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*Trust, Power, & Cognitive Proximity: identifying critical factors for how stakeholders can collaborate for a more sustainable coffee supply chain*



**Universiteit Utrecht**

*Faculty of Geosciences*

Name:	Kale Jewell
Date:	08/08/2016
Student Number:	4276957
Contact Details:	+31 6 46 04 72 08   <a href="mailto:k.jewell@students.uu.nl">k.jewell@students.uu.nl</a>
Academic Supervisor:	Ir. Sjors Witjes   <a href="mailto:s.witjes@uu.nl">s.witjes@uu.nl</a>
First Reader:	Dr. Walter Vermeulen   <a href="mailto:w.j.v.vermeulen@uu.nl">w.j.v.vermeulen@uu.nl</a>
Second Reader:	Dr. Jacco Farla   <a href="mailto:j.c.m.farla@uu.nl">j.c.m.farla@uu.nl</a>
Company Name:	Holland Startup B.V.
Company Supervisors:	Maurice Bakker   <a href="mailto:m.bakker@hollandstartup.com">m.bakker@hollandstartup.com</a> <i>Co-founder &amp; Chief Operating Officer</i> Jelmer Laks   <a href="mailto:j.laks@hollandstartup.com">j.laks@hollandstartup.com</a> <i>Entrepreneur in Residence</i>

# Abstract

Collaboration between interdependent stakeholders engaged in the delivery of refined products to an end user is necessary to address sustainability challenges that threaten the resilience of the global coffee supply chain network. However, relationship dynamics between stakeholders engaged in collaborative endeavours for more sustainable outcomes are underexplored. This research investigated how stakeholders in the coffee sector can effectively collaborate to contribute to a more sustainable supply chain network. It was found that stakeholders could collaborate through aligning towards a common vision and creating stakeholder specific commitments based on contextual capabilities and priorities (contextual position), which is facilitated by cognitive proximity. Contrary to existing literature, cognitive proximity seemed to be a more influential factor for successful collaboration than propinquity. Trust and sharing were found to be the most recurrent antecedents to collaboration and meaningful relationship dynamics amongst netchain stakeholders in the coffee sector. Conversely, the dependency and abuse of power seemed to negatively influence stakeholder's willingness to engage in collaboration for sustainability. Furthermore, it was determined that stakeholders can successfully develop strategies for network collaboration by embracing emergent strategy formations in an iterative manner to account for the large amount of varied perspectives with regard to improved sustainability over time.

Exploratory research was conducted using the coffee sector as a case study and two subcase netchains. A conceptual framework was proposed and used for interpretative analysis of the netchain subcases. A total of thirteen stakeholder organizations were split between the netchains based on engagements in a collaborative endeavour. Fourteen semi-structured interviews were conducted and documents were collected from each stakeholder organization which were compiled into the netchain subcase datasets. Thematic content analysis and the use of an iteratively developed coding tree were used to interpret the qualitative dataset. The findings propose an extension to Mitchell et al.'s (1997) stakeholder classification and salience using proximity: propinquity, cognitive and structural. Future research is required in order to validate the framework and generalize findings to the broader academic literature on sustainable supply chain collaboration dynamics. This can be achieved by using higher sample sizes of netchains from varied cases of agri-food sectors.

# Executive Summary

This report provides an analysis and evaluation of determinants and strategies for effective stakeholder collaboration contributing to resilience and sustainability goals in the coffee supply chain network. Two subcases netchains consisting of 7 stakeholder organizations—vertical and horizontal—each were used to explore the above. It is recommended that stakeholders in the coffee supply chain network align around a common vision and utilize an emergent strategy formation, where learning and discovery are prioritized. Once a vision for future development has been established it is crucial to conduct stakeholder outreach sessions in order to understand the individual priorities and capabilities of collaborating stakeholders. Such sessions will aid in defining equitable stakeholder specific commitments prior to engaging in a collaborative process. It was found that a deep understanding of the socio-cultural and business environment in which stakeholders operate leads to more effective collaboration processes and outcomes. Furthermore, beginning a collaborative process with an emphasis on long-term relationships and the establishment of appropriate antecedents (see section 2.4.1 and 5.3) can contribute to successful outcomes. Leveraging digital platforms, as a means to facilitate open and constant communication between stakeholders is further recommended when pursuing sustainability goals. Additionally, establishment of a set of mutually defined key performance indicators to measure impact of sustainability initiatives will help to ascertain an appropriate pre-competitive zone for collaborating stakeholders. Finally, shifting towards more direct trading relationships offers an alternative transaction strategy that would facilitate supply chain network resilience through profit redistribution to value adding stakeholders.

The proposed process recommendations were generated from 14 interviews and a number of documents in which trust, sharing and cognitive proximity were found to be critical factors enabling successful collaboration amongst the netchain subcases. A major barrier for supply chain network collaboration in the pursuit of more sustainable supply chains was opportunistic behaviour of stakeholders and the abuse of power. Data analysis was conducted using a conceptual framework and coding scheme, which was iteratively altered during the process. Concluding, the conceptual framework can be used as a template for initiating and iterative effective strategies for stakeholder collaboration contributing to more resilience supply chains.

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# 1. Introduction

Increased flexibility of international trade laws has contributed to freer flow of goods between sovereign states (Kehoe & Ruhl, 2003). This has resulted in a larger volume of agri-food products being exchanged (FAO, 2002; UNEP, 2005), of which coffee represents one of the largest international agri-food markets by retail valuation - over \$100 billion USD (Panhuysen & Pierrot, 2014). However, the coffee sector is subject to a potential global decline of production up to 77% by 2060 (Ovalle-Rivera et al., 2015) impacting an estimated 100 million individuals involved in production and processing (ILO, 2015) as a result of negative impacts associated with climate change.

Within the market, a mere one-quarter of all coffee was sustainably sourced during the 2014 fiscal year in accordance to voluntary sustainability standards (ITC, 2015). Stakeholders responsible for the establishment of certification and auditing of standards have increased the number of horizontal tiers in the supply chain network. Furthermore, global sourcing has contributed to elongated, complex and increasingly fragmented supply chains (Mena et al., 2013). The inclusion of more varied stakeholders and multiple tiers has increased complexity, both in composition and types of relationships, in agri-food supply chains (Roth et al., 2008).

A common barrier to improving sustainability is the ability to organize integrated supply chain approaches, management systems and a common strategy (Wognum et al., 2011) amongst varied stakeholders in a supply chain network. Supply chain composition and structure vary based on the particular agri-food product, its characteristics, the market structure, and the types of stakeholders involved in the supply chain network (Maloni & Brown, 2006). Additionally, contemporary supply chain networks operate in more dynamic and globalized environments, which are characterized by intense competition, increased number of stakeholders and heightened customer responsiveness (Soosay & Hyland, 2015). Relationships amongst stakeholders are particularly useful for sustainable management within a supply chain network. However, despite efforts to implement sustainability goals into supply chain networks, in practice there is a lack of successful realization (Bowen et al., 2001).

Oversight, assessment, and monitoring of stakeholders in a supply chain network is not sufficient in order to improve sustainability single-handedly (Gimenez & Tachizawa, 2012). Stakeholders in isolation cannot achieve sustainability goals and thus require collaborative involvement of multiple supply chain stakeholders (Varsei et al., 2014). Collaboration amongst stakeholders plays a key role in enhancing competitive advantage of a supply chain network and thus contributes to interorganizational resilience (Gold et al., 2010b). Nevertheless, collaborative endeavours in supply chain networks occur in competitive environments. In order to improve progression of resilience, sustainable consumption and the sustainability performance of global supply chains, power asymmetries must be avoided (Sayogo et al., 2015). Therefore, an understanding of collaboration dynamics in supply chain networks with

coexistence of competition is necessary to drive sustainable market transitions. The following research question has been developed in order to address the aforementioned:

*How can stakeholders in the coffee supply chain network effectively collaborate for sustainability goals?*

The coffee market was selected as the case study for this research. The selection was suitable for this research based on several factors including: market maturity; the presence of varying types of stakeholders and attributes; the presence of complex and dynamic supply chains; threats of volatility; and engagement in more sustainable practices. An exploratory research approach has been employed to address the above research question using thematic analysis of qualitative data derived from case studies as detailed in section 3. In order to answer the above research question the following three sub questions will be examined:

1. What are the antecedents and conditions required for supply chain network collaboration?
2. How do socio-cultural and proximity factors influence relationship dynamics in the coffee supply chain network?
3. What collaborative strategies do stakeholders in the coffee supply chain network use?

Although the term *stakeholder* is often associated with a firm's perspective (Freeman, 1984; Mitchell et al., 1997), in the context of a supply chain network each member, entity or actor displays a degree of relative stake. Thus, in order to adopt a more holistic approach to supply chain collaboration and frame the following research from a multi-tier perspective, the term supply chain stakeholder is used synonymously with supply chain actor, member, organization, firm, and entity etcetera. The contemporary body of literature on supply chain network collaboration was used to derive a comprehensive list of drivers for, and barriers, to collaboration as well as strategies to overcome the barriers. An elaboration of the existing literature on market transformations for sustainability, sustainable supply chain management and networks, stakeholder relationship dynamics, collaboration for sustainability and preconditions for collaboration is detailed in the succeeding sections. This research aims to address the contribution of collaborative endeavours to supply chain network sustainability using the coffee sector as a case study.

## **1.1 Social & Scientific Relevance**

Agri-food commodities are natural products derived from the primary sector. This sector is responsible for the foundation of all other economic activities and the foremost source of wealth creation. Over 1 billion people depend on work from growing, processing, trading or manufacturing agri-food commodities globally (ILO, 2015). The majority are small holder farmers increasingly dependant on supply chain stakeholders and favourable market conditions. Supply chain stakeholders in agri-food commodity markets trade contracts for the future delivery of physical raw materials or resources (Gorton & Rouwenhorst, 2006). Thus, agri-food

commodity markets display large lead-times with high demand variability due to factors such as seasonal, quality, and informational variability (Gorton & Rouwenhorst, 2006). Furthermore, exponential global population growth has greatly contributed to increased demand on agri-food commodity markets and the agricultural sector as a whole (UNEP, 2015).

According to a United Nations report, approximately 12 million hectares of land are lost annually to desertification and soil degradation associated with poor farming practices (UNCCD, 2015). Additionally, loss of biodiversity is primarily driven by intensified demand on the agricultural sector. Systematic productivity increase of arable land and widespread land use change has taken place in order to feed the growing population (UNEP, 2015). Moreover, organizations minimizing product costs—through commoditization, exerting maximum bargaining power and sourcing globally—has come at the expense of upstream supplier health, as well as externalized environmental and economic impacts (Porter & Kramer, 2011). Such markets are designed to simply optimize profitability of large downstream stakeholders. As a result, upstream stakeholders are increasingly exposed to vulnerability and forced to live in harsh conditions with limited capacity development or market sustainability.

Collaboration is a necessary process in order to facilitate the shift towards more sustainable supply chain networks (Varsei et al., 2014). Stakeholders must understand the capabilities and ability of other stakeholders to collaborate in order to effectively manage green practices across the whole supply chain (Vachon & Klassen, 2006). In the context of market interactions and the business imperative, collaboration requires alignment of various socio-cultural elements between stakeholders, including trust and power, to obtain shared competitive advantage. However, full disclosure of information is potentially harmful for individual stakeholders since supply chain relationships are of a negotiating nature (Lancaster & Vermeulen, 2012) in which asymmetries are powerful bargaining tools (Mishra et al., 1998; Mishra et al., 2007). Thus, information and power asymmetries produce unfavourable market conditions for collaboration in supply chain networks. Discerning appropriate collaboration strategies that drive sustainability and retain competitive advantage is of high relevance.

Demand for accurate and traceable information with regard to sustainable practices of food and agriculture industry players demonstrates the importance of collaboration in supply chain networks (Wilson & Clarke, 1998; Opara, 2003; Locke & Romis, 2007). Additionally, exchange amongst supply chain networks can uncover inefficiencies related to sustainability issues (Porter & Kramer, 2011) and save resources wasted on transforming unsustainable practices. Yet, cooperation of supply chain stakeholders for the pursuit of sustainability goals remains difficult in contemporary market conditions (Lancaster & Vermeulen, 2012) due to potential individual performance reductions (Sayogo et al., 2015). Coexistence of competition and collaboration is a dilemma for a transition to more sustainable supply chain networks. Conversely, a collaborative approach acts as a source of mutual distribution of benefits in supply chain networks (Soosay & Hyland, 2015). There exists an opportunity to facilitate sustainable market transitions through incentive alignment and collaboration (Simons, 2014). In order to effectively transition to more sustainable supply chain networks, socio-cultural factors that inhibit collaborative endeavours in competitive environments must be overcome.

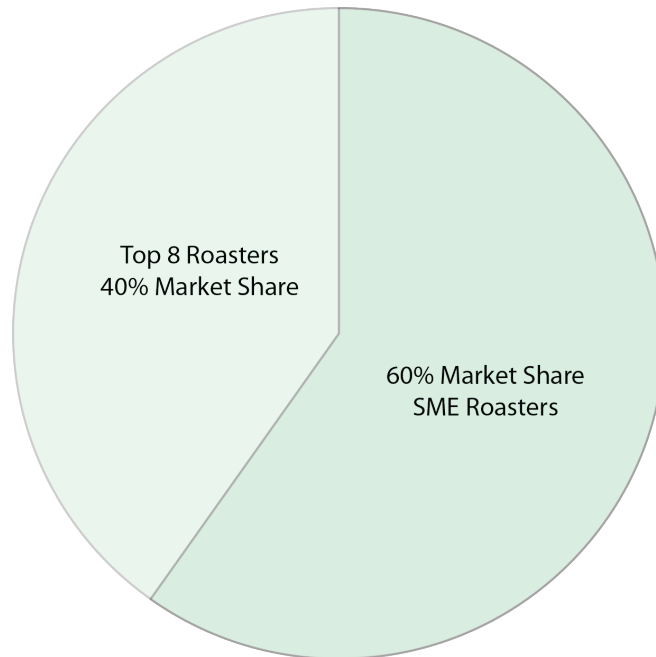


## 2. Case Description

The coffee market is in a critical phase of sustainable market transformation in which sectoral alignment towards a common vision has not yet been achieved (Simons, 2014). Furthermore, the global market is complex and dynamic with a plethora of stakeholders engaged in numerous supply chain networks. The sector is also threatened by market-induced volatility, unstable geopolitics in sourcing origins, poor weather and climate change (ICO, 2015) amongst others. The coffee market was one of the first commodity markets to adopt sustainability certifications standard (Reinecke et al., 2012) and is considered an indicator soft commodity for sustainable market practices and sourcing (Sayogo et al., 2015). However, sectoral sustainability, growth and flourishing will require various stakeholders and skill sets in the coffee supply chain network to work together which is where this research aims to contribute.

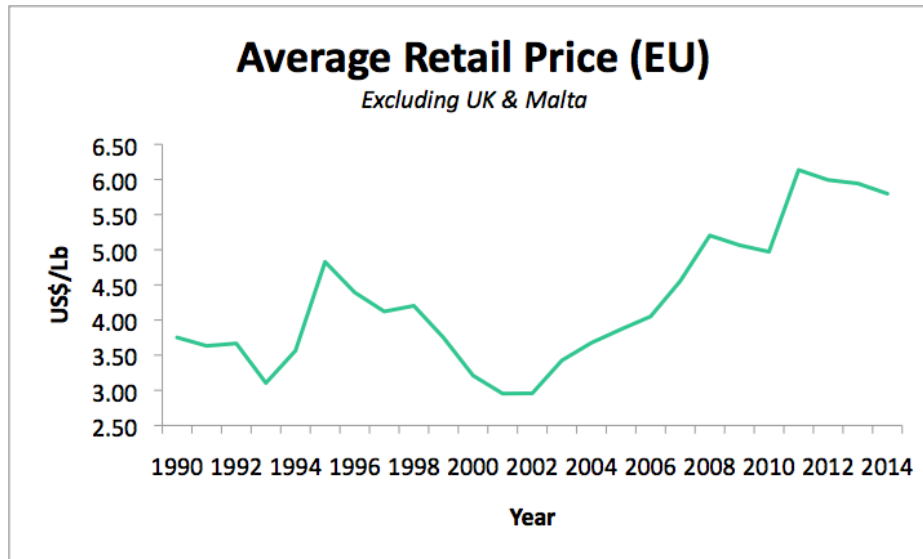
### 2.1 The Coffee Market

The coffee market employs over 25 million farmers in developing countries around the world (ILO, 2015). A total of 70 countries produce coffee globally, the top twenty are listed in Appendix A1 (ECF, 2016). The total volume of coffee produced globally in 2014 was 143.25 million bags and the forecast is to reach 152.7 million 60 kilo bags by 2016 (ICO, 2015; USDA, 2015). Bean exports in 2014 were 104.9 million bags with the European Union importing nearly half (44.5 million) of all produced beans; the second largest importer was the US (24 million) (USDA, 2015). Coffee cultivation offers developing countries a source of primary economic growth and an undisclosed amount of migrant workers a source of income (ILO, 2015; Simons, 2014). Additionally, it is estimated that over 100 million individuals are involved in production and processing of coffee globally (ILO, 2015). However, there is a large consolidation of the coffee market in the roaster segments in which 40% of the market is dominated by 8 stakeholders (figure 1). Such roasters engage in multiple supply chains simultaneously and diversify their sourcing strategies.



**Figure 1.** Consolidated market share in metric tons of the top eight roasters in 2014—Jacobs Douwe Egberts, Nestle, The J.M. Smucker Company, Strauss, Starbucks, Tchibo, UCC and Lavazza—and the remaining small and medium sized enterprises. Data obtained from the Hivos Coffee Barometer (Panhuysen & Pierrot, 2014).

As mentioned previously, the coffee market is subject to constant and various sources of volatility. Sector wide production is forecasted to decrease drastically over the next 50 years due to climate induced volatility (Ovalle-Rivera et al., 2015). This includes an approximately 34% decline in coffee production by 2020, a 25% decline in arable land for coffee production by 2050, and a 77% decline in global production by 2060 (Ovalle-Rivera et al., 2015). Primary producers will be first to experience negative impacts, which will likely be more significant for these stakeholders. Furthermore, market induced volatility has consistently been an inhibiting factor for farmer capacity development (Panhuysen & Pierrot, 2014). Market prices have fluctuated between \$3.00 (USD) per pound to just under \$6.50 (USD) a pound since the 1990s and is currently on the decline, as seen in figure 2 (ICO, 2016). This is in part due to market mechanisms but not exclusive of structural and situational factors.



**Figure 2.** Average retail price of coffee in the European Union from 1990. Data obtained from the International Coffee Organization (2016) historical records.

## 2.2 Coffee Trade: Commodity Futures and Direct Sourcing

A commodity is a type of good which can be substituted with other goods of the same type due to its apparent undifferentiation. Coffee adheres to this undifferentiation within this commodity group and the trading practices of *commodity futures*. In this type of transaction, individuals trade contracts for the future delivery of physical raw materials based on forecasts of volume to be produced in the coming season (Gorton & Rouwenhorst, 2006). Commodity futures differ from traditional assets in the sense that they are short maturity claims on tangible assets (Gorton & Rouwenhorst, 2006). Contracts are secured between buyers and suppliers prior to the particular growing season of a future to provide estimates on capital expenditure and volumes required to fit demand (Gorton & Rouwenhorst, 2006). The inherent seasonal uncertainty associated with securing futures prior to growing seasons contributes to market and trade volatility (Gorton & Rouwenhorst, 2006). Long-term pricing decreases have been observed over the past century and are associated with oversupply resulting from price volatility, uncoordinated investments and information distortions (Potts et al., 2014). Thus, poverty eradication of upstream stakeholders in coffee supply is a challenge, yet crucial for the sustainability of the sector.

Direct trade differs from commodity futures trading in that buyers leverage relationships to conduct sourcing practices. Direct trade relationships, which balance trust, quality, and competition, offer an alternative to existing procurement practices (Badiyan-Eyford, 2013). Farmers retain greater amounts of control over the trading process and benefit from more stable pricing structures as negotiated with buyers directly (Badiyan-Eyford, 2013). Due to the fact that direct trade relationships often focus on quality bean production, rather than interchangeable and undifferentiated beans, trust and investment are encouraged which results in a shift in power dynamic between producers and buyers (Badiyan-Eyford, 2013). Pricing structures are

developed via negotiations between the supplier and buyer in an uninterrupted manner and thus are not directly influenced by shifting market dynamics during the contractual period. These buying practices are quality- and relationship-centric which offers buyers an alternative ethically inspired model for procurement. Therefore, direct trade relationships offer a promising alternative for supply chain network resilience.

