Sustainability governance in agri-food value chains: evidence from Mexico and Brazil.

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Abstract

Managing the sustainability of agri-food global value chains is synonymous with a plethora of transnational environmental governance (TEG) mechanisms. In this thesis, I engage with a growing body of interdisciplinary accounts explaining the design, uptake, provision and outcomes of TEG mechanisms. The three substantive papers that constitute this thesis reflect on the conditions leading to the emergence of TEGs, their role in reshaping value chain governance (or not), and the imperatives around value chain transparency for sustainability. I engage with the Global Value Chains (GVC), the TEG and Global Environmental Politics (GEP) scholarships to analyse the evolving governance processes for the soybean and beef value chains – two environmentally destructive agricultural commodities – with evidence from Mexico and Brazil. The first paper investigates the hybrid governance framework set up for the Brazilian soy chain. It pushes the GVC research agenda beyond its preoccupation with explaining TEG design, uptake and effectiveness within buyer-driven GVCs. Instead, I analyse the implications of a 'multipolar' chain structure for sustainability governance beyond standards and certifications, including interactions with novel public regulations. The second paper deals with the embryonic process of environmentally upgrading the Mexican beef chain. I investigate how environmental considerations enter regional and domestic agri-food value chains and to what extent they reshape value chain dynamics and configurations. Finally, the third paper explores the processes of building accountability relationships through TEG and public governance mechanisms. Following recent accounts exploring the accountability relationships established between chain and non-chain actors when adopting sustainability standards and traditional regulations, I provide a comparative political analysis of the cases of beef in Mexico and soy in Brazil. I delve into the complexities that arise when building such relationships within the dynamics of emerging markets, generally assumed to be less environmentally conscious or where economic imperatives supersede environmental ones.

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Finally, I want to dedicate this thesis to the memory of my maternal grandmother, Enedina (Ene). Back in the mid-1970s in a small Mexican village –formerly a mining town— Ene, imposed her views over those of my grandfather. Ene thought that her three daughters would be better off if they continued their formal education. While originally, my grandpa was not as keen as her, he ended up supporting his daughters' university studies. Out of ten children, only their three daughters went to university. I wonder how my life would have turned out without Ene's stubbornness and commitment. I like to think those two traits helped my mom, Elizabeth, while she raised me as a single mother back in the 1990s. Similarly, I reckon they have underpinned my career. I want to express my gratitude and love to Ene and my mom, for the person I am today is forever indebted to them.

Declaration

I declare that this thesis, which I have presented for examination for the PhD degree of the University of York, is a presentation of my original work. I declare that I am the primary author of this thesis and its papers, with field research and editorial contributions made by co-authors Tony Heron, Chris West and Patricia Prado for Chapter Two. Primary data gathered by Tony Heron and Patricia Prado is analysed in Chapter Four. I am the sole author of all other sections of this thesis. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

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Chapter One

Introduction

In this thesis, I offer an original theoretical and empirical contribution to debates regarding the social and environmental impacts of the global food system on people and the planet. More specifically, I focus on the role of 'agri-food' commodities – drawing on the cases of beef and soybeans — in the global food system and the various attempts to govern and regulate these over the past two decades, in order to meet environmental goals and policy objectives. As is now well known, the global food system – and agriculture more particularly — is a significant contributor to anthropogenic climate change (Poore and Nemecek, 2018), especially as a driver of land use change and deforestation (Pendrill et al., 2019; 2022).

The concept of an 'agri-food' commodity captures the significance of agriculture to the environmental footprint of the global food system in a number of important respects. First, the production of agri-food commodities is land-intensive, meaning that their cultivation is a principal driver of land conversion (Lambin et al., 2011; Meyfroidt et al., 2013), deforestation (zu Ermgassen et al., 2020) and biodiversity loss (Ceballos et al., Green et al., 2019). It is for this reason that four out of the seven 'high risk' global commodities cited by the WWF and RSPB in their influential *Risky Business* report from 2017 are agri-foods: palm oil, beef, soybeans and cocoa (WWF-RSPB, 2017). Second, these agri-foods are heavily commodified, meaning that local production is geared towards satisfying consumers, quite literally, on the other side of the world. The significance of this, from an environmental standpoint, is that social and environmental externalities are almost exclusively found at the point of production, not consumption. Third, and related to this, agri-food commodities very rarely constitute end-use products; or, to put it another way, they are 'embedded' within other

foodstuffs, meaning that (until very recently) they are almost entirely invisible to the final consumer. In short, eliminating (or even just mitigating) the negative environmental impacts of agri-food GVCs constitutes a quintessential collective action problem: the consequences of inaction are widely dispersed and negligible to the individual policymaker or consumer, while the upfront costs of action require coordination on the part of a global uncoordinated polity.

In the last two decades, attempts to resolve this collective action problem have taken numerous forms, but perhaps the most noted –and certainly the most widely-debated— are transnational sustainability standards (TSS), exemplified by the Roundtable on Sustainable Palm Oil (RSPO) and the Round Table on Responsible Soy (RTRS), both established in 2004. While these and other similar initiatives differ in their understandings of sustainability, the precise objectives and the stakeholders that underpin them, they exemplify a particular *form* of sustainability governance. They share the fundamental characteristic of being 'multi-stakeholder' efforts (typically involving environmental NGOs, business representatives and labour organisations, sometimes with state support) and 'non-state' initiatives. The success of these schemes –both in terms of uptake and in terms of achieving better environmental outcomes— has been modest, to say the least. For farmers, the uptake of sustainability certifications has imposed additional barriers to entry to global markets, where the opportunities for higher prices or thought to reside, even though this is rarely the case (Ponte 2019). At the other end of the supply chain, for processors and retailers, there has been a tendency to design in-house standards leading to problems of low stringency, multiplicity and overlapping efforts with third-party standards that do not necessarily result in better environmental outcomes (Krauss and Krishnan, 2016, 2022; Krishnan, 2017). In response, an interdisciplinary scholarship has coalesced around the search for general conditions under which sustainability governance is more likely to emerge and to be effective in delivering sustainable agri-food chains (to

illustrate see Auld, 2010; Bitzer, Franken and Glasbergen, 2008; Boström et al., 2015; Foley and McCay, 2014; Grabs et al., 2016; van der Ven, 2018). This scholarship encompasses accounts of private authority and rulemaking for the environment; business and managerial studies on Corporate Social Responsibility (CSR) and the so-called 'greening' of the global economy; ecological economics, rural sociology and political economy studies of the effectiveness of the governance instruments as well as the socio-economic and political implications for involved actors. My thesis contributes to this interdisciplinary literature.

Theoretical debate

I situate this thesis at the intersection of the scholarships researching global environmental governance (GEG), global environmental politics (GEP), transnational environmental governance (TEG), and global value chains (GVC). The first three literatures are strongly intertwined and they coalesce around explaining the regulation of the global environment by multiple actors at multiple scales. While the fourth literature, GVC studies, stand alone as a field to investigate the contemporary configuration and operation of the global economy, a growing number of scholars are applying the GVC heuristic to investigating the governance of the environmental outcomes associated with the global economy dynamics. My thesis draws from these four literatures to build a theoretical framework from which to account for contemporary expressions of agri-food sustainability governance in the global, regional and local contexts. The key literatures introduced (albeit very briefly) below provide the underpinnings of my key theoretical choices and research priorities: the conceptualisation of private actors as key agents in global environmental governance, their interaction with traditional forms of state authority; and the intersection of economic governance and environmental governance dynamics within global value chains.

Global Environmental Governance and Global Environmental Politics

The first point of theoretical engagement for this thesis is with the GEG and GEP scholarships. Jointly, the GEG and GEP fields provide conceptual avenues to understand how environmental change is governed, by who and with what implications, both in terms of environmental and political outcomes. Biermann and Pattberg (2012) contend that three characteristics of GEG, as an analytical term, distinguish it from traditional international environmental politics. First, the emergence of new types of agency and actors besides national governments. Second, the emergence of new mechanisms and institutions of global environmental governance, beyond traditional forms (state-led, treaty-based regimes). Third, the increasing fragmentation and emerging interlinkages of the overall governance system. Importantly, the governance concept is broadly defined as a certain degree of self-regulation by societal actors, either at national or international scale (Biermann and Pattberg, 2012, p. 3).

In analysing the diverse ways in which 'polities and societies allocate resources for the management of the environment' (Clapp and Dauvergne, 2011) the GEP field deals with the evolution of GEG initiatives and institutions, from formal (state-based or international regimes) to broader expressions in which non-state actors interact with state power (Clapp and Dauvergne, 2011, p.3; Dauvergne and Clapp, 2016). Thus, the origins of GEP and GEG are generally traced back to the period between the 1970s and early 2000s during which International Relations (IR) and International Political Economy (IPE) scholars set out to explain the role of private actors within global environmental governance (Auld and Gulbrandsen, 2013; Falkner, 2003). For the IR scholarship, this focus represented a departure from a traditional focus on the role of states in the formation and maintenance of Multilateral Environmental Agreements (Patterson, et al., 2003; Young, 1989; Newmayer, 2001). With GEP in place, the analytical attention thus shifted from the forms and outcomes of international relations to those resulting from relations between states and non-state

actors (Andonova, 2010; Biermann and Pattberg, 2008; Biermann et al., 2009). Early research dealt with the political conditions underpinning the shift towards private governance. As such, these studies of market-led environmental regulation heavily reflected the transformations brought by the neoliberal paradigm synonymous with the 1980s and 1990s (Dauvergne and Clapp, 2016).

Importantly, with GEP's roots stemming from key IR and IPE insights, a legacy of foundational studies delved into theorising the emergence and subsequent consolidation of private self-regulation in the form codes of conduct, standards, corporate social responsibility (to illustrate see Cutler et al., 1999; Haufler, 2001; Vogel, 2008; Sassen, 2006). Three interrelated contributions are illustrative of the main debates put forward by the IR-IPE interdisciplinary scholarship concerned with explaining private regulation. First, the conceptualisation of what Ruggie (2004) called the 'new global public domain' in which broader frameworks of social agency exist, for instance, non-governmental organisations (Ruggie, 2004). Second, the conceptualisation of the 'global firm' as a decisive and crucial economic actor capable of determining and defining labour, environmental and human rights conditions and requirements in the economic processes it leads (Vogel, 2008, p. 266). Third, considering the first two elements, the characterisation of a reduced state – in its regulatory functions— was coined to explain the 'policy voids' that were left to be filled by private rules (Bernstein and Cashore, 2007). The idea of the void was thus analogous to poor and ineffective state action in regulating market failures, particularly negative environmental externalities associated with economic globalisation (Auld, Bernstein and Cashore, 2008; Bernstein and Cashore, 2007; Bernstein, 2005; Bernstein and Cashore, 2007; Vogel, 2008; Newell, 2008).

Substantively, with the 'new global public domain' concept, Ruggie offered an account of the late 1980s and 1990s transformations within the global political arena, which implied an ontological

challenge to IR, political science and IPE. Namely, for private regulation to be explained the public domain ought to be opened to account for novel actors and their interactions. The shift in essence implied a departure from the former understanding of a 'global governance system' as synonymous with the Westphalian order. Consequently, Ruggie's new domain was rooted in a conceptualisation of governance as the constellation of authoritative rules, institutions and practices through which a collectivity manages its affairs and engages in the production of global public goods (Ruggie, 2004: 8-9). Accordingly, early IR-IPE accounts on private environmental governance build a dialogue with Ruggie's global public domain conceptualisation as the main elements of the concept underly the broad political fabric in which TEG and GEP debates take place. To illustrate, Falkner's (2003) account of private environmental governance offered an early definition of private governance as that which '… emerges at the global level where interactions among private actors, or between private actors on the one hand and civil society and state actors on the other, give rise to institutional arrangements that structure and direct actors' behaviour in an issue-specific area' (Falkner, p. 73, 2003). Crucially, GEP, GEG and TEG studies are concerned to some extent with explaining one or more of the three main claims that Falkner argued characterised private environmental governance: i) to be a byproduct of the broad processes of global economic governance; ii) to be a feature of the contemporary global political economy, and iii) to convey different expressions of multilateralism, transnationalism and the governance of international business. More recently, the so-called 'systems of private regulatory governance' have been defined as those in which 'nongovernmental actors formulate procedural or substantive rules, monitoring and enforcing them with or alongside third parties, and in result preferential treatment for actors in compliance is granted' (Grabs, Auld and Cashore, 2020; p.1). While over the past two decades, multiple disciplines have contributed to theorising non-state governance systems underscoring the emergence and legitimacy of private authority (Cashore et al., 2004), the perennial private-public relationships for the governance purposes

continues to be at the forefront of GEP, GEG and TEG studies (Cashore et al., 2021; Reckens, 2020). For one, the identification of 'governance spheres' by Cashore et al., (2021) exemplifies the latest developments on this sub strand of the TEG literature. Furthermore, several of the private rules and mixed systems of governance that the interdisciplinary scholarships investigate address environmental problems associated with food systems, more precisely, with food supply chains (Bernstein and Cashore; 2007). I turn next to a brief review of the main debates and research areas that GEP scholars dig into when concerned with food systems and supply chains.

Global environmental politics of food

For this thesis, a second point of theoretical engagement is established with accounts investigating the global environmental politics of food, which includes the scholarship researching private governance arrangements systems (to illustrate see: Bloomfield and Schleifer, 2017; Gulbrandsen and Auld, 2016; Schleifer, 2016, 2017), but similarly a broad array of accounts unpacking other questions on power, legitimacy and governance applied to food systems. At present, theorising about food systems sustainability is well incorporated into the GEP field's research scope. Clapp and Scott (2018), however, suggest the early GEP and food studies scholarships were focused on specific environmental outcomes and discrete environmental governance regimes thus downplaying the 'multiple interconnected environmental effects of food system's activities and risking dismissing the political dynamics of the broader economic system in which food systems are integrated. To overcome the cited limitations, Clapp and Scott (2018) offered a conceptual framework with four key features from which to analyse the global environmental politics of food in a broader way which allows to engage with the political dynamics of multiple and dynamic interconnected implications surrounding food systems. The framework maps out four intertwined main features of the contemporary global food systems influencing their sustainability and political governance (Clapp and Scott, 2018, p.2). First, the

global food system is complex and distanced which allows for power dynamics to be both reinforced and responsibilities over environmental outcomes obscured. Second, there are competing models for sustainability, underpinned by a diversity of scientific models, which tend to feed 'polarised ideational debates' on which model should be followed. Third, there is a weak and fragmented governance landscape with many governance arrangements focused on specific environmental problems, but the industrialised food and agriculture systems have multiple and interconnected environmental problems associated. Finally, global food systems are characterised by unequal power dynamics, with implications for the global environmental politics of food. Corporations and powerful countries are likely to shape food systems governance in alignment with their needs and preferences. Thus, some actors are more likely to shape the environmental politics of food than others. In this thesis, I situate the analysis of the sustainability governance for two selected case studies –to be introduced in the following section— within the broader debates on the GEP of food systems. From this perspective, it is possible to offer an account for each case's local and regional particularities, while acknowledging the intersections with the global environmental politics of global food systems, particularly to underpin each specific analysis on the four key features of contemporary global food systems, as identified by Clapp and Scott (2018).

Global value chains (GVCs) and the intersection with Transnational Environmental Governance

Finally, the third point of theoretical engagement for this thesis is established with the GVC scholarship and its intersection with TEG and GEP studies. The concept of global value chains 'refers to the set of intra-sectoral linkages between firms and other actors through which this geographical and organizational reconfiguration of global production is taking place' (Gibbon et al., 2008: 318). A vast scholarship has flourished around GVCs, as a framework for the study of global economic governance. Arguably, the most significant contribution stemming from the GVC heuristic - itself

built on the earlier Global Commodity Chain (GCC) tradition - has been through unpacking what Feenstra described as the 'disintegrations of the production process' brought about by 'the rising integration of world markets' (Feenstra, 1998). Hence, over the past three decades, alongside the Global Production Networks (GPN) literature (Henderson et al., 2002, Coe et al., 2004), the GVC framework has been used for capturing the transboundary organisation of production and consumption that characterises the global economy (Bush, 2015). Importantly, both the GVC and GCC frameworks share their origins, with a direct lineage to world-systems theory (Hopkins and Wallerstein, 1994). While the latter was occupied with the investigation of the general capitalist logic driving commodity chains, the GVC approach has leaned towards a firm-centred study of corporate governance (Gibbon et al., 2008).

Gereffi's (1994) pioneering work on GCC theory laid out the foundations for studying the transboundary organisation of production and consumption by identifying four dimensions of chain analysis: a) an input-output structure; b) a territoriality or geographical configuration; c) a governance structure; and d) an institutional context. Crucially, the 'governance structure' conceptualisation enabled the analysis of power relationships within chains to explain the appropriation, distribution and creation of value (Gereffi, 1994). Two governance ideal types were originally identified: producer-driven and buyer-driven chains (Gereffi, 1996). From this early understanding, scholars showed a growing interest in investigating how global buyers used their intangible assets (especially brand exclusivity) and factor mobility to control and coordinate other actors in the creation of a functional division of labour (Gereffi and Lee, 2016; Ponte, 2019; Sturgeon et al., 2008). Interrelated with the chain governance concept the analysis of value chain upgrading became a central preoccupation for GVC scholars (Gereffi et al., 2005; Gereffi and Lee, 2016; Gibbon, 2001, Lee and Gereffi, 2012). Gereffi (2005) defined economic upgrading as 'the process by which economic actors - nations, firms,

and workers- move from low-value to relatively high-value activities in global production networks' (Gereffi, 2005, p. 171). To operationalise the concept at the firm level, Humphrey & Schmitz (2001) provided a typology to distinguish between the upgrading of a product (higher sophistication/higher value), a process (increased efficiency due to production system reorganisation or new technology), a function (leaving low-value-added functions of the chain) or an intersectoral change (moving into new sectors). The broader applications for the upgrading concept and dynamics were brought out by GCC scholars examining structural inequality, including through case-study analyses of tropical commodity chains (Bair, 2009). Importantly, the emergence, spread and consolidation of CSR across GVCs meant scholars faced an additional element to analyse when unpacking the reconfiguration of chains. In essence, CSR exemplifies the introduction of non-economic aspects of chain governance to the GVC studies (Bair, 2017). The examination of CSR thus has been a perfect research arena for the consideration of different types of governance, from private to public to social and its interactions that Gereffi and Lee (2016) called 'synergistic' governance (Gereffi and Lee, 2016). Thus, the understanding and deployment of the GVC framework extended from an early (and somehow exclusive) focus on processes of economic upgrading, to include other forms of upgrading, including environmental (Bush et al., 2015) and social upgrading (Barrientos et al., 2012; Gereffi and Lee, 2016).

In recent years, an increasing number of scholars have turned to the application of the GVC framework to account for the design, uptake and provision of TEG mechanisms for global supply chains (Khan et al., 2020; Krishan, 2017; Lund-Thomsen, 2020; Poulsen et al., 2021). While the early GVC literature did not, in the main, focus on the intersections of global environmental change, its regulation and the operation of global supply chains, some exceptions can be found (Bolwig, 2010; Bush, 2015; Jespersen et al., 2014). Gradually, as evidence on global environmental change and its relationship with anthropogenic activities has become widespread more GVC accounts have sprung

unpacking the complexities of responding and adapting to such change from GVCs stakeholders' perspectives (Alford et al., 2023; de Marchi and Gereffi, 2023; Krishnan et al., 2023). Accounts adopting the GVC framework highlighted the role of lead firms, predominantly in buyer-driven chains, as the main driver of environmental governance (Bush et al., 2015). Gradually, the consideration of TEG mechanisms gained space within GVC scholarship via the concept of environmental upgrading. Jeppesen and Hansen (2004) offered a pioneering account, distinguishing between two types of drivers underlying environmental upgrading: internal and external. For them, the unit of analysis was the lead firm. Hence the uptake of environmental upgrading via setting standards, monitoring and control activities and technical cooperation was explained as a lead firm strategy to move to higher value activities while –allegedly – improving the environmental conditions of production (Jeppesen & Hansen, 2004). Several accounts engaged with this understanding of environmental upgrading (de Marchi, 2013; Gereffi & Lee, 2016; Khan et al., 2020, Ponte 2020; Poulsen et al., 2018). Recently, a shift has been evident in a handful of accounts using the environmental upgrading lens, invoking it to explore the role and agency of upstream actors (Barrientos et al., 2016, De Marchi et al., 2013; De Marchi and Di Maria, 2019; Khan, Ponte and Lund-Thomsen., 2020; Krishnan, 2017; Poulsen, Ponte and Lister, 2016 and 2021; Ponte et al., 2023).

In sum, in this thesis I develop a conceptual framework derived from the synthesis of the GVC, TEG and GEP literatures. Crucially, the engagement with GVC literature is central to the thesis as the GVC construct provides a heuristic from which to operationalise the selected agri-food supply chains. However, the intersections between GVC and TEG studies are fundamental given its significance to account for sustainability governance expressed through value chains. In the following sections I turn to introduce the research questions underpinning this thesis, the description of the methods used, a brief statement on reflexivity and positionality and a summary of the contributions.

Research questions

In this thesis, I investigate the provision, form and uptake of agri-food sustainability governance instruments – which generally take the form of TEG or TSS— within the specific context of the Global South specifically, through the cases of Brazil and Mexico. In focusing on the examination and application of the GVC framework and aiming to build a dialogue with the broader TEG and GEP debates, I examine the prevailing assumptions concerning the drivers of TEG within and around value chains. The general question I address in this thesis is: How do sustainability governance instruments enter global, regional and domestic agri-food value chains and what are the implications on value chain governance dynamics? I approach this general question via specific sub-questions for each one of the thesis' three papers as follows:

1. **Chapter 2:** Two interrelated questions guide Chapter 2, firstly, what implications for environmental governance derive from a multipolar value chain governance structure? Secondly, how can we account for the encroachment of public regulatory mechanisms with private regulation from a GVC perspective?
2. **Chapter 3:** How do environmental considerations enter regional and domestic agri-food value chains and to what extent do they reshape value chain dynamics and configurations?
3. **Chapter 4:** How do sustainability governance instruments embed accountability relationships and how does this embedding shape their effectiveness?

Research methods

Initial motivations for this thesis stemmed from an interest in environmental politics and, more specifically, from observing experiments in agri-food sustainability governance performed by firms and other private actors such as NGOs, with no direct or explicit lead coming from public authorities. Hence, the rationale justifying the theoretical framework selected for this thesis is found in the

opportunities that the GVC approach and its intersections with the TEG and GEP literatures offer to unpack, on the one hand, the drivers of sustainability governance and, on the other, multifaceted implications and underlying goals, stemming from these governing mechanisms. For one, the implications arising from a sustainability governance practice can be analysed in terms of the effectiveness of the mechanism in achieving improved environmental outcomes, or else in the effects it has upon involved and adjacent stakeholders, e.g. chain actors that are not defining or guiding the sustainability governance mechanism. It is for this reason that I engage with, synthesise and subsequently apply a GVC-TEG theoretical framework - to explore the building of regulatory frameworks for the environmental risks associated with the functioning of the global economy, specifically in agri-food industries.

To examine the specifics of governing the sustainability of two separate but interrelated highly environmentally sensitive agri-food commodities –beef and soybeans —I conducted the research for this thesis via a case study approach. A case study research design allows scholars to perform information-rich and detailed examinations of '…a historical episode to develop or test historical explanations that may be generalisable to other events' (George and Bennett, 2005, p. 17) while offering opportunities in terms of conceptual validity, deriving new hypotheses, exploring causal mechanisms, and modelling and assessing complex causal relations. Thus, the two cases that form this thesis represent intensive studies of a single unit (forms of sustainability governance for agri-food commodities) which can inform further understandings of a larger class of (similar) units (Gerring 2004, p. 342). For one, the sustainability governance processes of many other agri-food commodities and extractive industries form part of the large class of units to which the cases here studied form part of. Hence, in and of themselves, the two cases offer novel theoretical and empirical research to the available scholarship on sustainability governance. Crucially, each case stands alone in its respective

significance and contributions to the literature earlier reviewed. Importantly, Chapter Four presents a comparative political analysis between the two case studies and while drawing causal inferences is not the main aim it is organised in line with a structured focus comparison method (George and Bennett, 2005).

