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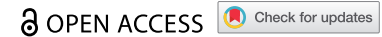


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RESEARCH ARTICLE



Practicing coopetition for food supply chain sustainability: a contextual perspective in the Norwegian fishing industry

Magoti Harun ^a, Deodat Mwesumo ^a, Heidi Hogset ^a and Amar Ramudhin ^b

^aMolde University College-Specialized University in Logistics, Department of Logistics, Molde, Norway; ^bDepartment of logistics, University of Hull, Business School, Hull, Kingston upon Hull, UK

ABSTRACT

With growing concerns about sustainability, competing companies in the food supply chain are compelled to engage in non-traditional forms of collaboration. Coopetition (i.e. horizontal collaboration with competitors) is gaining attention as a means of improving sustainability performance in supply chains. However, little is known in the existing literature about the causal mechanism and conditions of coopetition to improve supply chain sustainability in the food industry. Based on an embedded case study in the Norwegian fishing industry, we posit several propositions and develop an empirical framework delineating the relationship between coopetition and supply chain sustainability. The case study research is informed by semi-structured interviews corroborated by relevant secondary data. Our findings reveal a set of dynamic capabilities through which coopetition improves supply chain sustainability. Besides, laws and regulations, and certification and standards, positively impact the relationship between coopetition and supply chain sustainability. Conversely, insufficient funds, conflicts of interest, and firm size affect the same relationship negatively. This study contributes to the literature by providing valuable insights into coopetition as a source of dynamic capabilities. In addition, our results show how coopetition can best be leveraged by managers to improve the sustainability of the food supply chain.

ARTICLE HISTORY

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KEYWORDS

Coopetition; Supply chain sustainability; dynamic capabilities; Food industry

1. Introduction

Growing awareness of and interest in food supply chain sustainability (FSC sustainability) is evolving in line with market demands and conditions, concerns about food quality and safety, and environmental impacts (Gruchmann, Seuring, and Petljak 2019; Feng, Xueyan, and Orji 2021). Concerns about supply chain sustainability in the food industry are understandable, as food production is responsible for more than one-third of global greenhouse gas (GHG) emissions (Adams, Donovan, and Topple 2021; Singh, Yash Daultani, and Sahu 2022). More so, it has a significant socio-economic impact on society at large (León Bravo, Verónica, and Caniato 2021; Golini et al. 2016). Consequently, companies in the food industry are under constant scrutiny from various groups, including government and non-government organisations, other stakeholders, the public, and consumers (Beske, Land, and Seuring 2014; Adams, Donovan, and Topple 2021; Allen, Zhu, and Sarkis 2021). In response, individual companies continually invest and commit to independent projects and initiatives to implement sustainability practices in their supply chains (Govindan 2018; Li et al. 2014). According to Heydari, Govindan, and Basiri (2020), a survey of companies showed that 80% wanted to make their supply chains sustainable and were willing to change their policies to comply with new environmental regulations and market demands. Increasingly, companies across different industries are committing to implementing sustainability measures. For example, MOWI fishing company has committed to reducing 72% of

GHG emissions in its fisheries supply chains by 2050 (Vindheim 2019), while Nestle has committed to ensuring that 100% of its packaging is recyclable or reusable by 2025 (Schneider 2020). Besides environmental sustainability, companies are committed to promoting decent labour conditions and diversity (Feng, Xueyan, and Orji 2021). Despite these efforts, FSC sustainability cannot be improved only through individual initiatives and independent projects (Nagurney and Nagurney 2010). Companies are encouraged to collaborate across their supply chains to increase responsiveness to market demands and conditions in different industries (Rezaei Vandchali, Hadi, and Chen 2021; Nasrollahi et al. 2020). As such, recent studies (e.g. Seuring, Aman, and Hettiarachchi 2022; Nasrollahi et al. 2020) have highlighted collaboration as one of the key management strategies for improving sustainability performance.

Previous studies have examined the importance of collaboration in improving the overall performance of firms, especially small firms (Rezaei Vandchali, Hadi, and Chen 2021; Adams, Donovan, and Topple 2021; Nasrollahi et al. 2020). The two types of supply chain collaboration in the literature are vertical and horizontal collaboration. Of these, horizontal collaboration with competitors (i.e. coopetition) has been little studied in the context of supply chain sustainability (Christ, Burritt, and Varsei 2017; Mirzabeiki, Qile, and Sarpong 2022; Jalali et al. 2021; Heydari, Govindan, and Basiri 2020). For example, a literature review by Chen et al. (2017) found neither a case study nor a study based on survey

methods that discussed collaboration with competitors for sustainability performance. In response, recent studies (e.g. Seuring, Aman, and Hettiarachchi 2022) call for further research focused on collaboration beyond traditional supply chain actors to improve sustainability performance in supply chain.

Moreover, cooptation and supply chain sustainability require support from a contemporary management system (Rezaei Vandchali, Hadi, and Chen 2021) and a set of relevant capabilities (Bengtsson, Raza-Ullah, and Vanyushyn 2016; Gnyawali and Park 2011). Recent contributions therefore call for examining causal mechanisms, and contextual factors or contingencies that influence the effect of cooptation on supply chain sustainability in dynamic industries (Mirzabeiki, Qile, and Sarpong 2022; Christ, Burritt, and Varsei 2017; Crick and Crick 2021). This is because without a clear understanding of the contingencies in a dynamic industry such as food, it is difficult to maximise the benefits of cooptation (Bacon, Williams, and Davies 2020; Gernsheimer, Kanbach, and Gast 2021). Norway, for example, uses a holistic or ecosystem-based approach to fisheries management (Larsen 2020). This approach recognises the importance of collaboration with non-traditional actors, capabilities and skills in the supply chain, and regulations to promote sustainable development (Lindland, Brita Gjerstad, and Ravagnan 2019; Hjellnes, Rustad, and Falch 2020; Silva, Dias, and Gold 2021). The present study responds to the recent calls for research by examining how cooptation practices in the fishing industry impact sustainability performance. Specifically, the study addresses two research questions:

RQ1: How does practising cooptation in the fishing industry improve supply chain sustainability performance?

RQ2: What contingencies influence the relationship between cooptation and supply chain sustainability in the fishing industry?

This study advances the existing body of knowledge in three ways. First, to the best of our knowledge, it is one of the early studies that explore the causal mechanisms through which cooptation impacts sustainability performance. Hence, we provide valuable insights for the supply chain managers involved in sustainability initiatives. Second, the present study uses a contingency approach to empirically identify factors that affect the relationship between cooptation and FSC sustainability. Finally, we propose future research opportunities related to cooptation and supply chain sustainability in dynamic industries such as the food industry.

The remainder of this paper proceeds as follows. Section 2 provides a theoretical background, followed by Section 3, which outlines the methodology followed in the study. Section 4 presents the findings along with a discussion that places them in perspective. Subsequently, Section 5 draws on the results and provides the managerial and theoretical contribution of the study. Finally, the conclusion section identifies the limitations of the study and opportunities for further research.

2. Theoretical foundation

2.1 Food supply chain (FSC) sustainability

The most widespread and shared interpretation of sustainability is the one that underlines the balancing of social, economic and environmental issues in a firm's performance (the triple-bottom-line) (Elkington 1998). The existing literature provides valuable insights on sustainable supply chain management (Seuring, Aman, and Hettiarachchi 2022; Zhou, Pullman, and Zhiduan 2021; Pagell and Shevchenko 2014; Seuring and Martin 2008; Rajesh 2020; Nagurney and Nagurney 2010). Zhou, Pullman, and Zhiduan (2021) argue that sustainable supply chain management principally constitutes a proactive stance of firms towards integrating environmental, social and economic issues. Similarly, Rajesh (2020) and Nagurney and Nagurney (2010) recommend that managing a sustainable supply chain should entail integrative decision-making by considering the triple bottom line across the supply chain. This paper defines FSC sustainability as optimising food supply chain performance considering economic, social, and environmental sustainability.

There is empirical evidence in the existing literature of the challenges that impede supply chain sustainability performance in the food industry (León Bravo, Verónica, and Caniato 2021). Examples include structural inefficiencies or lack of coordination (Carolina and Ellen 2018; Rezaei, Vandchali, Hadi, and Chen 2021; Siddh et al. 2021; Nasrollahi et al. 2020), industry dynamism and environmental externalities (Govindan 2018; Beske, Land, and Seuring 2014) and conventional food distribution (Gruchmann, Seuring, and Petljak 2019). Consequently, these challenges have led to increased GHG emissions, turning 30–50% of produced food into waste or loss (Singh, Yash Daultani, and Sahu 2022; León Bravo, Verónica, and Caniato 2021). Optimising sustainability goals in the food industry is justified by its significant percentage contribution to GHG emissions and increasing population growth (León-Bravo, Caniato, and Caridi 2018; Dania et al. 2018; Tarnanidis, Papathanasiou, and Subeniotis 2019; Singh, Yash Daultani, and Sahu 2022). For example, a recent report by Crippa et al. (2021) shows that the food industry accounts for 34% of GHG emissions globally, attributing it to energy use, food-related practices, technology, and waste. However, many supply chain actors struggle to balance the triple bottom line and their organisational structure (Siddh et al. 2021; León Bravo, Verónica, and Caniato 2021). As a result, recent studies (e.g. Rajesh 2020; Nagurney and Nagurney 2010) suggest achieving a sustainable supply chain through integrative decision-making across the supply chain.

2.2 Cooptation and FSC sustainability

Cooptation is prominently defined as simultaneous cooperation and competition interaction between firms regardless of whether they are involved in horizontal or vertical relationships (Bengtsson and Kock 2014; Abdalla et al. 2022). In other words, cooptation occurs when competitors cooperate on some value-adding activities while competing on other value-

adding activities within the same supply chain (Ritala 2001; Bengtsson and Kock 2000).