## 2.3 Sustainable Certified Coffee

Sophisticated product labeling and inspection standards exist in the coffee market. A propagation of certification schemes and their respective standards have evolved as a voluntary disclosure initiative. Such schemes support sustainable production and consumption (Sayogo et al., 2015). Coffee was one of the first commodities to adopt sustainability certifications beginning in 1998 with the Fairtrade certification (Reinecke et al., 2012). Coffee marketed as sustainable has been categorised by the participation of the supply chain network in combinations of environmental, social and economic standards which are validated by third parties (van Oorschot et al., 2014). Since the inception of voluntary certification standards, market share of sustainable certified raw coffee—or green beans—have increased steadily, with a punctuated growth of 26% between 2008 and 2012 (Potts et al., 2014). To date, the five largest sustainability standards are Organic, Fairtrade, Rainforest Alliance, UTZ and 4C (Simons, 2014). However, such standards provide farmers with a premium over market value contracts yet do not shift power dynamics towards these upstream suppliers.

Certification standards have significantly contributed to increased sustainability of global supply chain networks, however they are limited in reach and impact. First, compliance with certification is costly and does not necessarily translate to increase revenue for upstream stakeholders (Simons, 2014). Furthermore, classic market mechanisms for standard-compliant coffee act as deterrents for suppliers (Haight, 2011). Coffee commodity futures are separated into two broad trading categories *commodity* and *specialty* (van Hilten et al., 2011). The *commodity* classification is split into various grades of quality, however each grade assumes a uniform bean quality and thus the product is interchangeable (Haight, 2011). Conversely, specialty coffees are classified based on distinctive flavour characteristics and exhibit higher quality grades (Haight, 2011). Sustainability certified coffee is considered a *specialty* coffee due to unique requirements during the production process and pricing structures, yet can exhibit any quality grade (Haight, 2011; van Hilten et al., 2011). The largest importer of certified coffee beans—the USA at 24%—implemented a fixed minimum price of \$1.40 per pound of raw standard-compliant coffee beans as of 2011 (Haight, 2011). Thus, suppliers of standard-compliant coffee are incentivized to sell lower quality beans at the fixed minimum price and therefore flood the market (Haight, 2011). This results in a mental association for poorer quality of sustainable certified coffee on the market. What is more, a lack of understanding of certification mechanisms and contents of each initiative act as barriers amongst consumers (van Oorschot et al., 2014). This is exemplified by the existence of 447 registered standards-compliant labels in commodity sectors alone (Omta et al., 2014). Finally, unclear impacts of certification standards in the countries of origin (van Oorschot et al., 2014) and there is a lack of

transparency when validating the certification process (Potts et al., 2014). Voluntary market initiatives have elicited crucial initial steps into realizing more resilient supply chain networks and sectoral sustainability goals, however there exists a limit to what such an approach can achieve (van Oorschot et al., 2014; Simons, 2014). In order to overcome these factors, there is a push from varied stakeholders in the coffee sector to collaborate and align towards further sustainable development goals.

## 3. Theoretical Framework

In order to explore how stakeholders can collaborate to contribute to more sustainable supply chain networks; several theoretical concepts are presented as a foundation. First, the theoretical composition and environment in which supply chain networks exist are detailed. Next, an examination of relevant stakeholder relationship dynamics and collaboration theories are proposed. Finally, the theory review outlines how collaboration and stakeholder dynamics are interlinked in the pursuit of more sustainable supply chain networks to provide a conceptual framework for more thorough explorative analysis.

### 3.1 Market Transitions for Sustainability

Markets are complex systems in which large quantities of intricate networks with varied stakeholders exist. A market is broadly defined as an area in which a range of commercial dealings are conducted (ITC, 2015). Thus, supply chain networks operate within market environments, which exhibit dynamic characteristics and are in a constant state of flux (Gorton & Rouwenhorst, 2006). The business environment in which markets—and subsequently, supply chain networks—operate is subject to disruptions induced by product demand fluctuations, exchange rates, poor weather conditions, natural disasters and climate variability (Mari et al., 2014). Volatility extenuates the vulnerability of upstream stakeholders and causes supply chain networks to abandon sustainability objectives (Mari et al., 2014).

In turbulent market conditions the pursuit of more sustainable supply chain networks is moot in the absence of resilience, defined by King (2008) as a system's capacity to adapt and respond to external perturbation and collaboration defined by Soosay and Hyland, (2015) as inter-organizational relationships engaged in sharing improved outcomes. The focus of this research is on sustainability from a resilience perspective. Resilience is defined as the ability of stakeholders in the supply chain network “to exist and flourish either unchanged or in evolved terms for lengthy timeframes” (Starik & Rands, 1995; p. 909) in the presence of external disruptions. This is because individual stakeholders in the coffee supply chain network must achieve economic viability prior to addressing sustainability goals.

Contributions of research regarding transformation of markets towards more sustainable modes of production and consumption have grown considerably (Coenen et al., 2012). For example, coffee certification standards have emerged as a result of a series of institutional transformations (Bray et al., 2002). In agri-food sectors, stakeholder alignment is required in order to confront barriers to more sustainable markets and halt identified social environmental and economically degrading practices (Simons, 2014). Sustainability is an important emerging theme in sectoral transformations. As mentioned previously, sustainability goals cannot be achieved in isolation; it requires involvement and collaboration of supply chain network stakeholders (Varsei et al., 2014). This research adopts the perspectives of the World

Commission on Environment and Development (1987) when defining sustainable development as “the development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (p. 41). Thus, sustainability will be regarded as resilience of the supply chain network such that development does not impede future generations’ ability to develop the sector. Additionally, collectives of stakeholders in dynamic and complex supply chain networks involve interorganizational relationships engaged in the delivery of products to an end user in a timely manner. Therefore, the interconnectedness of time and context to the dimensions of sustainability—economic, environmental, and social—(Vermeulen & Witjes, 2016) is relevant when examining a supply chain network. An examination of supply chain network composition and sustainable management dynamics is detailed below.

### 3.2 Sustainable Supply Chain Management

Stakeholders in supply chain networks operate autonomously, however the common purpose of delivering products to an end consumer remains. Management of supply chains is coordinated through integrating activities through improved relationships amongst stakeholders in the supply chain (Handfield & Nichols, 1999). In order to tackle periphery issues, which are not core to a stakeholders business, cooperation and alignment to a common goal is necessary (Simatupang & Sridharan, 2002). Management of more sustainable networks, within the supply chain is an example of a such a periphery issue. The definition of sustainable supply chain management proposed by Seuring and Müller (2008) emphasizes the need for collaboration of all stakeholders. This definition is as follows:

*“the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements” (p.1700).*

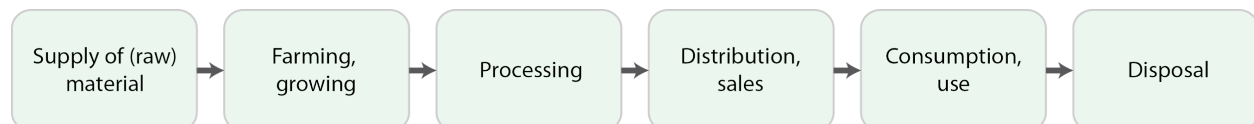
Globalization of markets has lead to the proliferation of supply chain networks of interdependent relationships cultivated through collaboration (Chen & Paulraj, 2004). Increasing internalization of peripheral, non-core supply chain activities has extended the collaborative paradigm with complex networks of stakeholders (Vachon & Klassen, 2006) and is needed for sustainable supply chain management (Seuring & Müller, 2008). Furthermore, well maintained relationships and collaboration between stakeholders in the supply chain network are a critical contributor to supply chain performance (Awaysheh & Klassen, 2010; Wu et al., 2014) and environmental performance (Albino et al., 2012). A critical component of sustainable supply chain management involves rigorous classification of stakeholders (Grimm et al., 2014). However, relationships between stakeholders are largely examined through a dyadic lens and lack a more holistic account of the business environment (Rowley, 1997). Constant fluxes of stakeholder attributes are a result of changes on a larger societal level. This is because stakeholder attributes are dynamic and socially constructed (Mitchell et al., 1997). Stakeholder relationships are influenced directly through interaction with other stakeholders and indirectly by system factors such as cultural shifts. The business environment is inherently negotiatory in supply chain

networks in which stakeholders exhibit varying degrees of influence and power, as well as physical and cognitive distances. In order to examine and classify stakeholders appropriately a consideration of supply chain networks and netchains is required.

### 3.2.1 Supply Chain Networks

Supply chains have been largely examined from a process perspective in which stages of product proliferation are independent from each other and broader networks are excluded. Production, procurement and distribution are the fundamental stages of the supply chain process, which are managed independently by stakeholders responsible at each stage (Thomas & Griffin, 1996). The process is composed of a set of dynamic activities associated with the flow and transformation of raw materials and information through to the end user by a set of interdependent firms (Handfield & Nichols, 1999). Therefore, a temporal element exists within supply chains such that delivery of products to end-users is executed in a timely fashion (Simatupang & Sridharan, 2002). The temporal dimension is governed by market dynamics and consumer demands, as a result multiple stakeholder interest must be considered during network exchanges to deliver products to an end consumer.

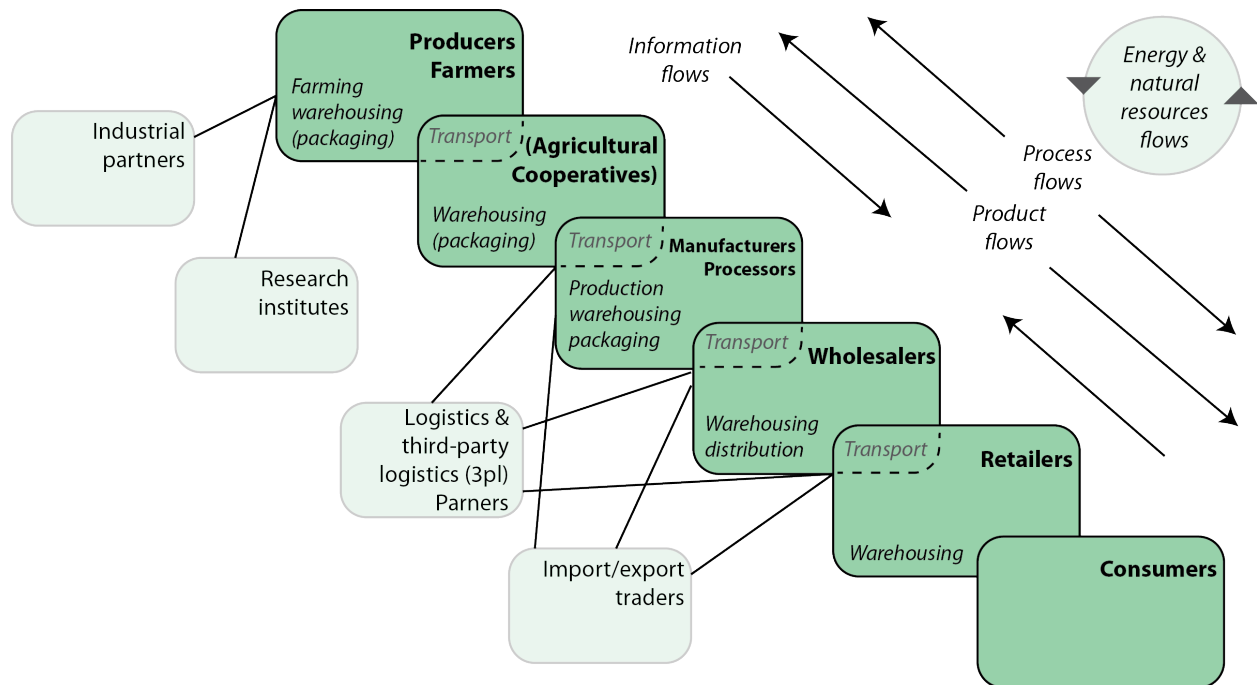
Flow of information and materials within supply chains is typically regarded as directional; either up or down (Handfield & Nichols, 1999). However, this research argues that exchanges flow omnidirectionally across network structures. Supply chains consist of: sequential upstream stakeholders, primarily associated with raw material extraction and processing; intermediary stakeholders exhibiting varying levels of betweenness; and downstream stakeholders typically involved with consumption and use. A conceptualization of agri-food commodity supply chain processes from raw materials extraction to disposal is detailed in figure 3 below.



**Figure 3.** A conceptualization of the processes in an agri-food commodity supply chain from Wognum et al. (2011).

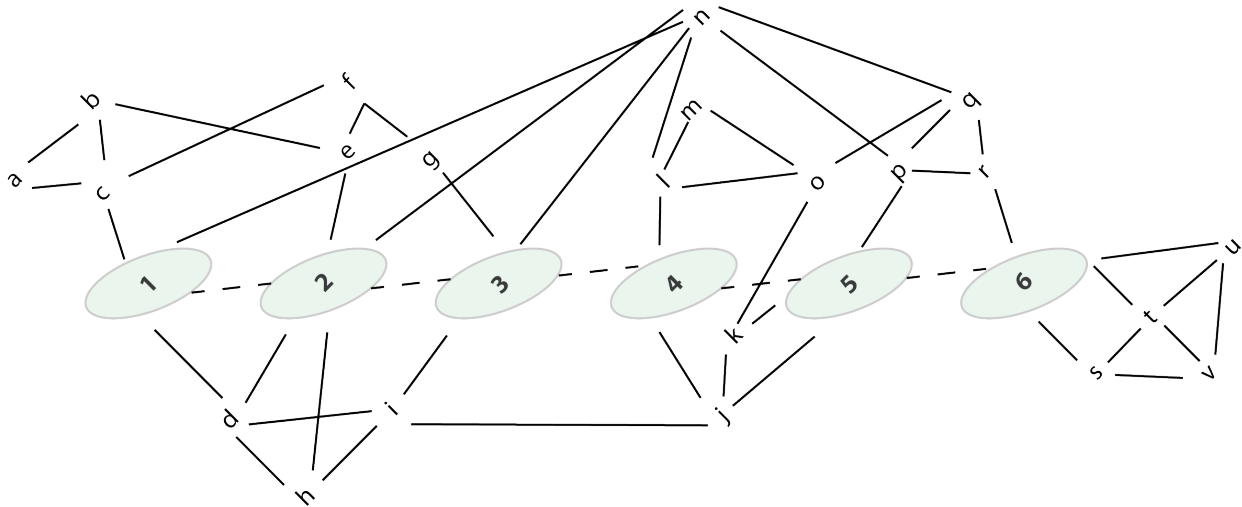
However, a linear oversimplification of the supply chain structure is not reflective of contemporary business environments. Due to product proliferation and the need to satisfy various stakeholder demands, agri-food supply chains have become increasingly complex and dynamic (Trienekens et al., 2012). Furthermore, supply chain composition has elongated and fragmented due to diversifying markets (Mena et al., 2013). Figure 4 below is a conceptualization of complex and dynamic agri-food commodity supply chain structure from Tsolakis et al. (2014).





**Figure 4.** Agri-food commodity supply chain conceptualization from Tsolakis et al. (2014).

Additional supply chain stakeholders have latched onto agri-food commodity markets in response to variable consumer demands, changing government legislation, increased complexity of safety regulatory environments, and social and environmental impacts (Trienekens et al., 2012; Tsolakis et al., 2014). Examples of such stakeholders are assurance providers, research organizations, certification authorities, NGOs, sector organizations and government organizations. Thus, contemporary supply chains exhibit network structures of stakeholders with varying degrees of influence and power. Figure 5 is a conceptualization of a contemporary supply chain network:



**Figure 5.** Conceptualization of a stakeholder supply chain network. Numbered vertical stakeholders are associated with product refinement and proliferation (dashed lines). Lettered horizontal stakeholders are associated with periphery functions to supply chain operations such as logistics providers or knowledge institutes.

### 3.2.1 Netchain Analysis

Supply chain networks do not differ from historical supply chains in absolute composition. There exists a fundamental binary in structure of horizontal stakeholders and vertical stakeholders. The former includes partners and third party services providers—such as logistics providers—involved in ancillary supply chain functions, as well as direct competitors with unique or complementary capabilities (Gardner & Cooper, 2003; Barratt, 2004). The latter refers to stakeholder involved in product refinement or proliferation including suppliers, intermediaries, wholesalers, retailers and consumers (Gardner & Cooper, 2003; Barratt, 2004). However, such a binary limits analysis of stakeholder collaboration due to the fact that different types of interdependencies are the unit of focus when a vertical or horizontal distinction is made. Netchain analysis provides concurrent deliberation of all types of interdependencies amongst stakeholders (Lazzarini et al., 2001). A netchain is a particular set of networks comprised of horizontal ties between stakeholders such that the echelons are sequential and based on vertical ties between other stakeholders (Lazzarini et al., 2001). In practice, however, particular types of stakeholders, such as an NGO, interact with both horizontal and vertical delineations. Each echelon of the supply chain has an associated network of stakeholders, including trading partners, with perceived attributes (Co & Barro, 2009). Such stakeholders influence groups and individuals on a normative or pragmatic basis, i.e. moral or opportunistic. Effective balancing of individual responsibilities to multiple stakeholders, with varying attributes, in the supply chain network and broader entities such as society and the natural environment (Hart, 1995; Starik & Rands, 1995) is an important consideration in management for sustainability (Carter & Rogers, 2008). Therefore, understanding of relationship dynamics between stakeholders in varied positions of netchains is required to examine collaborative contributions to sustainability.

### 3.3 Stakeholder Relationship Dynamics

As mentioned previously, supply chain networks are composed of interrelated and interdependent stakeholders coordinating to refine raw materials into a deliverable product in a timely fashion to end consumers. Stakeholder theory largely regards the influences of stakeholders on a focal firm (Freeman, 1984; Mitchell et al., 1997) and lacks examination of multiple relationship perspectives and the broader business environment. The dominant paradigm is that a stakeholder is “*any individual or group that can affect or is affected by the achievement of a firm’s objectives*” (Freeman, 1984: p24). However, in the context of a supply chain network, the broader business environment includes stakeholders that possess objectives and relative stake, yet are not firms per se.

Proper classification and identification of stakeholders is required in order to examine multiple relationships and influences on the broader environments (Mitchell et al., 1997; Rowley, 1997). The framework proposed by Mitchell et al. (1997) has been the most substantial contribution to stakeholder theory in terms of identification and salience (Neville et al., 2011). Three main qualitative attributes—power, legitimacy and urgency—are used to classify the dynamics of stakeholder interactions (Mitchell et al., 1997; Waxenberger & Spence, 2003; Co & Barro, 2009). However, dimensions of proximity between supply chain network stakeholders are a valid extension to Mitchell et al.’s (1997) classification. Proximity between stakeholders in a supply chain network plays a role in the perception of stakeholder attributes and relationships dynamics. In order to retain a multi-tier perspective, a consideration of the influence of proximity on relationship dynamics is essential. The following sections elaborate qualitative attributes—legitimacy, power, urgency, and proximity—of stakeholder relationship to aid in understanding of collaboration dynamics.

#### 3.3.1 Legitimacy

Stakeholder legitimacy is intrinsically tied to contextual factors when considering the supply chain network and broader business environment. The justification of an individual or organization's right to exist is tied to legitimacy (Maurer, 1971). However, concretely addressing what constitutes a justification requires the inclusion of cultural conformity in a broader social context (Dowling & Pfeffer, 1975). Legitimate claims on the firm by individuals, groups or organizations, are regarded as necessary preconditions to appropriately classify a stakeholder from a focal firm perspective (Freeman, 1984; Carroll, 1993). Despite this, the term legitimate is subjectively defined such that it is associated with the existence of an exchange relationship (Hill & Jones, 1992). A supply chain network is inherently exchange based across the vertical echelons, however not all stakeholders exchange materials or information in the same manner.

This focal firm classification based on an evaluative perspective of exchange lacks a cognitive dimension to legitimacy stake (Suchman, 1995). Considerations of the broader business environment in which social audiences with perceptions of appropriate normative elements, such as values and beliefs, is crucial in order to accurately define legitimacy (Suchman, 1995). Congruence between shared beliefs of a particular social group and the behaviours of a legitimate entity demonstrates the socially constructed nature of legitimacy. Thus, at various

levels of social organization, legitimacy is a desirable social good, which varies in definition (Mitchell et al., 1997). However, operationalization of legitimacy remains difficult due to the subjective and contextual nature.

Stakeholders in supply chain networks can claim varied forms of legitimacy based on analysis and context. Legitimate stake can therefore be delineated between normative and derivative; stake based on moral obligation versus stake as a consequence of power (Phillips, 2003). Normative legitimacy is derived from moral obligations to other stakeholders whereas derivative, or pragmatic, legitimacy regards those groups or individuals who retain the ability to affect another stakeholder through claims (Suchman, 1995; Phillips, 2003). Since external factors such as climate change threaten the coffee supply chain network, stakeholders are morally obliged to pursue mutually beneficial outcomes through establishing sustainability goals. Conversely, large stakeholders in the chain retain derivative power from the influence of their size in the market. Proportionate acceptance of benefits by participants in a collaborative scheme based on normative legitimacy constitutes one element of stakeholder fairness (Phillips, 2003). However, normative legitimacy alone cannot appropriately determine fair allocations of benefit when considering supply chain network stakeholders with varied characteristics, capabilities, and consequently, levels of stake. The distinction between derivative and normative legitimacy separates relationships based on power and moral obligation (Phillips, 2003).