The two main data collection methods were documentary analysis and semi-structured interviews. Documentary analysis was essential for mapping each of the two agri-food chains investigated in this thesis. Triangulation with other sources was used to ensure the validity of the data generated via interviews and documentary analysis. The analysed documents included: official government publications (national level laws, public programmes and policies, reports and audits on public programmes), corporate, industry or sectoral, NGOs and think tank reports and publications, and media and online blog entries. Documents were read and analysed in English, Portuguese and Spanish. To achieve a depth of understanding of both cases semi-structured interviews with elite and various types of stakeholders were selected as a primary research method in their capacity to produce knowledge from chain and what I call 'out-of-the-chain' actors, mainly referring to the state and organised civil society entities, related to the research questions listed above. Participant selection was undertaken via purposeful sampling; thus, interviewees were selected because they were experts on the value chain under analysis (both from private and public, or non-state, spheres), members and stakeholders of the studied value chains, or practitioners and representatives of sustainability governance mechanisms. Preliminary extensive document analysis was conducted before reaching potential interviewees and informal exploratory conversations were held with fellow academics (based in the UK, Mexico and Brazil) to determine initial samples. Both sets of semi-structured interviews, one for Brazil and one for Mexico were fundamental to gaining direct insights from key informants, which included agri-food firms, industry representatives, farmers, NGOs, government representatives

and certification bodies. The 12 interviews with Brazilian soy stakeholders were conducted between 2018 and 2019 by my co-authors, Tony Heron and Patricia Prado. Appendix A contains the list of example questions used for Brazilian stakeholders (A.1) and the guiding questions for Mexican beef stakeholders (A.2). I conducted 30 interviews with Mexican beef stakeholders online between 2021 and 2023. The approach for both sets of interviews was designed around guiding, open-ended questions, allowing interviewees to expand and control the conversation. As referred to above, to ensure data validity, the interviews' findings were triangulated with documentary analysis and participating in industry and academic online events (webinars and reports' launching events). Inductive thematic analysis was performed to identify patterns and themes with the two sets of interviews. However, while as part of the iterative process of analysis initially I used open coding --for both the Brazilian and Mexican interview's data—for the Mexican data the creation of categories and themes was guided by pre-set-codes developed from the guiding interviews' questions.

On ethics, positionality and reflexivity

Reflexivity in qualitative research is understood as a strategy to incorporate active reflectional processes on the role of the self when conducting research and generating knowledge (Berger, 2013). A reflexivity statement allows one to communicate research methods and design while addressing the potential effects of the researcher's social position, personal experiences and beliefs. Thus, in acknowledging the ethical challenges that occur while undertaking qualitative research, in particular interviews, it is relevant to make explicit the researcher's role and the influence of their assumptions on the process of knowledge production (Knott et al., 2022). In this regard, following the qualitative research methods literature (Berger, 2013; De Tona, 2006; Kacen and Chaitin, 2006) it is expected that my characteristics – gender (woman), race (Hispanic-Latina), affiliation (student at a Global North University) and former work experience (public policy analyst), among others, — as well as my

positionality as a social scientist with an interdisciplinary background, have influenced my research design and outcomes. For one, the disciplines of political science, environmental studies and international political economy influence my research design in determining the theoretical point of entry to discuss and analyse the sustainability governance of agri-food activities. Similarly, there is a possibility that because of previous professional experience and affiliation, the recruitment of interviewees was influenced (De Tona, 2006). To illustrate, depending on how the potential interviewee perceived my persona and research focus they could see the interview as a learning experience, an opportunity to showcase their work or business practice, or else as a threat to their status quo when disclosing sensitive information on topics that were central to the research project. Thus, it can be argued that being a former agricultural policy analyst in Mexico gave me credibility and legitimacy with some potential interviewees, who agreed to participate given such traits of my persona. Or else, precisely because of those traits, some potential interviewees refused to participate given that power relation built through the interview rendered them in a disadvantageous position vis a vis the researcher, in this case myself. Having consider these reflections I have aimed to further develop my ethical sensibility as a researcher and contribute to transparent knowledge creation.

Thesis outline

The remainder of this thesis is structured in four chapters, with the three substantive papers organised as chapters two to four. The thesis conclusions are presented in chapter five.

- **Chapter 2. Power and the sustainability governance in the soy-animal protein value chain.** In this chapter, drawing on theories of global value chain (GVC) governance and transnational environmental governance (TEG), we analyse the co-evolution of the Brazilian soy-animal protein chain governance alongside the

sustainability governance framework to gauge the influence of the latter upon the former.

- **Chapter 3. Leaderless value chains and environmental upgrading: evidence from the Mexican beef sector.** In this paper, working with the case study of the Mexican beef industry, I examine the drivers and obstacles to a small but growing set of sustainability governance initiatives.
- **Chapter 4. Building accountability relationships through sustainability governance.** In this paper, unpack the underlying accountability relationships built with and around public and private sustainability governance mechanisms, for environmentally sensitive agri-food value chains. I offer a comparative analysis based on the two cases introduced in Chapters 2 and 3.
- **Chapter 5. Conclusions.** In this chapter I review the main findings of the thesis and provide a summary of each chapter's individual set of findings. A future research agenda is delineated in this chapter as well.

Thesis contributions

To reiterate, my thesis offers an original theoretical and empirical contribution to debates regarding the social and environmental impacts of the global food system on people and the planet. More specifically, I focus on the role of 'agri-food' commodities – drawing on the cases of beef and soybeans — in the global food system and the various attempts to govern and regulate these over the past two decades, in order to meet environmental goals and policy objectives. The three papers that constitute this thesis build a dialogue with the multidisciplinary scholarship –above cited— that has over the past two decades or so, sought to explore the origins, forms, uptake, legitimacy, outcomes and interactions of sustainability private and public governance for global supply chains. While operationalising the two case studies with the GVC construct has led to a deeper engagement with the GVC scholarship, unpacking the politics of sustainability governance has been underpinned by the broader discussions that TEG and GEP scholars provide. I distinguish three broad theoretical and empirical contributions emerging from my research.

Firstly, a set of substantive contributions of this thesis stem from the assessment and testing of the GVC framework (Gereffi, 1994; Gereffi et al., 2005; Humphrey and Schmitz; 2001, Fernandez-Stark and Gereffi, 2019) regarding its suitability for investigating sustainability governance dynamics. Drawing from the extensive debates around the early chain governance conceptualisations and its evolution (Dallas et al., 2019; Ponte, 2014; Ponte and Sturgeon, 2014), I have engaged with the key contributions by Stefano Ponte and Timothy Sturgeon (2014) to investigate how moving beyond the conceptualisation of governance as 'interfirm linkages' it is possible to consider other factors as chain governance determinants, such as 'institutional, regulatory and societal processes' (Ponte and Sturgeon, 2014). The analysis offered in Chapter Two is underpinned by Ponte and Sturgeon's (2014) proposal to examine GVC governance along a polarity continuum and across multi-scalar levels. Additionally, in the same Chapter, I explore the work of scholars engaged with broadening the GVC framework to account for the interactions of chain and public governance. Namely, I refer to the arguments brought forward by political economists on the influence of the state on GVCs and Global Production Networks (GPN) configuration, operation and broader developmental outcomes (Alford and Phillips, 2018; Mayer and Phillips, 2017; Horner, 2017). A second contribution derives from the engagement with the GVC literature is regarding its intersections with Transnational Environmental Governance (TEG). In this sense, the three chapters provide novel contributions that resonate with recent work by scholars exploring the regulation and governance of environmental sustainability challenges while employing the GVC framework. A growing number of accounts have shown that while the initial focus for GVC studies was to delve into the transnational organisation of economic activities, the GVC construct and framework are pertinent to encompass the study of such organisation alongside the increasingly ubiquitous environmental governance processes (de Marchi, 2013; 2020; Krishnan, 2017; Krishnan et al., 2023; Ponte, 2019). Thus, overall, this thesis contributes

--albeit to different degrees of engagement-- to the three dimensions of GVC analysis that Ponte (2019) identifies: i) the various forms of chain governance, ii) the institutional framework in which chains operate and iii) the various forms of upgrading within chains and for chain actors (Ponte, 2019, p.42).

A second contribution of this thesis derives from the analytical effort to investigate the GVC scholarship at its intersections with Transnational Environmental Governance (TEG). I align with Biermann (2017) in that TEG entails 'the collective steering of societal processes by public and private actors to prevent, mitigate, and adapt to environmental change, involving two or more countries' (Biermann, 2017) and that it operates across borders and political jurisdictions (Andonova et al., 2009). In this regard, the three chapters provide novel contributions that resonate with recent work by scholars exploring the regulation and governance of environmental sustainability challenges while employing the GVC framework. A growing number of accounts have shown that while the initial focus for GVC studies was to delve into the transnational organisation of economic activities, the GVC construct and framework are pertinent to encompass its original aim alongside the study of the increasingly ubiquitous environmental governance processes (to illustrate see: de Marchi, 2013; 2020; Krishnan, 2017; Krishnan et al., 2023; Ponte, 2019). My contributions in Chapters 2 and 3 directly speak to this strand of the literature. However, while the GVC framework might allow accounting for TEG processes from the perspective of lead firms –mostly with the study of upgrading trajectories and strategies— its ontological basis, as Grabs et al., (2020) point out, renders it of limited explanatory power to account for other sources of agency (other private actors than firms and public actors). Hence, in the three papers of this thesis, the aim is shared: to build a bridge between the GVC framework and the broader disciplines studying TEG processes. In doing so I create a conceptual framework drawing from multiple accounts on the different dimensions and outcomes of

environmental governance in the global economy. Specifically, I review accounts scrutinising how TEG mechanisms --certifications, standards, multilateral commitments and multistakeholder-- gain access to diverse supply chains and sectors, which are the actors behind TEG, and what implications derive for chain governance (to illustrate with some key contributions see: Alger et al., 2021; Bernstein and van der Ven, 2017; Dauvergne and Garret et al., 2019; Grabs and Carodenuto, 2021; Lister, 2012; Lister et al., 2015; Schleifer and Sun, 2018; Schouten and Bitzer, 2015; Sun and van der Ven; 2020; van der Ven, 2018).

Importantly, for TEG scholars a longstanding endeavour has been the study of the relationships between private and public regulatory systems. Such concern dates back to the early IR and political science studies investigating the emergence of private governance and its interactions with public governance. For one, the early contributions that would shape the TEG scholarship disentangled the emergence and political legitimacy of the so-called 'non-state market-driven' governance mechanisms (see Cashore, 2002; Bernstein and Cashore, 2007; Cashore, Auld and Newsom, 2004) and have since informed interdisciplinary theorising of private governance far beyond political science (Grabs et al., 2020), including TEG and GVC studies. Thus, the debates on the interaction of private and public governance remain much alive (Cashore et al., 2021) and in this thesis I engage with them to inform my conceptual frameworks for each Chapter in two ways. First, as signalled above, I review strands of the interdisciplinary literature (encompassing studies on political economy, organisational studies, business and managerial studies) in direct dialogue with the GVC and GPN scholarships to explore whether and to what extent chain governance is co-determined by the state, in opposition to the thesis of the 'retreat of the state' or the 'governance deficit' (widely discussed among others by Alford et al., 2020; Alford and Phillips, 2018; Bair, 2017; Horner, 2017; and more). Second, I explore how the different conceptualisations of the interaction between private

and public rules contribute to advancing our understanding of the ongoing governance processes for agri-food value chains. While for broader debates some GVC scholars have explored the concepts of 'synergistic' (Gereffi and Lee, 2016) and 'hybrid' governance (Bair, 2017), here my contributions stem from environmental studies as those by Pirard et al., (2023), Lambin and Thorlakson (2018) and Lambin et al., (2023) who directly apply the term for sustainability matters.

Finally, a third contribution from this thesis derives from the specifics of Chapter Four which engages in a dialogue with a wider literature traversing the TEG and GEP studies. More explicitly, Chapter Four revolves around the processes through which sustainability regulatory mechanisms and frameworks embed accountability relationships –implicit or explicit— between the diversity of stakeholders involved with managing supply chains and their associated environmental risks. Chapter Four contributes to the TEG and GEP scholarships with the examination of how and why responsibilities --concerning the environment-- are assigned and embedded in the operation of agri-food commodities. This discussion fits with the work of scholars including Gupta (2008), Mol (2015) and others exploring GEG and TEG in its dimensions of transparency and consequently in the implicit accountability relationships (Kramarz and Park, 2019; van der Ven, 2019). I contend, the focus on the accountability relationships stemming from TEG and public governance mechanisms resonates with the research interests of GEP studies applied to food systems (Clapp and Scott, 2018), given that in underscoring how such relationships are enabled and whether they lead to effective sustainability governance the analysis revolves around unpacking the political dynamics of the agri-food supply chains. My contribution shows that certain chain actors exert larger influences thus shape the environmental politics of the two cases under study. Further applied research to the intersections of GEP, TEG and GVC studies are left for future agendas.

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Chapter Two
Power and the sustainability governance in the soy-animal protein value chain

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Abstract

In this paper, we investigate the nature and significance of an emergent sustainability governance framework, charged with delinking the soy-animal protein chain in Brazil from its most prevalent environmental consequences, namely: land clearance, deforestation and biodiversity loss. The framework is made up of both established, market-based mechanisms (market-based certification and multi-stakeholder commitments) alongside traditional (Brazilian domestic regulation) and novel state-backed instruments (EU+ Due Diligence requirements). Drawing on theories of global value chain (GVC) governance and transnational environmental governance (TEG), we analyse the co-evolution of the soy-animal protein chain governance alongside the sustainability governance framework to gauge the influence of the latter upon the former. Departing from the characterisation of the Brazilian soy-animal protein industry as a bipolar value chain, we offer an account of the gradual configuration of a sustainability governance framework for it. We contend that chain governance has evolved from bipolar to multipolar as sustainability considerations have become embedded, moving from strictly market-based mechanisms to hybrid and possibly mandatory requirements. Our results indicate that a multipolar characterisation of chain governance allows us to account for the interactions between chain governance dynamics and out-of-the-chain actors, particularly for incorporating sustainability mandates.

Keywords: Brazil, soybeans, global value chains, hybrid governance.

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Introduction

The production, trade and consumption of agri-food commodities are strongly associated with harmful environmental practices, including illegal and unregulated land use change, greenhouse gas emissions, deteriorating soil health and threats to biodiversity (Pendrill et al., 2019, 2022; Poore and Nemecek, 2018). The governance response to these practices has, for the past two decades, taken the form of private Transnational Sustainability Standards (TSS). More recently, private and voluntary TSS have been accompanied by hybrid arrangements in which private and public mechanisms interact, to inform and influence one another (Lambin, et al., 2014; Lambin and Thorlakson, 2018; Pirard et al., 2023). In this paper, we provide a theoretical and substantive contribution to the emergent literature on hybrid sustainability governance through a critical engagement with GVC and environmental governance literatures, applied to the specific case of the soy-animal protein chain in Brazil. We investigate the implications of the apparent shift toward hybridity for effective sustainability governance. In doing so, we depart from GVC scholarship's long-running preoccupation with buyer-driven chains, by drawing on Ponte and Sturgeon (2014)'s seldom used 'multipolar' governance framework. In proposing a 'modular theory' of GVC governance, Ponte and Sturgeon (2014) explore the *polarity* of chains as a heuristic to widen the understanding of chain governance: moving from equating it with the dominant inter-firm relationships - specifically, between lead firms and their captive suppliers - to assigning weight to other drivers, both in and out of chains. Thus, a GVC is deemed unipolar when lead firms are easily identifiable and prevailing governance mechanisms are understood as a function of the dominant role played by these lead firms. By contrast, multipolar GVCs are those in which lead firms are harder to identify or in which a plurality of drivers (state and non-state actors, as well as firms) and complex value chain dynamics and governance mechanisms are likely to exist. Apart from the typology introduced by Ponte and Sturgeon (2014), alongside some of Ponte's (2014; 2019) empirical work, there has been very little theoretical or empirical advancement

on these contributions, despite the strong potential of the concept of multipolarity to widen the scope of GVC and environmental governance research agendas.

We analyse the specific case of soy - one of the world's most economically significant but environmentally impactful agri-food commodities. Crucially, 85% of cultivated soy is used to produce animal feed, with only around 6% destined for direct human consumption (Voora et al., 2020). In the paper, we focus on the Brazil-EU and UK chain and observe the construction of a hybrid sustainability governance framework for soy, its derivatives and interrelated animal-protein chains. The main components of this framework are Brazilian domestic land-use change regulations and a plethora of TSS governance mechanisms. The most prominent are multi-stakeholder, zero-deforestation commitments, third-party sustainability standards, certifications, in-house corporate commitments and, most recently, EU and UK 'Forest Risk Commodities' regulations. The aim of these various initiatives is to de-link soy - and other agri-food commodities - from deforestation, although not all target a halt to both legal and illegal deforestation. Individually, the results of these regulatory mechanisms have varied from modestly successful to those deemed to have had negligible impact or else regarded as acts of 'greenwashing' (Bastos Lima and Persson, 2020; Reis and Prada Moro, 2022). Evidence also demonstrates the potential for significant unintended consequences derived from these initiatives. While the most prominent of these initiatives - the Amazon Soy Moratorium of 2006 - is thought to be responsible for a significant reduction in native land deforestation across the Amazon, it has also been associated with spillover effects, with soy plantations moving into other biomes, particularly the Cerrado savanna (Bastos Lima and Persson, 2020; zu Ermgassen et al., 2020).

In conceptualising the Brazilian soy sector and its trade relations with Europe and the UK as a global value chain we aim to unpack the power implications stemming from the embedding of environmental and GVC (economic) governance. To do so, we pose two interrelated research

questions. Firstly, what implications for environmental governance derive from a multipolar value chain governance structure? Secondly, how can we account for the encroachment of public regulatory mechanisms with private regulation from a GVC perspective? Thus, the main theoretical contribution of the paper is the development of a conceptual framework, along the lines of the multipolar GVCs heuristic first proposed, but not tested, by Ponte and Sturgeon (2014). Substantively, we use this conceptual framework to chart the emergence of hybrid governance in respect of the EU- and UK-oriented Brazil soy-animal protein GVC. Consequently, to offer a response to our research questions, we analyse the drivers and characteristics of this framework, pointing to the permeability of GVCs to 'out-of-chain' actors, not least states and NGOs. The paper does not speculate on the effectiveness of, or long-term prospects for, hybrid governance as a form of environmental regulation. Nevertheless, we contend that a likely consequence of hybridity - not least, due to the involvement of states - is that the environmental regulation and accountability demands of GVCs will go well beyond the economic upgrading strategies of lead firms. Hence, at least as far as environmental governance is concerned, the analytical divide between chain and out-of-chain actors will become increasingly difficult to maintain.

Methodologically, the article draws on a qualitative research strategy underpinned by document analysis, literature surveys and primary evidence in the form of public regulation and firm-level documents, as well as open-ended interviews with 12 key Brazilian stakeholders undertaken between 2018 and 2019. The rest of the paper is organised as follows. First, we begin with a critical engagement with the recent scholarship to develop a framework for understanding the politics of sustainability governance in multipolar GVCs. Second, we turn to our case study and describe the key governance structures of the GVC for soy-animal protein, paying particular attention to the distinguishing features of multipolarity. These insights are then carried forward to the third section of

the paper where we offer an analysis of both prevailing and emergent forms of sustainability governance in soy. A final, concluding, section considers the wider implications of our findings.

Global value chains and transnational environmental governance

Early GVC analysis was synonymous with the study of the economic aspects of chain governance, especially the role played by lead firms in determining the conditions in which upstream suppliers participate and potentially 'upgrade' within these chains (Lee, 2010). Lately, a growing number of contributions are applying GVC concepts to wider issues of social and environmental sustainability (Meyer and Gereffi 2010; Lee et al. 2012; Havice and Campling 2017; Heron et al. 2018; Van der Ven 2019; Ponte 2014, 2019). The starting point for these accounts, like their mainstream counterparts, is the identification of lead firms as the key actors in the global political economy. Whereas in mainstream GVC scholarship, the power of lead firms is analysed in terms of defining the conditions in which 'upstream' suppliers participate and upgrade in these chains, more recent scholars analyse these very same actors but in terms of their role in adopting and promoting private sustainability mechanisms. Mayer and Gereffi (2010) and Lee et al. (2012), for instance, argue that private governance is most likely to be forthcoming and effective in the presence of buyer-driven GVCs, in which lead firms enjoy considerable leverage over upstream suppliers but whose brand reputation is vulnerable to civil society mobilisation, media exposes and consumer boycotts. In these circumstances, the relationship between lead firms and civil society actors becomes, in effect, a two-way street: while major retailers and supermarkets possess what Van der Ven (2018) calls 'gatekeeper power' because of their high level of control over upstream suppliers, the brand sensitivity of these firms renders them highly dependent on civil society actors to lend credibility and legitimacy to their sustainability commitments (Cashore & Bernstein, 2007). For Van der Ven (2018), the power of lead firms to either promote or frustrate sustainability standards, is both dynamic and contingent:

> While occupying the role of lead firms in agrifood GVCs at once confers enormous power on retailers and supermarkets, this power is also constrained by the degree of scrutiny directed at lead firms in a fragmented system of global governance where civil society pressure is, to some degree, pivoting from governments to private business. (van der Ven, 2018, p. 636)

Ponte (2019), similarly, sees the so-called 'big buyers' as the key agents in the provision of TSS. But whereas others analyse the role of retailers and supermarkets from the point of view of brand sensitivity and dependence on civil society actors for credibility and legitimacy, Ponte draws attention to the business advantages that accrue to firms through their participation in TSS (see also Dauvergne and Lister 2012). For Ponte, the upshot of the adoption of TSS by lead firms is that it maximises their control over their upstream suppliers. Hence this strategy not only allows lead firms to manage the reputational risks inherent in outsourced supply chains but also to extract greater economic rent from their upstream suppliers. For this reason, Ponte argues, 'sustainable management' practices are prompting firms to develop in-house certification schemes rather than relying on third-party labelling. While this strategy runs the risk of internalising reputational damage to branded lead firms if poor or illegal practices are discovered in their supply chains, the advantage is that it maximises leverage over their upstream suppliers and at much lower costs than third-party schemes (see Chapter 3).

From buyer-driven to multipolar governance

Notwithstanding the richness and diversity of the work cited so far, its focus on lead firms' engagement with TEG renders it of only limited use to the specifics addressed in the paper. In accounting for hybrid sustainability governance mechanisms, e.g. those aligning private and public regulations, two analytical tendencies must be overcome. The first is the focus, almost without exception, on buyer-driven GVCs. The second is to rely, usually implicitly but sometimes explicitly, on an understanding of 'governance', which significantly underplays the indispensable role of the state in the provision of

public goods, including those that have been ostensibly 'privatised'. In this regard, Ponte and Sturgeon's work (2014) on a modular theory for GVC governance offers two significant contributions to our understanding of mainstream chain governance. First, they propose parsing the governance concept into three scalar dimensions: the *micro* level refers to the individual inter-firm linkages and conventions operating at individual nodes of chains; the *meso* level assesses how linkages and conventions travel upstream and downstream; and the *macro* level encompasses other factors than those captured by the micro and meso levels, such as regulations, the nature of business systems and the influence of non-chain actors. Second, they suggest approaching the *macro*-level with a focus on the polarity concept as a means to identify different power sources shaping GVCs. Accordingly, Ponte (2019) has defined a unipolar GVC as one in which lead firms are easily identifiable and prevailing governance mechanisms are understood as a function of the dominant role played by these lead firms. By contrast, a multipolar GVC is one in which lead firms are harder to identify (or indeed may not even exist) and/or one that incorporates a plurality of 'drivers', including state and non-state actors, as well as firms. Importantly, a multipolar chain is very different from the concept of the 'market', in the sense that multipolar chains are brought about by 'the explicit strategic actions of powerful actors' (Ponte 2014: 359), even when power is relatively dispersed and market-based resource allocation does occur. While the actions of these powerful actors are often captured in GVC analysis, as Ponte suggests, they are typically bracketed off in the 'institutional framework' and thus considered to be largely exogenous to chain governance.

Although Ponte and Sturgeon (2014) speculate that the level of drivenness is likely to be higher in unipolar chains, where power is more concentrated, the precise form this takes and the implications it carries for different outcomes can only be determined through empirical testing. Similarly, while not explicitly distinguishing between the power and agency concepts, in practice their proposal offers a

broadened understanding of agency within GVC analysis. In his empirical work on biofuels, Ponte (2014) deploys the concept of agency to identify two phases in the evolution of domestic and global chains: a unipolar phase in which public authorities in the EU and US used policy and regulation to effect a 'government-driven' GVC; and a second, multipolar phase in which different firms (e.g. agrochemical and biotech firms, agri-food traders, oil companies, fuel distributors), standard setters and environmental NGOs became increasingly important as governance drivers. As a result, Ponte argues that a conventional GVC analysis, premised on the identification of 'lead firms' and their functional position in chain governance, is unable to account for the emergence of the Brazilian biofuels' chain because it was fundamentally the creation of states rather than firms. In this way, we can conceive of GVCs as being conditioned, not just by the power relations between firms, but by a plurality of driving mechanisms across a range of different structural, institutional and ideational dimensions.

