Traders as Implementors of Sustainability in Tropical Agriculture Supply Chains

Masters Research Thesis

by

Sofia Silverman
B.Sc., University of Victoria, 2021

A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of

Master of Science

In the Department of Geography

We acknowledge and respect the lək'ʷəŋən peoples on whose traditional territory the university stands and the Songhees, Esquimalt and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.

Traders as Implementors of Sustainability in Tropical Agriculture Supply Chains

by

Sofia Silverman
B.Sc., University of Victoria, 2021

Supervisory Committee:

Dr. Sophia Carodenuto, Supervisor
Department of Geography, University of Victoria

Dr. Janina Grabs, Committee Member
Department of Society, Politics and Sustainability,
ESADE Business School, Barcelona

Abstract

Tropical agriculture commodities such as cocoa, coffee, and palm oil are popular ingredients across the globe. Despite their abundance, these crops have geographically few growing regions and are often concentrated in countries in the Global South. In order for products to transform from their raw form to their final consumable form, the commodities undergo significant travel and transformation across supply chains. Along these supply chains, known environmental and socioeconomic challenges are embedded at all stages. Stakeholders along the supply chain have long tried to remedy barriers and seek sustainable practices with little scalable success. But recent studies have realized there needs to be increased research dedicated towards a relatively opaque actor, traders. Traders are actors at the center of supply chains and mainly facilitate the movement of crops from upstream producers to downstream consuming markets, but they also serve as communicators along supply chains. This central position provides traders significant insight vertically across supply chains and horizontally across different crop markets. Still, little is known about how traders use this advantageous position and specialized knowledge to advance sustainability and equity goals. This thesis investigates the identified research gap using the Delphi Method and engages with traders not only as the research target but also as research participants. Working alongside academic and trading practitioners, the overall aim of this thesis is to address barriers preventing traders from operationalizing sustainability and looks at traders' self-perceived roles, responsibilities, and opportunities in furthering sustainability objectives in tropical agriculture supply chains.

Table of Contents

List of Tables

List of Figures

Acknowledgments

I am grateful to have completed my thesis on the traditional territories of lək'ʷəŋən peoples on whose territory the university stands and the Songhees, Esquimalt and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.

Thank you to my supervisors, Dr. Sophia Carodenuto and Dr. Janina Grabs, for their endless support, encouragement, mentorship, and kindness. The precedent they set as women in academia and research is truly inspiring and will continue to guide me in all my future endeavours. Thank you both for inspiring me and being amazing role models.

Thank you to the EGG Lab for all the friendship and guidance throughout the year.

Lastly, I would like to acknowledge the tremendous love and support my partner, friends, and family unconditionally provided me throughout this journey and, most importantly, my dog Louis who accompanied me on every single writing break walk.

Thank you, everyone; I would not have been able to get to this place without you.

Chapter 1: Introduction

This chapter introduces the context for researching the role of traders as implementors of sustainability in tropical commodity global supply chains for cocoa, coffee, and palm oil. Additionally, this chapter outlines the project's significance, scope, research question, and objectives.

Context

Perennial tropical tree crops such as cocoa, coffee, and palm oil are often linked to a variety of socio-environmental sustainability obstacles such as unsustainable agricultural practices, deforestation, low prices, and gender and human rights inequalities (Borrella et al., 2015; Brandi et al., 2013; Carodenuto & Buluran, 2021; Clay, 2004; Curtis et al., 2018; Dauvergne, 2018; Grabs, 2020; Grabs et al., 2021; Grabs & Ponte, 2019; Middendorp et al., 2020; Woolley et al., 2021). The interconnected sustainability and human equity challenges are often embedded in global supply chain operations. Often, mitigation and compliance with sustainability pressures have fallen upon smallholder farmers to remedy (Ansah et al., 2020; Borrella et al., 2015; Brandi et al., 2013; Middendorp et al., 2020; Oya et al., 2018). Yet, at the same time as smallholders struggle to adapt, the global nature of tropical commodity supply chains permits the erasure and obscuring of challenges at origins (Gardner et al., 2019). Through physical distance and multi-stakeholder involvement, agricultural supply chains shield production realities from consumers. Downstream approaches have also been implored, where scholars have focused on retailers and consumers as drivers of sustainability. However, both have reached similar outcomes: sustainability measures are often insufficient to alleviate negative social and environmental impacts in their respective commodity sectors (Cho et al., 2021; Folke et al., 2019, 2020; Grabs & Carodenuto, 2021; Thorlakson, 2018).

Research efforts have been directed toward tropical commodity supply chain sustainability improvements (Beulens et al., 2005; Carodenuto, 2019; Cho et al., 2021; Goldstein & Newell, 2019, 2020). The results have shown that consumers are increasingly aware of sustainability

shortcomings and demand knowledge regarding their purchases' environmental and social efficacy (Raynolds, 2002; Woolley et al., 2021). This aligns with recent research documenting the increased uptake of 'Ethical Consumerism', encompassing environmental and ethical considerations in consumer purchasing habits (Dowd & Burke, 2013). In response to these ethical market trends, supply chain transparency has been identified as an essential first step toward determining global food systems' environmental and societal impacts (Carodenuto, 2019; Cho et al., 2021; Clapp, 2020; Gardner et al., 2019).

A new perspective on addressing supply chain transparency is researching the role of traders in their myriad forms (Folke et al., 2019, 2020; Grabs & Carodenuto, 2021; Reis et al., 2020; Rosenberg et al., 2009; Serdijn et al., 2020; Thorlakson, 2018). These traders are private supply chain intermediaries whose operations facilitate the trade and movement of commodities between producers and purchasers (Grabs & Carodenuto, 2021). In this definition of traders, it is essential to note that there are varying sizes of traders that engage as either formal trading corporations or informal intermediaries. Secondly, the term 'trader' is used synonymously to describe several names for these types of intermediary companies and individuals, including merchants, traders, and brokers. But both share the embedded advantage of being a central node in their supply chains, which affords traders and brokers the opportunity to understand both upstream and downstream perspectives. Yet, these vital intermediary nodes of supply chains are often unknown to consumers or retailers, thus posing a significant hurdle for sustainable sourcing (Grabs & Carodenuto, 2021). Furthermore, while there have been considerable research efforts on retailers' and consumers' side and the smallholder compliance side for initiating sustainability, few have investigated how traders or transnational trading corporations have evolved in a way that their current position in global supply chains attests to them becoming stewards of sustainability in their networks (Clapp, 2020; Folke et al., 2019).

Considering such research gaps, I (in collaboration with Dr. Carodenuto and Dr. Grabs) organized a Delphi method-inspired dialogue to unite globally heterogeneous commodity trading practitioners and scholars to co-create a research agenda on sustainability. A core component of this collaborative approach was a 15-person workshop in June 2022 to provide a platform to study and collect data on the role of traders and learn from their insight alongside researcher expertise.

Significance & Scope

This thesis has been fully embedded in the Traders and Sustainability project (see tradersandsustainability.com) and draws on various stakeholder engagement activities carried out through that project, intending to better understand the role of traders and brokers as sustainability communicators to upstream and downstream actors in their supply chains. This research highlights the role of intermediaries as key mobilizers of supply chain sustainability knowledge. Data was collected using anonymous surveys and transcript data obtained throughout the three-day workshop in Victoria, British Columbia, in June 2022. Such methods are grounded in community-engaged applied research perspectives, seeking not just to study traders but also to work collaboratively with them (Israel et al., 1998; Leeuw et al., 2012; Minkler, 2004; Ryser et al., 2013; Strand et al., 2003).

The project was inspired by the identified knowledge gap in cocoa, coffee, and palm oil supply chain intermediaries (Folke et al., 2020; Grabs & Carodenuto, 2021). Parallels to the research gaps are also demonstrated by businesses seeking to improve their sourcing goals and standards. Therefore, using goals and challenges expressed by stakeholders, this research elicits a community-engaged and participatory action-based foundation where practitioners can generate insightful and practical results alongside researchers.

Research Question & Hypothesis

Acknowledging the knowledge gaps surrounding supply chain intermediaries, this study answers the following question: **What barriers prevent tropical commodity traders from operationalizing sustainability in commodity supply chains, and what are traders' roles, responsibilities, and opportunities in furthering sustainability?** Understanding the answer to these questions is important because if traders leverage their unique intermediary position within supply chains, then sustainability on the ground will more likely be implemented because some of these midstream nodes in the supply chain represent critical disablers, or enablers, of sustainability objectives. The outcome will provide information that can be utilized to improve sustainable global food systems, sourcing and promoting better agricultural practices, environmental stewardship,

and community and agricultural development. Assumptions are that traders want to meaningfully and voluntarily contribute to accountable, sustainable, equitable and transparent supply chain policies and operations.

Objective

Within the broader framing research question, two objectives are also identified. To discover i) how commodity traders or intermediaries talk about sustainability objectives; this will assess the current and potential role of traders in understanding the bottlenecks and opportunities of sustainable sourcing and ii) assess the differing responses between trading practitioners (traders) and academics, which will be derived from survey and participant observation data. Both objectives contribute to documenting the most salient topics discussed and surveyed between practitioners and researchers.

Chapter 2: Background on Tropical Agricultural Commodities: Three-Crop Deep Dive

This chapter addresses the advantage of studying multiple perennial tree crop supply chains in a single review. As stated by Grabs & Carodenuto (2021), traders often specialize in a single commodity but may also have horizontal relationships in global supply chains, i.e. trading in more than one commodity. Therefore, a deeper analysis of breakthroughs and challenges identified in other commodities and fields lends perspective to researchers studying across sectors and disciplines. Reviewing literature from various disciplines that address the research potential of tropical, perennial agriculture commodities, supply chain transparency, and the global scale of traders represents a novel research gap. The scope of this thematic review begins with the background of three commodities: cocoa, coffee, and palm oil, followed by literature on transparent global supply chains, concluding with various disciplines' perspectives on the role of traders. In this review, the relevant literature is critically evaluated from a variety of disciplines to understand how traders are perceived in the context of sustainability by academics. Literature from global value chains, business management, international developments and relations, public policy, law, business, sociology geography, global supply chains, global food systems, land-use change sciences, and the social sciences informs the novel theory centring traders as sustainability communicators (Baumann-Pauly, 2013; Bennett, 2021; Carodenuto, 2019; Goldstein & Newell, 2019). Drawing on transdisciplinary studies, there is compelling evidence suggesting that research completed alongside traders will remedy failed sustainability efforts that have not been holistic, missed key supply chain actors, and have exacerbated conditions in producing origins.

Cocoa, coffee, and palm oil are three tropical commodities coined as "frontrunner" commodities by Grabs and Carodenuto (2021) for studying sustainable supply chain innovations and governance, perennial tree crop studies are static and therefore "represent an extreme case of trader's importance in sustainbility governance" p.1316. Understanding their historical market, environmental and societal impacts is important for guiding and implementing future sustainability commitments across tropical agriculture sectors.

Cocoa:

Millions of smallholder farmers produce cocoa, and it is a critical revenue source for certain producing nations' economies (Nelson & Phillips, 2018). However, cocoa can only be grown in a narrow latitudinal topical region above and below the equator. This leads to the notion that producers should have the power to leverage their rare crop for an equitable price. But to the contrary, the sector's reality is influenced by the structure of the cocoa supply chain, where smallholders are at a significant disadvantage (Cocoa Barometer., 2015). As reported in the literature, there is evidence that deforestation, unsustainable agricultural practices, low incomes and human rights inequalities are embedded in operations (Carodenuto & Buluran, 2021; Grabs et al., 2021; Nelson & Phillips, 2018; Tscharntke et al., 2011). Of these vulnerabilities, problems such as low production rates, declining fertility in growing regions, poor management practices, climate change, poverty, gender inequalities, poor work conditions, child labour, human trafficking, and low farmgate prices have been identified as specific sources (Cocoa Barometer., 2015; Colfer, 2016; LeBaron & Gore, 2020; Nelson & Phillips, 2018).

It is also necessary to recognize the cocoa industries' colonial and imperial legacy, as experienced and documented as early as 1905 by Joseph Burtt while visiting sourcing regions for Cadbury Brothers (Colfer, 2016; Higgs, 2012). Such imperialist relationships dictate the structure of today's cocoa industry and set a precedent for much of the current human equity challenges. Studies have found that West Africa lost 2.3 million hectares of forest (Gockowski & Sonwa, 2011) from commodity production and shifting agricultural practices (Carodenuto, 2019). Carodenuto (2019) speaks to the low production cycles specifically about deforestation, recognizing that farmers in West Africa are either wholly unable to participate or face significant barriers when investing and achieving zero deforestation—stemming from impeded access to knowledge, resources, and financial stability, resulting in low productivity, continuous shifting of cultivation areas and thus resulting in high deforestation rates (Carodenuto, 2019; Reis et al., 2020). Throughout the literature, there is consistent evidence that this constant feedback loop that smallholders are entrenched in contributes to ongoing environmental and societal disparities (Carodenuto, 2019; Carodenuto & Buluran, 2021; Middendorp et al., 2020). The significance and scale at which disparities are still experienced in cocoa-producing regions provide novel

opportunities to consider new modalities of engagement on how consumers and retailers access cocoa markets.

Coffee:

Research on coffee complements cocoa in that the coffee industry is slightly better understood due to its' size and past sustainability achievements (Grabs, 2020; Grabs & Ponte, 2019; Middendorp et al., 2020). Secondly, the coffee sector provides critical insight into the single-origin movement (Grabs, 2020; Wilson & Wilson, 2014). The single-origin practice is not homogeneously defined across the industry but indicates that coffee originates from either a single country, region or farm, thus delivering on commodity transparency objectives (Grabs & Ponte, 2019; Teuber, 2010). The movement has notably been adopted in the cocoa industry but predominantly in the craft bean-to-bar movement (Grabs, 2020; Woolley et al., 2021). The coffee policy evolvements documented throughout the literature exhibit the "front-runner" qualities described by Grabs and Carodenuto (2021).

Like cocoa, coffee smallholders experience the effects of fluctuating market prices and environmental vulnerabilities (Borrella et al., 2015), with the potential to result in poor long-term decision-making and planning at the expense of sustainability. Research on the evolution of coffee supply chains and powers within supply chains demonstrated that previous aggregation within the sector resulted in the homogenization of products by large-scale food conglomerates through the onset of upscaling, which prioritized low prices and low quality, thus creating power inequalities between producers and consumers (Borrella et al., 2015; Grabs & Ponte, 2019). Such power inequalities result in a "poverty trap" for smallholder farmers who receive disproportionately low remunerations (Bacon, 2005; Borrella et al., 2015). While the low cost of coffee beans may be prioritized, farmers continuously face increased operational prices and increasingly hard-pressed environmental challenges such as crop disease, deforestation implications, soil and water degradation and contamination, erosion, and biodiversity loss exacerbated by shifting climates (Bager & Lambin, 2020; Borrella et al., 2015; Rosenberg et al., 2009; Samper & Quiñones-Ruiz, 2017; Solymosi & Techel, 2019). Social inequities in the sector include gender inequalities, low incomes, aging farmers, migration of young people to urban centers, barriers to market information

and access, and lack of institutional support (Samper & Quiñones-Ruiz, 2017). The adversities have significant parallels with those documented in the cocoa and palm sectors.

Counteracting the coffee blend market saturated with inequalities is the decommoditized market. In this case, farmers differentiate their products from traditionally grown commodities through novel tastes, sustainability, quality, and value considerations (Borrella et al., 2015; Galtier et al., 2013; Hughes, 2010). Such industry innovations permit farmers to step away from the competitive mainstream and flooded markets, providing farmers with opportunities to alleviate wealth disparities through product differentiation. Unfortunately, what is found throughout research on the process is that during the transition to sustainable practices, the adoption of such techniques is not always accessible or easy, and power imbalances can persist (Borrella et al., 2015; Galtier et al., 2013; Middendorp et al., 2020). This is also evident in the cocoa sector, where small-scale farmers, who comprise the majority of growers, continue to face systemic barriers to accessing these niche global agricultural supply chains despite new market processes and innovations (German et al., 2020; Hughes, 2010). Even though pushback is prominent, Middendorp (2020) states that continued decommoditization will allow direct trade and intermediaries to connect smallholders to new markets (Borrella et al., 2015).

Therefore, speculation regarding the market, systems change, and trends provides critical insight for future innovations. The inequalities outlined indicate necessary and continual research in the sector. Despite coffee being a model commodity regarding sustainability, continued transparency efforts are required to alleviate adversities experienced at origins. Due to the popularity of coffee, this sector provides an ideal opportunity to investigate how traders are involved.

Palm Oil:

Palm oil was also selected as a “front runner” of forest risk tropical commodities by Grabs & Carodenuto (2021) due to past sustainability growth. The scale and scope of the palm oil market also justify further investigation into the involvement of traders (Brandi et al., 2013; Dauvergne, 2018). A distinguishing feature of palm oil from cocoa and coffee is that single-origin palm oil is

not a trend. Despite this difference, parallels such as the transparency measures involved in certified palm oil, mirrors the diligent supply chain tracking occurring in single-origin cocoa and coffee (Grabs & Carodenuto, 2021).

Palm oil production is also found to have similar environmental and socio-economic challenges as cocoa and coffee. The largest palm oil producer is Indonesia, which generates a significant portion of revenue at origin, echoing West Africa and cocoa, South America and coffee. In addition, evidence of land-use change, deforestation, and biodiversity loss throughout the literature encompasses environmental challenges experienced in production regions (Brandi et al., 2013; Dauvergne, 2018; Kroeger et al., 2017). Another similarity in the three tropical commodity sectors is smallholder sustainability involvement, where there are challenges for smallholder farmers to participate in sustainable production (Brandi et al., 2013).

Similar to conditions previously acknowledged in the cocoa analysis, barriers impeding access to knowledge, capital, technical skills and resources prohibit active participation in transitioning to equitable and sustainable practices (Brandi et al., 2013; Grabs et al., 2021; Kroeger et al., 2017). Smallholder production has been defined as heterogeneous, but it is found that independent farms are less productive or efficient on average due to a lack of access to up-to-date technologies and information, similar to cocoa (Brandi et al., 2013). Throughout the three front-runner commodities, homogeneous mitigating tools that have been employed include certification schemes that safeguard and certify ecologically and socially just products. But research has shown that the shortcomings in non-state or private governance regulations have yet to irradicate challenges completely and have contributed to developing new obstacles for smallholders (Auld, 2014; Brandi et al., 2013). Parallels in the markets provide evidence for further knowledge on supply chain transparency and connecting origins to consumers via stakeholders' facilitating product movement across the globe.

Transparency in Global Supply Chains

Ethical and sustainable sourcing is becoming an increasingly popular industry norm, and objectives of manufacturers and processors aspire to include products meeting such standards

(Dowd & Burke, 2013; Reis et al., 2020; Steptoe et al., 1995). But for this sourcing methodology to be adopted as the industry standard, opaque and disjointed supply chain hurdles must be overcome. Solutions arise from researchers seeking to answer questions regarding supply chain transparency (Cho et al., 2021; Goldstein & Newell, 2019, 2020). Crucial questions that need to be answered include who the key players are, who facilitates the movement and exchange of commodities, and who connects producers' products to the consumers. Consistent with such questions, literature on transparency acknowledges multi-stakeholder nodes involved in global supply chains and that transparency is continuously being challenged in this pursuit (Carodenuto, 2019; Gardner et al., 2019; Thorlakson, 2018). This is evident by scholars documenting that stakeholder nodes in supply chains are often opaque and inherently under-researched (Carodenuto, 2019; Folke et al., 2020; Goldstein & Newell, 2019). A definition of transparency states that "the extent to which all the network's stakeholders have a shared understanding of, and access to, product and process-related information that they request, without loss, noise, delay and distortion," represents full transparency (Beulens et al., 2005, p. 482). In relation to this project, Beulens' quote alludes to an element of in-equity amongst supply chain nodes, between origins and consumers. Others have described achieving transparency in commodity sectors as a mapping process that must begin at the source of a commodity and continue to the consumer (Cho et al., 2021). Currently, transparency such as this does not exist homogeneously across commodities. Therefore, transparency is recognized as a fundamental step in detecting the socio-environmental challenges embedded in supply chains (Carodenuto, 2019; Cho et al., 2021), concluding that accessible supply chain information is an essential pre-condition for sustainable sourcing, growing, and consumption (Cho et al., 2021).

The Role of Traders: What is already known

Due to an overall unsuccessful implementation of all-encompassing sustainable supply chains policies thus far, Folke (2020) brought an invitation to the academic community to research transnational corporations, including but not limited to trading companies' operations involving biosphere sustainability (Folke et al., 2019). This call for research is consistent with theories proposed by others that traders are a potential and novel key to mobilizing and communicating sustainability and that they may play a role more broadly in sustainable global food systems

(Carodenuto, 2019; Clapp, 2020; Folke et al., 2019; Grabs & Carodenuto, 2021; Rosenberg et al., 2009). Proceeding with Grabs and Carodenuto's (2021) definition of traders as companies that trade agricultural commodities between producers and manufacturers as their primary business situates traders' role in the center of the supply chain and alludes to their extent and power. Traders, the intermediary node of the supply chain, are often the most concentrated — leading to the understanding that transnational trading corporations are connecting nodes in supply chains between producers and retailers and, more broadly, between people and the planet (Folke et al., 2020). Clapp (2020) furthers this theory by building on these relationships, which are present in the highly concentrated food economy. Food systems are influenced only by a handful of transnational corporations with an immense scale and geographical scope, resulting in horizontally and vertically integrated food systems, thus making it difficult to characterize and understand economic and ecological repercussions (Clapp, 2020; Grabs & Carodenuto, 2021).

Global Food Systems:

The literature on Global Food Systems established that the evolution of trading companies was a logistical solution for addressing complex and uncertain commodity movements (Clapp, 2020). A single company can now manage their supply and demand of goods, resulting in traders' current transnational and global power and scale (Clapp, 2020; Reis et al., 2020). Clapp (2014) further examined how the financialization of global food system markets created a 'distancing' in food systems, consequently creating severe implications for the broader food system and global food politics. Clapp (2014) attributes this to markets becoming "a mode of accumulation for large transnational agribusiness players" (Clapp, 2014, p. 797, 2020; Grabs & Ponte, 2019). The broader reverberations of this finding were that the number of actors or nodes in commodity chains has consolidated but has simultaneously grown across the globe. Food systems have now evolved into complex systems of commodity processing and transactions (Clapp, 2014; Freidberg, 2017).

Furthermore, these findings highlight how financial actors in complex commodity supply chains can easily be obscured. As a result, intermediaries cannot easily be identified or held accountable for their various ecological or human equity misgivings (Clapp, 2014). Such events within historical and current food systems have led scholars to recognize the space for

intermediaries in supply chains to flourish and hold significant power in international agriculture trade (Clapp, 2020; Folke et al., 2020; Grabs & Carodenuto, 2021).

Global Value Chains:

In the field of Global Value Chains, commodities of global origin are analyzed through an environmental, human equity and labour lens (Serdijn et al., 2020). Value chains analyze the interactions and activities between actors and firms who add value to products spanning from upstream to downstream across supply chains (Irwin, 2018). Previously, work on Global Value Chains predominantly dealt with efficiency logistics. But, Kano (2018) noted an addition to the field's focus, transitioning to relational dynamics embedded in Global Value Chain operations to improve understanding of international trade and network governance (Kano, 2018). This field of inquiry also argues there is a missing link in research, as attention is most often given to lead firms and producing suppliers (Serdijn et al., 2020), thus complementing what was stated by Grabs & Carodenuto (2021) on traders being typically underrepresented in research. In tandem, intermediary actors are either left out or given less consideration when reimagining sustainability (Serdijn et al., 2020). It was found that these 'backstage' intermediaries are given less recognition for their ability to impact value chain sustainability while they are, in fact, influential contributors to the system (Rosenberg et al., 2009; Serdijn et al., 2020). In summation, the analysis of Global Value Chains compliments the evolution of research in Global Food Systems literature. Both fields established a new research niche in addressing the intermediary's potentially new role in sustainability.

Chapter 3. Methodology

The methodology of this project is guided by previously published work documenting the process, benefits and logistics of operationalizing the Delphi Method (Silverman et al., 2023). The Delphi Method eased the experience of collecting both quantitative and qualitative data from transdisciplinary and multicommodity stakeholders. The methodology allowed us to dive deeper into our participants' experiences and perspectives during each data collection phase. Applying the Delphi Method is also an advantageous way to engage with business actors in a collaborative way.

The complementary nature of imploring a mixed-methods approach that drew on elements of qualitative and quantitative data analysis throughout the three phases is strongly justified by Sui et al. (2011), stating that mixed methods "is but one way of engaging the multiple voices present in the sites and communities where our research is placed" (Sui & DeLyser, 2012, p. 119). The significance of the mixed-methods approaches strongly advocated for the underlying community-engaged and participatory action-based tones central to the project. The findings of all three phases were compiled and analyzed in unison as the final methodological procedure, signifying a holistic and all-encompassing Delphi approach.

