create a framework and action plan to reduce deforestation. The Berau Forest Carbon Program began in 2009, initially focusing on the pulp and paper industry before expanding to palm oil production, the main driver of deforestation in the district. Berau's sustainable palm oil program

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launched in 2015, aiming to increase transparency in licensing, improve social and environmental impact assessments, and enhance smallholder inclusion and productivity. In neighbouring Central Kalimantan province, similar efforts to bring Reducing Emissions from Deforestation and Forest Degradation (REDD+) programs promoting sustainable landscape management together with longstanding agro-commodity supply chain programs were initiated by the Governor of the province, in partnership with the US-based Earth Innovation Institute and their Indonesian partner organisation Yayasan Penelitian Inovasi Bumi (INOBU). Beginning in 2013, the Governor led a multi-stakeholder process to develop a Roadmap to Low-Deforestation Rural Development, while INOBU coordinated district level pilots promoting sustainable palm oil production, including a pilot of the Roundtable on Sustainable Palm Oil's (RSPO) jurisdictional certification initiative in Seruyan district. In 2016, Unilever signed up to a new sourcing agreement grounded in its 2015 commitment to preferentially source palm oil from jurisdictions making progress towards sustainable production (Seymour et al., 2020, p.6). Over the past decade, similar JA programs targeting sustainable agro-commodity governance have been created across the global tropics (von Essen and Lambin, 2021).

JAs of these kinds have been broadly conceptualised as multi-stakeholder initiatives with significant government involvement that integrate environmental, social, and economic policy objectives in land use management in policy-relevant, territorial jurisdictions (Palmer and Paoli, 2017; Boyd et al., 2018; Brandão et al., 2020). Most JAs, although not all, focus on subnational jurisdictions as a strategic level of governance in which policy interventions can be adjusted to local contexts, while simultaneously supporting sustainability transitions at an ecologically significant scale (see Hovani et al., 2018a; Seymour et al., 2020; Von Essen and Lambin, 2021). As the above examples illustrate, such interventions integrate interventions designed to promote sustainable agro-commodity production with broader efforts to promote sustainable landscape management and low emissions rural development, though the relative emphasis placed on agro-commodity production versus other types of interventions varies between initiatives.

In the domain of agro-commodity governance, a strategic focus on the subnational governance scale represents a significant shift from the focus on farm and supply chain interventions that has dominated sustainable agro-commodity governance since the 1990s, most prominently in the form of voluntary sustainability standards (VSS) and supply chain certification programs. JAs have thus sometimes been referred to as "beyond certification" approaches to sustainable commodity governance (New Foresight, 2018). Beginning in the 1990s, transnational NGOs and corporations partnered to develop VSS that define and certify sustainable commodity production at farm and supply chain levels. However, concerns regarding their limited scope and issues such as spillover effects and leakage (Sonderegger et al., 2022), among other constraints, have prompted many organisations within the VSS community to adopt JAs as a complementary strategy to certification-based initiatives (Van Houten and De Koning, 2018).

While a more holistic focus on sustainable landscape management at the scale of jurisdictions (rather than individual farms or supply chains) represents a significant innovation within the global community of practice working on sustainable supply chain governance, such approaches draw very directly on long-standing policy agendas on sustainable land use by national and subnational governments, which VSS have previously been criticised for "bypassing" (Bartley, 2018). These encompass integrated landscape approaches and community-based conservation programs, whose origins date as far back as the 1980s (Reed et al., 2020). Many contemporary JAs also built upon foundations laid by the United Nations (UN) Program on Reducing Emissions from Deforestation and Forest Degradation (UN REDD+) (Seymour et al., 2020, p. 4–5), and these approaches continue to co-exist and co-evolve. Thus, while JAs have often been viewed as offering a novel approach to sustainable agro-commodity governance, they are better understood as reflecting a convergence of different approaches and communities of practice to advance territorial, multi-stakeholder commodity governance.

While REDD + programs or subnational governance initiatives that do *not* make significant investments in promoting sustainable agro-commodity production are sometimes discussed using similar language, such examples lie outside of the scope of our analysis. Jurisdictional REDD + programs have, on the whole, developed from a different starting point, such as forest conservation or rehabilitation (Agrawal et al., 2014). Such programs sometimes evolve to also encompass sustainable agro-commodity interventions in jurisdictions (as a part of efforts, for example, to promote alternative livelihoods that reduce deforestation), thus overlapping in focus with JAs centred on sustainable agro-commodity production. However, many do not, indicating there is a spectrum of REDD + programs that may or may not intersect with or fully accommodate the kinds of JA approaches on which this paper focuses.

The 'coordinated polycentricity' of JAs—in which attempts are made to coordinate otherwise decentred networks of interacting transnational, local, and public and private governance approaches—renders them a significant development in sustainable commodity governance (Furumo and Lambin, 2021). However, among earth system governance scholars, they remain relatively little-known and understudied. While there has been burgeoning literature on JAs since 2015, this has predominantly been descriptive, conceptual or practice-oriented, in part reflecting the extensive involvement of practitioners in authoring existing research outputs. A decade into the making of this governance agenda, our goal in this article is to bridge this knowledge gap by reviewing the current state of the art on JAs and identifying future research directions capable of encompassing both critical and practically-oriented questions.

Our review aims to identify which questions have attracted most attention within existing analyses of JAs, to critically evaluate how existing scholarship addresses these questions, and to suggest directions for future research. Accordingly, our analysis has entailed a global, cross-commodity review of the extant (mostly specialised) academic literature and select policy publications on these jurisdictional programs, beginning with an inductive analysis of existing scholarship in order to identify emerging questions, and then presenting a critical evaluation of existing research connected to each of these overarching questions.

Reflecting the multifaceted nature of JAs, the review has been conducted by a group of scholars with diverse areas of regional expertise, and diverse research backgrounds in transnational private governance, comparative natural resource governance, sustainable development, and international and national forest policy. We focus our review on five key emerging questions, which we believe are of interest to the wider earth system governance community of scholars, namely: (1) how should JAs be conceptualised; (2) how are JAs addressing social inclusion and participation; (3) how do varied social and political contexts shape the development and performance of JAs; (4) how are JAs interacting with external governing institutions; and finally, (5) what do we know about the impact and effectiveness of JAs in achieving sustainability objectives?

The article begins by describing our methodology for this literature review, along with providing a broad overview of the literature landscape. Subsequently, it delves into a more detailed synthesis of the JA literature, focusing on these five thematic questions. Finally, a concluding discussion reflects on collective insights and research gaps, and examines potential avenues for future research.

2. Methods

Our methodological approach to the literature review involved mapping and synthesising both the academic and grey literature on JAs. The mapping exercise organised the literature by category and sought to identify notable gaps (Grant and Booth, 2009). We proceeded in four

steps to generate a comprehensive list of articles.

First, we conducted a broad keyword-based literature search on scaled-up, beyond certification approaches to sustainable commodity governance in Web of Science, Scopus, EBSCO Academic Complete, and Google Scholar. Details of this keyword search are described in the Appendix. Articles that appeared via the keyword search were manually filtered for their relevance to the topic of scaled-up, beyond certification approaches to sustainable commodity governance. To this first list of articles, we added grey literature as identified through websites and publication repositories from specialist organisations working on related themes such as Evidensia, the Jurisdictional Approach Resource Hub (jaresourcehub.org), greenjurisdictions.org, ISEAL, Earth Innovation Institute/INOBU, IDH, and Solidaridad. All authors also added grey and academic literature already known to them, from across their diverse disciplinary fields and country expertise.

Second, we filtered this preliminary literature list by focusing on articles that either explicitly invoked the JA concept, offered at least some minor contribution to understanding JAs, or included a case study that could be considered a JA, even if authors used a different name for it.

Third, we mapped the articles by summarising, *inter alia*, their type (academic or practitioner), key research questions, commodity type, region, year of publication, academic field, the main methodological and empirical approach used in each article, and data sources.

Fourth, we used this literature map to identify emerging themes around which the rest of this paper is organised. We also prepared an annotated literature review that drew together insights from each piece on these themes. Finally, we summarised our findings in the narratives presented in the next section.

3. Overview of the literature on jurisdictional approaches

We evaluated 67 publications in total—key aspects of which are summarised in Figs. 1–3 below. These were almost evenly split between academic and grey literature (37 academic, 30 grey). This divide, however, proved to be somewhat artificial. Much of the emergent academic work on JAs cited practice-oriented publications. Practitioners also appear frequently as co-authors on peer-reviewed academic papers. Further, as practitioners are participating in implementing JAs while also doing research on them, we note that this authorship structure influences the tone and focus of the current academic literature. Existing work tends to ask practice-oriented rather than critical questions about JAs, often providing a rather optimistic outlook on the potential of JAs. Such tendencies also highlight that the project of JAs itself is not value neutral.

Literature to date tends to comprise heavily descriptive and analytical/conceptual work, including JAs' conceptualisation and functions, with less focus on evaluation. It also features many qualitative analyses of cases of JAs in practice, although such casework often lacks a detailed analysis of how JAs are working on the ground, and incorporates little comparative analysis of performance. Fewer than half of the pieces in our assessment draw on concrete implementation cases as examples, and only slightly over half explicitly explore focal countries or jurisdictions. These descriptive overviews therefore only represent roughly half of the examined literature since the rest did not use specific cases.

As Fig. 1 indicates, the JA literature is also relatively new, with most pieces explicitly mentioning JAs as a concept emerging after 2015. Older literature seems to be mainly concerned with jurisdictional REDD + or other kinds of landscape-based agricultural approaches that do not incorporate an explicit focus on sustainable agro-commodity production. This previous literature draws on related yet distinct concepts (e.g. integrated landscape approaches, climate-smart/multifunctional landscapes) without placing private sector actors and supply chain initiatives at the centre of analysis. This is consistent with our above interpretation of JAs as having emerged out of an intersection between established yet previously disconnected practices of sustainability governance within global commodity supply chains on the one hand, and both ecological landscapes and administrative jurisdictions on the other.

The disciplinary focus of existing work is unsurprisingly dominated by a focus on governance/policy studies, sustainability, forestry, and environmental fields, though JAs are also of growing interest in the fields of conservation and development studies (see Fig. 2). The relative interdisciplinarity of the research reflects the multiple environmental and development goals (e.g. social inclusion) of JAs and their complex governance structures, which may bode well for assessing JAs from multiple perspectives. Notably, however, business and political economy research is almost absent, despite the strong emphasis within JAs on public collaboration with private entities and the importance of distributional questions arising from JAs.

