A Systematic Literature Review on Sustainability-oriented Supplier Development

Meng Jia

Department of Management Science, Lancaster University Management School, Lancaster, UK

m.jia2@lancaster.ac.uk

Mark Stevenson

Department of Management Science, Lancaster University Management School, Lancaster, UK

m.stevenson@lancaster.ac.uk

Linda C. Hendry

Department of Management Science, Lancaster University Management School, Lancaster, UK

l.hendry@lancaster.ac.uk

Abstract

Many buying firms are implementing sustainability-oriented supplier development (SSD) projects. This paper provides a systematic literature review on the SSD process and develops a future research agenda. A total of 83 papers are analysed according to their research content and using contingency theory variables, i.e. contingencies and response actions, and contingency forms of fit that influence performance outcomes. Although there has been a considerable focus on contingency factors in the SSD literature, explicit use of the contingency fit perspective has been limited. A conceptual framework is developed and supported by a series of research recommendations to provide a holistic view of SSD and a starting point for future research. To the best of our knowledge, this is the first paper to focus specifically on reviewing the SSD literature. The contingency theory lens provides a promising theoretical perspective for understanding how SSD initiatives can be successfully embedded in the supply chain.

Keywords: Sustainability-oriented supplier development; contingency theory; systematic literature review; sustainable supply chain.

1. Introduction

Effective supplier management is very important in the current global context as many firms are spending a larger amount of money on purchasing goods and services from external suppliers (Zimmer, Fröhling, and Schultmann 2016; Rashidi and Saen 2018). Supplier management has traditionally focused on four broad operational measures of supplier performance, i.e. cost, quality, flexibility, and delivery (Awasthy and Hazra 2019); but firms are now paying more attention to a fifth dimension – sustainability. Sustainability cannot be achieved by buying firms alone (Soosay and Hyland 2015), yet such focal firms are frequently held responsible by the media, non-governmental organisations (NGOs), and activists for sustainability oriented violations in their supply network (Hofmann et al. 2014; Zimmer, Fröhling, and Schultmann 2016). For example, China Labour Watch, a US-based NGO, has been conducting site investigations of Apple suppliers since 2011 and publishes reports when labour rights violations are detected (China Labour Watch, 2019). Such disclosures of supplier violations have caused direct reputational damage and economic loss to Apple, thereby underlining the importance of supplier management (Yang and Zhang 2017).

A lack of sustainability oriented capabilities is one of the main causes of supplier violations (Fu, Zhu, and Sarkis 2012). To achieve long-term strategic development goals (Reuter et al. 2010), there is an incentive for buying firms to manage and develop their supply base more proactively to fulfil sustainability goals (Liu et al. 2018) instead of abandoning poor performing suppliers altogether (Blome, Hollos, and Paulraj 2014). As a result, an increasing number of firms have started to implement sustainability oriented supplier development practices and regard this as a route to gaining competitive advantage (Blome, Hollos, and Paulraj 2014; Liu et al. 2018), i.e. benefits that are not limited to direct sustainability performance improvements (Busse et al. 2016).

Sustainability-oriented supplier development (SSD) expands the focus of traditional supplier development (SD) by going beyond the aim of improving suppliers' operational performance to incorporate the goal of sustainability (Yang and Zhang 2017). SD is generally defined as any effort made by the buying firm to improve supplier performance or capability (Krause, Handfield, and Scannell 1998) for the benefit of the buying firm (Zhang, Pawar, and Bhardwaj 2017). SSD is thus defined as any initiative aimed at improving supplier sustainability performance or capability to meet two or more elements of the triple bottom line (TBL) (Busse et al. 2016; Kumar and Rahman 2016). The TBL emphasises the simultaneous achievement of economic/business, social, and environmental benefits (Elkington 1998; Gimenez and Tachizawa 2012). Thus, it has been argued that SSD is an important contemporary topic that requires further research attention (Liu et al. 2018).

To define SSD, it is first necessary to clarify that there are two independent types of practice that can be used to develop suppliers: indirect SD and direct SD (Wagner and Krause 2009). Indirect SD focuses on the transfer of codified knowledge (Krause, Handfield, and Tyler 2007), which usually includes: competitive pressure among suppliers, supplier improvement incentives, and routine supplier evaluation and feedback. Direct SD focuses on the transfer of tacit knowledge, including via supplier training and education, staff exchange, management involvement, and financial investment (Krause, Handfield, and Tyler 2007; Modi and Mabert 2007; Glock, Grosse, and Ries 2017). Similar distinctions have been made in the literature specific to SSD (e.g. Zhang, Pawar, and Bhardwaj 2017).

In addition to the term SSD, some studies (e.g. Grimm, Hofstetter, and Sarkis 2014; Yadlapalli, Rahman, and Gunasekaran 2018) refer to related terms such as sustainability-oriented supplier collaboration and sustainability-oriented supplier assessment. All three terms contribute to achieving overarching sustainable supplier management (SSM), although each contributes in a different way. The three terms are not mutually exclusive, and the exact scope

of each approach differs somewhat across studies. Sustainability-oriented supplier assessment emphasises selective, evaluative and monitoring strategies for ensuring compliance without necessarily seeking to bring about change (Grimm, Hofstetter, and Sarkis 2014). It is complemented by sustainability-oriented supplier collaboration, which focuses more on a supportive and collaborative relationship between the buyer and supplier to achieve SSM (Grimm, Hofstetter, and Sarkis 2014; Ni and Sun 2018). SSD entails elements from both of the above approaches because it is constituted by both indirect and direct initiatives but with a focus on the effort initiated and led by the buying firm. We thus understand SSD as being about one-way supportive initiatives from the buyer with a long-term outlook towards investments in developing suppliers in terms of their sustainability.

A significant number of publications related to SSD have emerged in recent years (Yawar and Seuring 2018), and several literature reviews have been published that incorporate SSD, as detailed in Table 1. From the table it can be seen that a systematic literature review (SLR) approach has been adopted in most prior studies to create a transparent and replicable procedure (Denyer and Tranfield 2009). All prior studies, however, have integrated SSD as part of a broader SSM study, with only two looking more specifically into either SSD practices to address social issues (Yawar and Seuring 2017) or analytical approaches to SSD (Zimmer, Fröhling, and Schultmann 2016), thereby limiting the depth of their coverage of this important topic. Thus, a comprehensive literature review on all aspects of SSD is missing. Importantly, more than one third of the papers included in this literature review (33 out of 83, cf. Section 3.1) have been published since 2017. Therefore, these papers could not have been considered in previous literature reviews. Such a surge in research attention on SSD underlines the important, contemporary nature of this topic, and it means there is a need to re-examine the current state-of-the-art within SSD research and identify priorities to guide future research.