Study Area and Participant Selection:

The in-person participation took place at the University of Victoria in June 2022. The workshop hosted transnational and trans-disciplinary trading practitioners and researchers. Participants were invited from Asia, Europe, North America, Africa, and South America to capture the global nature of tropical commodity trading. Participants work as practitioners or academics in cocoa, coffee, or palm oil. Inviting participants from the "front-runner" tropical commodity backgrounds speaks to the vertical and horizontal supply chain sustainability goals of the workshop (Grabs & Carodenuto, 2021). The project participants participated in a hybrid in-person and virtual workshop. The Kick-Off and Follow-Up Activities surveyed additional expert participants who were interested in the workshop but could not attend, as well as the workshop participants.

Methods:

This study consisted of two data collection methods: survey data and workshop proceedings. Both data collection methods were obtained from practitioners and researchers during three main collection phases (Figure 1). The methodology most prudent for such diverse qualitative data sources was the Delphi Method. The Delphi Methodology is an iterative process in which experts are consulted using multiple data-gathering methods to elicit expert opinions to shape future predictions or reach a consensus (Crisp et al., 1997; J. Skulmoski et al., 2007; Silverman et al., 2023; Thangaratinam & Redman, 2005; Turoff & Linstone, 1975). The significance of the Delphi methodology being used on the diverse workshop participants is expressed by Skulmoski et al.'s (2007) definition of the method, "The Delphi method can be used when there is incomplete knowledge about a problem or phenomena" and "The method can be applied to problems that do not lend themselves to precise analytical techniques but rather could benefit from the subjective judgments of individuals on a collective basis" (J. Skulmoski et al., 2007, p. 2). The flexibility of the methodology aligned with how little is currently understood about the role of traders as sustainability communicators and the current calling for research on traders. The Delphi process was, therefore, conducted through multiple modes and rounds of expert knowledge-gathering sessions, which informed the workshop's agenda as well answered the overarching research question.

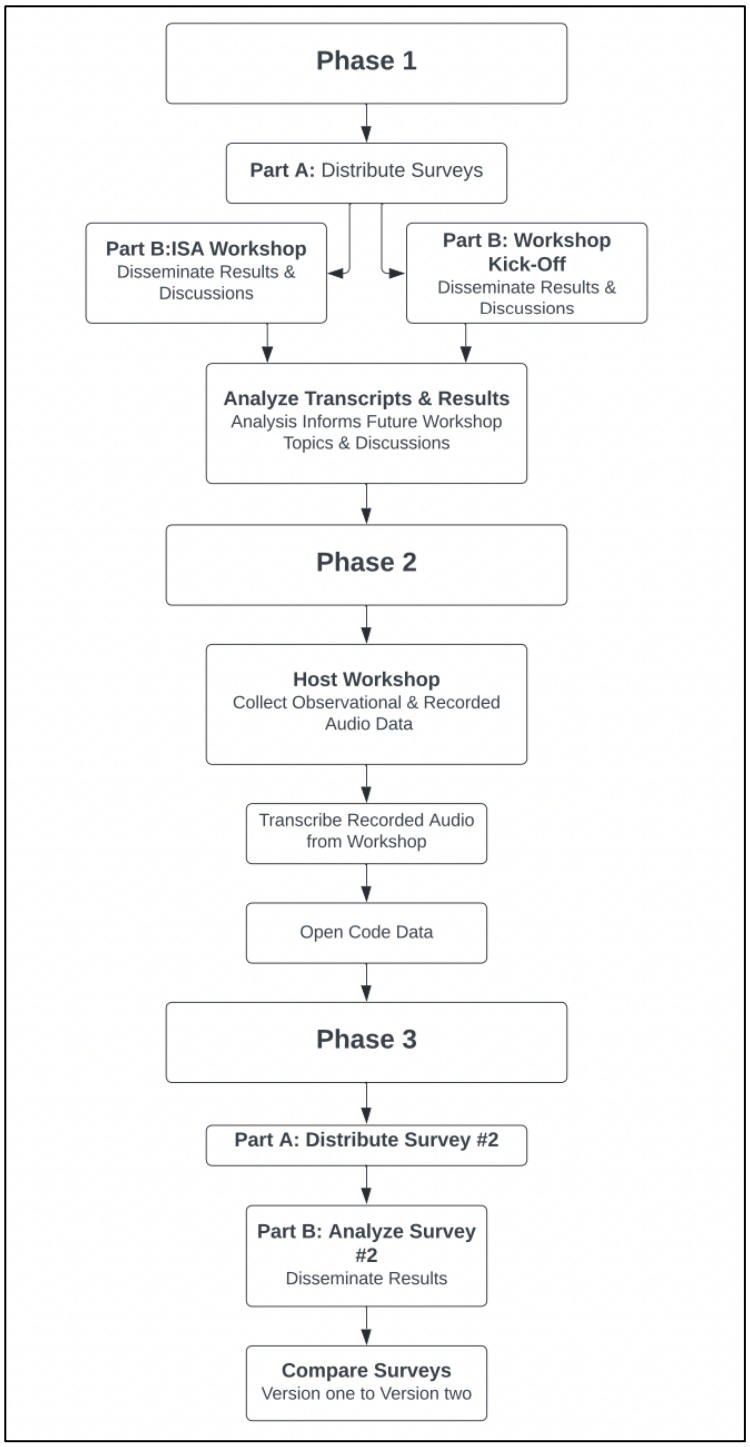

Figure 1. Phases of Delphi Method

Phase One: Scoping Surveys on Perceptions

Phase One began prior to the graduate student's (Sofia Silverman, the author) study but was completed by the student's supervisors and therefore is still considered primary data. A combination of trading practitioners and academics were recruited for phase one of data collection. Phase one consisted of two sub-stages: 1) two online surveys and 2) two virtual meetings intended to disseminate survey results and foster introductions.

Part A: Survey:

Participants were asked to participate in a voluntary online survey. Participants were invited based on their academic or career connections to tropical agriculture commodity trading and research. Primary survey data was derived from 24 experts in the field, collected from group 1) academics or trading practitioners whom voluntarily specified their ididentitys 2) commodity traders, 3) consultants, 4) non-profit sector stakeholders, 5) vertically integrated green coffee suppliers, and 6) industry. Survey questions elicited expert opinions on the central theme, assessing the opportunities and challenges of traders behaving as sustainability governance actors (Allen et al., 2019) (Appendix A). The survey participants were from two separate meetings the 1) International Studies Association (ISA) Roundtable Workshop and 2) Workshop Kick-Off Meeting. Both groups received the same survey but in separate invitations. This was to ensure that events could be distinguished during data analysis. One discrepancy is noted: one participant completed a survey in both meetings; therefore, only 24 experts were represented, but 25 surveys were completed (Table 1). As the survey is anonymous, the repetitive survey cannot be removed from the record.

Table 1. Phase One Survey Deployment includes the number of surveys completed.

	ISA Roundtable Workshop	**Workshop Kick-Off Meeting**
Number of Surveys Completed	9 **Acedemic: 9** **Practitioner:0**	16 **Acedemic: 9** **Practitioner:7**

The survey was conducted over Google Forms and had been previously approved by the University of Victoria's Ethics Committee. The first round of the Delphi Method survey anonymously collected information on the experts' backgrounds and perspectives using Likert Scale parameters. The Likert Scale is a questionnaire assessment tool that elicits qualitative data responses such as opinions, attitudes, and perceptions along a linear scale which can be transformed into quantitative values (Nemoto & Beglar, 2014). The Likert Scale questions ranged from Not Important At All, Somewhat Important, Important, Important, Extremely Important and Don't Know, or Don't Agree at All, Agree Somewhat, Mostly Agree, Completely Agree Don't know. The numerical data derived from the Likert Scale quantitatively illustrated participants' views, opinions, and perspectives (Appendix A). This was completed by assigning the Likert Scale options a numerical value between 1 and 5.

The limitations of applying a non-parametric Likert Scale question in isolation from other means of analysis and simply deriving numeric data would not produce a "well-rounded understanding" of an event and, therefore, the methods were bolstered with open-ended qualitative questions and comments (Nemoto & Beglar, 2014, p. 8). Thus, in response to the numerical limitations and further abiding by the Delphi Method's multiple rounds of inquiry, open-ended questions were also asked, allowing participants to explain their choices. Non-parametric methods were selected as this method makes fewer assumptions than parametric methods and can be used on data that is not normally distributed. Lastly, participants were asked to select pre-determined topics they thought would be pertinent to discuss during the workshop or provide supplementary suggestions.

Survey results were re-visited using thematic analysis and Python to deduce empirical results such as the mean, and perform a Mann-Whitney U Test to assess for statistical differences between practitioner types from the anonymous qualitative turned quantitative Likert Scale data, which completed part A of phase one of the Delphi Methodology. The quantitative analysis differentiated answers between academic and trading practitioners' responses.

Part B: Meetings:

Results of the anonymous first Delphi survey were used as the basis of two virtual meetings 1) International Studies Association (ISA) Roundtable Workshop and 2) Workshop Kick-Off Meeting (Table 1). Both sessions took place over Zoom. The same participants who were invited to partake in the survey also took part in the meetings. The objectives of the sessions were to re-visit and discuss the proposed topics and results of the survey and introduce participants to one another. Participants were allowed to see the results and comment. Participants were also encouraged to further ideas or propose additional topics of interest. All conversations were recorded using Zoom and transcribed using Otter Ai software version 3.34.0.

Secondary transcription data was then thematically analyzed to identify themes based on topics' frequency and prominence during the discussion. The analysis was informal and did not follow any pre-determined analytic code or use any software. Meeting transcripts were manually reviewed and the identified themes were used as a foundation for phase two's methods.

Phase Two: Delphi Dialogue

Expert Workshop:

Consistent with the Delphi Method, the second iteration of the expert-knowledge gathering occurred during the Traders as Sustainability Governance Actors – Initiating a research agenda workshop between June 27th to 29th, 2022, in Victoria, British Columbia. The workshop structure was based on the pre-defined topics from phase one's thematic analysis results using the Delphi Methodology (Appendix B). The hybrid workshop included both in-person and virtual participation and had a Lead Discusser and Presenter for each topic, followed by informal group discussions. Presentations and discussions were audio-recorded and transcribed for data analysis, which was also approved by the University of Victoria's Ethics Committee. Recordings were documented using Zoom's record function, and the audio data was transcribed using Otter Ai software. Anonymity was not possible during this phase, but responses were made anonymous during data analysis.

After the workshop, the transcription data were summarized using qualitative analysis. Transcriptions underwent systematic examination seeking themes and responses to the central question, *What types of barriers do tropical commodity traders see that prevent them from operationalizing sustainability in commodity supply chains, and what are traders' roles, responsibilities, and opportunities in furthering sustainability?* The analysis was approached using inductive coding analysis methods. This process involves reading and interpreting data to identify themes and concepts (Dyck, 2015). Transcript data were coded using NVivo software. Inductive open coding was the ideal methodology as it permitted familiarization with the data and the natural progression of coding themes to develop or better described as snowballing (Rewhorn, 2018). As coding was inductive, the precise coding structure unfolded during analysis and resulted in the structure seen in Figure 2.

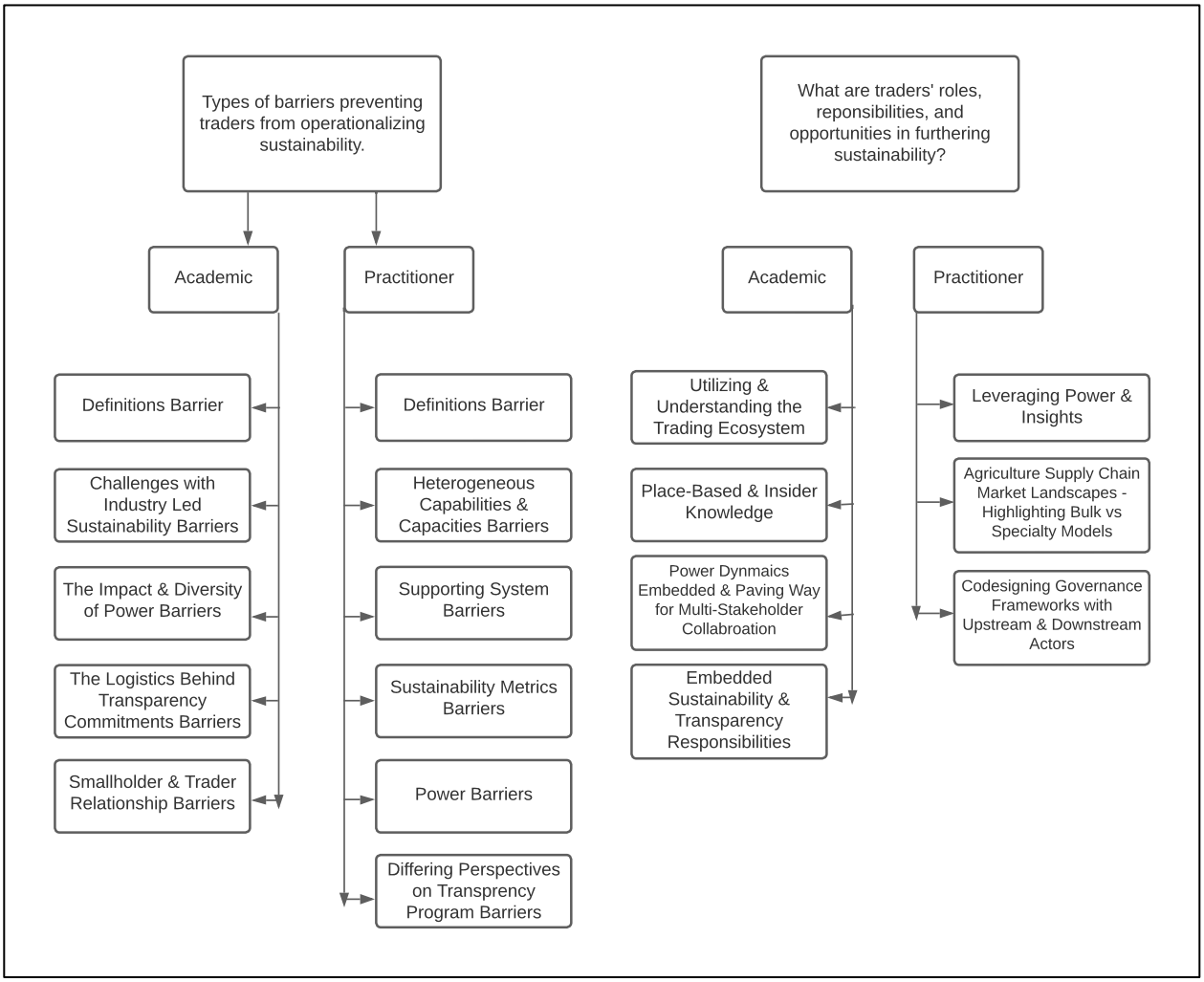

Figure 2. Coding of Workshop Transcript Data.

Phase Three: Final Survey on Perspectives Change

Part A: Second Survey:

The final round of the Delphi Method was a second voluntary and anonymous survey completed by the workshop participants following the in-person and virtual stages of the methods. The last survey was similar to the initial one from phase one. The second version of the survey was altered to decrease the emphasis on workshop topic planning but an increased emphasis on the evaluation of perspectives and knowledge sharing between participants at the workshop. Secondly, the survey also differentiated between academic and trader responses in order to evaluate the potential binary between the two. This was justified by a similarly completed Delphi Method-based study that evaluated stakeholder differences (Begemann et al., 2021). Lastly, version two differed in that participants were asked if they participated in the first iteration of the survey, either during the International Studies Association Roundtable Workshop or the Workshop Kick-Off Meeting. Due to unforeseen challenges surrounding the ongoing COVID-19 pandemic, the initial participant list significantly changed, and the second survey results reflected that. This was a vital aspect of the analysis as the response results were compared between phase one and phase three.

The survey again used Likert Scale non-parametric questions and open-ended responses and comments to collect quantitative and qualitative data. During this phase, mixed-methods analysis procedures proposed in phase one part A were repeated, such as thematic analysis and statistical analysis that used Python.

Part B: Comparing Surveys:

Finally, acknowledging that the participant list had significantly shifted since the commencement of the project, results from phase one, part A, and phase three, part A were statistically analyzed for the survey questions that remained unaltered. As the workshop was centred around knowledge exchange between diverse and transnational stakeholders, participant results demonstrated how and if the workshop facilitated new perspectives or increased understandings. Results of version two of the survey permitted the comparison of each survey's

overall findings but also noted that the survey participants are different. Similar to phase one, part A and phase three, part A, the same statistical analysis was used to derive the results.

Chapter 4: Results

This section depicts stakeholders' perspectives and discussions that took place throughout the duration of the project and methodology phases. The data documents the barriers preventing traders from operationalizing sustainability, and traders' roles, responsibilities, and opportunities in furthering sustainability objectives in commodity supply chains. The results are structured as follows; Academic and Practitioner – Barriers, Academic and Practitioner – Roles, Responsibilities and Opportunities, and Survey Results – One, Two, and Comparing Surveys. As the research questions are not subject to a simple yes or no response, the multiple data collection phases collected qualitative and quantitative data that built off and complemented preceding data collection phases (Silverman et al., 2023). Qualitative data is documented using quotes, paraphrases, and summaries made by the author and has further been discerned as either academic or practitioner data. The quantitative data is also identified as being derived from academics or practitioners.

In support of the qualitative data, quantitative data was also collected. Given the small sample size, characteristic of an expert opinion-based project, there are limitations with the quantitative data results section. The caveat of having a small number of participants contribute to the quantitative observations is that data analysis does not go beyond descriptive statistics and only accounts for inferences on this group's perspectives, and does not make larger-scale assumptions outside of this group. Considering the limitations, the mixed methods approach still results in a holistic understanding of the problem at hand.

Workshop Participants:

Table 2. Number and Type of Workshop Participants.

Participant Type at Workshop	**Total Number of Stakeholders at Workshop**
Academic	11
Practitioner	15

1. What Types of barriers do traders see that prevents them from operationalizing sustainability in commodity supply chains?

This section is the second phase of the Delphi methodology. Phase one's results informed phase two, the Traders and Sustainability Workshop (Table 2). The workshop was recorded, transcribed and coded using the coding structure shown in Figure 2. Results are documented as comments, paraphrases, and quotes and are distinguished as either academic or practitioner; this is to identify differences and similarities between stakeholders. The following categories and headers are not listed in order of importance.

Academic Perceived Barriers:

i) Definitions Barriers

Definitions, terminology, language, and labelling were expressed as common barriers amongst the academics at the workshop. Academics agreed that the term 'trader' has a multitude of definitions. It was stated that a trader's role is not homogeneously understood and that they are heterogeneous across geographies and commodities, resulting in a variety of stakeholders being categorized as a trader even though they perform different functions. An academic explained that some "[traders are] defining themselves as agricultural product sector companies, while others are looking at themselves as processed food sector companies, and as a result [there are] different risk assessments that are attributed to those companies and there are different requirements that are placed upon them by the financial sector." Therefore, heterogeneous terminology results in challenging conditions for implementing sustainability objectives as it is difficult to task the influential actor of a supply chain to be a sustainability champion if they cannot be identified.

Additionally, traders do not operate in isolation, especially in bulk markets. There are multiple tiers of traders who play vital connecting roles within

the supply chain, eventually feeding into the large-scale traders who are typically thought of as the key leverage stakeholders. It was explained that given the opaque nature of many tropical commodity supply chains, there is a disconnect between on-the-ground operations and large-scale traders. An academic explained the situation at hand as by "focus[ing] on the small [traders] rather than the big [traders]. But I think if we do that, we have missed this kind of ecosystem aspects of these middle segments of the supply chain. Now all these actors do interact, there are very strong synergies between them, and [we need] to somehow capture this as an ecosystem, and not just as one group of actors ignoring how they benefit and how they need the support of all the other [traders]." Which has been noted as contributing barrier to sustainability objectives. West African cocoa was used as an example, where in attempts to eradicate obscurity, local governments are proposing the elimination and formalization of small informal intermediaries. While in fact, these tiers of traders provide vital services to smallholder producers that large scale-traders do not have direct access to, thereby cutting off farmers from an important revenue source." Moreover, academics agree that self-identified and external definitions of the entire trading ecosystem are inconsistent, but simultaneously, correct definitions are important for identifying and tasking the correct stakeholders.

ii) Challenges with Industry Led Sustainability

A second barrier identified was the conflicting interests of trading firms. The opposing roles within a company are at the root of this barrier. There is an ongoing battle between sustainability and pro-business motivations internally; the cost of implementing sustainability projects is found to be disruptive, expensive, and demanding of both time and energy. The reinforcement of a more industry-friendly interpretation of sustainability is often at risk by business-led sustainability. Others acknowledged the high degree of risk associated with engaging projects known for uncertain outcomes, which discourages investors or board members from onboarding programs. It was explained that " most

sustainability projects are inherently subject to high uncertainties. You don't go in thinking about sustainability with a slam dunk… and that's due to the complexity of the system. And the difficulties of evaluating the impact of any conservation mechanism on nature and stakeholders." Envisioning scalable solutions was mentioned as a barrier, as this has rarely been done at scale holistically enough to address the multitudes of embedded challenges. Academics explained that it is more common for firms to address single issues, despite a clear need for a multi-pronged approach. Follow-up comments were made regarding regenerative agriculture, but it was noted that solutions of this nature are hard to implement at scale. The multiple components of this barrier result in a challenging environment to propose, implement, and maintain sustainability initiatives.

iii) The Impact and Diversity of Power

This barrier addresses the variety of power imbalances traders encounter, which hinder their ability to act as sustainability communicators. An academic challenged the commonly known structure of the supply chain, which resembles an hourglass (Figure 3). The central position in supply chains does permit upstream and downstream influence, but on the other hand, the bottleneck spotlights traders, thus becoming a position of vulnerability. Here there is a risk level for traders demanding too much from their upstream and downstream partners. Insisting too much could impact traders' future in a sourcing area due to overstepping and pushing local governments.

Power between traders and supporting smallholder producers was considered a sustainability barrier. The economic logic advocating for traders to invest in multiple sourcing regions instead of a single one is conflicting with sustainability objectives. Academics explained that standard trading operations promote the diversification of sourcing regions to mitigate supply insecurities. One academic explained their point of view as "investing in one sourcing location would be counterproductive because what companies are interested in is risk

mitigation … [and] investing too much into one or expending too many resources into one specific location" is seen as risky. This perception discourages traders from committing to a sourcing area, thus hindering the concentration of socioeconomic and environmental improvement opportunities they could have in a region and diluting their significance of impact.

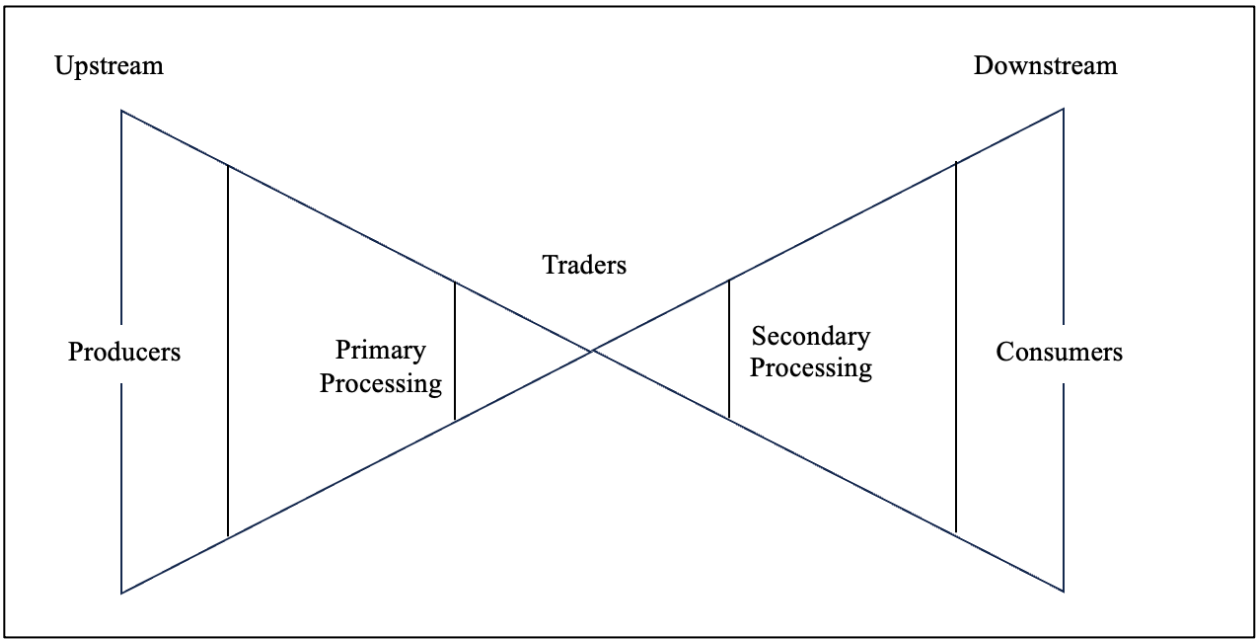

Figure 3. Simplified Hourglass Cocoa, Coffee and Palm Oil Supply Chain as described by (Grabs & Carodenuto, 2021).

iv) The Logistics Behind Transparency Commitments

Transparency-related barriers were a common problem among academics. Transparency-related barriers appeared to be twofold, 1) being transparent is inherently risky, reputation-wise, and 2) transparency programs are difficult to implement homogeneously due to the heterogeneous nature of sourcing origins.