The JA literature so far is also dominated by emphasis on specific countries and commodities (see Fig. 3A and B). The figures double-count articles if they are specific to more than one commodity and region. Brazil (20%) and Indonesia (32%) feature prominently in the literature because of their high forest cover, agro-commodity production in forest areas, and relative empowerment of subnational levels of government. However, we also see analyses focusing on Malaysia, other countries in Latin America (i.e., Colombia, Ecuador, Peru, and Mexico), and Sub-Saharan Africa (i.e., Ghana, Liberia, and Mozambique). As the focus of early pioneering JA work, palm oil so far dominates sectoral case studies of JAs, but with cocoa, beef, soy, and coffee also seeing increasing scholarly attention. While most existing JA initiatives focus on terrestrial commodities, there is also nascent interest in translating the concept to fisheries and other seafood products (Obregon, 2023). Given the breadth of countries and sectors in which JAs are being studied, it is surprising how little explicitly comparative work exists to date. In addition, while a number of authors highlight the need for multi-commodity JAs that engage more than one commodity sector (Palmer et al., 2023), the vast majority of JAs in practice are organised with focus on one commodity.

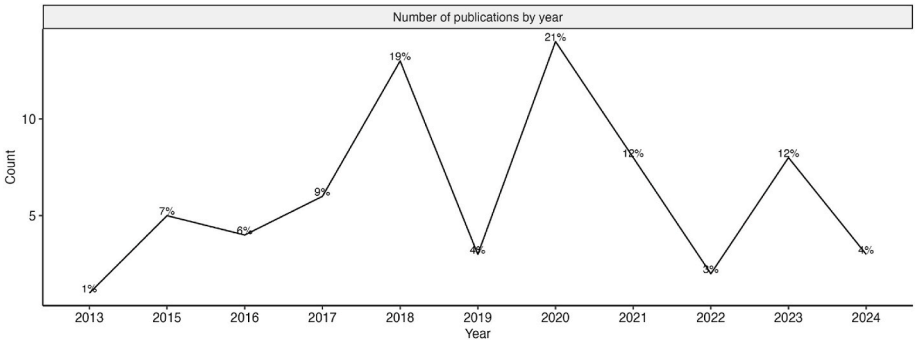

Fig. 1. Number of assessed publications on commodity-focused jurisdictional approaches by year (n = 67).

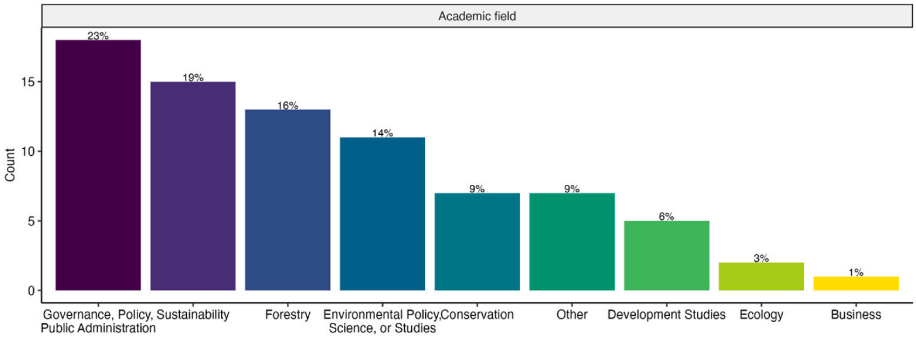

Fig. 2. Commodity-Focused Jurisdictional Approach Literature by Academic Field (n = 36; fields can be double-counted).

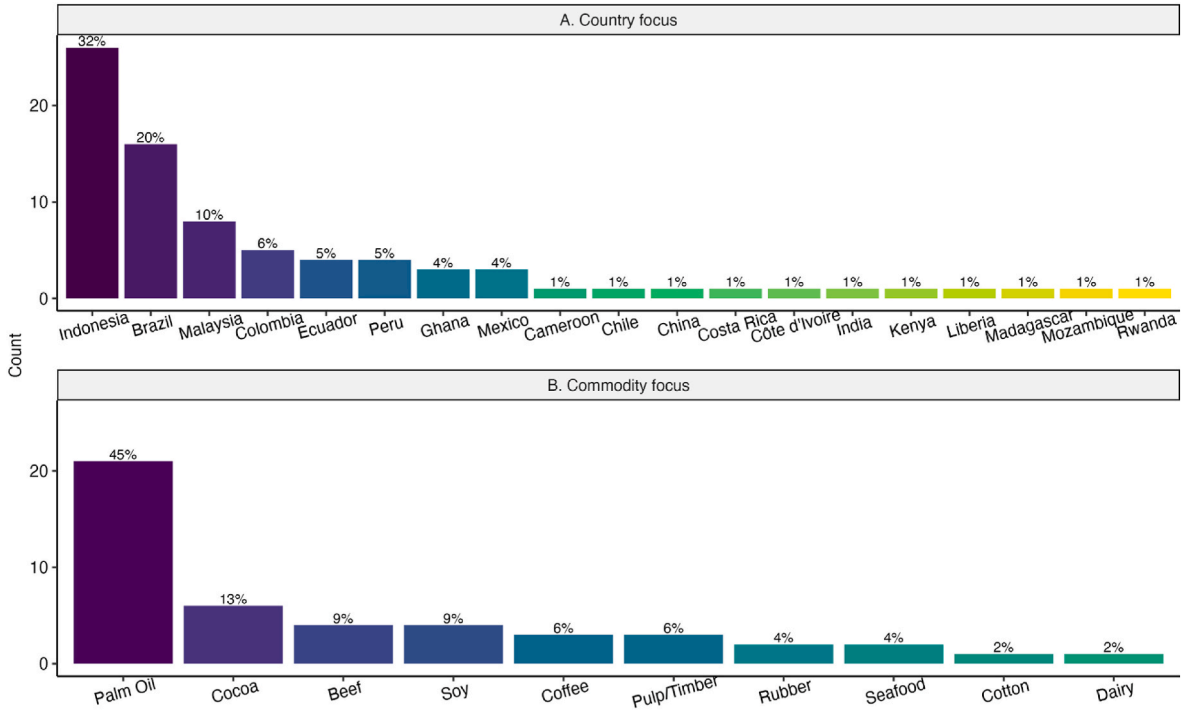

Fig. 3. (A)Commodity-Focused Jurisdictional Approach Literature by Country (n = 43, countries can be double-counted); (B) Commodity-Focused Jurisdictional Approach Literature by Type of Commodity, if specified (n = 26; commodities can be double-counted).

4. Emerging themes and findings

4.1. Conceptualising jurisdictional approaches

As noted above, one challenging aspect of analysing JAs is the conceptual fuzziness that persists regarding what these approaches consist of and how they differ from other sustainability initiatives, such as supply chain-centred initiatives (e.g., Bartley, 2018; Sonderegger et al., 2022) and forest and landscape conservation or rehabilitation programs (Afiff, 2016; Angelsen et al., 2009, 2012). Amidst widely varied and rapidly evolving practice and persistent ambiguity, the JA concept often serves as an umbrella term that references territorial approaches of different kinds. Such conceptual elasticity can be useful for opening dialogue around a broadly shared vocabulary. Yet, some precision in shared conceptualisation of the term is also important for the evolution of collective communication and thinking (Palmer and Paoli, 2017) and to assess the broader impact of JAs. As Palmer and Paoli (2017, p. 3) observe, the term JA "is often used loosely to refer to any program oriented towards sustainable land use in a particular jurisdiction." The concept is thus inclusive of a broad range of programs aiming to advance goals of sustainable land and resource use at the territorial scale, which often build on long traditions of landscape approaches to sustainability (Hovani et al., 2018b; Reed et al., 2020; Schleifer, 2023, p.137-165). While Palmer's and Paoli's conceptualisation is very broad, other authors offer more clarity in their definitions regarding what does and does not constitute a JA, as illustrated by the following:

· "[J]urisdictional approaches [are] governance initiatives that promote sustainable resource use at the scale of jurisdictions through a formalised 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" (von Essen and Lambin, 2021, p. 161).

· Jurisdictional approaches "attempt to align government-led, multistakeholder processes within provinces and districts with prospective external financial and market incentives for jurisdictional-scale performance on indicators such as reducing deforestation while also meeting social and economic objectives" (Seymour et al., 2020, p. 1–2).

· Jurisdictional approaches are "a type of integrated landscape management, with an important distinguishing feature: the

landscape is defined by policy-relevant boundaries and the underlying strategy is designed to achieve a high level of governmental involvement" (Stickler et al., 2018a, p. 1).

These definitions show that JAs are differentiated from other overlapping approaches based on a range of characteristics. In this section, we place particular emphasis on three key distinguishing characteristics: their operational scope, actor involvement and issue focus. As shown in Table 1, further differences exist also with regard to the use of policy instruments and incentives (Seymour et al., 2020, Macdonald et al., 2024). A useful point of comparison that brings these characteristics into focus is to contrast the distinguishing characteristics of JAs with those of the two broad models of sustainability governance from whose intersection they have emerged.

On the one hand, JAs can be contrasted with supply chain-centred initiatives such as private certification programs (e.g., Forest Stewardship Council, Roundtable on Sustainable Palm Oil), which have played an important role in the sustainability governance agenda on primary agro-commodities since the early 1990s. As mentioned in the introduction, the current push to develop JAs was in part motivated by the perceived scope limitations of supply chain-centred initiatives. On the other hand, JAs can be contrasted with forest and landscape conservation and rehabilitation programs, such as REDD + or subnational government land management programs. The weaknesses of such programs were often attributed to their failures to address tropical deforestation and its drivers, for example by failing to make adequate early provisions for alternative livelihoods, tenure security and rural development needs of local communities, alongside failures in multi-level policy coordination and monitoring processes which were necessary for, but beyond the boundaries of designated REDD + sites (Stickler et al., 2018b). To illustrate the JA as an emerging mode of sustainable commodity governance that attempts to straddle and in some respects improve on these established approaches, Table 1 contrasts JAs with these two previously dominant modes of governance. The table describes ideal types, though as noted above, the JA continues to be highly malleable and remains characterised by a significant degree of conceptual fuzziness.