Table 1. Survey of relevant literature reviews

Paper	Topic covered	Analysis focus	Methodology covered	Sustainability focus	Time horizon	Theoretical lens	SLR or not
Gimenez and Tachizawa 2012	Sustainability-oriented supplier assessment & collaboration	Enabler and performance outcome	Empirical papers	TBL	1996-2011	-	SLR
Zimmer, Fröhling, and Schultmann 2016	Sustainability-oriented supplier selection & development & monitoring	Analytical models employed to achieve SSM	Analytical papers	TBL	1997-2014	-	SLR
Chen et al. 2017	Sustainability-oriented supplier development & collaboration & monitoring	Collaboration within the supply chain	Not limited	TBL	1998-2015	-	SLR
Yawar and Seuring 2017	Sustainability-oriented supplier assessment & development & monitoring	Strategies employed to manage social issues within supply chain	Not limited	Social issue	2000-2013	-	Non-SLR
Jia et al. 2018	Sustainability-oriented supplier assessment & collaboration	SSM achievement in developing countries	Not limited	TBL	2000-2016	-	SLR
This review	Sustainability-oriented supplier development	All aspects of SSD	Not limited	TBL	Until end of 2019	Contingency theory	SLR

For the above reasons, there is a clear need for a comprehensive literature review on SSD. This paper thus presents a contemporary SLR specifically on all aspects of SSD. An overview of the extant literature plus an analysis of SSD practices adopted and performance outcomes is provided to answer the first of our two research questions:

- **RQ1:** What is the current state-of-the-art in the literature on sustainability-oriented supplier development?

SSD goes beyond traditional SD. It is a more complex process typically involving a wider range of stakeholders and inter-/intra-organisational factors. Thus, it is argued that better performance is more likely to be achieved if there is a consistent yet adaptive approach to SSD. This is in line with contingency theory, which suggests that it is the 'fit' between organisational actions in response to intra-/inter-organisational factors (contingency factors/contingencies) in the long run that determines organisational performance (Sousa and Voss 2008). With this in mind, we further investigate the reviewed papers in terms of how they studied SSD and its

performance outcomes from a contingency fit perspective. In doing so, we intend to address our second research question:

- **RQ2:** How can a contingency fit perspective advance our understanding of SSD and its effectiveness?

In addressing the two research questions, this paper provides in-depth coverage of all aspects of SSD, evaluating the state-of-the-art in the field. It identifies a promising theory lens – contingency theory – to further study the complex and dynamic features of SSD and outlines several important avenues for future research. Finally, implications for practitioners are provided, including the need to establish a performance evaluation system, to identify important contingencies and to pay more attention to the deployment actions when carrying out SSD.

The remainder of this paper is structured as follows. Section 2 describes the method used to select and review papers and outlines the theoretical lens used in the paper. A descriptive analysis of the literature, along with an analysis of the SSD practices and performance outcomes, are then provided in Section 3. Section 4 presents an analysis of the literature through the contingency theory lens before Section 5 discusses the gaps and future research directions. Finally, the paper concludes in Section 6.

2. Research Method

2.1 Systematic literature review process

A SLR enables a more objective and replicable approach to reviewing the literature to be adopted through transparent, inclusive and explanatory searching, retrieving, and filtering principles (Colicchia, Wilding, and Strozzi 2012). It also aids in building a solid and

dependable chain of evidence about the findings from prior studies (Denyer and Tranfield 2009). Thus, SLRs have contributed substantially to knowledge building and development (Tranfield, Denyer and Smart 2003; Durach, Kembro, and Wieland 2017). A SLR process is therefore followed in this research, as outlined in Figure 1 and detailed below.

Figure 1. The systematic literature review process

	Criteria	Rationale
Stage 1 **Identifying papers**	1.1 Keywords search in Scopus with no timeframe restrictions	Broad keywords without limit on the year of publication allowed to thoroughly uncover all relevant literature
↓ *1068 papers*	1.2 International peer-reviewed journals in English	Attempt to include high-quality published studies with the broadest audience
Stage 2 **Paper selection and evaluation**	2.1 Included papers from ABS Guide 2018 listed journals (604 papers)	ABS Guide – the most widely used and accepted quality indicator
	2.2 Excluded irrelevant articles after abstract analysis (124 papers)	Papers only focusing on the economic dimension or not focusing on supplier development cannot contribute to answering the research questions
	2.3 Excluded less relevant articles after full-text analysis (75 papers)	The main focus is not on any aspects of SSD
↓ *83 papers*	2.4 Included eight additional papers from citation check (83 papers)	Checked papers covered by the surveyed literature reviews to retrieve relevant work that had not been captured
Stage 3 **Paper synthesis and results reporting**	3.1 Developed Microsoft Excel database	Recorded the papers and classified them into different headings and sub-headings for analysis
	3.2 Descriptive analysis and thematic analysis	To identify trends and gaps in order to answer the research questions

Stage 1 – Identifying papers

Scopus was selected as the core database for this research because of its wide coverage of social science journals (Ansari and Kant 2017) and because it is widely used in other supply chain management literature reviews (e.g. Durach et al. 2015), including in the field of supplier management (Zimmer, Fröhling, and Schultmann 2016; Glock, Grosse, and Ries 2017). The search string used to retrieve literature is constructed of synonyms of supplier development and sustainability, as summarised in Table 2. A range of terms was used due to their interchangeable nature to obtain as much pertinent literature as possible. Such a search strategy was used in previous literature review exemplars from the SSD field (e.g. Zimmer, Fröhling, and Schultmann 2016; Yawar and Seuring 2017). Examples of widely used alternatives to supplier development include supplier engagement (e.g. Liu et al. 2018), supplier collaboration (e.g. Yawar and Seuring 2018), and supplier management (e.g. Chen and Chen 2019).

Meanwhile, the triple bottom line, sustainable, green and social are all widely used keywords employed by studies related to sustainability (Zimmer, Fröhling, and Schultmann 2016). As a first proxy for quality, only international peer-reviewed academic papers were selected without any limit on the year of publication, resulting in a total of 1,068 papers.

Table 2. Systematic literature review search strings

	Searching string used
Supplier development	TITLE-ABS-KEY ("supplier engagement" OR "engaging supplier" OR "supplier development" OR "developing supplier" OR "supplier relationship management" OR "managing supplier relationship" OR "supplier management" OR "managing supplier" OR "buyer supplier relationship" OR "supplier collaboration" OR "collaborating supplier" OR "vertical integration")
	AND
Sustainability	TITLE-ABS-KEY ("triple bottom line" OR "TBL" OR sustainability OR sustainable OR green OR environmental OR ethical OR social OR "sustainability stewardship" OR responsible OR multi-tier OR lower-tier OR sub-tier)

Stage 2 – Paper selection and evaluation

Durach, Kembro, and Wieland (2017) emphasised the need to consider quality as well as subject content when determining the article selection and evaluation criteria. Thus, we followed a transparent process with pre-specified inclusion and exclusion criteria based on relevance and quality considerations to filter the papers (as shown in Figure 1):

(1) ABS List: Papers published in journals included in the 2018 ABS Academic Journal Quality Guide were retained, thereby reducing the sample to 604 papers. This approach was adopted in prior SLRs, such as in Zorzini et al. (2015), using an earlier version of the ABS list.