The existing literature shows that there are increasing efforts to address these challenges. Several approaches have been proposed in previous studies. Examples include the development of sustainable supply chain frameworks (Govindan, Shaw, and Majumdar 2021; Manzini and Accorsi 2013), life cycle assessments (Gosalvitri et al. 2021), an integrative decision-making model or framework (Rajesh 2020; Flores et al. 2008) and alternative food supply chains (Gruchmann, Seuring, and Petljak 2019). However, the results of these efforts have not been satisfactory due to differences in independent management approaches, supply chain network embedment, and individual sustainability commitments and initiatives (Rezaei Vandchali, Hadi, and Chen 2021; León Bravo, Verónica, and Caniato 2021). As such, supply chain partners must increasingly build collaborative relationships while remaining competitive without harming the environment, people, or society, especially in highly dynamic industries such as the food industry (Carolina and Ellen 2018; Nasrollahi et al. 2020; Kumar, Subramanian, and Arputham 2018). Accordingly, a new form of collaboration, such as coopetition, is advocated to address the current challenges in the food industry (Gernsheimer, Kanbach, and Gast 2021; Crick and Crick 2021).

Coopetition goes beyond the orthodox rules of the business relationship between cooperation and competition (Luo 2007;

Hamel, Doz, and Prahalad 1989). This is because competitors who cooperate go beyond exogenous requirements, i.e. out of altruism or concern for the welfare of other stakeholders (Heide and Miner 1992). When competing firms cooperate, they tend to ignore the assumption of risk propensity as it is encompassed in the social aspect by considering the future of society as a whole and the indeterminate interaction (Hung and Tangpong 2010; Heide and Miner 1992). The food industry provides the subjects for interactions between actors that influence the tendency to cooperate indefinitely. This is due to existing environmental externalities, market conditions, regulatory requirements and technological change that have no end point (Wiengarten, Pagell, and Fynes 2012; Beske, Land, and Seuring 2014).

Previous studies have documented the impact of coopetition on firms' supply chain sustainability performance (see examples in Table 1). For instance, Bengtsson and Johansson (2014)'s findings show that coopetition can strengthen firms' market power through joint product-market strategies that help improve financial performance. Likewise, coopetition can promote sustainable innovation as firms share complementary capabilities to develop friendly environmental technology (Gnyawali and Park 2011; Munten et al. 2021; Mirzabeiki, Qile, and Sarpong 2022). For example, Limoubpratum, Shee, and Ahsan (2014) confirm that sharing distribution or transport facilities between competitors reduces GHG emissions. Similarly, Christ, Burritt, and Varsei

Table 1. Review of published articles on coopetition for sustainability.

Author (s)	Research objective	Findings
Christ, Burritt, and Varsei (2017)	To identify potential benefits and problems of sustainability-based coopetition strategies using an actual cooperative agreement between two companies in the Australian wine industry	<ul style="list-style-type: none"> • Each cooperating company's profitability increased due to the efficient use of transportation capacity. • Improved environmental performance, particularly in terms of reduced carbon dioxide emissions from increased bulk shipments • It is problematic to balance economic performance with other sustainability aspects (e.g. the environmental aspect). • The importance of recognising and incorporating collaborative competition strategies into environmental and sustainability management debates, standards, guidelines, and codes • The outcomes of cooperative strategies depend on the market and environmental dynamics of the industry as they evolve.
Limoubpratum, Shee, and Ahsan (2014)	Investigates whether coopetition strategy can lead to sustainability in the transport industry.	<ul style="list-style-type: none"> • The findings reveal cooperative strategies lead to improved economic, social and environmental performance
Jalali et al. (2021)	To investigate the impact of coopetition within a closed-loop supply chain (CLSC) in the electronics industry.	<ul style="list-style-type: none"> • Coopetition strategies increase the economic and environmental performance of all members within the closed-loop supply chain network. • The study revealed scenarios (e.g. market demand and consumer preference) under which companies engage in cooperative strategies.
Mirzabeiki, Qile, and Sarpong (2022)	To identify drivers, facilitators, and barriers of coopetition for supply chain sustainability in various industries such as the food industry, transport etc.	<ul style="list-style-type: none"> • Coopetition is an innovative type of interorganisational relationship to meet triple bottom line (economic, social and environmental) objectives to gain a competitive advantage • Coopetition enables participating firms to develop rare capabilities.
Crick and Crick (2021)	To investigate whether coopetition strategy can lead to improved economic performance in the wine industry.	<ul style="list-style-type: none"> • Cooperative strategies lead to improved economic performance • The relationship between coopetition and economic performance is contingent on competitive intensity and competitor orientation
Munten et al. (2021)	To investigate tensions related to coopetition for sustainable innovation in the automotive industry.	The study identified four broad tensions between competitive strategy and cooperation in striving towards sustainability at the firm and societal levels.

(2017) note that co-competition through dual sourcing reduces greenhouse gas emissions, subsequently improving sustainability performance. Overall, Gernsheimer, Kanbach, and Gast (2021) conclude that co-competition can address sustainability challenges because it stimulates mutual commitment and learning between firms towards optimising sustainability goals. Despite its benefits, co-competition is also seen as a source of additional financial and time costs, loss of control over critical activities, unintended knowledge loss, unscrupulous opportunism, and profit-sharing problems (Morris, Koçak, and Alper 2007; Munten et al. 2021). We argue that the inconclusive results in the existing literature regarding the importance of co-competition are likely due to a lack of investigation of causal mechanisms and exclusion of context.

3. Methodology

3.1 Research Context: Co-competition practices in the Norwegian fishing industry

Fishing gear and instruments, waste management, healthy stocks, and controls are common targets of sustainability measures in the Norwegian fishing industry. Fisheries waste, for example, has become a symbol of the fishing industry's global ecological crisis. To address this challenge, Norway was the first country in the world to introduce a ban on discards in 1987, more than 30 years before its European Union counterparts (Larsen 2020). Similarly, in implementing other sustainability measures, Norway uses an ecosystem-based approach to manage the fishing industry (Lindland, Brita Gjerstad, and Ravagnan 2019). This approach recognises the importance of collaboration throughout the fisheries supply chain. For example, a collaborative sustainability initiative project – the Fishing for Litter Project – was introduced in 2017. The project scheme involves competing for fishing vessels to fight against marine litter and bycatch. Companies receive supply chain subsidies as an incentive to implement the project (Johnsen et al. 2020). Pakdeechoho and Sukhotu (2018) found that supply chain incentives prompt companies to participate in collaborative sustainability projects and improve sustainability performance in their supply chains. For example, in 2020 alone, 208 tonnes of fishing litter were collected (Johnsen et al. 2020).

To understand the context and types of collaboration in the Norwegian fishing industry, we needed to conduct an extensive literature review, as suggested by (Silva, Dias, and Gold 2021; Stuart et al. 2002). It turned out that the whitefish industry met our research objectives, as co-competition is widespread in this sector. Different fishing associations are formed depending on geographic location. Competing fishing vessels with varying fishing techniques (e.g. longliners and trawlers) are represented in the same association (Hjellnes, Rustad, and Falch 2020). Through initial contacts with individuals involved in the fishing industry, we confirmed that the Norwegian Frozen at Sea (NFAS) association meets the requirements of our research design for case selection, as discussed in the next section.

3.2 Research design and case selection

This exploratory study uses an embedded case design (see Figure 1). The decision to choose a case study is based on

Norwegian Frozen at Sea (NFAS)

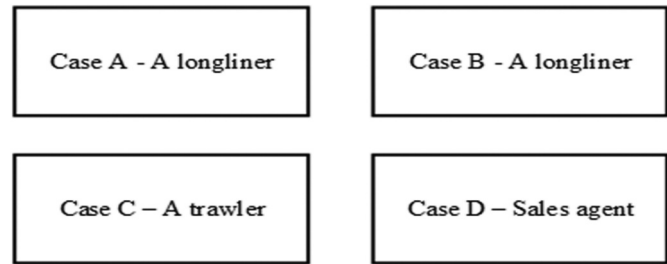


Figure 1. Embedded case study.

four reasons. First, the case study research design allows for extensive data collection to draw plausible conclusions from a small study population (Miles, Michael Huberman, and Saldana 2020). Second, case studies allow for in-depth interviews, making it relatively easier to understand the context (Bengtsson and Kock 2000). Third, case studies are suitable for investigating contemporary phenomena, such as co-competition in the food industry, where there is insufficient empirical research (Thomas 2016). Finally, an ecosystem-based approach and strict laws and regulations in Norwegian fisheries management make this phenomenon complex, so a case study design is appropriate.

In line with our research objective, we selected and analysed cases based on the following criteria: (a) firms that compete and cooperate simultaneously within the same food industry and market, (b) cooperating firms embedded in the same network and (c) evidence of ongoing cooperative activities in both ends of their supply chains; upward and downstream. NFAS association members meet these criteria. For example, the selected cases within NFAS use the same sales organisation for all first-hand sales.¹ Meanwhile, firms compete in selling non-first-hand products using their own sales agent. We applied purposive sampling (Miles, Michael Huberman, and Saldana 2020) and selected four cases within the NFAS association: two longliner vessels, one trawler, and one sales agent. The four cases fall within the requirements of the research objective. Moreover, the selected number of cases is within the recommended sample size threshold of two to four for a small study aiming to cover the context and generate potentially relevant variables (Eisenhardt 1989). In addition to the 4 cases, we used the administrator of NFAS as an informant.

3.3 Data collection

We collected both primary and secondary data. Semi-structured interviews were the primary sources of data. According to Thomas (2016), in-depth semi-structured interviews are more suitable for data collection in small companies. The key informants involved in the interviews were directors or managers with sustainability knowledge. Due to COVID-19 restrictions, all the interviews were conducted and recorded on Zoom or Microsoft Teams. Subsequently, the interviews were transcribed following the data protection guidelines issued by the Norwegian Centre for Research Data (NSD). The compiled interview transcripts amounted to 58

pages, excluding handwritten notes taken during the interviews. Archival sustainability reports, webpages, laws and regulations, and research reports related to the fishing industry were reviewed as secondary data for triangulation or to corroborate the primary data. The secondary data collected complemented each other, as Miles, Huberman, and Saldana (2020) suggested. The secondary data collected included approximately 212 pages that were used to validate the contradictory and inconsistent statements in the cases identified in the primary data. Table 2 summarises these sources.