4.1.1. Operational scope

One distinctive feature of JAs is their spatial boundaries, which map onto the policy-relevant boundaries of a particular administrative, political, or legal jurisdiction (Stickler et al. 2018; Brandão et al., 2020; Schleifer, 2023, p. 137–165), as opposed to the boundaries of either ecologically defined landscapes or specific production locations or land concessions (Van Houten and De Koning, 2018; Von Essen and Lambin, 2021). This shift in scale to jurisdictionally-defined territories, such as local districts or provinces, is at the heart of the jurisdictional concept.

Advocates of JAs have argued that emphasising policy-making jurisdictions offers several potential benefits for the effectiveness of sustainability interventions. First, it aligns better with the nature of environmental challenges and ecosystem service provision. Issues like water security and local climate adaptation can not be addressed through individual plot behaviours alone (Sayer et al., 2015; Stickler et al., 2018a). Second, it aligns with existing monitoring capacities in many areas, which are insufficient for reaching property or plot level granularity (Seymour et al., 2020). By promoting sustainable land use and tackling deforestation at jurisdictional scales, it has been argued that this can lift some burden from companies or private land concession holders, increase the credibility of commitments by involving local governments, and improve effectiveness by going beyond limited and somewhat arbitrary boundaries of company concessions (Pirard et al., 2015, p. 13). The case for such territorial approaches has also frequently been linked to a broader desire to improve the effectiveness of a range of sustainable development interventions by localising sustainable development, empowering governments and communities at subnational as well as national scales, and thus recognizing and responding to the

Table 1
Comparing the jurisdictional approach to forest conservation and supply chain initiatives.

	Forest and landscape conservation or rehabilitation programs	Jurisdictional approach	Supply chain initiatives (e.g., certification programs)
Operational scope	Focus on landscapes of high conservation value	Focus on entire territorial jurisdictions, defined by administrative-political boundaries; mainly subnational jurisdictions (state or district) in commodity producing regions	Focus on supply chains; certification of farms or plantations linked to global supply chains
Actor involvement	State led, sometimes with multistakeholder involvement	Multistakeholder, with significant involvement of local government actors	Firm led, civil society led, or multistakeholder; transnational actors dominate; no local government involvement
Issue focus	Issue focus usually on forest and landscape conservation with little emphasis on commodity production and trade	Holistic, board issue focus; often cross-commodity; integrating a focus on social protection, environmental conservation and economic development	Issue focus varied, but typically focused on social and environmental problems within specific supply chains; often single-commodity focus
Policy instruments	Central reliance on financial incentives (typically payment for ecosystem services), institutional capacity building and policy change	Limited use of actor-specific rules; central reliance on: jurisdiction-level sustainability indicators; farmer training; institutional capacity building and policy change; aligning public policy and private sustainability programs	Central reliance on actor-specific rules and monitoring and associated enforcement mechanisms (typically via audits)
Incentives	Results based payments	Preferential sourcing and non-monetary incentives	Price premiums and supply chain access

complexities of local economic, ecological, and social transformation processes to promote more sustainable and equitable development (Forster et al., 2021).

4.1.2. Actor involvement

Closely linked to the territorial focus of JAs is their emphasis on harnessing the involvement and often leadership of governments (Stickler et al., 2018b). For many observers, linking external sustainability interventions to policy commitments from local governments is a core rationale for pursuing JAs. This is a lesson learned from problematic experiences with private supply chain initiatives, which, led by Global North firms and/or civil society actors, have attempted to bypass domestic government actors in the producer countries (Bartley, 2018). Stickler et al. (2018, p. 148) highlight the importance of facilitating "strategic alignment with public policies and programmes" and enabling governments to be "leaders or active participants in strategy development and implementation." Active government engagement can support a range of measures including "policies, regulations, fiscal incentives, land use and action planning, enforcement and/or monitoring" (GIZ, 2018, p. 2). Strong government involvement can also enable efforts to develop rigorous performance monitoring and reporting frameworks that blend international sustainability standards with local performance evaluation frameworks (Nepstad et al., 2013; Palmer and Paoli, 2017; Milhorance and Bursztyn, 2018). Many have emphasised the value of engaging *subnational* governments, particularly in highly decentralised contexts, where "little may be accomplished unless the individual provinces and regencies, who hold authorities in land use planning and permitting, are involved" (Larsen et al. 2018, p. 552). Indeed, some have viewed subnational government leadership as an essential defining feature of the JA (e.g. Bishai et al., 2022, p. 9; GIZ, 2018). Others acknowledge that JAs can span multiple jurisdictional scales (Forster et al., 2021), and that these scales vary according to the political and administrative contexts of particular jurisdictions, potentially encompassing "nation-states, states, provinces, districts, counties, and other political administrative units" (Stickler et al. 2018, p. 147; LTKL, 2019; Ingram et al., 2020).

4.1.3. Issue focus

Also widely viewed as a distinctive defining feature of JAs is their embrace of an integrated approach to sustainability interventions that has variously been described as 'holistic' (Bastos Lima and Persson, 2020, p. 2) or 'comprehensive' (Umunay et al., 2018, p. 5) in scope. The overarching goal is to "reconcile competing social, economic and environmental objectives" (Buchanan et al., 2019, p. 7), while also coordinating interventions in a specified territory. As Hovani et al. (2018b, p. 5) describe, JA programs thus function as "a network of inter-related initiatives working together to achieve wall-to-wall sustainability goals" (see also Garrett et al., 2021; Von Essen and Lambin, 2021). In comparison, the issue focus of supply chain initiatives has been narrower in scope. For example, certification organisations like the RSPO are more focused on key impacts, often in a single sector, such as oil palm. However, as described in section 4.4, there are also efforts under way to integrate existing supply chain initiatives with emerging jurisdictional programs.

Despite broad agreement that JAs seek holistically to connect otherwise fragmented and piecemeal interventions in a geographical space, there is variation in which elements of integration are emphasised in both the conceptualisation and design of JAs. Jurisdictional initiatives can involve integration across sectors, sustainability aims, governance actors, scale, and types of policy interventions. Integration is also promoted between government agencies (horizontal integration) and between levels of government (vertical integration) (Hovani et al., 2018b; Padnamaba et al. 2023; Martin et al., 2024). Vertical integration is particularly important in decentralised systems of governance where different levels of governance may have authority over different domains that need to be considered together. For instance, in both Brazil and Indonesia the national government holds authority over the forest estate, while subnational entities such as municipalities or districts hold authority over land use decisions in areas outside of the forest estate (Sampaio, 2023, Padnamaba et al. 2023). Holistic design is also frequently understood to encompass promotion of mutually reinforcing "alignment" between interventions targeting different commodity sectors (Nepstad et al., 2013), stakeholders (Paoli et al., 2016, p. 6; Buchanan et al., 2019), policy instruments (LTKL, 2019) or territorial and supply chain initiatives (Pacheco et al., 2018; Seymour et al., 2020; Boshoven et al., 2021).

4.2. Inclusion and participation

A commitment to stakeholder inclusion and participation lies at the heart of many arguments for embracing JAs—the stated aims of JAs are often explicit in their ambition to include marginalised groups in sustainable commodity governance processes. Indeed, in response to prior criticisms of severe barriers to including smallholder farmers in supply chain sustainability programs, providing such an enabling framework has been a core rationale for shifting towards jurisdictional sourcing of sustainable commodities (Boyd et al., 2018; Hovani et al., 2018b; Brandão et al., 2020; Schleifer, 2023, p. 137–165). Yet in practice, translating such aspirations into practice continues to face significant obstacles.

For many JA advocates, a commitment to inclusive and participatory approaches is expressed primarily via multi-stakeholder governance designs that support the representation and participation of a range of government, business, and civil society stakeholders. Local leadership and ownership in such processes has received particular emphasis given longstanding criticisms of externally imposed initiatives, in which producers have been perceived to be "at the receiving end of mandates" dictated by "demand-side consumer companies and traders," thus undermining "the willingness of both producers and their local governments to engage" (Wolosin, 2016, p. 4).[1] Inclusive approaches to multi-stakeholder governance can play a particularly important role in the initial establishment and promotion of JAs, helping to build trust, manage conflict, foster wider coalitions of supporters amongst influential local actors, and pool diverse sources of knowledge, resources, and legitimacy possessed by actors of different kinds (Chervier et al., 2020; Forster et al., 2021; Von Essen and Lambin, 2021). While multi-stakeholder approaches do not necessarily enable grassroots participation, such designs can at least promote co-ownership of JAs and enable more robust, legitimate, and durable institutionalisation of sustainability programs.

4.2.1. Forms of multi-stakeholder participation

Multi-stakeholder participation in JA governance arrangements can take various concrete forms. These encompass: (1) the establishment of formalised institutional structures or processes to facilitate regular multi-stakeholder consultation and dialogue (Bahruddin et al., 2024); (2) co-development of 'roadmaps' to coordinate interventions in support of sustainable production and to incorporate sustainability principles into local development plans (Seymour et al., 2020); (3) development of collaborative approaches to collecting and reporting data on sustainability performance (Peteru et al., 2021); and (4) facilitating resourcing, network building, capacity building, and incentives for regions committed to promoting sustainable production (LTKL, 2019). These approaches often build on pre-existing multi-stakeholder processes used in participatory natural resource governance arrangements such as jurisdictional REDD + projects (Hovani et al., 2018b).