(2) Abstract analysis: The abstracts of the 604 papers were screened with an initial focus on the research context. Research that was not set in a sustainable supply chain context was excluded, reducing the sample to 219 papers. The remaining papers were carefully examined to determine whether or not they are relevant to SSD, resulting in a database of 124 papers.

(3) Full-text analysis: The full text of the remaining 124 papers was assessed to determine whether or not a paper covered at least one aspect of SSD. Papers using other terms, such as supplier relationship management or supplier collaboration, were retained if they explicitly mentioned any supplier development practices in relation to sustainability. This reduced the sample to 75 papers.

(4) Further searching for relevant papers: We revisited the literature reviews from Table 1 to identify any relevant papers missed by our process. This supplemented the sample by a further eight papers. This added additional insight but was not a sufficiently large number of papers to suggest our process was not robust. The final database was therefore comprised of 83 papers.

Stage 3 – Paper synthesis and results reporting

A data extraction form was created to record content from the 83 papers, including descriptive data (e.g. research method and context) and thematic information (e.g. contingencies and deployment actions) to aid the synthesis and analysis of the papers. This structured approach can reduce human bias (Denyer and Tranfield 2009). Codes for descriptive analysis (e.g. research context and use of theory) were gained from prior literature reviews (e.g. Zorzini et al. 2015) and themes for thematic analysis were mainly informed by contingency theory. Thus, this theory lens and its relevance to SSD are presented next followed by a summary of the codes for thematic analysis before reporting the descriptive and thematic analysis results in Section 3 to address the research questions.

2.2 The theoretical lens - Contingency theory

There has been a growing trend in the Operations Management (OM) field to benefit from applying theories from other academic disciplines (Zorzini et al. 2015). Referring to theories from other fields can build stronger and more valuable insights (Barratt, Choi, and Li 2011); it

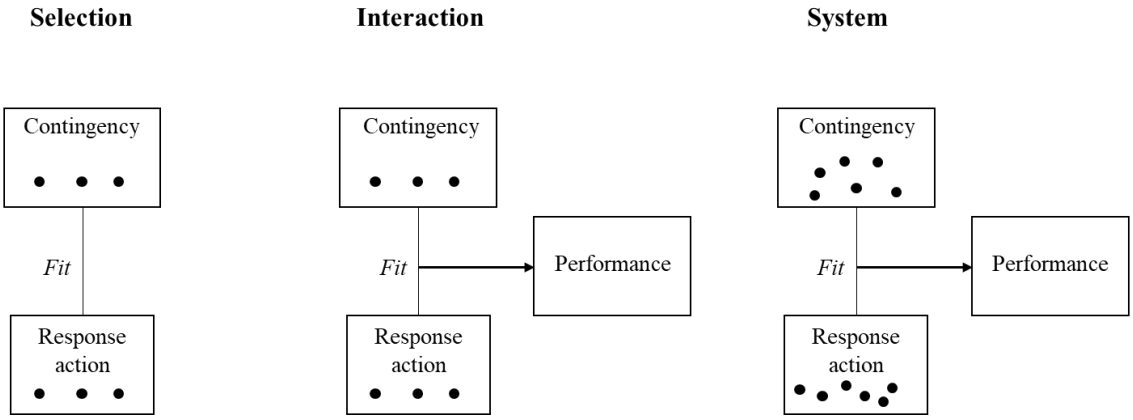
also helps further understanding of OM problems, which are often cross-disciplinary in nature (Sousa and Voss 2008). The sustainable supply chain management (SSCM) field of research has recently been informed by contingency theory (Sauer and Seuring 2018). The field has extensively examined the contingencies that affect how sustainability can be extended further up the chain to suppliers (e.g. Gimenez and Tachizawa 2012). Further, the theory has been used to identify relevant contingencies and identify their impact on sustainability practices (e.g. Wilhelm et al. 2016). For example, Tachizawa and Wong (2014) applied the lens to review the contingencies identified in previous papers and develop propositions on how these contingencies may affect the decisions and strategies employed to manage lower-tier suppliers in terms of sustainability. However, the literature offers only limited insight into the central argument of contingency theory (Sousa and Voss 2008) – the fit between the contingencies and the management process in order to survive or to attain higher performance. To fit the set of contingencies across different contexts, organisations need to design and adjust their management processes to achieve sustainable supply chain management on an individual basis (Grötsch, Blome and Schleper 2013). Thus, the concept of fit from contingency theory can be used to further explore all aspects of SSD and its effectiveness, revealing the fit between the actions taken, the different sets of contingencies and how this affects SSD performance outcomes.

In line with recent studies in the SSCM literature (e.g. Sauer and Seuring 2018; Silvestre et al. 2020), which have referred to the contingency perspective proposed by Sousa and Voss (2008) to identify contingencies, we employ this approach and go one step further than previous studies by using their classification of the different forms of fit – selection, interaction, and system – to review the papers. Each of the three different forms of fit consists of at least two variables from the set of contingency variables, response variables, and performance variables (Sousa and Voss 2008). Contingencies are usually high inertia factors

that can hardly be influenced or manipulated by a single firm or manager, and thus firms need to adapt to these in order to obtain better performance; response variables are actions or practices taken by an organisation to deal with current or potential contingencies; and performance variables are measurements used to evaluate the contingency effects generated by contingencies, response variables and the fit between the two (Sousa and Voss 2008; Grötsch, Blome and Schleper 2013).

Figure 2 illustrates the classification framework adapted from Sousa and Voss (2008), which will be employed as a starting point for addressing RQ2. The selection approach assumes that fit is a congruence between contingency factors and response actions without considering the impact of the contingency-response pair on the performance variable. Meanwhile, the interaction and system approaches consider all three variables. The interaction approach focuses on contingency-response action pairs and the impact of each individual pair on the performance variable, while the system approach broadens this to multiple contingency factors and response actions simultaneously and holistically to also consider the interactive feature among different variables and contingency-response pairs (Sousa and Voss 2008). The system approach can be further divided into the partial-system and full-system approach, with the former only considering the individual effects of each contingency/response action while the latter takes mutual interactions into consideration (Sousa and Voss 2008). This classification framework is a comprehensive foundation for contingency-based OM research to study the impact of contextual conditions and the adaptive features of OM processes (Wong, Boon-Itt, and Wong 2011).

Figure 2. The three forms of fit (Adapted from Sousa and Voss 2008)



By its very nature, SSD is a dynamic process that requires an adaptive perspective since it entails multiple stakeholders, various implementation options, and a diversified supply base (Liu et al. 2018; Tong et al. 2018). Research into SSD is still at a nascent stage of development, with little attention having been given to the fit approach; however, various underlying contingencies have been identified in prior studies (e.g. Tachizawa and Wong 2014). As Sousa and Voss (2008) suggested, identifying an exhaustive list of contingencies serves as an important first step, paving the way for the further application of contingency research. Hence, there appears to be a logical fit between the theoretical lens – contingency fit – and the study of SSD. Moreover, by applying the contingency theory lens to guide our analysis, we respond to recent calls to use theory to strengthen the theoretical contributions of SLRs and add to theory development in the field of SSCM (Seuring et al. 2020). Thus, the reviewed papers were categorised based on the forms of fit they employed (either implicitly or explicitly) to structure the analysis.