Engaging in transparency projects has implications for traders. Tracking and mapping of supply chains mean that operations and the movement of commodities are no longer opaque, and the potential for negative or unsustainable

products to be discovered increases. Companies are no longer able to hide challenges, and transparency commitments can have legal repercussions resulting in an increased incentive to hide unsustainably sourced goods. Perceptions of transparency trends and brand reputation were described as being "counterproductive for [traders, and that] the move would be to go back into obscurity to avoid pressure toward transparency. And rather than saying, we will now build on this, and we will build our reputation. Can we just not have a reputation, to begin with, and we will try to maintain the way that we've flown under the radar for now." Academics also expressed that transparency pressures can cause companies only to report their sustainable products and hide their unsustainably sourced goods, which creates increased preventive barriers for remedying problems.

The secondary consideration was implementation barriers. Due to the diversity of sourcing regions tracking and transparency infrastructure is not always reliable in sourcing regions. A common problem observed in the field is the capacity to support supply chain mapping technology. Secondly, complex supply chains commonly have several stakeholder nodes and multiple tiers of middlemen, including informal traders, which impedes the transparency transition processes. Lastly, implementing increased transparency policies and processes is expensive, will ultimately result in higher costs in the final product, and is speculated to deter consumer purchasing.

v) Smallholder and Trader Relationship Barriers

This barrier refers to traders' advantageous relationships with both upstream and downstream actors. Traders ultimately want to protect their position and relationship with communities to ensure ongoing trading. Relational barriers were found to be of particular importance when it came to smallholder producers, as traders " that have specialized in certain producing origins and have built

connections with farmers, and they might be interested in protecting those producing communities" from onerous and unnecessary sustainability burdens.

Practitioner Perceived Barriers:

i) Definitions Barriers

Practitioners described barriers that traders encounter when operationalizing sustainability in commodity supply chains. The first unanimously identified barrier again was the diversity of perceptions and understandings of traders. There is a myriad of understandings among the broader tropical agricultural supply chain community on who and what roles and services traders perform. Practitioners described scenarios where traders have been associated with a "Wolf of Wall Street" stereotype. This misrepresentation neglects the multitude of values and services traders bring to the supply chain, such as "storing, shipping, financing, building farmer relationships, providing risk management services, implementing programs, managing company stock, and buying and selling." In addition, one cocoa-experienced participant reminded the group of the historical connotations of the trading industry and made analogies of traders being "supply chain colonizers." Following this, a practitioner pointed out that a barrier in moving forward is further hindered by "whether traders have made significant transitioning efforts to move away from a role rooted in colonization to "one of facilitation which has more stakeholders' interest at heart."

The definitions barrier is further embedded in supply chains and relates to supply chain misunderstandings and was addressed by practitioners who commented on the structural diversity of the supply chain—recalling that traders across the commodities can also be vertically integrated. Many commented on an oversimplified understanding of the supply chain and that it is not nearly as simple as it might appear (Figure 3). There was also a general recognition amongst the practitioners that the supply chain and its actors are not

homogeneously understood and, therefore, a barrier to implementing sustainability objectives.

ii) Heterogeneous Capabilities and Capacities Barriers

The capabilities barrier refers to trading practitioners' doubts about their abilities to shape and enforce sustainability initiatives. Traders are worried about sustainability costs due to a lack of consumer market support. Concerns were raised over consumer bases not being robust enough and that there needs to be significantly more research towards making supply chains more apparent in order to support every farmer with a higher price. One practitioner used an example of eco-certifications in the UK, where they found "there was no willingness to pay for the markup that sustainability services would cost." Practitioners continued to comment on the economic challenges sustainability managers continuously endure and simultaneously having to "prove their sustainability case to the businesspeople' in their companies." They explained that there is a clear gap in the desire to complete sustainability projects throughout companies.

According to the practitioners, even if there is motivation to implement sustainability, there is a significant risk for an individual trading firm to "raise its head above the crowd." One palm oil experienced participant stated that overstepping boundaries or norms in producing origins, internally or in the country of import, will "bring down many problems raining on your head," therefore, traders' capabilities are limited. Lastly, one trader explained that there is an overall lack of resources to have a holistic sustainability impact, which varies depending on a company's size. The collective voices indicate that traders' capabilities to evoke sustainability in supply chain operations are heterogeneous.

The final associated element to this barrier involves the lack of impact cohesion throughout the commodities, especially when comparing bulk and specialty traders. Practitioners explained that there is not a homogeneous level of

impact that traders can evoke. For specialty cocoa markets where many innovations are born, traders recognize the will to implement sustainability, but small specialty traders are not able to command any significant sustainability demands at scale. It was also pointed out that specialty sourcing often does not operate in the areas with the greatest sustainability adversities. There was a general understanding that traders' capacities and abilities are not equal as there is a significant diversity of market landscape barriers.

iii) Supporting System Barriers

Concerns over broader landscape risks and uncertainties deterring traders from implementing and initiating sustainability programs were raised. Current governance and policy are insufficient at the moment to support the scope of objectives needed to eradicate embedded environmental and socioeconomic strife. In addition, neither governance nor economic systems are set up for such processes. A participant shared their conflicting experience with traders' "desire for guiding legislation," promoting a community of support along the supply chain and creating a level playing field. But, simultaneously, traders are hesitant, as enforced compliance would result in a cascade of expensive and logistically intensive actions. Others provided information on the barriers related to the core capitalistic nature and composition of trading companies, where a solution such as accepting less profit margin is simply not an option. Other practitioners explained that the theory of "accepting less margin" is not feasible as their economic leverage is from sheer volumes, that is why " it's hard [for a trader to say], we're going to reduce margins and give that back to farmers."Additionally, this does not help trading firms avoid the risk and volatility of FOB prices placed upstream on the smallholder farmers.

iv) Sustainability Metrics Barriers

A barrier identified by the practitioners at the workshop was the

inconsistent and evolving discourse around sustainability metrics, reporting and their application. The first and coarsest scale challenge identified was the lack of consistent sustainability programs across the commodities. They explained that solutions are exceptionally localized and, therefore, cannot be made into generalizable solutions, which increases the difficulty of implementation. Additionally, traders stated that there is not a common set of key performance indicators (KPIs) that companies have all agreed upon to measure sustainability progress. One practitioner shared their experience by explaining that traders have successfully managed quality and volume-related objectives brought on by consuming market demands as these metrics are easily measurable. But they explained that it is difficult to demonstrate sustainability demands or socioeconomic achievements similarly as this is often not a visible characteristic. Here traders stated they would benefit from a strict governance framework or system or a set of KPIs in place so that they could more easily convey sustainability and socioeconomic accomplishments homogeneously. The inherent flaws of self-reporting on sustainability metrics were also brought up as there are risks of trusting companies to self-report and can cause traders to cover up unsustainable sources and engage in selective reporting and " when you can't evaluate certain elements of the company's performance, you end up taking their word for it" which can be misleading. Lastly, a couple of practitioners explained that they did not believe many of the current sustainability programs are farmer-centric enough to evoke significant change overall.

v) Power Barriers

The variety of power dynamics traders experience in their line of work was identified as a barrier when it came to tasking traders with initiating sustainability. Foremost, traders explained a contradiction to the hourglass structure of the supply chain (Figure 3), where they often do not feel they have enough power to make sustainable changes. The concentrated center of the hourglass was described as a constricting space where there is very little

maneuverability as opposed to being a leverage point. One explained that traders often have limited pricing power as it is dependent on the local context of the market, what they know, as well as the form the producer is selling in. An analogy was made that depicts one oil palm trader's lack of optimism, stating that utilizing traders as a leverage point for sustainability objectives "is like sucking liquid from a cup from the centre of a straw; you'd usually do it from the end." Another commodity trader explained their unsuccessful experience with the long-term uptake and continuation of sustainability programs by smallholder producers. The informant explained that "financial incentives were the only power they had."

The varying sizes of traders were also identified as a power barrier; here, the different sizes of traders result in varying degrees of influence and impact. Traders explained that they don't have homogeneous amounts of agency, and traders are usually the "price taker rather than the price givers." One participant explained it is often "someone sitting in an office somewhere far away who is determining the value" of the commodities and not the stakeholders on the ground, so the "locus of power" is not easily identifiable. Another remark made on the embedded power barriers was trader-to-trader collaboration. This concept was explained as conflicting with the very core of traders as they are not natural collaborators due to their competitive business models. Power barriers were different across geographies and commodities, but traders shared similar problems that are counterintuitive to sustainability progress.

vi) Differing Perspectives on Transparency Program Barriers

The final barrier the practitioners spoke on was transparency-related challenges. Traders were concerned and wanted to highlight the costs of transparency programs. One supported this barrier by stating that "the cost of implementing 100% traceability is higher than expected". In support, a participant refuted a common response, which is that "technology might make it easier, but it has yet to." A trader explained that "demanding transparency from a supply chain

that was born and bred on the efficiency of moving goods will result in the loss of efficiency." Traders will need to be prepared to erode demand to accommodate.

Traders were skeptical about the efficacy of such programs altogether and explained that there's a part of the industry that believes in transparency, and there's part of the industry that does not. From their experience, some of the traders who are saying transparency is not feasible "are the ones who have worked the hardest on it," and the practitioners thought that was a telling sign. Traders at the workshop summarized that transparency barriers hinder the motivation and willingness of traders to continue working on sustainability when there is such complexity involved.

2. What are tropical commodity traders' perceived roles, responsibilities, and opportunities in furthering sustainability?

Academic Roles, Responsibilities, & Opportunities:

i) Utilizing and Understanding the Trading Ecosystem

Academics emphasized traders' self-perceived roles, responsibilities, and opportunities in furthering sustainability in commodity supply chains regarding better utilizing and understanding the "trading ecosystem." The entire group proposed the ecosystem model; academics explained that this environment metaphor demonstrates that traders play highly complementary and symbiotic roles with one another. Here academics pointed out that small, more informal traders contribute to the sourcing and scaling up of multinational companies' inventories. Further, the informal trader plays a vital role in supporting farmers who would otherwise be too remote for larger-scale traders. An academic explained that smaller traders "play a very important role in supporting farmers who are otherwise vulnerable.… farmers who sell to cooperatives often don't receive payment for several weeks, [and that's why] pisteurs [are] a really important source of cash flow for those farmers who otherwise wouldn't be able

to get it." Continuing with the ecosystem theory, academics identified utilizing the ecosystem to identify the different capacities of traders. Using this typology to understand better what actors should be avoiding certain producing origins that have known sustainability problems as they do not have the capacity to improve those hotspots. Another embedded ecosystem suggestion was that traders are often physically seated in an office in both the producing country and the importing country and are familiar with the legal structures of both places; this was agreed upon as an opportunity for better tasking traders with the responsibility of furthering sustainability objectives due to their situational advantage.

ii) Place-Based and Insider Knowledge

The second identified opportunity operationalizes on traders' place-based insights and experiences. Academics recognized the formative path traders have been paving, such as developing new market spaces and "creating local institutions in terms of contracts and finance." Traders also are the key players who have been translating sustainability pressures and knowledge to farmers in producing regions. This is supported by academics describing traders as major sustainability actors "who have been the ones bringing in the development, job opportunities and infrastructure." Sourcing locations and connections to people on the ground are one of traders' unique resources and competitive advantages. Comments followed stating that traders should be interested in ensuring that their sourcing location becomes sustainable in order to maintain continuous market access. The more sunk cost traders have in an origin, the more motivation there is to improve sustainability and the more feasible it is. Moreover, academics concluded by saying that trading firms with local offices are better suited for sustainability work as opposed to actors further along the supply chain as they have greater insight into; what will work in an origin, how conducive the local government is for sustainability, and what motivates farmers as " smallholders are very reliant on traders' choices and sourcing patterns." The connections and

information that traders have are crucial for operationalizing sustainability.

iii) Power Dynamics Embedded and Paving Way for Multi-Stakeholder Sustainability Collaboration

This role and responsibility cover addresses power dynamics and multi-stakeholder collaboration opportunities for traders. Academics spoke about the pinch point position of the supply chain that traders occupy and how the more concentrated traders are, the more "concentrated power and value captures are as well." Follow-up agreements explained that if traders have more power, then they are the ones ultimately determining the discourse around sustainability and what sustainability means. Traders are vulnerable to downstream pressures but are also in the ideal position to impact behavioural changes upstream in landscapes.

Multistakeholder collaboration was of particular interest to the academic experts at the workshop. Supply chains each have their own set of sustainability commitments and programs, and academics agreed that adopting a more uniform, effective, and equitable set of commitments is necessary. Academics explained their concerns with stakeholders constantly jumping between commitments resulting in no long-term implementation. This was identified as being cost-ineffective for traders, as they are continuously spending money with no return. One academic identified this as the "pressure and motivation for improved sustainability." Following were theories on collaboration 1) on the ground and 2) across the supply chain. The group spoke about the need to gather multiple actors from across different sectors to implement sustainable land use and socioeconomic objectives. Academics spoke of trader and local government collaboration, addressing government-led smallholder farmer initiatives; academics agreed that trader involvement would result in increased uptake and long-term continuation of programs. Collaboration lends way to jurisdictional approaches that bring together multiple traders alongside local governments to change policies at the state level. Academics explained that this is an ideal model

for change due to the associated risks of individual trading firms trying to propose sustainable change alone, whereas proposing multistakeholder-led programs is more feasible.

iv) Embedded Sustainability and Transparency Responsibilities

The final role and responsibility of traders, as identified by academics, are entrenched sustainability and transparency responsibilities. The spotlight was shifted to traders' obscurity. Academics noted “reputational risk management,” as it is in the trader’s best interest to be seen in a good light, to protect their brand reputation and be seen as a sustainability leader. This is additionally supported by mitigating NGO attacks and any negative media attention. It was also explained that transparency monitoring was not viewed as a major problem by traders, but it was viewed as a cost that traders are addressing and are increasingly integrating. Academics also brought up a common concern over monitoring costs and explained that this is not a valid excuse for larger traders, and the actual problem is that monitoring data is not sufficiently being taken up and used to evoke significant change appropriately. Here academics wanted to continue looking at what traders must leverage to make more sufficient sustainability transformations.

An academic additionally pointed out that engaging in sustainable projects offers traders greater access to sustainable financing opportunities like “revolving credit funds that are providing better interest rates for sustainability criteria fulfilled, and therefore would be an attractive business case for trading companies.” Academics concluded that increased sustainable behaviour supported by financial regime support would aid in the uptake of transparency work as there will be fewer associated risks.

Practitioner Roles, Responsibilities & Opportunities:

i) Leveraging Power and Insights

The trading practitioners self-perceived roles, responsibilities, and opportunities for furthering sustainability in supply chains identified coupling benefits of the trading ecosystem and utilizing traders leveraging capabilities. Traders addressed that the term 'trader' does not accurately capture the diversity of roles and services traders provide; they suggested alternative vocabularies, such as "supply chain managers or supply chain facilitators." Traders believe that different labels better represent the diversity of functions and sizes of traders. One trader accounted that they had a "preconceived perception of informal traders as being nefarious" but, in fact, were surprised that these actors often have "long-term and trusted relationships" with both upstream and downstream stakeholders and provide an opportunity for sustainability progress throughout the entirety of the chain.

Practitioners similarly highlighted the power that traders have, such as product-related data, pricing and bargaining power, and overall insight into the supply system. In contrast, asymmetries of power and information along the supply chain were mentioned. Traders explained that the mainstream side of trading is based on a very extractive sourcing model that takes advantage and enables underpriced commodities and furthers rural poverty and natural resource depletion in origins. Here a practitioner proposed that there is an opportunity to leverage this "all-knowing power to reframe the problems in order to arrive at new outcomes."

ii) Agriculture Supply Chain Market Landscapes – Highlighting Bulk vs Specialty Models

Next, practitioners identified traders' insight into specialty and bulk

markets as an opportunity for sustainability trajectories. The group brought attention to the decommoditized nature of the specialty markets, where one trader who exclusively trades in specialty cocoa explained that the "specialty market is so new that governance and sustainability policy overall could benefit from learning from bulk." Currently, "there is not enough data to support specialty cocoa sustainability claims due to its recent development in the market." The trader also believes there are significantly more innovations in the specialty market, as "there [are] greater opportunities for small companies to try new ideas." As opposed to the mainstream bulk market, where the focus is consistency, volume, the movement of goods, transformation, and delivery. The same trader also explained how transparency in specialty cocoa will evolve, enabling broader conversations around producer profitability. The final comments were on specialty traders vs bulk traders needing to hold 'each other' with respect while recognizing each other's differences in order to learn from each other's successes. Specialty has the opportunity to be innovative and take greater risks, whereas bulk has the opportunity to provide governance and logistical insight. Many hope this will aid in the transition from business as usual to working toward alternative models, structures, margins, and pricing.

Beyond the specialty versus bulk landscape, coarser scale comments were made on the nature of commodity trading. Where the current system perpetuates a penalization-based supply chain for sustainability infractions. Personal anecdotes stated that "those who are penalized are usually the ones with the least power in the system, such as farmers and those on the ground." Therefore, excluding origins and sources with known challenges from trade will not resolve the problem. Traders explained that risks are continuously being pushed upstream toward the farmer and asked how downstream actors can take on more of the risk. Traders acknowledged their role in this risk dispersion and proposed ideas around incentivizing actors, including themselves, along the entire supply chain. Opportunities brought forth were solutions addressing the competitive nature of agricultural commodity trading, which hinders sustainability collaboration and

trajectories. One participant suggested an idea around trader data sharing to a new external governing body that audits sustainability data. This suggestion removes the competitive barrier, which would otherwise deter collaboration and participation, protecting people's business ability while encouraging sustainability.

iii) Codesigning Governance Frameworks with Upstream and Downstream Actors

The final role and responsibility practitioners spoke on was traders fostering the involvement of downstream actors to collaborate on the development of governance frameworks. A trader was excited about investigating the "real cost of production for smallholder producers." This would properly enable building towards a living income and involving all actors across the supply chain that would fully understand the roles and contributions to both reducing risk and increasing revenue for smallholder producers. Suggestions on how to best proceed addressed transparency and how the myriad of actors can be held accountable. Practitioners explained that this requires transparency across the supply chain, including clients. All stakeholders must support this move to transparency, as what traders are permitted to say is linked to what they do for their clients. Such sustainability objectives must be done in conjunction with the origin countries. Practitioners requested researchers to reach out further and communicate more with them as there is a research opportunity to outline transition points. Traders explained that "to create long-lasting change, a multi-pronged approach that touches every supply chain member, from the consumer, importer, exporter, and people on the ground, is [required]."

The trading practitioners believe that calling the spectrum of supply chain actors to action will promote sustainability opportunities for codesigning governance frameworks. Traders pointed out that sustainability commitments are poorly followed through without a governance or measurement system. Traders identified this as motivation for wanting stricter sustainability governance systems

in place. Additionally, in the absence of a functioning government in origin, governance systems are a way to achieve sustainability. Another suggested that measuring impact demands through data collection and sharing can be interpreted as a governance system.

Lastly, practitioners commented on traders' ability to standardize, invent and commit to investing in formal practices and quantity. This due diligence should be applied to human rights and sustainability measures. Traders agreed upon an ultimate goal: to aggregate tools, baselines, key performance indicators, NGO requests, metrics, and guidelines.

3. How do academics' and practitioners' perspectives differ or overlap when considering roles, responsibilities, and barriers?

This section examines the survey data from two groups of expert participants' professional backgrounds and their perspectives on traders' roles, responsibilities, opportunities and the barriers they experience in sustainable agricultural supply chains. From the ISA roundtable workshop, nine academics completed the survey, and from the Workshop Kick-Off Meeting, nine academics and seven practitioners responded (Table 1 & 3). Only the four Likert Scale questions were used to determine participants' perspectives from the survey (Table 4). The Likert Scale data were collected qualitatively but converted into quantitative data using Microsoft Excel and Python to determine the mean, followed by a Mann-Whitney U to test the statistical differences between academic and practitioner responses.

Survey One (Phase One Part A):

The first question was, how important are traders (compared to other supply chain actors) in carrying out the following sustainability governance tasks (see Table 5)? On average, academics are likely to perceive traders to be less important than other supply chain actors in carrying out sustainability governance tasks compared to practitioners' perspectives. Similarly, from question two, asking academics the likelihood of traders acting as horizontal connectors and translators,

vertical connectors, or place-bound champions was seen as less likely than practitioners (see Table 6). Question three on the challenges of traders as sustainability actors showed that practitioners believed that the influence of goal conflicts, incentives, and competition might result in a reluctance to participate or collaborate in such initiatives and was less of a driving factor than academics (Table 7). The final question regarding the importance of specific traders' roles in sustainable supply chain governance had no consistent trend among the stakeholder groups (Table 8). Practitioners agreed more with changes in supply chain organization and governance than academics. In contrast, academics agreed that trader-producer relationships, producer-level impacts and governance, arrangements and interactions with state actors and other existing sustainability governance arrangements were more important.

Subsequently, a Mann Whitney-U Test was performed to test if there was statistical significance between the two stakeholder groups: Academic and Practitioner. This test was used to compare the differences between the stakeholder groups, as the data is not normally distributed. For questions four to seven from the Likert Scale questions, statistically significant results are bolded (Table 5-8). The statistically significant p-values are less than 5% (0.05), which is the accepted significance level. Only results of significance are reported in this section.

For question four, how important traders are compared to other supply chain actors implementing lead company programs (e.g., Nespresso AAA, Mondelez Cocoa Life) in question four (Table 5), academics' and practitioners' answers were statistically significant 4 vs. 4.85, **p = 0.0246.** Question five (Table 6), asking what are the advantages of traders as sustainability actors are acting as vertical connectors and translators of sustainability demands and constraints along the supply chain due to their expertise in connecting local to global markets, was statistically different between academics 3.667 vs. practitioners 5, **p =0.006**. Question six (Table 7), the challenges of traders acting as sustainability actors are likely to encounter goal conflicts between sustainability implementation and their business mission, which might push implementation costs onto farmers and/or curtail farmers' bargaining power due to the market capture of 'sustainable' regions, academics and practitioners answers were statistically significant 4.056 vs. 2.714, **p= 0.047**. Lastly, question seven (Table 8), the importance of understanding traders' roles in

sustainable supply chain governance, had a statistical difference between academics 3.833 vs practitioners 4.571, **p = 0.041.**

The statistical data serves as a baseline for the participants of the project and will be referred back to when understanding qualitative perspectives from phase two and will be compared to the second survey distributed in phase three.

Table 3. Phase One Part A Survey Participant Type and Number of Surveys Completed.

	ISA Roundtable Workshop Participant Type	**Workshop Kick-Off Meeting Participant Type**
Number of Surveys Completed	Academic: 9 Practitioner: 0	Academic: 9 Practitioner: 7

Table 4. Likert Scale Questions from Surveys Phase One and Three.

Question 4	Session Topics	Anticipated & Possible Responses
	Sustainability tasks of traders: From your perspective, how important are traders (compared to other supply chain actors) in carrying out the following sustainability governance tasks?	- Community-level CSR through own foundations - Sector coordination through multi-stakeholder organizations - Rolling out third-party and multi-stakeholder certifications on the ground (e.g. Rainforest Alliance, RSPO) - Implementing lead company programs (e.g. Nespresso AAA, Mondelez Cocoa Life) - Enforcing sustainable sourcing policies in their supply chains (e.g. palm NDPE policies, codes of conduct) - Developing and implementing their own producer development and empowerment initiatives (e.g. sustainability management services, extension, farmer support organizations)
Question 5	Advantages of traders as sustainability actors: How much do you agree with the following statements?	-Traders are likely place-bound champions of sustainable supply chain initiatives because they are invested in certain sourcing regions and have a

		business interest in seeing these regions become more sustainable - Traders are likely vertical connectors and translators of sustainability demands and constraints along the supply chain due to their expertise in connecting local to global markets - Traders are likely horizontal connectors and translators of best practices across commodity sectors due to their expertise in trading multiple commodities
Question 6	Challenges of traders as sustainability actors: How much do you agree with the following statements?	-Traders are likely to encounter goal conflicts between sustainability implementation and their business mission, which might push implementation costs onto farmers and/or curtail farmers' bargaining power due to the market capture of 'sustainable' regions - Traders are likely to have incentives to downplay sustainability problems on the ground in communications with their buyers to protect their sourcing base - Traders are likely to run into problems with on-the-ground competition when participating in 'pre-competitive initiatives' working at the farm level, and may thus be reluctant to participate or collaborate in such initiatives
Question 7	Research agenda: In your opinion, how important are the following categories of research questions when trying to better understand traders' roles in sustainable supply chain governance?	- Changes in supply chain organization and governance (incl. the 'decommoditization' of commodity trade, novel ways of service delivery, power dynamics between traders and lead firms, new roles and responsibilities of traders) - Trader-producer relationships and producer-level impacts (incl. power dynamics on the ground, incentive and disincentive-setting, farmer livelihood enhancement) - Interactions with state actors and other existing sustainability governance arrangements (incl. local lobbying, collaboration via jurisdictional approaches, traders' role in multi-stakeholder initiatives)

Table 5. Phase One Survey Results Question 4 - Sustainability tasks of traders: From your perspective, how important are traders (compared to other supply chain actors) in carrying out the following sustainability governance tasks? 1= Not Important at All, 2= Somewhat Important, 3= Don't Know/NA, 4= Important, 5= Extremely Important.