Those empirical case studies of JAs that have so far been developed in the literature demonstrate a variety of distinct multi-stakeholder

[1] In some cases, local governments have viewed such externally imposed commitments "as a form of neo-colonialism" (Wolosin, 2016, p.4).

processes. In Sabah (Malaysia) and Seruyan (Indonesia), multi-stakeholder steering committees were established by sub-national governments to manage the implementation of the RSPO's jurisdictional certification pilot. The pilot included equal representation of government agencies, companies, and NGOs (Colchester et al., 2020a, 2020b, 2020c; Ng et al., 2023). In Mato Grosso, Brazil, the sub national government established the Produce, Conserve, Include (PCI) strategy that serves as a broad public planning instrument, incorporating the participation of government, private sector, and civil society organisations (CSOs) alongside farmer associations (Boyd et al., 2018; Milhorance and Bursztyn, 2018). National and local stakeholders, including public and private agents, comprise the majority of the PCI governance, but international NGOs also participate (Schleifer, 2023, p. 137–165). In Merangin District in Jambi Province, Indonesia, multi-stakeholder negotiations have been used to raise awareness and build knowledge, foster stronger relationships among local participants and external actors, and facilitate dialogue in policy planning processes (Minang et al., 2015). In Ecuador, somewhat unusually, a pilot of RSPO's jurisdictional certification program is being established at the national (rather than subnational) level, led by the national government and organised through an Inter-Institutional Steering Committee for Sustainable Palm Oil (CISPS), which encompasses equal formal representation from the broad categories of government, palm oil supply chain actors and CSOs (Alvarado, 2021).[2]

4.2.2. Inclusion of marginalised groups

While efforts to facilitate participation through formal mechanisms of multi-stakeholder governance lie at the heart of JAs, there has been little documentation of significant shifts toward strengthened inclusion of marginalised groups (Nepstad, 2017; Pacheco et al., 2017; Stickler et al., 2018b; Bastos Lima and Persson, 2020; Seymour et al., 2020; Von Essen and Lambin, 2021). In many JAs, the independent smallholder sector has been cited as a priority for interventions in the form of a variety of training, capacity building, or preferential sourcing programs (Schleifer, 2023, p. 137–165). Yet this focus has rarely translated into strong smallholder and other grassroots group representation in decision making forums.

Alvarado (2021), for example, observes that the RSPO's jurisdictional pilot in Ecuador has so far lacked systematic inclusion of several key stakeholder groups, including small-scale producers, social NGOs, Indigenous and Afro-Ecuadorian peoples' organisations, and government representatives focused on social issues. In other cases, while efforts have been made to include marginalised groups in multi-stakeholder governance arrangements, inclusiveness has remained constrained in significant ways. In Mato Grosso, the government established a formal dialogue with Indigenous communities (Boyd et al., 2018), but studies suggest Indigenous groups have had little direct participation in the elaboration of PCI or associated planning process (Milhorance and Bursztyn, 2018). This is despite some international PCI participants promoting an agenda of rights and livelihoods protection for traditional communities. In Central Kalimantan, Indonesia, the multi-stakeholder working group established to support an RSPO jurisdictional certification pilot included Indigenous peoples' organisations alongside a broad range of other stakeholders, though observers argued the forum remained dominated by government officials (Van Houten and De Koning, 2018; Schleifer, 2023, p. 137–165). Similarly, analysts of a jurisdictional initiative in Kapuas Hulu, Indonesia have reported a lack of free, prior, and informed consent (FPIC) procedures for Indigenous peoples, their inclusion in decision-making, or adequate mechanisms of information-sharing with affected communities (Colchester et al., 2020a). There is also little discussion in the current studies on the extent to which Indigenous peoples are recognised as knowledge holders.

Significant contestation continues to surround decisions about when, how, and in what forms to include smallholder farmers or other marginalised groups in decision-making processes. This is perhaps a natural reflection of the deeply contested aims of JAs, with some viewing them primarily as means of building powerful coalitions in support of preventing deforestation and safeguarding forest areas, while others stress the need to prioritise inclusion, Indigenous rights recognition, and related process for managing contested resource access and land use (Colchester et al., 2020a; Seymour et al., 2020).

4.3. Contexts: socio-economic and political factors in JAs

An expansive literature on environmental sustainability initiatives emphasises how varied social, environmental, economic, and political contexts enable or constrain intervention pathways and outcomes under different conditions, especially at subnational levels in sites of conservation and production. This includes scholarship examining how global governance interventions and transnational initiatives targeting sustainable commodity extraction, land use, and environmental management influence–and in turn are shaped and constrained by–domestic arenas (e.g. McCarthy, 2004; Bebbington, 2012, 2017; Bernstein and Cashore, 2012; Molenaar et al., 2015; Arts et al., 2017; Nolte et al., 2017; Diprose et al., 2019, 2022; Barletti et al., 2020; Brandão et al., 2020). It also includes scholarship on antecedent or related initiatives such as landscape approaches to ecosystem management and REDD+, which explores how these initiatives interact with and are operationalised within multi-level social and political contexts (e.g., Duffy, 2006; Angelsen et al., 2009; Angelsen et al., 2012; Redosudarmo et al., 2013; Sills et al., 2014; Afiff, 2016). Such scholarship often emphasises the importance of political economy, or power relations, that underpin governance processes.

Indeed, in their critical review of international forest governance, Kleinschmit et al. (2024, p150) emphasise that over the past decade understanding power asymmetries and social relations has gained prominence in scholarship among scientists and practitioners alike in ascertaining why efforts to tackle climate change have been slow to produce outcomes. They, and others (e.g. UNDP n.d.; Stickler et al., 2020) also relatedly find that while supportive governance structures and institutional strengthening have positive knock-on effects for ensuring sustainability governance initiatives are sufficiently well-resourced to have longer-term viability, resource allocation decisions frequently become politicised, as a variety of actors concerned more with short-term economic gain and growth compete for resources. Promoting effective governance initiatives therefore requires navigating a complex policy environment in which sufficient finance for long-term sustainability initiatives and supportive governance structures is rare (Kleinschmit et al., 2024, p.149).

Despite important lessons from these adjacent literatures, the existing scholarship on JAs insufficiently explores how context interacts with emergent initiatives to constrain or enable JAs. There is a noticeable absence of the distinctively political questions explored in other literatures, including (1) how different interest groups contest or capture design and implementation, (2) how elites might resist, enable, or limit JAs (including through diverting funding away from JAs), and (3) the potential risks of 'bringing the state back in' to guide the sustainability agenda (e.g., Seymour et al., 2020). While some analyses of JAs include implicit contextual socio-economic or political analysis, such analysis is rarely elaborated systematically. This may be understandable given the early stage of development of most JAs, but understanding power dynamics has been shown to be important in explaining outcomes even (perhaps especially) at the stage of policy and program design (e.g. see Bahruddin et al., 2024; Hovani et al., 2018b).

[2] Participation and inclusion is also promoted through application of a National Consultation Guide for the Implementation of REDD + Actions on Collective Lands or Territories, with regard to obtaining consent of traditional landowners based on rights established under the national constitution (Alvarado, 2021, p. 21).

Those studies that do explicitly analyse socio-economic and political contexts often focus on enabling conditions for establishing new initiatives. A number of enabling factors have been identified, including strong support and leadership from local policymakers with significant political skills and legitimacy to perform a convening role, supportive governance arrangements (for example via strengthened policies relating to spatial planning and tenure security) and deep private sector engagement with sustainability initiatives in targeted landscapes (Ng et al., 2022; Palmer et al., 2023; Bahruddin et al., 2024). Other relevant features of regulatory and institutional arrangements include patterns of political and administrative (de)centralisation (Boyd et al., 2018; Seymour et al., 2020), policy coordination across levels of government (Nepstad, 2017; Brandão et al., 2020; Boshoven et al., 2021; Ng et al., 2023), and sufficient political stability and state capacity to enforce laws and regulations (Pirard et al., 2015; Paoli et al., 2016; Hovani et al., 2018b; LTKL, 2019, 2020; Colchester et al., 2020a; Garcia et al., 2021).

Relatedly, political will and political turnover feature prominently as additional variables that enable or constrain the establishment and consolidation of JAs (Meyer and Miller, 2015; Fishman et al., 2017; Nepstad, 2017; Boyd et al., 2018; Brandão et al., 2020; Chervier et al., 2020; Garcia et al., 2021; Von Essen and Lambin, 2021; Schleifer, 2023). It is also increasingly recognised that resources and funding have been limited (and even declining relative to investments in other sectors that contribute to emissions such as energy or transportation) for investments in activities such as subnational tropical forest conservation and restoration initiatives, scaling up JA pilots (e.g. enabling a shift in focus from short-term project outputs to longer-term policy outcomes), community and Indigenous peoples' efforts to secure tenure and manage forests,[3] or detailed impact evaluations and other research that might support such a shift in scale (UNDP n.d.; Stickler et al., 2020). This is likely why we see programs in well-funded states like Mato Grosso progress further than in jurisdictions without similar resource investment (Stickler et al. (2020), and why we see organisations like the global Governors' Climate and Forests Task Force (GCFTF) call for larger and more sustained investments in JA implementation (UNDP n.d.).

Jurisdiction size has also been identified as a potentially relevant factor, with JAs being more likely to succeed where the targeted jurisdictions are "small enough to enable stakeholders to come together, but large enough to provide a meaningful commodity supply and reduce 'leakage' across jurisdictional boundaries" (Boshoven et al., 2021, p. 2). Certain features of land use dynamics in particular commodity-production landscapes can also contribute to creating enabling conditions for JAs. For example, it can be easier to build support for a JA when the primary threat to ecosystem conversion comes from the production of a few internationally traded agricultural commodities, and it is possible to intensify crop production on existing and/or degraded lands to allow for economic growth without bringing new lands into production. Similarly, strong economic incentives for sustainable production (for example in the form of preferential sourcing, price premiums or green finance) increase the likelihood that key stakeholders will make necessary investments in capacity, trust-building, and expenditure of political will (Boshoven et al., 2021, pp. 8–11).

Interacting socio-economic and political conditions also play an important role in enabling or constraining the establishment and implementation of JAs. Socio-economic factors that often play important enabling or constraining roles include dynamics of land tenure security, land use planning and land disputes (Van Houten and De Koning, 2018; Colchester, 2020; Seymour et al., 2020; Peteru et al., 2021), social capital, and trust (Chervier et al., 2020; Ng et al., 2023), and opportunities for social learning for stakeholders within a JA (Chervier et al., 2020). Bahruddin et al. (2024) similarly emphasise the importance of interactions between socio-economic, political and environmental governance conditions. They emphasise the interplay between political support for JAs, the local structure of production and resource endowments, and local histories of sustainable commodity governance initiatives. Such interactions have been shown to depend importantly on actor interests, elite coalitions, and power relations within contested multi-scalar processes of sustainable commodity governance.

4.4. External governance interactions

It is clear that JA programs do not exist in an institutional vacuum, but rather are embedded in complex social and political contexts that can enable and constrain their development. As a "new" mode of sustainable commodity governance, JAs are also entering an increasingly crowded governance sphere (Cashore et al., 2021), spanning sectors (public, private), policy domains (i.e., forest governance, rural development, and social inclusion), and levels of governance (local, national, and transnational).