Based on the above analysis, the codes employed to categorise the papers for thematic analysis include: contingencies, response actions, performance outcomes and employed form of fit – selection, interaction, and system. All of them are gained from the contingency research framework proposed by Sousa and Voss (2008). To ensure consistency in coding the papers

that use different terms, each paper was evaluated according to the definitions of the above codes. For example, papers using terms such as enablers and antecedents were categorised as papers covering the theme 'contingencies' if they discussed the impact of these factors on SSD. Sub-codes (e.g. buyer-side contingencies and the adoption of SSD practices) emerged from the papers during the reviewing process and are discussed under respective themes in Section 3.2.2 and Section 4. As an example, contingency factors affecting SSD were broken down into sub-codes according to the source: buyer side, supplier side, buyer-supplier dyad, and external. When a new code emerged, we went back and forth among relevant papers that discussed the same topic to finalise the naming and the scope of the code. Besides, the categorisation of the SSD practices into direct and indirect SSD practices was borrowed from previous SD papers (e.g. Krause, Handfield, and Tyler 2007) and SSD papers (e.g. Zhang, Pawar, and Bhardwaj 2017). Multiple researchers were involved in determining and validating the coding process.

3. Overview of the Literature – Research Question 1

3.1 Journal distribution, sustainability scope and research method

Table 3 demonstrates that the 83 papers are distributed across 31 different journals, with 16 journals publishing two or more papers. The table also shows that SSD has received increasing attention over time. More specifically, more than one third (33 out of 83) of the papers were published in the past three years (2017-2019). Meanwhile, Table 4 classifies the literature according to the (non-economic) sustainability dimension covered in each paper, i.e. environmental sustainability, social sustainability, and sustainability in general. There are 38 papers in the third category, examining sustainability in general without going into deeper discussion of environmental or social sustainability individually. For example, the evaluation criteria employed by Luzzini et al. (2015), in investigating the performance outcomes of SSD practices, are social and environmental compliance. However, no further specific measurement

items are used to distinguish between compliance performance for each sustainability dimension. The research provides a general discussion of SSD without having any specific focus on either dimension. Papers discussing the extension of CSR to suppliers also generally fall into this category as they usually consider both social and environmental issues together. Only a few papers have tried to distinguish between the management strategies for each dimension (e.g. Akman 2015; Rogers, Carter, and Kwan 2019), although even here this is done without further differentiating between their impact on performance outcomes.

Table 3. Distribution of the papers by journal and year

Journal	**Number of papers**	**2005-2009**	**2010-2014**	**2015- 2019**
Journal of Cleaner Production	12		2	10
Journal of Purchasing and Supply Management	8		2	6
International Journal of Production Economics	7		3	4
Supply Chain Management: An International Journal	6	2	1	3
International Journal of Operations and Production Management	5	1	2	2
Journal of Business Ethics	4	1		3
Journal of Supply Chain Management	4		2	2
Corporate Social Responsibility and Environmental Management	3		2	1
European Journal of Operational Research	3		1	2
International Journal of Physical Distribution and Logistics Management	3			3
Production and Operations Management	3	1		2
Benchmarking	2			2
Business Strategy and the Environment	2			2
Computers and Industrial Engineering	2			2
International Journal of Production Research	2		1	1
Journal of Environmental Management	2			2
Annals of Operations Research	1			1
Applied Economics	1			1
California Management Review	1	1		
Competition and Change	1		1	
Global Business and Economics Review	1			1
International Review of Retail, Distribution and Consumer Research	1			1
Journal of Business Logistics	1		1	
Management of Environmental Quality: An International Journal	1			1
Management Research Review	1		1	
Management Science	1			1
Politics & Society	1	1		
Production Planning and Control	1			1
Regulation and Governance	1			1
Review of International Business and Strategy	1			1
Supply Chain Forum	1		1	
Total	**83**	**7**	**20**	**56**

Table 4. Sustainability scope of the retrieved papers

Sustainability scope	Definition	Number of papers	2005-2009	2010-2014	2015-2019	Sample papers
Environmental	SSD practices aimed at making suppliers more environmentally friendly	**27**	2	8	17	Vachon and Klassen 2006; Ehrgott et al. 2013; Nguyen Donohue and Mehrotra 2019
Social	SSD practices aimed at making suppliers more socially responsible	**18**	3	3	12	Mamic 2005; Sancha et al. 2015; Awasthy and Hazra 2019
Sustainability in general	SSD practices aimed at making suppliers more sustainable in general	**38**	2	9	27	Keating et al. 2008; Harms, Hansen, and Schaltegger 2013; Sancha, Wong, and Gimenez 2019

Table 5 presents a summary of the research methods employed in the reviewed papers. The sample includes 6 theoretical papers, i.e. 3 literature reviews and 3 conceptual frameworks. Of the 57 empirical papers, most adopt a single research method – either a case study (30 papers) or survey (25 papers). Vachon and Klassen (2006) and van Hoof and Thiell (2015) are the exceptions, both employing a mixed-methods approach based on a combination of case study and survey research. Meanwhile, of the analytical papers, some also incorporated an empirical element. For example, Dou, Zhu, and Sarkis (2018) applied action research principles to a Decision-Making Trial and Evaluation Laboratory (DEMATEL) model by first establishing the DEMATEL model and then applying it in practice. Their research furthered understanding of how SSD affects performance outcomes. Finally, behavioural experiments were conducted by Rogers, Carter, and Kwan (2019), focusing on individual-level decision-making processes as part of SSD implementation, which complements other studies that focused on an organisational level analysis using different research methods.

Table 5. Research method applied by the papers

			Number of papers	(Sample) Papers
Research method	Theoretical	Review	3	Gimenez and Tachizawa 2012; Zimmer, Fröhling, and Schultmann 2016; Yawar and Seuring 2017
		Conceptual framework	3	Hajmohammad and Vachon 2016; Akhavan and Beckmann 2017; Sauer and Seuring 2018
	Empirical	Case study	30	Mamic 2005; Huq, Stevenson, and Zorzini 2014; Liu, Zhang, and Ye 2019
		Survey	25	Vachon and Klassen 2006; Luzzini et al. 2015; Sancha, Wong, and Gimenez 2019
		Mixed method	2	Vachon and Klassen 2006; van Hoof and Thiell 2015
	Analytical	Modelling	16	Bai and Sarkis 2010; Bai, Dhavale, and Sarkis 2016; Awasthy and Hazra 2019
		Modelling + empirical	3	Akman 2015; Thakker and Rane 2018; Dou, Zhu, and Sarkis 2018
	Experimental	Behavioural experiment	1	Rogers, Carter, and Kwan 2019

The above descriptive analysis has shown that there is scope for more research on the social dimension of SSD. Future studies could also distinguish between social and environmental SSD as the two dimensions are indeed different and thus require specific approaches (Wilhelm et al. 2016). Adopting a longitudinal perspective or applying more experimental approaches is also advocated to provide new insights that would complement case study, survey and modelling work.