3.4 Data Analysis

To begin our analysis, we conducted a descriptive exploration of the entire data set using qualitative analysis software (i.e. NVivo 12 Pro). We focused on the most frequently mentioned words: sustainability, food, knowledge, regulations, quotas, certifications, size and funds, technology, and standards. Next, we developed codes according to the analytical procedures recommended by Gioia, Corley, and Hamilton (2013). Using an abductive reasoning approach (Kovács, Remko, and Spens 2005; Vanover, Mihás, and Saldaña 2021), we gained an initial understanding of coopetition practices in the Norwegian fishing industry and relevant contextual factors. Furthermore, we conducted content analysis to develop meaningful themes by aggregating the emerging codes that explain the conditions influencing the relationship between coopetition and supply chain sustainability in the fishing industry (Stuart et al. 2002).

In this iterative process, we moved back and forth between literature and our data, exploring how existing concepts might explain or be challenged by the data (Vanover, Mihás, and

Saldaña 2021). Each author coded differently, and when disagreements arose, adjustments were made. This process continued until a set of theoretical concepts emerged that explained the phenomenon (Vanover, Mihás, and Saldaña 2021; Gioia, Corley, and Hamilton 2013). As a result, the second-order concepts were aggregated into three dimensions underlying the mediating, strengthening and weakening factors that influence the relationship between coopetition and FSC sustainability. Figure 2 summarises the analytical procedure.

4. Results and Discussion

Our analysis reveals that coopetition for FSC sustainability is associated with capabilities and mindset categorised into four main factors (1) Knowledge development, (2) Organisational responsiveness, (3) Reflexive control, and (4) Sustainability consciousness (see Figure 3). In the second part of our findings, we explain how laws, regulations, standards, and certifications strengthen the relationship between coopetition and FSC sustainability performance. Finally, we identify insufficient funds, conflicts of interest, and firm size as weakening factors.

4.1 Mediating factors

Using the analytical approach presented in Figure 2, we found that knowledge development, organisational responsiveness, and reflexive control are capabilities through which coopetition can improve sustainability performance. Interestingly, the mediating factors revealed by our analysis are equivalent to the dynamic capabilities discussed in the extant literature (Siems,

Table 2. Primary and secondary data collected.

Primary data				Secondary data				
Firm	Details	Firm size	No. of Interviews	Interview length (Min.)	Transcribed Min	Transcribed pages	Interviewee (Code)	Internal & External sources
CASE A	A family-owned and operated company that owns and operates longline fisheries	Small	1	75	66	11	Manager, CA	<ul style="list-style-type: none"> ● Fisheries Act ● Sustainability reports (49 pages) ● Webpages (Cases-10 pages) ● NSC (3 pages)) ● MRA (11 pages), ● FHS-WMR (6 pages) ● Standard guidelines (7 pages) ● Press release (2 pages) ● Articles of association (10 pages) ● Marine research institute (114 pages) ● Marine Resource Act
CASE B	A longliner producing fillets on board, mainly of cod and haddock	Small	1	45	39	9	Director, CB	
CASE C	A family-owned trawler that produce fillets on board	Small	1	65	58	12	Director, CC	
CASE D	Sales agent	Small	2	90	75	18	Manager, CD; Director CD	
Administrator	Administrator that represents the interest of vessels owner within the same association	N/A	1	60	56	11	Director, NFAS	
Total			6	335	294	61		

Acronyms: NSC- Norwegian Seafood Council; FHS-WMR- First-Hand sale of wild marine resources acts and regulations; MRA- Marine Resource Act

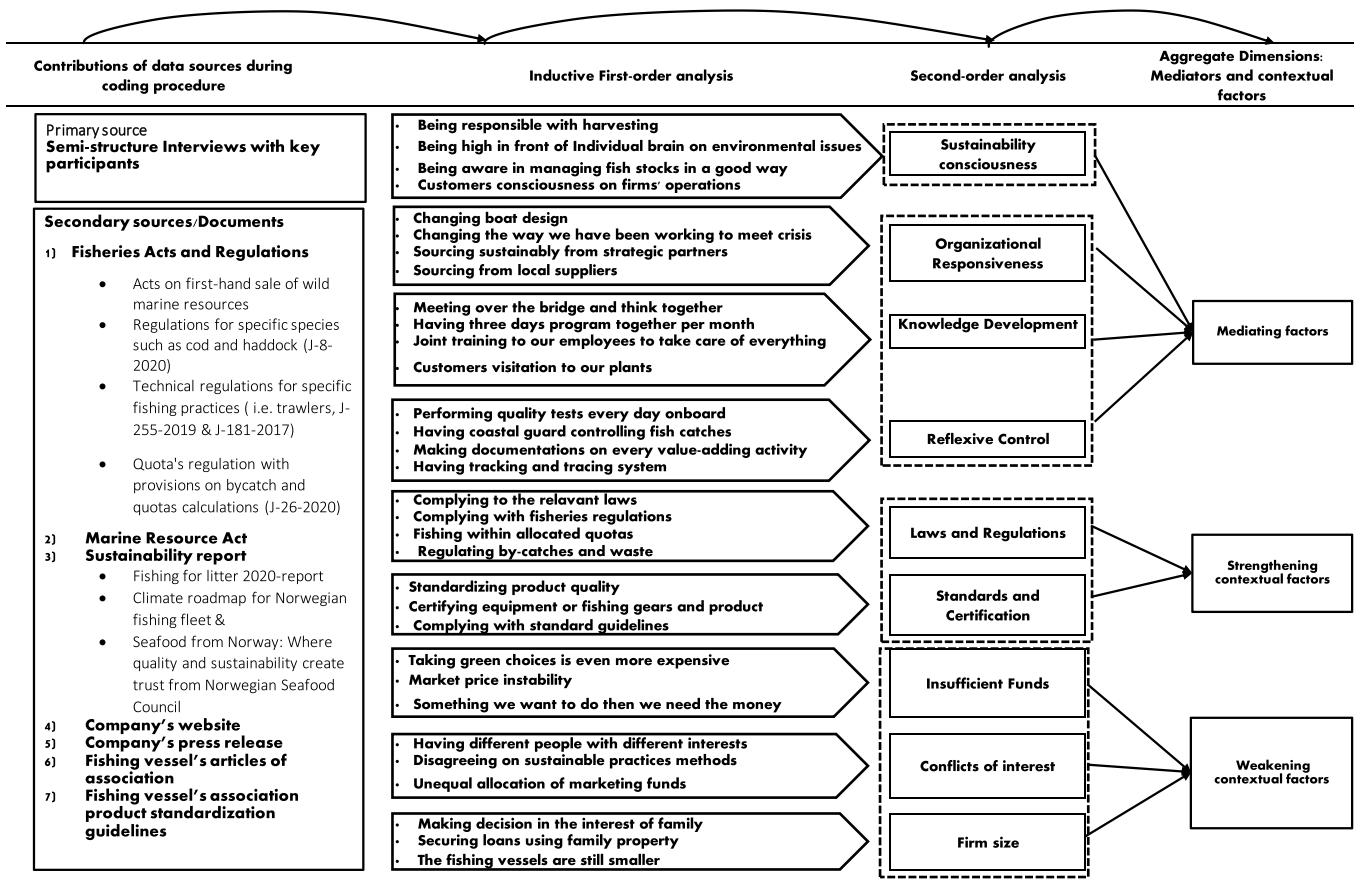


Figure 2. Analytical procedure.

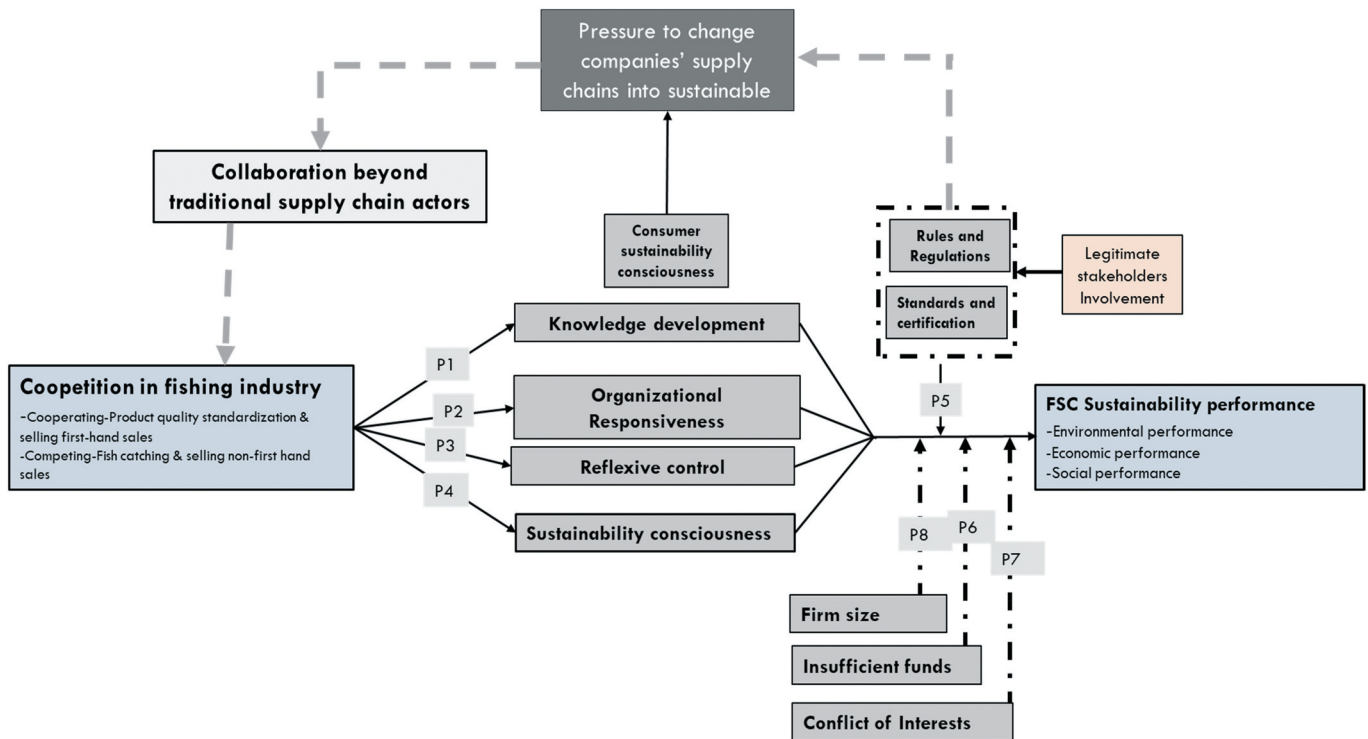


Figure 3. Empirical framework.