Those public, private, local, and transnational actors that participate directly in jurisdictional programs frequently interact through local multi-stakeholder processes, whose level of institutionalisation can vary from loose, informal networks in the early stages of program development, to more formalised organisational structures in more advanced jurisdictional programs (Paoli et al., 2016; Hovani et al., 2018a). Conceptually, these interactions can be said to be "internal" to a jurisdictional program. Yet, jurisdictional programs, as governance entities, are also engaged in a myriad of what can be labelled "external" interactions with governance actors and instruments that are not directly involved in these programs. These external interactions or linkages can also be of a more formal or informal nature, can evolve organically, or can be the product of purposeful design.

The idea of interlinking external intergovernmental, transnational, and (sub)national governance instruments to advance holistic sustainability governance objectives has been central to the JA concept from the onset (Nepstad et al., 2013). As the approach evolves, the JA literature continues to emphasise the need to integrate JA programs with other governance actors and instruments. The need to generate "external incentives" for local stakeholders through linking jurisdictional programs to international climate finance mechanisms or private market-based instruments is a particular recurring theme in both academic and practitioner-oriented publications (e.g., Irawan et al., 2019; Seymour et al., 2020, p. 7–12; Boshoven et al., 2021). Moreover, this literature stresses the need to interlink jurisdictional programs horizontally to facilitate learning and collective action between jurisdictional programs nationally and internationally (e.g., Seymour et al., 2020, p. 15). Below we review three emerging institutional linkages, namely with the UN REDD + program, with private supply chain initiatives and emerging public supply chain regulations in Northern consumer countries, and between jurisdictional programs in the context of national and transnational jurisdictional networks.

4.4.1. International governmental programs and UN REDD+

Many (sub)national jurisdictional programs have linkages with intergovernmental organisations and their programs, which in turn have begun to support jurisdictional programs for sustainable commodity governance through a variety of "orchestration measures" (see Abbott et al., 2015) such as convening, agenda-setting, assistance, and endorsement. The UN REDD + program has played an especially important role in this regard, given the JA concept has partially originated in and organically co-evolved with jurisdictional REDD + initiatives, thereby generating a degree of path dependence. Indeed, the jurisdictional REDD + agenda has been described as an "institutional antecedent" of JAs (Seymour et al., 2020, p. 4–5). Created under the umbrella of the United Nations Framework Convention on Climate

[3] Research suggests that investments in such efforts are cost effective and make a significant contribution to emissions reduction in forests, as does a focus on equity in forest restoration—both contribute to the long-term viability of sustainability initiatives Rainforest Foundation Norway (2021); Löfqvist, 2023.

Change (UNFCCC), REDD + provides results-based payments to tropical forest countries for reductions in deforestation, with the scope of REDD + increasing over time to cover entire (subnational) jurisdictions.

Even though REDD + finance has turned out to be less transformative for tropical forests than some had initially hoped (Seymour and Busch, 2016, p. 359), it continues to be an important international finance mechanism to create external incentives for local stakeholders to support JAs. Many advanced subnational jurisdictional programs, for example, in Acre (Brazil), Mato Grosso (Brazil), Central Kalimantan (Indonesia), and San Martin (Peru), have received technical and financial support through REDD+ and/or REDD + provisions have been included in subnational policies and legislation (Boyd et al., 2018; Milhorance and Bursztyn, 2018; UNDP n.d.). However, existing studies on the subnational jurisdictional REDD + suggest that these programs have been slow to develop due to a multitude of political and technical challenges (see Duchelle et al., 2018; Irawan et al., 2019), and waning political enthusiasm for the approach (Seymour et al., 2020, p. 4–5).

Even so, the approach has created important foundations in knowledge infrastructure, stakeholder networks, and institutional capacities, with the expanding JA community of practice building on these foundations (Seymour et al., 2020, p. 5). The recent GCFTF review of support for jurisdictional REDD + found that where there were significant financial investments in capacity/strategy building that led to policies, strategies and technical instruments being finalised (rather than remaining in draft), such institution building had led to better jurisdictional REDD + financing for longer-term impacts (UNDP n.d.). Recent developments, which saw major funds for jurisdictional REDD + mobilised internationally, could also make REDD + again central to the development of the JA and in generating external support and incentives for local stakeholders to participate in these programs. For example, launched in 2021, the Lowering Emissions by Accelerating Forest Finance (LEAF) Coalition, a UN-endorsed public-private partnership, has raised USD 1.5 billion to provide results-based payments to tropical forest jurisdictions. Several Brazilian states, including Amapá, Amazonas, Mato Grosso, and Pará, then signed a memorandum of understanding with the LEAF Coalition at the COP 27 Climate Summit in Sharm el-Sheikh (Leaf Coalition n.d.).

4.4.2. *Private supply chain initiatives and public supply chain regulation*

In addition to the co-evolutionary nature of interactions between the JA community of practice and REDD+, efforts are underway to purposefully link (sub)national jurisdictional programs with existing supply chain initiatives to reduce tropical deforestation (Lambin et al., 2018). This includes private supply chain initiatives, such as company pledges and sectoral certification programs, as well as newly enacted public supply chain regulations in the consumer countries of the Global North.

To create external incentives for local actors to engage in jurisdictional programs to sustainable commodity governance, practitioners are seeking to create complementarities between global supply chain initiatives and subnational JAs (van Houten and De Koning, 2018; Watts and Irawan, 2018). This includes efforts to scale up existing certification programs to cover entire jurisdictions or landscapes, as opposed to individual farms or plantations, through the creation of "zero-deforestation zones" (Meyer and Miller, 2015), "verified sourcing areas" (IDH, 2018), and "jurisdictional sourcing" mechanisms (Boshoven et al., 2021). As part of this agenda, certification organisations are developing new standards and verification tools and are upscaling their auditing and traceability systems. For example, the RSPO, the leading global certification program for palm oil, is testing its jurisdictional certification system in several (sub)national jurisdictions in Ecuador, Indonesia, and Malaysia (RSPO, 2021). The International Social and Environmental Accreditation (ISEAL) Alliance, a meta-standard setter for private sustainability standards, recently published its good practice guidelines for making credible jurisdictional claims (ISEAL Alliance, 2020). And, in 2021, Rainforest Alliance and Sustainable Trade Initiative (IDH) launched LandScale and SourceUp, respectively, two platforms that provide assessment methodologies, verification services, and online portals to connect global buyers of agricultural commodities to jurisdictional and landscape programs at the (sub)national level. Another major initiative is the Strategy for Collective Action in Production Landscapes of the CGF's Forest Positive Coalition of Action, which brings together twenty-one of the world's leading retailers and consumer goods manufacturers. Launched at the COP26 Climate Summit in Glasgow, the strategy aims to scale up twenty-two jurisdictional and landscape initiatives in Brazil, Chile, Indonesia, Malaysia, Mexico, and Russia (CGF Forest Positive Coalition of Action, 2021).

As part of the JA's 'holistic design' described in section 4.1, there are also attempts by JA practitioners to link these programs to emerging supply chain regulations in the consumer countries of the Global North (Schleifer and Fransen, 2022, p. 38–39). Recently, the European Union (EU) enacted the EU Deforestation Regulation or EUDR, a new regulation that prohibits the importation of deforestation-linked products into the EU market. The regulation covers palm oil, soy, timber, cocoa, and other "forest-risk" commodities (European Union, 2023). Formally adopted in late 2023, the regulation establishes mandatory due diligence obligations and traceability requirements on companies placing these commodities on the EU market, and will include procedures to evaluate the level of risk of the exporting country or region. Given significant differences in the sustainability policies between subnational jurisdictions in Brazil, Indonesia, and other tropical forest countries, the JA community of practice advocates for conducting these risk assessments at the subnational rather than national level to recognise the existence of advanced jurisdictional programs as an indicator of compliance with the EUDR (IDH and Proforest, 2022; Trase, 2022). Their objective is to link demand-side supply chain regulations with supply-side subnational jurisdictional programs as part of a broader "smart mix of measures" (Schleifer and Fransen, 2022), though little progress has been made to date in advancing this agenda (TFA, 2020).

4.4.3. *Linkages through domestic and transnational networks*

Multiple networks have recently been formed that connect jurisdictional programs within and across countries. In terms of their overall design, purpose, and functionality, these networks bear some resemblance to municipal networks, such as those that exist in climate governance (e.g., Betsill and Bulkeley, 2004; Gordon, 2013). Global philanthropists, (e.g., David and Lucile Packard Foundation) similarly support the implementation of jurisdictional programs in several countries. Among other activities, inter-jurisdictional networks facilitate learning between programs, support collective action, and provide meta-governance functions.

Some of these jurisdictional networks are domestic. For example, in Indonesia, a Sustainable District Association (Lingkar Temu Kabupaten Lestari or LTKL) was launched in 2017, incorporating numerous district-level governments involved in jurisdictional programs. The LTKL formulated a regional competitiveness framework—a monitoring and reporting system to measure participating districts' progress toward the Sustainable Development Goals (SDGs) (Nofyanza et al., 2020). As a meta-governance instrument, the framework facilitated comparisons and learning between LTKL members, providing them with a common language and the technical tools necessary to connect with global buyers of agricultural commodities, thus supporting the creation of linkages with private supply chain initiatives. Other examples of domestic jurisdictional networks include the Brazilian Legal Amazon Governors' Forum, which proposed a consortium of the nine states of the Amazon region to "promote the sustainable development of the region, the integration of policies, and the cooperation and sharing of knowledge and instruments in public management" (Sampaio, 2023, p. 373), and the Sustainable Municipalities Program in Brazil, founded in 2014 to connect local municipalities with sustainable rural development agendas in the state of Mato Grosso. The Sustainable Municipalities Program was an important building block of PCI—Mato Grosso's state-wide jurisdictional program (Milhorance and Bursztyn, 2018, p.

15).

At the transnational level, the GCFTF network is the largest and most institutionalised inter-jurisdictional network on deforestation and low-emission rural development. Formed in 2008, the GCFTF currently brings together 43 states and provinces from 10 tropical forest countries, facilitating learning between members through annual meetings, technical exchanges, and the creation of a dedicated knowledge database (Duchelle et al., 2018, p. 5–6). In addition to other transnational networks, such as the Jurisdictional Exchange Network of the Tropical Forest Alliance, GCFTF is central to creating horizontal interactions between jurisdictional programs and the wider JA community of practice (Di Gregorio et al., 2020).