		Community -level CSR through own foundations	**Sector coordination through multi-stakeholder organizations**	**Rolling out third-party and multi-stakeholder certifications on the ground**	**Implementing lead company programs**	**Enforcing sustainable sourcing policies in their supply chains**	**Developing and implementing their own producer development and empowerment initiatives**
All Participants	**Mean**	3.208	3.68	3.8	4.24	4.52	4.28
Academic	**Mean**	3.176	3.611	3.722	4	4.389	4.111
Practitioner	**Mean**	3.286	3.857	4	4.857	4.857	4.714
Academic vs Practitioner	**P value (Mann-Whitney U test)**	0.87091757	0.89885711	0.34826174	**0.02360952**	0.11304264	0.35094639

Table 6. Phase One Survey Results Question 5 - Advantages of traders as sustainability actors: How much do you agree with the following statements? 1= Don't Agree at All, 2= Agree Somewhat, 3= Don't Know/NA, 4= Mostly Agree, 5= Completely Agree.

		Traders are likely place-bound champions of sustainable supply chain initiatives because they are invested in certain sourcing regions and have a business interest in seeing these regions become more sustainable	**Traders are likely vertical connectors and translators of sustainability demands and constraints along the supply chain due to their expertise in connecting local to global markets**	**Traders are likely horizontal connectors and translators of best practices across commodity sectors due to their expertise in trading multiple commodities**
All Participants	**Mean**	3.08	4.04	3.2
Academic	**Mean**	2.556	3.667	3.111
Practitioner	**Mean**	4.429	5	3.429
Academic vs Practitioner	**P value (Mann-Whitney U test)**	0.35094639	**0.00592603**	0.58325656

Table 7. Phase One Survey Results Question 6 - Challenges of traders as sustainability actors: How much do you agree with the following statements? 1= Don't Agree at All, 2= Somewhat Agree, 3= Don't Know/NA, 4= Mostly Agree, 5= Completely Agree.

		Traders are likely to encounter goal conflicts between sustainability implementation and their business mission, which might push implementation costs onto farmers and/or curtail farmers' bargaining power due to the market capture of 'sustainable' regions	**Traders are likely to have incentives to downplay sustainability problems on the ground in communications with their buyers to protect their sourcing base**	**Traders are likely to run into problems with on-the-ground competition when participating in 'pre-competitive initiatives' working at the farm level, and may thus be reluctant to participate or collaborate in such initiatives**
All Participants	**Mean**	3.68	3.8	3.48
Academic	**Mean**	4.056	4.111	3.556
Practitioner	**Mean**	2.714	3	3.286
Academic vs Practitioner	**P value (Mann-Whitney U test)**	**0.04748668**	0.16715546	0.52911345

Table 8. Phase One Survey Results Question 7 - Research agenda: In your opinion, how important are the following categories of research questions when trying to better understand traders' roles in sustainable supply chain governance? 1= Not Important at All, 2= Somewhat Important, 3= Don't Know/NA, 4= Important, 5= Extremely Important.

		Changes in supply chain organization and governance (incl. the 'decommoditization' of commodity trade, novel ways of service delivery, power dynamics between traders and lead firms, new roles and responsibilities of traders)	**Trader-producer relationships and producer-level impacts (incl. power dynamics on the ground, incentive and disincentive-setting, farmer livelihood enhancement)**	**Interactions with state actors and other existing sustainability governance arrangements (incl. local lobbying, collaboration via jurisdictional approaches, traders' role in multi-stakeholder initiatives)**
All Participants	**Mean**	4.04	4.36	3.96
Academic	**Mean**	3.833	4.389	4.167
Practitioner	**Mean**	4.571	4.286	3.429
Academic vs Practitioner	**P value (Mann-Whitney U test)**	**0.0407614**	0.94592117	0.94592117

Meetings (Phase One Part B):

Results from Phase One Part B were from two meetings composed of the same expert participants who were invited to complete the survey in Phase One Part A. Minutes from the meetings were transcribed and thematically analyzed in search of workshop topics for phase two. Using both frequency and thematic analysis, topics were finalized. The analysis also derived an order to the topics, starting with agreed-upon knowledge gaps, such as definitions, to ensure a common understanding. Once basic backgrounds were in place, participants were to discuss the goals and motivations of traders. Followed by a session on traders' abilities and capabilities. Next, experts in the front-runner commodities shared key insights from their fields, then a session on specialty markets versus bulk commodity markets. The preceding session addressed power dynamics embedded in supply chains and potential barriers or leveraging capabilities may have on sustainability objectives. The final workshop session focused on how traders can begin to implement scalable services in their supply chains, given current landscapes. Part B set the Agenda for phase two of the project (Table 9).

Table 9. Phase One Part B Meeting Transcription Results.

Topic Title	**Description of Session**
Traders as a category - What are we talking about?	Definitions (from trader to merchant) and distinctions (from MNC to individual on a motorbike). What do and don't we know about each actor?
Motivations and intent	To what extent are traders' interests likely to align with sustainability objectives? What do we know about conditions under which companies may be supportive, neutral, or blocking agents of change?
How much room to maneuver is there?	Are traders stuck in the middle or key actors in shaping GVCs and sustainability within it? Under which conditions do they have more/less maneuvering space? When is collaboration between traders possible?
Commodity spotlights	Focal supply chain sustainability challenges and solutions in coffee, cocoa, and palm oil
Specialty trade learning from bulk and vice versa	Specific cocoa examples
Power dynamics along the supply chain	How power manifests in supply chains amongst the variety of stakeholders
Creating scalable services for farmers that provide the right incentives for change	How traders are best capable of working alongside producers to promote sustainability

Survey Two (Phase Three Part A):

This section details the results from the third phase of data collection. Quantitative data from a Likert Scale survey supplements understandings of perspectives that may have changed as a result of multi-stakeholder deliberations (workshop) throughout the project. The results were gathered from surveys taking place after the workshop. In total, nine participants responded; five were academic stakeholders, and four were practitioners (Table 10). The Likert Scale questions were the same as phase one's survey (Table 4). The mean and the difference between stakeholder groups were reported.

Beginning chronologically with question four asking how important traders are compared to other supply chain actors in carrying out sustainability governance tasks, academics' average response was only higher (4.2) than practitioners' (4) looking at community-level CSR through their own foundations. In contrast, the mean for all other survey factors was lower for academics (Table 11). The fifth question addressing the advantages of traders as sustainability actors showed that academics were less likely to agree with traders as place-bound champions of sustainable supply chain initiatives because they are invested in certain sourcing regions and have business interest in seeing these regions become more sustainable than practitioner's responses (Table 12). Academics were also less likely to agree that traders are horizontal connectors and translators of best practices across commodity sectors due to their expertise in trading multiple commodities. But the mean response from academics was greater when asked if traders are likely vertical connectors and translators of sustainability demands and constraints along the supply chain due to their expertise in connecting local to global markets. Next, in question six (Table 13), asking how much participants agreed on certain challenges of traders as sustainability actors, academics and traders shared an equal mean of 4, for Traders are likely to encounter goal conflicts between sustainability implementation and their business mission, which might push implementation costs onto farmers and/or curtail farmers' bargaining power due to the market capture of 'sustainable' regions. Academics greater agreed that Traders are likely to have incentives to downplay sustainability problems on the ground in communications with their buyers to protect their sourcing base. While practitioners' average was greater than academics looking at traders are likely to run into problems on-the-ground competition when participating in 'pre-competitive

initiatives' working at the farm level and may thus be reluctant to participate or collaborate in such initiatives. Lastly, question seven addressed how important certain categories of research questions are when understanding traders' roles in sustainable supply chain governance (Table 14). Academics for all three categories, changes in supply chain organization and governance, trader-producer relationships and producer-level impacts, and interactions with state actors and other existing sustainability governance arrangements mean response was greater than practitioners' responses.

Using the same statistical testing as phase one, a Mann-Whitney U test was used to determine statistically significant results between the academic's and practitioner's responses to the second survey (Table 11-14). The data for all Likert Scale Questions (4 - 7) was not found to be statistically different between the stakeholders.

Table 10. Phase Three Survey Participant Type and Number of Surveys Completed.

	Second Survey Participant Type
Number of Surveys Completed	Academic: 5 Practitioner: 4

Table 11. Phase Three Survey Results Question 4 - Sustainability tasks of traders: From your perspective, how important are traders (compared to other supply chain actors) in carrying out the following sustainability governance tasks? 1= Not Important at All, 2= Somewhat Important, 3= Don't Know/NA, 4= Important, 5= Extremely Important.

		Community-level CSR through own foundations	**Sector coordination through multi-stakeholder organizations**	**Rolling out third-party and multi-stakeholder certifications on the ground**	**Implementing lead company programs**	**Enforcing sustainable sourcing policies in their supply chains**	**Developing and implementing their own producer development and empowerment initiatives**
All Participants	**Mean**	4.111	4.222	4.111	4.889	4.889	4.778
Academic	**Mean**	4.2	4.2	3.6	4.8	4.8	4.6
Practitioner	**Mean**	4	4.25	4.75	5	5	5
Academic vs Practitioner	**P value (Mann-Whitney U test)**	0.89108562	0.88361746	0.88361746	0.50233495	0.50233495	0.23672357

Table 12. Phase Three Survey Results Question 5 - Advantages of traders as sustainability actors: How much do you agree with the following statements? 1= Don't Agree at All, 2= Agree Somewhat, 3= Don't Know/NA, 4= Mostly Agree, 5= Completely Agree.

		Traders are likely place-bound champions of sustainable supply chain initiatives because they are invested in certain sourcing regions and have a business interest in seeing these regions become more sustainable	Traders are likely vertical connectors and translators of sustainability demands and constraints along the supply chain due to their expertise in connecting local to global markets	Traders are likely horizontal connectors and translators of best practices across commodity sectors due to their expertise in trading multiple commodities
All Participants	**Mean**	4	4.667	3.556
Academic	**Mean**	3.8	4.8	3.4
Practitioner	**Mean**	4.25	4.5	3.75
Academic vs Practitioner	**P value (Mann-Whitney U test)**	0.66054921	0.66054921	0.79342825

Table 13. Phase Three Survey Results Question 6 - Challenges of traders as sustainability actors: How much do you agree with the following statements? 1= Don't Agree at All, 2= Somewhat Agree, 3= Don't Know/NA, 4= Mostly Agree, 5= Completely Agree.

		Traders are likely to encounter goal conflicts between sustainability implementation and their business mission, which might push implementation costs onto farmers and/or curtail farmers' bargaining power due to the market capture of 'sustainable' regions	Traders are likely to have incentives to downplay sustainability problems on the ground in communications with their buyers to protect their sourcing base	Traders are likely to run into problems with on-the-ground competition when participating in 'pre-competitive initiatives' working at the farm level, and may thus be reluctant to participate or collaborate in such initiatives
All Participants	**Mean**	4	3.889	3.667
Academic	**Mean**	4	4	3.6
Practitioner	**Mean**	4	3.75	3.75
Academic vs Practitioner	**P value (Mann-Whitney U test)**	0.89631985	0.79342825	0.89727896

Table 14. Phase Three Survey Results Question 7 - Research agenda: In your opinion, how important are the following categories of research questions when trying to better understand traders' roles in sustainable supply chain governance? 1= Not Important at All, 2= Somewhat Important, 3= Don't Know/NA, 4= Important, 5= Extremely Important.

		Changes in supply chain organization and governance (incl. the 'decommoditization' of commodity trade, novel ways of service delivery, power dynamics between traders and lead firms, new roles and responsibilities of traders)	Trader-producer relationships and producer-level impacts (incl. power dynamics on the ground, incentive and disincentive-setting, farmer livelihood enhancement)	Interactions with state actors and other existing sustainability governance arrangements (incl. local lobbying, collaboration via jurisdictional approaches, traders' role in multi-stakeholder initiatives)
All Participants	**Mean**	4.222	4.556	4.222
Academic	**Mean**	4.6	4.6	4.6
Practitioner	**Mean**	3.75	4.5	3.75
Academic vs Practitioner	**P value (Mann-Whitney U test)**	0.28313087	0.88753708	0.28313087

Comparing Survey One & Two:

The final analysis compares the initial survey results to the final survey completed after the workshop. Due to unforeseeable circumstances, the COVID-19 Pandemic significantly delayed the workshop, and therefore our participant list changed due to availability. Due to the anonymity of the surveys and the inherent nature of working with an expert-based participant group, that results in a small sample size. We still chose to compare the two surveys in order to demonstrate the effects of the transdisciplinary and cross-commodity knowledge exchange that took place through multiple phases of the Delphi Methodology data collection phases.

Comparing academic perspectives using the mean between surveys one and two (see Tables 15 -18) shows that academic perspectives, on average, became more optimistic about traders as facilitators of sustainability. In contrast, practitioners' responses between surveys were more heterogeneous. Traders were less optimistic after the workshop when asked what are the advantages of traders as sustainability actors as place-bound champions of sustainable supply

chain initiatives because they are invested in certain sourcing regions and have a business interest in seeing these regions (Tabel 16 Highlighted) and traders are likely vertical connectors and translators of sustainability demands and constraints along the supply chain due to their expertise in connecting local to global markets (Table 16 Highlighted). Practitioners' perspectives also decreased when responding to the importance of certain categories and research questions when trying to better understand traders' roles in sustainable supply chain governance (Table 18 Highlighted). Opinions on changes in supply chain organization and governance (including the 'decommoditization' of commodity trade, novel ways of service delivery, power dynamics between traders and lead firms, and new roles and responsibilities of traders) decreased.

Considering all the quantitative data collected (Table 5-18) demonstrates that academics' and practitioners' perspectives do differ when considering traders' roles, responsibilities, opportunities and the barriers they experience towards operationalizing sustainability in commodity supply chains. But what is also seen is that by utilizing dialogue and procedures guided by the Delphi Method to share and collaborate on perspectives, opinions, and experience, experts in academia and tropical commodity trading benefit from cross-commodity and transdisciplinary knowledge exchanges. The quantitive data collected supports the qualitative data from the proceeding sections, demonstrating the evolution of opinions that took place throughout the workshop.

Table 15. Comparing Surveys Question 4 - Sustainability tasks of traders: From your perspective, how important are traders (compared to other supply chain actors) in carrying out the following sustainability governance tasks? 1= Not Important at All, 2= Somewhat Important, 3= Don't Know/NA, 4= Important, 5= Extremely Important.

		Community -level CSR through own foundations	Sector coordination through multi-stakeholder organizations	Rolling out third-party and multi-stakeholder certifications on the ground	Implementing lead company programs	Enforcing sustainable sourcing policies in their supply chains	Developing and implementing their own producer development and empowerment initiatives	
Survey One								
All Participants	**Mean**	3.208	3.68	3.8	4.24	4.52	4.28	
Academic	**Mean**	3.176	3.611	3.722	4	4.389	4.111	
Practitioner	**Mean**	3.286	3.857	4	4.857	4.857	4.714	
Survey Two								
All Participants	**Mean**	4.111	4.222	4.111	4.889	4.889	4.778	
Academic	**Mean**	4.2	4.2	3.6	4.8	4.8	4.6	
Practitioner	**Mean**	4	4.25	4.75	5	5	5	

Table 16. Comparing Surveys Question 5 - Advantages of traders as sustainability actors: How much do you agree with the following statements? 1= Don't Agree at All, 2= Agree Somewhat, 3= Don't Know/NA, 4= Mostly Agree, 5= Completely Agree.

		Traders are likely place-bound champions of sustainable supply chain initiatives because they are invested in certain sourcing regions and have a business interest in seeing these regions become more sustainable	Traders are likely vertical connectors and translators of sustainability demands and constraints along the supply chain due to their expertise in connecting local to global markets	Traders are likely horizontal connectors and translators of best practices across commodity sectors due to their expertise in trading multiple commodities
Survey One				
All Participants	**Mean**	3.08	4.04	3.2
Academic	**Mean**	2.556	3.667	3.111
Practitioner	**Mean**	**4.429**	5	**3.429**
Survey Two				
All Participants	**Mean**	4	4.667	3.556
Academic	**Mean**	**3.8**	4.8	**3.4**
Practitioner	**Mean**	4.25	4.5	3.75

Table 17. Comparing Surveys Question 6 - Challenges of traders as sustainability actors: How much do you agree with the following statements? 1= Don't Agree at All, 2= Somewhat Agree, 3= Don't Know/NA, 4= Mostly Agree, 5= Completely Agree.

		Traders are likely to encounter goal conflicts between sustainability implementation and their business mission, which might push implementation costs onto farmers and/or curtail farmers' bargaining power due to the market capture of 'sustainable' regions	**Traders are likely to have incentives to downplay sustainability problems on the ground in communications with their buyers to protect their sourcing base**	**Traders are likely to run into problems with on-the-ground competition when participating in 'pre-competitive initiatives' working at the farm level, and may thus be reluctant to participate or collaborate in such initiatives**
Survey One				
All Participants	**Mean**	3.68	3.8	3.48
Academic	**Mean**	4.056	4.111	3.556
Practitioner	**Mean**	2.714	3	3.286
Survey Two				
All Participants	**Mean**	4	3.889	3.667
Academic	**Mean**	4	4	3.6
Practitioner	**Mean**	4	3.75	3.75

Table 18. Phase Three Survey Results Question 7 - Research agenda: In your opinion, how important are the following categories of research questions when trying to better understand traders' roles in sustainable supply chain governance? 1= Not Important at All, 2= Somewhat Important, 3= Don't Know/NA, 4= Important, 5= Extremely Important.

		Changes in supply chain organization and governance (incl. the 'decommoditization' of commodity trade, novel ways of service delivery, power dynamics between traders and lead firms, new roles and responsibilities of traders)	**Trader-producer relationships and producer-level impacts (incl. power dynamics on the ground, incentive and disincentive-setting, farmer livelihood enhancement)**	**Interactions with state actors and other existing sustainability governance arrangements (incl. local lobbying, collaboration via jurisdictional approaches, traders' role in multi-stakeholder initiatives)**
Survey One	**Mean**			
All Participants	**Mean**	4.04	4.36	3.96
Academic	**Mean**	3.833	4.389	4.167
Practitioner	**Mean**	**4.571**	4.286	3.429
Survey Two				
All Participants	**Mean**	4.222	4.556	4.222
Academic	**Mean**	4.6	4.6	4.6
Practitioner	**Mean**	**3.75**	4.5	3.75

Chapter 5: Discussion

This section explores the key findings from the multiple data collection rounds from Traders as Agents of Sustainability Project and discusses the multifaceted challenges of sustainable sourcing in tropical agricultural supply chains. Using expert insight, current literature, and evolving global sustainability legislation and policies, I take a deeper look into how commodity traders can be at the forefront of sustainability despite the industry's embedded environmental and socioeconomic barriers.

Barriers:

The results collected on the perceived barriers preventing traders from operationalizing sustainability revealed similar perspectives by both academics and practitioners. While there were no strong opposing views to the opposite stakeholders' statements, there was an identifiable emphasis placed on topics by certain stakeholder groups.

Shared Academic & Trader Barriers:

Barriers related to definitions, power, and transparency were shared relatively equally between the academic and practitioner stakeholders.

Typology of Traders and Mapping Supply Chains:

Concerns over defining and mapping supply chain stakeholders are a risk due to potential inaccuracies leading to misrepresentations of the trading ecosystem and can result in the exclusion of a key stakeholder simply due to inconsistencies in language and terminology. Due to the varying sizes and services of traders, implementing homogeneous solutions is not considered feasible. In support of such concerns, past oversimplified depictions of supply chains (Figure 3) have neglected to include small-scale intermediaries traders who operate in close relations with smallholder farmers (Abebe et al., 2016). Secondly, limiting language has exclusively targeted multinational trading corporations, which are far removed from origin

(Grabs & Carodenuto, 2021; zu Ermgassen, 2022), and holistic implementation of sustainability approaches across intentionally opaque supply chains have yet to be successful.

Power:

Systemic power struggles were also emphasized by participants as a barrier. The experts find that traders, in reality, do not feel capable of acting as freely and uninhibited as the literature portrays (Folke et al., 2019; Gardner et al., 2019; Grabs & Carodenuto, 2021; Rosenberg et al., 2009; Serdijn et al., 2020; zu Ermgassen, 2022), due to their position in producing countries being too vulnerable to make sweeping sustainability declarations. Considering ongoing disputes on who in the supply chain is capable of paying for improved sustainability services, traders express that consumers downstream are responsible and not themselves, despite claims stating that traders wield financial leverage and power (Clapp, 2014, 2020; Zerbe, 2014).

Transparency:

Transparency and supply chain mapping are of growing interest due to improved mapping technology and methods (Goldstein & Newell, 2019; Kalischek et al., 2023). Such tools are increasingly being used to identify hidden actors and relationships and uncover supply chain hotspots (Cho et al., 2021; Goldstein & Newell, 2020). Despite advancements, transparency mapping is sometimes regarded with hesitation by experts. The heterogeneity of supply chains is still thought of as a barrier to mapping. Additionally, concerns over the high costs, logistics management, maintenance of such programs and the actual success of such efforts are of concern. Increased transparency efforts will likely push costs and burdens onto either already marginalized producing communities as previously seen with similar sustainability legislation and certifications (Grabs & Garrett, 2023; Oya et al., 2018), or downstream onto customers, whom experts are skeptical of paying increased costs. Critical concerns were raised about strategies that expose supply chain actors by using penalization, reputation-based strategies, and other consequences (Bartley & Child, 2014; Gallemore & Jespersen, 2019). Such efforts further risk obscuring unstainable products out of necessity, especially for smallholders or informal traders who receive the least compensation in the supply chain despite bearing the brunt of

sustainable practices (Adams & Carodenuto, 2023; DeFries et al., 2017; Middendorp et al., 2020). Additionally, fear of traders and other stakeholders abandoning a sourcing region due to too challenging an environmental and human rights clean-up is a risk, despite these regions being the ones in greatest need of a holistic, long-term, and well-executed sustainable trading relationship. Drawing on past implementation of third-party certification systems or in-house programs, experts are wary that such high demands for transparency so soon will be too costly or ineffective at alleviating strife.

Trading Practitioner Barriers:

Trader insights across commodities indicate that capabilities, landscapes, and metrics restrict sustainable progress.

Trader Capabilities & Capacities:

Our participants explained that there is inconsistent support both within trading firms and in the market for the uptake of sustainability projects. Voluntary sustainability commitments require internal advocation within companies and are often met with resistance and are thought of as restricting to business. Secondly, traders' willingness to go beyond their capabilities at origins is due to the risk of asking too much and possibly losing a commodity source by overstepping their trading relationship in a country (Grabs & Carodenuto, 2021; Liverpool-Tasie et al., 2020). Varying firm sizes impacts the scale traders feel they have. Additionally, in specialty and bulk markets, bulk traders are found to source from origins with heightened challenges (Ansah et al., 2020; Woolley et al., 2021; zu Ermgassen, 2022), whereas specialty is perceived as already operating in easier and more developed origins. Critiques from both specialty and bulk are that the innovation is coming from specialty, but the resources come from bulk. Our experts believe knowledge exchange and collaboration between the two markets are not inherent due to traders not being natural collaborators due to competition, and therefore capacities and capabilities are at a standstill.

General Market Landscape Challenges:

The precarious position and lack of certainty traders expressed are derived from an absence of supporting sustainability policy, legislation, governance, and economic systems being insufficient both in origin and import countries (Carodenuto, 2019; Carodenuto & Buluran, 2021). Accusations have been continuously placed on traders to accept less margin when it comes to sustainability (Rosenberg et al., 2009), but the practitioner participants of this study explained that leverage comes from the volume they operate at and that they are often the price taker due to on-demand market information. As for cocoa, government policies pushing to formalize informal middlemen into cooperatives (Lenou Nkouedjo et al., 2020) is felt as a hasty plan that does not address the root of the problem, which in rural sourcing regions is the lack of access to services (Abebe et al., 2016). The landscape that trading takes place in physically, economically, and relationally poses significant barriers prohibiting traders from maximizing sustainable change.