Apart from Ponte's intervention, the concept of multipolarity has received surprisingly little attention from other GVC scholars. Fold (2002) used the 'bipolar' GVC term in his study of the chocolate industry. Fold shows that chocolate is actually made up of two separate subsystems - cocoa and chocolate - both of which are dominated by a handful of lead firms. As such, both subsystems are buyer-driven with lead firms exercising power through 'containment strategies', that is, defending their market position by shifting competitive pressures upstream while expanding their customer base downstream. The concept of bipolar GVCs shares some similarities with Lee *et al.'s* (2012) notion of 'bilateral oligopolies', which they use to describe agri-food chains including bananas, coffee and pineapples. Like the chocolate GVC, these sectors are defined by the extent to which economic power is concentrated at *both* the production and retail stages of the chain. Unfortunately, Lee *et al.* do not

explore the implications of this power structure for economic or sustainability governance, either in theoretical or substantive terms.

Understanding of mainstream chain governance has proven useful in accounting for the agency of non-chain actors when offering explanations of the globalisation of firms and the repercussions of this for development. However, this approach falls short of accounting fully for sustainability governance mechanisms now shaping global value chains. Inter-firm governance might explain reasonably well why lead firms are willing to take up and promote TSS as part of an economic upgrading strategy. But it cannot account for the presence of out-of-chain actors, whose actions have consequences for chain actors. In short, GVCs are not hermetically sealed. It is worth noting at this point the various critiques offered by political economists of the firm-centric nature of GVC analysis. Mayer and Phillips (2017: 135), for instance, argue the GVC analysis is based on a conception of the 'political' that is "too narrow to capture the intrinsically political nature of GVCs and the governance of a GVC-based economy". This critique is not without significance for the recent application of GVC concepts to the study of environmental governance - not least because the neglect of the state was also a charge frequently levelled at the latter (Newell 2008; Mayer and Phillips 2017; Bartley, 2018).

The emergence of private forms of environmental regulation was initially understood and explained in terms of the conjuncture of three sets of factors: (1) the growing structural power of transnational firms, given their increasingly central role in determining and defining labour and production processes (Vogel, 2008, p. 266); (2) a widening 'policy void' (Cashore et al., 2004) generated by the increasing tension between the territorially bound nature of political authority (i.e. state sovereignty) and the 'deterritorializing' effects of globalisation (Agnew 2004; Scholte 2005); and (3) the emergence of what Ruggie (2004) refers to as a 'new global public domain', centred on the

reconfiguration of civil society from a national to a global scale and through which, Ruggie argues, broader frameworks of social capacity and agency could be articulated: in short, a global civil society.

Although 'bypassing of the state' was a recurrent theme in the early environmental governance literature, recent iterations present a more nuanced theory of the state and the complex interplay between public and private authority (Gulbrandsen, 2014). Bartley (2018), for instance, challenges the assumption that private authority emerged to fill the 'empty spaces' left by states, which were either unwilling or unable to govern these areas. Instead, Bartley argues, private actors cooperate and/or compete with public actors, according to different policy mandates and implementation strategies. These interactions, moreover, occur within 'crowded' rather than 'empty' policy spaces; the success, or otherwise, of different initiatives largely depends on the implementation strategies chosen and the nature of the sector that is the target of regulation. In a similar vein, Gulbrandsen (2014: 89) compares the cases of forestry and fisheries to reveal the extent to which policy outcomes in the context of TSS "are not indicative of less government, but rather of public-private governance interactions at multiple governance levels and in multiple ways". Specifically, Gulbrandsen shows that states often play a crucial role in promoting private certification schemes, but that the incentive structures for individual states to do so vary, depending on the sector in question and how intervention is likely to affect their key national industries. Hence, in the case of timber, where the import interests of developed countries are typically in the driving seat, states use private certification and auditing regimes to ensure exporting countries conform to sustainability criteria. In contrast, in the case of fisheries, where domestic political sensitivities have ensured that the interests of exporters are protected and in a context in which legally binding mechanisms are already in place, states chose to challenge the authority of the Marine Stewardship Council (MSC) private certification scheme by mandating the UN Food and Agriculture Organisation (FAO) with the task of establishing rules for fisheries certification and eco-labelling.

Elsewhere, the concept of 'orchestration' has also figured prominently, wherein public authorities seek to align different policy instruments - only some of which they have direct control or influence over, while others they can only indirectly shape or facilitate (Henriksen and Ponte, 2018; Abbott and Snidal, 2009; Hale and Roger, 2014, Schleifer, 2013). Henriksen and Ponte (2018) speak of 'public orchestration' to signal more explicitly a concern for cases in which public regulatory bodies shape TSS through a combination of mandatory and voluntary instruments. Bartley (2014) uses the concept of 'legality regimes' to describe those cases in which public authorities use mandatory instruments to enforce compliance with private transnational standards. Importantly, Bartley argues that not only are states present in transnational governance arrangements, but they also stand above other actors because of their unique 'capacity to shape market access on a large scale and institutionalise the rights of citizens and firms within their borders' (Bartley 2014: 96). Hence, unlike orchestration, which is typically seen as falling to importing countries (especially the EU and US), a legality regime underscores the importance of the political and economic context of exporting countries, which can "frustrate, amplify, or reconfigure transnational business governance initiatives" (*ibid.* p. 95). More recently, the evolution of hybrid governance frameworks where private and public regulations overlap and form policy ecosystems is gaining further scholarly attention (Lambin and Thorlakson, 2018).

Hence, while early accounts explained the emergence of TEG as a result of the perceived failures of public regulations, the growing number of mechanisms aligning public and private rules points towards the idea of hybrid governance. Pirard et al., (2023) suggest such arrangements involve 'the use of both public and private governance features –rules, tools, instruments, initiatives— in ways that explicitly interact and reinforce each other, while maintaining independence and unleashing

consequences individually' (Pirard et al., 2023, p. 2). Hybrid governance reflects a perceived failure of private regulations to achieve the stated sustainability outcomes they target; or more precisely, it is a reaction to the market failures associated with private governance: that is, the oversupply of TTS, with multiple, overlapping schemes competing for 'market share' by lowering rather than raising standards to minimise compliance costs for participating firms (Lambin and Thorlakson, 2018). While, in theory, having private standards setters in competition should lead to higher standards, the opposite is equally possible: namely, a race to the bottom, in which TSS are lowered on stringency and what is demanded from potential subscribers in order to gain further uptake (Lambin and Thorlakson, 2018, p. 374). In the next section, we draw on the theories and concepts so far to analyse the evolution of the hybrid sustainability governance framework operating for the soy-animal protein chain complex. Our analysis is underpinned by primary data gathered through interviews and triangulated with secondary data obtained from documentary analysis and data on land use change and associated environmental consequences.

Brazilian soy and animal protein chains

In the realm of global agribusiness, the last two decades have been marked by soaring demand for soybeans and its derivatives: soy cake and oil. As in other areas of the global economy, China is the key player (Schleifer and Sun, 2018); the transition from plant to meat-based diets fuelling its huge demand for oilseed imports (Garrett, Rueda and Lambin, 2013). In 2000, China imported around 11.1m tonnes of soy; by 2020, demand had expanded almost tenfold to 105m tonnes (Chatham House, 2023). Recently, the top global producers, Brazil and the US, contributed around 40% and 28% of total production respectively (USDA, 2023). While Brazil is synonymous with global soybean production and with the most pressing environmental consequences of the activity, on the demand

side, it is the EU and UK that have been at the forefront sustainability initiatives despite their imports being dwarfed by those of China.

In this section of the paper, we detail the evolution of a sustainability framework that has entailed a shift from market-based mechanisms towards hybrid arrangements underpinned by multipolar governance chain characteristics. The sustainability framework consists of four main elements, which have evolved both chronologically and synchronically: i) market-based voluntary TSS and multi-stakeholder commitments to delink soy from land use change; ii) Brazilian government legislation on land use change and restoration; iii) Multilateral Environmental Agreements (MEA) and multi-stakeholder commitments designed to delink tropical deforestation from global agri-food value chains; and iv) European and British legality instruments in the form of Due Diligence regulations. Before analysing this hybrid sustainability framework, in the coming section we first map the power structures that underpin these arrangements: that is, multipolar GVCs. We apply the concept of multipolarity in two important ways. First, in examining the development of the Brazilian soy and EU/UK chain governance over time, we emphasise the difficulty of identifying unambiguous lead firms, the evolution of the inter-firm linkages across nodes and the continuous but changing and multifaceted influence of the state. Second, in unpacking the current hybrid sustainability governance framework, we characterise the influence exerted by out-of-the-chain actors' strategies and drivers, e.g. international environmental NGOs, the Brazilian state, and indirectly, European states.

Soy as a bipolar GVC

Soy had a discrete presence within the Brazilian agricultural economy up until the 1960s, when the crop's expansion effectively began. Several accounts trace its journey between the 1970s and the 1990s, from a 'minor' crop used for biomass as feeding feed, then grown in rotation with wheat, and finally

an agro-industrial crop fully integrated with the animal proteins industry (Cattelan and Dall' Agnol, 2018; Oliveira and Schneider, 2014). Two distinctive periods are illustrative of the sector's evolution into a global value chain in close interaction with the animal proteins industry. First, a pre-liberalisation era comprising the three decades between the 1960s to 1990s. Secondly, the open-economy era from the early 1990s onwards. Over the first period, soy spread northwards from the southern states - with the 1960s boom setting off from the Southern state of Rio Grande do Sul - spurred on by state-directed incentives designed to expand and modernise agriculture across isolated and less well-connected areas of the country (Cattelan and Dall'Agnol, 2018; Garrett and Rausch, 2016). The expansion continued, encroaching into the Amazon and, later, the Cerrado savannas (zu Ermgassen et al., 2020). Ultimately, prompted by state-directed interventions and technological innovation, the crop adapted to different types of land and soil across the country.

Alongside strategic state-led actions - crop research, subsidies and investments in infrastructure - a set of contingent factors also aided the crop's expansion. On the one hand, during the first period, soy was already a key protein for animal feed globally and the Brazilian soy farming's seasonality fitted well into the yearly global supply, as the harvesting period filled the gap left by US production (Rocha de Sousa, 2012). On the other hand, the US, the world's main supplier, imposed export bans in 1973 (due to an exceptional drought) and 1980 (in response to USSR's invasion of Afghanistan) respectively. These actions led to a global supply gap, pushing up prices and incentivising South American countries to dedicate more land to soy for export purposes (AVRIL, 2020; Messers et al., 1983; Porter and Bowers, 1983). By the mid 1980s, soy had become vital for the burgeoning oil industry, as would be the case for the domestic pork and poultry livestock industries a decade later. Two key policy actors were instrumental in this shift (Oliveira and Schneider, 2014; Garrett and Rausch, 2016). Firstly, EMBRAPA, a state-owned agency, promoted technological innovations for

adapting the crop to the heterogeneous Brazilian landscapes and soils, improving agricultural technologies for hitherto deemed un-arable lands (Garrett and Raush, 2016), as well as leading the efforts to master pork and poultry industrialised operations (Oliveira and Schneider, 2014). Secondly, in the private sphere, the buyer power and corporate lobbying of domestic edible oil companies, organised collectively through the Brazilian Association of Vegetable Oil Industries (ABIOVE) group since 1981, were fundamental to the uptake of soy for the human edible fats sector. In addition, following a period of overproduction in the early 2000s, the crop would also become key to the growth of the biofuel industry (Ponte, 2014).

Hence, the insertion of Brazilian agri-businesses into the soy global value chain resulted from a mixture of coalescing factors, emanating from both public and private drivers. The former played an essential role in the crop's expansion across the Brazilian territory, thus setting the scene for soy agribusinesses to flourish. The latter successfully engaged in promoting the business opportunities available from embracing a hitherto novel crop for the country. For one, throughout the process of liberalisation and internationalisation of the Brazilian economy - especially the removal of export taxes and price support mechanisms - agri-food industrial clusters adapted to the new context by reorienting their business models. The ABIOVE group turned to raw beans exports, despite having previously prioritised vertical integration with the animal proteins sector. ABIOVE originally focused on crushing soy for its animal proteins nodes, managing to concentrate around 22% of the country's total crushing capacity of soy, particularly in the south (Oliveira and Schneider, 2014; Soondergard, 2014; interview R_013). Crucially, while still highly focused on the domestic market during the first identified period, the chain operated with easily identifiable lead firms organised in agri-food clusters (ABIOVE and ANEC), embedding the two crucial functional positions: the soy processing stage and the industrialised animal protein sector. Expressed in terms of GVC governance theory, this organisation

structure constituted a high level of *drivenness,* emanating from the midstream and downstream nodes. Subsequently, as the chain evolved into further integration with global agri-food and animal protein industries; a global soy-animal protein complex took shape and the role of 'global buyers' was then shared with food retailers and food services companies coordinating the chain through their buyer power. International companies provided new stability for the Brazilian node with the setup of future contracts transactions and infrastructure deployment. At the upstream nodes, this meant important shifts were taking place, reflected in the insertion of soy farming cooperatives into global markets (Garrett and Raush, 2016; Wesz Junior, 2016).

From bipolar to multipolar GVCs

So far, we traced the origins of the contemporary soy-animal protein chain complex, describing this as a bipolar value chain - constituted by public and private chain actors. Importantly, the multipolarity lens captures the significance of out-of-the-chain actors - at this stage, the Brazilian state - in shaping macro-level chain governance. Even if we ignore the role of the state at this stage, Brazilian soy-animal protein GVCs of the 1990s and early 2000s would still be a poor fit with the theoretical model of an unipolar chain. The latter generally refers to a value chain with one node –typically, retailers or branded manufacturers— exercising power and coordination capacity over other chain actors. In the case of the Brazilian chains described above, we observed the concentration of power in not one but two nodes: soy processing and animal proteins. Crucially, both for the pre-liberalisation and contemporary chains, such a characterisation (a unipolar chain) fails to consider other chain stakeholders with relevant participation in the internal dynamics of the chain. This omission is significant if, when accounting for the complexities of designing, implementing and monitoring the sustainability governance of the chain, the main focus of attention is directed to a single node of the chain. To illustrate, at present, lead firms are not limited to those large soy processors and traders (the so-called

Big Five group: ADM, Amaggi, Bunge, Cargill and Louis Dreyfus) and the ABIOVE and ANEC clusters. At the upstream node, the germplasm and agricultural inputs industry - seeds, fertilisers, herbicides - similarly represents a constellation of powerful firms *vis-a-vis* farmers. Recently, the sector has been under scrutiny with a recent wave of global consolidation, referred to as 'from Big Six to Big Four', specifically mergers between Bayer and Monsanto; Dow, DuPont, and Corteva; ChemChina and Syngenta; and BASF with no mergers (OECD, 2018). Also at the upstream node, an assumption and generalisation of farmers as fully captive or powerless oversimplifies and misrepresents the complex structure of soy production in Brazil, which includes small individual farmers, collectives of farmers organised in cooperatives, large-size family farms and entrepreneurial farmers oriented to export markets (Vander Vennet et al., 2015, interviews R_2, R_9, and R_10). Finally, at the downstream node, the role of the lead firms in agri-food chains is generally assumed to be played by consumer goods retailers and food services. However, in the soy-animal protein chain traders, processors and animal-protein manufacturers share significant bargaining power *vis-a-vis* other chain actors. Amaggi, Bunge, Cargill and other multinational firms perform multiple functional positions along the chain (interviews R_04, R_06, R_08).

In sum, the Brazilian GVC for soy constitutes a multipolar chain, given its structural complexity and the dispersal of power across multiple, sometimes overlapping, nodes. Importantly, the inter-firm governing strategies of lead firms at the midstream and downstream have heavily shaped overall chain governance, e.g. multinational soy processors and traders are vertically integrated with some performing farming and animal protein manufacture (interviews R_04, R_06, R_08). Consequently, these two elements, the multipolarity and the inter-firm governing strategies used by powerful chain actors, underpin the hybrid sustainability framework introduced earlier. In the next section of the paper, we turn to its analysis by disentangling the influence exerted by previously

deemed out-of-the-chain actors that now are explicitly operating *within* the chain. Here we observe a second element indicating a multipolar chain: namely, other macro-level determinants (sustainability considerations) have also increasingly shaped the chain.

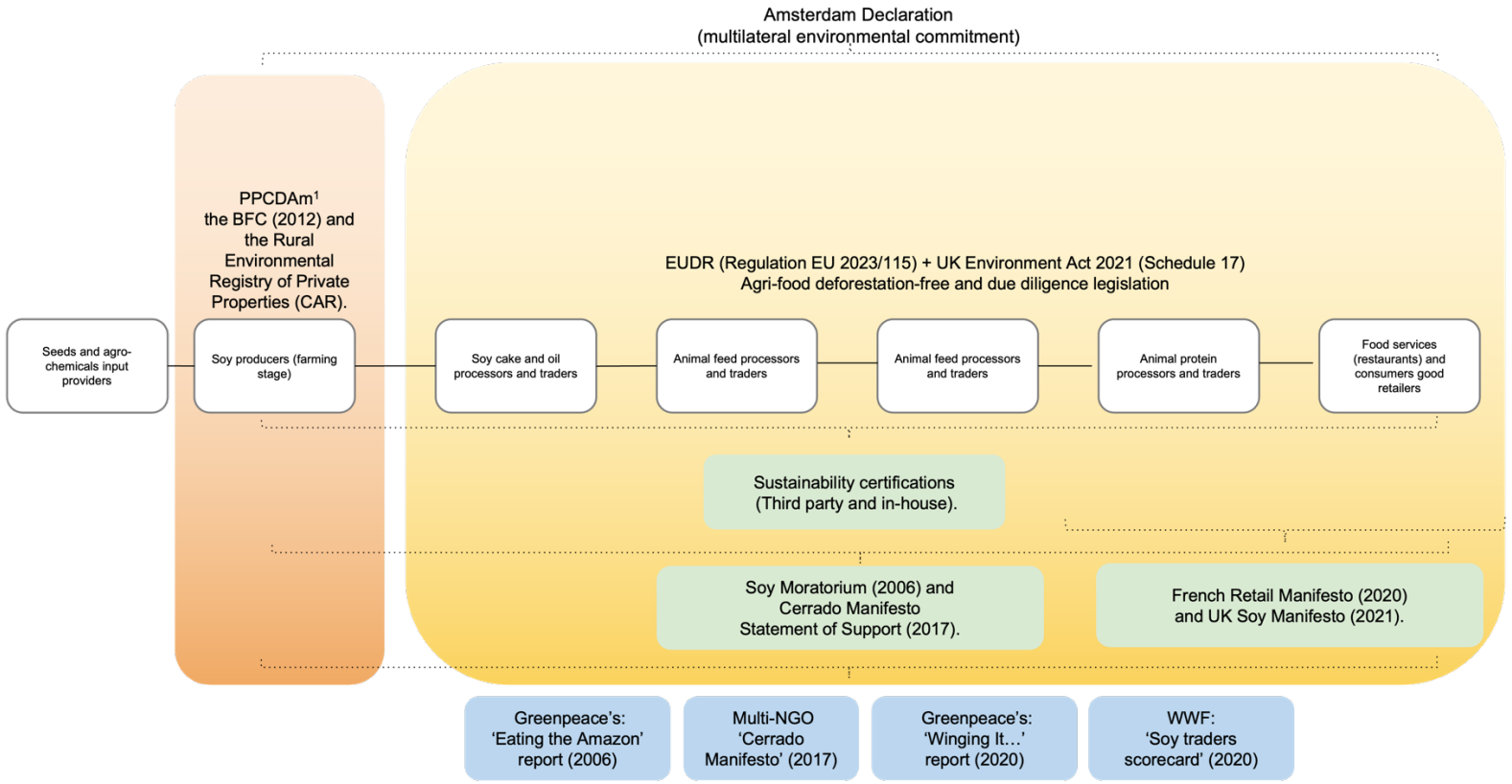
Multipolar GVCs and hybrid sustainability governance

The hybrid sustainability framework for the soy-animal protein chain is depicted in a simplified graphic representation in Figure 1. While we include the most prominent instruments relative to our case study, Figure 1 is not an exhaustive representation of all the mechanisms and initiatives coexisting today. We contend the multipolarity of the chain has recently reached its maximum level to date - in terms of the presence of multiple governing drivers - with the launching of the European and UK Due Diligence regulations. These regulations add additional layers to an already crowded governance framework, including two multi-stakeholder deforestation moratoria, various in-house and transnational private sustainability certification schemes, as well as Brazilian government legislation. We represent these mechanisms in Figure 1 as the colour blocks traversing some of the nodes representing the soy-animal protein chain complex. The rationale for the stylised graphic representation is to underline the main scope of action of each governing instrument; in other words, to underscore which chain actors ought to be influenced by each regulatory mechanism. To illustrate, while the EU and UK regulations are targeting soy (and other deforestation-risk commodities) importers, the expected outcome of effectively complying with the rules would be synonymous with cascading the environmental considerations applied by midstream and downstream actors (Bager et al., 2021; Berning and Sotirov, 2023; Rudloff, 2022; Sotirov et al., 2022). Hence, the yellow block representing those hybrid regulations covers almost all nodes.

i. Environmental regulation through private governance

Applying a multipolarity lens to the Brazilian soy-animal protein chain suggests an initial, bipolar governance structure, heavily shaped by both the state and soy agribusiness. By the 2000s, however, following a sustained period of economic liberalisation and industry restructuring, the state's role became less prominent (Muller, 2005). Accordingly, environmental NGOs targeted multinational agribusinesses (foreign and Brazilian-based) operating in the trading and processing nodes. The most celebrated case of this was the lobbying activities and direct action of Greenpeace, culminating in its 2006 *Eating up the Amazon* report and, more significantly, the Soy Moratorium (SoyM) agreed the same year. This report's main focus were the agribusinesses, but the Brazilian state was not spared, with Greenpeace claiming it was not fulfilling its regulatory prerogatives in regulating the land use change associated with soy (Greenpeace, 2006, p. 9). The report and the campaigning that accompanied it brought global awareness of soy's expansion into the Brazilian Amazon's native vegetation and appealed to lead firms by underscoring the chain control they exerted at both the midstream and downstream nodes (interviews R_1, R_2, and R_3).

Figure 1. The Brazilian soy and EU+UK animal-proteins value chain complex under a hybrid sustainability governance framework



[1] PPCDAm Action Plan for Prevention and Control of Deforestation in the Brazilian Amazon.
[2] BFC: Brazil Forest Code

Note: European and UK hybrid regulations are represented with the yellow block, the Brazilian regulations for land use change (and environmental conservation across rural properties) with the orange block, the NGOs-led initiatives demanding chain actors' action to halt deforestation associated with their soy businesses with the blue block, and finally the green blocks represent midstream and downstream firms-led initiatives.

The knock-on effects kindled by Greenpeace's name-and-shame report came primarily from close-to-end-consumer European stakeholders. To illustrate, a quick alliance was built with ABIOVE and ANEC, representing Brazilian soy exporters and traders, aligned with international branded food services companies, including McDonald's (Gibbs et al., 2015; Hospes et al., 2012; IMAFLORA, 2016). Importantly, some European stakeholders were previously engaged with local NGOs and the private sector in setting an early agenda for soy's sustainability with the foundational criteria for the Round Table for Responsible Soy (RTRS) and its associated certification, under discussion since 2004 (Hospes, 2012; Schouten and Bitzer, 2015). A similar mix of actors was behind the private certification designed by European third-party certifiers for non-GMO soy: ProTerra and Cert-ID (Heron et al., 2018).

Since Greenpeace's 2006 report, a growing number of NGOs have called on lead firms and governments to do more to delink the soy-animal protein chain complex from land use change and the pervasive impacts to native inhabitants of the most affected biomes (APIB and Amazon Watch, 2024). The Cerrado Manifesto is among the most relevant examples, as with it, NGOs and civil society organisations demanded attention towards the expansion of soy plantations into the Cerrado savannas (Bastos and Persson, 2020). The tactic, however, has evolved and downstream firms have been targeted more directly through either name-and-shame activities or with commitment and consensus-building sectoral strategies (WWF, 2020). In 2020 Greenpeace launched its '*Winging It. How the UK's chicken habit is fuelling the climate and nature emergency*' report, which accused the British poultry industry and global fast-food brands of indirectly supporting deforestation by failing to disclose traceability data of the feed used by their suppliers (Greenpeace, 2020). A different approach has been adopted by the WWF with its '*Soytraders scorecard. How committed to a conversion-free industry?*' (WWF, 2021).

Regardless of the chosen strategy, many midstream and downstream coalitions have gradually put in place voluntary commitments to de-link their soy businesses from being associated with deforestation. These commitments have been articulated through a variety of business roundtables and industry fora (see green boxes in Figure 1 for some examples).