Land, and Seuring 2021; Beske, Land, and Seuring 2014; Gruchmann, Seuring, and Petljak 2019; Zhou, Pullman, and Zhiduan 2021). However, unlike previous studies (Siems, Land, and Seuring 2021; Beske, Land, and Seuring 2014), our results are based on an empirical analysis rather than a literature review. Similarly, in contrast to Mirzabeiki, Qile, and Sarpong (2022) and Zhou, Pullman, and Zhiduan (2021), our analysis explains how coopetition engenders dynamic capabilities relevant to improving supply chain sustainability performance rather than static capabilities of the firm.

4.1.1 Knowledge Development

In line with (Beske, Land, and Seuring 2014), we define knowledge development as practices that enable the acquisition of new knowledge and the evaluation of the current knowledge of the partners involved in the coopetition strategy. Our analysis shows that the coopetition strategy promotes team cohesion as firms are willing to share knowledge with their partners. As one interviewee noted, ‘... in this group, instead of each actor sitting on their own knowledge network, we try to combine the knowledge we have ...’ (Manager, CA). To develop and evaluate new knowledge, the coopeting companies meet regularly and conduct joint programmes to respond to customer needs and fill knowledge gaps. Besides, key customers from different parts of the world are invited to visit fishing boats in Norway. As one interviewee noted ‘... we also have customers from UK visiting us on board vessels to inspect our operations on board and also the crew; then they can give us a certificate of approval ...’ (Director, CB). In this way, customers become knowledgeable about the production process. The result is that fishing vessels increase their ability to meet customers’ requirements and improve customers’ confidence in product quality and the reputation of fishing practices. Consequently, companies can retain their customers for a long time, thus sustaining their business. The following quote can illustrate this: ‘... many times, we see that they have different points of view because, in the end, the buyer doesn’t know anything about the fishery, or the fisherman doesn’t know anything about the final market ... we meet each other and think together’ (Manager, CA).

In addition, customers are invited by the NFAS association to participate in a competition. The goal is not only competition, but that fishers and customers have program together to synthesise knowledge. As the director for CD said: ‘each year in Britain there is a big competition; the fish and chips award (...) and every year we invite the ten finalists ... we invite them to have a three-day programme together’. Customer visits to fishing operations are an essential incentive for companies to move towards more sustainable fishing practices as customers are conscious of environmental impacts and food safety. Jalali et al. (2021) suggest that customers’ increased sustainability awareness is forcing companies to meet them regularly.

Furthermore, since marketing activities are part of the collaboration, companies use the Seafood Council to provide market information to consumers on behalf of the companies. Jointly organising the marketing of seafood, especially whitefish, improves the marketing knowledge of each company and protects the brand and reputation of Norwegian seafood. Thus, companies can easily reach the world seafood market. The

director for CD noted: ‘they promote seafood from Norway and make sure that we have market access. Also, they serve as an information channel as they go out and ensure that all matters related to the seafood industry in Norway are communicated correctly’. The result is that fishing companies expand the customer base for their products, which improves the business profitability (Siems, Land, and Seuring 2021; Beske, Land, and Seuring 2014). This leads to our first proposition:

P1: Coopetition enables participating actors to develop new knowledge through regular meetings and joint training programmes, which subsequently improve supply chain sustainability performance in the fishing industry.

4.1.2 Organisational Responsiveness

The analysis found that coopetition improves companies’ ability to respond to unforeseen events and reshape the supply chain. Consistent with previous studies (Da-yuan and Liu 2014; Ki-Jung, Park, and Kim 2016; Gruchmann, Seuring, and Petljak 2019), we refer to this capability as organisational responsiveness. Accordingly, we define organisation responsiveness as an organisation’s ability to respond to unforeseen changes in a timely manner and reconfigure its routine collective actions to seize opportunities arising from the rapidly changing environment. Our analysis revealed that coopeting firms develop this capability through continuous resource improvement, adaptability, and innovative behaviour. Our results highlight three ways the continuous improvement capability developed through coopetition improves sustainability performance. First, sustainable sourcing of key partners for fishing boat construction. Coopeting companies help each other to improve their ability to identify and select the right partner for boat construction that uses less fuel or oil to reduce GHG emissions. This allows fishers to improve the ability to outsource globally. As one interviewee noted, ‘... the reason for building in Turkey is that we had a time in Norway when we built so many oil boats ...’ (Director, CE). Second, coopeting companies improve their ability to source all other components of fishing boats (e.g. electrical equipment and spare parts) locally. Third, companies cooperate in building shipyards and deep-freeze terminals locally. This allows companies to reduce operating costs, create more jobs for surrounding communities, and reduce gas emissions (Siems, Land, and Seuring 2021; Deng, Guan, and Jiayan 2021).

Moreover, competition improves the ability to change old business practices in times of crisis to meet new customer demands. For example, during the ongoing COVID-19 pandemic, fishers were able to reshape their supply chains and find alternative outlets for their products. Eslami et al. (2021) consider this ability as supply chain agility. As the interviewee explained, ‘... with the Corona situation, we see in some cases that we are able to change the way we work to cope with the crisis, and we use the knowledge to do that’ (Manager, CA). This ability helped the cooperating companies to survive economically during this pandemic period. It enabled the companies to meet the demand of their customers, achieve their annual sales target, and thus improve their financial performance. At the same time, the cooperating companies provided a good working environment for their employees, as no

employees worked in a furlough programme during the pandemic.

On the other hand, boat design improvement is one of the innovative behavioural capabilities generated through co-competition. Consistent with Flores et al. (2008) and Munten et al. (2021), technological growth increases pressure on the entire supply chain to improve operational efficiency and reduce GHG emissions. One interviewee noted that ‘the new modern technology uses the peak shaving battery to power the vessel’s main engine, which minimises fuel consumption’ (Director, CD). Therefore, innovative behaviour through interorganisational relationships is critical to addressing these pressures (Silva, Dias, and Gold 2021). Similarly, fishing boats are designed to sail smoothly on the sea. This reduces the fuel consumption of the boats and thus the emission of pollutants. This innovative behaviour leads to modern environment-friendly technology for fishing boats. The following quote illustrates this: ‘... but also, another thing is the design of the boat. You need to get it sail smoothly in the waters, which reduces oil consumption’ (Director, CD)”

The lesson here is that co-competition improves the organisational responsiveness capability of each participating company. The ability to reshape a company’s supply chains is critical in addressing the challenges posed by unpredictable events, rapid technological change, and the unpredictability of market demand (Eslami et al. 2021). These challenges have proven to be an obstacle for most companies in improving the sustainability of their supply chains (Siems, Land, and Seuring 2021; Govindan 2018; Beske, Land, and Seuring 2014). This leads us to our second proposition as follows:

P2:Coopetition enables actors to reshape their supply chains through continuous improvement, adaptation, and innovative behaviour, subsequently improving their sustainability performance.

4.1.3 Reflexive control

Reflexive control refers to capabilities that enable the organisation to continuously assess ongoing sustainability requirements and conditions to maintain its business functionality (Beske, Land, and Seuring 2014; Zhou, Pullman, and Zhiduan 2021; Siems, Land, and Seuring 2021). Our findings highlight two ways co-competition improves reflexive control capabilities that enhance sustainability performance. First, developing joint boats tracking system to improve catch traceability. The system tracks all fishing boats and their activities at sea. As one interviewee noted, ‘... all our boats are tracked, and we can go back minute by minute and know where the boats have been and where they have been fishing’ (Director, CB). The joint tracking system guarantees that (1) the fish are caught legally and (2) the total catch, time, and location are recorded. This allows other key stakeholders in the fishery to easily access all necessary information. For example, the government can monitor each company’s total allowable catch (TAC) on time, which in turn helps prevent overfishing. In addition, the customer can quickly determine the quality of the fish before approving further processing stage. One interviewee said, ‘... all the fish we take on board are labelled and can be traced ... if our customer in the US has a problem with fish from our fleet, they can trace it back to the fishing field’

(Director, CD). This way labels signal to customers details about the fish’s quality standards and ingredients (Pakdeechoho and Sukhotu 2018).

Second, through reflexive control, co-competition helps improve the firm’s ability to sustain its long-term financial performance. Our analysis found that co-competiting companies use a joint credit control system to assess the creditworthiness of their customers. This system keeps records of all potential customers and their creditworthiness. The aim is to prevent fishing vessels within the same co-competition network from going bankrupt. This is because only financially stable customers can buy. Thus, co-competition improves the ability of companies to secure credit sales by increasing transparency. This is evidenced by the following quote.

‘What this organisation ensures is that the fishers get paid if they sell on credit; we make sure that a company doesn’t sell fish to customers who already have too much on credit ...’. (Director, NFAS)

In line with Zhou, Pullman, and Zhiduan (2021) and Gruchmann, Seuring, and Petljak (2019), reflexive control improves a company’s ability to implement new sustainability demands, guaranteeing product quality and food safety. In contrast to previous studies, our analysis shows reflexive control as a requisite for co-competition to improve sustainability. Accordingly, we posit our third proposition:

P3:Coopetition enables actors to develop reflexive control capabilities through shared ICT tracking and customer credit analysis system, which improves supply chain sustainability performance in the fishing industry.