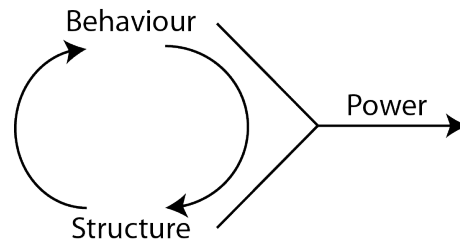
### 3.3.2 Power

From a stakeholder relations perspective, power is defined as the ability of an individual, group, or organization to impact another entity (Carroll, 1993; Rowley, 1997) by completing something or affecting outcomes (Mintzberg, 1983). However, at a conceptual level, the definition of power is contested in the distinction between the *ability/potential* or *use/enactment* of power (Brass & Burkhardt, 1993). Although, distinguishing between potential or perceived power and the use of power is unrealistic in a business environment (Mintzberg, 1983). Therefore, power is regarded as a stakeholder's ability to affect the sovereign abilities of another stakeholder in the supply chain network,

Supply chain network stakeholders acquire and use power through various contextual elements. The dynamics of power acquisition and use is split into two predominant dimensions; structure and behaviour (Brass & Burkhardt, 1993). Structural dynamics regard the relative positioning of stakeholders by centrality within a network (Brass & Burkhardt, 1993). Therefore, a stakeholder's position within the coffee supply chain inherently influences the ability to affect other stakeholders in the network. Three types of network centrality compose structurally acquired power: degree, closeness, and betweenness which correspond to number of direct ties, distance between and control over other stakeholders in the network respectively (Brass & Burkhardt, 1993). This distinction is particularly useful when considering interdependencies of both vertical and horizontal stakeholders.

A particular stakeholder's position within the patterns of interactions which define a network encompasses both physical and socio-cultural dimensions (Ibarra, 1993). Therefore, formal structural power derived from hierarchical positioning, and informal derived power determined

from socio-cultural norms and behaviours are inextricably linked by contextual factors. Behavioural tactics include assertiveness, ingratiation, exchange, upward appeal, rationality and coalition formation (Brass & Burkhardt, 1993). However, a mutually productive relationship between behaviour and structure exists. Behaviour is in part shaped by structure and structure emerges from behavioural tactics (Brass & Burkhardt, 1993) (figure 6).



**Figure 6.** Adapted conceptual model of stakeholder power from Brass & Burkhardt (1993).

Power is dynamic and transitory due to the fact that stakeholders can lose and acquire power. In order to impose will in a relationship a stakeholder must gain access to normative, coercive or utilitarian means (Mitchell et al., 1997). Normative power regards symbolic resources, whereas coercive power is derived from physical resources of force or restraint and finally, utilitarian power regards financial or material resources (Mitchell et al., 1997). Access to such means are variable and dependant on a stakeholder’s behaviour, structure and capabilities within a supply chain network.

### 3.3.3 Urgency

The emphasis on timely delivery of refined products to end consumers in the definition of a supply chain function contains an element of urgency, which can be seen to various degrees across the supply chain network with regard to sustainable transformations. Stakeholder urgency is defined as “*the degree to which a stakeholder claims call for immediate attention (p. 864)*” and thus exhibit both a temporal and critical element (Mitchell et al., 1997). Therefore, power of stakeholders claims increase in the presence of urgency and a prioritization of salience becomes more apparent (Neville et al., 2011). The subjective nature of urgency as a core attribute for stakeholder identification and salience is based upon perceptions of the individuals or groups analyzing a particular stakeholder.

### 3.3.4 Proximity

Globalization of markets and supply chain networks has blurred the influence of proximity on structural and social systems alike. The growth of connectedness globally has meant that proximity is no longer solely associated with geographic location. Therefore, this thesis is used to propose a distinction between three types of proximity influencing stakeholder relationships: propinquity, cognitive, and structural. The first relates to physical and geographic location (Borgatti & Foster, 2003). The second refers to socio-cultural similarities of attitudes, beliefs, affective ties, and interactions of stakeholders (Borgatti & Foster, 2003). Finally, the third pertains to position within a system—in this case a supply chain network.

Proximity's influence on relationship dynamics and collaboration is poorly understood at present. However, proximity plays a facilitation role in the intensity of relationships through interconnectedness (Oliver, 1991; Bansal & Roth, 2000). Uniting stakeholders around a common pursuit such as sustainability goals requires contextual understanding and cohesion. Cohesion between stakeholders is dependant on clusters and proximity (Bansal & Roth, 2000) and strengthened by collaborative relationships (Luukkonen & Nedeva, 2010). Conversely, structural distance can result in problems of data gathering, assessment, implementation (Klassen & Vachon, 2003) and collaboration (Awaysheh & Klassen, 2010; Grimm et al., 2013).

Dietrich et al. (2010) found that propinquity and socio-cultural proximity positively related to quality stakeholder collaboration in a project context. A precondition for successful collaboration in a supply chain context is physical and socio-cultural proximity between entities (Walker & Brammer, 2012). However, structural barriers, such as network position and cultural barriers including behavioural norms, often inhibit true collaboration (Stank et al., 2001; Fawcett et al., 2010). Therefore, a third dimension of proximity is explored along with physical and socio-cultural dimension: the structural dimension.

### *Propinquity: the Physical Dimension*

The positive influence of close propinquity between stakeholders has been examined extensively from an economic and innovation capacity perspective (Baptista & Swann, 1998; Porter, 1998; Porter, 2000a; Porter, 2000b; Delgado et al., 2010). Synergistic possibilities offered by geographic clusters contribute to collaborative endeavours (Mirata, 2004). For example, colocation of working teams and frequency of communication are correlated in R&D environments (van den Bulte & Moenaert, 1998). In project based environments, physical proximity is positively related to collaborative behaviour (Dietrich et al., 2010). Existing sustainable supply chain management literature supports the notion that increasing geographical distance negatively impacts collaboration (Awaysheh & Klassen, 2010; Grimm et al., 2013). However, less attention has been paid to determinants of propinquity on social structures, such as relationships, and the effects on collaboration.

The role of space and isolation in a post-globalized era has contributed to free flows of knowledge and material between stakeholders. In supply chain networks, the number of interactions between stakeholders increases within smaller geographic distances (Awaysheh & Klassen, 2010; Grimm et al., 2014). On the contrary, to mitigate operational uncertainties between stakeholders across large geographical distances, auditing, monitoring and evaluation systems have been established (Koplin et al., 2007). Hannon (2012) noted that a firm's local environment influences its connections and relationships both in origin and abroad. Physical proximity is often accompanied by similar regulatory environments and socio-cultural norms. Thus, firms operating in geographically proximate environments exhibit similar standards and social cohesion (Bansal & Roth, 2000). Propinquity and socio-cultural proximity are interrelated such that socio-cultural norms exist, to a certain extent, unique to specific regions.

### *Cognitive: the Socio-cultural Dimension*

Socio-cultural distance represents the existence of differences between cultures of the societies in which stakeholders originate (Hofstede, 1984). Normative elements of social constructs govern what an audience deems as acceptable or legitimate and influence relationship dynamics (Reynolds et al., 2003). Socio-cultural proximity of stakeholders in business environments influences various factors such as legislation, management, decision making and relationships (Awaysheh & Klassen, 2010; Grimm et al., 2014). Mutual understanding of the practices of other stakeholders is positively related to collaborative behaviours (Arslanian-Engoren, 1995). Conversely, dissimilar working styles and values negatively affect collaborative relationships (Liedtka et al., 1998). Furthermore, highly divergent cultural thought worlds and linguistic differences severely inhibit collaboration (Griffin & Hauser, 1996). Awaysheh & Klassen (2010) found that linguistic differences, cultural habits, and values also inhibit the ability of supply chain stakeholders to interact. Supply chain stakeholders develop convergent norms and values when embedded in culturally alike structures (Awaysheh & Klassen, 2010). Cultural differences, including high power distance and a focus on social relationships, influence interorganizational collaboration (Chen et al., 2014). The influence of socio-cultural proximity on business environment is particularly strong in challenging times (Awaysheh & Klassen, 2010). Finally, both physical and socio-cultural dimensions of proximity are antecedents of stakeholder collaboration (Dietrich et al., 2010).

### *Structural: the Composition Dimension*

The structural dimension of proximity and its influence on collaborative relationships has been largely ignored. Structural dimensions varied based on level of analysis and thus a focus is retained on the supply chain network with considerations of the broader business environment or market. Structural distance includes number of tiers and total length of the supply chain (Banet, 1976; Awaysheh & Klassen, 2010), network centrality in terms of degree, closeness and betweenness (Brass & Burkhardt, 1993) and market position (Drake & Schlachter, 2008). Stakeholders in supply chain networks with dominant positions elicit dictatorial collaborations (Drake & Schlachter, 2008). Furthermore, large structural distance tends to escalate complexity and additional relationships resulting in more secondary exchanges of information (Awaysheh & Klassen, 2010). Thus, stakeholders engaged in collaborative endeavours must consider data validity and impose a level of trust in networks. Further elaboration of antecedents and preconditions for supply chain network collaboration are detailed in the section below.

## **3.4 Supply Chain Network Collaboration**

An understanding of stakeholder attributes and relationships dynamics is an essential precursor to a collaborative endeavour. Prior to engaging in a collaborative process, stakeholders must have a mutual understanding of each other's abilities and perceptions. This is crucial in order to establish antecedents to collaboration, which will be explored in the following section. Additionally, an exploration of drivers for, barriers to, and strategies to overcome barriers to,

collaboration is detailed to account for throughput elements of a collaborative process. Finally, several overlapping elements of relationship dynamics and collaboration are detailed: trust, power and dependence, and knowledge and information sharing.

### 3.4.1 Drivers, Barriers, Strategies and Antecedents

Collaborations in supply chain networks are inherently relationship based due to the fact that multiple stakeholders engage collectively in the pursuit of mutual benefit. Yet, realization of benefits from supply chain partnerships are rarely achieved due to conflicts of interest between and amongst stakeholders (Clemons & Row, 1992). The primary reason for such a lack in mutual benefits is the opportunistic behaviour and local perspective of stakeholders solely seeking individual profit (Simatupang & Sridharan, 2002). Stakeholders within supply chains are challenged to discern appropriate timing and strategies for collaboration, which often proves problematic (Sabath & Fontanella, 2002). A detailed list of barriers to supply chain network collaboration are detailed in table 1 below:

**Table 1.** Barriers to supply chain network collaboration.

Barrier	Reference(s)
Lack of trust	Sabath & Fontanella, 2002; Simatupang & Sridharan, 2002; Barratt, 2004; McCarter & Northcraft, 2007; Fawcett et al., 2008; Co & Barro, 2009; Fawcett et al., 2010; Nyaga et al., 2010; Wagner et al., 2011; Fawcett et al., 2012; Wu et al., 2014
Conflicts of interest	Clemons & Row, 1992
Opportunistic behaviour	Simatupang & Sridharan, 2002; Fawcett et al., 2012
Local perspective	Simatupang & Sridharan, 2002
Difficult to discern appropriate timing	Sabath & Fontanella, 2002; Barratt, 2004
Difficult to discern appropriate strategies	Sabath & Fontanella, 2002
Difficult to implement	Barratt, 2004; Fawcett et al., 2012
Relationship difficulties	Simatupang & Sridharan, 2002; Barratt, 2004; Fawcett et al., 2010
Incentive misalignment	Simatupang & Sridharan, 2002; Fawcett et al., 2012
Differences in perception	Simatupang & Sridharan, 2002
Differences in goals and objectives	Simatupang & Sridharan, 2002; Fawcett et al., 2012
Poor communication or miscommunication	Simatupang & Sridharan, 2002; Barratt, 2004
Asymmetric information and exchange	Simatupang & Sridharan, 2002
Cultural distance	Barratt, 2004; Stank et al., 2001; Fawcett et al., 2010
Abuse of power and dependency	Cheng et al., 2008; Drake & Schlachter, 2008; Fawcett et al., 2008; Co & Barro, 2009; Nyaga et al., 2010; Wagner et al., 2011; Fawcett et al., 2012; Sridharan & Simatupang, 2013; Byrne & Power, 2014; Wu et al., 2014
Market conditions	Sayogo et al., 2015
Inappropriate performance indicators	Simatupang & Sridharan, 2002
Outdated policies	Simatupang & Sridharan, 2002
Structural barriers	Stank et al., 2001; Drake & Schlachter, 2008; Fawcett et al., 2010; Sridharan & Simatupang, 2013
Resistance to change	Fawcett et al., 2012

Barriers for stakeholder collaboration are abundant in the literature which is likely due to the perceived difficulty of successfully achieve mutually beneficial outcomes. Yet, supply chain network collaboration is a major factor in maintaining competitive positioning and enacting



progressive change (Soosay & Hyland, 2015). Close cooperation between supply chain stakeholders helps to effectively manage supply and demand while contributing to overall profitability of the chain (Simatupang & Sridharan, 2002). Additionally, collaboration in a supply chain results in resource efficiencies, development of new competencies and better market positioning for individual stakeholders (Nooteboom, 2004; Mentzer et al., 2008; Fawcett et al., 2012). This research attempts to examine netchains from a holistic perspective and thus inter-organizational and multi-stakeholder benefits as a result of collaboration will be explored. Several authors have detailed collaboration as an essential factors when serendipitously addressing social, environmental and economic performance improvements (Gold et al., 2010a; Beske & Seuring, 2014; van Hoof & Thiell, 2014). A detailed list of drivers for supply chain network collaboration is detailed in table 2.

Collaboration is distinguished from other supply chain network cooperative endeavours due to the critical element of relationship-based engagements with varied stakeholders. Cooperation defined by the exchange of basic information by a firm, as well as some long-term relations with other vertical stakeholders (Singh & Power, 2009). On the other hand, coordination in a supply chain is defined by continuous flow of essential information between stakeholders achieved by using information communication technologies (Soosay & Hyland, 2015). Collaboration, which includes a high level of commitment, trust, information sharing, and joint decision making, exists at a higher conceptual level than both cooperation and coordination (Soosay & Hyland, 2015). Collaboration involves multiple stakeholders engaging in a relationship with the aim to share benefits of the collective.

**Table 2.** Drivers for supply chain network collaboration.

Driver	Reference(s)
Mutual benefit	Songini, 2001; Simatupang & Sridharan, 2002
Performance improvement (individual productivity & lower costs)	Mentzer et al., 2008; Co & Barro, 2009; Fawcett et al., 2012; Blome et al., 2014
Performance improvement (chain)	Simatupang & Sridharan, 2002; Fawcett et al., 2012; Green et al., 2012
Environmental performance improvement	Gold et al., 2010a; Nanako & Hirao, 2011; Albino et al., 2012; Green et al., 2012; Benjaafar et al., 2013; Blome et al., 2014; Ramanathan et al., 2014; Theißen et al., 2014
Increase of green practices performance	Vachon & Klassen, 2006; Vachon, 2007; Vachon & Klassen, 2008; Gold et al., 2010a
Increased sustainability (triple bottom line) performance	Gold et al., 2010a; Beske & Seuring, 2014; van Hoof & Thiel, 2014
Resource exploitation and capture efficiency	Nooteboom, 2004; Mentzer et al., 2008; Gold et al., 2010a; Fawcett et al., 2012
Development of new competencies/capabilities	Nooteboom, 2004; Mentzer et al., 2008; Gold et al., 2010a; Fawcett et al., 2012
Securing market position or obtaining better market positioning	Nooteboom, 2004; Gold et al., 2010a; Fawcett et al., 2012
Transaction uncertainty mitigation	Tokman et al., 2007;
Process improvements	Mentzer et al., 2008; Fawcett et al., 2012; Soosay & Hyland, 2015
Customer demands for higher service levels	Fawcett et al., 2012
Desire to build a winning supply chain network	Fawcett et al., 2012
Better supply chain relationships	Fawcett et al., 2012
Difficult to imitate by competitors	Gold et al., 2010a

Collaborative engagements between stakeholders in supply chain networks can occur in multiple forms, across multiple network structures and distances. Inclusion of a wider set of stakeholders has spurred collaboration within supply chain networks (Vachon & Klassen, 2006). Soosay and Hyland (2015) proposed six key strategies and characteristic elements that enable collaboration: establishing mutually beneficial relationships, sharing outcome improvements, gaining appropriate levels of trust, sharing information, joint decision making and process integration where necessary (for a detailed list of strategies enabling and antecedents for collaboration see table 3 below). However, various types of relationships exist within a supply chain network that do not necessarily correspond to collaboration (Soosay & Hyland, 2015). To conduct business in an inherently adversarial environment, such as a supply chain, stakeholders establish relationships for various reasons. The coexistence of cooperation and competition relationships are often present between supply chain stakeholders (Nalebuff et al., 1996). Furthermore, strength, closeness and breadth of relationships between stakeholders in a supply chain vary over time (Harrison et al., 2014). A greater understanding of relationship attributes and characteristics in collaborative endeavours is required to discern joint efforts from true collaboration (Soosay & Hyland, 2015).

**Table 3. Antecedents and strategies to overcome barriers to collaboration.**

<b>Antecedents &amp; Strategies</b>	<b>Reference(s)</b>
Establishing appropriate levels of trust / trust	Barratt, 2004; Simatupang & Sridharan, 2002; Cheng et al., 2008; Fawcett et al., 2008; Co & Barro, 2009; Dietrich et al., 2010; Nyaga et al., 2010; Wagner et al., 2011; Fawcett et al., 2012; Wu et al., 2014; Soosay & Hyland, 2015
Knowledge and information sharing/exchange	Barratt, 2004; Cheng et al., 2008; Cao et al., 2010; Fawcett et al., 2012; Soosay & Hyland, 2015
Joint decision making	Kim & Oh, 2005; Cao et al., 2010; Ha et al., 2011; Fawcett et al., 2012; Kumar & Banerjee, 2012; Nyaga et al., 2013; Soosay & Hyland, 2015
Process integration (where necessary)	Simatupang & Sridharan, 2005; Fawcett et al., 2012; Nyaga et al., 2013; Harrison et al., 2014; Soosay & Hyland, 2015
Incentive alignment	Simatupang & Sridharan, 2002; Simatupang & Sridharan, 2005; Cao et al., 2010; Dietrich et al., 2010; Fawcett et al., 2012; Soosay & Hyland, 2015
High level of commitment	Vlachos et al., 2008; Dietrich et al., 2010; Fawcett et al., 2012; Wu et al., 2014; Soosay & Hyland, 2015
Mutuality as defined by shared risks, rewards and cost	Barratt, 2004; Kim & Oh, 2005; Olorunniwo & Li, 2010; Ha et al., 2011; Kumar & Banerjee, 2012; Soosay & Hyland, 2015;
Goal congruence and synchronisation	Simatupang & Sridharan, 2002; Wagner & Hoegl, 2006; Cao et al., 2010; Dietrich et al., 2010; Nyaga et al., 2013; Simons, 2014; Soosay & Hyland, 2015
Openness and honesty	Barratt, 2004; Wagner & Hoegl, 2006; Olorunniwo & Li, 2010
Technology sharing	Harrison et al., 2014
Collaborative communication	Barratt, 2004; Cao et al., 2010; Hammervoll & Bo, 2010
Neutral facilitation	Simons, 2014
Roles and process for collaboration	Dietrich et al., 2010; Fawcett et al., 2012
Physical and cultural proximity	Awaysheh & Klassen, 2010; Dietrich et al., 2010
Conflict resolution	Simatupang & Sridharan, 2002; Dietrich et al., 2010
Expectations fulfillment	Dietrich et al., 2010
Managing dependence	Simatupang & Sridharan, 2002; Nyaga et al., 2013
Resource and capabilities investment	Barratt, 2004

### 3.4.2 Trust

Trust is a multidimensional construct grounded in a moral belief system, as well as a socio-cultural context. The exact definition of trust has long been debated, however trust is regarded as a stakeholder's belief that collaborating entities will act in a manner that does not result in negative outcomes for the stakeholder (Anderson & Narus, 1990). Therefore, trust is either an implicit or explicit commitment of continuity between stakeholders (Dwyer et al., 1987). Furthermore, truly collaborative relationships are characterized by trust and commitment (Uzzi, 1997). Therefore, stakeholder engagement in multiple supply chain networks may hinder trust building due to switching commitments.