As referenced earlier, theoretically speaking, the adoption of TEG is said to be a function of the brand sensitivity of global businesses, the degree to which these firms are consumer-facing and hence their responsiveness to changing consumer preferences (Bartley, 2018; van der Ven, 2019; Ponte, 2019). From this perspective, the actions of consumer goods retailers and food services companies supplying animal proteins (e.g. McDonald's, Kentucky Fried Chicken, Nandos, etc.) are in line with what we would expect to see. On the contrary, it would not be expected that 'brandless' midstream firms, generally invisible to final consumers, would engage with TEG. However, many processors and traders did so in the form of self-regulatory sectoral commitments, first in 2006 with the SoyM and a decade later in 2017 with the Cerrado Manifesto Statement (green boxes at the mid-section in Figure 1). Such behaviour can be interpreted as both a means to protect their sectoral reputation and, more importantly, to reinforce their power in determining access to and roles within the soy value chain (interviews R_013). Importantly, both commitments - the SoyM and the Cerrado Manifesto Statement of Support - essentially meant traders and processors would refrain from using soy grown in land deforested after specific cut-off dates; for the Amazon biome with the SoyM originally after 2006 (Gibbs et al., 2015), then extended until 2008 (Rausch, 2021).

In sum, the multipolar characteristics of the soy GVC created the conditions in which out-of-chain actors –specifically, international environmental NGOs— co-shaped the rules of chain governance: specifically, their environmental preferences became part of the criteria to define how

and where soy could be produced. This did not mean, however, that the inter-firm power relationships between upstream actors (farmers), global buyers of soy and lead firms (processors and traders) were necessarily changed. In fact, these relationships have remained fairly stable despite the incorporation of mechanisms to determine chain membership based on environmental criteria. To illustrate, those traders and processors that were promptly engaged created their own sustainability agendas independently. At present, most big traders have in-house standards or sustainability programmes; e.g. ADM: responsible soybean standard; Bunge: pro-s; Cargill: Triple S; Louis Dreyfus: Responsible Soy Solution (IDH, 2023), thus adding layers of compliance for actors directly interacting with them, e.g. captive farmers and others keen to penetrate Global North markets. Put another way, the lines separating the use standards for the purpose of economic governance and the use of standards to meet environmental criteria became increasingly blurred. So, too, did the lines separating the standard setting power of in-chain actors - farmers, traders, processors and buyers - from out-of-chain actors - NGOs and, increasingly, activist governments in Europe.

On the demand side, an additional element enlarging the macro-level polarity of the chain is found in the form of Multilateral Environmental Agreements (MEA). In recent years, numerous EU member states, along with Norway and the UK, have engaged with a deforestation-free policy agenda for their agri-food imports. The European Commission began a process of formulating deforestation policies in 2008 (Bager, Persson and dos Reis, 2008); later, in 2015, a group of EU states (Denmark, France, Italy, Netherlands, Norway, Germany, alongside the UK, which was still a member of the EU at the time) endorsed the multi-stakeholders agreement, the 'New York's Declaration on Forests' via signing the Amsterdam Declaration on Deforestation. With these declarations, the EU sent a clear signal of their alignment with multilateral sustainability governance efforts for global agri-food supply chains. More significantly, it represented a rejection (albeit implicitly at this stage) of the status quo

associated with market-based forms of environmental regulation, as states sought to influence and ultimately shape models of commodity governance. To illustrate, the Declaration on Palm Oil declared that 'Europe is the second largest global import market for palm oil and home to some of the world's biggest brands and companies. Europe can be an important 'game changer' when it comes to a sustainable palm oil supply chain for the world' (Amsterdam Declarations, 2019). In other words, these states were arguing for a new model of environmental regulation - in partnership with private sector firms and NGOS - with the potential to reconfigure soy GVCs, not just at the macro levels, but possibly at the meso and micro levels, also.

ii. Legality mandates and soy chains: Brazilian land use change and the European deforestation-free legislation

After two decades, efforts to promote 'sustainable soy' through private voluntary regulations has had negligible impact in turning the tide away from deforestation. While land clearance has dropped significantly in the Amazon, soy plantations continue to expand in the Cerrado biome (zu Ermgassen et al., 2019). A number of public instruments, however, now coexist alongside private-led initiatives. First, the Brazilian Forest Code (BFC), was launched in 2012 to bring back to life an outdated 1960s land-use change regulation (see Figure 1, orange block). Second, there is the recently published European Union DR and UK 'Forest Risk Commodities' legislations, that are in their initial stages of implementation. In essence, these mechanisms regulate land use change and share the aim of halting illegal deforestation, although from different ends of the chain. The BFC delineates two available types of land use for rural landowners: agricultural use and conservation and restoration, which varies across the Brazilian territory (for a detailed explanation of the BFC procedures see Chiavari and Lopes, 2021). The enforcement of the code is mainly through compliance with registering in the Cadastro Ambiental Rural (CAR) and with the development of restoration plans. The EU and the UK are part of the family

of regulations aiming to incorporate sustainability goals into trade policies (Rudloff, 2022), hence targeting the demand side. Crucially, with the incorporation of these three instruments, the sustainability framework for the soy-animal protein chain effectively becomes hybrid as it comprises both private and public regulatory mechanisms. This hybridity forms another layer of governance in the GVC for soy and, we suggest, serves to extend the polarity of the chain as foreign directives encroach upon domestic land use regulations and TSS already in place. However, the extent to which the presence of novel macro-level determinants will exert an additional influence on chain actors is yet to be seen. Soy importers based in Europe are soon to be subject to mandatory due diligence monitoring and reporting. Subsequently, the expectation is that more midstream actors will demand compliance with the BFC from their suppliers. In the case that legality demands travel all the way to the upstream node, following previous research, the prospects for complementarity between private and public instruments would be significant (Lambin et al., 2014; Pirard et al., 2023). However, the implications for the overall sustainability of the soy-animal protein chain are less certain. On the one hand, the internal demand for soy in Brazil is not expected to be influenced by the hybrid governance framework. On the other hand, soy exporters in Brazil work with less environmentally-conscious trade partners - not least, China - are unlikely to face incentives to modify their behaviour. Evidence shows that in enforcing the BFC the Brazilian government, both at national and sub-national levels, is facing significant challenges, e.g. limited capacities to enact sanctions when deforestation is detected (Chiavari and Lopes, 2016) or keeping the pace with detection of novel and changing patterns of deforestation, which lately have turned to clearing land in smaller patches to reduce the chances of being detected by satellite imagery (Azevedo et al., 2017).

Conclusion

A hybrid sustainability governance framework is aiming to delink the soy-animal protein chain from its associated environmental consequences, primarily land use change in Brazilian biomes. It comprises private, voluntary and public domestic and international regulatory mechanisms. Previous evidence on the governance of agri-food supply chains indicates that the presence of multiple privately-led regulatory options has led to a 'race to the bottom' scenario (OECD, 2016). Even so, private initiatives have addressed regulatory gaps when state capacities are suboptimal; and in interaction with public command and control regulations, there is potential to create scenarios of complementarity (Lambin et al., 2014; Pirard et al., 2023). For several agri-food value chains, the sustainability governance literature has dedicated significant attention to the influence and effects of sustainability standards and certifications; however, the analyses of hybrid regulatory frameworks are less developed.

In this paper, we have unpacked the extant hybrid sustainability governance framework for the Brazilian-EU soy-animal protein chain. In doing so, we have engaged with the GVC scholarship and the transnational environmental governance literature to assess the implications of multipolar governance structures for sustainability governance. More specifically, we have developed a conceptual framework along the lines of the multipolar GVCs heuristic first proposed, but not tested, by Ponte and Sturgeon (2014). In doing so, we have shown the analytical value that the multipolarity concept holds for understanding the dynamics for structural complex GVCs –particularly at the intersection of economic and environmental governance—. Our analysis points to the permeability of chain boundaries in two important respects. First, the lines separating the use standards for the purpose of economic governance and the use of standards to meet environmental criteria become increasingly blurred. While lead firms use product standards as an expression of power to determine the conditions in which upstream suppliers participate within these chains, in the case of the

environment it may well be the case that this standards-setting power needs to be shared or perhaps is outside of the reach of lead firms altogether. Second, and related to this, the multipolar framework we have developed challenges the reification of chain boundaries; that these boundaries are increasingly permeable to out-of-chains actors (states, NGOs etc), with the potential to influence and even determine the 'rules of the game' with GVCs - at the macro, meso and micro levels.

Returning to the specifics of our case, the results show that, in its origins the Brazilian soy-animal protein chain was characterised by a bipolar chain structure, driven by the state and agribusinesses. We argue these origins are a significant factor when it comes to analysing contemporary sustainability governance. Specifically, it sheds light upon the presence of strong state influence and the role of powerful domestic midstream and downstream nodes; this insight, in turn, informs the analyses around the political feasibility of sustainability governance mechanisms. Additionally, in examining the macro level governance, we contend the chain is increasingly shaped by external driving forces, particularly organised civil society in the form of NGOs, public land regulations in the form of the Brazilian land use change framework and EU and UK regulatory agendas. These actors and processes have shaped, and continue to shape, the chain's governance by institutionalising claims regarding the need to tackle environmentally destructive outcomes. More importantly, they delineate responsibilities and accountability at different chain nodes. While the results of the full implementation of the identified hybrid sustainability governance framework are yet to be observed, we contend a GVC analysis underpinned with a multipolarity lens is pertinent to examine the potential outcomes and limitations of these sustainability mechanisms.

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Appendix

Interviews list

#	File code	Language	Role & Organisation	Code
1	001_181116_001_Interview	English	Director, Sustainability standard	R.001
2	002_181121_001_Interview	English	Head of Agricultural Policy and Stakeholder Affairs, Germplasm and farming inputs	R.002
3	003_181122_001_Interview	English	Soy Sector Coordinator, TNC	R.003
4	004_181122_002_Interview	English	Director, Agricultural, energy and infrastructure firm	R.004
5	005_181123_001_Interview	English	President/Executive Board - Sustainability standard	R.005
6	006_181123_002_Interview	Portuguese	Social and Environmental Sustainability Manager - Agri-firm (soy trader and processor)	R.006
7	007_181123_003_Interview	Portuguese	Food Chain Relations and Sustainability Manager - Agri-firm (soy trader and processor)	R.007
8	008_181123_004_Interview	Portuguese	South America Sustainability Manager - Agri-firm (soy trader and processor)	R.008
9	010_190226_001_Interview	Portuguese	Smallholder (c. 800 ha), certified farm (CAT)	R.010
10	011_190226_002_Interview	Portuguese	Smallholder (c. 800 ha), certified farm (CAT)	R.011
11	012_190226_003_Interview	Portuguese	Independent Auditor	R.012
12	013_190226_004_Interview	English	Vice-president - Brazilian third-party organisation for agribusiness	R.013

Chapter Three

Leaderless value chains and environmental upgrading: evidence from the Mexican beef sector

Paulina Flores-Martínez

Abstract

In this paper, I investigate the (under-) provision of environmental sustainability governance for agro-food commodities. Working with the case study of the Mexican beef industry, I examine the drivers and obstacles to a small but growing set of sustainability governance initiatives. I contribute to an expanding literature seeking to explain why agri-food chain actors located in Global South participate in the design and uptake of transnational environmental governance (TEG) mechanisms. I do this through engaging with the GVC scholarship on environmental upgrading and broader studies on the sustainability governance of agri-food commodities. Drawing on interviews and secondary data sources, I develop a GVC mapping exercise to characterise the type of chain under study and interrogate whether chain actors are subject to drivers to pursue environmental upgrading, or else to engage with sustainability governance initiatives. I then investigate the role of out-of-the-chain actors in promoting or preventing environmental upgrading and sustainability governance. My findings show that, contrary to GVC expectations, the main external driver influencing chain actors is not found in the demand for environmentally upgraded beef coming from global 'big buyers'. Instead, I show that it is the economic incentives that the initiatives offer upstream actors. I explore the influence of two crucial out-of-the-chain actors, NGOs and the state, to delve further into the establishment of the initiatives and the implications for achieving sustainable beef in the future.

Keywords: beef, environmental upgrading, certifications, global value chains, standards.
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Introduction

Like elsewhere in Latin America, the experience of three decades of neoliberal policy reform in Mexico has led to the transformation of its agricultural system, marked by corporate consolidation and integration into regional and global markets. The trade, welfare and food security implications of this transformation have been the subject of an extensive academic literature (e.g. Dyer et al., 2018; Nadal, 2000; Jaramillo, Yunez-Naude and Serrano, 2016; Puyana, 2012). Conversely, the environmental implications of this transformation have received much less scholarly attention (for exceptions, see Galván, Walker and Warf, 2015; González 2014 and 2020). In this paper, I address this omission through an investigation of the embryonic attempts to govern the environmental consequences of Mexico's agricultural transformation. To do so, the paper draws on the interdisciplinary literature examining the emergence and uptake of sustainability governance mechanisms for agri-food commodities embedded in global, regional and domestic value chains. Specifically, it engages with two separate but complementary scholarships: the global value chain (GVC) literature on environmental upgrading and the transnational environmental governance literature. Accounts rooted on the former have offered explanations for the uptake of sustainability standards as a result of expectations of economic upgrading, whereby lead firm chain actors tend to impose additional requirements on suppliers. The latter, however, provides a wider engagement with other explanations than those relative to firms.

I inform the analysis with two interrelated strands of the GVC-based interdisciplinary scholarship that offer a lens for understanding the efforts to improve the sustainability of the global economy through environmental upgrading strategies. On the one hand, I review managerial and business accounts discussing the drivers for chain actors, mostly lead firms, to engage with environmental upgrading and continue to inform the shifts to greener versions of industries (Poulsen

et al., 2016). On the other hand, I review a subsequent critical strand of GVC-based accounts that emphasise the use of environmental upgrading strategies as an additional means for lead firms to exercise control over supply chain actors (de Marchi, di Maria, and Ponte, 2013; Ponte, 2019). In addition, I draw on interdisciplinary accounts exploring the prospects for private, non-state or hybrid sustainability and social governance emerging within Global South contexts (Schleifer and Sun, 2018; Sun and van der Ven, 2020; van der Ven, Sun and Cashore, 2021). Here, I incorporate a growing scholarship providing an analytical framework to incorporate the analysis of upstream actors' perspectives and responses to sustainability governance dynamics. More accounts are exploring the emergence and consolidation of private regulation - social and environmental standards are generally expressions of such a type of regulation - in cases where the Global North is not the primary end market (Schleifer and Sun 2018), or else where South-to-South trade is consolidating (Langford et al., 2023) and in which the relevance of the domestic markets is in need of further analytical attention, for one, in conceptualising domestic markets as regional, local or domestic value chains (Langford, 2021). Finally, to depart from the tendency to overlook the possibilities for other actors to lead or co-lead environmental upgrading processes, including the state, I echo scholars calling for rethinking the point of entry when theorising with the GVC lens, thus opening conceptual space to direct the analytical efforts to actors other than lead firms (Krishnan, 2017). I pose two interrelated questions. First, how do environmental considerations enter regional and domestic agri-food value chains? Second, to what extent environmental considerations reshape value chain dynamics and configurations?

In answering to the research questions above, my substantive contribution is based on the specific case of the beef value chain in Mexico and local sustainability initiatives that have sprung up in recent years. I unpack the drivers and dynamics behind these initiatives and provide an analysis that encompasses chain and out-of-chain actors. I begin with a brief value chain mapping exercise based,

in the first instance, on a standard GVC 'top down' model in an attempt to identify the lead firm or firms driving environmental upgrading processes. Building on calls for further research into the agency of other actors (Krishnan, 2017; Krishnan, de Marchi and Ponte, 2023), I then depart from standard GVC assumptions to analyse the behaviour upstream actors, independent of the presence or otherwise of 'lead firms'. In doing so, I reveal the extent to which these upstream firms are responding to conditions of low competitiveness and environmental pressures simultaneously. Secondly, I highlight the entrepreneurial role performed by NGOs in bringing chain actors, both downstream and upstream, to engage with early proposals aiming to align the chain with more sustainable practices. In a sense, the influence of NGOs is the first external driver lead firms are facing, but its influence is not limited to firms; instead, NGOs target upstream actors simultaneously, albeit with different strategies. Thirdly, I reflect on the influence and participation of the Mexican state, in contrast to the rather limited attention afforded to traditional forms of political authority in previous GVC scholarship.

Methodologically, the article draws on a qualitative research design, consisting of document analysis and semi-structured elite interviews. The study was conducted in three stages. Firstly, to map the Mexican beef value chain (with its global and regional strands), I identified, selected and analysed primary source documents related to the evolution of the beef industry, its regulation and current marketing policies. Secondly, I identified national and international NGO and public programmes that led the agenda on 'sustainable beef rearing'. Thirdly, to triangulate the preliminary findings and to gain an in-depth understanding of chain and out-of-chain actor priorities, concerns and perspectives towards the environmental upgrading initiatives, I conducted 30 semi-structured interviews. The sampling strategy was purposive, and it was followed up by snowball sampling. Most interviews were held online via video calls (Zoom) and held in Spanish (one in English). While semi-structured, a differentiated set of guiding questions was used for each type of stakeholder: farmers and farmers'

organisations, midstream actors (fatteners, processors and retailers), public servants and government officials, and NGOs, think tanks and other civil society actors (see Table 1). Interviews were recorded, transcribed and anonymised. Using pre-existing and emerging themes from transcripts, I inductively coded findings into topics covering the main perceived environmental, economic and social challenges, knowledge and perception of environmental challenges, and consequences for the beef chain. Interviews were used to understand chain actor motivations for participation (or otherwise) in the identified initiatives as well as to gain insight into the contextual obstacles to implementing the initiatives.

Table 1 Interviews' sample description

Informant group & abbreviation	Type of actor	Number of informants
Farmers (F)	Cattle farm owner engaged with any of the identified initiatives.	5
Cattlemen and feedlots organisations (CM-F)	Cattlemen association or feedlot association representative.	2
NGOs, Think Tanks and Civil Society (NG)	Manager, lead manager and regional technician.	7
Academia (A)	Researchers	5
Government (G)	National and subnational (state) level representatives.	10
Consumers goods firm (CG)	Processors or retailers	1
	Total	30

The rest of the paper is structured as follows: the next section reviews the two main research areas developed by GVC scholars when identifying how and why chain actors engage with environmental upgrading processes. The third section presents the analysis developed for the four identified

environmental upgrading initiatives operating within the Mexican beef value chain. Ultimately, the paper shows that the four identified initiatives amount to an embryonic sustainability agenda for the Mexican beef chain through promoting environmental upgrading across different nodes of the chain. These findings, however, are somehow at odds with the literature suggesting that environmental upgrading is mostly explained by lead firm demands and that the state role is mostly passive. Through unpacking the drivers for chain and out-of-the-chain actors, the paper concludes that within a Global South context in which value chains differ from the ideal type of a 'buyer driven' governance structure, it is essential to look at the incentive structures for upstream actors, independent of the presence or otherwise of lead firms. These conclusions are presented in the fourth section.

GVCs, environmental upgrading and sustainability governance

Regulating the environmental footprints of geographically dispersed chains forming global interconnected businesses is a highly complex task. Over the past three decades, for agri-food industries such a task has increasingly been addressed via the design and uptake of transnational environmental governance (TEG) mechanisms (e.g. private sustainability standards, certifications and Corporate Social Responsibility (CSR) strategies). These regulatory frameworks have caught the attention of scholars across multiple disciplines. For one, early strands of expanding interdisciplinary literature progressed the understanding of TEGs as instruments showing evolving regulatory capacities for both the state and non-state actors, firms and NGOs in relation to global environmental endeavours (Clapp, 1998; Cashore, 2002). The main thrust of the literature revolved around the reflection on the broad political changes underpinning TEGs.

The political significance of TEGs as borderless rules, which are fundamentally distinct from traditional state-led regulations, is not usually among the main concerns for business and managerial

accounts framed within the GVC approach. Instead, generally, scholars working with the GVC framework engage with the uptake of sustainability standards, certifications and other expressions of TEG, across chains and networks via analyses of chain environmental upgrading (De Marchi, Di Maria and Micelli, 2013; Gereffi and Lee, 2016; Poulsen, Ponte, and Sornn-Friese, 2018; Poulsen, Ponte and Lister, 2016). The concept of environmental upgrading has been defined as 'the process of improving the environmental impact of value chain operations – including production, processing, transport, consumption and waste disposal or recycling' (Poulsen, Ponte and Lister, 2016, p. 84); or else 'the process by which actors modify or alter production systems and practices that result in positive (or reduce negative) environmental outcomes' (Krishnan, 2017, p. 312). To explain such processes GVC accounts typically distinguish between two types of drivers that apply either to lead firms or their suppliers, but in practice the former has received far more attention than the latter. Internal drivers are defined as factors that chain actors leverage to enable strategic choices, like increasing efficiency or early movers foreseeing future profit gains or to sustain contracts (Khan et al., 2020, Ponte 2020, p. 5; Poulsen et al., 2018). External drivers, meanwhile, refer to changing consumer preferences and resulting demands, or regulations themselves. Internal drivers are distinguished by proactive upgrading: that is, chain actors changing their strategic behaviour to enter new markets or anticipate incoming shifts in regulations, or changes in consumer preferences and retailer demands.

Within the early GVC scholarship on environmental upgrading, the tendency was to focus the analysis on the role of lead firms while the study of upstream on suppliers actively engaged in environmental upgrading were rare (for an exception see de Marchi, 2013). Most documented cases refer to an understanding of environmental upgrading strategies as lead-firm strategies in chains corresponding to the 'buyer-driven' chain GVC model (Gereffi, 1995). Hence, environmental upgrading has been characterised essentially as a lead-firm demand made upon captive suppliers (de

Marchi, 2023; Khan et al., 2020). To illustrate, in their pioneering account, Jeppesen and Hansen (2004) argued that Northern transnational firms engage in environmental upgrading mechanisms as the very purpose of a business transaction or instead as an unintended consequence, e.g. an externality of a business transaction. In other words, seen as a business transaction, a firm would pursue environmental upgrading either because they trade environmental goods (e.g. timber or tropical fruits), or else because improving the chain's environmental credentials was profitable. Alternatively, in the case of externalities, a Northern firm would engage in upgrading because it fulfils other tier buyer-firm's needs, e.g. a processor demands upgrades to first tier supplier, or else to a second-tier supplier, which might itself be acting in response to retailer demands.

What does lead-firm-imposed environmental upgrading entail for captive suppliers?

The role and participation of upstream chain actors has mostly been explored by a critical strand of the emergent literature. In general, it is expected that suppliers will engage with environmental upgrading to maintain their functional position, just like midstream and downstream actors do, but for suppliers it means survival within the chain. Hence, suppliers accept buyers' environmental upgrade requests to 'remain in the game', despite the fact that the adoption of upgrades may translate into further rent extraction for them (Ponte, 2019; Khan et al., 2020). In short, the costs of adjusting to environmental upgrades are typically borne by suppliers, not buyers. Ponte (2020) has documented this pattern in detail and argued that, by using environmental upgrading strategies, lead-firms ultimately become contributors to heightened inequality, specifically reproducing Global North-South unequal relations (Ponte, 2020, p. 2).

Two cases depicting the typical Global North demand and Global South trade pattern are illustrative of heightened inequality concerns. In their analysis of Pakistani apparel manufacturing,

Khan, Ponte, and Lund-Thomsen (2020) explore the 'factory manager dilemma' to reveal tensions that suppliers face when coping with environmental upgrading requirements that global buyers impose on them. Khan and her co-authors describe the role of suppliers as 'absorbers' of global buyers' unsustainable practices at the expense of the former's profitability. For one, the costs of certification, audits, consultancy fees and product testing are paid by suppliers, which are effectively cleaning the chain for the sake of the buyer's reputation in their home market. In this specific case, these upgrading demands come with little compensation, for instance, in the form of financial incentives of price premiums for manufacturing firms in Pakistan. In the same vein, Goger et al. (2013) provide an account of Sri Lankan-based apparel manufacturers that engaged with the building of 'eco-factories' to respond to a proposal from the British food and clothing retailer, Marks & Spencer's (M&S). They suggest the buyer (M&S) relies on environmental upgrading to extract higher concessions from their suppliers and to make business sense from CSR practices. To some extent, their findings underscore strategic opportunities both for the retailer as well as for a handful of early-mover suppliers (large Sri-Lankan manufacturers). Despite the factories representing an avenue for enhanced long-term competitiveness, the costs of the investments are largely absorbed by suppliers and without a price premium or improved contracting arrangements for incurring the costs associated with the building of eco-factories (Goger et al., 2013).