3.2 Overview of the empirical papers

3.2.1 Research perspective, use of theory, and research context

As shown in Table 6, most of the 57 empirical papers adopted (either explicitly or implicitly) a focus on the buyer's involvement in SSD, whereas 17 papers incorporated the supplier's perspective (either the supplier's perspective only or a multi-stakeholder perspective). An explicit discussion of other actors, e.g. NGOs and consulting companies, was found in only 4 papers. The dominant unit of analysis is the buyer-direct supplier dyad whereas only 8 papers explicitly extended this in some way to lower tier suppliers. Table 6 also summarises the theoretical lenses adopted in prior work, with 36 papers using an established theory frame to

some degree. A total of 19 different theories have been used, with 17 papers utilising multiple theories. The resource-based view (RBV) and institutional theory are the most commonly adopted theories when studying SSD, appearing in 12 and 9 papers, respectively. RBV emphasises the unique organisational resources that can be leveraged to form sustainable competitive advantage (Barney 1991). Accordingly, SSD is regarded as an approach that augments the resource base of the buyer, supplier, dyad, or supply chain, which can benefit the diffusion of sustainability along the supply chain (e.g. Ehrgott et al. 2013). Institutional theory emphasises, for example, the substantial influence of the institutional setting on isomorphic behaviour. It has been used to explain factors that drive SSD practices in the supply chain. Of the 36 papers, 20 were published after 2015. Research studies have broadened the range of theoretical lenses used to now also include, for example, social capital theory and contingency theory (e.g. to examine the impact of SSD on performance outcomes) and both absorptive capacity theory and stewardship theory (e.g. to explore the role of suppliers).

Table 6. Research perspective, unit of analysis, and use of theory

		Number of papers	(Sample) Papers
Research perspective	Buyer perspective only	38	Vachon and Klassen 2006; Lepplt et al. 2013; Sancha, Wong, and Gimenez 2019
	Supplier perspective only	6	Lee and Klassen 2008; Wu 2017; Chen and Chen 2019
	Multi-stakeholder perspective	13	Grimm, Hofstetter, and Sarkis 2014; Rodríguez, Giménez, and Arenas 2016; Liu et al. 2018
Unit of analysis	Buyer-direct supplier dyad	49	Mamic 2005; Ehrgott et al. 2013; Liu, Zhang, and Ye 2019
	Buyer-multi-tier supplier relationship	8	De Marchi, Di Maria, and Ponte 2013; Aßländer, Roloff, and Nayır 2016; Lechler, Canzaniello, and Hartmann 2019
Use of theory	(Natural) Resource-based view	12	Pagell, Wu, and Wasserman 2010; Kumar and Rahman 2016; Yadlapalli, Rahman, and Gunasekaran 2018
	(Neo-) Institutional theory	9	Blome, Hollos, and Paulraj 2014; Tachizawa, Gimenez, and Sierra 2015; Yawar and Kauppi 2018
	Transaction cost economics	6	Vachon and Klassen 2006; Huq, Stevenson, and Zorzini 2014 ; Sancha, Wong, and Gimenez 2019
	Relational view	4	Sancha et al. 2015; Rodríguez, Giménez, and Arenas 2016; Sancha, Wong, and Gimenez 2019
	Stakeholder theory	4	Pagell, Wu, and Wasserman 2010; Ehrgott et al. 2013; Kumar and Rahman 2016
	Agency theory	4	Aßländer, Roloff, and Nayır 2016; Yadlapalli, Rahman, and Gunasekaran 2018; Lechler, Canzaniello, and Hartmann 2019
	Dynamic capability view	2	Foerstl et al. 2010; Reuter et al. 2010
	Resource dependence theory	2	Leppelt et al. 2013; Lo et al. 2018
	Social capital theory	2	Rodríguez, Giménez, and Arenas 2016; Rodríguez et al. 2016;
	Absorptive capacity theory	1	Liu, Zhang, and Ye 2019
	Antecedent theory	1	Large and Gimenez Thomsen 2011
	Critical success factor theory	1	Grimm, Hofstetter, and Sarkis 2014
	Contingency theory	1	Ni and Sun 2018
	Goal setting theory	1	Busse et al. 2016
	Legitimacy theory	1	Stekelorum, Laguir, and Elbaz 2018
	Network theory	1	van Hoof and Thiell 2015
	Prospect theory	1	Chen and Chen 2019
	Self-determination theory	1	Roehrich, Hoejmose, and Overland 2017
	Stewardship theory	1	Aßländer, Roloff, and Nayır 2016

Table 7 summarises the country and industry contexts studied in prior work. There has been a rapid increase in studies in the last 5 years that have incorporated a developing country focus, meaning the developed world no longer dominates the literature. This research shift better reflects the distribution of suppliers in global supply chains and the acute nature of sustainability problems often associated with some developing countries (Busse et al. 2016). Cross-country research, including both developing and developed countries, has also seen a recent upsurge although the majority of research conducted in developing countries thus far concentrates on a single-country context, such as China (e.g. Sancha, Wong, and Gimenez 2019) or India (e.g. Yawar and Kauppi 2018). In terms of the industry sector, studies based on a

developed country context cover a relatively broad range of sectors, including ten of the eleven main sectors listed by The Global Industry Classification Standard (Standard & Poor's and Morgan Stanley Capital International 2017), i.e. all except for the real-estate sector. The consumer discretionary sector (e.g. apparel and textiles) has gained the most attention – in both the developed and developing worlds – due, for example, to its labour-intensive nature and history of sustainability issues (Zorzini et al. 2015). Research in developing countries is thus far comparatively narrow in scope. The consumer oriented staple goods sector (e.g. food and beverages) is the second most researched industry whereas service sectors such as financials and healthcare have received only limited attention despite, for example, the widespread global outsourcing of call centres and software development.

Table 7. Country and industry context

		Developed countries	**Developing countries**	**Developed & developing**
Overall	**Total**	**20**	**20**	**11**
	2005-2009	3	1	3
	2010-2014	11	3	0
	2015-2019	6	16	8
Country setting	Single country	13	17	-
	Multiple countries	7	3	11
Industry sector setting	Consumer discretionary	11	13	4
	Materials	10	6	4
	Industrials	8	6	4
	Consumer staples	4	9	2
	Financials	4	0	0
	Information technology	3	6	5
	Energy	3	0	0
	Health care	2	3	2
	Utilities	2	0	0
	Communication services	1	1	1

From the above it is concluded that more cross-context research is needed to investigate SSD in a global supply chain setting given that supply chains are increasingly dispersed around the world (Grimm, Hofstetter, and Sarkis 2014). Meanwhile, studies that extend the unit of analysis to the multi-tier supply base would also help to address end-to-end sustainability issues in supply chains.