Sustainability Metrics:

Our results indicate that traders do not have the support they need to operate sustainably at scale or homogeneously across producing origins. Globally and locally, there is no common set of metrics or definition as to what constitutes as sustainable (Ansah et al., 2020; LeBaron, 2021); this proves to be a challenge across commodities (Grabs & Carodenuto, 2021). This heterogeneity has resulted in the proliferation of in-house, and third-party certifications (Grabs, 2020; Thorlakson, 2018), which are at risk of false self-reporting, opting for business-friendly metrics (Folke et al., 2020), poor results (Oya et al., 2018) and missing key sustainability elements (DeFries et al., 2017). The results of the project demonstrated that across our participants, there is a desire for a common set of key performance indicators, metrics, and stricter governance frameworks to streamline everyone's efforts. The diversity of efforts has led some traders to be skeptical of any sort of agreement being reached and wary of the logistics, time and financial capital required. Simultaneously, although there is a desire for laws, policies, regulations, and standards, traders expressed there can be adverse feelings towards compliance penalization, and reputation-based consequences for non-compliance (Bartley & Child, 2014;

Gallemore et al., 2022; Goldstein & Newell, 2020) as seen recently by palm oil stakeholders on recent EU deforestation legislation (Chye, 2023). But without a holistic set of metrics, legislation and/or governance, efforts are ad-hoc across commodities, stakeholders and geographies and are not significantly changing sustainability in tropical agriculture supply chains.

Academics Practitioner Barriers:

Lastly, academics identified the final barrier as on-the-ground sustainability implementation.

Implementation On-The-Ground:

Sustainable agricultural projects in tropical regions are commonly difficult to onboard due to challenges of replicability and implementation at scale (Harvey et al., 2014). Similarly, as seen with multiple types of voluntary certification schemes, there are gaps between programs (DeFries et al., 2017; Dietz & Grabs, 2022; Hutabarat et al., 2019; Thorlakson, 2018), and companies are typically taking on single-issue programs that do not address the entire sustainability problem at hand (zu Ermgassen et al., 2022). Envisioning scalable and multipronged solutions was understood as beyond the scope of individual firms, thus preventing progress. Without addressing the entirety of the environmental and socioeconomic situation, challenges at origin will not be resolved. Unanimous agreement over traders' advantageous position in the supply chain is the relationship traders are privy to and have developed in producing countries (Grabs & Carodenuto, 2021; Rosenberg et al., 2009). In addition, previous attempts at certification schemes have resulted in cumbersome pressures being funnelled upstream to smallholders to bear the brunt of the work for the least financial gain (Dietz & Grabs, 2022), as the ongoing upkeep of sustainability programs has historically not been upheld (Auld, 2014; Brandi et al., 2013; Grabs et al., 2021). Therefore, academics are wary of longstanding trading relationships, with smallholders being a hurdle as traders would want to protect their partners from onerous and potentially yet another ineffective and unsuccessful sustainability measure placed on smallholders.

Opportunities:

Tropical commodity traders' and academics' insights on roles, responsibilities, and opportunities in furthering sustainability in tropical agricultural supply chains provide novel opportunities for traders to mobilize and be supply chain leaders. The experts we surveyed perceived opportunities as 1) utilizing the trading ecosystem, 2) breaking down power dynamics, 3) the realms of collaboration, and 4) specifically learning from the bulk and specialty markets.

Utilizing the Trading Ecosystem:

The trading ecosystem, a term coined during our workshop, emphasized what previous sustainable commodity studies have addressed before; that targeting a single stakeholder in the supply chain does not get at the root of adversity (Cho et al., 2021; Gardner et al., 2019; Goldstein & Newell, 2019). Of particular interest to this group was the dynamic typology of traders, especially the role of informal middlemen who are critical at supplying rural producing origins with services too removed for large-scale traders (Abebe et al., 2016). Second was the size and scale that traders operate, indicating sustainability capabilities (Grabs & Carodenuto, 2021; Lenou Nkouedjo et al., 2020; zu Ermgassen et al., 2022). The size and scale of traders are key indicators of success and capacity when tasking a trader with cleaning up their supply chain. The current move to formalize middlemen or irradicate informal middlemen (*pisteurs*) in cocoa is an example of looking at the trading ecosystem and pinpointing this visible trader but not considering their size and scale. Sustainability policies and governance needs to consider the complementary and symbiotic roles that each element of the trading ecosystem plays and, as a result, will impact the success of projects, governance, policy and legislation.

Power:

Consistent with recent studies on other sustainable crop supply chains, power was found to be a barrier both locally and globally, but re-evaluating and addressing power asymmetries is an opportunity for sustainability innovations (Barrientos, 2001; Coles & Mitchell, 2011.; German et al., 2020; LeBaron, 2021; McCarthy & Moon, 2018; Zhunusova et al., 2022). Despite the dual

nature of power in trading relationships, traders are ultimately at the focal point of supply chains and can place pressure on both upstream and downstream actors, and therefore traders can use their situated power in origin and export countries (Grabs & Carodenuto, 2021). Knowledge of both upstream and downstream laws, products, regulations, and culture does, in fact, allow traders to place sustainability pressures on buyers to pay premiums for sustainable products (Grabs, 2020), and develop key sustainability insight into the gaps and areas needing improvement in producing country governance. Unlike previous sustainability demands that have fallen onto smallholders who are at the mercy of systemic supply chain problems (Ansah et al., 2020; DeFries et al., 2017; Fountain & Hütz-Adams, 2017; Hutabarat et al., 2019; Middendorp et al., 2020) using informed lobbying, traders can use their power to influence downstream actors, and governments to design holistic solutions that no other stakeholder is privy to.

Collaboration & Data:

Traders' competitive edge, earned through place-based knowledge and experience, has resulted in an uncollaborative space horizontally and vertically throughout supply chains. An opportunity to fill this collaboration gap is the development of new operational, managerial, and governance systems that level the playing field, promoting collaboration amongst traders while still allowing for business to continue and grow. Data sharing and data analysis tools are of particular interest for practitioners (Carodenuto & Buluran, 2021; Goldstein & Newell, 2019, 2020; Lynam et al., 2007; zu Ermgassen et al., 2022). Calls for increased data collection for supply chain mapping and due diligence is a contemporary solution addressing opaque supply chains. Traders are continuously gathering product data with every transaction (Cho et al., 2021) and have the opportunity to share such insights. But what is currently missing is a neutral and mandatory governing system which can obtain trade data and perform guiding research-based evidence on sustainability across geographies, origins, and commodities. This is beneficial for traders that have significantly sunk time and equity into relationships and infrastructure at origin and would see a return on their investments through data sharing with a network of traders. This would require a third party to neutrally audit the data to a common set of standards, potentially specific to commodities and regions, but would eliminate the risks abundant in self-reporting.

This is unlike in-house sustainability metrics, which have previously failed to uphold long-term environmental and social progress commitments (Grabs, 2020; Thorlakson, 2018). Increased transparency, and supply chain mapping have already been effective tools for governance and would capitalize on data already privately collected.

Current due diligence legislation set forth by the European Union to limit products associated with deforestation (Lobdell, 2023) legally implicates companies importing to Europe to implement increased data collection and management in order to monitor imports (Chye, 2023; European Commission, 2021, 2022; Haahr, 2023). Compliance no longer being voluntary provides motivation and the ideal opportunity for traders to additionally pursue cooperation, using their pre-existing relationships with producing countries for ease of data collection (Bellfield & Tan, 2023). As companies importing to Europe are now legally responsible for their own due diligence, they have been given the necessary push to implement traceable and transparent data collection and map their supply chains at a finer scale.

Policy Considerations:

Related to collaboration, what is additionally seen as an opportunity for sustainable progress is multistakeholder collaboration throughout the trading ecosystem. Jurisdictional approaches are systematic approaches (Carodenuto, 2019; zu Ermgassen et al., 2022) that can be used for amalgamating multiple traders and local governments in a sourcing region to address challenges holistically as opposed to higher-risk projects pinpointing singular stakeholders. As currently seen with the recent European country's supply chain due diligence laws (European Commission, 2022; Weihrauch et al., 2022), supporting multistakeholder collaboration for corporate social responsibility is necessary; this is not without consideration of political, social, and market-based barriers (Moog et al., 2015; Zhunusova et al., 2022). Using a jurisdictional approach highlights traders' desire for guiding governance systems supported by other stakeholders so as to not place themselves in too risky of a position. The evolvement and uptick in sustainability, deforestation, and sustainability policy will mobilize traders’ knowledge, data, and experience.

Specialty and Bulk Markets:

The final opportunity identified as a novel pathway for traders to implement sustainability into their commodity supply chains is learning from specialty and decommoditized markets. Research on cocoa and especially specialty coffee due to its greater market age (Samper & Quiñones-Ruiz, 2017; Wilson & Wilson, 2014) provides insight for larger-scale bulk market traders to draw insight and vice versa. Comments regarding keeping the two markets separate due to their not being the capacity to support all stakeholders in the way that specialty markets do negates valuable knowledge exchange between the markets. The specialty market has been home to significant sustainability innovations such as attaining higher farm gate prices, addressing rural poverty and biodiversity loss, as well as improved soil and water management (Bacon, 2005; Borrella et al., 2015; Woolley et al., 2021). What is of particular interest regarding the barriers we identified as prohibiting traders is what Woolley et al. defines as *collaborative governance* in the cocoa bean-to-bar movement. Collaborative governance highlights the relationship between craft chocolate entrepreneurs and smallholder suppliers who are able to cooperate over shared sustainability goals (Woolley et al., 2021). This will ensure and prioritize equitable working relationships are upheld first and foremost over profit-driven goals. Collaborative governance theory speaks to multistakeholder and ecosystem collaboration and governance that is currently sought after in larger scale landscape-level due diligence legislation and supply chain mapping (Cho et al., 2021; Goldstein & Newell, 2019, 2020; Renier et al., 2023; Weihrauch et al., 2022).

Informed Pathways Forwards:

Barriers that academic and trading participants identified as sustainable supply chain deterrents range from tasking the right stakeholder using the correct terminology, power vulnerabilities, opaque supply chains, varying capacities, market logistics, ad-hoc sustainability metrics, and implementation barriers. While opportunities that experts perceive traders are well situated for include investigating the trading ecosystem, re-evaluating power, multistakeholder collaboration, data sharing, leaning into sustainability policies, and learning across commodities and markets. While the challenges and opportunities presented are geographically and

commodity diverse, traders are situated in an ideal position to capitalize on their strengths: relationships, data, knowledge and experience, unlike any other stakeholder in the supply chain.

Using expert insight from multiple data collection modes and not intending to arrive at a yes or no style answer but to gain a better understanding of perspectives and opinions across a diversity of stakeholders (Silverman et al., 2023), it is clear that traders alongside other influential supply chain actors need foster increased collaboration both vertically and horizontally. Due to the multitude of advantageous insights and experiences only privy to traders, they should be capable of spearheading and creating the cascading sustainability change that tropical agriculture commodity supply chains need.

Chapter 6: Conclusion

Summary:

This research used a community-engaged and mixed methods approach to explore perspectives on tropical agriculture commodity traders' self-perceived barriers and opportunities in implementing sustainability throughout supply chains. In a time of increased consumer awareness (Dowd & Burke, 2013), climate change affecting producing origins (Samper & Quiñones-Ruiz, 2017; Solymosi & Techel, 2019), and increasing import country sustainability legislation (European Commission, 2021; Weihrauch et al., 2022; Zhunusova et al., 2022), creating a baseline derived from expert opinions and perspectives provides a jumping off point new ways of imagining sustainability. As discussed, capitalizing on traders' supply chain position (Clapp, 2020; Folke et al., 2019), relationships (Grabs & Carodenuto, 2021; Rosenberg et al., 2009) and experience delegating between upstream and downstream stakeholders will facilitate increased supply chain sustainability and due diligence efforts.

What was found was that experts in the field (academics and trading practitioners) raised concerns over systemic barriers embedded in supply chain management impeding traders from remedying such diverse and large-scale challenges alone and holistically. By opening the door for traders' concerns over their capacities supplemented by academic insight, this project created a dialogue for traders to voice their concerns which is not standard practice in these kinds of spaces. This is due to the competitive nature and reputational risks typically at stake with expressing industry vulnerabilities (Gallemore et al., 2022; Goldstein & Newell, 2020). But by eliminating barriers such as identities, and consequences, perspectives and opinions were able to be accurately recorded.

Following data collection on barriers, participants discussed where they felt traders have the opportunity to address supply chain sustainability. My analysis concluded that collaboration in a multitude of forms is desired by all stakeholders. Both academics and traders saw the need for multistakeholder collaboration across the supply chain that opposes the competitive nature of the market, which has made traders feel isolated and at risk. Typical of the Delphi method, there

is no simple yes or no answer to conclude (Thangaratinam & Redman, 2005; Turoff & Linstone, 1975), but what I found is that for transformative change to occur, all actors across supply chains will need to uphold sustainability commitments, but traders are ideally situated to champion such agendas.

Implications & Limitations:

In response to Folke et al.'s (2020) calls for increased research on transnational corporations' role in biosphere stewardship, this research has implications for local governments in exporting and importing countries, traders, the public, involved NGO's and everyone along the supply chain; all who have historically attempted a multitude of approaches towards attaining sustainable production and consumption. Limitations of this study include the small sample size of participants surveyed; in response, the Delphi Method is meant to consult experts in the field, which does limit the number of participants available (Allen et al., 2019; Begemann et al., 2021; Silverman et al., 2023). Additionally, trading stakeholders speaking about market vulnerabilities openly is not typical for trading practitioners and therefore limits participation. In support of alleviating risks for traders, this project works alongside them performing research 'with' them as opposed to 'on' them in hopes of arriving at action-based solutions for the sector.

Reflections and Future Considerations:

My research found that traders as potential agents of sustainability change, is an educated pathway forward for sustainable change in tropical agriculture commodity supply chains. Some traders have already been successful on smaller scales, but given the scope, scale and popularity of cocoa, coffee, and palm oil, the uptake of such initiatives needs to increase in order to see the global market alleviate the diversity of challenges they experience both environmentally and socially.

References

Abebe, G. K., Bijman, J., & Royer, A. (2016). Are middlemen facilitators or barriers to improve smallholders' welfare in rural economies? Empirical evidence from Ethiopia. *Journal of Rural Studies*, *43*, 203–213. https://doi.org/10.1016/j.jrurstud.2015.12.004

Adams, M. A., & Carodenuto, S. (2023). Stakeholder perspectives on cocoa's living income differential and sustainability trade-offs in Ghana. *World Development*, *165*, 106201. https://doi.org/10.1016/j.worlddev.2023.106201

Allen, T., Prosperi, P., Cogill, B., Padilla, M., & Peri, I. (2019). A Delphi Approach to Develop Sustainable Food System Metrics. *Social Indicators Research*, *141*(3), 1307–1339. https://doi.org/10.1007/s11205-018-1865-8

Ansah, E. O., Kaplowitz, M. D., Lupi, F., & Kerr, J. (2020). Smallholder participation and procedural compliance with sustainable cocoa certification programs. *Agroecology and Sustainable Food Systems*, *44*(1), 54–87. https://doi.org/10.1080/21683565.2019.1579776

Auld, G. (2014). *Constructing Private Governance: The Rise and Evolution of Forest, Coffee, and Fisheries Certification*. Yale University Press. https://web-s-ebscohost-com.ezproxy.library.uvic.ca/ehost/ebookviewer/ebook/bmxlYmtfXzg2MTMxOF9fQU41?sid=cb5b440f-e910-46cc-9d9c-a90af9c5a836@redis&vid=0&format=EB&rid=1

Bacon, C. (2005a). Confronting the Coffee Crisis: Can Fair Trade, Organic, and Specialty Coffees Reduce Small-Scale Farmer Vulnerability in Northern Nicaragua? *World Development*, *33*(3), 497–511. https://doi.org/10.1016/j.worlddev.2004.10.002

Bager, S. L., & Lambin, E. F. (2020). Sustainability strategies by companies in the global coffee sector. *Business Strategy and the Environment*, *29*(8), 3555–3570. https://doi.org/10.1002/bse.2596

Barrientos, S. (2001). Gender, Flexibility and Global Value Chains. *IDS Bulletin*, *32*(3), 83–93. https://doi.org/10.1111/j.1759-5436.2001.mp32003009.x

Bartley, T., & Child, C. (2014). Shaming the Corporation: The Social Production of Targets and the Anti-Sweatshop Movement. *American Sociological Review*, *79*(4), 653–679. https://doi.org/10.1177/0003122414540653

Baumann-Pauly, D. (2013). Global rules—private actors: The role of the MNC in global governance. In *Managing Corporate Legitimacy: A Toolkit* (pp. 1–10). Greenleaf Publishing Limited. https://doi.org/10.9774/GLEAF.978-1-909493-92-6_2

Begemann, A., Giessen, L., Roitsch, D., Roux, J.-L., Lovrić, M., Azevedo-Ramos, C., Boerner, J., Beeko, C., Cashore, B., Cerutti, P. O., de Jong, W., Fosse, L. J., Hinrichs, A., Humphreys, D., Pülzl, H., Santamaria, C., Sotirov, M., Wunder, S., & Winkel, G. (2021). Quo vadis global forest governance? A transdisciplinary delphi study. *Environmental Science & Policy*, *123*, 131–141. https://doi.org/10.1016/j.envsci.2021.03.011

Bellfield, H., & Tan, J. (2023). *Data can make the EU deforestation regulation fair and workable _ World Economic Forum*. World Econmic Forum.

Bennett, E. (2021). Rethinking the "necessary" trade-offs of distributing value to suppliers: An analysis of the profit-sharing model. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3872899

Beulens, A. J. M., Broens, D.-F., Folstar, P., & Hofstede, G. J. (2005). Food safety and transparency in food chains and networks Relationships and challenges. *Food Control*, *16*(6), 481–486. https://doi.org/10.1016/j.foodcont.2003.10.010

Borrella, I., Mataix, C., & Carrasco-Gallego, R. (2015). Smallholder Farmers in the Speciality Coffee Industry: Opportunities, Constraints and the Businesses that are Making it Possible. *IDS Bulletin*, *46*(3), 29–44. https://doi.org/10.1111/1759-5436.12142

Brandi, C., Cabani, T., Hosang, C., Schirmbeck, S., Westermann, L., & Wiese, H. (2013). *Sustainability certification in the Indonesian palm oil sector: Benefits and challenges for smallholders* (Studies No. 74; Deutsches Institut Für Entwicklungspolitik (DIE), Bonn).

Carodenuto, S. (2019). Governance of zero deforestation cocoa in West Africa: New forms of public–private interaction. *Environmental Policy and Governance*, *29*(1), 55–66. https://doi.org/10.1002/eet.1841

Carodenuto, S., & Buluran, M. (2021). The effect of supply chain position on zero-deforestation commitments: Evidence from the cocoa industry. *Journal of Environmental Policy & Planning*, 1–16. https://doi.org/10.1080/1523908X.2021.1910020

Cho, K., Goldstein, B., Gounaridis, D., & Newell, J. P. (2021). Where does your guacamole come from? Detecting deforestation associated with the export of avocados from Mexico

to the United States. *Journal of Environmental Management*, *278*, 111482. https://doi.org/10.1016/j.jenvman.2020.111482

Chye, M. (2023). Growing tensions between Asian palm oil producers and the European Union. *Reuters*. https://www.reuters.com/markets/commodities/growing-tensions-between-asian-palm-oil-producers-european-union-2023-01-13/

Clapp, J. (2014). Financialization, distance and global food politics. *The Journal of Peasant Studies*, *41*(5), 797–814. https://doi.org/10.1080/03066150.2013.875536

Clapp, J. (2020). *Food* (Vol. 3).

Clay, J. W. (2004). World agriculture and the environment: A commodity-by-commodity guide to impacts and practices. *Island Press*.

Cocoa Barometer. (2015). *Looking for a Living Income. Cocoa Barometer Consortium.* https://www.voicenetwork.eu/wp-content/uploads/2019/07/Cocoa-Barometer-2015.pdf

Coles, C., & Mitchell, J. (2011). *Gender and agricultural value chains – a review of current knowledge and practice and their policy implications*. 32.

Colfer, C. J. P. (Ed.). (2016). *Gender and forests: Climate change, tenure, value chains and emerging issues*. Routledge, Taylor & Francis Group.

Crisp, J., Pelletier, D., Duffield, C., Adams, A., & Nagy, S. (1997). The Delphi Method? : Nursing Research. *Nursing Research*, *46*(2), 116–118.

Curtis, P. G., Slay, C. M., Harris, N. L., Tyukavina, A., & Hansen, M. C. (2018). Classifying drivers of global forest loss. *Science*, *361*(6407), 1108–1111. https://doi.org/10.1126/science.aau3445

Dauvergne, P. (2018). The Global Politics of the Business of "Sustainable" Palm Oil. *Global Environmental Politics*, *18*(2), 34–52. https://doi.org/10.1162/glep_a_00455

DeFries, R. S., Fanzo, J., Mondal, P., Remans, R., & Wood, S. A. (2017). Is voluntary certification of tropical agricultural commodities achieving sustainability goals for small-scale producers? A review of the evidence. *Environmental Research Letters*, *12*(3), 033001. https://doi.org/10.1088/1748-9326/aa625e

Dietz, T., & Grabs, J. (2022). Additionality and Implementation Gaps in Voluntary Sustainability Standards. *New Political Economy*, *27*(2), 203–224. https://doi.org/10.1080/13563467.2021.1881473

Dowd, K., & Burke, K. J. (2013). The influence of ethical values and food choice motivations on intentions to purchase sustainably sourced foods. *Appetite*, *69*, 137–144. https://doi.org/10.1016/j.appet.2013.05.024

Dyck, I. (2015). Qualitative Methods in Geography. In *International Encyclopedia of the Social & Behavioral Sciences* (pp. 682–684). Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.72091-5

European Commission. (2021). *EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT REPORT minimising the risk of deforestation and forest degradation associated with products placed on the EU market*.

European Commission. (2022). *Corporate sustainability due diligence Fostering sustainability in corporate governance and management systems.* https://commission.europa.eu/business-economy-euro/doing-business-eu/corporate-sustainability-due-diligence_en

Folke, C., Österblom, H., Jouffray, J.-B., Lambin, E. F., Adger, W. N., Scheffer, M., Crona, B. I., Nyström, M., Levin, S. A., Carpenter, S. R., Anderies, J. M., Chapin, S., Crépin, A.-S., Dauriach, A., Galaz, V., Gordon, L. J., Kautsky, N., Walker, B. H., Watson, J. R., … de Zeeuw, A. (2019). Transnational corporations and the challenge of biosphere stewardship. *Nature Ecology & Evolution*, *3*(10), 1396–1403. https://doi.org/10.1038/s41559-019-0978-z

Folke, C., Österblom, H., Jouffray, J.-B., Lambin, E. F., Adger, W. N., Scheffer, M., Crona, B. I., Nyström, M., Levin, S. A., Carpenter, S. R., Anderies, J. M., Chapin, S., Crépin, A.-S., Dauriach, A., Galaz, V., Gordon, L. J., Kautsky, N., Walker, B. H., Watson, J. R., … de Zeeuw, A. (2020). An invitation for more research on transnational corporations and the biosphere. *Nature Ecology & Evolution*, *4*(4), 494–494. https://doi.org/10.1038/s41559-020-1145-2

Fountain, A. C., & Hütz-Adams, F. (2017). Raising Farm Gate Prices. Approaches to Ensure a Living Income for Smallholder Cocoa Farmers. *Cocoa Barometer Consultation Paper*. https://www.voicenetwork.eu/wp-content/uploads/2019/08/Raising-Farm-Gate-Prices-Cocoa-Barometer-Consultation-Paper-170419.pdf

Freidberg, S. (2017). Trading in the secretive commodity. *Economy and Society*, *46*(3–4), 499–521. https://doi.org/10.1080/03085147.2017.1397359

Gallemore, C., & Jespersen, K. (2019). Offsetting, Insetting, or Both? Current Trends in Sustainable Palm Oil Certification. *Sustainability*, *11*(19), 5393. https://doi.org/10.3390/su11195393

Gallemore, C., Jespersen, K., & Olmsted, P. (2022). Harnessing relational values for global value chain sustainability: Reframing the roundtable on sustainable palm oil's offset mechanism to support smallholders. *Ecological Economics*, *193*, 107303. https://doi.org/10.1016/j.ecolecon.2021.107303

Galtier, F., Belletti, G., & Marescotti, A. (2013). Factors Constraining Building Effective and Fair Geographical Indications for Coffee: Insights from a Dominican Case Study. *Development Policy Review*, *31*(5), 597–615. https://doi.org/10.1111/dpr.12027

Gardner, T. A., Benzie, M., Börner, J., Dawkins, E., Fick, S., Garrett, R., Godar, J., Grimard, A., Lake, S., Larsen, R. K., Mardas, N., McDermott, C. L., Meyfroidt, P., Osbeck, M., Persson, M., Sembres, T., Suavet, C., Strassburg, B., Trevisan, A., … Wolvekamp, P. (2019). Transparency and sustainability in global commodity supply chains. *World Development*, *121*, 163–177. https://doi.org/10.1016/j.worlddev.2018.05.025

German, L. A., Bonanno, A. M., Foster, L. C., & Cotula, L. (2020). "Inclusive business" in agriculture: Evidence from the evolution of agricultural value chains. *World Development*, *134*, 105018. https://doi.org/10.1016/j.worlddev.2020.105018

Gockowski, J., & Sonwa, D. (2011). Cocoa Intensification Scenarios and Their Predicted Impact on CO2 Emissions, Biodiversity Conservation, and Rural Livelihoods in the Guinea Rain Forest of West Africa. *Environmental Management*, *48*(2), 307–321. https://doi.org/10.1007/s00267-010-9602-3

Goldstein, B., & Newell, J. P. (2019). Why academics should study the supply chains of individual corporations. *Journal of Industrial Ecology*, *23*(6), 1316–1327. https://doi.org/10.1111/jiec.12932

Goldstein, B., & Newell, J. P. (2020). How to track corporations across space and time. *Ecological Economics*, *169*, 106492. https://doi.org/10.1016/j.ecolecon.2019.106492

Grabs, J. (2020). Assessing the institutionalization of private sustainability governance in a changing coffee sector. *Regulation & Governance*, *14*(2), 362–387. https://doi.org/10.1111/rego.12212

Grabs, J., Cammelli, F., Levy, S. A., & Garrett, R. D. (2021). Designing effective and equitable zero-deforestation supply chain policies. *Global Environmental Change*, *70*, 102357. https://doi.org/10.1016/j.gloenvcha.2021.102357

Grabs, J., & Carodenuto, S. L. (2021). Traders as sustainability governance actors in global food supply chains: A research agenda. *Business Strategy and the Environment*, *30*(2), 1314–1332. https://doi.org/10.1002/bse.2686

Grabs, J., & Garrett, R. D. (2023). Goal-Based Private Sustainability Governance and Its Paradoxes in the Indonesian Palm Oil Sector. *Journal of Business Ethics*. https://doi.org/10.1007/s10551-023-05377-1

Grabs, J., & Ponte, S. (2019). The evolution of power in the global coffee value chain and production network. *Journal of Economic Geography*, *19*(4), 803–828. https://doi.org/10.1093/jeg/lbz008

Haahr, T. (2023). *Parliament adopts new law to fight global deforestation*. News European Parliament.