As elaborated above, the business and managerial literature on environmental upgrading has evolved from early engagement concerned mostly with explaining the drivers motivating lead firms to green their chains, to critical analyses of the implications carried by those decisions upon suppliers. Similarly, concerned with the effects on suppliers, recent interdisciplinary accounts provide evidence of social and environmental downgrading at the upstream node. An example is found in Krauss and Krishnan (2021) with their analysis of the upgrading dynamics for the Nicaraguan cacao and Kenyan

horticulture production networks, showing that the uptake of the UTZ certification (for cocoa) and the GlobalGAP (for horticulture) led to environmental downgrades. The former allowed greater use of agrochemicals than before certification was implemented while the latter demanded the replacement of indigenous production techniques with the pr mono-cropping (Krauss and Krishnan, 2021, p. 12 and 17). In pointing out the social and environmental downsides stemming from environmental upgrading, scholars are interrogating the limitations of the mainstream GVC operationalisation of the 'environmental upgrading' concept. In her work on Kenyan horticulture farmers, Krishnan (2017) called for an investigation of environmental upgrading with a different epistemology that allows 'moving away from the centrality of global lead firms and large organisations and go into exploring the agency of suppliers/farmers, to better understand local dynamics'. In doing so, the agency of Southern actors, particularly upstream actors, gains further analytical attention and expands our understanding of environmental upgrading processes beyond that of lead firms. In turn, this move opens up space to explore the reasons why upstream firms commit to environmental upgrading, independent or at least partially independent, of the preferences of downstream buyers.

The turn to the agency of upstream actors resonates with concerns coming from a broader literature engaged with unpacking how sustainability governance is shaped from, and for, Global Southern contexts (Sun and van der Ven, 2020; van der Ven, Sun and Cashore, 2021). Importantly, this emergent strand distinguishes itself from earlier discussions focused on examining upstream actors' perspectives and responses when facing external market standards. For instance, a nurtured research agenda has been built on investigating the economic outcomes when Southern suppliers adhere to Northern standards (Barrientos, 2016; Giuliani et al., 2017; Khattak et al, 2015). By contrast, recent accounts are studying the prospects for the emergence of effective sustainability governance when trade patterns differ from the traditional Global South supply/Global North demand (Kloster

and Mercado-Celis, 2016); or else, when certifications, standards and other governance mechanisms target new or emerging markets (Schleifer and Sun, 2018). Similarly, among the emergent scholarship, authors have questioned the usual conceptualisation of the role and position of the state. For instance, early discussions on TEGs shared a strong tendency to explain it, at least partially, as a result of governments showing limited capabilities and resources for regulating the environmental consequences of transnational economic activity (Bernstein and Cashore, 2007). However, the evolution of private regulatory mechanisms governing the sustainability of global supply chains has meant more initiatives are hybrid and thus, further research is needed to examine whether the hypothesis of 'the absent state' remains a plausible hypothesis to explain TEGs. For the Global South context, the implication of this oversight is that the complex relationship between the state and market actors that shape economic and sustainability governance processes is missed. Underpinned by these insights, in the next section I present the analysis of local initiatives promoting the sustainability governance of the Mexican beef chain through environmental upgrading processes.

Prospects for governing the sustainability of beef in Mexico: unpacking four environmental upgrading initiatives

Globally, the livestock sector is associated with approximately 14.5% of human-induced GHG emissions (Gerber et al., 2013), with beef and milk accounting for 41 and 20% respectively (Gerber et al., 2013; Ripple et al., 2014). Beef emissions derive mainly from the land-use changes required for growing feed crops, and through extensive grazing and intensive rearing systems (feedlots). In addition to emissions associated with land use change, two main greenhouse gases result from beef livestock agriculture: methane (CH4) and nitrous oxide (N2O). Thus, while the GHG emissions associated with beef production have attracted most of the scholarly and practitioner attention, the sector is also heavily implicated in growing water scarcity, pressure over water repositories and biodiversity loss

(Gerber et al., 2013; Weis, 2013; Willett et al., 2019). In what follows, I analyse four initiatives (see Table 2 below) recently developed in Mexico to tackle some of the aforementioned environmental externalities.

These initiatives were identified through web-archival research and documentary analysis. Initial findings were triangulated with data obtained through semi-structured interviews with key stakeholders identified during the research. The four initiatives share the goal of promoting environmental upgrading across the chain and most are led or co-led by environmental NGOs and multi-stakeholder partnerships. Three out of four (the BioPasos project, the TNC RITERs project and the NAMA) promote upgrades to the downstream node via strategies that aim to alter extensive rearing practices and associated features pertinent to environmental impacts. The BioPasos project has concluded its official operation lifetime, the TNC RITERs continues in operation and the implementation of the NAMA is pending. The Roundtable targets midstream and downstream nodes, but so far it has made only limited progress. I use the remainder of this section to present the analysis of the chain actors' motivations for participating in the identified initiatives, as well as obstacles to implementing the initiatives. Following the early studies on GVC environmental upgrading, my analysis begins with a simplified chain mapping exercise for the contemporary Mexican beef chain. This mapping exercises allows us to identify the presence and identity of lead firms - and whether and to what extent there are external factors influencing the uptake of environmental upgrading mechanisms.

Table 2. Four NGO-led projects leading the environmental upgrading of the contemporary Mexican beef value chain.

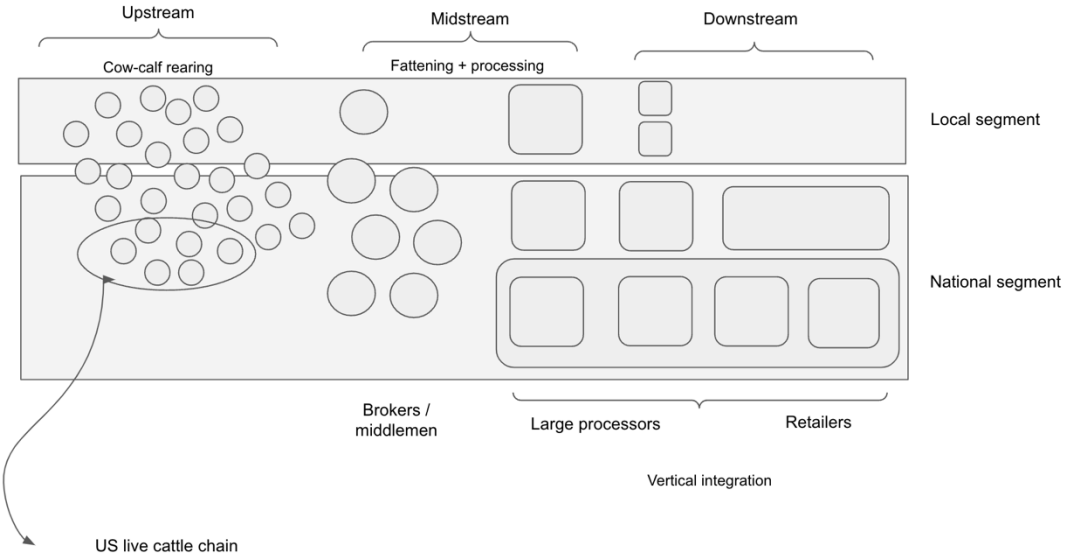
Project name / Organisation	Lead actor and type of actors	Period (operative)	Targeted states or regions	Main instrument	Main goal
BIOPASOS (Sustainable Biodiversity and Livestock Landscapes') Project	CATIE. Multistakeholder (public and independent members) and funds from German International Climate Initiative (IKI)	2016 - 2021	Jalisco (Midlands) Campeche Chiapas - lowland deciduous or dry tropical.	Field Farm Schools offer training for rotational grazing systems.	Improve smallholders or subsistence farmers, local instructors/qualified agricultural technicians, and local institutions' knowledge on sustainable beef-rearing practices. Ultimately, BIOPASOS aimed to improve smallholders' livelihoods and simultaneously contribute to biodiversity restoration. **Main strategy:** training smallholders on rotational grazing systems (deemed sustainable versus traditional grazing), Voisin rearing techniques, alternative feeding and animal health management strategies.
The Nature Conservancy Mexico	International NGO with local office.	2017 - ongoing	Yucatan Peninsula (Mayan rainforest) and Chiapas	RITER Regenerative Ranching and Agriculture – R2A.	Promote the construction of cohesive agricultural and beef local farmers networks. Farmers receive training on sustainable practices for agricultural and beef-rearing systems with the goal of economic upgrading and climatic resilience.
NAMA for extensive rearing	International organisation with National government	2018 - 2020	10 States (out of 32).	Sustainable technologies toolkit	Reduce extensive beef rearing GHG emissions through the implementation of improved rearing practices and linked technologies. **Key targets:** minimising GHG emissions, ensuring animal wellbeing, zero deforestation, and minimising LUCS.
Roundtable for sustainable beef	Multistakeholder (private independent members) - Led by WWF Mexico (local office of American WWF). Formerly led by TNC Mexico.	2014 - 2018 and 2019 - present	National level	Roundtable itself and its agreements across the value chain.	To set up the Mexican Roundtable with the key stakeholders in the sector that will discuss and agree on how to incorporate a sustainable approach to all the activities of the beef and milk value chains in Mexico. **Key targets:** minimising GHG emissions, ensuring animal wellbeing, zero deforestation, and minimising LUCS.

The contemporary Mexican beef value chain: are lead firms interested in environmental upgrading?

After 1983, neoliberal economic reforms, culminating with the launch of the North American Free Trade Agreement (NAFTA) in 1994, served to radically transform Mexico's food system and rural economy (Dyer et al., 2018; González, 2014; Galván et al., 2015; Nadal, 2000). For the Mexican beef sector, the reforms were synonymous with the emergence of new actors, the privatisation of state-owned enterprises and consolidation of incumbent private firms. Changes are now visible at both the midstream and downstream nodes. To illustrate, the consolidation of the current largest beef processor, packer and leading exporter, SuKarne-Grupo Viz, began in the mid 1990s. SuKarne has all the hallmarks of a quintessential lead firm, simultaneously seated at the midstream and downstream nodes, and accounting for a significant share of the domestic and export-oriented markets. It operates in more than 12 countries, is positioned as the top exporter of Mexican beef to the USA and has a domestic and regional network consisting of large-scale feedlots, export-certified slaughterhouses and end-consumer retail points that expand across Central America. Alongside the emergence and consolidation of large and mid-size meatpackers, the contemporary beef industry has been similarly marked by the expansion of supermarkets. At present, over 30 supermarket chains operate across Mexican territory. Yet, the food retail sector is dominated by three leading firms: Walmart (which opened its first store in 1991), followed some way behind by Soriana and Chedraui (COFECE, 2020). Walmart has the largest share of the market and faces very low competition, with 87% of its nationally spread locations having no competitors (COFECE, 2020). While the domestic market consumes beef from a diversity of outlets, with traditional butchers and wet markets still significant, around 60% of Mexicans live in urban localities where large retailers are the main players. Figure 1 offers a simplified representation of the contemporary chain.[1]

[1] A distinction between two different segments is used to describe that two main end markets are represented: the local and the national. The former refers to beef transactions concentrated in proximity or the same geographical area where

Figure 1. A stylised representation of the contemporary Mexican beef value chain



While the downstream node has been significantly reoriented to export markets –SuKarne ranks 5th supplier of packed beef to the USA— the chain is better characterised as domestic and regionally-focused. The upstream node is highly fragmented, comprising thousands of individual small farms involving cow-calf production systems from which cattle are later provided to brokers, feeders or feedlots systems and for live export (see Figure 1). Weaned calves are sold to intermediaries called *'acopiadores'* (cattle brokers in Spanish, similar to the *'coyotes'* term that is also used for other agri-food chains) which are usually regarded as being in a key position for value capture. The reason for this is that these firms face fewer risks than upstream actors and show better bargaining possibilities regarding processors' demands (preferred animal weight and size of herds to be sold). Generally, there are no long-term contracts between farmers and brokers, nor with processors and meatpackers.

cattle are reared and fattened. The latter to transactions that involve cattle travelling across national territory, e.g. from Southern states to Northern states.

Thus, interactions between upstream and midstream actors are closer to arms-length market transactions. This general case differs from the business model implemented by SuKarne, which engages with intermediaries (brokers) through coordination rather than direct ownership, and transmits its preferences and demands - cattle features, such as weight and absence of diseases and pests - to farmers via brokers sourcing from over 100,000 farms (SuKarne, 2023). While it is difficult to extrapolate from SuKarne's business model to other meatpackers, the case exemplifies important integration dynamics that are shaping the chain. Furthermore, inferring from SuKarne's example, it would be expected that given the type of relationship between an industrialised meatpacker and the consumer goods retailers that midstream actors can be characterised as captive suppliers. In short, it is unlikely that mid- and large-size meatpackers are relatively powerless *vis-a-vis* downstream players like Walmart. In this case, the chances for retailers to impose environmental upgrading demands on first or second tier suppliers is significantly reduced.

What drives downstream actors to engage with the Roundtable for Sustainable Mexican Beef?

Considering that the described chain differs significantly from most cases documenting lead-firm-imposed environmental upgrading processes, both in its chain structure and market orientation, a puzzle emerges: what are the drivers, if any, for lead firms to demand or engage with environmental upgrading processes? As presented above, early business and managerial scholars working with GVC lenses distinguished two drivers explaining environmental upgrading. First, external pressures influence chain actors, e.g. either changes in consumers' preferences or in regulations that ultimately demand environmentally improved products. Secondly, internal drivers are said to emanate from chain actors' search for increased efficiency or to leverage forthcoming opportunities of larger value capture, e.g. by being early movers in adopting more sustainable production practices. Here, the lack of publicly available downstream-imposed environmental upgrading can be interpreted as an absence of at least

one of the two types of drivers. However, from observed levels of engagement with the Roundtable for Sustainable Mexican Beef, it can be inferred that lead firms have faced at least one external pressure: namely, NGOs calls for engaging with their initiatives. Importantly, the pressure is shaped mainly in the domestic context and is not directly linked to Global North demands. It should be noted, however, that the two NGOs underpinning the foundation and current operation of the Roundtable are the Mexican branches of two Northern-based organisations: WWF and The Nature Conservancy (TNC).

Generally, NGOs' steering efforts are understood as synonymous with the external influence needed to drive environmental upgrading processes across the chain (de Marchi, 2013; Ponte, 2019). According to interviewed representatives, the table's goal resonates with their agendas on conservation and habitat restoration, given that the challenges associated with extensive and non-regulated livestock rearing are present across several Mexican biomes in which they intervene. To illustrate, WWF has initiatives for the Chihuahuan desert, the Neo-volcanic system and the Mayan Forest (interview #5NG). The latter is one of twenty-four global deforestation fronts that WWF is advocating to urgently protect and put under immediate restoration policies (Pacheco et al., 2021). Furthermore, an interviewed NGO representative acknowledged the need for transitioning to sustainable agriculture and livestock farming practices in Mexico is essential because:

> 76% of its territory (Mexico) is to some extent used and transformed by livestock rearing activities. Then, 53% of its territory is under extensive and non-regulated rearing with high to very high impact to ecosystems. The remaining 23%, from that 76%, is used for growing crops directly incorporated into livestock feed' (interview #5NG).

Yet, while the NGOs' influence set off a decade ago (with the Roundtable's initial constitutive meetings held in 2014), as of the time of writing the strategies and indicators that it will use to achieve its overarching goal – to collectively contribute to the transition towards sustainable beef and milk

value chains (WWF, 2021) - are not publicly available, nor is a baseline for measurement of progress and evaluation. The evidence thus indicates sluggish development of this initiative. This in turn conveys an additional puzzle regarding what are the prospects for effective, and timely, reshaping agri-food value chains through the multi stakeholder roundtable mechanism. By their nature, roundtables aim to bring multiple voices to the sustainability discussion, hence, to find common grounds for action and transformation. But invariably, the complexity of arriving at agreements and consensus grows as more voices and different interests interact, and sustainability is interpreted according to different interests and logics. To illustrate, over the years different midstream and downstream firms have joined the table, including the lead consumers goods retailer (Walmart), the two largest milk processors (Nestlé Mexico and Lala), the above-mentioned largest meat packer and exporter (SuKarne – Grupo Viz), and the largest livestock farmers lobbying association, the National Cattlemen Organization (CNOG). Additionally, at least one financial firm (CitiBanamex) has participated. After several stages of negotiations over legal matters, at present the roundtable has around 35 members (interview #5NG). The engagement of these firms has varied over the years. In the words of two NGO representatives, between the initial conversations in 2014 and 2022, some 'big names' decided to leave the Table for a couple of years, in some cases more, because of the time and effort needed to establish the foundational steps and definition of milestones. However, the interviewees showed confidence that lead firms will show committed participation in the short term driven by market pressure, global trends and mirroring their peers abroad:

> I'm certain those who have not yet returned will be here soon, because globally pressure is increasing. e.g., Walmart in the USA is starting its traceability program. This will reach Mexico soon and how will these big brands achieve such demands? Through our work, they won't have another way around it. They cannot only announce sustainability goals without proper work. (interview #5NG).

The NGO argument illustrates a crucial factor regarding external influences shaping the chain, namely: the gravitational pull of the US market. Accordingly, the industry has organically reorganised

the fattening stage ('finishing') into a feedlot system reflecting an alignment with the American chain. The National Association of Feedlots (AMEG) has operated as a lobbying group since the mid 1990s, and increasingly more and more herds go through feedlots in search of efficiency by producing animals faster and cheaper. In the words of an interviewee, 'they (feedlots) give the current Mexican beef chain a closer resemblance to the American way of finishing beef' (interview #4A). In short, targeting the preferences of the U.S.A. market - both for live cattle and packed beef - has effectively reshaped the chain structure; the feedlot node emerged both to support the trade with the USA, but also to achieve similar efficiency gains (mimicking US production methods) for beef destined for the Mexican domestic market. As of mid 2023, there are no American environmental upgrading demands whatsoever for live cattle or packed beef imported from Mexico. So, for the Mexico-USA trade relations, chain actors are not yet expecting to accrue more value through sustainability upgrades. Some stakeholders (e.g. the AMEG and CNOG) are aware that this is likely to change soon because of the enforcement of the 'Protein Pact USA'. The Pact is an industry-led coalition lobbying for the American protein industry and it is underpinned by the narrative of aligning the industry with human health and sustainability commitments. As was expressed by one interviewee, the implementation is around the corner, and it will likely influence Mexican farmers exporting to the U.S.A. (interview #1CM-F).

What drives farmers' engagement with the BioPasos and RITERs projects?

For decades, the livestock veterinary, business and agricultural economics literature documenting the Mexican first-stage beef-rearing practices have deemed the activity as economically inefficient (Parra-Bracamonte et al., 2020). A key concern is low productivity, understood as low rates of cattle reproduction (González et al., 2019). Interviewed stakeholders expressed a shared belief that the first-rearing beef farming node is not profitable enough (interviews #10A, #20F, #21F, and #22F).

Upstream actors pointed out that the most relevant and costly challenges for their business include a) ensuring healthy herds; b) securing enough feed availability, c) ensuring adequate provision of water and infrastructure; and d) dealing with the relatively recent additional challenge of cattle smuggling. Overall, failing to overcome these challenges translates into profit and investment losses (interviews #20F, #21F and #15G). Specifically, from the smallholder perspective, the costs of animal health and feed is considered unbearable, with the burden of animal disease being the most important risk. The latter is responsible for most of the animals' development both in terms of time and resources (feed, water, veterinary drugs, etc.). Whenever cattle illnesses and pests are poorly attended, farmers risk losing their capital investment. For a smallholder beef livestock farmer, losing an animal represents a lost venture which imposes financial constraints for the coming rearing cycle and other agricultural farming activities that they may simultaneously perform. It is estimated that, in low-income and developing countries, livestock disease kills approximately 20% of ruminants (Grace et al., 2015). Comparatively, brokers face fewer risks as they aim to trade with feeder farmers or beef processors, as exemplified by the SuKarne business model. Thus, brokers are responsible for rearing for a shorter period than first-rearing stage farmers and subsequent feeding stages. Yet according to some sources, smallholders stick with the beef business as it represents a venture with higher profits than other agricultural businesses, mainly mainstream crop farming (interviews #10A and #14A). In many cases, for small and mid-size holders, owning cattle is seen as an investment instrument given that it is expected that farmers can sell their animals pretty much at any stage of the rearing process. Therefore, if needed, additional income can be received by reducing herd size (interviews #20F, #24F and #25F).

Attending to the financial constraints that smallholders face, both the BioPasos and the RITERs projects were framed with a dual aim: to develop beef farmers' skills towards sustainable ranching practices and to achieve better financial gains. In turn, such an aim ultimately would lead to the achievement of some of the NGOs' broad goals, e.g. biodiversity conservation in livestock-

affected landscapes (interviews #3NG, #4NG, #14A). Ultimately, both initiatives incentivise farmers to transform their rearing practices towards more efficient systems while reducing associated environmental harms, e.g. to minimise soil depletion, increase the diversity of grasses, bushes and trees, and to practice rotational grazing instead of the mainstream extensive non-monitored grazing. Aligned to the narrative of 'agroecological systems' versus monoculture extensive pastures, the BioPasos project successfully created 'Farmer Field Schools' (FFS) for beef cattle farmers, mainly smallholders, to learn about best practices in animal nutrition and appropriate use of pastureland to avoid soil erosion and degradation (interview #3NG). In total, 1,200 beef farmers participated in the BIOPASOS Field Farm Schools. Similarly, the Nature Conservancy (TNC) initiative involves creating and operating 'Territorial Innovation Networks' (RITER by its acronym in Spanish), which are farmers' networks in which integral management of agroecosystems and sustainable productive intensification are promoted. The RITERs use a 'problem-based' approach to the training scheme that initiates with the identification of lead farmers performing sustainable practices, followed up by enabling social learning processes facilitated by the NGO and partners (interviews #7NG and #14A). Interviewed participants, both independent frontrunner farmers and farmers who engaged with the capacity-building initiatives, reported they were better off via reduced costs of animal health maintenance and less dependent on subsidised water provision and infrastructure (interviews #19F, #21F and #24F). Similarly, some expressed that they gained an enhanced reputation amongst their peers and farmers' associations because implementing environmentally upgraded rearing practices has improved their profit margins (interviews #21F, #24F, and #25F). Some are aware of knowledge spillover effects, e.g. farmers not involved with the BioPasos or the TNC RITERs are expressing interest, to those interested in learning from the initiatives' proposals (interviews #21F and #22F).

In sum, two drivers explain farmers' uptake of the BioPasos and the TNC RITERs projects. Firstly, the potential economic upgrading outcomes associated with the changes promoted by the two initiatives. Secondly, according to interviewees, and interlinked with the first condition, the training performed by NGOS fulfilled a role previously performed by the state (interviews #7NG, #21F and #14A). Crucially, the two drivers have meant that farmers could reap economic upgrading with minimal interactions with other chain actors, e.g. brokers or large meatpackers. However, while interviewees cited cases in which farmers have transformed a significant number of their mainstream practices, e.g. shifting to rotational grazing and use of non-agrochemical animal health techniques, the added value created has proven elusive. The reason for this was in neither the traditional wet markets nor when selling to brokers buying for SuKarne, did farmers face demand for sustainably reared heard or sustainable improved beef (interview #3NG, #7NG). An exception was for those small groups of farmers (usually women), which came together to establish short supply chains: that is, a processing and selling facility for their produce (mostly for dairy rather than beef), reaching the final consumer directly and disclosing the origins and sustainability features of their produce.

Importantly, while opening new markets was not a key priority for any of the three NGO-led initiatives, the skills that farmers gained through participating meant that farmers were better at coping with environmental pressures synonymous with low profitability. In this case, then, the intertwined environmental and economic upgrading trajectories are still somehow independent from the downstream node of the chain. Yet, some NGO representatives acknowledged they are liaising with large processors and retailers to bring them on board through financing their projects (interview #3NG and #5NG). The aim of creating novel end markets where the added value of sustainable practices is captured, e.g. for a 'sustainable beef', is found in the Nationally Appropriate Mitigation Actions (NAMA) for Sustainable Extensive Cattle Ranching for Mexico, which is the fourth identified

initiative under study here. A key distinguishing feature of the NAMA, in comparison to the other three initiatives, is the coalition of actors behind its design: namely, a third-party research organisation (the IICA) and the Mexican Agriculture Ministry. The latter actively participated in the technical preparation and negotiation processes required to create the initiative. This distinctive feature, the state's participation in the NAMA initiative, as well as the presented evidence that farmers lack public-led training on the environmental consequences of their activities, calls for further analysis on how the state plays a role, or not, around the sustainability governance of the beef chain in Mexico. In analysing the NAMA, I turn to this task next.

Towards a greener Mexican beef? The role the state in Mexico's private environmental governance landscape

As we have seen, the general tendency in the broad scholarship investigating transnational sustainability governance is to assume that states, either individually or participating in international coalitions, are either unwilling or unable to regulate the environmental consequences associated with global value chains. Recent contributions, however, focusing on the prospects for governing the sustainability of agri-food chains in the Global South have challenged this general characterisation. In analysing the four initiatives identified, there is evidence that the Mexican state has so far been either incapable or/and unwilling to regulate the environmental consequences of the beef industry. At the same time, there is counter evidence that it has supported and engaged with the initiatives. Specifically, two different roles for the Mexican state can be distinguished. The first role is that of a regulator with two discordant agendas: namely, environmental and agricultural (including livestock) policies. Importantly, the agricultural policy reflects a strong prioritisation of policies that encourage economic upgrading and further integration into global markets. The second role refers to the state being an endorser, supporter and in some cases a leader promoting environmental upgrading initiatives.