3.2.2 SSD practices and performance outcomes

This subsection presents a summary of SSD practices and performance outcomes, as shown in Table 8. The summary of performance outcomes is presented here as it is an element that responds to both research questions and connects them together. Most studies refer to the combined use of direct and indirect SSD practices, which supports the argument by Zimmer, Fröhling, and Schultmann (2016) that SSD is a continuous improvement process that is usually comprised of both evaluative and developmental initiatives which are likely to reinforce each other. Training/education is the most discussed direct SSD practice and regular evaluation and feedback is the most widely used indirect SSD practice. Other direct SSD practices such as management involvement (e.g. joint process design) and financial investment (e.g. direct asset investment) are not widely used or discussed in much detail as they require a longer term outlook and a more deeply engaged level of involvement by both the buyer and supplier.

Table 8. Practices and performance outcome measurements

	Dimensions	Specific items	Number of papers	(Sample) Papers
Direct SSD practices	Training/ education	Technical training, training on codes of conduct, sustainability knowledge transfer workshop/courses, etc.	50	Mamic 2005; De Marchi, Di Maria, and Ponte 2013; Sancha, Wong, and Gimenez 2019
	Personnel transfer	Site visit, joint team, visit suppliers' premises, invite suppliers to buyers', etc.	25	Andersen and Skjoett-Larsen 2009; Hoejmose, Brammer, and Millington 2013; Yadlapalli, Rahman, and Gunasekaran 2018
	Management involvement	Build top management commitment of supplier, formal long-term plan/contract, process/product design with supplier, etc.	10	Locke, Amengual, and Mangla 2009; Aıan et al. 2016; Liu et al. 2018
	Financial investment	Direct financial support, asset investment, assist with obtaining loan from the bank, etc.	8	Mamic 2005; Rodríguez et al. 2016; Yawar and Kauppi 2018
Indirect SSD practices	Evaluation and feedback	Corrective action plan, regular audit/evaluation with feedback, etc.	34	Mamic 2005; Tachizawa, Gimenez, and Sierra 2015; Yawar and Kauppi 2018
	Improvement incentives	Better terms and conditions in the contract, cost-sharing, increase of business, etc.	12	Locke, Amengual, and Mangla 2009; Porteous, Rammohan, and Lee 2015; Liu et al. 2018
Performance outcome	Operational	Cost, delivery, quality, responsiveness, innovation, HR, BSR	17	Reuter et al. 2010; Blome, Hollos, and Paulraj 2014; Sancha, Wong, and Gimenez 2019
	Social	Occupational health and safety, human rights, awareness	13	Locke, Amengual, and Mangla 2009; Sancha et al. 2015; Ni and Sun 2018
	Environmental	Energy, waste, emission, environmental reputation	11	Lee and Klassen 2008; Yadlapalli, Rahman, and Gunasekaran 2018; Chen and Chen 2019
	Economic	Profit/EBIT, income, return on asset, sales	8	Perez-Aleman and Sandilands 2008; Rodríguez et al. 2016; Subramaniam et al. 2019
	No impact	Social – labour rights, wages & working hours, reputation Economic – return on asset, sales, resource efficiency Operational – cost, delivery, quality, responsiveness, BSR	5	Distelhorst et al. 2015; Kumar and Rahman 2016; Yang and Fang 2017
	Negative impact	Economic – Sales/EBIT/ financial strength Operational – Technical capabilities/ purchasing performance	3	Large and Thomsen, 2011; Ehrgott et al. 2013; Sancha, Wong, and Gimenez 2019

Of the 57 empirical papers, 35 papers discussed the performance outcomes of SSD. Research has employed a variety of performance measurement dimensions and items (see Table 8), ranging from sustainability-relevant dimensions (i.e. social, environmental and/or economic) to operational dimensions, suggesting SSD outcomes are not limited to sustainability performance improvements. Almost all of the papers reported a positive impact on either buyers or suppliers or both. For example, Subramaniam et al. (2019) found that SSD contributes to improving suppliers' social performance and subsequently to the buyers' social, economic and operational performance. This indicated that improvements on the supplier side

are good for both parties, that they may be a prerequisite for the SSD effort to fully pay off on the buyer side, and that the performance outcome of SSD is not limited to sustainability oriented dimensions only.

A few papers have reported a negative impact arising from SSD. For example, although Sancha et al. (2015) reported a positive impact on supplier social performance, the authors reported a negative impact on buyer economic performance, measured by indicators such as sales. The use of different measurement items across studies may explain such inconsistencies or contradictions, and thus the further identification of both valid and comparable measurement items is crucial to consolidating findings across studies. Meanwhile, Locke, Amengual, and Mangla (2009) reported positive impacts on social conditions derived from improved operational efficiency, whereas in Yawar and Seuring (2018) this is derived from improved economic conditions. Such findings suggest that the connection between different performance dimensions requires further investigation.

Further, Distelhorst et al. (2015) found no improvement from suppliers participating in off-site managerial training and suggested future research should investigate the impact of other types of SSD practices. It has been acknowledged that the combined use of different SSD practices may generate better performance as SSD is a continuous improvement process that is usually comprised of both evaluative and developmental initiatives (Zimmer, Fröhling, and Schultmann 2016). Thus, deployment strategies can also affect the performance outcomes of SSD. In addition, the specific positive impact depends on contextual factors. For example, Ni and Sun (2018) found that the deployment strategy should match the contextual factors, such as stakeholder pressure, to reap the desired benefits. It is therefore argued here that both the various contingencies and deployment strategies can affect the performance outcomes of SSD. This is in line with the contingency theory perspective. Thus, the following section reviews the papers using a contingency theory lens by first examining the elements of contingency theory

– contingencies and response actions (i.e. deployment strategy) – and then the forms of fit employed to further our understanding of SSD.

4. Contingency perspective – Research Question 2

4.1 The contingencies and response actions

4.1.1 Contingencies

Prior studies have identified a variety of contingencies, with 72 papers within the set of reviewed papers discussing at least one contingency factor that would affect the performance outcome of SSD (as shown in Table 9). Given the multi-stakeholder nature of SSD (Rodríguez et al. 2016; Ni and Sun 2018), contingency factors identified from the literature are categorised into buyer-side, supplier-side, buyer-supplier dyad, and external contingencies. In particular, although many organisational level contingencies are identifiable from the literature, there has been less attention on individual level contingencies (e.g. decision-making preferences and capability).