Harvey, C. A., Chacón, M., Donatti, C. I., Garen, E., Hannah, L., Andrade, A., Bede, L., Brown, D., Calle, A., Chará, J., Clement, C., Gray, E., Hoang, M. H., Minang, P., Rodríguez, A. M., Seeberg-Elverfeldt, C., Semroc, B., Shames, S., Smukler, S., … Wollenberg, E. (2014). Climate-Smart Landscapes: Opportunities and Challenges for Integrating Adaptation and Mitigation in Tropical Agriculture. *Conservation Letters*, *7*(2), 77–90. https://doi.org/10.1111/conl.12066

Higgs, C. (2012). *Chocolate islands: Cocoa, slavery, and colonial africa*. Ohio University Press.

Hughes, J. (2010). Coffee and Chocolate – Can We Help Developing Country Farmers Through Geographical Indications? *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1684370

Hutabarat, S., Slingerland, M., & Dries, L. (2019). Explaining the "Certification Gap" for Different Types of Oil Palm Smallholders in Riau Province, Indonesia. *The Journal of Environment & Development*, *28*(3), 253–281. https://doi.org/10.1177/1070496519854505

Irwin, S. M. (2018). *Forging pathways to sustainable food systems and rural poverty reduction: Insights from a social and economic value chain analysis of aquaculture in the Bolivian Amazon by*. University of Victoria.

Israel, B. A., Schulz, A. J., Parker, E. A., & Becker, A. B. (1998). REVIEW OF COMMUNITY-BASED RESEARCH: Assessing Partnership Approaches to Improve Public Health. *Annual Review of Public Health*, *19*(1), 173–202. https://doi.org/10.1146/annurev.publhealth.19.1.173

J. Skulmoski, G., T. Hartman, F., & Krahn, J. (2007). The Delphi Method for Graduate Research. *Journal of Information Technology Education: Research*, *6*, 001–021. https://doi.org/10.28945/199

Kalischek, N., Lang, N., Renier, C., Daudt, R. C., Addoah, T., Thompson, W., Blaser-Hart, W. J., Garrett, R., Schindler, K., & Wegner, J. D. (2023). Cocoa plantations are associated with deforestation in Côte d'Ivoire and Ghana. *Nature Food*, *4*(5), 384–393. https://doi.org/10.1038/s43016-023-00751-8

Kano, L. (2018). Global value chain governance: A relational perspective. *Journal of International Business Studies*, *49*(6), 684–705. https://doi.org/10.1057/s41267-017-0086-8

Kroeger, A., Bakhtary, H., Haupt, F., & Streck, C. (2017). *Eliminating Deforestation from the Cocoa Supply Chain*. World Bank, Washington, DC. https://doi.org/10.1596/26549

LeBaron, G. (2021). The Role of Supply Chains in the Global Business of Forced Labour. *Journal of Supply Chain Management*, *57*(2), 29–42. https://doi.org/10.1111/jscm.12258

LeBaron, G., & Gore, E. (2020). Gender and Forced Labour: Understanding the Links in Global Cocoa Supply Chains. *The Journal of Development Studies*, *56*(6), 1095–1117. https://doi.org/10.1080/00220388.2019.1657570

Leeuw, S. de, Cameron, E. S., & Greenwood, M. L. (2012). Participatory and community-based research, Indigenous geographies, and the spaces of friendship: A critical engagement: A critical engagement. *The Canadian Geographer / Le Géographe Canadien*, *56*(2), 180–194. https://doi.org/10.1111/j.1541-0064.2012.00434.x

Lenou Nkouedjo, L., Mathe, S., Fon, D. E., Geitzenauer, M., & Awah Manga, A. (2020). Cocoa marketing chain in developing countries: How do formal-informal linkages ensure its sustainability in Cameroon? *Geoforum*, *117*, 61–70. https://doi.org/10.1016/j.geoforum.2020.09.005

Liverpool-Tasie, L. S. O., Wineman, A., Young, S., Tambo, J., Vargas, C., Reardon, T., Adjognon, G. S., Porciello, J., Gathoni, N., Bizikova, L., Galiè, A., & Celestin, A.

(2020). A scoping review of market links between value chain actors and small-scale producers in developing regions. *Nature Sustainability*, *3*(10), 799–808. https://doi.org/10.1038/s41893-020-00621-2

Lobdell, K. (2023). *Implications for global trade professionals as EU legislation seeks to limit deforestation*. Thomson Reuters.

Lynam, T., de Jong, W., Sheil, D., Kusumanto, T., & Evans, K. (2007). A Review of Tools for Incorporating Community Knowledge, Preferences, and Values into Decision Making in Natural Resources Management. *Ecology and Society*, *12*(1), art5. https://doi.org/10.5751/ES-01987-120105

McCarthy, L., & Moon, J. (2018). Disrupting the Gender Institution: Consciousness-Raising in the Cocoa Value Chain. *Organization Studies*, *39*(9), 1153–1177. https://doi.org/10.1177/0170840618787358

Middendorp, R. S., Boever, O., Rueda, X., & Lambin, E. F. (2020). Improving smallholder livelihoods and ecosystems through direct trade relations: High-quality cocoa producers in Ecuador. *BUSINESS STRATEGY & DEVELOPMENT*, *3*(2), 165–184. https://doi.org/10.1002/bsd2.86

Minkler, M. (2004). Ethical Challenges for the "Outside" Researcher in Community-Based Participatory Research. *Health Education & Behavior*, *31*(6), 684–697. https://doi.org/10.1177/1090198104269566

Moog, S., Spicer, A., & Böhm, S. (2015). The Politics of Multi-Stakeholder Initiatives: The Crisis of the Forest Stewardship Council. *Journal of Business Ethics*, *128*(3), 469–493. https://doi.org/10.1007/s10551-013-2033-3

Nelson, V., & Phillips, D. (2018). Sector, Landscape or Rural Transformations? Exploring the Limits and Potential of Agricultural Sustainability Initiatives through a Cocoa Case Study. *Business Strategy and the Environment*, *27*(2), 252–262. https://doi.org/10.1002/bse.2014

Nemoto, T., & Beglar, D. (2014). Developing Likert-Scale Questionnaires. *JALT 2013 Conference Proceedings. Tokyo: Jalt*, 8.

Oya, C., Schaefer, F., & Skalidou, D. (2018). The effectiveness of agricultural certification in developing countries: A systematic review. *World Development*, *112*, 282–312. https://doi.org/10.1016/j.worlddev.2018.08.001

Raynolds, L. T. (2002). Consumer/Producer Links in Fair Trade Coffee Networks. *Sociologia Ruralis*, *42*(4), 404–424. https://doi.org/10.1111/1467-9523.00224

Reis, T. N. P. dos, Meyfroidt, P., zu Ermgassen, E. K. H. J., West, C., Gardner, T., Bager, S., Croft, S., Lathuillière, M. J., & Godar, J. (2020). Understanding the Stickiness of Commodity Supply Chains Is Key to Improving Their Sustainability. *One Earth*, *3*(1), 100–115. https://doi.org/10.1016/j.oneear.2020.06.012

Renier, C., Vandromme, M., Meyfroidt, P., Ribeiro, V., Kalischek, N., & Zu Ermgassen, E. K. H. J. (2023). Transparency, traceability and deforestation in the Ivorian cocoa supply chain. *Environmental Research Letters*, *18*(2), 024030. https://doi.org/10.1088/1748-9326/acad8e

Rewhorn, S. (2018). Writing your successful literature review. *Journal of Geography in Higher Education*, *42*(1), 143–147. https://doi.org/10.1080/03098265.2017.1337732

Rosenberg, D., Eckstein, M., & Brett, C. (2009). *Sustainable trading Traders as agents of sustainability in coffee and cocoa supply chains*. The Dutch Sustainable Trade Initiative.

Ryser, L., Markey, S., & Halseth, G. (2013). Developing the next generation of community-based researchers: Tips for undergraduate students. *Journal of Geography in Higher Education*, *37*(1), 11–27. https://doi.org/10.1080/03098265.2012.696596

Samper, L., & Quiñones-Ruiz, X. (2017). Towards a Balanced Sustainability Vision for the Coffee Industry. *Resources*, *6*(2), 17. https://doi.org/10.3390/resources6020017

Serdijn, M., Kolk, A., & Fransen, L. (2020). Uncovering missing links in global value chain research – and implications for corporate social responsibility and international business. *Critical Perspectives on International Business*, *ahead-of-print*(ahead-of-print). https://doi.org/10.1108/cpoib-01-2020-0002

Silverman, S., Carodenuto, S., & Grabs, J. (2023). *Adventures in Transdisciplinary Translation: Co-creating and Vetting a Novel Research Agenda on Trading Companies as Sustainability Governance Actors*. SAGE Publications Inc. https://doi.org/10.4135/9781529628371

Solymosi, K., & Techel, T. (2019). *Brewing up climate resilience in the coffee sector—Adaptation strategies for farmers, plantations,and producers*. https://www.sustaincoffee.org/assets/resources/Brewing_up_Climate_Resilience_in_the_Coffee_Sector.pdf

Steptoe, A., Pollard, T. M., & Wardle, J. (1995). Development of a Measure of the Motives Underlying the Selection of Food: The Food Choice Questionnaire. *Appetite*, *25*(3), 267–284. https://doi.org/10.1006/appe.1995.0061

Strand, K., College, H., Marullo, S., Cutforth, N., Stoecker, R., & Donohue, P. (2003). *Principles of Best Practice for Community-Based Research*. 11.

Sui, D., & DeLyser, D. (2012). Crossing the qualitative-quantitative chasm I: Hybrid geographies, the spatial turn, and volunteered geographic information (VGI). *Progress in Human Geography*, *36*(1), 111–124. https://doi.org/10.1177/0309132510392164

Teuber, R. (2010). Geographical Indications of Origin as a Tool of Product Differentiation: The Case of Coffee. *Journal of International Food & Agribusiness Marketing*, *22*(3–4), 277–298. https://doi.org/10.1080/08974431003641612

Thangaratinam, S., & Redman, C. W. (2005). The Delphi technique. *The Obstetrician & Gynaecologist*, *7*(2), 120–125. https://doi.org/10.1576/toag.7.2.120.27071

Thorlakson, T. (2018). A move beyond sustainability certification: The evolution of the chocolate industry's sustainable sourcing practices. *Business Strategy and the Environment*, *27*(8), 1653–1665. https://doi.org/10.1002/bse.2230

Tscharntke, T., Clough, Y., Bhagwat, S. A., Buchori, D., Faust, H., Hertel, D., Hölscher, D., Juhrbandt, J., Kessler, M., Perfecto, I., Scherber, C., Schroth, G., Veldkamp, E., & Wanger, T. C. (2011). Multifunctional shade-tree management in tropical agroforestry landscapes - a review: Multifunctional shade-tree management. *Journal of Applied Ecology*, *48*(3), 619–629. https://doi.org/10.1111/j.1365-2664.2010.01939.x

Turoff, M., & Linstone, H. A. (1975). *The Delphi Method: Techniques and Applications*. 618.

Weihrauch, D., Carodenuto, S., & Leipold, S. (2022). From voluntary to mandatory corporate accountability: The politics of the German Supply Chain Due Diligence Act. *Regulation & Governance*, rego.12501. https://doi.org/10.1111/rego.12501

Wilson, A. P., & Wilson, N. L. W. (2014). The Economics of Quality in the Specialty Coffee Industry: Insights from the Cup of Excellence Auction Programs. *Agricultural Economics*, *45*(S1), 91–105. https://doi.org/10.1111/agec.12132

Woolley, J. L., Pozner, J.-E., & DeSoucey, M. (2021). Raising the Bar: Values-Driven Niche Creation in U.S. Bean-to-Bar Chocolate. *Strategy Science*, stsc.2021.0147. https://doi.org/10.1287/stsc.2021.0147

Zerbe, N. (2014). Jennifer Clapp: Food: Polity, Cambridge, 2012, 218 pp, ISBN 978-0-7456-4936-8. *Agriculture and Human Values*, *31*(1), 161–162. https://doi.org/10.1007/s10460-014-9481-y

Zhunusova, E., Ahimbisibwe, V., Sen, L. T. H., Sadeghi, A., Toledo-Aceves, T., Kabwe, G., & Günter, S. (2022). Potential impacts of the proposed EU regulation on deforestation-free supply chains on smallholders, indigenous peoples, and local communities in producer countries outside the EU. *Forest Policy and Economics*, *143*, 102817. https://doi.org/10.1016/j.forpol.2022.102817

zu Ermgassen, E. K. H. J., Lima, M. G. B., Bellfield, H., Dontenville, A., Gardner, T., Godar, J., Heilmayr, R., Indenbaum, R. A., dos Reis, T. N. P., Ribeiro, V., Meyfroidt, P., Abu, I., & Szantoi, Z. (2021). Addressing indirect sourcing in zero deforestation commodity supply chains. *AgriRxiv*, *2021*, 20210399227. https://doi.org/10.31220/agriRxiv.2021.00085

Appendices

Appendix A. Workshop: Traders and Sustainability Governance - Co-constructing a research agenda Survey Questions

Workshop: Traders and Sustainability Governance - Co-constructing a research agenda
You are invited to participate in a study entitled Traders as sustainability governance actors in global food supply chains: A research agenda that is being conducted by Sophia Carodenuto (University of Victoria), Janina Grabs (ETH-Zürich)

Agricultural commodity trading 6rms connect producers with the global market and are uniquely positioned to implement sustainability programs. Our research project aims to assess both the opportunities as well as potential challenges that arise when traders play a greater role as sustainability governance actors.

We de6ne traders as companies (1) whose main business lies in the trade of agricultural commodities between producers and manufacturers, and/or (2) whose activities control a major share of the trade of the agricultural commodity in question.

As part of this project, we aim to conduct multiple rounds of expert knowledge gathering (known as a Delphi method) in order to hone in on issues commonly agreed to be most relevant. We will also use your answers to inform in-person discussions. Finally, this data will further be used in an academic publication describing the process of co-creating a transdisciplinary research community of action. All data will be used anonymously. The survey is anticipated to take no longer than 15 minutes.

Note: It is recommended, but not required, that you read the accompanying article "Traders as sustainability governance actors", or review the following website: https://tradersandsustainability.com/, as questions will be structured around some of the propositions we make in that article and summarize on the website.

Please be advised that this research study includes data storage in U.S.A. As such, there is a possibility that information about you that is gathered for this research study may be accessed without your knowledge or consent by the U.S. government, in compliance with the U.S. Freedom Act.

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

* Required

1. I consent to taking part in this survey. *

Mark only one oval.

- ◯ Yes
- ◯ N0

Start of survey

2. I am a member of the following professional community (multiple answers possible): *

Check all that apply.

- ☐ Academia
- ☐ Commodity trade
- ☐ Consultancy
- ☐ Non-pro6t sector
- Other: ☐ _____

3. I have expertise in the following commodity sectors (multiple answers possible):

Check all that apply.

- [ ] Coffee
- [ ] Cocoa
- [ ] Palm oil
- [ ] Other agricultural commodities (soy, cotton, …)
- [ ] Other transnational supply chains (textiles, electronics, …)
- [ ] Other: _____

4a. Sustainability tasks of traders: From your perspective, how important are traders (compare to other supply chain actors) in carrying out the following sustainability governance tasks? *

Mark only one oval per row.

	Not important at all	Somewhat important	Important	Extremely important	Don't know/N
Community-level CSR through own foundations	◯	◯	◯	◯	◯
Sector coordination through multi-stakeholder organizations	◯	◯	◯	◯	◯
Rolling out third-party and multi-stakeholder certifications on the ground (e.g. Rainforest Alliance, RSPO)	◯	◯	◯	◯	◯
Implementing lead company programs (e.g. Nespresso AAA, Mondelez Cocoa Life)	◯	◯	◯	◯	◯
Enforcing sustainable sourcing policies in their supply chains (e.g. palm NDPE policies, codes of conduct)	◯	◯	◯	◯	◯
Developing and implementing their own producer development and empowerment initiatives (e.g. sustainability management services, extension, farmer support organizations)	◯	◯	◯	◯	◯

4b. Feel free to comment on or explain your choices below:

4c. Are there any other tasks relevant to supply chain sustainability governance that you see traders take on? Which ones?

5a. Advantages of traders as sustainability actors: How much do you agree with the following statements? *

Mark only one oval per row.

	Don't agree at all	Agree somewhat	Mostly agree	Completely agree	Don't know/NA
Traders are likely place-bound champions of sustainable supply chain initiatives because they are invested in certain sourcing regions and have a business interest in seeing these regions become more sustainable	◯	◯	◯	◯	◯
Traders are likely vertical connectors and translators of sustainability demands and constraints along the supply chain due to their expertise in connecting local to global markets	◯	◯	◯	◯	◯
Traders are likely horizontal connectors and translators of best practices across commodity sectors due to their expertise in trading multiple commodities	◯	◯	◯	◯	◯

5b. Feel free to comment on or explain your choices below:

5c. Are there any other advantages you see for traders as sustainability governance actors due to their supply chain position or expertise?

6a. Challenges of traders as sustainability actors: How much do you agree with the following statements? *

Mark only one oval per row.

	Don't agree at all	Somewhat agree	Mostly agree	Completely agree	Don't know/NA
Traders are likely to encounter goal condicts between sustainability implementation and their business mission, which might push implementation costs onto farmers and/or curtail farmers' bargaining power due to the market capture of 'sustainable' regions					
Traders are likely to have incentives to downplay sustainability problems on the ground in communications with their buyers to protect their sourcing base					
Traders are likely to run into problems with on-the-ground competition when participating in 'pre-competitive initiatives' working at the farm level, and may thus be reluctant to participate or collaborate in such initiatives					

6b. Feel free to comment on or explain your choices below:

6c. Are there any other challenges you see in relying on traders as sustainability governance actors due to their supply chain position or expertise?

7a. Research agenda: In your opinion, how important are the following categories of research questions when trying to better understand traders' roles in sustainable supply chain governance? *

Mark only one oval per row.

	Not important at all	Somewhat important	Important	Extremely important	Don't know/NA
Changes in supply chain organization and governance (incl. the 'decommoditization' of commodity trade, novel ways of service delivery, power dynamics between traders and lead 6rms, new roles and responsibilities of traders)	◯	◯	◯	◯	◯
Trader-producer relationships and producer-level impacts (incl. power dynamics on the ground, incentive and disincentive-setting, farmer livelihood enhancement)	◯	◯	◯	◯	◯
Interactions with state actors and other existing sustainability governance arrangements (incl. local lobbying, collaboration via jurisdictional approaches, traders' role in multi-stakeholder initiatives)	◯	◯	◯	◯	◯

7b. Feel free to comment on or explain your choices below:

7c. What other research questions not captured in the categories above should be studied in your opinion?

8. Which of the following topics would you be interested in learning more about or discussing in an in-person event? *

Check all that apply.

- [ ] Best practices in incentivizing producers toward more sustainable behavior
- [ ] Engaging informal intermediaries for supply chain traceability and transformation
- [ ] New technology for supply chain sustainability (satellite data, blockchain, etc.) - opportunities and challenges
- [ ] Making jurisdictional approaches work in practice
- [ ] Farmer-buyer relationships amidst power differentials at origin
- [ ] Industry collaboration amidst commercial competition

Learning lessons across commodities (e.g. on COVID resilience)

9. Besides the broad range of topics described above, are there other issues regarding trade and sustainability governance that you would like to discuss or bring onto the agenda?

10. Thank you so much for your participation! We will get in touch with some of the results and next steps soon. If you would like to mention anything else or comment on the format of the survey, please do so below.

Appendix B. Proposed Agenda for Traders as Sustainability Governance Actors – Initiating a research agenda

Monday, 27.06.2022: Questioning assumptions in the original research agenda

9:30am – 10:30am	Welcome, introductions and ice breaker
10:30am-11am	Workshop objectives and initial advances (Carodenuto/Grabs)
11am-11.15am	Coffee break
11.15am-12.30pm	Traders as a category - What are we talking about? *Definitions (from trader to merchant) and distinctions (from MNC to individual on a motorbike). What do and don't we know about each actor?* Lead presenter: Discussant:
12:30pm – 2pm	Lunch break
2pm – 3.15pm	Motivations and intent *To what extent are traders' interests likely to align with sustainability objectives? What do we know about conditions under which companies may be supportive, neutral, or blocking agents of change?* Lead presenter: Discussant:
3.15pm – 3.30pm	Activation break
3.30pm – 4.30pm	How much room to maneuver is there? *Are traders stuck in the middle or key actors in shaping GVCs and sustainability within it? Under which conditions do they have more/less maneuvering space? When is collaboration between traders possible?* Lead presenter: Discussant:
4:30pm – 5pm	Wrap-up: Summary of insights gained and the plan ahead
6:30 pm	Workshop dinner

Tuesday, 28.06.2022: Identifying key developments for traders as governance actors

9am – 11am	Commodity spotlights: Focal supply chain sustainability challenges and solutions in coffee, cocoa, and palm oil (40 min each) Lead presenter coffee: Lead presenter cocoa: Lead presenter palm oil: Discussant:
11am-11.15am	Coffee break
11.15am-12.30pm	Whose data? Gathering, sharing, and using (farmer) data in ethical ways Lead presenter: Discussant:
12:30pm – 2pm	Lunch break
2pm – 3.15pm	Engaging and working with informal intermediaries Lead presenter: Discussant:
3.15pm – 3.30pm	Activation break
3.30pm – 4.30pm	Creating scalable services for farmers that provide the right incentives for change Lead presenter: Discussant:
4.30pm – 5pm	Wrap-up: Summary of insights gained and the plan ahead
5:00pm – 5:30pm	Finalization of small groups for World Café (by commodity, shared topic interest, or other overlap)
6:30 pm	Workshop dinner and walking tour of Victoria

Wednesday, 29.06.2022: Moving forward on transdisciplinary research collaborations

9am – 11am	World Café – in small groups, brainstorm potential research collaborations, including: 1) research question(s);

	2) research setting; 3) research method.
11am-11.15am	Coffee break
11.15am-12.30pm	Presentation of research collaboration ideas
12:30pm-1pm	Closing summary and follow-up plans
1pm – 2:30pm	Final lunch
2:30pm – 4:30pm	(Optional) Outlining final summary report and ideas on other workshop outputs [those who want are free to join!]