4.5. Impact and effectiveness

Because JAs are relatively new modes of governance, it is unsurprising that few ex-post formal evaluations of their impact or effectiveness exist. While some pioneering JAs have already accumulated close to a decade of experience, many publications conclude that it is too soon to tell whether JAs will reach their goals or contribute to global problem-solving (Fishman et al., 2017; Boshoven et al., 2021; Forster et al., 2021; Ingram et al., 2020; Von Essen and Lambin, 2021; van der Haar et al., 2023). Others have elucidated the difficulty of comparative case analysis due to variation in how different JAs are defined and conceptualised (see Sec tion 3.1) (Garcia et al., 2021).

Measuring JAs' impact or effectiveness is challenging also for other reasons. Primary among those are questions regarding: the appropriate time horizon with which to expect an impact, especially given the complicated political processes involved; the appropriate goal metric to be evaluated; the effects that can or cannot be attributed to a JA, given their attempts to coordinate many stakeholders and interact with many other initiatives (Palmer et al., 2023); and methodological challenges of establishing a counterfactual (what would have happened in the absence of such initiatives). Below, we reflect on the measurement challenges and initial attempts to overcome them. We find relatively little critical reflection in the literature on potential unintended consequences and trade-offs associated with moving towards jurisdictional approaches to multi-stakeholder governance.

4.5.1. Measurement challenges

In traditional impact evaluation procedures, a program's impact is measured by assessing key indicators of change and comparing baseline data (prior to the intervention) to data collected after the intervention has taken place, while allowing for an appropriate time lapse so that effects are observable. Changes in indicators over time can also be compared to a counterfactual by using experimental (e.g., by randomising the intervention) or quasi-experimental methods, including finding sufficiently similar comparison cases or using other statistical tools to isolate the true effects of the intervention from other contextual factors. These processes are complicated for JAs due to three factors: determining an appropriate time frame, defining indicators, and selecting methods that can be operationalised at jurisdictional scale.

It is difficult to define a clear endpoint or determine how long will it take for the effects to be felt, especially given many JAs are ambitious in convening a wide range of stakeholders, negotiating common goals, and engaging in sensitive political processes of aligning policies and attracting investment. Such steps are usually time-consuming and prone to delays and breakdowns, especially due to political turnover (Schleifer, 2023, p. 137–165). Despite time-bound and quantitative JA targets (Stickler et al., 2018a), goals and dates are prone to shift, especially when steps are delayed for reasons beyond key actors' control (Grabs, 2023; Grabs and Garrett, 2023).

Appropriate indicators of effectiveness depend on the intended goal or outcome—also a point of contention. At the broadest level, JAs have the goal of jurisdictional sustainability, which can be defined as the successful transition to sustainable development encompassing social, environmental, and economic dimensions across an entire political geography (Schleifer, 2023, p. 142). How this is operationalised depends on the JA and is often part of the JA process. The literature tends to focus on (mainly forest) ecosystem conservation to explain the rise of JAs (LTKL, 2020; Garcia et al., 2021), but many JAs also aim to address land conflicts (Colchester et al., 2020b), achieve certification compliance (Colchester et al., 2020b), or support other dimensions of sustainable development. This means intended outcome indicators of early jurisdictional programs may not yet be agreed on and might indeed be subject to intense political negotiations between relevant stakeholders. Additionally, some argue that JAs are often driven by a focus on the right process (e.g., multi-stakeholder engagement) more than specific ultimate goals (Van Houten and De Koning, 2018), and should be evaluated with that intent in mind. Chervier et al. (2020)'s theory of change takes a middle ground by arguing that the most appropriate outcome to attribute to a JA is the "formalisation of a consistent and locally adapted framework of operational and collective rules" (p.4), which then may lead to the ultimate impact of interest, such as lower rates of deforestation.

Methodologically, there is broad agreement that when assessing the impacts or effectiveness of a JA, the entire jurisdiction or political geography should be chosen as a unit of analysis (Pacheco et al., 2017; GIZ, 2018; Colchester et al., 2020b). Yet this is challenging for traditional impact evaluation methods as it is often difficult to find comparable and credible counterfactual (or control) cases and indicators (Chervier et al., 2020), particularly given the diversity of aims, interventions, and contexts discussed above. Novel methods such as regression discontinuity design (RDD) along jurisdictional borders may address this challenge (Wüpper and Finger, 2022). However, a potential unintended consequence of JAs is leakage—undesirable behaviour such as deforestation being displaced across borders into neighbouring jurisdictions where JAs are absent. Measuring a JA's impact by comparing deforestation inside its borders with deforestation outside of them, as RDD would do, could overestimate the real effect if leakage is not considered.

Given the relatively large unit of analysis, it is also comparatively difficult to attribute a causal effect to the activities of a JA (Seymour et al., 2020). The inclusivity and all-encompassing scope of JAs might make it promising to compare jurisdictional-level statistics over time, but the metrics needed to capture local disparities and differential effects on various types of producers and other actors might only be visible via large-scale, expensive household surveys.

Some learning can be drawn, however, from a (limited number of) recent studies that use modelling and simulations to gauge potential intervention impacts at scales similar to jurisdictions. These include Lippe et al.'s (2022) efforts to model the spatially-specific impact of land use and land use change (LULUC) policy interventions in tropical forest areas in Ecuador. They show that to reverse deforestation, constrain the expansion of agro-commodity production into High Conservation Value (HCV) forest areas, and achieve other sustainability impacts, policy interventions need to be multi-stakeholder, cross-sectoral, enforced, and operate at at least the landscape level, which not only aligns with JA designs, but could inform evaluations. Similarly, using agent-based (or actor) modelling of land use governance interventions in tropical commodity frontiers, Von Essen and Lambin (2023, p1735) show that collaborative, multi-stakeholder subnational interventions (involving the state, private sector and civil society) have the greatest impact on deforestation, among a number of examined interventions, via providing 'the best balance between effectiveness and equity'. While the aforementioned studies rely on significant assumptions or scenario building, they can nonetheless provide further information for policy makers comparing different interventions and potential impacts.

4.5.2. Evaluations in practice

The above challenges have meant that practical assessments of JAs to date have relied primarily on qualitative case studies (e.g., Schleifer, 2023, p. 137–165) that often describe rather than analyse

implementation processes or pathways of change, and/or use process tracing or other narrative tools to describe implementation processes and attribute JA impacts. Such assessment approaches tend to focus on processes and intermediate outcomes (e.g. degree of institutionalisation of relevant initiatives) rather than final impacts (e.g. improvements in ecosystem conservation or poverty rates of local producers), or assess a limited number of relatively easily measurable factors (e.g. deforestation rates) rather than complex socio-economic indicators.

For instance, to examine JA success, Forster et al. (2021) focus on evaluating policy adoption and local acceptance of action plans and programs, with reference to success factors such as participatory territorial assessments, multi-sector engagement, cross-sector coordination, and investment in multi-level participation and capacity development (see also Boyd et al., 2018). Others have emphasised the selection of outcome indicators and the establishment of related performance monitoring tools and verification systems as intermediary steps toward goal attainment (Nepstad, 2017; Palmer and Paoli, 2017). Such steps have been achieved in some cases—such as establishment of the LTKL's district jurisdictional sustainability performance tool called Terpercaya (Terpercaya, 2018; Bishai et al., 2022) and the PCI dashboard in Mato Grosso. The most comprehensive framework to date to assess intermediate outcomes is the Climate, Community and Biodiversity Alliance's (CCBA) Sustainable Landscapes Rating Tool (SLRT), that "rates governance conditions for sustainable landscapes against internationally recognised criteria, thereby focusing on process and enabling conditions rather than on outcomes" (Peteru et al., 2021, p. 2). Nonetheless, such indicators are rarely linked to an explicit theory of change articulating how jurisdictional interventions affect the indicators in question (Chervier et al., 2020).

Regarding final impacts, scholars have focused on a limited number of (mainly environmental) indicators that can be compared at scale without the need for broad-based household surveys, such as deforestation rates. Stickler et al. (2018b) report separately on policy/process outcomes and deforestation trends in 39 jurisdictions across 12 countries without aiming to establish causality. They conclude that "more than half of [the evaluated] jurisdictions have time-bound, quantitative targets related to commitments made for reducing deforestation, forest recovery, sustainable agriculture, and various socioeconomic factors" (p. 154) but also stress that "truly advanced policy and legal reforms – and other plans and actions – have taken place in just a few jurisdictions, including Acre, Mato Grosso, Jalisco and Sabah" (p. 158). Stickler et al. (2020) compare 30 first-order subnational jurisdictions in Brazil, Indonesia, Mexico, and Peru and assess each jurisdiction's progress toward the Rio Branco Declaration commitment to reduce deforestation by 80% by 2020 compared to national baselines. They find that "progress toward achieving the target was slow and likely unattainable in most jurisdictions outside of Brazil" (p. 1). The reasons they identify for the lagging process include inadequate global support for requested performance-based funding and development of the metrics needed to access such financing. In a comparison of two contrasting municipal-level case studies in the eastern Amazonian state of Pará, Brandão et al. (2020) similarly find that private financial support has lagged behind expectations, and conclude that it is not possible (and may even be counterproductive) to impose the same targets or expect the same rate and level of change across cases due to locally unique circumstances (Brandão et al., 2020). In sum, these qualitative assessments of JA effectiveness and impact to date provide useful analysis of specific case studies, but have generated few generalizable findings given the complexity and diversity of JAs.

5. Discussion: persistent research gaps

As the above review makes clear, the sizable literature on jurisdictional approaches that has rapidly emerged over the last 5–10 years offers important insights regarding their conceptualisation, forms of inclusion and participation, factors enabling and constraining their emergence, operation and interaction, and their impact and effectiveness. At the same time, there remain significant blind spots within the existing body of research. In the discussion below, we identify three cross-cutting thematic areas in which we see significant potential to bridge existing gaps in the research on JAs, and to draw lessons from adjacent but as yet poorly integrated bodies of research and practice on the socio-political dynamics of other forms of environmental governance. These cross-cutting themes relate respectively to: the social and political power dynamics underpinning environmental governance processes; principles and practices of inclusion and participation; and approaches to evaluating effectiveness that take appropriate account of unintended as well as intended consequences of policy interventions.