Table 9 Contingencies

	Types	**Specific items**	**Number of papers**	**(Sample) Papers**
Contingencies	External	Characteristics of SSD process/practices Institutional pressure Impact of external organizations Market context Complexity of sustainability Interrelationship among different contingencies	31	Mamic 2005; Fu, Zhu, and Sarkis 2012; Hultman and Elg 2018
	Buyer side	Commitment to sustainability Sustainability relevant capability and knowledge Supportive resources/strategies Organizational context factors Goal of the SSD Behavioural factors	31	Locke, Amengual, and Mangla 2009; Blome, Hollos, and Paulraj 2014; Awasthy and Hazra 2019
	Supplier side	Sustainability relevant capability and knowledge Organizational context factors Commitment to sustainability Profitability Behavioural factors	24	Dou, Zhu, and Sarkis 2014; Roehrich, Hoejmose, and Overland 2017; Nguyen, Donohue, and Mehrotra 2019
	Buyer-supplier dyad	BSR Supplier integration level Characteristic of supply base Geographical/cultural distance Agency problems	23	Vachon and Klassen 2006; Rodríguez et al. 2016; Sancha, Wong, and Gimenez 2019

More attention has been given to contingencies external to the buyer-supplier relationship and to contingencies on the buyer side. In terms of the external contingencies, institutional pressure is a key driving force behind SSD, especially when complementary to buyers' sustainability requirements (Distelhorst et al. 2015). The characteristics of the SSD practices/process (e.g. coverage and cost) is another widely discussed factor. For example, Rashidi and Saen (2018) found that SSD is a dynamic process that requires a gradual or stepwise approach. Relatively less attention has been given to characteristics such as the market context, the complexity of the sustainability concept, or the interrelationship among several contingencies. It is common that there are multiple contingencies that affect SSD and thus investigations into the interrelationship amongst them are needed to identify the most important contingencies for SSD that require the most attention (Grimm, Hofstetter and Sarkis 2018).

From the buyer side, commitment to sustainability is the most discussed factor, but this commitment has to be embedded throughout the entire organisation at both an organisational and individual level (Locke, Amengual, and Mangla 2009) and supported by operational level actions (Wan Ahmad et al. 2016) if it is to have a positive impact on the performance outcomes of SSD (Andersen and Skjoett-Larsen 2009). Meanwhile, having the necessary upfront financial resources is crucial to success as SSD implementation can be costly (Bai, Dhavale, and Sarkis 2016) and budgets are difficult to change in the short term (Trapp and Sarkis 2016). Some other types of contingencies are discussed more infrequently in the literature, e.g. the goal of SSD and behavioural factors. Individual-level contingencies are given little attention with only one recent paper explicitly discussing the impact of a behavioural factor – psychological distance – on the decision-maker. By taking the psychological distance, i.e. the view that events that are spatially or temporally further away are perceived as having increasingly discounted consequences for the decision-maker, Rogers, Carter, and Kwan

(2019) surprisingly found that decision-makers care as much for the social dimension as they do for the economic dimension, but less for the environmental dimension.

From the supplier side, supplier knowledge and capabilities relevant to sustainability have been given the most attention (e.g. Dou, Zhu, and Sarkis 2014), followed by organisational contextual factors such as company size and country context, which are covered in several analytical studies (e.g. Bai, Dhavale, and Sarkis 2016). Less attention, however, has been paid to suppliers' level of commitment towards and awareness of SSD and to sustainability in general. These factors will influence suppliers' follow-up actions after SSD as it requires a supplier to genuinely internalise what has been learned through SSD to address the sustainability challenges it faces. Also, behavioural and individual-level contingencies, such as the risk preference of suppliers, have received little attention.

A good buyer-supplier relationship (BSR) within the buyer-supplier dyad can have a positive impact on the successful implementation of SSD practices (Sancha, Wong, and Gimenez 2019), while an adversarial BSR may exert a negative impact (Lechler, Canzaniello, and Hartmann 2019). Meanwhile, the characteristics of the supply base, such as the size of the supply base, have been considered in several studies as they can affect the goal, duration and effectiveness of SSD. For example, some recent studies have considered SSD within the context of a multi-tier supply base (e.g. Sauer and Seuring 2018) and identified several contingencies that are important to achieving SSM (e.g. Grimm, Hofstetter, and Sarkis 2014). However, these studies have considered contingencies from a general perspective, with the exception of Aßländer, Roloff, and Nayır (2016) who specifically investigated the agency or stewardship role of first-tier suppliers. Further, previous research (e.g. Wilhelm et al. 2016) has found that the first-tier supplier can play a 'double agency role' by meeting the sustainability requirements of the buyer themselves and diffusing the requirements to its own suppliers within

a multi-tier supply chain. It would be interesting to further examine how first-tier suppliers successfully fulfil this dual role and the challenges they face in doing so.

4.1.2 Response actions

Table 10 shows that the discussion of response actions is mainly in relation to SSD practices. Some papers have discussed the use of different types of SSD practices to respond to different contingencies. More specifically, direct SSD practices are mainly used to assist in developing supplier capabilities, while indirect practices are more often used to respond to institutional pressures (Zhang, Pawar, and Bhardwaj 2017). Meanwhile, employing an analytical approach to evaluate and rank SSD practices – by taking industry, company size, and profitability factors into account – has been discussed in a few papers (e.g. Bai, Dhavale, and Sarkis 2016), but coverage was limited to environmental SSD practices only. This type of response action is mainly used in response to contingencies from the supplier side (e.g. supplier sustainability relevant capability and knowledge or organisational context factors). Many papers have however proposed using SSD as a tool – the adoption of SSD practices to develop suppliers in terms of their sustainability but without specifying how SSD could be deployed. For example, Ehrgott et al. (2013) studied the impact of environmental SSD but did not include any discussion regarding the deployment strategy. This action is the one that has been discussed the most and used in response to various contingencies from the buyer side, such as commitment to sustainability.

Table 10 Response actions

	Types	Specific items	Number of papers	Most discussed contingencies	(Sample) Papers
Response actions	Configuration in the use of SSD practices	Differentiate between direct/indirect SSD practices Rank of SSD practices Combined use of different SSD practices	30	Supplier side contingencies (14)	Keating et al. 2008; Bai et al. 2016; Awasthy and Hazra 2019
	Adoption of SSD practices	Deploy SSD practices without specifying details	22	Buyer side contingencies (16)	Leire and Mont, 2010; Ehrgott et al. 2013; Liu, Zhang and Ye, 2019
	Actions taken to complement the use of SSD practices	Adjust the deployment strategy according to supplier capability/needs Dynamic perspective of the process Localization/standardization of SSD process Build good buyer-supplier relationships	14	External contingencies (9)	Mamic 2005; Locke, Amengual, and Mangla 2009; Yawar and Seuring 2018
	Collaboration with other organizations	Collaboration with external stakeholders Collaboration with first-tier suppliers Collaboration with business partners Horizontal collaboration with other buying firms	10	External contingencies (6)	Mamic 2005; Rodríguez, Giménez, and Arenas 2016; Liu et al. 2018

Response actions that could complement the use of SSD practices, such as tailoring the SSD process according to contingencies like the supplier country context or capability gap (e.g. Locke, Amengual, and Mangla 2009), or taking the multi-stage and dynamic nature of SSD into consideration (e.g. Hultman and Elg 2018), localising SSD, and facilitating good BSRs (e.g. Busse et al. 2016) were less discussed. Even less attention has been given to collaboration with other organisations, which is mainly employed in response to contingencies from the external environment (e.g. NGOs) to access capabilities and resources that could complement those of the buyer (Rodríguez et al. 2016). Specific actions include accessing lower tiers by collaborating with first-tier suppliers (e.g. Lechler, Canzaniello, and Hartmann 2019) and horizontal collaboration to share out the costs of SSD (e.g. Mamic 2005). However, more research is needed to further investigate one of the big issues within such collaborations – ways of achieving goal/strategy alignment between actors in terms of sustainability and SSD (e.g. Rodríguez, Gimenez, and Arenas 2016).