Regarding the first role, that of a regulator, the interviewed NGOs' representatives and academics shared a common understanding that Mexican public policies have heavily focused on the economic and industrial upgrading of the export-oriented nodes, while the regulation of the environmental risks associated with agricultural practices and livestock husbandry has been mostly non-existent (interviews #6NG and #11A). For representatives of the capacity-building initiatives, the agricultural and environmental policies are incoherent and operate without clear shared goals amongst the two agendas (interviews #3NG and #7NG). According to one of these representatives, while interacting with national and subnational level governments they faced challenges given that the two policies are still implemented as if their goals were independent on one another, although they acknowledged there are efforts from national level government offices to build bridges between them (interview #3NG). A key example is found in the NAMA initiative, co-led by the national government, which aims to reduce GHG emissions associated with beef in Mexico. Recent data suggests livestock emissions are around 73.3M tonnes of CO_2e, accounting for 10% of total GHGs domestically emitted and 71% (50.1 MtCO2e) associated with beef livestock (SEMARNAT-INECC, 2018). The main proposal of NAMA is for farmers to perform ranching practices incorporating one or more options of sustainable practices and technologies from a curated toolkit, according to their own needs and possibilities, ultimately leading to the minimisation of the GHGs associated with livestock.

Yet, the complex situation refereed by interviewees regarding putting in action the NAMA speaks about the priorities so far addressed by the Mexican government, which ultimately receive more attention than sustainability concerns around the beef chain. In the words of a NAMA representative, the dynamics of sub-national governments, as well as limited public-administration capacities, have impeded the originally proposed states from participating (interview #6NG). When interviewed, most state-level public officials were vaguely aware or completely unaware of the NAMA document despite

the fact that the sample of interviewed states was precisely aligned with those included for the NAMA pilot stage (interviews #15G, #16G, #17G and #18G). In contrast, a shared sense of accomplishment stemmed from public officials boasting about their success in enforcing the phytosanitary policies for the eradication and correct remediation of bovine diseases that could significantly undermine profits for all chain actors (interview #12G). In other words, the regulation of phytosanitary standards is amongst the top governmental priorities both at national and subnational levels. This translates into officials using a significant number of resources, including time, to comply with the United States Department of Agriculture (USDA) requirements (interviews #12G and #13G), to ensure the live cattle exports face the least trade disruption possible.

Related to the second identified facet in each of the four identified environmental upgrading initiatives, there has been some type of support and endorsement by the Mexican state, observed at different levels and to different extents. For those cases in which the local authorities have supported the initiatives, this was expressed as authorities being collaborative in organising workshops and providing additional funds for related events and similar engagement activities with local groups of cattlemen (interviews #3NG and #8NG). For three projects (excluding the Roundtable), the support and endorsement of diverse government offices was essential to ensure access to local groups and their pre-established dynamics. Similarly, acceptance and legitimacy of the upgrading initiatives were reinforced given that the NGOs were in alliance with government offices (interview #3NG). The BioPasos operative team encountered several local governments generally keen to receive the project and to support the establishment of it in their contexts. In a similar vein, another interviewed NGO representative acknowledged that the government's role is that of a facilitator for different types of processes, but in their words 'it is not solving almost any challenge along the value chain, nor the low profitability issues beef farmers face, nor the environmental unintended consequences of livestock

agriculture in general' (interview #7NG). Furthermore, local and regional dynamics of patronage and dependence on cash transfers for political gain continue to heavily influence the behaviour of local farmers and government officials, potentially interfering with the changes that the NGO projects were proposing (interviews #14A, #9G, #14G).

Importantly, NGO representatives underscored the capacity and legitimate role of the state as a provider of training services. Several farmers and government officials coincided in asserting that, in general, former farmer training programmes offered by national and sub-national governments have recently declined or been discontinued (interviews #15G). Henceforth, the BioPasos and the TNC initiative filled an 'empty space' with the training programmes their projects were aiming to deliver and ensured that the first step was taken: namely, that the negative environmental consequences of beef farming were identified and acknowledged by farmers themselves. Farmers acknowledged that before joining the initiatives they would reproduce the mainstream farming practices (mainly unsustainable extensive rearing) that cause poor soil health, unhealthy conditions of pastureland and excessive and unregulated use of medication and pests' controllers with unregulated waste management, thus ending up with lower reproduction rates and compromised weight-gain among their herds (interviews #20F, #22F, #24F).

Finally, the studied case shows that in a federal system, as is the case of Mexico, the capacities and willingness to operationalise environmental regulation differs across sub-regions. To illustrate, some state level governments are behaving as frontrunners by incentivising regional cattlemen to adopt more sustainable rearing systems - e.g. the State of Jalisco, which since 2015 has dedicated a reasonably permanent team for the promotion and support of sustainable livestock systems. By contrast, the majority of the federal states have little to no actionable policies for the environmental

regulation of livestock value chains (interviews #7NG and #14A). Moreover, as described above, the interviews with national and sub-national level public officials showed that at the sub-national level (state jurisdiction) the offices in charge of livestock policies are heavily oriented towards improving productivity and safeguarding the phytosanitary status of the state-level herd. The environmental upgrading of livestock agriculture was seen as a pending task by several public officials (interviews #15G, #16G, and #18G). Others stated that the longstanding local dynamics led to farmers preferring state support in the form of non-conditional cash transfers or for, in the words of an official, 'irrelevant, non-adequate support projects for the area that on the top of their inadequacies reinforce a pattern of farmers being adverse to change' (#15G). In sum, a simplistic characterisation of the state as either incapable or unwilling to regulate the environmental consequences of the beef chain in Mexico fails to capture the nuances, dynamics and complexities of state-market interactions.

Conclusions

The proliferation of transnational sustainability mandates, goals and instruments for a plethora of globally traded products and services has received significant attention from an expanding interdisciplinary scholarship. Significant amounts of research are related to the drivers, challenges, limitations and drawbacks for many of those innovations. Regardless of the discipline at hand, most evidence refers to a handful of tropical agri-food commodities, including coffee, cocoa, tea, timber, fisheries and more recently horticulture and oilseeds. In contrast and somewhat surprisingly, few GVC-based studies have focused on governing the sustainability of animal protein chains, which usually come with additional socio-political and environmental complexities. In this paper, I have offered an account of the prospects for governing the sustainability of one animal protein chain, beef. In fulfilling that task, I have provided a substantive contribution to the interdisciplinary debates around the forms and uptake of sustainability governance for agri-food value chains. Specifically, to

answer to the two interrelated research questions; namely, how do environmental considerations enter regional and domestic agri-food value chains? and, to what extent environmental considerations reshape value chain dynamics and configurations?, I have built on two separate but intersected literatures: the GVC studies on environmental upgrading and an emergent scholarship explaining private and transnational sustainability governance within and for the Global South.

Drawing on the GVC approach, I characterised the Mexican beef agri-food industry as a value chain to explore the hypothesis that environmental upgrading is more likely to occur under a unipolar, buyer-driven governance structure. The analysis has been similarly informed by critical accounts using the GVC approach to unpack the implications for environmental upgrading when it is a lead-firm imposed demand. Generally, such accounts argue that under the buyer-driven ideal type, and as result of buyer bargaining power, lead firms impose environmental upgrading requests along other chain nodes mostly to accrue further value capture. Hence any environmental improvement is secondary to chain control goals. Finally, whereas much of the GVC-underpinned accounts for environmental upgrading processes shed light on Global South supply/Global North demand trade patterns, the Mexican beef chain does not fit such a pattern. Instead, I drew on the scholarship stressing the importance of accounting for 'out-of-the-chain actors' –referring to the state, civil society groups and any other stakeholder that is not directly participating in a value chain— understanding and appropriation of sustainability governance within Global South contexts.

My findings show that while the four identified initiatives have mostly worked independently from one another, they have jointly set off a sustainability agenda for the Mexican beef chain via promoting environmental upgrading across different nodes of the chain. Three out of four promote upgrades to the downstream node via strategies that alter the mainstream extensive rearing practices

and associated features currently leading to relevant environmental consequences, many of which have been long overseen by chain and out-of-the-chain actors. One initiative, the roundtable, targets the midstream and downstream nodes; however, it has shown limited progress so far, or it has yet to be publicly disclosed. Looking at the four initiatives as one single movement underpinning a sustainability agenda for the chain, they can be interpreted as an embryonic effort that demands further research to understand the prospects for it to succeed in its ambitions. Importantly, through unpacking the drivers for the so-called 'lead firms', farmers and the state, my research shows that within a Global South context, in a chain that differs from the ideal type of a 'buyer driven' governance structure, upstream actors, e.g. farmers, are likely to engage with environmental upgrading independently, that is without downstream actors' demand as it contributes to the economic upgrading needs they face. However, while the demand-side aspects are not a prerequisite for the upgrading process itself, there is evidence that a broader engagement with it could boost the upgrades for the dispersed supply base. Furthermore, in looking at the role of the state as a relevant stakeholder within the politics of beef in Mexico, I have identified it is perceived both as an enabler and hindering actor for the upgrading initiatives. Hence, the Mexican case exemplifies the risk of characterising Global Southern states as simply unwilling or unable to enact and implement environmental regulatory frameworks for local and regional value chain nodes. In sum, the environmental upgrading of Mexican beef is gaining momentum and the prospects for its alignment with economic upgrading are indicative of significant potential for a broader engagement with the ongoing initiatives to come. However, the evidence shows that for this animal-protein sector it is unlikely that a 'generalisable' model for upgrading is seen in the near future. This should be taken into consideration as it has been shown that farmers are willing to implement better rearing practices while accruing benefits from it. Yet if this willingness to change continues to fall on deaf ears, any potential public good that a sustainability improved beef chain could bring will be lost.

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Chapter Four

Building accountability relationships through sustainability governance

Paulina Flores-Martínez

Abstract

In this paper, I unpack the underlying accountability relationships built with and around public and private sustainability governance mechanisms as for environmentally sensitive agri-food value chains. I offer a comparative analysis based on the two cases introduced in Chapters 2 and 3 - Brazilian soy and Mexican beef - to identify key stakeholders and analyse their roles as accountability claimants. I examine the logic of action underpinning the behaviour of these stakeholders, and their interactions with other stakeholders with respect to different environmental mandates and policy agendas. I conceptualise sustainability governance mechanisms as a source of accountability relationships and analyse the competing interests and preferences that are said to define agri-food stakeholders in the Global South. I interrogate these assumptions while assessing the barriers and enablers to positive collective action towards effective sustainability governance. My findings show that in utilising the accountability lens to explore the drivers behind the engagement with sustainability governance initiatives, it is possible to unpack the prospects for building effective governing mechanisms.

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Introduction

In recent years, the form, uptake and efficacy of transnational environmental governance (TEG) has received significant scholarly attention, especially in the case of agri-food supply chains. This attention has produced vibrant debates between and across numerous academic disciplines, ranging from examining the conditions for the emergence and legitimacy of TEG (Bartley, 2007; 2018; Cashore, 2002), to highlighting the negative consequences for upstream suppliers located in the Global South (Barrientos et al., 2016), to understanding the limitations and unintended effects of TEG, for regulating economic behaviour in line with environmental priorities might impose extra costs to the less powerful actors, for instance. An emergent strand of the debate focuses on the transparency and accountability dimensions of TEGs (Auld and Gulbrandsen, 2010; Mol, 2015; van der Ven, 2019). By underlining these dimensions, an emergent scholarship is drawing attention to the relationship between transparency and accountability - as expressions of global democratic norms - to the actual effectiveness of sustainability governance on the ground (Gupta and Mason; 2014; Gupta, Boas and Oosterver, 2020; Schleifer, Fiorini and Auld, 2019). In this paper, I draw on and seek to extend this intellectual agenda by conceptualising, mapping and then analysing the transparency and accountability relationships underlying the two cases introduced in Chapters 2 and 3: Brazilian soy and Mexican beef. As I have shown in previous chapters, the TEG arrangements in these two cases are at very different stages of maturity.

By analysing their similarities and differences, I provide a theoretical and empirical contribution to recent accounts examining how does accountability relationships emerge from TEGs (Gulbrandsen and Auld, 2019; van der Ven 2019) and global environmental governance in general (Kramarz and Park, 2019). Considering both cases I ask: how do sustainability governance instruments embed accountability relationships and how does this embedding shape their effectiveness? I centre

my analysis on the role of TEG as an enabler of accountability for transnational economic activity linked to negative environmental outcomes (van der Ven, 2019; Kramarz, Mason and Partzsch, 2023). For one, third-party sustainability standards convey a message that chain actors which adhere to them are accountable and hence responsible for the environmental consequences of their actions. In the same vein, through the uptake of and engagement with value chain transparency initiatives actors are held to account either by their peers or broader constituencies (e.g. consumers or society at large). In theory, then, TEG embeds a significant social purpose within value chains - by holding chain actors accountable, for instance, through supply chain transparency or other mechanisms involving information disclosure.

Studies focusing on TEG accountability mechanisms in the context of the Global South remain few and far between. In the absence of these, a common assumption is that developing countries lack the capacity and/or political will to introduce and/or enforce costly environmental measures that threaten to stymie economic growth (Gardner et al., 2019). This common assumption is implicit in the strategies of international NGOs and transnational advocacy coalitions, seeking to achieve 'accountability from without' through Northern-designed standards, certification, auditing and other governance instruments. The assumption that accountability mechanisms are under-supplied in the Global South cannot be discounted. Even so, it is important to verify this empirically rather than by theoretical assumption. As such, my analysis is designed to capture institutional processes and behavioural responses emanating from both global and local sources.

My analysis draws on van der Ven's (2019) pioneering account of private accountability, which he conceptualises as a causal sequence and through the identification of logics of action to explain the engagement behaviour. In addition, I also draw on the GVC approach developed and applied in

Chapters 2 and 3 to define the type of value chain structure for Brazilian soy and Mexican beef. I then trace accountability relationships between chain and out-of-the-chain actors through and within sustainability governance mechanisms and public regulations. Methodologically, my analysis draws on a combination of desk-based archival research, field interviews and participation as an observer in industry online events (e.g. webinars led by NGOs, sustainability standards, sustainability organisations, and government forums). The first stage of the research involved a literature review and documentary analysis of corporate sustainability reports and public regulations. In the second stage, I triangulated the preliminary findings with primary data obtained from key stakeholders' interviews, conducted in Brazil and Mexico between 2019 and 2023. Both sets of interviews were held for exploratory purposes; insights were then used to triangulate with the literature data and documentary analysis findings. The paper proceeds in three sections. First, in the literature review, I engage with the TEG and transparency/accountability literatures. Second, I provide a comparative analysis of Brazil and Mexico incorporating a number of different initiatives relevant to each case. Third, in the concluding section, I offer reflections on the relevance and usefulness of applying GVC approaches to chain structures other than buyer-driven setups and the 'double challenge' that non-state actors face when demanding accountability from both firms and states.

Transparency and accountability through transnational environmental governance

The advent and subsequent operation of TEG mechanisms for agri-food commodities have shed light on the specific loci of globally dispersed environmental depletion associated with key supply chains. Similarly, they have contributed to identifying involved stakeholders and promoted strategies to de-link chains from land use change, biodiversity loss and other environmental consequences. A degree of supply chain transparency has also been built into TEG. Increasingly, however, transparency is an

end itself and therefore an indispensable pillar of the sustainability governance of global supply chains (Gupta and Mason, 2014). Put more straightforwardly, transparency is achieved through information disclosure, hence enabling the establishment of accountability relationships to be built (Poulsen et al., 2021). The potential for transparency to lead to effective sustainability governance, however, is not straightforward (Gardner et al., 2019; Gupta et al., 2014; 2020; Mol, 2015). In short, the mere disclosure of information is rarely synonymous with transformative change within value chain operations (Gardner et al., 2019; Gupta and Mason, 2014; Mol, 2015; Poulsen et al., 2021).

Within the sustainability governance scholarship, an emerging strand of the literature assesses under what arrangements transparency can effectively advance empowerment, democracy and sustainability goals (Mol, 2015). Gupta and Mason (2014) argue that transformative transparency lives up to its potential if it fulfils two tasks: firstly, by making environmental harm visible, in its locus and source; secondly, by empowering the actors receiving the disclosed information to enhanced decision-making and holding accountable those responsible for the environmental harm through improved performance and outcomes. Crucially, critical perspectives have shed light on the idea that transparency is fundamentally a site of political and normative conflict and not a neutral means for the achievement of certain ends (Gupta, 2008). This argument is particularly relevant for the uptake of TEG mechanisms, including information disclosure, within the Global South where conflicting priorities are generally said to constrain the prospects for effective sustainability governance. However, regardless of the obstacles and the geographical location, stakeholders and supply chain actors are increasingly engaged in the supply and demand of different types of information for sustainability governance purposes - ranging from production practices to financial data linked to investment decisions. This trend is what Mol (2015) characterises as a novel "preferred governance norm', which means information disclosure has taken the forms of sustainability standards, certification, auditing as

well as multi-stakeholder disclosure initiatives, and metrics for the assessment of corporate disclosure (e.g. scorecards organised by civil society and environmental NGOs). In theory, the success of these governance norms will enable accountability regarding the environmental and social risks associated with transnational economic activity (Auld and Gulbrandsen, 2010; Mol, 2015; van der Ven, 2019).

Following van der Ven (2019), private accountability in global value chains can be conceptualised as a causal sequence originating from environmentally conscious consumers demanding accountability. These demands are either implicit through the purchasing signals they transmit to consumer-facing firms or indirect through the legitimacy they bestow on environmental NGOs. The initial demands, van der Ven (2019, p. 63) suggests, then travel upstream and, if successful, can lead to changes in production practices. This characterisation offers a useful heuristic for the purposes of my analysis in two ways. First, it contributes to explaining the uptake of TEG mechanisms from the point of view of chain and out-of-the-chain actors, specifically in responding to a demand for accountability regarding the environment. Second, it allows a theoretical unpacking of the different implicit accountability relationships between the involved parties when uptaking (or not, as the case may be) TEG mechanisms. To illustrate, van der Ven (2019) works with the hypothesis that consumers' demand for accountability travels from NGOs to lead firms, to third-party standard setters to Conformance Assessment Bodies, to finally reach consumer-goods producers. The key assumptions in his exercise are the presence of a lead-firm chain governance structure and the demand preferences of consumers. While, for simplicity, van der Ven (2019) works with an ideal lead-firm-driven value chain, another layer of analysis is added when he examines the logic, or the logics, behind each actor's involvement with the demands for accountability. Here, van der Ven (2019) invokes March and Olsen's (2006) distinction between two ideal logics of action in political life: consequence and appropriateness: the former accounts for actions driven in response to rules being rightful and

legitimate; the latter accounts for behaviours explained as a result of rational calculations. Van der Ven (2019) employs the two logics to distinguish the different preferences that stakeholders express through their engagement in accountability relationships. I turn next to the analysis of the accountability relationships in my two chosen cases.

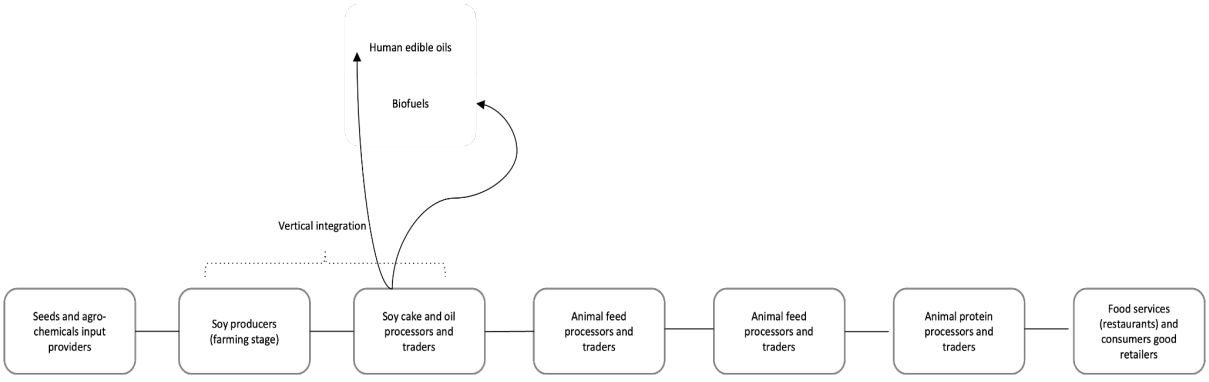
Building accountability relationships for the soy in Brazil and beef in Mexico

In this section, I examine the building of implicit and explicit accountability relationships within sustainability governance initiatives for Brazilian soy and Mexican regional beef. I draw on van der Ven's (2019) conceptualisation of private sustainability governance as a causal sequence of multiple accountability relationships. I extend van der Ven's understanding, however, to incorporate public as well as private initiatives. By incorporating both private and public arrangements, I capture a broader range of relevant examples but also touch on the interaction and crossover between public and private governance. My two cases show different levels of maturity regarding their sustainability governance trajectories. While Brazil is a relatively mature case in terms of implementing multiple sustainability governance initiatives, Mexico is at a much early stage. The analysis is structured as follows. First, I provide an overview of each agri-food industry, its characterisation according to a GVC typology and the main environmental consequence it is associated with. Secondly, I review the sustainability governance initiatives and public instruments while unpacking the accountability relationships embedded within them. In examining these relationships, I explore the extent to which the actions of leading actors are constrained by the accountability mechanisms and hence controllable by the architects of these.

Accountability relationships within the sustainability governance of the Brazilian soy value chain

The soy industry is a cornerstone of the Brazilian agricultural economy; the economic expansions during the last several decades have been associated with the spectacular growth of agribusiness, ranging from soybeans to beef and biofuels. According to the 2017 agricultural census, there were approximately 236,000 Brazilian farms spread across 30.7Mhas, producing soy for domestic and global markets. Over the past decade, soy productivity has significantly improved. For the 2022-2023 global harvest, Brazil contributed roughly 41% of global production (circa 154.5m tons out of the total 370M tons produced globally), most of which is exported to China (EMBRAPA, 2024; Chatham House, 2023). In Chapter 2, I characterised this agri-food industry as a multipolar value chain given two key defining aspects. First, power is dispersed across different functional positions in the chain but is mainly concentrated at the midstream and downstream nodes. Second, the lines distinguishing between economic governance and sustainability governance are increasingly blurred. Importantly, in both types of governance, midstream and downstream firms are increasingly engaging in defining the sustainability criteria for the entire chain.

Figure 1. Simplified soy value chain.



The Brazilian soy value chain has received significant examination due to its association with the deforestation of biodiverse-rich biomes (Strassburg, 2017; Rajao et al., 2020). Dramatic land-use change in the form of native land clearance became globally acknowledged less than two decades ago. In 2006, the environmental NGO Greenpeace launched its *'Eating up the Amazon'* report, igniting the initial debates around de-linking the oilseed industry from deforestation (Greenpeace, 2006). In the past two decades, several nonstate-led sustainability governance mechanisms (sustainability certifications, standards, multi-stakeholder commitments and transparency rules) have been designed and implemented to tackle deforestation in Brazil. Gradually, other environmental and social implications have arisen to the global public agenda over recent years, e.g. the implications on native and indigenous groups living across the lands now transformed into soy plantations (APIB and Amazon Watch, 2020; Bastos and Persson, 2020). At present, governing the sustainability of Brazilian soy is synonymous with a mixture of domestic and transnational governance (see Chapter 2). Yet, many of the challenges for which sustainability mechanisms were created persist; or worse, have multiplied and expanded (Rajão et al., 2020). To illustrate, while it is widely acknowledged that the Soy Amazon Moratorium (SoyM) led to a relevant curtailing of deforestation rates in the Brazilian Amazon, what was initially overlooked was the spillover of soy expansion across the Cerrado region (Strassburg, 2017). The latter has received much less attention than the Amazon biome, despite its relevance for biodiversity and the maintenance of water repositories in Brazil (Cattelan and Dall'Agnol, 2017; Lima et al., 2019; zu Ermgassen et. al., 2020).

Holding midstream and downstream actors accountable via voluntary information disclosure

For the Brazilian soy chain, the first implicit relationship of accountability is found between environmental NGOs and soy processors and traders, most of which are linked to the Brazilian Association of Vegetable Oil Industries (ABIOVE) and Cereals Exporters National Association

(ANEC by its acronym in Portugues) associations. As cited above, since 2006 a handful of NGOs (Greenpeace being the most prominent) have deployed 'name-and-shame' strategies aiming to hold big soy traders and processors accountable for the environmental consequences of sourcing soy grown at the expense of clearing native vegetation in the Legal Amazon and the Cerrado savannas. The 2006 Amazon SoyM and the 2017 Statement of Support for the Cerrado Manifesto were, in part, reactions from the soy traders to the pressure imposed by global and local NGOs. While evidence to attribute direct causality is scarce, some midstream representatives (interviewees) were keen to inform of their participation as leads for the Cerrado Working Group and the Soy Working Group (interview #B_03). In essence, the commitment to these initiatives can be interpreted as 'governance by disclosure' via voluntary mechanisms (Mol, 2015; Poulsen et al., 2021). Thus, lead firms became accountable to NGOs in informing their commitment to stop sourcing soy from deforested Amazonian land with the original cut-off date being July 2006 (Gibbs, 2015). Theoretically, following van der Ven (2019), with this engagement firms also indirectly engage in accountability relationships with final consumers; the engagement is indirect because, in the private accountability causal sequence, it is consumers who transmit an accountability claim to NGOs, for instance via withholding donations (van der Ven, 2019, p. 67).