4.1.4 Sustainability consciousness

Sustainability consciousness refers to the experience and awareness of the importance of sustainable practices in their supply chains (Gericke et al. 2019). In this study, we define experience as actors’ recognition of the harmful impact of past fishing practices. On the other hand, we define awareness as the present mindset and actions towards supply chain sustainability. Co-competition creates sustainability consciousness as information about the past generation’s actions is widely ingrained in the mindsets of many actors. Being aware and understanding past generation actions motivates co-competiting actors to adopt sustainable fishing practices. As one interviewee noted ‘... If you go thirty years back in time, then the boats just threw all the garbage to the sea. Now, nobody does it because we have a totally different understanding about our environment’ (Manager, CD). As a result, all co-competiting companies within NFAS association voluntarily participate in a collaborative Fishing for Litter Project. The project aims to fight against marine litter thrown into the sea by the past generation. Actors collect bycatch waste, both recyclable waste and other litter, from the sea to land for free. This is evidenced by the following quote.

‘... also have this fishing for litter project where we take litter when we go out and bring it back. Because in our history there have been lots of things put in the sea going back for many years, but now we have more focus on the impacts’ (Director, CA).

Our findings suggest that the fishing for litter project directly impacts the companies’ financial performance because actors

use this project to market and create a reputation for their involvement in sustainability practices to customers. In this way, Norwegian whitefish market grows and so does the profit of each company as sales revenue increases annually. Consequently, Norwegian whitefish is considered to be caught sustainably in seafood markets worldwide. The quote below highlights the importance of the fishing for litter project.

‘We get calls from our customers about the feedback they get when they say that the boats that deliver our fish are also part of this fishing for litter project, meaning that they [suppliers] are taking care of the environment. This is very important for them in their marketing up against the UK food chains’. (Director, CE).

Against the backdrop above, we advance our fourth proposition.

P4:Coopetition generates actors’ sustainability consciousness to rectify past actions, subsequently improving sustainability performance in their fishing supply chains.

4.2 Strengthening factors

4.2.1 Laws and regulations

Our analysis shows that laws and regulations strengthen the relationship between coopetition and supply chain sustainability performance. Fishing vessels involved in the coopetition strategy operate in a strict regulatory environment under the supervision of governmental organisations (GOs) and non-governmental organisations (NGOs) with legitimate power. Stakeholders are involved in (1) formulating and monitoring fisheries management (e.g. catch quota regulations), (2) conducting research, and (3) certifying standards for fish quality, safety, and sustainability

Previous studies have broadly discussed the role of stakeholders in supply chain sustainability (Siems, Land, and Seuring 2021; Govindan 2018; Nasrollahi et al. 2020). However, this study contextualises laws, regulations, certifications, and standards. This is because we relied on established Norwegian fisheries management legislations in our analytical procedure to corroborate our primary data source. These legislations provide detailed regulations for catches, quota management, licences, penalties and fees, technical requirements, and sustainability practices. The analysis identifies three ways laws and regulations strengthen the relationship between coopetition and FSC sustainability.

First, the dynamics of fishery products caught and practices in the sea have led the government to establish different regulations for certain species and fishing practices or methods (see Figure 2). For example, cod and haddock, which account for nearly 70% of the total first sale or value in the Norwegian Barents Sea zone, are subject to different regulations. At the same time, there are technical regulations for certain fishing practices or methods. For trawlers, for example, there are several regulations that impose technical requirements on gear design and use in certain areas to reduce bycatch of fish below the minimum size. As one interviewee noted, ‘it’s also about regulations that are there . . . for instance, there’s a place in the ocean where it’s not allowed to use trawlers . . . or there are places where it’s not allowed to trawl deeper than 1000 metres . . .’ (Director, NFSA). The goal is to address the lack of

consensus on conceptualising sustainable practices between longliners and trawlers involved in the coopetition strategy. Hence, improving sustainability performance.

Second, our findings show that inadequate regulations and laws in the past generation may have been the cause of the extinction of some fish species in the sea. The government set the Total Allowed Catches (TAC) under the quota system to deal with this problem. Essentially, all interviewees reported the existence of a quota system enshrined in the laws regulating wild marine resources towards sustainability performance. For example, one interviewee noted, ‘we have these regulations that we fish based on quotas, and it helps to take care of sustainability’ (Manager, CA). Interestingly, the quota system reforms have resulted in higher profits for individual companies within the NFAS association. As a result, companies were able to invest in new modern technology for fishing vessels. The initiative has reduced CO₂ emissions from 1.8 million tonnes in 2004 to 1.1 million tonnes in 2015.

Third, all coopeting firms must comply with state labour laws to ensure decent workplaces, labour rights, and diversity. As the manager in CA noted, ‘I think in Norway the social aspect is not very important in most companies because we have very good workers’ rights’. Legal requirements for local community support and workers’ rights are part of social sustainability initiatives. For example, one interviewee said, ‘. . . and everything goes back, and we support everything in the village and the system, we stay in’ (Director, CB). Besides, all companies understand sustainability as putting people’s interests first. As the director of NFAS noted, ‘. . . when we talk about sustainability, of course, it is about the people; the crew and the new boats have a better standard’.

4.2.2 Standards and Certification

Our analysis has revealed the prominent role of certification as part of regulation in the Norwegian fisheries sector. According to the standard guidelines, all companies must certify their fishing gear and catches to comply with the principle of sustainable exploitation. Although a private organisation carries out the certification, it has been institutionalised in the state system and made mandatory for fishing companies. Nevertheless, market demand also plays an essential role in ensuring that fishing companies certify their products to be able to sell them. This is highlighted by the following quote:

‘For example, we have had a boat last week delivering fish that we caught on Greenland and it’s not within MSC approval. Then my customers in the UK said that we can’t buy this fish because it’s not MSC approved’ (Manager, CD).

Although certification plays an important role, some respondents believe the process is unnecessary. The biggest concern is that Norwegian fisheries are strictly regulated, and there is no way to catch fish in an unsustainable way. In addition, the MSC organisation heavily depends on the government inspection system for certification. Nevertheless, they see the importance of certification because not all countries in the same market have the same regulations as Norway. So, as the director of CB questioned, ‘there are issues with this MSC certification, but at the same time, the purpose of what they do is very serious in many ways, very good, because they regulate’.

Despite these concerns, all coopting companies believe that the certification and standards play an essential role in improving their market share in the global market, thus improving the financial performance of each company.

Unlike previous studies that emphasise the importance of stakeholder engagement in improving sustainability performance, our study focuses on regulations, laws, certifications, and standards, which tend to vary across industries and countries and may significantly impact sustainability practices regardless of who is responsible for monitoring them. Hence, we propose the following:

P5: Laws and regulations strengthen the coopting relationship and supply chain sustainability performance in the fishing industry. In addition, certification and standard guidelines complement laws and regulations to strengthen the role of coopting in improving sustainability performance.

4.3 Weakening factors

All respondents identified insufficient funds, group structure and conflicts of interest as weakening factors for achieving better sustainability performance through the NFAS network, as explained below.

4.3.1 Insufficient funds

Building modern and environmentally friendly fishing vessels requires companies to invest heavily. As the manager in CA stated, 'when you have to make those green choices, it's even more expensive'. Our analysis shows that investing in sustainable technologies depends on (1) market price and exchange rate stability and (2) altruism. As the Director in CC noted, 'it's expensive, but I think you just have to make some of those choices to be part of where the world is going'. However, the first reason is more prominent as it affects the company's profit. The director in CD explains, 'if you have a fleet that's not making profit, you cannot expand and develop to meet the changes in the market'.

Even though companies are making good money due to the current market prices and exchange rate stability (at the time of data collection), the market price can change, and companies are concerned about the future financial performance of their businesses. Thus, they are reluctant to allocate considerable funds to invest in greener vessels, as very few companies have been able to invest in fifth-generation vessels. Most importantly, companies are unwilling to allocate more funds to greener ships because they know the impact of market price declines and exchange rate fluctuations on their financial performance.

The analysis suggests that the instability of market prices and exchange rates affects firms' profits because firms cannot invest in more advanced and environmentally friendly technologies. Hence, the following proposition:

P6: Uncertain cashflows, characterised by market price and exchange rate instability, weaken the role of coopting in improving supply chain sustainability in the fishing industry.

4.3.2 Conflicts of interests

We found that several groups in the Norwegian fishing industry differ regarding geographical location and the type of fish

species they catch. Each group is allocated a different fund for marketing activities. However, they must all follow the general marketing strategies established by the Norwegian Seafood Council. The unequal allocation of funds directly affects how companies engage in sustainability initiatives. This is because companies see their market position in the global marketplace at risk. Furthermore, the lack of consensus on sustainable fishing practices within the same association affects how companies engage or invest in sustainable initiatives and technologies. Because longliners feel that trawlers are not sustainable, they are not willing to invest much in environmentally friendly technologies. As the manager in CA stated: 'instead of going to the market and say we have the best quality, we have tried to focus on fillets from Norway in general. So, we try to give a bigger and better picture and talk about Norwegian fillets in general instead of saying that our fillets are the best and the trawlers' fillets are not so good'. The fewer conflicts of interest there are in a group, the more likely cooperating companies will engage in sustainability initiatives and practices (Munten et al. 2021). This leads us to propose the following:

P7: Conflicts of interest characterised by a lack of consensus on sustainability practices and generic marketing activities weaken the link between coopting and FSC sustainability.