Placing faith in external stakeholders in business environments results in a vulnerability for the trusting party operationally and implies an honest and sincere belief (Claro et al., 2006). However, the trusting stakeholder conceptualizes a risk-versus-reward weighting of prospective future benefits when engaged in a trust-based relationship for collaboration. Exchange enabled trust is regarded as a phenomenon within the supply chain context which contributes to the strength of relationships (Wu et al., 2004) and is an important precondition for supply chain

management (Halldorsson et al., 2007). High quality and open communication between stakeholders engaged in collaborative relationships is thus correlated to the level of trust in the relationship (Diallo & Thuillier, 2005). Conversely, high levels of trust between supply chain stakeholders incentivizes open communication and a willingness to take risks (Kwon & Suh, 2005). High levels of trust between stakeholders is a critical mediating factor for supply chain sharing, collaborative endeavours and relationships (Cheng et al., 2008; Vachon & Klassen, 2008). Avoidance of opportunistic behaviour, active participation and communication all positively influence trust-based relationships (Cheng et al., 2008). Negative effects of unforeseen imperative incidents in collaborative relationships can be mitigated by a high degree of trust and dependance (Ahola, 2009). However, trust includes the normative (moral) belief system and social context in which stakeholders are based, as well as emotional aspects. Therefore, segmentation of trust into distinct forms is beneficial when considering relationship dynamics.

Trust in supply chain relationships can exist in informal and formal variations, as well as with regard to different dimensions of a relationship. Thus a distinction between affective trust and trust in capabilities is required (Ha et al., 2011). Affective trust is characterized by openness, benevolence, likeability, honesty, understanding, and respect in relationships whereas; trust in competencies is the belief in another stakeholder's capabilities such as ability, skills, knowledge, specialty, and business judgement (Ha et al., 2011). In early stages of collaboration, stakeholders often aim to establish relationships based on trust in capabilities yet, long-term engagements require more emphasis on emotional aspects of trust and therefore, affective trust is preferred (Ha et al., 2011). However, trust alone cannot account for quality outcomes of collaborative relationships since the construct of trust has various contributing elements.

Determinants of collaborative quality outcome are relatively underexplored, however trust is a recurrent antecedent (Dietrich et al., 2010). The presence of trust can increase reliability of contracts, provide incentives for cooperation and reduce risk of uncertainties, thus creating a more attractive working environment for partners (Yang et al., 2008). The outcome quality of collaboration is difficult to gauge prior to enacting a relationships for mutual benefit. Dietrich et al. (2010) established a collaboration quality construct in which the authors argue that trust between actors improves collaboration quality. Additionally, in order to establish a long-term collaborative strategy between supply chain network stakeholders, a high level of trust is the foundational building block (Wu et al., 2014). This foundational element helps to mitigate issues of dependence and the exercise of power for individual pursuits.

### 3.4.3 Power & Dependance

Power is a crucial attribute to stakeholder identification and salience, as well as a foundational element of supply chain network relationships. Power refers to the relative dependence between exchange members, where power gained by one member can influence the decisions and behaviors of other members (Gaski, 1984). Supply chain networks consist of a variety of interdependent and interrelational stakeholders who endeavour to achieve individual goals and targets. However, stakeholders possess varying levels of power and influence over other stakeholders.

In a collaborative endeavour power balancing influences the type of relationship and outcome. When a dominant supply chain stakeholder in a collaborative relationship possesses sufficient power—obtained from structural elements such as market position, size, strategic importance and capabilities—the relationship is dictatorial (Drake & Schlachter, 2008). The use of coercive power in relations results in compliance as opposed to collaboration (Byrne & Power, 2014). As argued previously, potential power and the use of power are intrinsically bound. *Dictatorial collaborations* are prevalent in dyadic buyer-supplier relationships in which one stakeholder often exerts power, or threatens the use of power over the other (Byrne & Power, 2014).

Asymmetrical levels of power perpetuate opportunistic behaviour yet can also be used to find solutions to pressing issues. Power balancing reduces the perception of vulnerability and allows for more innovative behaviour in other parties (Khoja et al., 2011). Nyaga et al. (2013) support this claim by demonstrating power asymmetries negatively affecting partners adaptive and collaborative behaviour. In the absence of trust, weaker entities are conflicted as to whether or not collaborative endeavours are established to achieve the goals of a more powerful party (Sridharan & Simatupang, 2013). However, power asymmetries within a supply chain network are inevitable. At a dyadic level, mutual adaptation behaviour as a result of power balancing, improves collaborative behaviour of supply chain actors (Nyaga et al., 2013).

Finally, several authors have noted that power, dependence, and trust act as both a critical antecedent to collaboration and factors inhibiting supply chain collaboration if not adequately addressed (Drake & Schlachter, 2008; Co & Barro, 2009; Wagner et al., 2011, Naya et al., 2013; Sridharan & Simatupang, 2013; Byrne & Power 2014; Wu et al., 2014; Chen et al., 2014). Sridharan & Simatupang (2013) postulate that power and trust are pivotal relationship factors governing the alignment of interaction mechanisms for collaborative endeavours such as information sharing.

#### 3.4.4 Knowledge & Information Sharing

Historically, information exchange is considered to be the fundamental mechanisms enabling collaboration which typically refers to mutual benefit of stakeholders involved or shared rewards and risks (Barratt, 2004). Information sharing is a focal factor influencing incentive alignment, integration, collaborative performance systems and decision synchronization (Simatupang & Sridharan, 2005). However, information exchange occurs in the context of a market and thus exchange between supply chain stakeholders is a source of competition. Due to the coexistence of competition and cooperation in supply chain environment, stakeholders may impede knowledge sharing if exchange parties are viewed as competitors or potential competitors, to protect against opportunistic behaviour (Spekman et al., 2002). Conversely, Simatupang and Sridharan (2002) argue information sharing is beneficial when addressing vulnerability of opportunistic behaviour and moral hazard. However, the degree to which supply chain network entities engage in sharing behaviour in relationships is in part dependant on power and trust which requires further explanation.

Trust is an essential condition for interorganizational knowledge sharing (Dyer & Nobeoka, 2000). Paradoxically, information sharing is an essential precondition for trust in the context of supply chains (Kwon & Suh, 2005). Trust, commitment, reciprocity and power are all antecedents of information sharing; trust being the most significant (Wu et al., 2014). Stakeholders engaged in exchanges with other parties develop social attachments over time through different collaborative environments, in which trust enables the development of relationships. The perceived integrity of exchange parties, derived from trust over time facilitates interorganizational knowledge sharing (Chen et al., 2014). Conversely, opportunism is created through information and power asymmetry derived from the control of knowledge (Lado et al., 2008) and inadequate information communication practices (Byrne & Power, 2014).

Effective communication is difficult to accomplish across complex and globally fragmented supply chain networks. Stakeholders are confronted with fragmented one-sided exchange, small and medium sized enterprise isolation by larger actors, unclear responsibilities, disconnected consumers, and isolation (Lancaster & Vermeulen, 2012). Challenges with regard to content include overloads of required information, disagreement of improvement cost, disagreement about transaction costs, and exclusion (Lancaster & Vermeulen, 2012). Finally, the nature of communication faces difficulty with regard to directional coercive interaction, mutual lack of trust and a perception of blame (Lancaster & Vermeulen, 2012). Clearly, true collaboration is grounded in effective communication and information sharing.

Contemporary information management requires information communication technologies to store, share and make informed decisions. Commoditization of markets causes stakeholders to hoard or obscure information in order to gain competitive advantage, manipulate other stakeholders or mitigate the threat of substitution (Sayogo et al., 2015). Thus, in dynamic and complex supply chain networks, stakeholders often utilize information in a strategic manner. Timely sharing of complete and accurate data allows stakeholders in a supply chain network to extract knowledge (Simatupang & Sridharan, 2002; Simatupang & Sridharan, 2005). Information provision is continuous and flow is increasingly dynamic (Sayogo et al., 2015). Conversely, non-monetary information—such as sustainability related information—in commodity markets is cumbersome to obtain and subject to asymmetry (Sayogo et al., 2015). However, information sharing amongst supply chain networks is an important prerequisite for effective collaboration (Sandberg, 2007).

### 3.5 Supply Chain Network Collaboration for Sustainability

Confusion and misuse of the term sustainability implying a static state or end goal, is prominent in the literature. Sustainability is a dynamic and evolutionary process, which emphasizes societal progress from an economically responsible point of view, in a manner conforming with environmental and natural processes (Glavič & Lukman, 2007). In order to transition towards a more sustainable state, solitary individuals must involve supply chain stakeholders (Varsei et al., 2014). Various studies examined sustainable supply chain management using a collaborative paradigm (Vachon & Klassen, 2006; Lozano, 2007; Vachon, 2007; Vachon & Klassen, 2008; Awaysheh & Klassen, 2010; Gold et al., 2010a; Nanako & Hirao, 2011; Albino et al., 2012; Green Jr et al., 2012; Walker & Brammer, 2012; Beske & Seuring, 2014; Grimm et al., 2014; Ramanathan et al., 2014; Theißen et al., 2014, van Hoof & Thiell, 2014; Witjes & Lozano, 2016). However, there is a focus on environmental performance improvements as a result of collaboration instead of sustainability from a resilient systems perspective (Albino et al., 2012; Ramanathan et al., 2014; Theißen et al., 2014). Furthermore, dyadic relationships between structurally proximate stakeholders were the primary unit of analysis. The varied interdependencies, as well as the quality and effectiveness of collaborative endeavors of supply chain stakeholders are crucial to determine success of implementing more sustainable practices (Sarkis et al., 2011). In addition, stakeholder contributions to collaboration vary depending on position. Contributions can be in the form of tangible resources (Ta et al., 2015), knowledge and information (Fawcett et al., 2011; Ta et al., 2015), capabilities (Gold et al., 2010a; Fawcett et al., 2011) or relationships (Zacharia et al., 2011). High quality collaboration typically results in the potential for learning and innovation, successful outcomes and potential for future collaboration (Dietrich et al., 2010). A multi-tier perspective examination beyond dyadic relationships is taken to better understand the dynamics of collaboration for more sustainable global supply chain networks.

#### 3.5.1 Strategy Formation for Sustainability

Strategy formation is challenging in dynamic business and societal environments, which impedes plan formation in advance. Defining strategy formation as “*a pattern in a stream of decisions*” (Mintzberg, 1978) allows for prospective analysis and dynamic reformation. Strategy can be either planned, with intentions realized in actuality, or emergent, in which strategies are realized yet initially partially unintended (Mintzberg, 1978). Correspondingly, strategy formation is conducted in a proactive manner autonomously or induced in retrospect due to external pressures (Hutt et al., 1988). Autonomous strategy formation involves iterative commitments towards a particular course (Hutt et al., 1988), such as the pursuit of more sustainable supply chain networks. Ultimately, a clear identification of appropriate stakeholders to engage in mutual pursuits is necessary for successful collaborative efforts (Co & Barro, 2009). It is noted in the literature that stakeholders assume risk or opportunity orientations to strategy formation for improved sustainability outcomes (Harms et al., 2013). Such examples include the termination of contracts with underperforming supply chain stakeholders and capacity development respectively. However, there exists a conflict in the strategies adopted in practices—risk-oriented—versus those supported by the literature, which are opportunity-oriented (Harms et al.,

2013). However, such a view adopts a single stakeholder perspective and lacks collaborative strategy formation. Therefore, when pursuing improved sustainability outcomes—such as production, performance or resilience—across a supply chain network, a wide variety of stakeholder influences, capabilities and needs must be considered.

### **3.6 Proposing a Framework for Netchain Collaboration**

Whilst stakeholders in supply chain networks have long coordinated and cooperated to improve efficiencies in delivering products to end consumers, considerations of sustainability dimensions have proved cumbersome (Blome et al., 2014). This may be due to the fact that such a consideration requires a process, perception of others in a system and a strategic transition. In order to answer the research question a holistic conceptual framework has been synthesized to merge the theoretical concepts and present a pathway for stakeholder collaborations contributing to more sustainable supply chain networks.

Establishing a vision for the sustainability of a future supply chain network is a necessary initial step for stakeholders engaging in a collaborative endeavour. Stakeholder alignment within the supply chain networks is necessary to overcome barriers to transitioning to more sustainable outcomes (Simons, 2014). Once a target has been established, stakeholders can orchestrate a planned strategy (Mintzberg, 1978) to begin addressing sustainability issues within a supply chain network. In order to operationalize a strategy, process formation requires the consideration of several key elements namely, starting position, input, throughput, and output.

Stakeholders at varied positions—vertically and horizontally—in the supply chain network perceive sustainability differently. To achieve beneficial outcomes of collaboration with regard to sustainability goals, perceptions of the relative ante and position stakeholders occupy within a supply chain network are essential (Vachon & Klassen, 2008). Each stakeholder possesses relative amounts of varied capabilities and interdependencies. Further, stakeholders prioritize dimensions of sustainability based on the environment in which they operate. Thus, sustainability goals require a collective understanding of the supply chain network and what stakeholders at varied positions perceive as sustainable, which will hereby be referred to as contextual position. Alignment amongst stakeholders with varied perceptions of sustainability is necessary for sustainable supply chain collaboration (Blome et al., 2014).

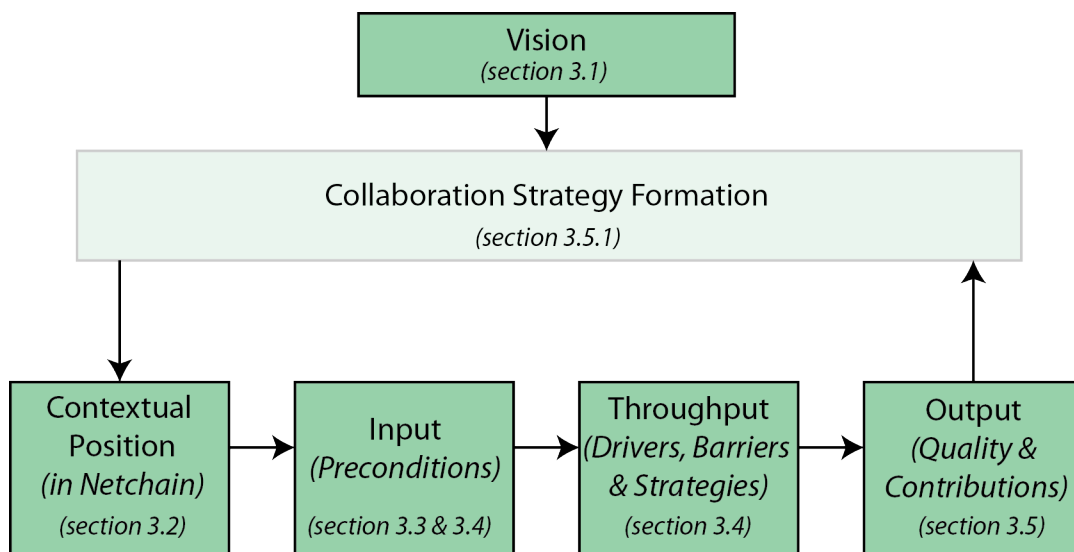
The contextual position of stakeholders in the supply chain network inherently influences the preconditions to collaboration based on capabilities and priorities. The position and function that stakeholders occupy influence the perceived attributes of other interdependent stakeholders (Co & Barro, 2009). For example, a farmer (supplier) is dependent on intermediaries to get their product on the market, whereas a wholesaler is dependent on large quantities of beans from intermediaries. Both stakeholders have a degree of dependence on intermediaries, however, in this example, farmers are relatively powerless stakeholders in comparison to wholesalers. Moreover, the urgency for a farmer to find a buyer is much higher than that of an intermediary particularly if the farmer holds a small market position. Based on the contextual position of each



stakeholder, the perception of other stakeholders' attributes in the supply chain network will be inherently influenced. Therefore, considerations of contextual position and the associated stakeholder attributes are valid precursors to orchestrate truly collaborative endeavours.

The above precursors influence the necessary antecedents for collaboration documented in the literature. This is because a thorough understanding of collaborating stakeholders' context and attributes is necessary to establish appropriate input conditions prior to pursuing mutually beneficial outcomes. Such preconditions for collaborative endeavours influence the quality of the outcome (Dietrich et al., 2010) and influence the adoption of a cooperative strategy (Co & Barro, 2009) amongst all collaborating stakeholders.

Similar to contextual positioning are the throughput elements utilized by the collaborating stakeholders. Each stakeholder possessed different intrinsic drivers for and barriers to collaboration. It is necessary to overcome these barriers in order to achieve mutually beneficial outcomes. Thus, strategies to overcome the barriers to collaboration are essential throughput elements for a transition towards a more sustainability oriented state (Lozano, 2012). All of the throughput elements are influenced by the previously mentioned position, attributes and antecedents, yet vary based on relationship dynamics between stakeholders (Wu et al., 2014). Thus, dynamics between stakeholders can improve or hinder collaborative outcomes. Outcome quality of collaborative endeavours is therefore determined by several factors through the process. Figure 7 links the contextual position of stakeholders in a netchain to the components of a collaborative process—input, throughput and output—to assess how stakeholder collaboration can contribute to more sustainable supply chain networks.



**Figure 7.** Netchain collaboration for more sustainable supply chains

## 4. Methods

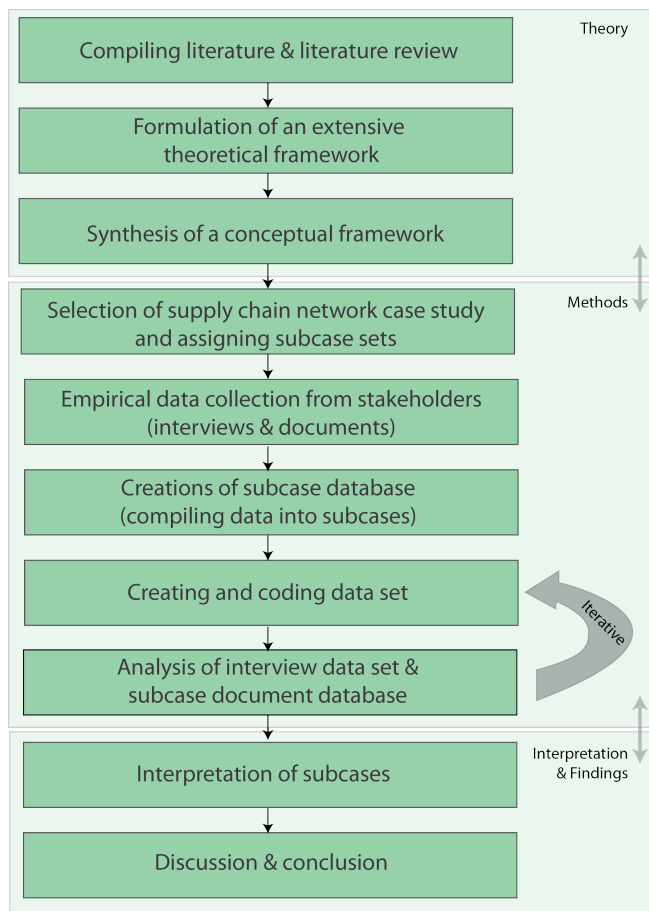
The following section offers an explanation of the steps taken to answer the research question and elaborates on research design, data collection, analysis, and interpretation of the data. Exploratory research was conducted using interpretative analysis. The case study method was used to facilitate exploratory research using qualitative information (Yin, 2003; 2013). Additionally, the use of case studies was appropriate since contemporary and relevant behaviours in this research were not manipulated (Jupp, 2006). Case studies are useful for preliminary stages of investigation (Denzin & Lincoln, 2011) and a suitable method for exploratory research, since the analyzed entity has more variables than data points (Yin, 2013). The established research question examines 'how' a particular phenomenon occurs in a contemporary environment. The case study method is therefore an appropriate method (Yin, 2013). Furthermore, this method is appropriate when a lack of empirical evidence is found in the literature (Yin, 2003). As demonstrated by the literature in the above section, empirical evidence supporting how stakeholders' can effectively collaborate for more sustainable supply chain networks is lacking. Therefore, this research contributes to the existing body of literature by examining the dynamics from a multi-stakeholder perspective.

The use of a qualitative research design has several limitations with regard to reliability, replication and validity. A case study cannot provide reliable information about the broader class of theory (Denzin & Lincoln, 2011). Additional subsets of the case study were used to improve validity and reliability (Denzin & Lincoln, 2011). In order to ensure objective and accurate observations, the systematic use of conceptual coding schemes for data categorization was done using NVivo 11. This contributes to the reliability and replicability of the research (Fraenkel et al., 1993; Jupp, 2006; Denzin & Lincoln, 2011). Explorations of patterns formed from data analysis and several supporting quotation examples aim to increased reliability of the interpretation process. Additionally, the primary form of data collection, in this case semi-structured interviews, is subject to observer bias and thus threatens reliability (Fraenkel et al., 1993). Furthermore, ambiguity of word choice during interviews may influence observer interpretation (Louise Barriball & While, 1994). In order to avoid phrase-meaning ambiguity, semi-structured interview design was utilized to pose clarification questions (Louise Barriball & While, 1994). The setup of interview design and complete list of questions were used to increase transparency of this research, as detailed in Appendix A2. The various steps of research design framework are detailed in the section below.