5.1. Social and political power dynamics

As is clear from the above analysis, there are a range of characteristics of socio-economic and political contexts that can enable or constrain the establishment and operation of JAs. Power imbalances within implementing contexts are implicitly rather than explicitly acknowledged in some scholarship as potential barriers to both the effective operation of multi-stakeholder dialogue and to the political sustainability and legitimacy of JAs (Palmer and Paoli, 2017).[4] For example, existing work has acknowledged the importance for JA sustainability of potential challenges linked to changes in local political leadership and administrations, competition between political parties, weak institutional capacity, constrained long-term resourcing or financing, and strong patronage connections between influential policymakers and business actors resistant to sustainability governance initiatives (Ng et al., 2022; Van der Haar et al., 2023; Stickler et al., 2020; UNDP n.d.). Such literature thus acknowledges, albeit sometimes implicitly, that while the state is central to the potential of JAs, its involvement can introduce its own risks and challenges.

Most existing JA scholarship, however, remains focused on less overtly political questions about the negotiation of shared goals and the formalisation of collective rules and institutions rather than questions about social inequality, barriers to participation, or power struggles surrounding the design and implementation of JAs (for exceptions see also Hovani et al., 2018a; Seymour et al., 2020; Bahruddin et al., 2024). There is also surprisingly little systematic *empirical* analysis of power dynamics within JAs or the social and political dynamics shaping the conditions under which JAs are most likely to flourish. The emphasis on practical questions rather than more abstract analyses of power perhaps reflects the high number of practitioners contributing to this work. A more systematic exploration of power dynamics is needed to build deeper understanding of how sustainability interventions are enabled and constrained by complex and varied socio-economic and political contexts, and how JAs can attempt to build support (or overcome resistance) from powerful political and economic actors.

In further exploring such power dynamics, we can borrow important insights from broader critical political economy and political ecology scholarship on environmental governance that places analysis of power at its centre. Such work recognises that global governance interventions such as JAs are inherently political in that they shift political outcomes and influence the distribution of both power and resources (Duffy, 2006; Kohne, 2014; Arts et al., 2017; Hameiri and Jones, 2017; Bastos Lima and Persson, 2020). It further highlights the importance of socio-economic power relations in shaping struggles over governance, stressing factors such as inter-ethnic or group relations, access to resources or land rights, and the strength of worker and producer organisations (e.g., Barrientos and Smith, 2007; Bridge, 2008; Bebbington,

[4] Power dynamics are also frequently acknowledged in relation to power struggles between different levels of government (Minang et al., 2015) and between elite and marginalised stakeholder groups (Bastos Lima and Persson, 2020).

2015; Diprose et al., 2022). Future research and evaluations of JAs would benefit from more explicitly addressing the influence of such political and socio-economic power relations over both the initial establishment of JAs, and JA implementation and outcomes.

There is also significant potential to draw more extensively from political economy frameworks surrounding the role of the state. For example, theoretical frameworks for analysing political settlements and leadership coalitions have been productively applied to analyse challenges with local political resistance in other contexts of multi-scalar natural resource governance and development policymaking (e.g. Bebbington et al., 2017). Such work also helps to place JAs into a broader historical context, for example by taking into account colonial legacies, histories of state formation, and inter-temporal patterns of extractive sector control by elite coalitions (e.g., Gellert, 2010; Bebbington, 2012; Hickey et al., 2015; Diprose et al., 2019; Winanti and Diprose, 2020). These studies tend to show that in regions highly reliant on extraction, sustainability initiatives struggle to achieve success–tending to create change only when they take advantage of windows of opportunity to build political will, in the face of persistent resistance or capture from influential elites (Bahruddin et al., 2024; Barletti et al., 2020; Bastos Lima and Persson, 2020).

Related work has further shown how struggles to promote or resist external environmental governance agendas are shaped by legitimation contests among domestic and international stakeholders (Oliver, 1991; Black, 2008; Glover and Schroeder, 2017; Diprose et al., 2019) and competition to influence which policy instruments are prioritised and financed (Kleinschmit et al., 2024). Such analyses generate important lessons that may help identify leadership and coalition-building strategies in support of JA establishment and implementation. Productive lessons regarding strategies for building political support and navigating political resistance can also be drawn from scholarship on policy transitions, which has explicitly examined how to overcome embedded political and social forces (e.g. Furumo and Lambin, 2021; Rogge and Reichardt, 2016). Broader literature on policy mixes has likewise explored how varied policy mixes can create flexibility and resilience in the face of varied contexts (Sewerin et al., 2022; Howlett and Ramesh, 2023). Particularly salient lessons can be drawn from those studies of related sustainability initiatives (such as REDD + or subnational landscape sustainability programs) that pay attention to how *subnational* political economies enable or constrain the sustainability and inclusion goals of JAs. In Brazil, for example, subnational political actors have political power over processes of territorial planning, and have pursued sustainability and inclusion goals via initiatives such as the state-led "zoneamento ecologico-economico" (Economic-Ecological Zone, ZEE). Studies of this Brazilian case have shown how the dominance of sub-national interests favouring continued commodity extraction over environmental interests has tended to produce relatively weak jurisdictional approaches, reinforcing the invisibilities of grassroots input, particularly with respect to indigenous groups (Gonzales Tovar et al., 2021).

Interactions with wider *transnational* governance initiatives and political economy dynamics can also enable or constrain JAs in important ways, as we saw in Section 3.4 above, though research on such interactions also remains nascent. Transnational governance interactions involving subnational jurisdictions in the Global South are a particularly important blind spot within existing research (Hickmann et al., 2020, p. 120). Two avenues for future research on JA interactions with global environmental governance processes seem particularly promising: a more systematic mapping of how evolving (sub)national jurisdictional programs fit into broader transnational regime complexes for climate change and forest governance (see Abbott, 2012; Rodríguez Fernández-Blanco et al., 2019); and more empirical-analytical work that analyses how external linkages between national and subnational jurisdictions are designed and function in practice. For example, little is known about the multitude of newly created governance intermediaries, such as LandScale, SourceUp, and the LEAF coalition, that aim to connect (sub)national jurisdictional programs to transnational private and intergovernmental policy instruments.

5.2. Principles and practices of participation and inclusion

The participation and inclusion of marginalised social stakeholders is another important theme that has been relatively neglected within existing scholarship on JAs. In the design and promotion of JAs, discursive emphasis is often placed on inclusion and participation. Yet so far there is no corresponding body of empirical research focused on in-depth evaluation of the scope and quality of participation of marginalised groups in JAs (c.f. DiGiano et al., 2020; Ng et al., 2023), either in multistakeholder JA policy decision-making forums, or on-the-ground programs.

The lack of existing research on dynamics of social inclusion in JAs is particularly surprising in view of the extensive analysis of social inclusion and participation in broader scholarship on sustainability governance. Such work has highlighted the importance of protecting land ownership and use rights for land and forest dependent communities, while also reflecting critically on the role of global FPIC or Consultation standards as means of facilitating customary, indigenous, and community involvement (e.g. Angelsen et al., 2009; Wunder, 2009; Tacconi et al., 2010; Angelsen et al., 2012; Tacconi, 2012). This work has further explored the potential to move beyond simple concern for 'representation' of social interests to encompass broader goals of empowering marginalised actors and communities in the design and implementation of sustainability initiatives (e.g. Blomquist, 2009; Brockhaus et al., 2011; Mwangi and Wardell, 2012; Tseng et al., 2021). Research on integrated water resources management has similarly shown how multi-stakeholder sustainability governance processes frequently exclude many important categories of affected stakeholders. In some cases, relatively powerful actors, such as large-scale water users, refrain from participating in collaborative governance spaces that might spotlight their privileges and result in redistributed water. In others, the costs of stakeholder participation are too high for small-scale water users. As such, the resilience of governance institutions has often depended heavily on a narrow set of influential champions of sustainability initiatives (e.g. Thoradeniya and Maheshwari, 2018; Cisneros, 2019; Moreira et al., 2024).

Yet despite the recognised importance of themes relating to social inclusion and participation, the overarching emphasis on the role of JAs as means of tackling deforestation and land management has seemingly crowded out attention to these critical questions (Newton and Benzeev, 2018). In order to gain deeper understanding of the conditions under which JAs can achieve their stated goals of tackling inequalities, supporting social inclusion, and empowering marginalised groups in decision making processes, there is a need to re-centre analytical focus on the kinds of power imbalances that shape inequalities and promote or prevent participation. Concretely, this entails the need for more systematic research on: how JAs engage with socially, economically, and politically marginalised groups in focal jurisdictions; how the benefits of JAs are distributed between different social groups and how they intersect with broader patterns of socioeconomic inequalities; what participation means; and, how it is best effected for different contextually-specific social groups.

5.3. Effectiveness, impact and unintended outcomes

Significant gaps in knowledge also persist with regard to the effectiveness and impact of JAs. First, despite efforts by several authors to elaborate theories of change for jurisdictional approaches (e.g. Boshoven et al., 2021; Chervier et al., 2020; Bahruddin et al., 2024), most process and impact evaluations do not precisely spell out the underlying assumed causal logics that could allow for a more holistic identification and assessment of relevant mechanisms of change. There is no doubt that identifying clear causal logics associated with such complex,

long-term, and multi-dimensional processes is immensely challenging. This challenge is compounded by the evolutionary nature of JAs, as practitioners learn from and adapt to evolving opportunities and constraints in complex and dynamic environments. Intermediate indicators of progress are frequently revised, but must still be incorporated into longer-term measures of impact and effectiveness. Notwithstanding such challenges, there is an opportunity to draw useful lessons from extensive bodies of research in the policy sciences that have examined the challenges of evaluating long-term and complex processes of policy intervention and social change (e.g. van den Berg et al., 2019; Sanderson, 2000).

Second, few contributions have integrated learnings from impact evaluation methods developed for similar sustainability governance approaches, such as REDD + initiatives, Integrated Landscape Approaches, or multi-stakeholder forums on land use change, despite the existence of substantial academic literature in this field (e.g., Irawan et al., 2019; Barletti et al., 2020; Carmenta et al., 2020; Van der Haar et al., 2023). Such bodies of work have generated important sources of learning with regard to the evaluation of social inclusion and participation, from which studies of JAs could usefully learn.