4.4.3 Firm size

The findings show that sustainability initiatives and decisions are highly dependent on a few top managers, as most companies are family-run. Thus, vessel owners prioritise the family interests over investing in advanced technologies. The reason is that these companies use private property as collateral for bank loans. The managers feel that they risk losing family ownership if they invest heavily in sustainable technologies. As one of the Directors for CB noted, 'to get the money from the bank, I have to secure the bank (loan) with my private house at home'. Limited financial resources affect how members of the same group implement sustainability, especially in dynamic industries such as food. Thus, we propose the following:

P8: Firms' size, characterised by few top decision-makers in implementing sustainability, weakens the link between coopting and FSC sustainability.

5. Contribution

This study contributes to theory and actionable insights for managers and policymakers. In this section, we discuss theoretical and managerial implications as follows.

5.1 Theoretical implication

The main contributions of this study to theory are threefold. The study provides empirical evidence that (1) practising coopting in the food industry improves supply chain sustainability performance (2) practising coopting fosters the development of a bundle of dynamic capabilities for increasing sustainability performance (3) Laws, regulations and certifications are contingent factors under which coopting effectively improve supply chain sustainability performance in the food industry.

First, to the best of our knowledge, this is one of the first studies to empirically examine the importance of practising cooptation for supply chain sustainability performance in the fishing industry. Cooptation acts as a sustainability information bridge between actors across the supply chain, improving sustainability awareness. The results of this study show that dynamic capabilities (i.e. knowledge development, organisational responsiveness, and reflexive control) are required for optimising the triple bottom line in food supply chains. Besides, our results are consistent with Dyer, Singh, and Hesterly (2018) and Aslam et al. (2018), who argued that firms that repeatedly collaborate in a dynamic environment tend to derive the greatest benefits. Thus, this study is one of the few studies in the field of supply chain management that explain the role of sustainability consciousness in achieving FSC sustainability performance.

Second, while previous studies emphasise the importance of cooptation for firm performance and innovation, we knew little about how cooptation strategy leads to improved supply chain sustainability in dynamic industries such as the food industry (Mirzabeiki, Qile, and Sarpong 2022). Therefore, this study provides empirical evidence that suggests causal mechanisms under which cooptation effectively improves supply chain sustainability performance in the fishing industry. Third, besides highlighting the importance of practising cooptation in the fishing industry, this study uncovers a relevant dynamic capabilities mediating the relationship between cooptation and FSC sustainability performance. Unlike previous studies (e.g. Gnyawali and Park 2011; Bengtsson, Raza-Ullah, and Vanyushyn 2016; Mirzabeiki, Qile, and Sarpong 2022) that focus on the static capabilities required to manage cooptation strategy and the resulting tensions, our study provides empirical evidence of the dynamic capabilities developed through cooptation to improve supply chain sustainability performance in highly turbulent business environments.

5.2 Managerial implications

Our study provides actionable insights to help managers involved with the food industry optimise the triple bottom line of their supply chains (i.e. environmental, social, and economic) through cooptation. In general, this study outlines the routine actions (e.g. joint programmes and training) that help managers continuously develop dynamic capabilities to maximise the benefits of cooptation in developing sustainable supply chains. In addition, we encourage managers to cooptate as it improves sustainability awareness throughout the supply chain. Cooptation also helps actors with different fishing practices within the same industry reach consensus on sustainable practices. Cooptation is thus a tool to solve the problem of conceptualising sustainable practices and thus making common standards and certification for sustainability acceptable to a broader society.

Moreover, our findings reveal that optimising supply chain in line with triple bottom line (i.e. environmental, social and economic) requires huge financial investments, as greener technologies are expensive in the fishing industry. This study strongly advises owners and managers in the food industry to

'cooptate' as it improves the ability of companies to adapt to new changes that could impact individual profits if they had committed to stand-alone sustainability initiatives or projects. For example, sharing the fisheries tracking system helps companies reduce their individual financial commitment.

Finally, our results provide policymakers with guidance on relevant laws, regulations, and certification measures to monitor cooptation in improving supply chain sustainability performance in the food industry. Our findings show that cooptation in improving supply chain sustainability performance in the food industry is associated with challenges such as insufficient investment or resources and conflicts of interest. Therefore, policymakers should focus on providing sustainability-friendly incentive schemes (i.e. sustainability subsidies), especially for small and medium enterprises, to motivate them to transform their supply chains to sustainability.

6. Conclusion

This study began with the argument that FSC sustainability is increasingly gaining attention due to dynamic market conditions and concerns about food safety and environmental impacts. In response, companies are increasingly pressured to collaborate beyond their traditional actors. In this way, horizontal collaboration, such as cooptation, is seen as a crucial inter-firm relationship for improving sustainability in supply chains (Mirzabeiki, Qile, and Sarpong 2022). However, the results of the existing literature on the outcomes of cooptation are inconclusive. We have provided two possible reasons for this problem. In our study, we avoided these two pitfalls. As a result, we provide empirical evidence on the casual mechanism, strengthening and weakening factors that contribute to cooptation improving supply chain sustainability performance in the fishing industry (see Figure 3).

Based on our findings, we argue that cooptation improves sustainability performance in the food industry through dynamic capabilities (i.e. knowledge development, organisational responsiveness & reflexive control) and sustainability consciousness. Firms within an established network can develop a range of relationship-related capabilities (Chauhan et al. 2022). For example, sharing ICT networks in the fishing industry increases supply chain transparency for all interested stakeholders, leading to better monitoring and control of fishing practices. As a result, this fosters firms to meet minimum standards of environmental and social conduct. Similarly, through increased collaboration, such as cooptation, companies within the network improve their ability to reshape their supply chains to seize new adaptations and changes to optimise the three sustainability goals.

Moreover, our findings reveal that laws and regulations, standards and certifications positively influence the link between cooptation and FSC sustainability performance. In contrast, insufficient funds, firm size, and conflicts of interest weaken the relationship between cooptation and FSC sustainability.

Although this study provides valuable insights, it has several limitations that suggest avenues for future research. First, our study is based on a single embedded case which limits the ability to generalise our findings as it lacks a quantitative analysis to

support our findings. Therefore, a quantitative analysis is needed to test our empirical framework. Second, our study did not consider the interactions or complementary effects between these factors that influence the relationship between coopetition and FSC sustainability. For example, the interaction between organisational responsiveness and knowledge development could have a complementary effect on the link between coopetition and FSC sustainability. Further study will help reveal how combining lower levels of dynamic capabilities would affect higher-level orders towards achieving sustainability performance.

Finally, insufficient resources and conflicts of interest increase environmental externalities and complexities in the food supply chain. Therefore, companies fail to plan and predict the outcomes of their sustainability commitments and initiatives. Future studies should therefore focus on using quantitative methods to examine how dynamic capabilities improve FSC sustainability performance under different levels of environmental dynamism in the food industry.

Note

1. First-hand sales are sales of wild marine resources from the person who hauled them, and the first sales after landing if the catch has not previously been sold through or with the approval of a fishing community

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Notes on contributors

Magoti Harun is a PhD Research Fellow from Molde University College, Norway. Has a degree in management science from the University of Dar Es Salaam, Tanzania. Took Masters' degree in Logistics; supply chain management at Molde University College, Norway, and now admitted as PhD Research Fellow in logistics. His major research project is food supply chain sustainability and inter-firm collaboration.

Deodat Mwesiumo is an Associate Professor in supply chain management at Molde University College, Specialized University in Logistics, Norway. His research activities focus on interorganisational relations in value chains and digital business management. His work has appeared in internationally accredited scientific journals, including Journal of Business Research, Technovation, Tourism Management, Journal of Travel Research and Journal of Purchasing & Supply Management.

Heidi Hogset is an associate Professor at Molde University College, Norway. Took a master's degree at Purdue University (2000) and PhD at Cornell University (2005) in the US in agricultural economics. Has been affiliated with Molde University College since 2007. Is now a participant in an international research project on links between local and

global food supply chains, with partners in the UK, the Netherlands, and several Asian countries. Research interests are sustainable food production and food supply, especially in tropical countries. Her work has appeared in different international accredited journals.

Amar Ramudhin is a Professor in logistics at the University of Hull. He also serves as director of the Center of Supply chain Management and Technology at Georgia Tech's Supply Chain & Logistics Institute. His research activities focus on supply chain collaboration, sustainability, and food safety. His work has appeared in internationally accredited scientific journals, including Internal Journal of Production Research, International of Production Economics and International Journal of Operational Research.

ORCID

Magoti Harun  <http://orcid.org/0000-0002-8495-0606>
 Deodat Mwesiumo  <http://orcid.org/0000-0003-0620-7582>
 Heidi Hogset  <http://orcid.org/0000-0001-7886-8721>
 Amar Ramudhin  <http://orcid.org/0000-0003-1009-076X>

Data availability

The data that support the findings of this study are available from the corresponding author, [MH], upon reasonable request.