### 4.1 Research Design

An overview of research design is found below in Figure 8. The initial phase of research was used to compile and review literature, as seen in the previous section, to foster insights into the current research regarding elements of stakeholder collaboration in supply chain networks. A conceptual framework was synthesized using major elements of the theoretical knowledge to

guide the analysis and interpretations of findings and relate to the broader academic literature. Second, a supply chain network was selected and subcase netchains were assigned. Next, interviews were conducted with individual stakeholders and documents were compiled from the stakeholder organizations. As suggested by Eisenhardt (1989) subcase database development was achieved by collecting data from a number of sources of primary and secondary sources and grouped into two different netchains. The initial coding scheme was established by using major categorization themes derived from the literature review in the section above. Exploratory research was conducted using thematic content analysis to identify patterns across individual and subcase examples (Yin, 2003): the coffee supply chain network and two netchains respectively. Qualitative data were grouped around major themes and constructed in an iterative process (Miles & Huberman, 1994) to allow for additional code generation from hidden themes. Findings were then interpreted and linked back to the broader academic literature in the discussion section. Finally, the research question was answered in the conclusion followed by recommendations.



**Figure 8.** Research design model.

## 4.2 Empirical Data Collection

Based on the separation of stakeholders into subcase netchains by position, this research explored the influence of preconditions, relationship dynamics and strategies, which lead to collaborative endeavours amongst stakeholders contributing to more sustainable supply chain. Data was collected using external stakeholders over an eight-month period during which a full time internship was completed at a host organization. Three different methods were used to collect data in order to answer the research question and subquestions. First, semi-structured interviews with individual stakeholders in the coffee supply chain network were conducted. Next, document analysis (digital and hardcopy) from the individual stakeholders' representative organization were compiled. Finally, a subcase dataset was created as described by Eisenhardt (1989) by synthesis of interview and document data from stakeholders in the same netchain. Triangulation of interview data with data derived from document analysis and the subcase database was used to increase the validity and reliability of research findings as proposed by Yin (2003). This triangulation was adopted to improve generalizability of the coding schemes in thematic analysis.

### 4.2.1 Subcases

The separation of subcases established a bounded system for empirical data collection as put forward by Denzin and Lincoln (2011). The coffee supply chain network was split into two netchain subcases each consisting of three vertical supply chain echelons are with economically interdependent stakeholders. The three echelons were as follows: upstream (primary processing and exporting), intermediary (importing and trading) and downstream (processing and wholesale). Four horizontal network stakeholders were used for each netchain to examine all types of interdependencies amongst stakeholders concurrently. The horizontal selection included NGOs, a certification authority, a consultant and a bank. In order to increase replicability of the research yet retain a multi-tier perspective, primary producers and end consumers were excluded from the stakeholder selection (see Appendix A3 for a conceptualization). Stakeholders were allocated to a particular netchain based on their engagement in a collaborative endeavour with other stakeholders of the same netchain. This selection was done to explore the smallest possible netchains and establish a bounded system of business-to-business stakeholders. Three types of vertical stakeholders in the coffee supply chain were selected: exporters, importers (and/or traders) and processors (and/or wholesalers). The separation into two subcases by positioning within the network allowed for analysis of the impact of additional stakeholders on relationship dynamics between supply chain network stakeholders.

Stakeholder bodies were selected to satisfy the following criteria: operating in a business-to-business environment; privately owned; operating on a global scale; and currently engaged in a network attempting to collaborate for more sustainable outcomes. Selection began with downstream vertical stakeholders (roasters) which were then used to gain access to their collaborative network and referrals to additional stakeholders. This selection further establishes a bounded system for exploratory research, eliminates unidirectional transaction

interdependencies and increases replicability. Table 4 presents an overview of the stakeholders selected for the case study and primary functions in the supply chain network. The details of the stakeholders have been kept anonymous for the purposes of this reach.

**Table 4.** List of stakeholders in the coffee supply chain network selected for qualitative data collection. The certification authority is included in both netchains as it is part of both collaborative endeavors.

<b>Netchain subcase</b>	<b>Type of stakeholder</b>	<b>Years in operation</b>	<b>Vertical or horizontal</b>	<b>Chain echelon allocation</b>	<b>Primary function</b>
1	Roaster	> 200	Vertical	Downstream	Processing and wholesale
2	Roaster	~ 8	Vertical	Downstream	Processing and wholesale
2	Importer	~ 3	Vertical	Intermediary	Buying
1	Importer	~ 5	Vertical	Intermediary	Buying
1	Exporter	~ 10	Vertical	Upstream	Selling
2	Exporter	~ 5	Vertical	Upstream	Selling
1	Trader	> 150	Horizontal	Intermediary	Trading
2	Trader	> 20	Horizontal	Intermediary	Trading
1 & 2	Certification Authority	~ 14	Horizontal	Intermediary	Program and label
1	NGO	~ 10	Horizontal	Upstream	Sector revival
2	NGO	~ 30	Horizontal	Intermediary	Sector collaboration and conservation
1	Bank	~ 25	Horizontal	Downstream	Financing
2	Consultant	~ 10	Horizontal	Downstream	Advisory services

#### 4.2.2 Semi-structured Interviews

Semi-structured interviews were selected as the primary source of data collection method to facilitate comparability since all respondents answered each question (Louise Barriball & While, 1994). The interviews were semi-structured to allow for additional hidden themes whilst retaining primary subject focus during exploratory research (Varvasovszky & Brugha, 2000). Such hidden themes were used to iterate and further develop the conceptual categories used in coding thematic analysis. Furthermore, semi-structured interviews allowed for additional probing questions to eliminate ambiguity during data collection and explore responses in further detail (Louise Barriball & While, 1994). Interview questions were generated based on the major themes described in the theoretical framework.

Fourteen individual interviews were conducted with thirteen stakeholder bodies across the subcases (see table 5). The use of additional subcases in the case study improves generalizability to the broader context (Denzin & Lincoln, 2011). Stakeholders were selected based on satisfying two of the following three criteria. A direct involvement with neighbouring stakeholder relationships in the supply chain network: strategic involvement in collaborative endeavours and planning for sustainability goal pursuits; operational expertise in the specific subcase netchain.

**Table 5.** List of interviewed stakeholders and their respective expertise. Stakeholder names were removed and presented in random order to satisfy confidentiality agreements.

<b>Code</b>	<b>Function</b>	<b>Expertise</b>
SH13	Agri-food and agriculture commodities economist	Global agri-food commodity market dynamics, macro and micro economist in the agriculture sector
SH6	Principal, investor and trader	Soft commodity markets, commodity futures trading, trading dynamics, investing
SH3	Manager, operations	Direct trade sourcing, relationship management and perceptions, coffee market
SH10	Director	International development, coffee trade, direct trade, global coffee market, supply chain network, coffee market history
SH11	Monitoring and evaluation officer (Impact)	Standards and certification, development, data collection, analysis and reporting, communication of impact related data
SH2	International operations manager	Collaborative work and productivity improvement, global stakeholder relations in the coffee sector, in origin expertise
SH14	Founder and owner	Strategy, global agriculture markets, sustainable supply chain transformation, sustainable market transformations
SH7	Global sustainability manager	Global coffee market, development and implementation of sustainability strategy
SH12	Senior associate, agri commodities clients	Global agriculture markets, investment and financing climate, repurchasing agreements
SH4	Founder and owner	Direct trade, coffee quality, relationship management, supply chain network
SH9	Manager, sustainable coffee policy	Policy and project management, global coffee stakeholder management, supply chain network, sustainable development in origin
SH8	Chief executive officer	Coffee trading, supply chain network collaboration, vulnerability reduction
SH1	Farmer relations officer	Relationship management, in origin dynamics, quality coffee production, direct trade, business models for direct trade
SH5	Sustainability coordinator coffee division	Program development, partnership management, KPI development for impact assessment

The aim of conducting the interviews was to assess how stakeholders engage in and perceive interorganizational collaboration and the influence it has on more sustainable supply chain networks. The question structure during interviews was essential to develop a rapport and gain access to information essential to answering the research questions (Leech, 2002). Interviews were structured as suggested in Leech (2002) with generic and non-threatening leading questions moving to a narrow focus with sensitive questions in the middle and ended with broad questions. This ensured the subject did not feel the interview was a personal matter and a rapport was gained prior to extracting sensitive information (Leech, 2002). Grand tour questions, prompts and example questions were used in an open-ended fashion to facilitate hidden theme extraction as suggested by Leech (2002). The core topics include current roles and projects: supply chain network development and structure; vision for improved collaboration; strategies

for improvements; preconditions and antecedents to collaboration; exchange; and future developments of the coffee sector. The broad topics were supplemented with more specific questions to eliminate ambiguity and observer biases. The topics correspond to the conceptual framework presented in section 2.6. To ensure transparency of the data collection process a full list of interview question is found in Appendix A2. Interviews were conducted face-to-face for approximately one to two hours, recorded in order to enable identical replication of the contents for analysis (Louise Barriball & While, 1994) and backed-up via note taking. Transcripts of the interviews were completed and used as input for the database.

#### **4.2.3 Document Collection**

In order to explore complementary data to the interviews and assess the availability of data to other stakeholders in the supply chain network data was collected from stakeholder organization documents: archival data; grey literature; corporate documents; codes of conduct; and digitally available materials. Furthermore, document analysis was used to verify responses to interview questions. Documents were included as input for analysis if it was referred to during the interviews or mentioned during pre and post interview correspondence with participants.

#### **4.2.4 Subcase Database**

A subcase database was generated by synthesizing data derived from interviews and documents of stakeholders in the same netchain. The use of data subsets improved reliability of the research by comparing data between individual stakeholders (Denzin & Lincoln, 2011). Subcases were used as a thematic categorization during data analysis. Additionally, supplementary codes derived from conflicting information in the aggregated subcases were generated and used for analysis.

### **4.3 Data Analysis**

Organization and thematic analysis of content derived data collection was done using computer assisted qualitative data analysis software NVivo version 11. Manual thematic coding is time and labour intensive thus, NVivo 11 was used to store and organize data, manage codes and themes, retrieve text associated with codes, compare texts with multiple code associations, compare code labels, and document personal memos. Content analysis was used to increase replicability and validity of data inferences from semi-structured interviews (Krippendorff, 1989) and interpret meaning from text data (Hsieh & Shannon, 2005). A directed approach was utilized beginning with theory and research findings as direction for initial code development, as described by Hsieh and Shannon (2005). Six broad phases were used: data familiarization; code generation; searching for themes; defining themes; naming themes; and interpretation of data. This was done in an iterative process according to the constant comparative method proposed by Glaser and Strauss (1965) to allow for addition and hidden theme discoveries during primary data collection. An analysis and comparison of individual stakeholder data within the subcase netchains was performed to avoid premature and false conclusions as result of a variety of human errors in data processing (Eisenhardt, 1989) and to examine data

discrepancies. Additionally, this method was used to identify patterns across examples (Eisenhardt, 1989; Yin, 2003). To improve transparency of the research a coded excerpt of a stakeholder interview is available in appendix A4.

Codes generated for specific elements related to stakeholder network collaboration, such as antecedents, drivers for collaboration, barriers to collaboration, and strategies to overcome these barriers, were recorded in a consolidated manner where a value of 1 represented identification in the dataset and 0 represented the absence. This was done for each individual stakeholder organization and congruence was measured by dividing the value of the sum of consolidated observations by the total number of interviews conducted. Coding of themes relating to sub question two and three was generated using the final coding tree (Appendix A5). Analysis of quotes were clustered around major patterns recurring in the dataset. This was done on a consolidated basis to explore a holistic representation of varied netchain subcases. Netchain composition was constructed using responses to interview questions and from referrals to additional stakeholders.

#### **4.4 Interpretation**

The goal of interpretive coding was to identify stakeholder collaboration dynamics and how collaboration can lead to more sustainable supply chain networks. This consisted of interpretation surrounding the elements in the three research subquestions. Various statements and passages collected from interviews and documents were not directly linked to the research question due to the exploratory scope of research. However, these items were useful in understanding the context of the netchain subcases—in the overarching case study of the coffee supply chain network—in order to test the proposed framework. These items were categorized into the descriptive coding scheme under the background information subset and analyzed to provide a reference of the coffee supply chain network and sector. Without such a reference it would be difficult to suggest claims of improved sustainability via contributions of stakeholder collaboration.

First, grouping major themes within both netchain subcases allowed for interpretations of visions and initial strategies. Netchain structural composition was used as a basis to evaluate contextual position of stakeholders in the netchain and interpret how stakeholders perceived sustainability dimensions. Additionally, the dataset was analyzed to detect the drivers for collaboration, barriers to collaboration and strategies to overcome the barriers to stakeholder collaboration. Once consolidated into netchain subcases, the three components were then compared to those identified in the literature (tables 1, 2 & 3) to interpret throughput perceptions on engaging in collaborative endeavours. Next, interpretive coding elements were examined from individual cases and grouped around major themes and constructs such as collaborative strategies for, contributions to, and quality of collaboration, as well as socio-cultural and geographic factors influencing stakeholder relationship dynamics. The netchain subcases were compared based on patterns that emerged from the set of coding themes and interpreted on a consolidated basis.



This interpretive approach is explorative and thus the goal is to offer initial insights into how stakeholder collaboration can contribute to more sustainable supply chain networks. The theory on supply chain network collaboration was used as a basis to reflect on patterns that emerged in the coding structure and data analysis. A comparison of the existing theory can be made by this reflection and used to generate recommendations for practitioners. The analysis followed the reasoning of the proposed framework in order to answer the research question and sub questions.

#### 4.4.1 Limitations

Several limitations to the data collection, analysis and interpretation phases were experienced. First, agri-food commodity sectors, such as coffee, are notoriously opaque due to the high number of stakeholders with individual pursuits. Thus, gaining access to data was cumbersome and dependent on personal contacts or referrals. Furthermore, the global nature of the coffee supply chain network made scheduling interviews difficult due to time differences. Data acquisition via interviews was also limited due to availability of identified stakeholders engaging in a collaborative endeavour within the given timeline. As a result, the representation of stakeholders in table 4 was not equally divisible between horizontal and vertical allocations, as well as vertical echelons of the supply chain. The lower numbers may be influenced by biases from larger cohorts and inhibit generalizability of the findings. As a result, triangulation of responses regarding all types of interdependencies was not possible which limited the validity of observations. Absolute comparability is not possible, therefore subcases were interpreted on a consolidated basis in order to test the framework. Future research is required with larger sample sizes amongst each subcase network.

Second, the use of a conceptual framework involves a degree of selection in terms of relevant theoretical concepts. Therefore, the developed coding scheme is subject to a degree of bias. The use of a conceptual framework and case study method combined limit the generalizability of findings to the broader body of literature. Further research is required to test the validity of the framework proposed and compare findings across multiple case studies.

## 5. Findings

This section provides an overview of the data collected, analysis conducted, and the interpretations of the findings. First, a consolidation of the data collected is presented. Second, an analysis of the composition and objectives of the two subcase netchains is detailed followed by the perceptions of sustainability based on contextual position in the netchain. Third, there is an examination of preconditions including factors influencing relationship dynamics within netchains and antecedents for collaboration. Fourth, throughput elements such as drivers for, barriers to and strategies to overcome barriers to collaboration are explored between netchains to discern similarities and differences. Fifth, a set of observations surrounding collaboration quality and contributions are explored within netchains followed by emergent strategy trends. Finally, a synthesis of the findings is proposed to interpret the findings and link them to the broader academic literature. A consolidation of the data collected is presented in appendix A6. Coding the data set using the coding tree (Appendix A5) yielded a total of 3146 references as seen in appendix A6. Descriptive references totaled 936 and the remaining 2210 were generated in the interpretive segment of the coding tree.

### 5.1 Vision, Strategy & Contextual Position

Two subcase netchains of stakeholders collaborating for improved sustainability outcomes are detailed below. Netchain 1 aims to address systemic vulnerabilities to the coffee sector such as climate change related impacts, including disease and revitalizing upstream origin economic infrastructure, to sustain coffee production. Stakeholders in netchain 1 envision a more resilient coffee sector through improved productivity and livelihood of farming communities. The vision for the coffee sector in netchain 2 is to make coffee the world's first sustainable agricultural product. After coding the dataset, it was clear that netchain 2 (figure 8) is collaboratively pursuing supply chain network resilience from an economic centric approach by making coffee a more sustainable product.

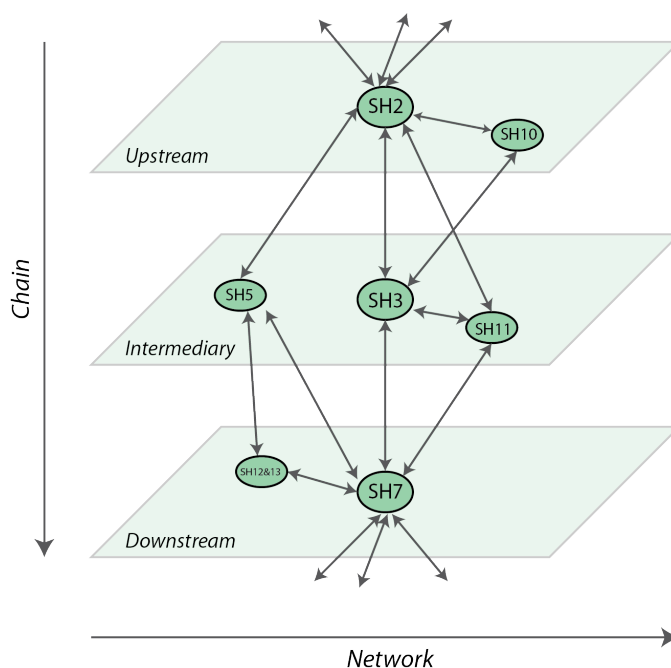
Stakeholder perception on sustainability varied slightly by echelon, however, the most emergent pattern was an emphasis on economic viability, as seen in table 8. Several other notable patterns were observed in the coded dataset. When stakeholders were grouped by chain echelon it was observed that the upstream echelon lacked a focus on the environmental dimension of sustainability, whereas social and economic dimensions were of higher urgency. Next, the intermediary cohort demonstrated relatively equal representations of all three dimensions of sustainability. However, the environmental dimension of sustainability was referenced slightly more in comparison to other echelons. Finally, the downstream echelon referenced the economic dimension highest and referenced the remaining dimensions relatively equally. Table 6 below presents a summary of the patterns observed.

**Table 6.** Reference count of the sustainability dimensions presented by consolidated chain echelons (netchain 1 and 2)

Echelon	Number of SH	Sustainability Dimensions		
		Environmental	Societal	Economic
Upstream	3	13	38	43
Intermediary	6	84	76	96
Downstream	5	55	64	95
<b>Total</b>		<b>152</b>	<b>178</b>	<b>234</b>

### 5.1.1 Netchain 1

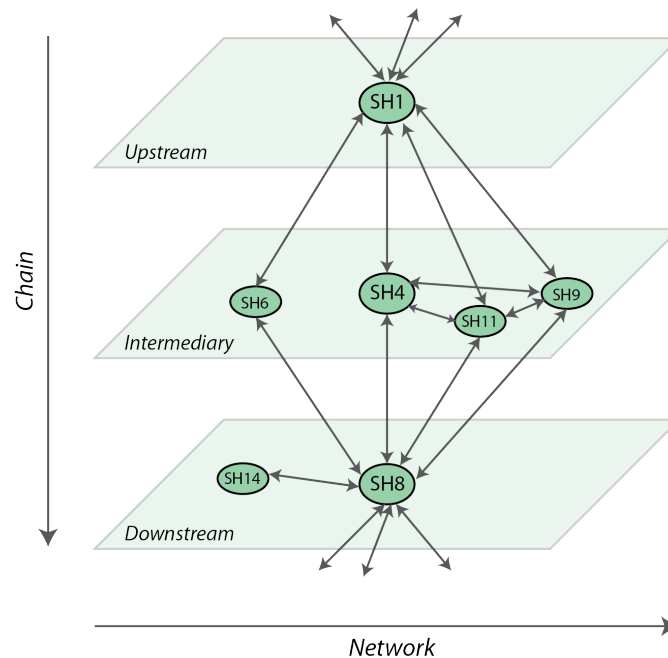
Two patterns emerged amongst stakeholders in netchain 1 for strategy formation to collaboratively address the systemic threats to the coffee sector. First, establishment of pre-competitive initiatives at a production level by downstream stakeholders, as well as to continue and intensify investment in development programs. Second, the establishment of a common reporting framework used to facilitate a continuous improvement process amongst all stakeholders in the coffee supply chain network. Stakeholders in netchain 1 stress the importance of sectoral alignment in both initiatives and vision to achieve mutually beneficial collaborative outcomes. Figure 9 below depicts stakeholder interdependencies in the netchain using arrows connected to stakeholder organizations as represented by green circles.



**Figure 9.** Subcase netchain 1 compositions. Interdependencies of three vertical supply chain stakeholders (SH2, SH3, SH7) and 5 horizontal stakeholders (SH5, SH10, SH11, SH12, SH13) are depicted across the netchain. SH12 and SH13 belong to the same organization and are thus grouped together.