Secondly, an accountability relationship has been established between Brazilian-based midstream actors (soy traders and processors) and other actors at the same node, or else at the downstream node, e.g. consumer goods retailers, animal protein manufacturers, animal feed manufacturers and food services chains, but located mainly in European importing countries. Specifically, the relationship can be inferred from the uptake of sustainability certifications for soy, which is mostly taking place among European downstream firms; animal-protein feed processors and consumer goods retailers. At present, seventeen sustainability standards are accepted by the European Compound Feed's Manufacturers Federation (FEFAC) as compliant with its Soy Sourcing Guidelines

(IDH, 2023, p. 14). Here, the evidence indicates that the logic of action explaining the uptake of standards by soy processors and traders is consequential, as the repercussions of doing the contrary (refusing to certify or uptake standards) would be to lose the opportunity to export to the European market. Importantly, from this relationship and its underpinning logic of action, it follows then that Brazilian soy processors and traders have a stronger incentive to supply less demanding trade partners, especially China (interviews #B_03, and #B_08). Sustainability governance is rarely associated with Chinese demand. On the contrary, it is generally deemed largely responsible for recent land use changes in the tropics (Fuchs et al., 2019). This type of demand (with no request for compliance with standards) is similarly important for explaining the behaviour of those upstream actors (soy farmers) unwilling to participate or uptake sustainability standards. As some interviewees expressed, farmers have significant opportunities to supply either the Brazilian domestic market or foreign markets that do not impose sustainability criteria. Ultimately, interviewees in Brazil linked sustainability with additional paperwork, bureaucracy and a financial burden (interviews #B_03).

Thirdly, I identify an additional accountability relation implicit within explicit transparency and traceability initiatives implemented over the past decade (which on many occasions are backed up by coalitions of third-party actors, including NGOs). An example is found in the TRASE initiative, which lately has gained prominence in compiling and processing supply chain information and associating with soy stakeholders. With these transparency initiatives, the think tanks and the coalition of actors behind them become the accountability claimants for the environment and search to hold firms accountable via disclosing supply chain information and associated environmental impacts. Under these arrangements, civil society organisations aim to reveal soy sourcing patterns and land use tendencies across the Brazilian biomes, and then link those processes with chain stakeholders. The hypothesis here is that to enable an accountability relationship, firms should react to the disclosed information and change their behaviour in what refers to sourcing soy delinked from deforestation.

To empirically test this hypothesis further research is needed; however, from the support that some lead firms are showing to these initiatives, it can be inferred that chain actors are indeed responding to accountability claims, albeit partially and unevenly. For one, Cargill and Unilever are listed as Partners for the Global Forest Watch Initiative (Global Forest Watch, 2023). Regarding the logic of action underlying the participation of think tanks and NGOs, if one assumes that these operate not primarily for material- self-interest, but to exercise their ethos of duty to the environment, then following van der Ven's (2019) suggested path of reasoning it can be inferred that their logic of action is one of appropriateness.

Holding upstream actors accountable via mandatory information disclosure

A fourth accountability relation for the Brazilian soy chain is established between the government and upstream actors (farmers) through the implementation of a mandatory information disclosure instrument, namely, the 'Brazilian Forest Code' (Lei 12.651). The Code regulates land use change and was launched in 2012 to revive and revisit the prior version from 1965. The Forest Code only came to be after a long and contested negotiation process between agribusiness and the Brazilian government (Chiavari and Leme Lopes, 2016). It regulates around 394 Mha of privately owned lands with the main goal of ensuring agricultural land use aligns with land use conservation and restoration (Azevedo et al., 2017; Leme Lopes, Segovia and Chiavari, 2020; Brock et al., 2021). Substantively, this mechanism relies on mandatory information disclosure for the types of land use within each rural property. In essence, it demands landowners maintain natural vegetation reserves within their properties, according to a set of guiding criteria relative to biome characteristics (Chiavari and Leme Lopes, 2016). To illustrate, landowners in the Legal Amazon must reserve 80% of their land untouched and restore native vegetation where needed. For the Cerrado, 35% must be preserved. The percentage varies across the rest of the territory according to the establishment of two types of natural

reserves: first, Permanent Preservation Areas (PPAs); and second, the Legal Forest Reserve, which requires landowners to designate and maintain a percentage of their land for reserve. Complying with the BFC requires landowners to register their properties in the National Rural Registry (in Portuguese, the Cadastro Ambiental Rural, or CAR). Hence, in the case of the BFC, the identification of a logic of action underpinning the engagement of stakeholders is straightforward. Rural landowners ought to comply with the code by registering in the CAR and establishing reserve areas to avoid sanctions, in the form of fines. Hence, a logic of consequence is most likely explaining the uptake of the regulation. While imposing fines and monitoring deforestation (enforcing the instrument) has proven challenging, Azevedo et al., (2017) found that farmers have complied with the code, given the right financial incentives - e.g. registering in the CAR allows accessing additional lines of credit (Azevedo et al., p. 7654).

To summarise, so far, I have discussed four accountability relationships that emerge from the sustainability governance mechanisms established for the Brazilian soy value chain. Three relations are implicit and stem from the pressure exerted by out-of-the-chain actors on key soy stakeholders. The fourth relationship is explicit and relates to a traditional state-oriented 'command and control' policy instrument. In short, these accountability relationships rely on both voluntary and mandatory information disclosure (see a summary of these relationships in Table 1). In essence, these mechanisms revolve around delinking the chain from illegal deforestation. As a multipolar GVC (see Chapter 2), it follows that the external actors' agency is understood as a driver that influences soy chain governance. This is relevant for understanding the effect of the NGOs' intervention so far described. Here I deem they have played a significant role as accountability-claim makers vis-a-vis lead firms, which includes those located at the downstream and midstream nodes of the chain. Although it remains to be empirically tested whether firms have responded directly to NGOs' pressure, midstream and downstream firms in Europe have generally shown a gradual engagement with the sustainability

agenda. As shown, in some cases firms have started direct collaboration with NGOs, e.g. the working groups created by firms to interact with NGOs in support of the SoyM and the Cerrado Manifesto. Similarly, while the enforcement of the BFC continues to be a major endeavour, the instrument embodies a formal and mandatory accountability relationship between the state and upstream actors.

Table 1. Identified accountability relationships for the Brazilian soy chain

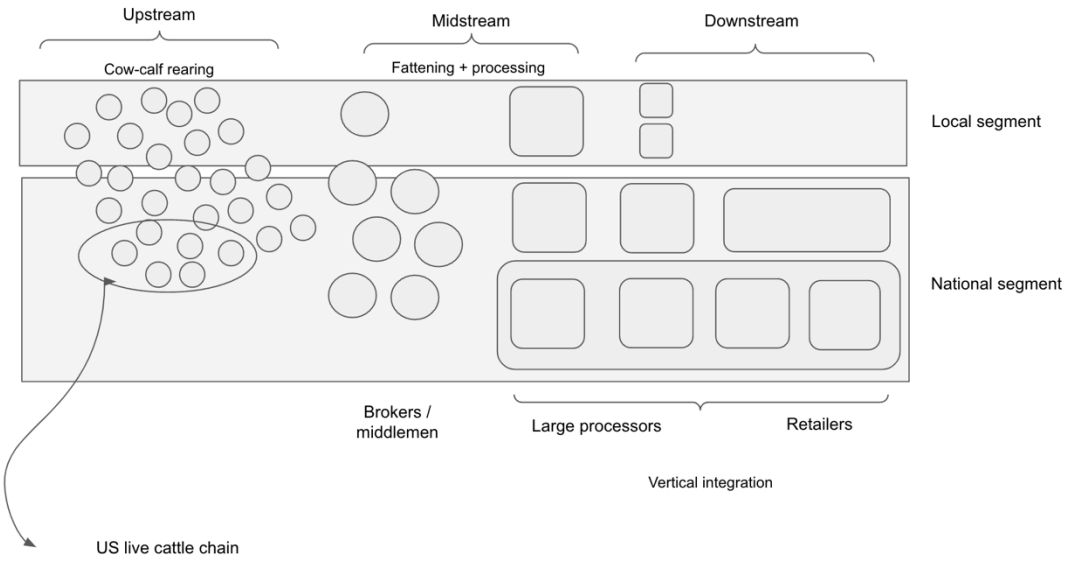
Type of accountability	**Strategy, initiative or instrument**	**Involved stakeholders** **1. Claimant.** **2. To be held accountable.**	**Logic(s) of action**	**Information disclosure: voluntary or mandatory**
Private	Name and shame strategy.	1.NGOs. 2.Agri-food firms (midstream and downstream).	NGOs: appropriateness Agri-food firms: consequentialist	Voluntary
Private	Sustainability standards and certifications.	1.Downstream and midstream firms. 2.Soy farmers (suppliers).	Agri-food firms: consequentialist Suppliers: consequentialist	Voluntary
Public	Brazilian Forest Code (land use change regulation)	1.State. 2. Agricultural landowners.	State: appropriateness Agricultural landowners: consequentialist.	Mandatory

Accountability relationships for the Mexican beef chain

The contemporary Mexican agri-food system is characterised by concentrated corporate power structures – export-oriented producers, processors, traders, a handful of agri-food transnationals, and national and multinational supermarkets – coexisting with a wide diversity of supply actors. Amongst the latter, many are fully integrated into global value chains, but most operate within regional and local chains. The supply base for the beef chain comprises approximately 1.5M farms providing cattle to local abattoirs and butcheries, medium and large-size domestic meatpackers, or else trading directly with American buyers. On average, between 800,000 and 1.2M animals (bovine cattle) are exported to the USA every year, mainly from the northern states of Sonora, Chihuahua, Coahuila and Tamaulipas (Peel, 2011). Generally, cattle reach the border with the USA after having spent different

stages of their life across several Mexican states, other than those near the border. While the chain is slowly transitioning towards a more sustainable path (see Chapter 3) sustainability challenges have yet to be fully addressed. There are two main challenges. The first is the need to reduce land use changes associated with extensive beef rearing, or else with opening land for pastures destined for different types of livestock (CONAFOR, 2020). The second is the need to reduce direct and indirect GHG emissions and implement mitigation measures across the industry. The steering efforts have been led by environmental NGOs, and coalitions of stakeholders including think tanks, subnational governments and at least one national government office (see Chapter 3).

Figure 3. Generic representation of the Mexican beef value chain



NGO-led accountability relationships in Mexico

For the Mexican beef chain, the first accountability relationship is identified between environmental NGOs and downstream and midstream firms. Two NGOs, The Nature Conservancy (TNC) and WWF have sponsored the Roundtable for Sustainable Mexican Beef with signatories representing the

retailers, meatpacking and dairy industries alongside at least one financial institution (see Chapter 3). Following van der Ven (2019), this relationship is based on a 'soft' NGOs' strategy compared to more confrontational name-and-shame practices, illustrated earlier with the Brazilian soy chain. Even so, firms still face the threat of sanctions in the form of reputational damage or profit loss, hence their engagement. To illustrate, interviewed fatteners, cattlemen organisations and NGO representatives coincided in explaining the participation of stakeholders with NGO initiatives mainly as a result of the potential profit improvement and the reputational benefit of being part of the initiatives (interviews #M_1, #M_2, and #M_5). Put short, the logic of action that underlies the participation of firms - including Walmart, SuKarne (the largest meatpacker in the country), Nestlé México and others - is a logic of consequence. This logic of consequence, however, presents a puzzle for what is an implicit accountability relationship: namely, how can NGOs enforce a consequence in the absence of compliance? After all, sanctions in the form of reputational damage are not within the gift of NGOs but ultimately lie in the realm of changing consumer preferences, at which point it becomes almost impossible to disentangle cause and effect. In this specific case, a decade has passed since the early discussions were held to establish the Roundtable and while a growing number of participants has been registered, the implementation of consensus-based goals has proven complex (see Chapter 3). Among other reasons given, my interviews with participants in the Roundtable cite the absence of external pressure or the non-enforceability of sanctions (interviews #M_5 and #M_7). As was shown in Chapter 3, the Mexican beef industry is gearing itself for involvement in sustainable animal protein production following the launch of the USA 'Protein Pact' initiative. In this case, the sanction –in the form of possible exclusion from the US market – will be explicit and enforceable, in contrast to the implicit and unenforceable accountability relationship on which the Roundtable is premised.

At the time of writing the participation of the lead firms in the Roundtable remains uncertain. However, its advocates expect that once clear goals have been agreed through the Roundtable the

downstream node will be in the position to demonstrate accountability to the environmental groups, their peers, consumers and potentially to the Mexican society at large (interview #M_5). According to one downstream interviewee (dairy firm representative), there is interest from firms to see this happening (interview #M_29) as they could be in the place to inform consumers that they (firms) are high performers concerning the sustainability of the industry. In terms of the logic of action underlying this 'potential' accountability relationship, the position illustrated here can be interpreted as a logic of consequence; downstream actors are willing to be held accountable to consumers as long as they accrue market benefits from that relationship. Similarly, the risk of being deemed a 'laggard' while the industry incorporates environmental considerations is offered as a significant motivation (interview #M_29). In other words, the demonstration effect is a powerful instrument in the building of implicit accountability relationships.

Thus, given that the first accountability relationship (implied in the Roundtable) is under construction, downstream and midstream actors are not yet demanding accountability from other actors down the chain, for instance, in the form of requesting compliance with sustainability standards they impose or agree to adopt. This means that, at present, suppliers (beef farmers) are not facing any direct claim for accountability from chain actors. However, at least three capability-building initiatives have progressed a sustainability governance agenda with beef farmers underpinned by a collective belief that higher production standards will equal higher profits. The initiatives include the BioPasos project, TNC RITERs and the NAMA for sustainable and low-emissions Mexican beef (Chapter 3). In engaging beef farmers, these projects are enabling processes of information disclosure essential to characterise the environmental consequences of the first beef-rearing stage at the smallest unit (smallholder farms) and assess the potential pathways for achieving more environmentally sustainable farming practices. Interviewees expressed that through these initiatives farmers have shared information on their mainstream rearing practices and herd management methods (interviews #M_3,

#M_5, and #M_7). Crucially, the information reveals at least two important environmental consequences for which farmers are not being held accountable yet. First, land-use change processes; or the so-called practice of '*desmonte*' (a Spanish term which roughly translates to 'clearing the mountains', meaning to clear forested areas for opening pastures). Second, excessive and non-regulated use of veterinary drugs with unknown consequences for soil and nearby water health. While not related to an environmental consequence, similarly, farmers have disclosed the common practice of using non-approved hormone enhancers for the promotion of muscle development in cattle. These environmentally harmful practices are the main areas that NGOs have proposed to tackle via capability-building schemes, particularly agro-forestry rearing. Importantly, according to NGO representatives, at present, the disconnection between beef farmers and end-consumers implies that establishing an accountability relationship between these two actors is highly unlikely. Hence, while no accountability relationship exists, the engagement of farmers with NGOs' projects can be interpreted as a result of a logic of consequence. In this case, there is not yet a threat of sanction (in the form of losing market share or consumers' preference), but there is a possibility to be more profitable if implementing the agro-forestry proposals. The same logic is at work in accounting for farmers' engagement with the NGOs' proposals to cope with the increasing environmental pressures, e.g. severe droughts, impoverished soils, and heat waves (interviews #M_19, 20, 21, 22, 24 and 25).

Setting the basis for public accountability

Contrary to the Brazilian soy case, for the Mexican beef chain the state has not yet set up a formal 'command and control' instrument from which an accountability relationship can be established. There are, however, several national and sub-national policy instruments designed to incentivise sustainable forestry and land use management (SADER, 2023). The most recent national-level instrument is the 'National Strategy for the Reduction of Emissions from Deforestation and Forest

Degradation' (ENAREDD+). The latter builds on the Mexican climate change policy instruments aiming to curtail GHG by 22% by 2030 and to achieve a net-zero deforestation rate (SEMARNAT-CONAFOR, 2017). However, the translation of these guiding policies into formally implemented instruments is yet to be seen. The recent design of traceability instruments like the 'Computerised Traceability System for Agricultural, Livestock, Aquaculture and Fishing Goods' (SITMA acronym in Spanish) sheds light on the type of instruments that can be used for enabling accountability relationships for the environment. This is not yet the case, as the SITMA's main goal is to trace the origin of agri-food products for trade purposes, e.g., maintaining extant and future domestic and international agri-food flows, ensure rapid response in case of disease outbreaks, and to standardise traceability information. Hence, for the livestock sector, no formal mechanism exists to establish an institutionalised accountability relationship between the state and farmers clearing forests for livestock agriculture. Instead, diverse policies incentivise ecosystem restoration and preservation of forested land based on Payment for Ecosystem Services (PES). Importantly, the approach is underpinned by a logic of incentives not of enforcement of regulations. Hence, to some extent, the basic foundations to build the absent accountability relationship are visible within the NAMA proposal for Sustainable Extensive Cattle Ranching (see Chapter 3). The main goal of the NAMA is, again, to incentivise beef farmers to perform ranching practices incorporating one or more options of sustainable practices and technologies. The coalition behind the NAMA (including a leading agricultural think tank for Latin America and the Mexican Ministry for Agriculture) is building a framework that requires information disclosure from farmers (e.g. hectares being cleared) that otherwise would not be disclosed. At a future point, this proposal could form the basis of an institutionalised accountability relationship, but as of now, we can only regard this as a work in progress.

Conclusions

The scholarly debate regarding the form, uptake and efficacy of TEG with respect to global food systems is both vibrant and diverse. In this paper, I have engaged critically with a relatively new aspect of the debate: information disclosure as a source of transparency and accountability in agri-food GVCs. In engaging with this debate, I have offered a theoretical and empirical contribution, based on the cases of Brazilian soy and Mexican beef. Theoretically, I have drawn on the theoretical synthesis and conceptual framework developed in Chapters 2 and 3 but applied here to highlight the relationship between value chain structure and the presence or future potential of implicit or explicit accountability relationships. Empirically, I have revealed the extent to which the cases of Brazil and Mexico are following different trajectories in the building of accountability relationships. Regardless of the type of value chain structure (export-oriented and multipolar for Brazilian soy, regional/domestic-oriented and relatively bipolar for Mexican beef), I observed a relevant similarity between the two cases: environmental NGOs have initiated the building of accountability relationships, or else, laid the foundational institutions for them to be established in the future.

In the Brazilian case, some NGOs have operated with a name-and-shame strategy, targeting multinationals located at the downstream node of the chain. I framed this strategy as an NGO-driven accountability demand, acting as a proxy for environmentally conscious consumers, albeit an implicit one. Importantly, in this case, the accountability claim has travelled 'down' the chain, to be institutionalised in the form of multistakeholder commitments, standards and certifications. Furthermore, the Brazilian Forest Code, a public 'command and control' mechanism, approximates an accountability relationship between upstream chain actors (landowners) and the Brazilian state, even though this relationship has worked better in theory than practice. In the parlance of institutional

theory, these relationships are based on a logic of consequence: that is, chain actors respond to claims for accountability as a result of rational calculations.

The Mexican case is significantly different. Not only does Mexico lack the *cause cèlèbre* status of Brazil in global environmental politics, its dependence on agri-food exports is comparatively small. Hence the external leverage afforded to environmental NGOs and consumer-facing firms is much less significant than in the case of Brazil. Nevertheless, it is still possible to identify the early signs of accountability relationships under construction, in this case, between NGOs and midstream and downstream actors. Here, once again, NGOs are acting as claim-makers, targeting upstream and downstream actors simultaneously. In the case of upstream actors, the proposed Roundtable for Sustainable Beef could lead to an institutionalised accountability relationship, although this eventuality is far from guaranteed. Meanwhile, in the case of upstream actors, the identification of an accountability relationship is more complex. Here NGOs have deployed a 'soft' strategy based on cooperation rather than confrontation, alongside capability-building initiatives designed to foster information disclosure practices. The difficulty here is that this form of cooperation is taking place out of sight of the everyday consumer. As a result, the claimed accountability relationship rests on a very tenuous assumption regarding the idea that environmental NGOs are acting as a collective agent for consumers and that the preferences of these two groups are one and the same. Clearly, more research is required to explore these relationships in greater depth - and to interrogate the theoretical assumptions regarding information disclosure, accountability and democratic legitimacy. More work is also needed to understand the relationship between transparency, accountability and the actual effectiveness of TEG, in terms of mitigating or reducing the environmental harms produced by agricultural commodity production. For now, however, my findings have shed light on the importance

of unpacking sustainability governance with a focus on accountability relationships; and drawn attention to the practical challenges that this prospectus has on the ground.

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Chapter 5

Conclusions

In this thesis, I have offered an original theoretical and empirical contribution to debates regarding the social and environmental impacts of the global food system on people and the planet. More specifically, I focused on the role of 'agri-food' commodities – drawing on the cases of beef and soybeans — in the global food system and the various attempts to govern and regulate these, in order to meet environmental goals and policy objectives. The two studied agri-food industries are synonymous with a set of interconnected environmental consequences (land use change, biodiversity loss and water scarcity) for which deploying governance mechanisms entails significant socio-political endeavours. Crucially, both cases are located in the Global South, wherein the conflict between immediate economic priorities and long-term environmental sustainability are especially pronounced. To illustrate, historically the two cases are situated in countries that have followed the so-called *extractivism* economic model and at present remain highly dependent on commodity trade (McKay et al., 2021). Consequently, the environmental regulation of economically and politically relevant sectors and industries has received comparatively less attention than the industrial and sectoral development goals (Andrade, 2022; González, 2014).

The three papers that constitute this thesis are underpinned by a theoretical synthesis derived from the GEP, TEG and GVC studies. A shared goal of the three papers has been to offer a critical examination of the utility of applying the GVC framework alongside the broader sustainability governance literature for supply chains, to explore if in dialogue we can deliver novel explanatory accounts on the ongoing processes of sustainability commodity governance. The papers thus, revolve around the initial motivation to explain the provision, form and uptake of TEGs and TSS within the

specific context of the Global South. Collectively, they aim to offer responses to the main research question of this thesis: How do sustainability governance instruments enter global, regional and domestic agri-food value chains and what are the implications on value chain governance dynamics? In what follows, I summarise the main findings of my three papers in turn, before outlining a future research agenda.

Main findings and contributions

In Chapter Two, with my co-authors we engaged with the GVC and TEG literature to assess the implications of multipolar power structures for sustainability governance. Surprisingly, the multipolar GVCs heuristic first proposed, but not tested, by Ponte and Sturgeon (2014) has received relatively little attention. Thus, in analysing the Brazilian soy-animal protein agri-food industry, we first adapted Ponte and Sturgeon's heuristic and then applied it empirically. Our account exemplifies the analytical value that this heuristic holds for understanding the dynamics of structurally complex GVCs, particularly at the intersection of economic and environmental governance. For one, the concept of multipolarity allowed us to account for chain boundaries not as hermetically sealed as they may have been theorised previously. Firstly, the lines between using standards for economic governance and standards for environmental purposes are becoming increasingly blurred. While lead firms have the power to use product standards to determine the conditions in which upstream suppliers participate in the chains, they may not have the authority to set environmental standards. Secondly, the framework of multipolarity challenges the idea that chain boundaries are fixed. Actors outside of the chains, such as states and NGOs, are becoming more influential in shaping the 'rules of the game' within GVCs at different governance levels, macro, meso and micro.

The empirical findings of Chapter Two can be summarised as follows. First, we unpacked the hybrid sustainability governance framework in place to delink the soy-animal protein chain from its associated environmental consequences in Brazilian biomes. Crucially, the merging of chain and sustainability governances is circumscribed to the Brazilian-EU and UK trade flow. We argue the sustainability governance literature requires more analyses explaining the growing presence of hybrid regulatory frameworks. Previously, several strands of the GVC and GPN literature have analysed the interactions of private and public governance, including social governance (to illustrate see: Bair, 2017; Gereffi and Lee, 2016), however, the specific focus on sustainability governance offers ample space to develop further research and testing of available conceptualisations. In particular, we discuss the organic construction of what we defined as a 'hybrid sustainability framework' to highlight the coexistence of private and public governance mechanisms. Second, in tracing back the origins of the Brazilian soy-animal protein chain we offer a characterisation of it as a bipolar chain to shed light upon the presence of strong state influence and the role of powerful domestic midstream and downstream nodes. Third, in examining macro level governance, we found the chain to be increasingly shaped by external drivers, which are reshaping the chain's governance by institutionalising claims regarding the need to tackle environmentally destructive outcomes. More importantly, these institutionalised claims delineate responsibilities and accountability at different chain nodes. While the results of the full implementation of the identified hybrid sustainability governance framework are yet to be observed, we demonstrated that GVC analysis underpinned with a multipolarity lens is pertinent to examine the potential outcomes and limitations of these sustainability mechanisms.