References

- Abdalla, M.J., Mwesiumo, D., Öztüren, A., Kılıç, H., 2022. Perceived Threat of Informal Players: Enhancing the Operational Performance of Inbound Tour Operators through Coopetition. *Int. J. Tour. Res.* doi: 10.1002/JTR.2544.
- Adams, David, Jerome Donovan, and Cheree Topple. (2021). "Achieving Sustainability in Food Manufacturing Operations and Their Supply Chains: Key Insights from a Systematic Literature Review." *Sustainable Production and Consumption* 28:1491–1499. doi: 10.1016/j.spc.2021.08.019.
- Allen, S. D., Q. Zhu, and J. Sarkis. 2021. "Expanding Conceptual Boundaries of the Sustainable Supply Chain Management and Circular Economy Nexus." *Cleaner Logistics and Supply Chain* 2. doi:10.1016/j.clscn.2021.100011.
- Aslam, Haris, Constantin Blome, Samuel Roscoe, and Tashfeen M. Azhar. (2018). "Dynamic Supply Chain Capabilities." *International Journal of Operations & Production Management* 38 (12):2266–2285. doi: 10.1108/ijopm-09-2017-0555.
- Bacon, Emily, Michael D. Williams, and Gareth Davies. (2020). "Coopetition in Innovation Ecosystems: A Comparative Analysis of Knowledge Transfer Configurations." *Journal of Business Research* 115:307–316. doi: 10.1016/j.jbusres.2019.11.005.
- Bengtsson, Maria, and Marlene Johansson. (2014). "Managing Coopetition to Create Opportunities for Small Firms." *International Small Business Journal* 32 (4):401–427. doi: 10.1177/0266242612461288.
- Bengtsson, Maria, and Sören Kock. (2000). "Coopetition in Business Networks-to Cooperate and Compete Simultaneously." *Industrial Marketing Management* 20 (5):411–426. DOI: 10.1016/S0019-8501(99)00067-X
- Bengtsson, M., and S. Kock. (2014). "Coopetition-Quo Vadis? Past Accomplishments and Future Challenges." *Industrial Marketing Management* 43 (2):180–188. doi: 10.1016/j.indmarman.2014.02.015.
- Bengtsson, Maria, Tatbeeq Raza-Ullah, and Vladimir Vanyushyn. (2016). "The Coopetition Paradox and Tension: The Moderating Role of Coopetition Capability." *Industrial Marketing Management* 53:19–30. doi: 10.1016/j.indmarman.2015.11.008.
- Beske, Philip, Anna Land, and Stefan Seuring. (2014). "Sustainable Supply Chain Management Practices and Dynamic Capabilities in the Food Industry: A Critical Analysis of the Literature." *International Journal of Production Economics* 152:131–143. doi: 10.1016/j.ijpe.2013.12.026.

- Bouncken, Ricarda B., and Sascha Kraus. (2013). "Innovation in knowledge-intensive Industries: The double-edged Sword of Coopetition." *Journal of Business Research* 66 (10):2060–2070. doi: 10.1016/j.jbusres.2013.02.032.
- León Bravo, Verónica, Antonella Moretto, and Federico Caniato. (2021). "A Roadmap for Sustainability Assessment in the Food Supply Chain." *British Food Journal* 123 (13):199–220. doi: 10.1108/bfj-04-2020-0293.
- Arias Bustos, Carolina, and Ellen H. M. Moors. (2018). "Reducing post-harvest Food Losses through Innovative Collaboration: Insights from the Colombian and Mexican Avocado Supply Chains. (Report)." *Journal of Cleaner Production* 199:1020. doi: 10.1016/j.jclepro.2018.06.187.
- Chauhan, Chetna, Puneet Kaur, Rakesh Arrawatia, Peter Ractham, and Amandeep Dhir. (2022). "Supply Chain Collaboration and Sustainable Development Goals (Sdgs). Teamwork Makes Achieving SDGs Dream Work." *Journal of Business Research* 147:290–307. doi: 10.1016/j.jbusres.2022.03.044.
- Chen, Lujie, Xiande Zhao, Ou Tang, Lydia Price, Shanshan Zhang, and Wenwen Zhu. (2017). "Supply Chain Collaboration for Sustainability: A Literature Review and Future Research Agenda." *International Journal of Production Economics* 194:73–87. doi: 10.1016/j.ijpe.2017.04.005.
- Christ, Katherine L., Roger L. Burritt, and Mohsen Varsei. (2017). "Coopetition as a Potential Strategy for Corporate Sustainability." *Business Strategy and the Environment* 26 (7):1029–1040. doi: 10.1002/bse.1967.
- Crick, James M., and Dave Crick. (2021). "Coopetition and family-owned Wine Producers." *Journal of Business Research* 135:319–336. doi: 10.1016/j.jbusres.2021.06.046.
- Crippa, M., E. Solazzo, D. Guizzardi, F. Monforti-Ferrario, F. N. Tubiello, and A. Leip. (2021). "Food Systems are Responsible for a Third of Global Anthropogenic GHG Emissions." *Nature Food* 2 (3):198–209. doi: 10.1038/s43016-021-00225-9.
- Dania, Wike Agustin Prima, Ke Xing, and Yousef Amer. (2018). "Collaboration Behavioural Factors for Sustainable agri-food Supply Chains: A Systematic Review." *Journal of Cleaner Production* 186:851–864. doi: 10.1016/j.jclepro.2018.03.148.
- Li, Da-yuan, and Juan Liu. (2014). "Dynamic Capabilities, Environmental Dynamism, and Competitive Advantage: Evidence from China." *Journal of Business Research* 67 (1):2793–2799. doi: 10.1016/j.jbusres.2012.08.007.
- Deng, Sijing, Xu Guan, and Jiayan Xu. (2021). "The Coopetition Effect of learning-by-doing in Outsourcing." *International Journal of Production Research* 59 (2):516–541. doi: 10.1080/00207543.2019.1696493.
- Dyer, Jeffrey H., Harbir Singh, and William S. Hesterly. (2018). "The Relational View Revisited: A Dynamic Perspective on Value Creation and Value Capture." *Strategic Management Journal* 39 (12):3140–3162. doi: 10.1002/smj.2785.
- Eisenhardt, Kathleen M. (1989). "Building Theories from Case Study Research." *The Academy of Management Review* 14 (4):532–550. DOI: 10.2307/258557
- Elkington, J. 1998. *Cannibals with Forks. The Triple Bottom Line of 21st Century Business*. Vancouver: New Society Publisher.
- Eslami, Mohammad H., Hamid Jafari, Leona Achtenhagen, John Carlback, and Alex Wong. (2021). "Financial Performance and Supply Chain Dynamic Capabilities: The Moderating Role of Industry 4.0 Technologies." *International Journal of Production Research*:1–18. doi: 10.1080/00207543.2021.1966850.
- Feng, Bo, Xueyan Hu, and Ifeyinwa Juliet Orji. (2021). "Multi-tier Supply Chain Sustainability in the Pulp and Paper Industry: A Framework and Evaluation Methodology." *International Journal of Production Research*:1–27. doi: 10.1080/00207543.2021.1890260.
- Flores, M., L. Canetta, A. Castrovinci, P. Pedrazzoli, R. Longhi, and C. R. Boër. (2008). "Towards an Integrated Framework for Sustainable Innovation." *International Journal of Sustainable Engineering* 1 (4):278–286. doi: 10.1080/19397030802496339.
- Gericke, Niklas, Jelle Boeve-de Pauw, Teresa Berglund, and Daniel Olsson. (2019). "The Sustainability Consciousness Questionnaire: The Theoretical Development and Empirical Validation of an Evaluation Instrument for Stakeholders Working with Sustainable Development." *Sustainable Development* 27 (1):35–49. doi: 10.1002/sd.1859.
- Gernsheimer, Oliver, Dominik K. Kanbach, and Johanna Gast. (2021). "Coopetition Research - A Systematic Literature Review on Recent Accomplishments and Trajectories." *Industrial Marketing Management* 96:113–134. doi: 10.1016/j.indmarman.2021.05.001.
- Gioia, Dennis A., Kevin G. Corley, and Aimee L. Hamilton. (2013). "Seeking Qualitative Rigor in Inductive Research." *Organizational Research Methods* 16 (1):15–31. doi: 10.1177/1094428112452151.
- Gnyawali, Devi R., and Byung-Jin Park. (2011). "Coopetition between Giants: Collaboration with Competitors for Technological Innovation." *Research Policy* 40 (5):650–663. doi: 10.1016/j.respol.2011.01.009.
- Golini, Ruggero, Antonella Moretto, Federico Caniato, Maria Caridi, and Matteo Kalchschmidt. (2016). "Developing Sustainability in the Italian Meat Supply Chain: An Empirical Investigation." *International Journal of Production Research* 55 (4):1183–1209. doi: 10.1080/00207543.2016.1234724.
- Gosalviit, Piya, Rosa M. Cuéllar-Franca, Robin Smith, and Adisa Azapagic. (2021). "Integrating Process Modelling and Sustainability Assessment to Improve the Environmental and Economic Sustainability in the Cheese Industry." *Sustainable Production and Consumption* 28:969–986. doi: 10.1016/j.spc.2021.07.022.
- Govindan, Kannan. (2018). "Sustainable Consumption and Production in the Food Supply Chain: A Conceptual Framework." *International Journal of Production Economics* 195:419–431. doi: 10.1016/j.ijpe.2017.03.003.
- Govindan, K., M. Shaw, and A. Majumdar. 2021. "Social Sustainability Tensions in multi-tier Supply Chain: A Systematic Literature Review Towards Conceptual Framework Development." *Journal of Cleaner Production* 279. doi:10.1016/j.jclepro.2020.123075.
- Gruchmann, Tim, Stefan Seuring, and Kristina Petljak. (2019). "Assessing the Role of Dynamic Capabilities in Local Food Distribution: A theory-elaboration Study." *Supply Chain Management: An International Journal* doi: 10.1108/scm-02-2019-0073. 24 6 767–783
- Hamel, G., Y. Doz, and C. K. Prahalad. 1989. "Collaborate with Your Competitors— And Win." *Harvard Business Review* 67 (1): 133–140.
- Heide, J. B., and A. S. Miner. 1992. "The Shadow of the Future: Effects of Anticipated Interaction and Frequency of Contact on Buyer-Seller Cooperation." *The Academy of Management Review* 35 (2): 265–291.
- Heydari, Jafar, Kannan Govindan, and Zahra Basiri. (2020). "Balancing Price and Green Quality in Presence of Consumer Environmental Awareness: A Green Supply Chain Coordination Approach." *International Journal of Production Research* 59 (7):1957–1975. doi: 10.1080/00207543.2020.1771457.
- Hjellnes, V., T. Rustad, and E. Falch. 2020. "The Value Chain of the White Fish Industry in Norway: History, Current Status and Possibilities for Improvement – A Review." *Regional Studies in Marine Science* 36. doi:10.1016/j.risma.2020.101293.
- Hung, K.-T., and C. Tangpong. 2010. "General Risk Propensity in Multifaceted Business Decisions: Scale Development." *Journal of Managerial Issues* 22 (1): 88–106.
- Jalali, H., A. Ansariipoor, V. Ramani, and D. G. Pietro. 2021. "Closed-loop Supply Chain Models with Coopetition Options." *International Journal of Production Research* 1–29. doi:10.1080/00207543.2021.1910871.
- Johnsen, H. R., E. R. Johannessen, A. O. Roland, and F. Johannessen. (2020). "Fishing for Litter as Measure Against Marine Waste in Norway – Annual Report 2020". SALT, accessed 1054. <https://salt.nu/assets/projects/SALT-1054-Fishing-for-Litter-som-tiltak-mot-marin-forsopling-i-Norge-Arsrapport-2020-1613653318.pdf>.
- Ju, Ki-Jung, Byeonghwa Park, and Taikyoo Kim. (2016). "Causal Relationship between Supply Chain Dynamic Capabilities, Technological Innovation, and Operational Performance." *Management and Production Engineering Review* 7 (4):6–15. doi: 10.1515/mper-2016-0031.
- Kovács, Gyöngyi, Remko van Hoek, and Karen M. Spens. (2005). "Abductive Reasoning in Logistics Research." *International Journal of*