Appendix C. Survey One - Likert Scale Responses

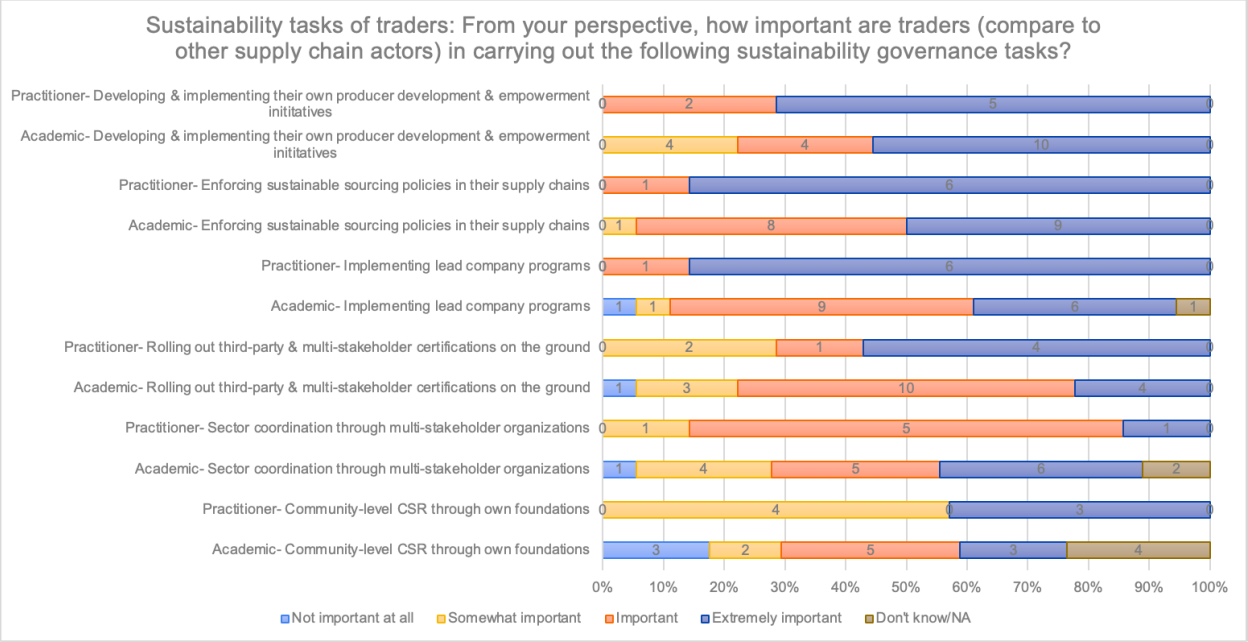

Figure 4. Survey Results Survey Phase One Question Four – Likert Scale Data from academic versus practitioner responses.

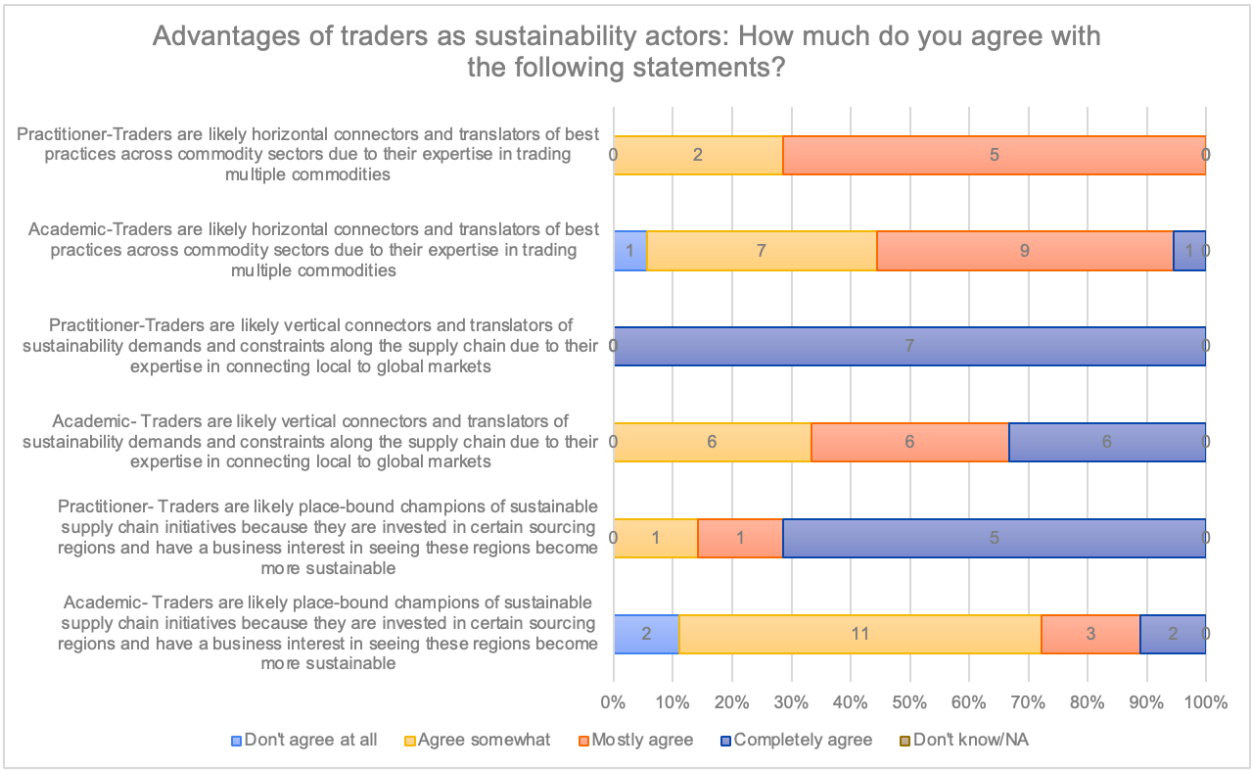

Figure 5. Survey Results Survey Phase One Question Five – Likert Scale Data from academic versus practitioner responses.

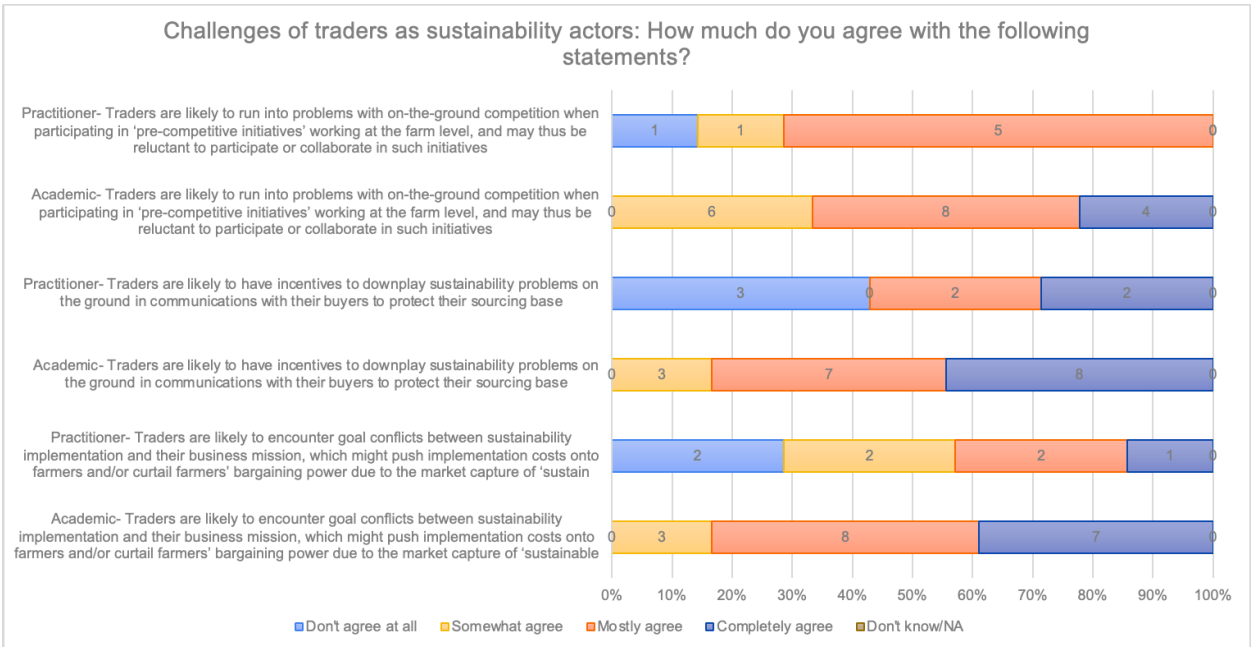

Figure 6. Survey Results Survey Phase One Question Six– Likert Scale Data from academic versus practitioner responses.

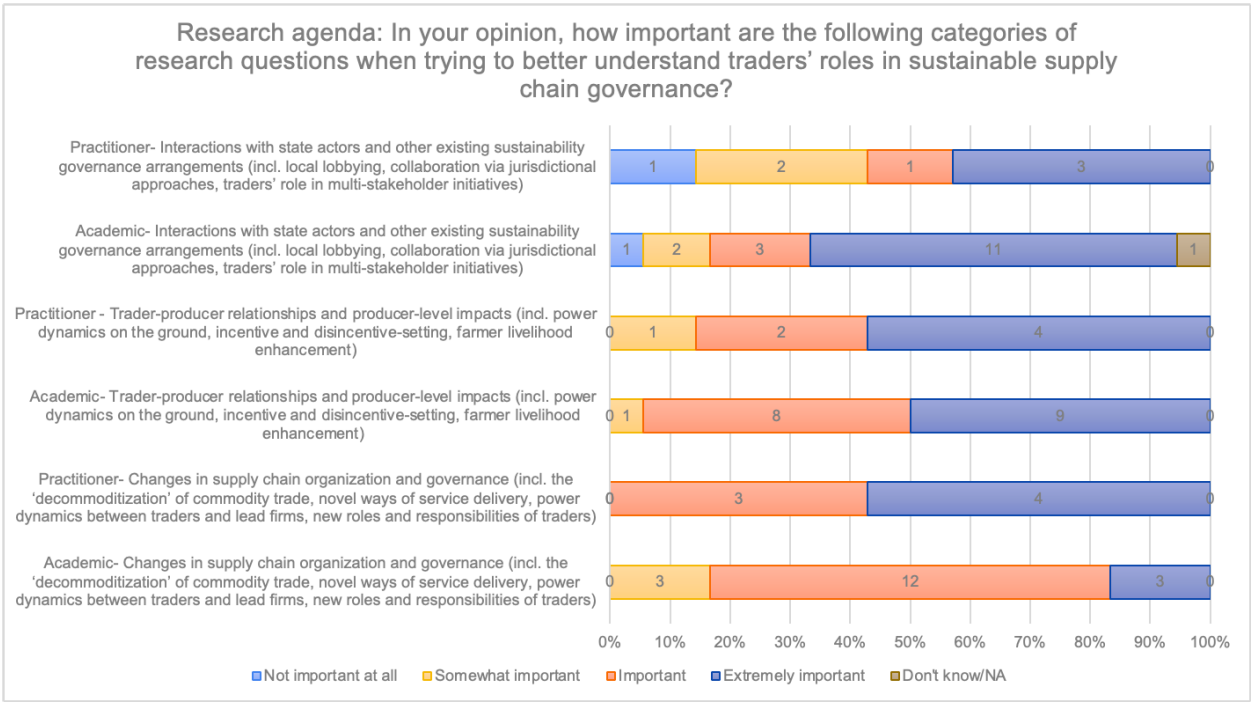

Figure 7. Survey Results Survey Phase One Question Seven – Likert Scale Data from academic versus practitioner responses.

Appendix D. Survey Two - Likert Scale Responses

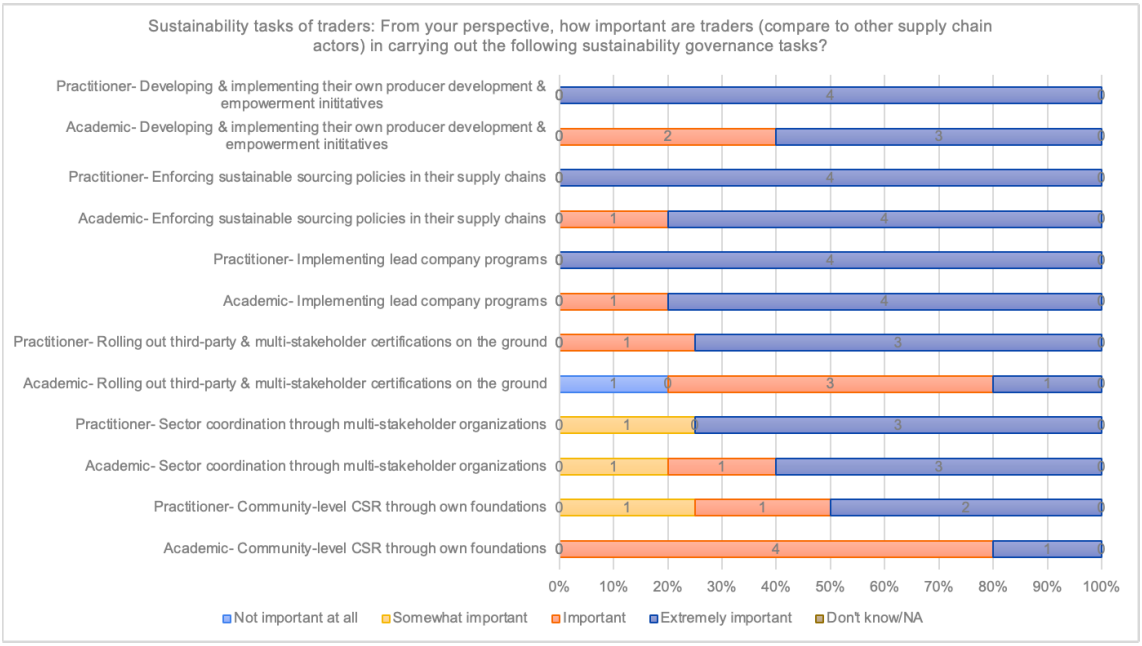

Figure 8. Survey Results Survey Phase Three Question Four – Likert Scale Data from academic versus practitioner responses.

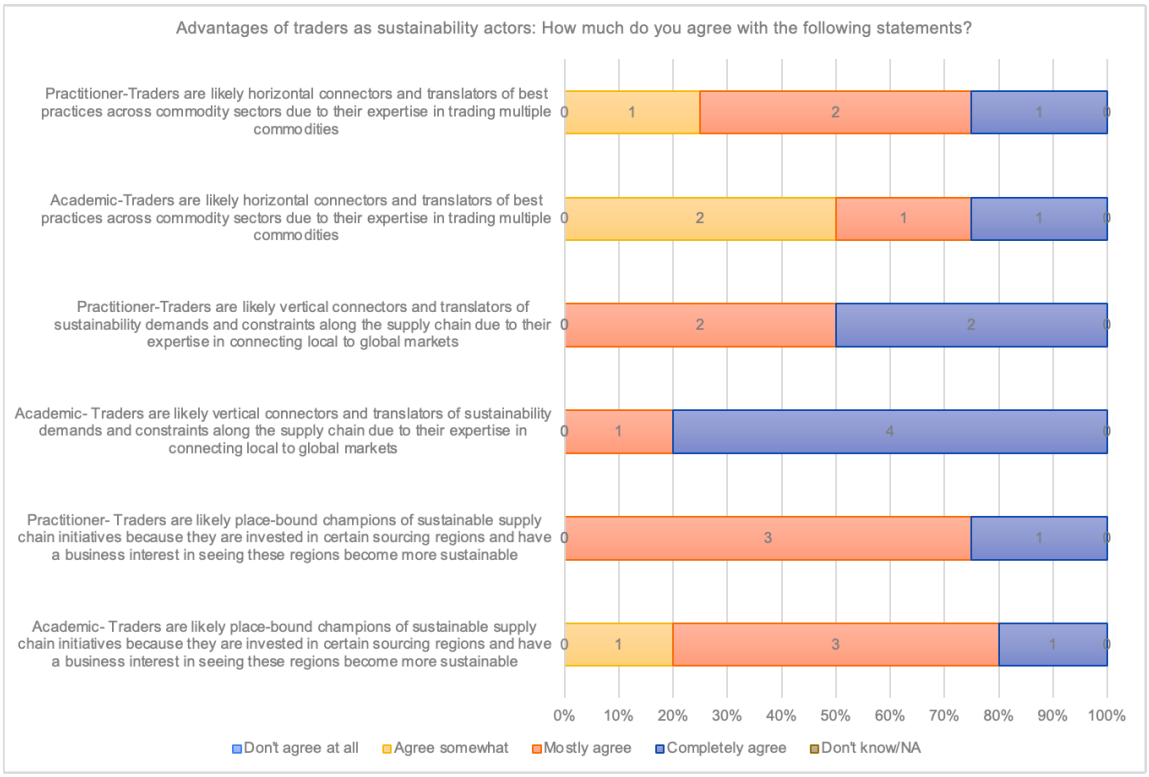

Figure 9. Survey Results Survey Phase Three Question Five – Likert Scale Data from academic versus practitioner responses.

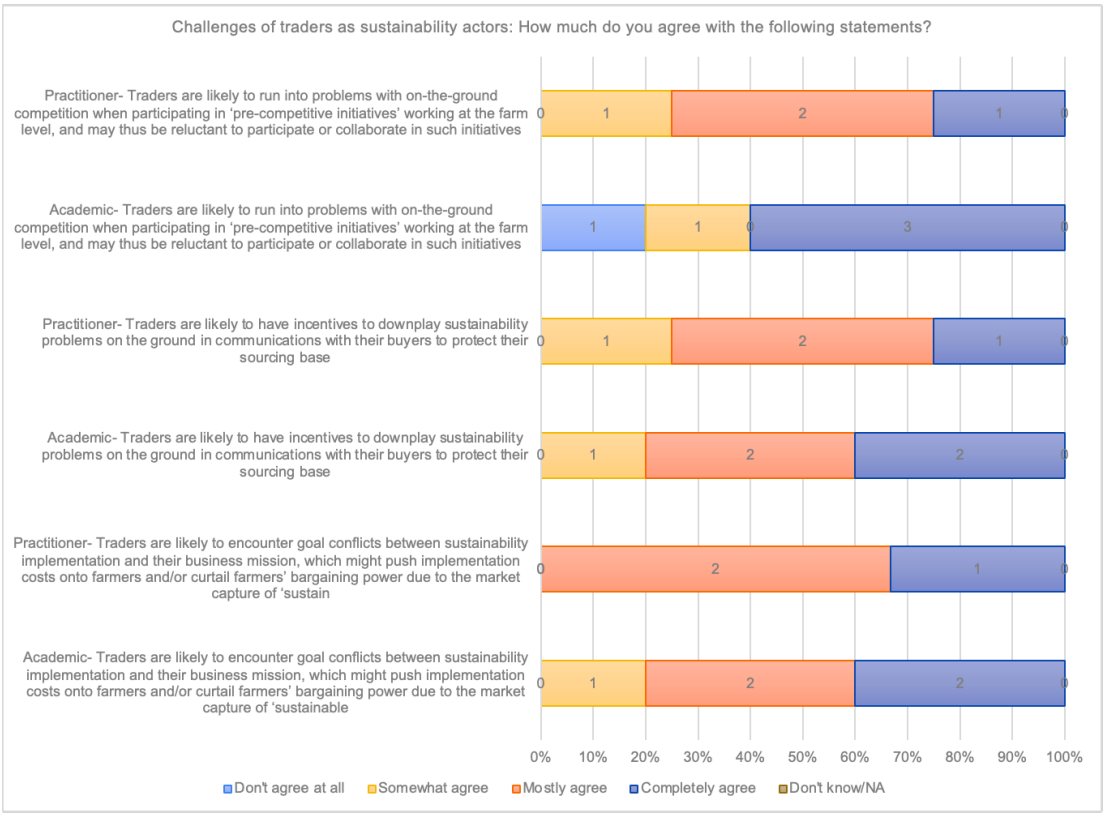

Figure 10. Survey Results Survey Phase Three Question Six– Likert Scale Data from academic versus practitioner responses.

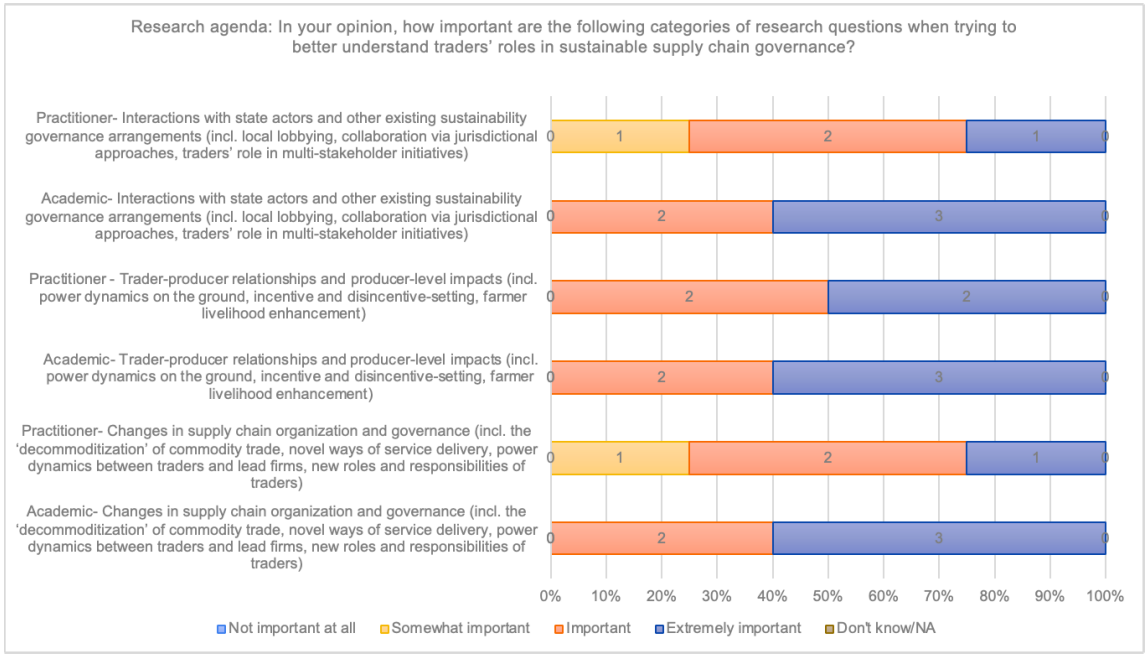

Figure 11. Survey Results Survey Phase Three Question Seven – Likert Scale Data from academic versus practitioner responses.

Appendix E. Publication of the Methods – Sage Research Methods: Business

https://doi.org/10.4135/9781529628371

Adventures in Transdisciplinary Translation: Co-creating and Vetting a Novel Research Agenda on Trading Companies as Sustainability Governance Actors

Abstract

This case study is based on the co-creation of a transdisciplinary research agenda assessing agricultural commodity traders as sustainability governance actors in tropical food production. We organized several online and in-person opportunities for researchers and practitioners in the agri-food trading sector to meet and discuss in order to gather input from several disciplines and industry representatives on our proposed research agenda and to kick-start transdisciplinary research projects. We used a Delphi-inspired methodology to collect transdisciplinary and geographically heterogenous expert insight on the cocoa, coffee, and palm oil sectors. Our methods piece discusses learnings and best practice advice gathered from pursuing this project in a challenging environment shaped by COVID-19-related travel restrictions and gives insights on how to approach practice-informed research on questions of global relevance.

Overview and Context

Tropical commodities such as coffee, cocoa, and palm oil are well-known everyday products, but due to lengthy and opaque supply chains, consumers are often unaware and shielded from the negative environmental and social impacts experienced in producing nations (Cho et al., 2021; Gardner et al., 2019). This research project aims to co-create a transdisciplinary research agenda that assesses the potential and challenges of traders - defined as mid-stream actors in global supply chains whose primary role or business activity is the trading of commodities - to improve the sustainability of such agri-food commodity production.

Cocoa, coffee and palm oil were identified as ideal agricultural commodities for this study as their supply chains operate similarly, producing regions are predominately equatorial,

crop production is spatially static, and they experience similar sustainability, and human equity challenges (Carodenuto, 2019; Grabs & Ponte, 2019), such as unsustainable agricultural practices, high levels of deforestation, low prices, and gender and human rights inequalities (Dauvergne, 2018; Middendorp et al., 2020). Sustainability challenges have commonly been addressed using third-party voluntary certifications such as Fair Trade and Rainforest Alliance, which have not achieved their intended impacts at scale and have, in some cases, exacerbated problems or introduced new challenges (Auld, 2014; Brandi et al., 2013).

Recent research has identified agriculture commodity traders as critical actors that shape the transition to sustainable and ethical supply chains (Folke et al., 2020; Grabs & Carodenuto, 2021). In particular, Dr. Janina Grabs and Dr. Sophia Carodenuto wrote a first agenda-setting article on traders' potential role in sustainability governance (Grabs & Carodenuto, 2021), highlighting that traders have well-established networks and positions in supply chains, making them potential leverage points to enact change. In response to the limits of certification, traders are now developing sustainable sourcing programs for their own supply chains, but these have limited external oversight and thus limited accountability (Carodenuto & Buluran, 2021). Through case studies on cocoa, coffee, and palm oil, our preliminary research demonstrates that traders hold significant power for upscaling sustainability efforts, but the motivations and constraints of traders remain understudied.

Considering these new developing sustainability approaches, it is an opportune time for traders and researchers to begin working collaboratively, using expert insights from both. Our aim in this project was to work collaboratively with commodity traders to create and initiate a research agenda surrounding the core issues and challenges for implementing supply chain sustainability in the coming years.