### 5.1.2 Netchain 2

Two main themes regarding strategy emerged from the dataset. First, stakeholders in netchain 2 aim to improve resilience through strengthening demand from the market by enhancements of productivity and quality in production. Second, reallocating profits and wealth proportionately to each stakeholder by the amount of value contributed to the product. Stakeholders in netchain 2 emphasize the importance of stakeholder specific commitments based on context and capabilities. Figure 10 below displays netchain 2 structural composition and stakeholder interdependencies.



**Figure 10.** Subcase netchain 2 compositions. Interdependencies of three vertical supply chain stakeholders (SH1, SH4, SH8) and 4 horizontal stakeholders (SH6, SH9, SH11, SH14) are depicted across the netchain.

### 5.1.3 Interpretation

The subcases used for data collection demonstrated similar ambitions for stakeholder collaboration aiming to further develop the coffee sector as a pioneering agri-food for sustainability. The observation that both subcases view sustainability through a resilience lens and place emphasis on the economic dimension likely due to the transactional nature of a supply chain. Furthermore, the high prevalence of references to the environmental dimension amongst the intermediary echelon may be in part due to the large presence of horizontal network stakeholders applying pressure to vertical stakeholders. Structural interdependencies are apparent in this analysis, however, it is not possible to interpret relational dependencies between stakeholders.

## 5.2 Input Elements: Relationship Dynamics & Antecedents

*"[coffee] is fundamental for human values because ... it builds relationships." (SH10)*

Coding references regarding relationship dynamics are presented in a consolidated manner. This is because structural compositions of the subcases were not identical. Thus, more reliable interpretations of the results can be drawn from examining the consolidated data of both netchains. 279 references of relationship dynamics were identified using quotes from interviewees and passages from documents by means of the classification in the final coding tree (Appendix A4). Table 7 presents a summary of the data used for analysis.

**Table 7.** Reference count of coded data regarding relationship dynamics

Codes in Coding Tree	Reference Count	Netchain 1 and 2 consolidated				
		Echelon			Stakeholder	
Relationship Dynamics	279	Upstream	Intermediary	Downstream	Vertical	Horzitoral
<b>Stakeholder Attributes</b>	<b>124</b>					
Legitimacy	28	4	10	14	11	17
Power	90	21	37	32	58	32
Urgency	6	1	1	4	5	1
<b>Proximity</b>	<b>92</b>					
Cognitive	42	10	17	15	14	28
Propinquity	17	4	7	6	8	9
Structural	33	3	19	11	19	14
<b>Trust</b>	<b>63</b>	13	26	24	29	34

### 5.2.1 Analysis

From the coded data presented above, it is clear that power, cognitive proximity and trust are most recurrent factors influencing relationship dynamics within netchains. Vertical stakeholders involved in product proliferation and refinery more often referenced power and dependency compared to horizontal stakeholders. However, amongst echelons there seemed to be a relatively even distribution. Cognitive proximity was evenly distributed amongst netchain echelons however horizontal actors referenced this factor slightly more. Finally, trust was the most evenly distributed factor influencing relationship dynamics within netchains. Additional patterns were identified regarding relationships dynamics, which are examined below.

Six patterns of socio-cultural and proximity factors were found to influence stakeholder relationship dynamics. First, there is a trend towards long-term commitments and investment in relationships amongst stakeholders in the coffee supply chain network. This was evident by the presence of long-term relationship investment in each of the subcases netchains.

*"If you want to invest and change things you need to build a relationship with your suppliers otherwise it doesn't make any sense. You cannot be in and out." (SH8)*

Second, the rise of digitally enabled communications and improved telecommunications has allowed stakeholders to interact without geographic proximity. Therefore, propinquity held lesser importance in stakeholder relations. However, for initial interactions face-to-face meetings were

identified as the most effective way of communicating and fostering initial trust for newly interacting stakeholders. Furthermore, communication of both positive and negative information seemed to facilitate trust formation between stakeholders interacting.

*“In a physical sense, it’s now possible to talk directly to everyone, though it doesn’t really mean anything if they [stakeholders] won’t share anything with you. It’s really trying to convince them [stakeholders] that even if you’re doing bad, or if you have a problem, share it and we will work on it together.” (SH4)*

*“But really working with them and assessing and finding issues and having open dialog and depending on the severity of the issue working on mitigation. It could always be a complete cut but in 99% of the cases, it would be a collaborative mitigation ...” (SH7)*

Third, structural proximity seemed to correspond with the influence of power and dependency. Horizontal stakeholders influenced relationships by acting as somewhat neutral facilitators. Furthermore, consolidation of vertical stakeholders, traders and roasters, at different chain echelons exacerbates the dependence of upstream stakeholders such as farmers and cooperative, which negatively impacts the level of trust in a relationship.

*“I mean they [large downstream stakeholders] require their suppliers to give them huge long credit terms, 180 days payment equals coffee, but if you’re a farmer how do you do that? You get money from traders, which means you’ll see further increasing concentration on the retail level and at the roasting level” (SH2)*

Fourth, cognitive proximity or distance appeared to have the greatest influence on stakeholder relationship dynamics. Perception of context seemed to be the largest discrepancy as a result of cognitively distant stakeholders, as exemplified by the quote below. There is a trend for upstream stakeholders to conceal negative information.

*“I have observed that information exchange up and down the supply chain is appallingly difficult and it’s not really working at all at any level. It’s not working well to the farmer because their understanding is completely different than the trader, it’s not working for the exporter and importer, it’s not working well between the importer and roaster, and it’s not working well between the roaster and retailer and not working well down to the consumer. Everyone has a completely different idea of what this thing “sustainability” is, means, and consists of.” (SH10)*

Furthermore, stakeholder relations in collaborative endeavours suffered from diverse workplace cultures. An example of this is demonstrated by working cultures in multinational stakeholder organizations: the segregation between process-oriented Europeans versus results-oriented Americans.

*“Whether you’re in South America or Asia or Africa, a common cultural thing, if there’s a problem [they] just don’t mention it. At least in this trade/culture.” (SH3)*

Fifth, upstream stakeholders seem to negatively perceive compassion and development style relationships. Fostering a sense of legitimacy for upstream stakeholders through a business-centric approach to relationships seem to positively influence dynamics.

*“Well not really, compassion is more something they are kind of allergic too because that’s really what all these development organizations come in with. ... Whereas, the approach to doing business, fair business, is something that makes them feel as equals and not as poor Africans.” (SH3)*

Finally, the generation of trust seems to be highly related to operational transparency. Stakeholders utilizing relationships as a platform to spur co-creation and innovation tend to have better interactions with other stakeholders in the netchain. Additionally, operational commitments tend to be highly associated with trust. If fulfillment isn’t achieved, the level of trust seems to dissipate almost instantaneously. Generally, stakeholders with sourcing portfolios predominantly filled by futures trading appear to demonstrate low levels of transparency. Conversely, stakeholders primarily engaged in direct sourcing tend to display higher levels of operational transparency.

*“Treating everyone as equal, even at a farmer level for example in Tanzania, I work directly with subsistence farmers, sharing my business model with them. Showing them exactly what I do. Bringing back bags of their coffee, roasted by micros [roasters], showing them this is your product. Let’s develop products together throughout the chain, instead of assuming that they don’t understand which is what most importers too. That gives them an insane boost to really work together and be proud of what they do.” (SH4)*

*“That’s really, because there is mistrust. I dare to say that it is mainly because of us. Because we are not transparent, we haven’t shown real good behaviour ... in terms of how we behave in the market and bringing down or having disappear some of the commitments.” (SH7)*

## 5.2.2 Antecedents

Antecedents were derived from the existing literature on collaboration, as well as uncovered as hidden themes if mentioned recurrently during semi-structured interviews. A total of 19 antecedents were coded which yielded a total reference count of 313 in the dataset. This analysis examines the subcase netchains individually and presents referenced preconditions in a consolidated manner, such that coded items mentioned several times during an interview or appearing in the subcase dataset are presented as a single value.

### 5.2.2.1 Netchain 1

Coding of the dataset revealed 12 antecedents for collaboration. Table 8 presents the coded antecedents (Appendix A7). Consolidated identification of a driver is presented with a value of 1. Antecedents absent from the dataset were: roles and process for collaboration (C66); clearly defined commitments (C76); process integration (C80); mutuality as defined by shared risks, costs and rewards (C81); conflict resolution (C82); and expectations fulfillment (C83).

**Table 8.** Consolidated identification of antecedents for collaboration

		<b>Antecedents (netchain 1)</b>							
<b>Code</b>	<b>Description</b>	SH1	SH10	SH3	SH5	SH11	SH7	SH12	SH13
C65	Trust between stakeholders	1	1	1		1	1		
C67	Commitments to project (high degree)	1	1				1		
C68	Sharing (knowledge and information exchange)	1	1	1		1	1		
C69	Goal congruence		1			1			
C70	Incentive alignment		1		1	1	1		
C71	Joint decision making	1	1						
C72	Cultural proximity	1	1	1		1	1		
C73	Physical proximity	1							
C74	Honesty and openness			1					
C75	Sector wide vision		1					1	
C78	Understanding context	1	1	1		1	1		
C79	Meaningful relationships	1	1	1		1	1		

Antecedents for stakeholder network collaboration generally coincide with the prominent elements observed in the drivers, barriers, and strategies conditions. The five most recurrent antecedents observed (63%) in the dataset for netchain 1 are: trust; sharing; cultural proximity; understanding context; and meaningful relationships. Second, incentive alignment was observed at 50% congruence between netchain 1. Average congruence amongst stakeholder in netchain 1 was observed at 42%.

### 5.2.2.2 Netchain 2

Coding of the dataset for netchain 2 revealed 15 antecedents for collaboration. Table 9 presents the coded antecedents and consolidated identification. Additional antecedents (C66, C74, C76 and C77) were observed in the dataset for netchain 2. Antecedents absent from the dataset were: process integration (C80); mutuality as defined by shared risks, costs and rewards (C81); conflict resolution (C82); and expectations fulfillment (C83).

**Table 9.** Consolidated identification of antecedents for collaboration

		<b>Antecedents (netchain 2)</b>							
<b>Code</b>	<b>Type</b>	SH1	SH4	SH6	SH9	SH11	SH8	SH14	
C65	Trust between stakeholders	1	1		1	1	1	1	
C66	Roles and process for collaboration				1				
C67	Commitments to project (high degree)	1	1		1		1		
C68	Sharing (knowledge and information exchange)	1	1		1	1	1	1	
C69	Goal congruence		1			1		1	
C70	Incentive alignment		1		1	1	1		
C71	Joint decision making	1			1	1	1	1	
C72	Cultural proximity	1	1		1	1	1		
C73	Physical proximity	1		1	1				
C74	Honesty and openness		1						
C75	Sector wide vision				1			1	
C76	Clearly defined commitments				1				
C77	Links to intergovernmental policy				1				
C78	Understanding context	1	1		1	1	1	1	
C79	Meaningful relationships	1	1			1	1	1	



Trust between actors, sharing and understanding context were observed most in the dataset for netchain 2 (86% each). Cultural proximity and meaningful relationships were the second most observed antecedent at 71%. Finally, commitments, joint decision-making, and incentive alignment were all observed at 57%. Average congruence amongst netchain 2 was observed at 50%.

### 5.2.3 Interpretation

The factors which most positively influence relationship dynamics appear to be trust, cognitive proximity and sharing. Trust seemed to be facilitated through a variety of complex socio-cultural, structural and behavioural mechanisms. Conversely, structural consolidations and the exercise of power appear to negatively impact relationship dynamics within netchains. Relationship dynamics within netchains seem to influence the antecedents for collaboration. For example, cognitive proximity and contextual understanding facilitated sharing of negative information between stakeholders in a netchain.

## 5.3 Throughput Elements

A total of 64 elements were coded which yielded a total reference count of 885 in the dataset amongst three components: drivers (196); barriers (423); and strategies (266). This analysis examines the subcase netchains individually and presents referenced preconditions in a consolidated manner, such that coded items mentioned several times during an interview or appearing in the subcase dataset are presented as a single value.

### 5.3.1 Analysis: Netchain 1

#### *Drivers*

Coding of the drivers revealed that 10 drivers were identified in the dataset whereas eight lacked presence. Table 10 below shows a comprehensive list of the coded drivers identified (code descriptions can be found in Appendix A7). Consolidated identification of a driver is presented with a value of 1. Several drivers were not observed in the dataset: difficult to imitate by competitors (C15); development of new competencies or capabilities (C08); transaction uncertainty mitigation (C10); process improvements (C11); customer demands for higher service levels (C12); the desire to build a winning supply chain network (C13); and showcasing progress (C16).

**Table 10.** Consolidated identification of drivers for collaboration in netchain 1

		<b>Drivers (netchain 1)</b>							
<b>Code</b>	<b>Description</b>	SH2	SH10	SH3	SH5	SH11	SH7	SH12	SH13
C01	Mutual benefit	1	1	1	1	1	1	1	
C02	Performance improvement	1							
C04	Environmental performance improvement			1			1	1	
C05	Increase of green practices performance			1			1		
C06	Increased sustainability performance							1	
C07	Resource exploitation and capture efficiency								1
C09	Securing market position or better market position			1			1		
C14	Better supply chain relationships				1			1	
C17	Stakeholder pressure	1	1	1	1	1	1	1	
C18	Pressure for more transparency	1			1	1	1	1	

Overall, drivers for collaboration identified in the literature and through emergent themes were relatively underrepresented by netchain 1 (56%). Mutual benefit (C01) was the most predominant driver, which was previously identified in the literature (86%). The second most identified driver for netchain collaboration was stakeholder pressure (C17) (75%). However, this driver was previously unidentified in existing literature. Finally, pressure for increased transparency (C18) was observed at 50% congruence. Overall, congruence amongst netchain 1 stakeholders was 38%.

### *Barriers*

Coding of the barriers revealed that 22 barriers were identified in the netchain 1 dataset, whereas eight lacked presence. Table 11 below details a comprehensive list of the coded barriers (Appendix A7). Consolidated identification is presented in a consistent manner with the drivers' section above. Several barriers were not observed in the dataset: conflicts of interest (C20); relationship difficulties (C26); incentive misalignment (C27); differences in goals and objectives (C29); poor communication (C30); miscommunication (C37); fear of duplication of efforts (C40); and false conclusions derived from extreme transparency (C45).

**Table 11. Consolidated identification of barriers to collaboration in netchain 1**

		<b>Barriers (netchain 1)</b>								
<b>Code</b>	<b>Description</b>	<b>SH2</b>	<b>SH10</b>	<b>SH3</b>	<b>SH5</b>	<b>SH11</b>	<b>SH7</b>	<b>SH12</b>	<b>SH13</b>	
C19	Lack of trust	1		1	1	1	1			
C21	Opportunistic behaviour	1				1	1			
C22	Local perspective	1	1				1			
C23	Difficult to discern appropriate timing		1				1			
C24	Difficult to discern appropriate strategies		1				1			
C25	Difficult to implement		1	1	1		1	1	1	
C28	Socio-cultural distance (differences in perception)	1	1	1		1				
C31	Asymmetric information and exchange			1		1				
C32	Structural barriers	1	1	1			1			
C33	Abuse of power and dependency	1		1	1	1	1			
C34	Market conditions			1			1	1	1	
C35	Inappropriate performance indicators					1				
C36	Outdated policies	1	1							
C38	Resistance to change / Can't see the incentive		1			1				
C39	Losing market share		1		1		1			
C41	Local institutional structures	1		1			1			
C42	Sectoral lock-in		1							
C43	Difficult to measure the impact of investments					1	1			
C44	Reluctance to share sensitive information			1		1	1			
C46	Cost, investment and funding (uncertain ROI)		1				1		1	
C47	Complexity		1	1						
C48	Geographic distance			1						

The most notable barrier was the difficulty to implement (75%). Lack of trust and the abuse of power/dependency were the second most referenced barriers to collaboration in netchain 1 (63%). Socio-cultural distance, structural barriers, and market conditions were all observed at 50% congruence amongst netchain 1 stakeholders. All of the most prominent barriers to stakeholder collaboration were previously cited in the literature. Average congruence amongst stakeholders in netchain 1 was measured at 36%.

### *Strategies*

Thirteen strategies to overcome barriers of collaboration were identified in the dataset for netchain 1. Table 12 below presents the coded strategies (Appendix A7). Consolidated identification is presented once again. Strategies absent from the dataset were: use of local implementers (C58); managing dependence (C63); and neutral facilitation (C64).

**Table 12.** Consolidated identification of strategies to overcome barriers to collaboration

		<b>Strategies (netchain 1)</b>							
<b>Code</b>	<b>Description</b>	SH2	SH10	SH3	SH5	SH11	SH7	SH12	SH13
C49	Establish trust	1	1	1		1	1		
C50	Use open and honest communication		1						
C51	Technology sharing					1			
C52	Collaborative communication						1		
C53	Resource and capabilities investment		1				1	1	1
C54	Sectoral agenda setting		1				1		
C55	Inclusivity		1						
C56	Reframe barriers as opportunities				1				
C57	Contextual flexibility			1			1		
C59	Generate awareness to upstream stakeholders		1			1			
C60	Utilize open source resources					1			
C61	Build long-term relationships		1	1		1	1		
C62	Be transparent	1	1			1	1		

The most referenced strategy was the establishment of trust between stakeholders (63%) which was the only element previously identified in the literature. Research and capabilities investment, being transparent and building long-term relationships were the second highest referenced elements at 50% each. Average congruence for netchain 1 was observed at 30%.

### 5.3.2 Analysis: Netchain 2

#### Drivers

Similar to the previous subcase, 11 drivers were observed in the dataset for netchain 2. Table 13 below details the comprehensive list of consolidated identification. Compared to netchain 1, the driver for showcasing progress was additionally found in netchain 2. The remaining missing drivers are consistent with netchain 1.

**Table 13.** Consolidated identification of drivers for collaboration in netchain 2

		<b>Drivers (netchain 2)</b>						
<b>Code</b>	<b>Description</b>	SH1	SH4	SH6	SH9	SH11	SH8	SH14
C01	Mutual benefit	1	1	1	1	1	1	1
C02	Performance improvement	1	1				1	
C04	Environmental performance improvement					1	1	1
C05	Increase of green practices performance					1	1	
C06	Increased sustainability performance					1	1	
C07	Resource exploitation and capture efficiency			1				
C09	Securing market position or better market position		1			1	1	1
C14	Better supply chain relationships	1	1				1	1
C16	Showcasing progress					1		
C17	Stakeholder pressure					1	1	1
C18	Pressure for more transparency		1			1	1	

Unanimous identification of mutual benefit (C01) as a driver to collaboration was observed in netchain 2. Second, better supply chain structure (C14) was observed at 71% congruence amongst netchain 2. Finally, stakeholder pressure (C17), pressure for more transparency (C18), environmental performance improvement (C04), and securing market position (C09) were all

observed at 57% congruence amongst netchain 2. Overall, congruence amongst netchain 2 stakeholders was 48%.

### Barriers

Barriers to collaboration were once again much more prevalent amongst the dataset for netchain 2; 22 barriers were observed. Table 14 below presents a list of the barriers identified. Compared to netchain 1, two additional barriers were observed (C40) and (C45): the fear of duplication of efforts and false conclusions drawn from extreme transparency. Conversely, two barriers identified in netchain 1 were not present in netchain 2 (C23) and (C24): difficulty discerning appropriate timing and strategies. The remaining missing barriers are consistent with those observed in netchain 1.

**Table 14.** Consolidated identification of barriers to collaboration in netchain 2

<b>Barriers (netchain 2)</b>		SH1	SH4	SH6	SH9	SH11	SH8	SH14
C19	Lack of trust	1	1		1	1	1	1
C21	Opportunistic behaviour	1	1		1	1	1	1
C22	Local perspective	1	1		1		1	
C25	Difficult to implement			1	1			1
C28	Socio-cultural distance (differences in perception)	1	1		1	1	1	
C31	Asymmetric information and exchange		1			1		1
C32	Structural barriers	1			1			1
C33	Abuse of power and dependency	1	1		1	1	1	1
C34	Market conditions			1				1
C35	Inappropriate performance indicators				1	1		
C36	Outdated policies				1			
C38	Resistance to change / Can't see the incentive				1	1	1	
C39	Losing market share			1				
C40	Fear of duplication of effectors				1			
C41	Local institutional structures	1						
C42	Sectoral lock-in		1		1		1	1
C43	Difficult to measure the impact of investments				1	1		1
C44	Reluctance to share sensitive information		1		1	1	1	
C45	False conclusions from extreme transparency				1			
C46	Cost, investment and funding (uncertain ROI)						1	
C47	Complexity				1			1
C48	Geographic distance				1			

Barriers to collaboration observed differed to a large extent in netchain 2 compared to netchain 1. Lack of trust, opportunistic behavior, and abuse of power/dependency were the most highly observed barriers (85%), followed by socio-cultural distance (71%). Sectoral lock-in, reluctance to share sensitive information, and local perspectives were all observed at 57%. Average congruence amongst stakeholders in netchain 2 was measured at 41%.