- Physical Distribution & Logistics Management* 35 (2):132–144. doi: 10.1108/09600030510590318.
- Kumar, Gopal, Nachiappan Subramanian, and Ramkumar Maria Arputham. (2018). “Missing Link between Sustainability Collaborative Strategy and Supply Chain Performance: Role of Dynamic Capability.” *International Journal of Production Economics* 203:96–109. doi: 10.1016/j.ijpe.2018.05.031.
- Larsen, R. (2020). “Why Norwegian Seafood Is Sustainable.” <https://en.seafood.no/articles/why-norwegian-seafood-is-sustainable/>.
- León-Bravo, V., F. Caniato, and M. Caridi. 2018. “Sustainability in Multiple Stages of the Food Supply Chain in Italy: Practices, Performance and Reputation.” *Operations Management Research* 1–22. doi:10.1007/s12063-018-0136-9.
- Limoubratum, Chattharn, Himanshu Shee, and Kamrul Ahsan. (2014). “Sustainable Distribution through Coopetition Strategy.” *International Journal of Logistics Research and Applications* 18 (5):424–441. doi: 10.1080/13675567.2014.977236.
- Lindland, K. M., A. V. K. Brita Gjerstad, and E. Ravagnan. 2019. “Governance for Sustainability in the Norwegian Aquaculture Industry.” *Ocean & Coastal Management* 179. doi:10.1016/j.ocecoaman.2019.104827.
- Li, Dong, Xiaojun Wang, Hing Kai Chan, and Riccardo Manzini. (2014). “Sustainable Food Supply Chain Management.” *International Journal of Production Economics* 152:1–8. doi: 10.1016/j.ijpe.2014.04.003.
- Luo, Yadong. (2007). “A Coopetition Perspective of Global Competition.” *Journal of World Business* 42 (2):129–144. doi: 10.1016/j.jwb.2006.08.007.
- Manzini, Riccardo, and Riccardo Accorsi. (2013). “The New Conceptual Framework for Food Supply Chain Assessment.” *Journal of Food Engineering* 115 (2):251–263. doi: 10.1016/j.jfoodeng.2012.10.026.
- Miles, M. B., A. Michael Huberman, and J. Saldana. 2020. *Qualitative Data Analysis: A Methods Sourcebook*. Fourth ed. California: SAGE Publication, .
- Mirzabeiki, Vahid, Qile He, and David Sarpong. (2022). “Sustainability-driven Coopetition in Supply Chains as Strategic Capabilities: Drivers, Facilitators, and Barriers.” *International Journal of Production Research*:1–27. doi: 10.1080/00207543.2021.1988749.
- Morris, M., A. Koçak, and Ö. Alper. 2007. “Coopetition as A Small Business Strategy: Implications for Performance.” *Journal of Small Business Strategy* 18 (1): 35–55.
- Munten, Pauline, Joëlle Vanhamme, François Maon, Valérie Swaen, and Adam Lindgreen. (2021). “Addressing Tensions in Coopetition for Sustainable Innovation: Insights from the Automotive Industry.” *Journal of Business Research* 136:10–20. doi: 10.1016/j.jbusres.2021.07.020.
- Nagurney, Anna, and Ladimer S. Nagurney. (2010). “Sustainable Supply Chain Network Design: A Multicriteria Perspective.” *International Journal of Sustainable Engineering* 3 (3):189–197. doi: 10.1080/19397038.2010.491562.
- Nasrollahi, Mahdi, Mohammad Reza Fathi, Hamid Reza Sanouni, Seyed Mohammad Sobhani, and Amirhossein Behrooz. (2020). “Impact of Coercive and non-coercive Environmental Supply Chain Sustainability Drivers on Supply Chain Performance: Mediation Role of Monitoring and Collaboration.” *International Journal of Sustainable Engineering* 14 (2):98–106. doi: 10.1080/19397038.2020.1853271.
- Pagell, Mark, and Anton Shevchenko. (2014). “Why Research in Sustainable Supply Chain Management Should Have No Future.” *Journal of Supply Chain Management* 50 (1):44–55. doi: 10.1111/jscm.12037.
- Pakdechoho, Nutcharee, and Vatcharapol Sukhotu. (2018). “Sustainable Supply Chain Collaboration: Incentives in Emerging Economies.” *Journal of Manufacturing Technology Management* 29 (2):273–294. doi: 10.1108/jmtm-05-2017-0081.
- Rajesh, R. 2020. “Sustainable Supply Chains in the Indian Context: An Integrative decision-making Model.” *Technology in Society* 61. doi:10.1016/j.techsoc.2020.101230.
- Ritala, Paavo. (2001). “Coopetition Strategy - When Is It Successful? Empirical Evidence on Innovation and Market Performance.” *British Journal of Management*:no.nono. doi: 10.1111/j.1467-8551.2011.00741.x.
- Schneider, U. M. (2020). “Creating Shared Value and Sustainability Report 2020.” Nestle. <https://www.nestle.com/sites/default/files/2021-03/creating-shared-value-report-2020-en.pdf>.
- Seuring, S., S. Aman, and B. D. Hettiarachchi. 2022. “Reflecting on Theory Development in Sustainable Supply Chain Management.” *Cleaner Logistics and Supply Chain* 3. doi:10.1016/j.clscn.2021.100016.
- Seuring, Stefan, and Martin Müller. (2008). “From a Literature Review to a Conceptual Framework for Sustainable Supply Chain Management.” *Journal of Cleaner Production* 16 (15):1699–1710. doi: 10.1016/j.jclepro.2008.04.020.
- Siddh, Man Mohan, Sameer Kumar, Gunjan Soni, Vipul Jain, Charu Chandra, Rakesh Jain, Milind Kumar Sharma, and Yigit Kazancoglu. (2021). “Impact of agri-fresh Food Supply Chain Quality Practices on Organisational Sustainability.” *Operations Management Research*. doi: 10.1007/s12063-021-00196-x. 14 3–4 378
- Siems, E., A. Land, and S. Seuring. 2021. “Dynamic Capabilities in Sustainable Supply Chain Management: An inter-temporal Comparison of the Food and Automotive Industries.” *International Journal of Production Economics* 236. doi:10.1016/j.ijpe.2021.108128.
- Silva, Minelle E., Gustavo Picanço Dias, and Stefan Gold. (2021). “Exploring the Roles of Lead Organisations in Spreading Sustainability Standards Throughout Food Supply Chains in an Emerging Economy.” *The International Journal of Logistics Management* 32 (3):1030–1049. doi: 10.1108/ijlm-05-2020-0201.
- Singh, Gaurvendra, Yash Daultani, R. Rajesh, and Rajendra Sahu. (2022). “Modeling the Growth Barriers of Fresh Produce Supply Chain in the Indian Context.” *Benchmarking: An International Journal*. doi: 10.1108/bij-09-2021-0517.
- Stuart, I., D. McCutcheon, R. Handfield, R. McLachlin, and D. Samson. (2002). “Effective Case Research in Operations Management: A Process Perspective.” *Journal of Operations Management* 20 (5):419–433. doi:10.1016/S0272-6963(02)00022-0.
- Tarnanidis, Theodore, Jason Papatheanasiou, and Demetres Subeniotis. (2019). “How Far the TBL Concept of Sustainable Entrepreneurship Extends beyond the Various Sustainability Regulations: Can Greek Food Manufacturing Enterprises Sustain Their Hybrid Nature over Time?” *Journal of Business Ethics* 154 (3):829–846. doi: 10.1007/s10551-017-3443-4.
- Thomas, G. 2016. *How To Do Your Case Study*. 2 ed. London: SAGE Publication .
- Rezaei Vandchali, Hadi, Stephen Cahoon, and Shu-Ling Chen. (2021). “The Impact of Supply Chain Network Structure on Relationship Management Strategies: An Empirical Investigation of Sustainability Practices in Retailers.” *Sustainable Production and Consumption* 28:281–299. doi: 10.1016/j.spc.2021.04.016.
- Vanover, C., P. Mihás, and J. Saldaña. 2021. *Analysing and Interpreting Qualitative Research: After the Interview*. London: SAGE Publications, Incorporated.
- Vindheim, I. (2019). “Mowi Climate Change and Energy Use Policy.” MOWI. <https://corpsite.azureedge.net/corpsite/wp-content/uploads/2021/05/210505-Mowi-Climate-Change-and-Energy-Use-Policy.pdf>.
- Wiengarten, Frank, Mark Pagell, and Brian Fynes. (2012). “Supply Chain Environmental Investments in Dynamic Industries: Comparing Investment and Performance Differences with Static Industries.” *International Journal of Production Economics* 135 (2):541–551. doi: 10.1016/j.ijpe.2011.03.011.
- Zhou, Xiongyong, Madeleine Pullman, and Zhiduan Xu. (2021). “The Impact of Food Supply Chain Traceability on Sustainability Performance”. *Operations Management Research*. doi: 10.1007/s12063-021-00189-w.