Research Design

Our transdisciplinary research employed a mixed methods approach that used multiple modes of inquiry. Transdisciplinary can be defined as collaboratively engaging with researchers and practitioners from other disciplines and drawing on their knowledge to address a common

problem. In an effort to capture the diversity of information that this project evokes, our research aimed to bridge the gaps between stakeholders, which required a methodology that sieves through and derives meaning from perspectives, opinions, and first-hand experiences across commodities, disciplines, and geographies (Allen et al., 2019; J. Skulmoski et al., 2007). The Delphi Method is one such methodology to manage this breadth of data. The case focuses on the chosen methodology as a crucial strategy for information dissemination between practitioners and researchers addressing similar sustainability and human equity supply chain questions.

The format of the project was Delphi Method inspired as it is an iterative process in which experts are consulted using multiple methods to elicit expert opinions (Thangaratinam & Redman, 2005; Turoff & Linstone, 1975) to shape future predictions or agendas targeting specific themes (Crisp et al., 1997). In our case, drawing on the Delphi Method permits a more streamlined process to evaluate stakeholder data multiple times and eventually arrive at a plan for proceeding forward given the data collected. The Delphi Method, paired with transdisciplinary engagement and cross-commodity collaboration was chosen as it helps mitigate research inaction, which would be simply analyzing a community to expose shortcomings or areas of improvement and not providing action-based solutions (Strand et al., 2003).

The project methods were also unique in that business actors are not typically contributing members in these academic spaces or discussions. The project provided an opportunity for researchers to engage in dialogue alongside trading company representatives, shaping future agendas and goals, and creating insights toward action-based research solutions. Elements of community-based research (CBR) and participatory action research (PAR) were guiding principles for pursuing research ‘with’ communities and not ‘on’ communities (Minkler, 2004; Ryser et al., 2013). Proceeding in this manner ensures the research is being done with the community stakeholders, highlighting their insights and unique positions to identify novel solutions for their operations.

The project collected data multiple times through several data intake formats from experts in transdisciplinary fields and across tropical agricultural commodities. We proceeded in three main data collection stages, each influenced by the preceding stage’s results.

Stage 1: Initial Survey – An initial online survey was distributed to both practitioners (traders) and researchers. Survey questions reflected the topics outlined in an agenda-setting paper (Grabs & Carodenuto, 2021). The survey gauged the participant's opinions using Likert Scale questions to assess how much stakeholders agreed or disagreed with specific statements regarding the position and roles of trading companies in furthering supply chain sustainability. The survey also allowed participants to comment on their responses or highlight other agenda-setting topics. Responses influenced the workshop agenda and topics.

Stage 2: Hybrid workshop – Based on the initial survey results, we planned a three-day workshop out of the University of Victoria in June 2022. The workshop hosted 11 in-person and 13 virtual participants comprised of practitioners and academics. Participants consisted of original survey contributors and new invitees who had not completed the initial survey. All invited participants have relevant experience in the tropical agricultural commodity field. At the workshop, set agenda topics were presented by all the participants, followed by open discussions in person and virtually. All meeting minutes were transcribed.

Stage 3: Final Survey – The final survey repeated the relevant survey questions from Survey 1 but incorporated additional questions specifically about transdisciplinary and cross-commodity engagement and personal takeaways from the workshop.

The qualitative data gathered throughout the survey stages can also be evaluated quantitatively for the Likert Scale questions. Doing so allows us to determine how opinions may have changed after the workshop and determine if there are differences amongst stakeholder groups. At the same time, the qualitative data collected during the surveys and workshop that elicit comment-style responses directly speaks to the value of the workshop and these types of transdisciplinary and cross-commodity opportunities.

Research Practicalities

The ethical considerations of our project included working with private sector stakeholders, the anonymity of data, and centering traders' perspectives in a majority academic group. The challenges were the inconsistent use of terminologies, the recruitment and engagement of participants, hosting an in-person workshop, and collecting varying types of data asynchronously. Also of considerable mention, this research project occurred during the COVID-19 pandemic. Based on the realities of several workshop iterations being postponed, recruitment, time, resources, and safety considerations significantly influenced the final methodology.

Private Sector Recruitment & Engagement:

The recruitment of private sector participants may potentially be biased in that it can be limited to working exclusively with traders who possess the ability to be transparent. Workshop invitations were sent to stakeholders in the cocoa, coffee, and palm oil sectors, in an attempt to have equal representation, but final participation decisions are not under the researcher's control. Therefore, once trading participants are secured, researchers can ask the traders to recommend other potential invitees from their networks to find additional transparent private sector partners.

Inconsistency in Terminologies:

During initial data collection in Stage One, we noted inconsistent terminology employed across disciplines, academics, and practitioners. Practitioners were also hesitant to define themselves as traders. Therefore, time was allocated towards getting everyone at the workshop on the same page. The workshop's first session was dedicated to “What are We Talking About,” as it was important for everyone to use the same language. Terminology consistency ensured a common understanding amongst the group from the beginning.

Attendance:

Researchers should work towards allocating funds for participant travel and accommodation to remove potential barriers that may deter in-person participation at the workshop. In our case, funds were allocated to participants who likely did not receive workplace compensation for research-related travel. This incentive was set in place to mitigate risks associated with missing work, which can be especially relevant for the trading practitioners who attended. Thereby eliminating a portion of the deterring factors related to financial and time constraints. This way, researchers can attempt to improve the likelihood of engagement and participation in their project.

Survey Engagement:

Participant engagement should be considered in the research design when distributing surveys. Many aspects of the project required significant time investments from the voluntary participants, which may have the potential to result in poor or low response rates. To address such constraints, approximated survey lengths were disclosed in the preambles. Additional measures included follow-up emails reaching out to participants with a 'final call' for submissions. Due dates were set ahead to ensure extra time for participants to complete the surveys after our follow-up emails. The final measure was keeping survey completion times realistic and as low as possible. The first survey was outlined as 10-15 minutes, and the second survey was anticipated to be 15-20 minutes.

Workshop Set Up:

Our second stage of Delphi Method data collection was the workshop. A critical aspect of the project was hosting agri-food trading practitioners and researchers from various disciplines to meet and discuss salient topics on the proposed research agenda. The workshop coincided with the advent of the COVID-19 pandemic and was rescheduled twice to accommodate ethical and safety considerations and travel restrictions. Therefore, practical considerations consisted of maintaining the interest of the participants who initially expressed they would like to contribute to the workshop in the early days of the project's development. In light of the unplanned two-year gap

between the initial planning of the workshop to when it took place, invitations and updates were regularly sent out to the previously interested participants and any new invitees. A significant change occurred between the original recruited participants and the final attendees, which required additional catching-up measures. Such practices should be implemented when conducting similar events, even with shorter planning stages; this can help foster relationships between the researchers and community partners before the event and improve willingness to participate and comfort levels at the actual workshop.

Workshop participant selection was based on experience in research or work in tropical agricultural commodity trade-related backgrounds. The participants spent three days at the University of Victoria engaging in the workshop, rotating roles as either the lead presenter, discussant, or participant in the discussions. To facilitate engagement, participants were given multiple months to self-select a role for one of our pre-determined session topics. They could then prepare for their session at their convenience. Additional measures included sharing contact information of presenters and discussers to facilitate prior collaboration and planning.

Application of the Delphi Method:

The Delphi Method was previously highlighted as the ideal methodology to structure the project. Still, it requires careful consideration regarding the multiple data collection strategies employed for the project. Practicalities consisted of how to best collect such diverse qualitative data on perspectives, opinions, and personal experiences in the field. A survey format was selected as an ideal mode of inquiry to structure qualitative data sourced from Likert Scale questions to rank the participant's quantitative opinions data for ease of comparison. While the workshop sessions permitted free-form discussions to debate the topics gleaned from the survey results. In Survey Two, questions from the initial survey were repeated with the addition of reflection-style questions based on workshop proceedings, eliciting responses on transdisciplinary knowledge exchange. This method was necessary for the project as it demonstrates how the data may have changed from Survey One to Survey Two.

Transcription & Note Considerations:

To capture data from the workshop proceedings, all sessions were recorded and transcribed using Ai software and were further reviewed by a graduate student to correct any errors. Additionally, a note-taker was employed for the duration of the workshop sessions; their work can be used to cross-reference the transcribed audio data and recordings. These notes were made available to all workshop participants in case they missed a session or would like to revisit any discussion points.

Ethical Considerations:

Survey data were consistently collected anonymously; the only attributing data was participants selecting which stakeholder group they belonged to. It is recommended that researchers engaging with private sector stakeholders follow Chatham House rules stating that participants can use information from the workshop but may not reveal who made a particular comment. All data collected by our research team at the workshop followed similar procedures, where comments expressed by participants were anonymous. However, attributing statements to the participant stakeholder group is retained as it is an essential component of the study. All confidentiality precautions and realities were disclaimed in the survey pre-amble and before the commencement of the workshop. Participants were also informed that they could stop participating at any time or have the information they shared redacted from our records at any point. Such precautions were set in place to demonstrate accountability amongst traders, researchers, and us, the hosts.

COVID-19 Planning:

Conducting an in-person workshop during the ongoing COVID-19 pandemic involved safety considerations for all participants. Preventative measures included daily antigen testing, encouraging mask use, additional outdoor space for breaks, and ongoing cleaning of surfaces.

Method in Action

Our research objective of co-creating a transdisciplinary research agenda that assessed the potential and challenges of improving the sustainability of agri-food commodity production with traders was a success. This was achieved through our organization of multiple online and in-person opportunities where researchers and practitioners in the agri-food trading sector collaborated on how to approach practice-informed research on questions of global relevance. The design of the project and its methods underwent ongoing adaptations in response to external factors beyond our control, such as the COVID-19 pandemic, recruitment challenges, private sector involvement, and scheduling conflicts. Yet, these external influences shaping the project also resulted in an engaging workshop with dedicated participants who actively contributed to the project.

What did not go according to plan & subsequent steps:

A challenge we encountered during the project was participant recruitment logistics. The original invited participants shifted significantly due to the postponements of the workshop. This was partly due to scheduling conflicts and the re-opening of work-related travel after travel restrictions were removed or changed, resulting in some of the original participants being unable to attend. The original invited participants were the responders of the first survey in Stage One. Therefore, when data is compared between Survey One and Two, it must be accounted for that some participants are different. Both surveys were collected anonymously; consequently, we cannot identify responses from participants who could not join from those who remained throughout the project.

Additionally, the pandemic's travel restrictions affected participants' ability for international travel to Canada. Our objectives of inviting participants from producing regions, which predominately exist in the Global South, were often confronted with vaccination challenges and obtaining travel visas in time. Our solution was to design the workshop as a hybrid model allowing online participation. Still, challenges occurred with time zone logistics, as many of the invited participants were based in Europe. It is recognized that Victoria, British Columbia was not a central location for many

participants and influenced the invited participants' ability and willingness to travel for the workshop.

Secondly, data collection from the private sector was limited by self-selection biases, where we only worked with stakeholders who wanted to participate or had the autonomy to participate. This limitation resulted in working exclusively with traders and companies that possess the ability to be transparent. Thus, data is restricted and does not reflect traders who are unable to participate or do not have the authority to speak on behalf of their companies. Another factor that we acknowledge influenced our ability to engage with the private sector is a counter-intuitive barrier in their involvement; as there are associated costs to engage in research that investigates the sustainability of their supply chains. Traders' profit goals can often be prioritized over rectifying the efficacy of their products due to profit constraints (Grabs & Carodenuto, 2021). These challenges did limit our availability and quality of private sector data. This resulted in a rigorous and ongoing recruitment process in an attempt to secure participants equally from the cocoa, coffee and palm oil sectors.

Securing academic participation for both the online and in-person aspects of the workshop was easier. However, potential ramifications would be that the organic nature of the workshop session's discussions was unintentionally academic-centered, thus impacting our goal of working alongside trading practitioners and centering their voices.

<u>What went well:</u>

The chosen methodology was ideal for sieving through diverse opinions and perspectives data. No singular data collection method could have captured the robust qualitative data that this type of transdisciplinary engagement generated. Using several iterations of data collection methods benefited our ability to gather information. In retrospect, it may also help capture perspectives that changed during the pandemic.

Inviting participants from tropical commodity backgrounds in cocoa, coffee, and palm oil was insightful as there are similarities and lessons that commodity groups can learn from one another. In the literature, this overlap is commonly recognized, especially for large-scale traders who operate horizontally throughout supply chains and have insight across multiple commodities (Grabs & Carodenuto, 2021), but this is often not the case for operations who trade in a single commodity and may not have the capacity to research outside of their niche. The workshop was able to facilitate this novel knowledge exchange across the commodities. A similar outcome can be said for hosting researchers from varying disciplines. All the participants rotated through lead presenter and discussant roles on the pre-determined session topics, and the diverse backgrounds of the participants led to unique knowledge exchanges. The online and in-person participation generated unique global and commodity-specific information that bolstered the quality of discussions and outcomes.

Practical Lessons Learned

Collecting multiple iterations of primary data through different means from the same set of participants requires dedication and consistency in communication on behalf of the researcher. The Delphi Method provides a structured approach for transdisciplinary sharing and translation across academic and practitioner boundaries. Practicalities and lessons learned using the Delphi Method are as follows:

1. **Practitioner Time Investments & Recruitment–** For any research with significant participant time investment, research plans should be solidified in advance, and time commitments should be disclosed. Once invitations are distributed, researchers' engagement and interest may be high, but logistically securing participants to travel to a voluntary workshop can prove complicated. Business representatives also have demanding schedules and often do not have the time to participate in person. Therefore, careful consideration should be given to the host location and the logistics of virtual participation. Lastly, offering reimbursement funds for participant expenses aids in incentivizing in-person involvement.

2. **Researcher Time Investments –** A critical lesson from this project was investing enough time up-front to get everyone on the same page regarding "what we are talking about" and using common language and terminology. This involves extra time and effort but mitigates future misunderstandings or data errors as people may use different language that implies different implications.
3. **Response rate for asynchronous engagement –** A) In-person data – We found that practitioners are most engaged when they are in a room talking with others. If physical presence is not possible, then virtual participation was most successful when it was 'live' rather than through email or online survey. B) Survey data – The main practical lessons learned while using surveys are explicitly stating the expected time to complete the surveys, creating clear and direct questions, and how best to appropriately follow up with participants who have not completed their survey. The length between each data collection stage can result in forgetting previous stages' content or forgetting to complete the survey. Additional recommendations include setting the submission dates ahead of time from when the data would be analysed and allowing extra time for follow-up correspondence asking participants if they still wish to complete their surveys.
4. **Planning practice-engaged research –** Hosting a hybrid in-person and virtual workshop was invaluable for transdisciplinary and transnational collaboration and knowledge exchange. The high calibre discussion and presentation data from this event result from detailed scheduling and prior communication with all participants. Key lessons gained from preparing for this portion of our methods included keeping an updated workshop agenda and a participant list circulated amongst the participants leading up to the workshop. A practical consideration for any research that requires participant participation is maintaining involvement from start to finish. Strategies we used included distributing draft agendas asking people to comment or suggest alternative sessions. Multi-stakeholder engagement strategies include pairing practitioners with academics because one is more familiar with creating an educational presentation, while the other has invaluable insider knowledge regarding how these commodities are traded and the real constraints to sustainability. Participants knew ahead of time whom they were working with, their contact information and their roles. This constant communication

kept participants updated with the latest changes and improved their ability to plan for their presentations and discussant roles.

5. **Diversity of Data –** Managing multiple data formats requires planning and storage considerations. All data collection methods should undergo a test run, especially recording devices. It is also wise to have a secondary source to refer back to. Employing a note taker for cross-referencing purposes can serve this purpose. Additionally, the note takers' work can be validated by referring to the recorded data.
6. **Engagement –** Inviting people to participate strongly depends on people's willingness to engage in discussions. Research participants' experience or stage of their careers can vary and has the potential to influence engagement and comfort levels. Time allocated for introductions and breaks between sessions allows participants to get to know one another and mitigate potential engagement challenges. Having structured introductions and group plans fosters connections between participants.
7. **Follow-up –** Lastly, collaboration and continued engagement with participants post-data collection demonstrate researchers' commitment to working with and alongside community partners. Researchers can express this by inviting participants to be contributing collaborators in projects coming out of their research.

The Delphi Methodology permitted ongoing flexibility to adapt to our participant's needs but required significant effort on behalf of the research team. The nature of collecting data through multiple collection modes inherently adds complications. Still, through thoughtful preparation and data management, it is an ideal method for obtaining expert opinions, perspectives, and experiential data.

Conclusion

Our application of the Delphi Method involved multiple engagement opportunities for knowledge exchange amongst transdisciplinary researchers and tropical agricultural commodity traders. In applying this methodology, a diverse set of expert data was collected using two virtual surveys and a workshop. The project was successful because we were able to work alongside business actors and facilitate ongoing collaboration between researchers and traders on practice-

informed research questions during the COVID-19 pandemic. Our results were made possible by each stage of our Delphi Method-inspired data collection process, informing the subsequent stage. This evolvement of methods allowed us to develop and target specific comments, opinions, perspectives, or experiences. Equal collaboration between traders and researchers is not always standard in academic spaces. Still, our project created an opportunity for traders to shape the direction of our research agendas to what would truly benefit them in achieving their sustainability goals. The insight gained from our Delphi Method application was how to facilitate cross-agricultural commodity and multi-discipline engagement. The project generated a unique opportunity for a group of people who are unlikely to engage with one another in this capacity to collaborate on the future of sustainable agricultural supply chains and create actionable steps.

Discussion Questions

1. What are the benefits of transdisciplinary and cross-commodity research?
2. What are the potential challenges of private sector research engagement?
3. How can researchers initiating practice-engaged research improve participant participation?
4. What are the positive and negative attributes of the Delphi Method?

Multiple Choice Questions

1. What methods inspired researching 'with' traders, as opposed to performing research 'on' them?
    a. Community Mapping
    b. Community-Based and Participatory Action Research CORRECT
    c. Participatory data analysis
2. What is not a benefit of the Delphi Method?
    a. Multiple data collection strategies
    b. Time-efficient CORRECT
    c. Flexible
3. What is a limitation of working with private sector community partners?
    a. Self-selection biases CORRECT

b. Different perspectives
c. High engagement levels

Further Reading

Begemann, A., Giessen, L., Roitsch, D., Roux, J.-L., Lovrić, M., Azevedo-Ramos, C., Boerner, J., Beeko, C., Cashore, B., Cerutti, P. O., de Jong, W., Fosse, L. J., Hinrichs, A., Humphreys, D., Pülzl, H., Santamaria, C., Sotirov, M., Wunder, S., & Winkel, G. (2021). Quo vadis global forest governance? A transdisciplinary delphi study. *Environmental Science & Policy*, *123*, 131–141. https://doi.org/10.1016/j.envsci.2021.03.011

Folke, C., Österblom, H., Jouffray, J.-B., Lambin, E. F., Adger, W. N., Scheffer, M., Crona, B. I., Nyström, M., Levin, S. A., Carpenter, S. R., Anderies, J. M., Chapin, S., Crépin, A.-S., Dauriach, A., Galaz, V., Gordon, L. J., Kautsky, N., Walker, B. H., Watson, J. R., … de Zeeuw, A. (2020). An invitation for more research on transnational corporations and the biosphere. *Nature Ecology & Evolution*, *4*(4), 494–494. https://doi.org/10.1038/s41559-020-1145-2

Serdijn, M., Kolk, A., & Fransen, L. (2020). Uncovering missing links in global value chain research – and implications for corporate social responsibility and international business. *Critical Perspectives on International Business*, *ahead-of-print*(ahead-of-print). https://doi.org/10.1108/cpoib-01-2020-0002

Web Resources

Traders and Sustainability: https://tradersandsustainability.com/

Traders and Sustainability Research Project: https://www.youtube.com/watch?v=59xPPD8C11Q&feature=emb_title

Trase.Earth: https://www.trase.earth/

References

Allen, T., Prosperi, P., Cogill, B., Padilla, M., & Peri, I. (2019). A Delphi Approach to Develop Sustainable Food System Metrics. *Social Indicators Research*, *141*(3), 1307–1339. https://doi.org/10.1007/s11205-018-1865-8

Auld, G. (2014). *Constructing Private Governance: The Rise and Evolution of Forest, Coffee, and Fisheries Certification*. Yale University Press. https://web-s-ebscohost-com.ezproxy.library.uvic.ca/ehost/ebookviewer/ebook/bmxlYmtfXzg2MTMxOF9fQU41?sid=cb5b440f-e910-46cc-9d9c-a90af9c5a836@redis&vid=0&format=EB&rid=1

Brandi, C., Cabani, T., Hosang, C., Schirmbeck, S., Westermann, L., & Wiese, H. (2013). *Sustainability certification in the Indonesian palm oil sector: Benefits and challenges for smallholders* (Studies No. 74; Deutsches Institut Für Entwicklungspolitik (DIE), Bonn).

Carodenuto, S. (2019). Governance of zero deforestation cocoa in West Africa: New forms of public–private interaction. *Environmental Policy and Governance*, *29*(1), 55–66. https://doi.org/10.1002/eet.1841

Carodenuto, S., & Buluran, M. (2021). The effect of supply chain position on zero-deforestation commitments: Evidence from the cocoa industry. *Journal of Environmental Policy & Planning*, 1–16. https://doi.org/10.1080/1523908X.2021.1910020

Cho, K., Goldstein, B., Gounaridis, D., & Newell, J. P. (2021). Where does your guacamole come from? Detecting deforestation associated with the export of avocados from Mexico to the United States. *Journal of Environmental Management*, *278*, 111482. https://doi.org/10.1016/j.jenvman.2020.111482

Crisp, J., Pelletier, D., Duffield, C., Adams, A., & Nagy, S. (1997). The Delphi Method? : Nursing Research. *Nursing Research*, *46*(2), 116–118.

Dauvergne, P. (2018). The Global Politics of the Business of "Sustainable" Palm Oil. *Global Environmental Politics*, *18*(2), 34–52. https://doi.org/10.1162/glep_a_00455

Folke, C., Österblom, H., Jouffray, J.-B., Lambin, E. F., Adger, W. N., Scheffer, M., Crona, B. I., Nyström, M., Levin, S. A., Carpenter, S. R., Anderies, J. M., Chapin, S., Crépin, A.-S., Dauriach, A., Galaz, V., Gordon, L. J., Kautsky, N., Walker, B. H., Watson, J. R., … de Zeeuw, A. (2020). An invitation for more research on transnational corporations and the biosphere. *Nature Ecology & Evolution*, *4*(4), 494–494. https://doi.org/10.1038/s41559-020-1145-2

Gardner, T. A., Benzie, M., Börner, J., Dawkins, E., Fick, S., Garrett, R., Godar, J., Grimard, A., Lake, S., Larsen, R. K., Mardas, N., McDermott, C. L., Meyfroidt, P., Osbeck, M., Persson, M., Sembres, T., Suavet, C., Strassburg, B., Trevisan, A., … Wolvekamp, P. (2019). Transparency and sustainability in global commodity supply chains. *World Development*, *121*, 163–177. https://doi.org/10.1016/j.worlddev.2018.05.025

Grabs, J., & Carodenuto, S. L. (2021). Traders as sustainability governance actors in global food supply chains: A research agenda. *Business Strategy and the Environment*, *30*(2), 1314–1332. https://doi.org/10.1002/bse.2686

Grabs, J., & Ponte, S. (2019). The evolution of power in the global coffee value chain and production network. *Journal of Economic Geography*, *19*(4), 803–828. https://doi.org/10.1093/jeg/lbz008

J. Skulmoski, G., T. Hartman, F., & Krahn, J. (2007). The Delphi Method for Graduate Research. *Journal of Information Technology Education: Research*, *6*, 001–021. https://doi.org/10.28945/199

Middendorp, R. S., Boever, O., Rueda, X., & Lambin, E. F. (2020). Improving smallholder livelihoods and ecosystems through direct trade relations: High-quality cocoa producers in Ecuador. *BUSINESS STRATEGY & DEVELOPMENT*, *3*(2), 165–184. https://doi.org/10.1002/bsd2.86

Minkler, M. (2004). Ethical Challenges for the "Outside" Researcher in Community-Based Participatory Research. *Health Education & Behavior*, *31*(6), 684–697. https://doi.org/10.1177/1090198104269566

Ryser, L., Markey, S., & Halseth, G. (2013). Developing the next generation of community-based researchers: Tips for undergraduate students. *Journal of Geography in Higher Education*, *37*(1), 11–27. https://doi.org/10.1080/03098265.2012.696596

Strand, K., College, H., Marullo, S., Cutforth, N., Stoecker, R., & Donohue, P. (2003). *Principles of Best Practice for Community-Based Research*. 11.

Thangaratinam, S., & Redman, C. W. (2005). The Delphi technique. *The Obstetrician & Gynaecologist*, *7*(2), 120–125. https://doi.org/10.1576/toag.7.2.120.27071

Turoff, M., & Linstone, H. A. (1975). *The Delphi Method: Techniques and Applications*. 618.