Third, many studies limit themselves to documenting and evaluating those activities that were pursued in a particular JA, rather than reflecting critically on whether these activities aligned with the original goals and were appropriate (according to specific criteria such as equity or inclusivity). This narrows the scope of critical evaluation in problematic ways–weakening the ability of such evaluations to interrogate the potential for jurisdictional approaches to 'crowd out' alternative and potentially stronger approaches to social inclusion or conservation, or to focus on more politically feasible and less costly problems while neglecting more contested or entrenched problems demanding greater resources and political capital. For example, Cisneros et al. (2024) highlighted the powerful incentives for jurisdictional initiatives to cherry pick the geographical areas and social and environmental issues that it is easier for them to influence, thus tending to create a systematic avoidance of those 'harder' problems embedded in market and state forces over which they exercise little control.

Relatedly, while most initial attempts at process or impact evaluation identify challenges or threats that may lead a given jurisdictional initiative to fail (e.g., Boyd et al., 2018; Von Essen and Lambin, 2021), few critically engage with the possibility that a JA could succeed on its own terms, while also creating unintended or negative consequences in terms of equality, power dynamics, livelihood outcomes, or ecosystem health. While there has been a general lack of attention to assessing such unintended consequences of JAs, there are some notable exceptions. For example, Bastos Lima and Persson's (2020) assessment of the Cerrado Working Group highlighted unintended consequences in the form of consolidated or intensified power imbalances between actors, concluding that "although effective for targeting conversion drivers, CCLG [commodity centric landscape governance] can crystalize and reinforce existing land use patterns by granting disproportionate power to dominant stakeholders, thus limiting the agenda to incremental changes" (Bastos Lima and Persson, 2020, p. 1).

More research of this kind is needed to better capture otherwise neglected drivers of inequality and understated power dynamics. This could allow for more comprehensive, multi-dimensional understandings of the impact of JAs for both livelihoods and ecosystems. Such a focus could also sharpen attention not only on evaluations *vis a vis* fixed or collectively agreed aims, but also analysis of which agendas and problems are dominating or crowding out others. Adjacent fields of sustainability governance scholarship have devoted extensive critical reflection and debate to risks of 'crowding out', for example via scrutinising the relative merits of market-driven sustainability governance schemes such as voluntary certification programs or mixed use protected areas, versus stronger nature-centred approaches to conservation (e.g. see Alger, 2021; Maxwell et al., 2020). The scholarship on JAs would benefit from engaging with such debates more explicitly and integrating these insights into frameworks of impact evaluation.

6. Conclusions and future research directions

In addition to the gaps we have identified for future research above, what then does our analysis imply for bigger critical questions about JAs to sustainable commodity production? What, exactly, is the potential value of JAs as a concept and form of governance in addressing environmental and social problems? One of the distinctive features of research on JAs is that a significant proportion of existing work has been authored or co-authored by practitioners, and sometimes appears to embody an implicit assumption that the project of advancing JAs to sustainable commodity production is inherently support-worthy. This has led much research to focus centrally on questions of how JAs can operate more effectively, sometimes at the expense of a more systematic critical probing of their limitations, obstacles to greater progress, and the deeper limits of what JAs can be expected to achieve.

The absence of more systematic bodies of critical evaluative research leaves us with persistent questions about the potential value of JAs that it will be crucial to interrogate more extensively in future research. At the same time, the emerging body of evidence that we have reviewed in the above hints at the potential appropriateness of an actively ambivalent assessment. Jurisdictional programs are trying to do something extremely ambitious. Not only do they attempt to scale up integrated conservation and sustainable agricultural development interventions in contexts in which political and market actors who benefit from the perpetuation of extractive agricultural political economies continue to exercise considerable power. They also attempt to recruit some of these actors as active supporters of jurisdictional sustainability efforts. The political character of this challenge is further intensified by the complexities of the multi-scalar governance processes through which jurisdictional initiatives are implemented, as they seek to harness support from both public and private actors at international, national and subnational scales. Such efforts to negotiate across conflicting stakeholder interests are extremely difficult to pull off given the complex power dynamics at multiple scales, yet are essential to creating openings for continued progress.

The inherent ambition of JAs offers significant promise. JAs offer a broader toolbox for governing land use than alternative approaches that focus on controlling deforestation behaviours within the scope of supply chains–whether in the form of voluntary corporate commitments, or government regulated initiatives such as the EU's Deforestation Regulation. They therefore create potential to slow the environmental harm caused by expanding agricultural frontiers, and to promote more sustainable resource use in areas marked for commercial activity. Nonetheless, while jurisdictional experiments thus open potential pathways towards incremental improvements in environmental performance and social outcomes, like other initiatives concerned with international forest governance and mitigating climate change, the impacts of such efforts are likely to remain limited by the inadequacies of long-term resourcing for such approaches in the face of powerful counter-pressures for perpetually expanding extractive frontiers to fuel persistent over-consumption.

Ambivalent evaluations of JAs are particularly hard to avoid in view of the absence of clearly defined goals attached to fixed timelines. JAs by design never reach an end state in which they have achieved their aims. Although they incorporate concrete programs with tangible deliverables, their interventions remain ongoing processes. There often appears to be an "old wine in new bottles" phenomenon in development and sustainability work (and other policy domains): if an approach shows limited effectiveness, there is a tendency for practitioners to rally around an alternative idea with great enthusiasm and quite a lot of goodwill by researchers, based on a logic of "let them try it and see how it works." This approach raises the risk of boom-and-bust cycles of interventions–described by Cashore et al. (2016) as cycles of policy creation, commitment euphoria and then implementation disappointment. JAs

could perhaps be generously interpreted as dynamic experiments that offer the potential to scale up, catalyse and coordinate broader processes of sustainability governance, rather than conceptualising their impact through a discrete program evaluation lens. But where there is continual shapeshifting of such initiatives, what are the implications for design and evaluation, and how should actors conceptualise political strategies to build coalitions and networks in support of broader impacts? In contexts in which deep contestation and disagreement about aims and approaches is intense, and aims are never likely to be fully or even mostly realised, this raises difficult questions about whether this cyclical approach remains an acceptable way of responding to the present planetary emergency. In view of the scale and urgency of the global planetary crisis, a rising chorus of voices is calling for more urgent systemic change underpinned by a clear prioritisation of environmental management over other competing outcomes (Cashore, 2023). Yet the political challenges of devising, negotiating and implementing such agendas across multiple governance scales, and in the face of often precarious socio-economic and political conditions in many tropical jurisdictions, remain daunting.

While JAs do not represent a radical departure from established approaches, they do repackage and extend tried and tested approaches in new ways, especially via their incorporation of both social and environmental goals, and multi-stakeholder approaches to decision making at jurisdictional scale in which the state takes on a central role. It is therefore not surprising that JAs find themselves confronting many of the same difficulties surrounding political capture and resistance to transformative change that have afflicted so many other sustainability initiatives in the past. In light of these persistent challenges, JAs can perhaps at best be thought of as one component of broader strategies for tackling ecosystem decline and interconnected challenges of social development. While further research that embraces the kinds of critical analytical lenses we have advocated above may end up vindicating an overall judgement of ambivalence with regard to JAs, such research nonetheless remains critical as a basis for deepening our understanding of the conditions under which such approaches are worthy of our support, and sharpening our understanding of how these jurisdictional governance mechanisms can ultimately contribute something new to advancing goals of sustainable production and landscape management in critical zones of conservation value around the world.

7. Methodological appendix: keyword search

For the keyword search of articles, we drew on Web of Science, Scopus, EBSCO Academic Complete, and Google Scholar.

We first performed separate structured searches on Web of Science, Scopus, and EBSCO Academic Complete with the following shared main keywords, grouped into 4 lists:

(Commodity OR "natural resource?" OR crop OR agricultur* OR cocoa OR "palm oil" OR coffee OR soy OR beef OR cattle OR farm* OR food) AND (sustainab* OR deforestation OR "zero?deforestation" OR "forest?risk" OR climate OR environment* OR conserv* OR eco?system OR biodiversity OR labo?r OR "human rights")

AND.

"supply?chain" OR "commodity?chain?" OR "value?chain?" OR "production network?" OR market OR "private sector" OR corporat* OR company OR business OR certification OR buyer.

AND.

Multi-stakeholder OR "multi stakeholder" OR multistakeholder OR "public?private" OR "cross?sector*" OR hybrid OR "multi?actor" OR collaborat*

AND.

Jurisdiction* OR landscape OR "transform*" OR "scal* up" OR "beyond?certification" OR "place?based"

We selected articles that contain one or more keywords from each of the four lists, so we will construct the searches based on 4 lists with OR between each word in the list, and AND between lists. All articles selected as meeting these inclusion criteria were saved onto Zotero, a free reference manager software. All articles that passed the inclusion criteria were also downloaded and saved onto Dropbox. The search terms generated 1284 search results from Web of Science, 619 search results from Scopus, and 357 search results from EBSCO Academic Complete. They were subsequently manually screened to sort out irrelevant papers.

In order to ensure that these broader search terms had not missed anything more directly focused on jurisdictional approaches, we further conducted two Google Scholar searches. The first, more specific one, used the following Google Scholar search string:

(Commodity OR agricultur* OR farm* OR food) AND (sustainab* OR deforestation OR climate OR environment* OR conserv*) AND (supply? chain OR commodity?chain? OR value?chain?) AND (Multi-stakeholder OR collaborat*) AND (Jurisdiction* OR landscape)

It found 1660 results since 2018 and we reviewed the first 1000 results.

Finally, we added a second, much broader one, to check we hadn't missed anything obvious via overly restrictive search terms by searching for the following search string.

Jurisdictional approaches commodities

That second search string generated 86,400 results, of which we reviewed the first 100.

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CRediT authorship contribution statement

Kate Macdonald: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization. **Rachael Diprose:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Funding acquisition, Conceptualization. **Janina Grabs:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization. **Philip Schleifer:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization. **Justin Alger:** Writing – review & editing, Writing – original draft, Conceptualization. **Bahruddin:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Joyce Brandao:** Writing – review & editing, Conceptualization. **Ben Cashore:** Writing – review & editing, Conceptualization. **Adelina Chandra:** Writing – review & editing, Visualization, Conceptualization. **Paul Cisneros:** Writing – review & editing, Conceptualization. **Deborah Delgado:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Rachael Garrett:** Writing – review & editing, Conceptualization. **William Hopkinson:** Writing – review & editing, Investigation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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