In Chapter Three, I offered an account of the prospects for governing the sustainability of beef. In this Chapter, as with Chapter Two, I built upon the GVC studies. In this case, however, I specifically engaged in a dialogue with those scholars investigating the environmental upgrading term and its implications upon chain actors - e.g. the value capture that stems from buyer-led imposed

upgrading. Additionally, I drew upon the interdisciplinary TEG scholarship calling for further research to close the gap found when accounting for the particularities of sustainability governance in the context of the Global South. In conjunction, these two theoretical frameworks underpinned my responses to the two guiding questions of the paper. Namely, how do environmental considerations enter regional and domestic agri-food value chains and to what extent do they reshape value chain dynamics and configurations? From this Chapter, my key empirical contribution was to highlight the characterisation of the Mexican beef agri-food industry as a value chain. I argue that given the relevance of the domestic market and the concentration of the global trade in one main client (the USA) this agri-food industry is better understood as a regional and domestic-oriented chain. My findings show that for this chain conceptualisation the characteristics of the industry and the current governance dynamics defined by downstream and midstream actors do not exactly fit the 'buyer-driven' chain model. Yet, without the direct demand of lead firms a group of sustainability governance initiatives are gaining momentum and traction, albeit slowly and unevenly.

Importantly, in Chapter Three to account for the actors driving the sustainability agenda I have informed my analysis with both GVC and TEG accounts shedding light on the agency of other actors other than those directly involved in the chain, e.g. farmers, traders and retailers. Here, I emphasised the importance for the GVC framework to be expanded to fully account for what I call 'out-of-the-chain' actors, such as NGOs and the state. Crucially, in opposition to GVC accounts, the participation and relevance of these actors are generally located at the spotlight in TEG and GEP accounts. Hence my contribution directly derives from the dialogue with scholars working with another analytical lens than the GVC framework. Thus, with this paper, on the one hand I contribute to the GVC scholarship by calling for a departure from the lead-firm centrist approach that characterises the GVC scholarship when explaining TEG mechanisms. On the second hand, to

account for the role of other stakeholders, including NGOs, and upstream actors I drew upon recent accounts on TEG studies in which the analysis of sustainability governance processes is primarily conducted by recognising the presence and interactions of multiple actors.

In Chapter Four, I contributed to the TEG and GEP literature concerned with explaining the role transparency plays in governing the sustainability of value chains. Given the ontological assumptions of the GVC scholarship, it is understandable that the transparency dimension of TEG mechanisms is rarely the main focus of GVC-based accounts on sustainability governance. On the contrary, for TEG and GEP food-related discussions, the focus on the political dynamics around the environmental implications of food is at the forefront. With this analytical focus in mind, in Chapter Four I developed a comparative analysis between the Brazilian soy and the Mexican beef chains to unpack the underlying accountability relationships built with and around public and private sustainability governance mechanisms. Considering both cases I asked, how do sustainability governance instruments embed accountability relationships and how does this embedding shape their effectiveness? Hence, my contribution in Chapter Four came from proposing an examination of the transparency and accountability dimensions embedded in the sustainability governance instruments, both private and public, identified in Chapters Two and Three. Adapting from van der Ven's (2019) pioneering account of private accountability, I have offered a detailed analysis of the logics behind the engagement of chain actors with the identified governance instruments. Crucially, my analysis comprises both the examination of private and public instruments, given that for the Brazilian chain such instruments were identified in Chapter Two, and for the Mexican chain the presence and role of the state was incorporated to account for embryonic sustainability initiatives described in Chapter Three. In looking into the implicit and explicit accountability relationships established between the chain and out-of-the-chain actors, I provided an account for the two different trajectories of sustainability governance deployed for each chain. Thus, I offer a reflection on the effectiveness of

sustainability governance instruments via the identification of the accountability relationships potentially underpinning such instruments. Importantly, regardless of the type of value chain governance structures (export-oriented and multipolar for the Brazilian chain and regional and domestic-oriented and leaning towards a bipolar structure, with power concentrated in the meatpackers and retailers nodes), I observe a similarity between the two cases; environmental NGOs have initiated the building of accountability relationships, or else, laid out the foundational institutions for them to be established in the future.

In sum, in relation to the GVC and TEG studies at intersection, this thesis contributes --albeit to different degrees of engagement-- to the three dimensions of GVC analysis that Ponte (2019) summarises as: i) the various forms of chain governance, ii) the institutional framework in which chains operate and iii) the various forms of upgrading within chains and for chain actors (Ponte, 2019, p.42). Furthermore, I underline the importance of inter- and intra-firm relationships pertaining to power, governance and coordination of economic activities – and the social, political and environmental correlates of these activities. Thus, I depart from mainstream GVC scholarship in three important respects: first, by moving away from the preoccupation with 'lead firms' located within the Global North; second, by questioning the assumption of buyer-drivenness - in other words, unipolar chains; and third, by contesting the firm-centric analysis that has typified most GVC analysis and which explains environmental governance as a byproduct of the economic upgrading preferences of lead firms transmitted to their captive supplies. Instead, considering the two selected case studies, I analyse two agri-food sectors and operationalise them as GVCs, then I draw from the TEG perspectives to examine the points of view of other actors than firms, and very importantly I underscore how those perspectives stem from actors are located in the Global South, which influences the drivers of TEG adoption and design. Hence, in the three chapters of this thesis, I conduct analyses

that reveal the plurality of drivers behind sustainability governance mechanisms. Thus, in essence, I contend that environmental governance processes and outcomes are contingent and cannot be simply read off from the preferences of lead firms situated in the Global North.

Finally, in relation to the broader sustainability governance literatures that have offered important building blocks for the analytical conceptual framework used in this thesis –for one, the GEP studies and the TEG scholarship applied to the Global South context— I content my thesis contributes to the study of the design, adoption and scrutiny of the political implications of sustainability governance mechanisms. In directing the analytical effort to the two complex food supply chains selected, the analyses contained in the three chapters provide evidence on the presence of competing models for sustainability and the fragmented governance landscapes so far developed (Clapp and Scott, 2018; Clapp et al., 2017) for the two studied agri-food sectors. Additionally, the focus on two producing countries located at the so-called Global South and deemed emerging economies with growing domestic markets has meant that my thesis offers a dialogue with the scholars unpacking the political economy of sustainability governance processes occurring in such types of contexts (Schleifer and Sun, 2018; Schouten and Bitzer, 2015; Sun, 2022; Sun and van der Ven, 2020). Further development of such dialogue can be explored in my future research agenda which I now turn to delineate.

Towards a future research agenda

My findings constitute an original theoretical and empirical contribution. As such, they have served to open numerous future research avenues. First, for the GVC scholarship, future research can continue testing the analytical utility of the multipolarity lens and the modular theory-building exercise proposed

by Ponte and Sturgeon (2014), to examine chain governance. The findings of this thesis show that this lens opens up the hitherto considered restrictive lens of GVC – heavily preoccupied with the study of lead-firm - and thus provides an alternative framework. This framework posits that the unit of analysis is not exclusively the firm itself, but other chain actors and out-of-the-chain actors, as well, thus it brings the GVC approach to closer terms with the GPN school. Similarly, further empirical testing of the multipolarity framework could inform research into the sustainability governance of global, regional and domestic chains; or else chains that are increasingly characterised by Global South-South trade. The investigation of regional and domestic chains with the GVC approach can test the validity of the framework to account for chain dynamics that while not inserted in global trade patterns (or not driven mainly by such a pattern) are worth examining, both for their theoretical and empirical contributions.

Additionally, in observing the coalescence of public and private governance mechanisms, in the form of hybrid instruments, future research could benefit from the multipolar framework to offer structured and systematised accounts of those interactions. The interaction between private and public rules is an established field. However, what I have offered is an approach that uniquely combines GVC concepts applied to the role of public regulations in shaping value chains. In theorising the regulation of global environmental change, some are already calling for revisiting the use of the GVC approach alongside the traditional role of the state (de Marchi and Alford, 2022). I echo these calls, having discovered several potential avenues for expanding the existing literature and conducting empirical research with a particular focus on countries that exhibit less-developed capitalist dynamics and have long-standing paternalistic patterns of state intervention. These areas of inquiry will prove valuable in shedding light on important issues and advancing our understanding of these complex contexts.

A second research agenda emerges from the conceptualisation and understanding of environmental upgrading. I found the epistemological expansion suggested by Krishnan (2017) offers a significant area of opportunity to account for the agency, motivations and drivers of other chain actors, rather than lead firms when investigating the meaning and implications of environmental upgrading (Krishnan, de Marchi and Ponte, 2023). This opportunity, I have found, is particularly relevant for agri-food chains which, as I have shown in Chapter Three, are generally synonymous with two major challenges: on the one hand, structural economic inequalities, and on the other, increasing environmental pressures. Thus, in applying the environmental upgrading concept to account for the perspective of upstream actors (e.g. farmers), a future research agenda can underline opportunities for rethinking sustainability governance mechanisms that entail positive outcomes both for farmers and the environment. For considerations of the scope of my analysis, and the chain under analysis, I did not cover the potential downgrading outcomes that lead-firm imposed environmental upgrading could entail for the upstream actors. However, I see here an important future research agenda, which can offer accounts of the unintended consequences and the impediments that upstream actors face when adopting environmental upgrading mechanisms elsewhere designed but in their production units.

A third research agenda is identifiable in relation with the engagement with broader TEG and related sustainability governance literatures. I refer in particular with relation to the emerging strand unpacking the environmental governance processes from the Global South perspective (Schleifer and Sun, 2018; Sun, 202; van der Ven et al., 2021). Similarly, the accounts by recent contributions examining how governing standards emerge in the Global South (not exclusively related with sustainability agendas), such as those proposed by Langford (2019) and Langford and Fransen (2022). While my thesis research accounts for the expressions, particularities, and nuances of sustainability governance for two agri-food value chains located in the Global South, further areas of research

require detailed attention to the specifics on the political economy of such contexts. An enlarging number of accounts directed towards such geographies and contexts (Andonova and Sun, 2019; Bloomfield, 2020; Bloomfield and Michael, 2020; Langford, 2019; Sun and Van der Ven, 2020; van der Ven, Sun and Cashore, 2021) are building a novel research agenda to further explore. I consider, my case studies indirectly speak to this new frontier and future research could engage more directedly with them. For one, Sun (2022) studies on the uptake of private and non-state certification within the Chinese contexts depart from acknowledging that emerging economies represent a different environment than developed markets for transnational governance. Thus, a careful investigation of the political economy guides Sun's work to point out what factors can contribute to a stronger sustainability governance for Chinese contexts. Similarly, Schleifer and Sun (2018) investigation on the market conditions of India and China as determinants of the uptake for sustainable palm oil standards, underscore the need for in depth studies of emerging economies with relation to the potential for TEG to either be expanded or created from within.

A fourth research agenda is found in the incorporation of the transparency and accountability lenses to GVC-TEG accounts examining sustainability governance and environmental upgrading in particular. To the best of my knowledge, this has been rarely explored (see an example in Poulsen et al., 2021). Yet, in the broader agenda of global environmental governance (GEG) and global environmental politics (GEP), the debate is turning into questioning what are the observable effects of 'the culture of accountability' (Kramarz and Park, 2019) on managing environmental change collectively and, more importantly, whether we are seeing an 'accountability trap': that, too many accountability relationships result in poor and ineffective sustainability governance. Future sustainability governance research could examine concepts like the GVC environmental upgrading through the lens of accountability relationships and their effects on improving both environmental outcomes but also broader development goals. The incorporation of an accountability lens to the

GVC-informed sustainability governance agenda thus can delve into how those relationships become legitimate, under what conditions and with what prospects for effective governance. Furthermore, the intersection of the critical transparency literature (Gupta, 2008; Gupta and Mason, 2014; Mason, 2020; Mol, 2015) with the GVC scholarship is a promising research area in the context of ever-increasing information flows from which to design governance institutions. Importantly, the ownership and appropriation of value chain information for sustainability purposes is a novel area for research, where I find multiple opportunities to contribute via the application of the GVC lens. Given the scope of Chapter 4, I did not cover the discussions on the effectiveness of transparency in governing the sustainability of the studied chains. However, this is a relevant research agenda for empirical testing, in particular for agri-food chains for which the role of traceability is arguably, one of the most important mechanisms to enable accountability relationships (Gardner et al., 2019).

Finally, overall, I find the analytical framework comprising the GVC framework, TEG and GEP tools, offers significant opportunities to be employed by interdisciplinary scholars and accounts engaged with exploring the sustainability of animal-protein chains, hitherto underexplored with this lens. The GVC framework itself can complement broader TEG and GEP research projects in accounting for the political complexities and challenges characterising many animal-protein chains. This is an under-research agenda, which potentially can shed light on the multiple complex socio-political relationships embedded within the two studied chains, beef and soy. Very frequently for beef there is a negative and pessimistic perspective on its sustainability governance, however, for several Global South nations, this agri-food industry entails rural jobs, ways of living and represents a significant amount of the calory intake. Hence, the political complexity and the competing definitions of sustainability are worth exploring in detail. More research is needed examining the possible pathways for more sustainable beef chains. This agenda can contribute significantly to broader debates

on dietary shifts to less meat-based and more plant-based patterns of alimentation. Similarly, the soybeans industry, and associated animal-proteins, are currently traversing an important stage concerning the possibilities to reduce the dependence on this oilseed for animal-proteins, in order to curtail the negative environmental consequences that its linkage to animal proteins entail. However, the broader sustainability governance literature is falling short on bringing those debates. I observe here, for the two studied chains a significant gap to be filled with more accounts testing the complementarity of the GVC approach with TEG and GEP studies to explore the novel propositions for a transition towards sustainability.

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Appendix

Brazilian soy stakeholders' interviews appendix.

List of Brazilian soy value chain stakeholders' interviews.

#	Text and audio file	Language	Role & Organisation	Code
1	001_181116_001_Interview	English	Director, Sustainability standard	B_1
2	002_181121_001_Interview	English	Head of Agricultural Policy and Stakeholder Affairs, Germplasm and farming inputs	B_2
3	003_181122_001_Interview	English	Soy Sector Coordinator, TNC	B_3
4	004_181122_002_Interview	English	Director, Agricultural, energy and infrastructure firm	B_4
5	005_181123_001_Interview	English	President/Executive Board - Sustainability standard	B_5
6	006_181123_002_Interview	Portuguese	Social and Environmental Sustainability Manager - Agri-firm (soy trader and processor)	B_6
7	007_181123_003_Interview	Portuguese	Food Chain Relations and Sustainability Manager - Agri-firm (soy trader and processor)	B_7
8	008_181123_004_Interview	Portuguese	South America Sustainability Manager - Agri-firm (soy trader and processor)	B_8
9	010_190226_001_Interview	Portuguese	Smallholder (c. 800 ha), certified farm (CAT)	B_9
10	011_190226_002_Interview	Portuguese	Smallholder (c. 800 ha), certified farm (CAT)	B_10
11	012_190226_003_Interview	Portuguese	Independent Auditor	B_11
12	013_190226_004_Interview	English	Vice-president - Brazilian third-party organisation for agribusiness	B_12

Interviews guides for Brazilian soy value chain stakeholders

Box 1. Interview guide for certifications and standards representatives.

1. Could you tell us a bit about your role in your organisation and how it works?
2. How does the sustainability label (certification or standard) work in A, B or C countries, and how is this relationship with the other countries in Latin America?
3. How would you describe the uptake of the sustainability label/certification in one country (e.g. Brazil) versus others in Latin America?
4. What would you say is the main barrier that you have come up against for why firms embrace or do not embrace the uptake of the sustainability label/certification?
5. What can you tell us about the response of firms towards the cost of the certification

Box 2. Interview guide for soy traders and other agri-food firms' representatives.

1. Could you tell us a bit about your role in your firm and how your soy (or agri-food) business operates?
2. How does your firm relate and work with farmers and other agri-food large businesses?
3. How does your firm relate and work with sustainability certifications? Can you provide some examples of in-house and sectoral certifications?
4. In terms of the uptake of certifications, do you see reluctance or embracement from the farmers you do business with? Please give us some examples.
5. Do you have any comments on the growing demand coming from China and its impacts on the soy governance landscape?

Box 3. Interview guide for soy farmers (translated from Portuguese by principal investigator of this thesis)

1. Could you please share how is the process to get (a, b or c) soy certification? For instance, you could share some details about how you learned about the certification and how you started with it.
2. How did your way of farming or doing business change after the uptake, or with the certification?
3. How could you describe the relationship with the certifier body?
4. How did you face the costs of adopting to the certification?

Mexican beef stakeholders' interviews appendix

List of Mexico interviews.

#	Code	Type of organisation	Based at City/State/Country
1	M_1	Livestock fatteners	Mexico City, Mexico.
2	M_2	Cattle ranchers	Mexico City, Mexico.
3	M_3	Public-Private initiative	Mexico City, Mexico.
4	M_4	Academia	Oklahoma, US
5	M_5	NGO	Michoacán, México
6	M_6	Public-Private initiative	Mexico City, Mexico.
7	M_7	NGO	Mexico City, Mexico.
8	M_8	NGO	Mexico City, Mexico.
9	M_9	Government / National	Mexico City, Mexico.
10	M_10	Academia	Chapingo, Mexico State, Mexico.
11	M_11	Academia	Texcoco, Mexico
12	M_12	Government / National	Mexico City, Mexico.
13	M_13	Government / National	Mexico City, Mexico.
14	M_14	Academia	Merida, Yucatan, Mexico.
15	M_15	Government / Subnational level	Villahermosa, Tabasco, México
16	M_16	Government / Subnational level	Saltillo, Coahuila, México.
17	M_17	Government / Subnational level	Xalapa, Veracruz
18	M_18	Government / Subnational level	Hermosillo, Sonora
19	M_19	Beef farmer	Lagos de Moreno, Jalisco.
20	M_20	Beef farmer	Jalisco, Mexico
21	M_21	Beef farmer	Jalisco, Mexico
22	M_22	Beef farmer	Jalisco, Mexico
23	M_23	Government / Subnational level	Tuxtla Gutiérrez, Chiapas, Mexico.
24	M_24	Beef farmer	Jalisco, Mexico

#	Code	Type of organisation	Based at City/State/Country
27	M_25	Beef farmer	Chiapas, Mexico
25	M_26	Government / Subnational level	Monterrey Nuevo León, México
26	M_27	Government / Subnational level	Guadalajara, Jalisco, Mexico.
28	M_28	NGO - Think tank	Mexico City, Mexico.
29	M_29	Private firm	Mexico City, Mexico.
30	M_30	NGO - Think tank	Mexico City, Mexico.

Interviews guides for the Mexican beef value chain stakeholders

Box 4. Interview guide for Government representatives (translated to English by principal investigator).

Introductory section
1. Researcher's introduction and brief description of research Project.
2. Could you please share with me a bit about your role within your organisation

Intermediate section
3. Considering your previous and current position (experience), could you share what have been and are the most important achievements of the beef industry at your State.
4. Considering your previous and current position (experience), could you share what have been and are the most important challenges or endeavours for the beef industry at your State.

(if needed some igniting topics to be mentioned to interviewee):
- Cattle reproduction and productivity
- Feed availability
- Infrastructure for feed
- Intermediaries and brokers' role
- Processing and trading of beef meat
- Environmental challenges

Third section: Environmental topics
5. Your State (Mexican States) has been included among a group of 10 states for the implementation of the pilot stage of the Nationally Appropriate Mitigation Actions (NAMA) for extensive sustainable livestock agriculture. The NAMA is a project led by the Mexican office of the IICA and other stakeholders. You can retrieve it here.
- Were you aware of the NAMA? (If not, principal investigator to provide basic information about it).
- How would 'sustainable livestock agriculture' be like in your State?
- Which would be the activities in need of transformation or change?

6. Regarding the 'Roundtable for Sustainable Mexican Beef':
- Were you aware of the Roundtable?
- What is your opinion about it?
- Do you know about beef farmers currently performing the so-called 'sustainable livestock agriculture'?

7. Does the State Level Development Plan currently include public policy regarding 'sustainable livestock agriculture'?
For instance, are there guidelines and public programs for adaptation of the sector to climate change adverse effects?

Final section
8. In case you have any further comments regarding the topics we have covered, please use this time to share your thoughts.
9. Principal investigator thanks the interviewee and reminds of consent form in case it has not yet been sent by interviewee.

Box 5. Interview guide for Government representatives (in Spanish).

La gobernanza ambiental de los agronegocios en México:
Un enfoque de cadenas de valor'.

Paulina Flores Martínez
Agosto de 2021

Entrevista semi-estructurada
Preguntas guía

- Podría platicarme un poco sobre los objetivos generales de la organización en la cual se desempeña, y el rol particular que usted tiene.

- En términos generales, y breves, podría señalar algunos de los retos más importantes que su organización, o los miembros de esta organización, actualmente enfrentan para lograr los objetivos antes señalados. Los retos pueden referirse a temas económicos, sociales o ambientales.

- Considerando los retos mencionados, en los últimos años cuáles son los cambios o estrategias más relevantes que su organización ha llevado a cabo para enfrentarlos.
  - Si su organización se conformó previo al TLCAN (NAFTA en inglés), o durante el TLCAN, cuáles serían los cambios más relevantes que su organización experimentó en las 3 décadas del tratado. Es decir, ¿es posible distinguir un antes y después?
  - ¿Los retos se han convertido en oportunidades?

- Recientemente se estructuró y publicó la Acción Nacionalmente Apropiada de Mitigación (NAMA) de Ganadería Sustentable para México (proceso liderado por el IICA en su representación México):
  - ¿La organización en la que usted labora/asesora tiene conocimiento de la NAMA?
  - ¿Participó en los procesos de consulta y diseño?
  - ¿Considera que todos los actores importantes están presentes?
  - Si no participa, qué opinión le merece este proceso (breve explicación). ¿Considera que el aspecto ambiental de la ganadería se verá transformado en los próximos años? ¿En qué escala?

- En la misma línea que la pregunta previa, ¿su organización tiene conocimiento de la Mesa Redonda Global para la Ganadería Sostenible y la versión para México? Visitar: www.grsbeef.org
    - ¿Cuál es su opinión general, sobre la construcción de la Mesa en México?
    - ¿Podría vislumbrar limitantes en México para su operación?
    - ¿Cómo es la participación de la organización que usted representa?

- Además de los recientes proyectos a escala nacional, y de corte interinstitucional, en México tenemos ejemplo de ganaderos que, desde hace tiempo, y de forma individual o guiados por instituciones, han empezado a transitar hacia prácticas ambientalmente más sustentables (sistemas agrosilvopastoriles, pastoreo Voisin, ganadería orgánica, etcétera) para evitar entre otras cosas: cambio de uso de suelo, sobrecarga de suelos, impactos a mantos freáticos por lixiviados.
    - ¿Considera que los miembros de su organización, o con quiénes la organización trabaja, observan oportunidades de negocio (ya sea en el mercado mexicano o en el extranjero) en la transición a una *ganadería más sustentable*?
    - ¿Qué barreras piensa que existen? ¿Cuáles son las más importantes?
    - ¿Se podría hablar de una demanda real del mercado para dicha transición?
    - ¿Cuáles actores o sectores en la cadena de la res serían considerados los más relevantes para impulsar esa transición? Ejemplo: la CNG, asociaciones regionales, empresas de alimento para ganado, grandes procesadoras y empacadoras, ONGs.

- La ganadería se práctica de distintas formas a lo largo del territorio nacional, sin embargo, existen factores comunes (precios de insumos, maraco institucional, presiones políticas y ambientales regionales) que la dan una forma relativamente uniforme; sí pensamos en términos de cadena de valor:
    - ¿Cuáles actores considera que tienen mayor poder de mercado, y, por ende, podrían influir en la transición a prácticas más sustentables?
    - ¿Considera que los procesadores de carne y vendedores al menudeo (supermercados) están jugando un rol activo en la transición a prácticas más sustentables?
    - Distinguiendo entre cadenas locales sin integración al mercado nacional y de exportación, ¿en cuáles observa más potencial para la transición a prácticas más sustentables?
    - ¿Cuáles serían las principales motivaciones?

- Sí tiene algún otro comentario o idea en torno a los temas discutidos, por favor siéntase libre de hacérmelo saber.

Muchas gracias por su tiempo, su información es muy importante para realizar mi investigación.
Paulina Flores Martínez