### Strategies

Thirteen strategies to overcome barriers to collaboration were identified in the dataset for netchain 2. Table 15 below presents a list of the coded strategies identified. Strategies absent

from the dataset were: inclusivity (C55); managing dependence (C63); and neutral facilitation (C64). The use of local implementers was observed in netchain 2 yet absent from netchain 1.

**Table 15.** Consolidated identification of strategies to overcome barriers to collaboration

		<b>Strategies (netchain 2)</b>						
<b>Code</b>	<b>Description</b>	SH1	SH4	SH6	SH9	SH11	SH8	SH14
C49	Establish trust	1	1		1	1	1	1
C50	Use open and honest communication	1	1					
C51	Technology sharing				1	1		
C52	Collaborative communication				1		1	
C53	Resource and capabilities investment		1					
C54	Sectoral agenda setting				1			1
C56	Reframe barriers as opportunities				1			
C57	Contextual flexibility		1		1		1	
C58	Use local implementers				1			
C59	Generate awareness to upstream stakeholders	1	1		1	1		
C60	Utilize open source resources				1	1		
C61	Build long-term relationships	1	1		1	1	1	
C62	Be transparent		1		1	1	1	1

Similar to netchain 1, the strategy observed most was establishment of trust (86%). Next, being transparent and building long-term relationships were the second highest referenced elements at 71% each. Finally, generating awareness to upstream stakeholders was observed at 57%. Average congruence of strategies for netchain 2 was observed at 40%.

### 5.3.3 Interpretation

The throughput elements seemed to differ largely between netchain subcases. However, several patterns were consistent amongst the subcase datasets. Drivers for collaboration were largely unspecified with stakeholders citing mutual benefit as the highest referenced element. This may be due to the fact that collaborating stakeholders perceive the overall vision as the main driver for collaboration. Three consistent barriers appeared in the subcases: lack of trust, abuse of power, and socio-cultural (cognitive) distance. Interestingly, stakeholders in both subcases referenced establishing trust, fostering long-term relationships, and being transparent as key strategies to overcome the previously mentioned barriers. Thus, this finding provides a targeted approach to overcoming critical barriers to collaboration during the process.

## 5.4 Output Elements: Quality & Contributions

Output elements were coded under the collaboration umbrella in the coding tree, which included strategies and contributions. Themes regarding quality were uncovered after grouping coded data within the subsets. 46 references to specific strategies used for engaging in collaborative endeavours were identified in the dataset. Additionally, 123 specific references to contributions from stakeholder organizations were observed. Table 16 presents a summary of data used for analysis.

**Table 16.** Reference codes of data for output elements

Codes in Coding Tree	References	Netchain 1 and 2 consolidated					
		Echelon			Stakeholder		
		Upstream	Intermediary	Downstream	Vertical	Horzital	
<b>Strategies</b>	<b>46</b>						
Planned	16	3	8	5	7	9	
Emergent	30	3	16	11	19	11	
<b>Contributions</b>	<b>123</b>						
Resources	51	2	31	18	23	28	
Capabilities	19	6	7	6	12	7	
Relationships	12	4	6	2	8	4	
Knowledge	41	7	21	13	15	26	

### 5.4.1 Analysis

*“We cannot solve it on our own. We have to play our role in the best possible way.” (SH09)*

There are four patterns that can be identified by an analysis of strategies and contributions by stakeholders in the netchain subcases. First, strategy formulation and execution is generally observed to occur in an emergent fashion in which the outcomes are not initially planned. This seems to be in large part due to the fact that collaborative endeavours require open flow of information between multiple stakeholders with varying priorities and contexts over time. Furthermore, multiple perspectives are present when varied stakeholders from geographically distant regions engage in collaborative affairs. Thus, both the structural business environment and socio-cultural context seem to contribute to the emergent nature of collaboration strategies.

*“A lot of NGOs have no clue about market prices or dynamics. I wouldn’t say it’s a precondition but it’s certainly an added value. You can combine the different views and disciplines to make entities understand each other and if you want to hold people accountable. Also, NGOs don’t really understand how this whole system works - they talk about supply chains but what does it actually mean and all the related issues of trade and the history of it and contextual sensitivities.” (SH1)*

Second, strategies for facilitating relationships between structurally distant stakeholders are targeted by stakeholders in netchains. Stakeholders utilizing such strategies attempt to bridge the socio-cultural gap between distant stakeholders and facilitate connection on a normative level.

*“That was sort of the turning point, where I could turn this into a business, being a connector and telling the story, basically branding these farming cooperatives if they produce high quality, get them to produce even higher quality while getting the roasters invested and emotionally connected to the farming community.” (SH4)*

Furthermore, collaborative strategies targeted on connecting diverse stakeholder relationships tend to utilize commitments of particular contributions in attempt to rejuvenate the coffee sector. Additionally, there seems to be an emphasis on empowerment of upstream stakeholders and demand driven contributions of collaboration.

*“We want to empower the farmers to understand their business and who knows where to invest and how to become more sustainable, meaning making more money out of their businesses but also looking into the environmental and the social performance.” (SH10)*

These types of collaborative strategies tend to focus on improving sustainable production or the quality of beans produced. Both netchain subcases tend to perceive level of quality as a proxy measure for coffee sector health and as a potential next step for market transformation beyond certification. This supports previous findings detailing an emphasis on the economic dimension of sustainability.

*“Most measures to upgrade quality automatically are good for the farmers. The environmental part is more of a challenge, because it doesn’t necessarily mean better coffee. However, a lot of measures that I’m talking about mean lower costs. So producing coffee more environmentally friendly with the right measures can actually save costs.” (SH4)*

Third, stakeholders in the coffee supply chain network are leveraging digitally enabled collaboration strategies and platforms to reduce complexity and streamline flows of information. However, large and powerful stakeholders are typically reluctant to utilize digital collaborative platforms unless the appropriate noncompetitive environment is established. This remains a difficult challenge for stakeholders utilizing digitally enabled collaboration strategies.

*“It’s the main disruption factor, which enables information to come through from both sides. Instead of it being stuck at the institutions who have—sometimes since colonial times—the information and the logistics network and the friends as well. Because it’s all large shipping companies and large importers and exporters, it’s all one family. It’s not in their interest to share. So all of that is disturbed when people figure out how to do that themselves.” (SH11)*

Finally, factors determining quality of the collaborative process amongst netchain stakeholders typically regarded three elements. The first of these elements, continuous learning and potential for innovation as a result of collaboration was highly regarded as a beneficial outcome of netchain collaboration. Second, vertical stakeholders particularly favored joint contributions to a netchain process, which yielded new capabilities. Lastly, the willingness of stakeholders to continue engaging in a collaborative endeavour or future collaborations within netchains contributed to successful evaluation of collaboration.

*“We knew that by collaborating with multiple stakeholders we would be challenged to see how good we could get. Through continuous learning and building new sets of tools and abilities, we’ve been able to strengthen our local capacities and provide a better service to our producers” (SH5)*

#### 5.4.2 Interpretation

Collaborative strategies are generally emergent in their formation due to the presence of multiple perspectives and contextual sensitivities. However, collaborative strategies appear to be planned initially by beginning with stakeholder engagement and outreach sessions. Clear establishing of competitive and noncompetitive environments and the use of digital platforms



appears to increase the incentive for varied types of stakeholders to opt into collaborative endeavours. Individual contributions seemed to be dependent on contextual position and the expertise of individual stakeholders in the netchains. Finally, high quality collaboration appeared to be associated primarily with learning and development, as well as long-term relationships contributing to future collaboration.

## 5.5 Synthesis

The proposed framework for netchain collaboration for more sustainable supply chains was used to interpret the findings of this exploratory research. Combining a transition and process model into one framework allowed for dynamic elements, such as relationships, and static elements, such as echelon position, to be analyzed congruently. Furthermore, combining the proposed conceptual framework with netchain analysis allowed for an examination of all types of interdependencies amongst collaborating stakeholders. The above was done in attempt to explore the complexities surrounding how stakeholders can effectively collaborate for sustainability goals.

Collaborative endeavours within global supply chain networks seem to spur from stakeholder pressure or a desire to achieve a more sustainability oriented state and communicating that vision amongst stakeholders. Stakeholder pressure as a catalyst for collaboration likely affects decision making of stakeholder organizations based on a risk assessment. Stakeholders resistant to collaboration may risk irrelevance or reputational value loss from business partners and consumers leading to further economic vulnerabilities. Conversely, initiating multi-stakeholder collaborative endeavours from a desire to transition towards more sustainability-oriented state may be a result of converging threat assessments amongst stakeholders. Regardless of the commencement factor, collaborative strategies appear to be planned initially.

Strategy development was observed to occur preliminarily with stakeholder outreach sessions, which aid to gauge contextual position and spur the collaborative process. This planned approach to strategy formation appears to be an archetypical stage in defining a pre-competitive zone for collaboration. However, high prevalence of fear of sensitive information disclosure amongst stakeholders in the coffee supply chain network may contribute to ineffective outreach sessions, which in term would result in stagnating alignment. Stakeholders in the coffee supply chain network were very candid in expressing the perceived value of information hoarding during semi-structured interviews. This was done on the belief that stakeholders believed their methods of operation were best practices and a source of competitive advantage. Securing a sustainable competitive advantage appeared to be at the top of stakeholder's priorities, even in the absences of explicit statement. Netchain stakeholders view sustainability primarily from an economic dimension—which is likely due to the transactional nature of a supply chain—and thus focus on productivity improvements. Therefore, in order to establish the appropriate conditions necessary for successful collaboration outcomes in competitive environments, input and throughput elements require a thorough exploration.

Input and throughput elements for collaboration were explored yielding several insights. Stakeholder relationships and antecedents seem to be highly influenced by the presence of trust and sharing, which may be facilitated by cognitive proximity and an understanding of contextual positioning. Trust and sharing appear to be mutually reinforcing elements considering the opaque nature of the coffee supply chain. Furthermore, avoidance of opportunistic behaviour and the exercise of power over dependent stakeholders are necessary to retain trust and continue collaborative endeavours for sustainability.

Collaboration resulting in beneficial learnings, capabilities, and innovations provide stakeholders incentive to continue engaging in collaborative pursuits. However, as previously mentioned, in order to effectively collaborate, stakeholders need to ascertain the necessary input and throughput elements. Investment into relationship building with netchain stakeholders appears to be a foundational strategy to improve collaborative outcomes. This may be due to the fact that preconditions, input, throughput and output of collaborations for sustainability require a multi-stakeholder approach. Therefore, emergent strategy formations are favoured to account for changes in dynamics and positioning over time, which is expressed by the cyclic nature of the proposed framework.

## 6. Discussion

The essence of this research was to assess how stakeholders in coffee netchains can collaborate to contribute to more sustainable supply chain networks. An investigation with a synthesized conceptual framework of a transformation and process-based approach was used to interpret the findings. The coffee market was used as a preliminary case study therefore, in order to generalize the findings, applications to other case studies are necessary.

Consistent with the existing findings on the inception of collaboration for sustainability pursuits as presented by Nyaga et al. (2013), Blome et al. (2014), and Simons (2014), stakeholder alignment within netchains around a common vision is a necessary precursor. However, stakeholder pressure was referenced as a highly contributing factor for the participation in collaborative endeavours. This may be explained by stakeholder perceptions of what Byrne & Power (2014) refer to as dictatorial collaborations initiated by larger more powerful stakeholders. Yet, the use of a netchain as a unit of analysis provides a multi-perspective and varied interdependencies to be examined concurrently (Lazzarini et al., 2001). Dictatorial collaboration may not necessarily be solely associated with vertical economic stakeholders creating transactional ultimata for less powerful stakeholders. Moreover, Fawcett et al. (2012) noted that when stakeholders do not collaborate effectively they risk irrelevance. Yet collaborative endeavours require a shift away from traditional behaviours, structures and cultures within stakeholder organizations.

Interdependence and a perception that stakeholders share the urgency to collaborate for a more economically resilient and sustainable supply chain network were noted in both netchain subcases. This finding is consistent with research conducted by Co and Barro (2009) on stakeholder dynamics in supply chain collaboration. This suggests a need for the understanding of contextual positioning during initial strategy formation. Agri-food supply chains are inherently adversarial business environments with low margins and high competition (Tsolakis et al., 2014). Therefore, contextual positioning in netchains offers a non-dyadic analysis of interdependencies and relationship dynamics between stakeholders with the inclusion of the broader business environment. Contextual positioning and cognitive proximity may influence the formation of what Co and Barro (2009) refer to as cooperative strategies amongst stakeholders, which are characterized by supportive attitudes and behaviours. Furthermore, the findings suggest fear of information disclosure by stakeholders is a key barrier to stakeholder alignment and understanding of contextual position. This findings is supported by Fawcett et al. (2012) whom remarked that stakeholders equated sharing of information with power loss and thus deeming collaboration as to risky. Finally, stakeholder emphasis on the economic dimension of sustainability amongst both netchain subcases is likely due to the transactional nature of supply chains. Due to the core function of a supply chain, the delivery of refined products to an end consumer is dependent on economic viability (Handfield & Nichols, 1999).

A successful outcome of collaboration involving stakeholders in varied positions requires mutual understanding of relationship dynamics in order to establish necessary antecedents. The findings of this research suggest that the presence of trust and sharing information, as well as knowledge, are two of the most critical factors for collaboration. This is consistent with the findings of various authors such as Cheng et al. (2008), Fawcett et al. (2012), and Soosay & Hyland (2015). However, it is important to note the paradoxical nature of such a claim in that trust and sharing are necessary antecedents for each other (Dyer & Nobeoka, 2000; Kwon & Suh, 2005). Thus, increased cognitive proximity may facilitate trust and sharing by understanding of contextual position amongst collaborating stakeholders. Research conducted by Dietrich et al. (2010) found that cultural proximity positively related to collaborative behaviour and project quality, which supports the findings in this research. Furthermore, better understanding of socio-cultural dynamics of the business environment in which stakeholders operate can aid in mitigating unrealistic expectations of commitments towards sustainability goals. Cognitive proximity may contribute to higher levels of affective trust, which is more suitable to long term collaboration as opposed to trust in stakeholders' specific capabilities. Thus, our findings suggest proximity is indeed a valid extension to Mitchell et al.'s classification of stakeholders and salience (1997).

Fostering affective trust may yield long-term relationships between collaborating stakeholders, which was found to be an outcome of successful collaboration. The findings with regard to throughput elements negatively affecting relationship dynamics amongst collaborating stakeholders, particularly the abuse of power, were consistent with a large majority of the literature (Cheng et al., 2008; Nyaga et al., 2013; Sridharan & Simatupang, 2013). This suggests that structurally powerful stakeholders pursuing operational control of a supply chain, such as vertically integrated traders who extend operations upstream by acquiring processing and export facilities, may inhibit sustainability goals by means of opportunistic behaviour. However, a larger sample size of netchains with vertical stakeholders integrated beyond single echelons is required to support the previous claim. Additionally, the findings of this research that long-term collaborative strategies between stakeholders in netchains require a high level of trust are consistent with the findings of Wu et al. (2014).

Outcomes of collaboration were found to be successful if new capabilities developed, the potential for learning and innovation was present, and stakeholders desired to engage in future collaborative endeavours. This finding is partially consistent with Dietrich et al.'s (2010) three factors for high quality collaboration outcomes: potential for learning, project success, and future collaboration. Interestingly, Dietrich et al. (2010) found that propinquity and socio-cultural proximity were antecedents to high quality collaboration. The findings of this research suggest propinquity is not necessarily a factor that influences collaboration outcome, especially when digital platforms are used to facilitate open communication. This finding further contradicts both Awaysheh & Klassen, (2010) and Grimm et al. (2013) who suggested increasing geographic distance negatively affects collaboration. Yet, it is important to mention the finding that a face-to-face meeting between stakeholders is the most effective method of communication and gaining trust with exchange partners.

Netchain subcases used for this research were engaged in collaborative projects, which were not yet fully completed, and thus it was not possible to judge project success. However, in the pursuit of sustainability goals, which are dynamic by nature and consistently evolving, project success as an outcome factor seems counterintuitive for sustainable supply chain network collaboration. Thus, supporting claims of factors negatively impacting collaboration outcomes is not possible. However, investment into long-term relationships amongst netchain stakeholders may be a mediating factor for successful sustainable collaboration. Investment into long-term relationships with collaborating stakeholders may help to facilitate sustainability goal pursuits in the presence of competitive business environments. Relationship health between stakeholders is likely a critical factor for addressing periphery issues such as farsighted vulnerabilities and supply chain sustainability. Issues that are not core to a stakeholders' business requires cooperation and alignment to a common goal (Simatupang & Sridharan, 2002). Pursuits of sustainability can offer this common target.

Netchains used as subcases for this research both aimed to improve productivity of upstream stakeholders yet differed in initial planned strategy. Sustainable production was therefore a common target for both netchains, however inclusion of the relationship with end consumers was only noted in netchain 2. In this research, it was found that upstream stakeholders negatively perceived development style aid such as investment without demonstrations of demand. Thus, Seuring and Müller's (2008) holistic approach of improving sustainability of supply chain networks utilizing all types of stakeholders including the end consumer is preferred as opposed to solely investing in upstream echelons. Cognitive proximity between primary producer and end consumer may support this claim if future research targets perception of these structurally distant stakeholders.

## 7. Conclusion

Preconditions, input, throughput and output elements for how stakeholders can effectively collaborate to contribute to more sustainable supply chains were examined using a conceptual framework and a case study of the coffee market. Two netchain subcase within the coffee sector were used as a unit of analysis consisting of collaborating stakeholders in a mutual pursuit of sustainability goals. It was found that stakeholders could collaborate through aligning towards a common vision and creating stakeholder specific commitments based on contextual capabilities and priorities, which is facilitated by cognitive proximity. Furthermore, targeting improvements at both ends of the supply chain through increased investment and fostering demand strengthens economic sustainability of the supply chain and allows for investment into periphery issues such as negative environmental impacts of production. Understanding stakeholders' position within a netchain is necessary to formulate strategies for collaboration and foster relationships to continue collaborative endeavours in the pursuit of sustainability goals. Contrary to existing literature, cognitive proximity seemed to be a more influential factor for successful collaboration than propinquity. Trust and sharing were found to be the most recurrent antecedents to collaboration and meaningful relationship dynamics amongst netchain stakeholders in the coffee sector. Conversely, the dependency and abuse of power seemed to negatively influence stakeholder's willingness to engage in collaboration for sustainability. Furthermore, it was determined that stakeholders can successfully develop strategies for network collaboration by embracing emergent strategy formations in an iterative manner to account for the large amount of varied perspectives with regard to improved sustainability over time. The framework used for this research could not be validated due to the use of a single case study. Thus, findings cannot be generalized to all supply chain networks prior to increasing the robustness of data through iterative case study analysis and increased sample sizes. Additional empirical evidence is required to justify the observations derived from this exploratory research.

### 7.1 Limitations

There are several limitations to the findings of exploratory research in this study. A number of newly emergent findings were identified, which require further empirical testing to ensure validity. Furthermore, the developed coding scheme was based on themes identified in the literature and consecutively expanded following data analysis which provides a source of selection bias. Next, comparability of the findings was not triangulated within each subcase since only two netchains were used. To improve reliability of the findings further research with a larger sample size is required. Also, the choice to categorize stakeholders in netchains based on position alone hinders replicability of the study. Creating more specific selection criteria for netchain stakeholders can improve the replicability, reliability, and validity of the findings. The findings derived from applications of the conceptual model and the exploratory nature of this research require further empirical testing on a larger sample size of netchain subcase datasets in the coffee sector. To conclude, in order to generalize the findings to other agri-food supply chain networks, the proposed framework must be tested using various agri-food commodities.

## 8. Recommendations for Practitioners

In addition to the conclusions derived from this study, several considerations are important for stakeholders in the coffee supply chain network aiming to effectively engage in collaborative endeavours for sustainability. First, establishing a farsighted vision for sustainability on a system wide level, which aligns all stakeholders around a common goal. The use of an emergent strategy as proposed by Mintzberg (1978) is recommended to account for dynamic changes in stakeholder attributes and context, as well as the prioritization of learning and discovery. Next, establishing a complete set of antecedents for collaboration amongst all stakeholders involved can mitigate abandonment of collaborative pursuits in turbulent times. To follow, leveraging digital platforms to connect geographically and socio-culturally distant stakeholders is recommended to transparently communicate progress. Additionally, establishing a mutually define set of key performance indicators for impact assessment will help to define an appropriate pre-competitive zone for collaborating stakeholders. Finally, shifting towards more direct trading relationships offers an alternative transaction strategy that would facilitate supply chain network resilience.

Goal congruence offers stakeholders engaging in a collaborative endeavour a common target to which individual capabilities can contribute to achieving. Therefore, stakeholder groups with similar characteristics and attributes can be grouped around types of commitments contributing to a successful outcome. Furthermore, this allows stakeholders to dynamically strategize on an individual level, yet retain a common pursuit. External factors such as market conditions and decreases in product demand by consumers can limit the ability of stakeholders to follow through on commitments. To mitigate abandonment of collaborative endeavours, mutually beneficial relationships and adequate preconditions and antecedents are necessary (Soosay & Hyland, 2015).

Establishing a complete set of antecedents for collaboration and effectively communicating them amongst all stakeholders involved and willing to engage in a mutual pursuit is recommended. The findings of this research suggested that stakeholders in both netchain subcases did not fully embrace antecedents of collaboration nor lacked an understanding of the role such antecedents may contribute to a resilient collaborative model. Process integration where necessary, mutuality as defined by shared risks, cost and rewards, conflict resolution, and expectations fulfillment were all lacking presence during this research. It is recommended that missing antecedents documented in the literature are incorporated into the input of a collaborative process. However, one amendment to the literature is recommended: mutuality should be contextually equitable such that shared rewards are associated with the level of input risk each stakeholder assumes.

Transparent communication of stakeholders' context and commitments can be achieved by leveraging digital platforms. Digital accessibility has increased exponentially in the past decades and as a result can facilitate connection between geographically distant stakeholders engaging in a collaborative affair. Collaborative communication amongst all stakeholders can bridge the gap between distant contextual positions and socio-cultural dynamics. Open and honest sharing

of non-commercially sensitive information can foster system wide trust. Furthermore, the use of digital platforms can clearly delineate between competitive and noncompetitive environments. Finally, digitally enabled collaboration provides a platform for continuous improvement and monitoring. This would allow stakeholders to benchmark themselves next to other stakeholders in similar contextual positions which will likely influence the willingness of stakeholders to continue engaging in future collaborations.

A further recommendation involves the establishment of a set of mutually defined key performance indicators to measure impact of sustainability initiatives. Such indicators will help to ascertain a pre-competitive environment in which collaborating stakeholders can target for improvement. This will help to align stakeholders around operational targets and allow for clear communication of improvements across the supply chain network.

Finally, shifting to more direct trading relationships offers an alternative transactional strategy that can improve resilience of the supply chain network. Direct trade is quality- and relationship centric, which can serendipitously provide benefits for each stakeholder along the coffee supply chain network. Quality production can aid to identify those stakeholders whom provide value added services during product refinement. Therefore, vertical stakeholders along the supply chain contributing to improved quality, such as appropriate processing at wet and dry mills, can generate larger revenues based on concrete value added procedures. It is important to note that stakeholders involved in delivering refined beans to end consumers without influencing the quality should appropriated profits based on function, not on higher margins of high quality products.

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# 11. Appendix

## A1 - Top 20 coffee producing countries

Central America	South America	Africa	Asia
Costa Rica	Brazil	Cote d'Ivoire	China
El Salvador	Colombia	Ethiopia	India
Guatemala	Peru	Kenya	Indonesia
Honduras		Tanzania	Papua New Guinea
Mexico		Uganda	Thailand
Nicaragua			Vietnam

## A2 - Semi-structured interview forms

### Semi-structured interview; collaboration and informational provision for more sustainable supply chain networks

This interview is being conducted with the objective of gathering expert opinions of sustainable information provision and collaboration from varied types of actors and stakeholders in the coffee sector. Data gathered will be used to understand the extent to which supply chain networks have shifted towards collaborative sustainability strategies in soft commodity supply chains and how relationship dynamics can support such a shift.

#### *Disclaimer:*

*All interviews will be recorded for the purpose of transcription, coding and analysis. Data from interviews will be used once coded using quotes and key variables identified by the researcher. Full confidentiality of information disclosure is established; information derived from interviews will be shared with the University and Host organization anonymously in the final thesis report. Should you have any questions/concerns prior to, during, or after the interview, please feel free to voice your apprehensions.*

*Transcriptions will be sent to you once completed in order to validate the content. Any retrospective questions or comments can be directed to Kale Jewell, k.jewell@students.uu.nl*

Location: \_\_\_\_\_ Date: \_\_\_\_\_

Name of organization: \_\_\_\_\_

Name: \_\_\_\_\_

Occupational title: \_\_\_\_\_

Duration of position held: \_\_\_\_\_

Duration within the organization: \_\_\_\_\_

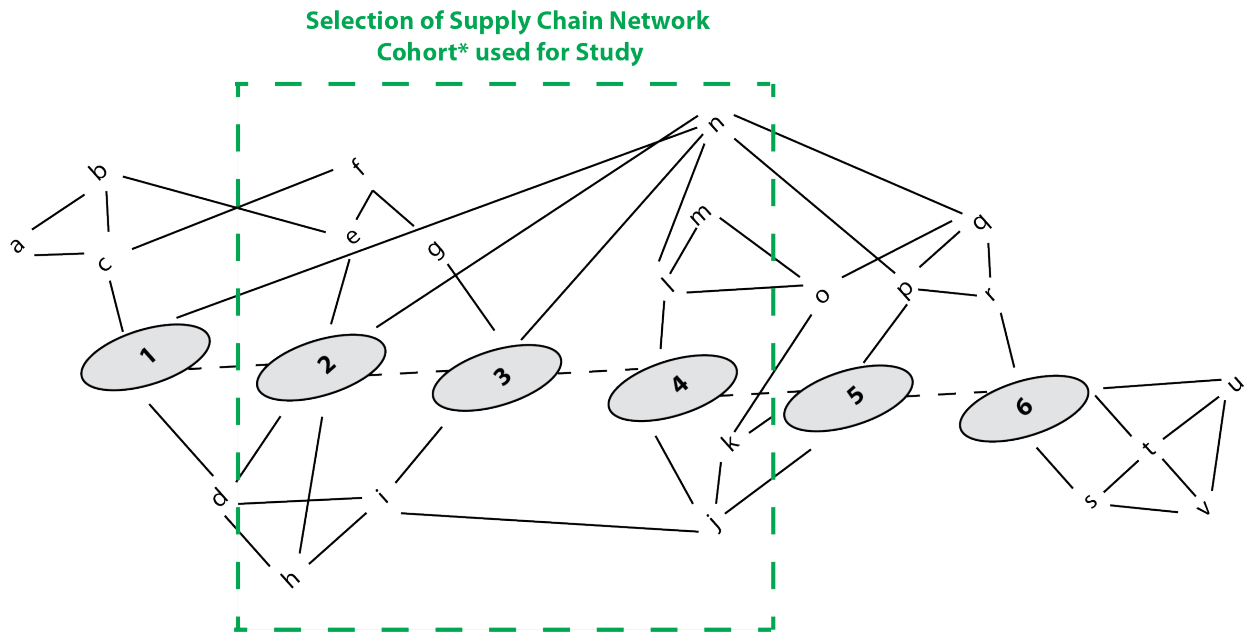
Time of interview start: \_\_\_\_\_ Time of finish: \_\_\_\_\_

1. Can you tell me about your role at \_\_\_\_\_?
  - a. What have been your responsibilities at \_\_\_\_\_?
  - b. What current projects are you working towards/on?
2. Can you tell me about your organization's current coffee supply chain?

- a. How is it structured, who are the players, your partners and networks?
  - b. Where is \_\_\_\_\_ situated in the supply chain network? What is \_\_\_\_\_ core business?
  - c. How proximate are you to other stakeholders and actors?
  - d. How does your organization monitor material, information and capital flows?
3. Does your organization have a vision for improved collaboration across its supply chain network?
  - a. Could you explain how this vision has been translated into practice with examples?
  - b. How has your organization operationalized this vision?
  - c. What systems and preconditions do you use to address collaboration?
  - d. What are critical factors to enable collaboration?
  - e. What are barriers to collaboration? Strategies to overcome them?
  - f. How do you assess improvements? Drawbacks? etc.
4. Who are the most important stakeholders within/amongst your organization's supply chain?
  - a. Why?
  - b. How does your organization classify stakeholders in/amongst the supply chain?
  - c. What socio-cultural elements influence stakeholder relationships?
  - d. How does proximity influence stakeholder relationships?
5. What is your organization's communication strategy with supply chain partners and stakeholders?
  - a. What are essential drivers of communication with supply chain actors?
  - b. What are essential elements of collaboration?
  - c. Does the information you exchange with stakeholders differ?
  - d. What difficulties do you run into when communicating with actors/stakeholders?
  - e. How do you mitigate such difficulties?
6. Can you describe your organization's strategy for future supply chain network development?
  - a. How does it differ from your existing supply chain network?
  - b. What are the areas targeted for improvement?
  - c. To what extent is sustainability, or sustainability information provision incorporated?
  - d. Do you leverage collaborative relationships to address sustainability challenges?
7. What is your organization's information provision strategy?
  - a. With whom do you provide information?
  - b. With whom do you exchange information?
  - c. With whom do you collaboratively derive or create information?
  - d. What is your disclosure policy?
  - e. How does this differ for non-monetary information?
    - i. What is the strategy for sustainability information?
    - ii. Could you provide examples of projects you've worked on?
8. What do you think is necessary for exchange of information amongst supply chain entities?
  - a. To what degree is collaboration a factor?
  - b. Is integration a factor?
  - c. To what extent are collaboration and integration utilized for information exchange?
  - d. What information does your organization disclose to chain entities?
  - e. What information do you obstruct or conceal?
  - f. How important is mutual benefits from information exposure?
  - g. When does your organization exchange information for competitive advantage?
  - h. When does your organization voluntarily disclose information?

- i. Is information exchange simply viewed as a transaction?
  - j. What is necessary to increase transparency?
9. What have been the enablers of sustainability information provision and collaboration amongst the supply chain network?
    - a. What strategies have been utilized to facilitate these drivers?
    - b. What drivers can influence other entities within/amongst the supply chain?
    - c. Do these drivers depend on organizational structures?
  10. What have been the barriers to sustainability information provision and collaboration amongst the supply chain network?
    - a. What barriers to information disclosure exist within your organization?
    - b. What barriers to obtaining information from chain entities exists?
    - c. How are these barriers mitigated? What strategies are used?
  11. To what extent does \_\_\_\_\_ utilize information systems to manage sustainability across the supply chain network?
    - a. What types of systems has \_\_\_\_\_ worked with or considered?
    - b. What role does ICT play in information provision?
    - c. What advantages does the use of ICT systems have?
    - d. What disadvantages does the use of ICT systems have?
    - e. To what extent is integration utilized? Why?
    - f. Could you provide examples?
  12. How do you think ICT can be used to improve sustainability information provision across the supply chain network?
    - a. What barriers of exchange can be overcome?
    - b. What barriers of exchange are the largest?
    - c. What socio-cultural dynamics influence the use of ICT as a provision tool?
    - d. How can ICT ensure cooperation without compromising competition?
  13. What is your biggest learning regarding sustainability information provision? Creating a more sustainable supply chain network and sector?
  14. What are the biggest informational risks with the coffee trade?
  15. If your organization integrates information systems with supply chain partners, do you think it will improve or threaten your organization's competitive advantage?
  16. How do you see the future of collaboration and sustainability information provision contributing to the overall sustainability of the coffee sector?
  17. What are the advantages and disadvantages of organizations urging for increased informational transparency amongst the supply chain?
  18. What does the future coffee market and supply chain network look like to you?

### A3 - Subcase selection schematic



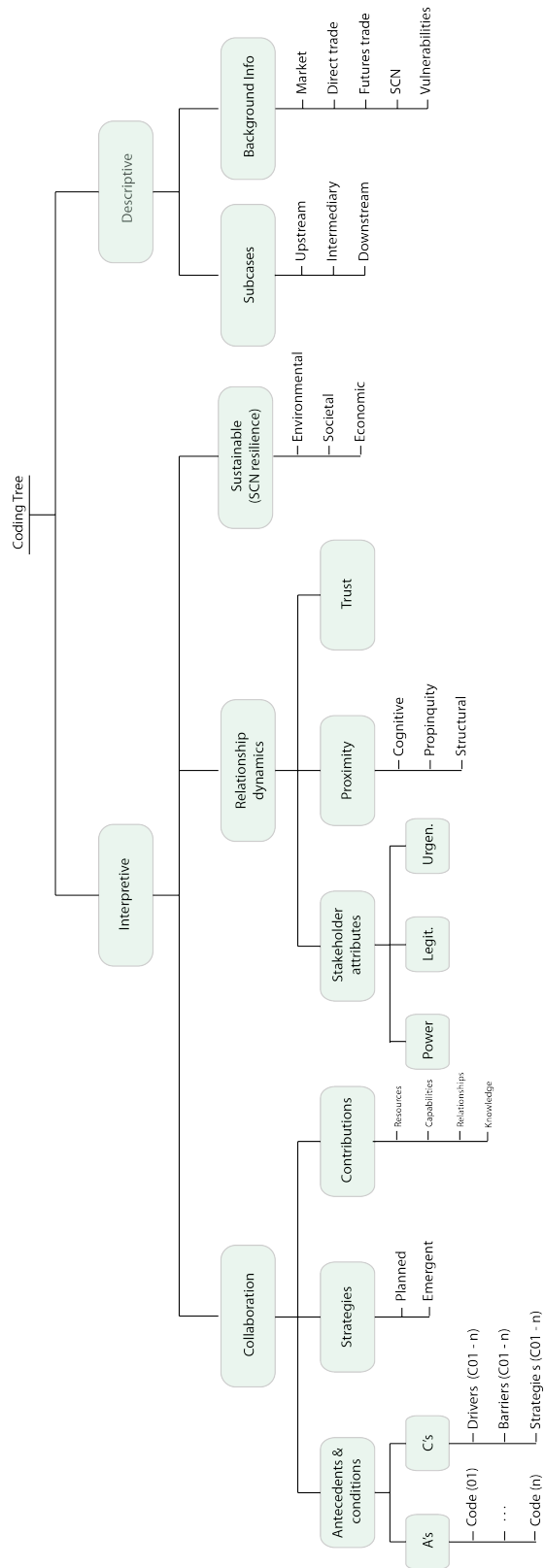
\* Cohort differs based on upstream origin. The selection was made to exclude individual subsistence farmers due to limited access to data. However, export authorities run farming operations in several cases. Thus, stakeholder between farmer and retailer were selected for study including spanning and secondary supply chain stakeholders.

#### A4 - Example of coded interview excerpt

Interview Excerpt	Codes
<p>A clear need in the sector for a new vision. Transparency. An opportunity for organizations to show what they are doing but at the same time to unstick the sector and make this next step. We have a number of organizations including [REDACTED] but also [REDACTED] the retailer who were like, we have our commitment in the case of [REDACTED] of 100% [REDACTED] certified, what's next? We know it doesn't solve everything, we will stick with [REDACTED] as our partner but there is more to do. Will it be with [REDACTED] or alongside. The example of [REDACTED] is that they have 99% [REDACTED] are the light but at the same time they also invest in farmer finance, 50 million, and we have a project working with them now in the US and Canada for each bag you buy they donate 70 cents, which is basically the price of a coffee tree. So one tree for every bag. We're going to have 5 million seedlings being donated, it's crazy. That's a commitment to rejuvenation in the coffee sector, that's a major issue. Like some farmers have had coffee trees for 30 years and production is going down and they don't know why.</p> <p>Yeah but cutting down trees doesn't really work in the mindset of a farmer, intuitively. So they rather chop down a piece of forest and plant new trees there than replace existing trees. So a quick overview of who we are in the sense of what we mentioned so far.</p>	<ul style="list-style-type: none"> <li>- Intermediary</li> <li>- C75</li> <li>- C62</li> <li>- C16</li> <li>- C42</li> <li>- Sustainable (environmental)</li> <li>- Collaboration               <ul style="list-style-type: none"> <li>- Emergent</li> </ul> </li> <li>- Sustainable (economic)</li> <li>- Sustainable (environmental)</li> <li>- Contributions (investment)</li> <li>- Contribution (knowledge)</li> <li>- C38</li> <li>- C28</li> </ul>



# A5 - Final NVivo coding tree



## A6 - Consolidated data & references codes

**Table A4.1** Compiled data per method of collection. Asterisk indicates the inclusion of values for SH11 in both netchains since SH11 is involved in both initiatives to improve supply chain network sustainability

<b>Subcase netchain</b>	<b>Interviews</b>	<b>Transcription pages (total)</b>	<b>Notes (pages)</b>	<b>Documents</b>
1	8*	94	24	13
2	7	97	32	15
<b>Total</b>	<b>14</b>	<b>177*</b>	<b>51*</b>	<b>25*</b>

**Table A4.2.** Coded dataset reference count

<b>Codes in Coding Tree</b>	<b>Reference Count</b>	<b>Codes in Coding Tree</b>	<b>Reference Count</b>
<b>Interpretive</b>	<b>2210</b>	<b>Descriptive</b>	<b>936</b>
<b>Relationship Dynamics</b>	<b>279</b>	<b>Background Info</b>	<b>921</b>
<b>Stakeholder Attributes</b>	<b>124</b>	Market	367
Legitimacy	28	Direct Trade	152
Power	90	Futures Trade	64
Urgency	6	SCN	291
<b>Proximity</b>	<b>92</b>	Vulnerabilities	47
Cognitive	42	<b>Subcases</b>	<b>15</b>
Propinquity	17	<b>Netchain 1</b>	<b>8</b>
Structural	33	Upstream	2
<b>Trust</b>	<b>63</b>	Intermediary	4
<b>Collaboration</b>	<b>1367</b>	Downstream	2
<b>Antecedents &amp; Conditions</b>	<b>1198</b>	<b>Netchain 2</b>	<b>7</b>
Drivers	196	Upstream	1
Barriers	423	Intermediary	4
Strategies	266	Downstream	2
Antecedents	313		
<b>Strategies</b>	<b>46</b>		
Planned	16		
Emergent	30		
<b>Contributions</b>	<b>123</b>		
Resources	51		
Capabilities	19		
Relationships	12		
Knowledge	41		
<b>Sustainable (SCN Resilience)</b>	<b>564</b>		
Environmental	152		
Societal	178		
Economic	234	<b>Total Reference Count</b>	<b>3146</b>

## A7 - Code descriptions for antecedents and throughput elements

Code	Type	Description	Code	Type	Description
C01	D	Mutual benefit	C43	B	Difficult to measure the impact of investments
C02	D	Performance improvement (Individual productivity & lower costs)	C44	B	Reluctance to share commercially sensitive information
C03	D	Performance improvement (chain)	C45	B	False conclusions derived from extreme transparency
C04	D	Environmental performance improvement	C46	B	Cost, investment and funding (uncertain ROI)
C05	D	Increase of green practices performance	C47	B	Complexity
C06	D	Increased sustainability (triple bottom line) performance	C48	B	Geographic distance
C07	D	Resource exploitation and capture efficiency	C49	S	Establish trust
C08	D	Development of new competencies/capabilities	C50	S	Use open and honest communication
C09	D	Securing market position or obtaining better market positioning	C51	S	Technology sharing
C10	D	Transaction uncertainty mitigation	C52	S	Collaborative communication
C11	D	Process improvements	C53	S	Resource and capabilities investment
C12	D	Customer demands for higher service levels	C54	S	Sectoral agenda setting
C13	D	Desire to build a winning supply chain network	C55	S	Inclusivity
C14	D	Better supply chain relationships	C56	S	Reframe barriers as opportunities
C15	D	Difficult to imitate by competitors	C57	S	Contextual flexibility
C16	D	Showcasing progress	C58	S	Use local implementers
C17	D	Stakeholder pressure	C59	S	Generate awareness to upstream stakeholders
C18	D	Pressure for more transparency	C60	S	Utilize open source resources
C19	B	Lack of trust	C61	S	Build long-term relationships
C20	B	Conflicts of interest	C62	S	Be transparent
C21	B	Opportunistic behaviour	C63	S	Manage dependance
C22	B	Local perspective	C64	S	Neutral facilitation
C23	B	Difficult to discern appropriate timing	C65	A	Trust between stakeholders
C24	B	Difficult to discern appropriate strategies	C66	A	Roles and process for collaboration
C25	B	Difficult to implement	C67	A	Commitments to project (high degree)
C26	B	Relationship difficulties	C68	A	Sharing (knowledge and information exchange)
C27	B	Incentive misalignment	C69	A	Goal congruence
C28	B	Socio-cultural distance (differences in perception)	C70	A	Incentive alignment
C29	B	Differences in goals and objectives	C71	A	Joint decision making
C30	B	Poor communication	C72	A	Cultural proximity
C31	B	Asymmetric information and exchange	C73	A	Physical proximity
C32	B	Structural barriers	C74	A	Honesty and openness
C33	B	Abuse of power and dependency	C75	A	Sector wide vision
C34	B	Market conditions	C76	A	Clearly defined commitments
C35	B	Inappropriate performance indicators	C77	A	Links to intergovernmental policy
C36	B	Outdated policies	C78	A	Understanding context
C37	B	Miscommunication	C79	A	Meaningful relationships
C38	B	Resistance to change / Can't see the incentive	C80	A	Process integration (where necessary)
C39	B	Losing market share	C81	A	Mutuality as defined by shared risks, costs and rewards
C40	B	Fear of duplication of effectors	C82	A	Conflict resolution
C41	B	Local institutional structures	C83	A	Expectations fulfillment
C42	B	Sectoral lock-in			