4.2 Contingency fit perspective

Although only Ni and Sun (2018) have explicitly referred to contingency theory, most of the

remaining papers reviewed in this SLR do at least partly employ a contingency perspective. For example, Andersen and Skjoett-Larsen (2009) explored contingencies and the corresponding response actions but without explicitly mentioning contingency theory. From a contingency fit perspective, such research employs a selection fit approach, contributing to exploring important relationships between the context and specific actions taken in the SSD process. Adopting a fit perspective approach to exploring SSD can contribute to theoretical advancement on the contingencies and how they influence value creation via inter-organisational interactions during SSD (Rodríguez, Gimenez, and Arenas 2016). Thus, the forms of fit employed by the papers and how this furthers our understanding of SSD are discussed next.

The selection and interaction approaches focus on how a single contingency factor affects a single response, which helps explore contingency-response pairs in a certain context. The system approach focuses on a holistic view, which is supposed to take the many contingencies, response alternatives and performance measurements and their interactions into consideration simultaneously (Sousa and Voss 2008). Table 11 presents the three forms of fit informed by Sousa and Voss (2008) and the number of papers from this review belonging to each form, demonstrating a substantial use of the selection approach (45 papers). The use of the interaction (17 papers) and system approaches (14 papers) is considerably lower. Amongst the papers adopting the system fit approach, 4 papers adopted a partial-system fit approach while the rest of the papers (10) adopted a full-system approach.

Table 11. Employed form of fit

Form of fit	Definition	Number of papers	(Sample) Papers
Selection	Fit is a congruence between one contingency factor and one response action	45	Mamic 2005; Fu, Zhu, and Sarkis 2012; Rashidi and Saen 2018
Interaction	Focuses on pairs of contingency-response actions and the impact on performance of each pair individually	17	Perez-Aleman and Sandilands 2008; Distelhorst et al. 2015; Chen and Chen 2019
System	Considers multiple contingency factors and response actions simultaneously and holistically	14	Lee and Klassen 2008; Bai, Dhavale, and Sarkis 2016; Nguyen Donohue and Mehrotra 2019

Selection fit approach

Within the selection fit approach category, 29 papers explored multiple contingencies, and 16 papers examined only one pair of contingency-response relationships. Amongst them, 10 papers examined more than one contingency and their mutual interactions, showing their potential to move a step further to the full-system perspective in order to explore the impact of pairs of contingencies on the performance outcome. For example, Sauer and Seuring (2018) examined the mutual interactions between two contingencies – suppliers' direct environment and their criticality to the buyer and responding actions accordingly – to demonstrate the need to consider these contingencies simultaneously when deciding on the appropriate response actions. They, however, did not include any discussion regarding the outcomes. Two papers (Dou, Zhu, and Sarkis 2018; Grimm, Hofstetter, and Sarkis 2018) within this category did however further examine the interrelationship amongst several contingencies and identified the most critical ones according to their relative importance. This fit approach adds to our understanding in terms of identifying contingency-response pairs, but it does not add to our understanding of how the contingencies and contingency-response pairs affect the outcome of SSD or how to make SSD more effective in a given context.

Interaction fit approach

This approach relates the contingency-response pair to the performance outcome. Most of the papers adopting this approach only examined one contingency and subsequent response action. For example, Sancha, Wong, and Gimenez (2019) found that the use of SSD practices is dependent on the level of supplier dependence, leading to different performance outcomes. In fact, this approach has been proposed to help identify the most important or critical contingency-response pairing amongst several pairs (Sousa and Voss 2008). Some of the papers within this category have identified more than one contingency or response action, but

only studied one contingency-response pair and its impact on the performance outcome. For example, Blome, Hollos, and Paulraj (2014) identified several contingencies such as top management commitment that can drive SSD, but only examined the impact of the procurement strategy-use of SSD practices pair on the performance outcome. This paper, however, suggested a combined use of both selection and interaction fit to identify several different contingency-response pairs. Further, there are 2 papers that examined more than one contingency-response pairs and their respective impact on the performance outcome. For example, Zhang, Pawar, and Bhardwaj (2017) found that the use of indirect SSD and direct SSD practices as response actions to institutional pressure and a supplier capability gap respectively, could both lead to improved performance. However, none of the papers in this category were able to detect critical contingencies or critical contingency-response pairs via comparing the performance outcomes of different pairs of contingency-response actions. Thus, there remains important scope for future research to study more than one pair of contingency-response relationships simultaneously and compare the results across different pairs to identify critical pairs that require more attention or investment.

System fit approach

The use of the system form of fit is argued to be the strongest approach as it makes the most powerful contribution to our understanding of how the outcome of SSD is affected and of how to fit different contexts by developing the response actions using the available SSD practices, complementary resources and strategies. Amongst the papers that employ the partial-system approach, Ni and Sun (2018) examined the fit between each of the two contingencies – environmental dynamism and stakeholder pressure – and the combined use of both direct and indirect SSD practices using the survey method. In doing so, they concluded that the use of

both practices under high environmental dynamism or stakeholder pressure works best. Besides, studies employing a full-system approach are primarily analytical papers that focus on the environmental dimension (e.g. Bai et al. 2019) (6 out of 10, as shown in Table 12). For example, Bai and Sarkis (2010) applied rough set theory to rank different SSD practices as a deployment strategy in response to various interacted contingencies (e.g. buyer sustainability capability and knowledge, supplier size, etc.) and examined the impact of different contingency-response pairs on both the operational and economic performance at suppliers. Such an approach was able to identify the fit between various contingencies and response actions simultaneously and the contingency-response pairs that could derive higher performance, thus informing decision-making within SSD.

Lee and Klassen (2008) and Rodríguez et al. (2016) have presented the only empirical studies employing a full-system approach. Rodríguez et al. (2016), for example, found that different sets of resource combinations between the focal firm and an NGO are needed to achieve different performance goals when deploying SSD initiatives. Prior research employing this approach has raised the importance of considering more than one contingency-response pair and the interactive nature of the contingencies. However, more use of the system fit approach is still needed as SSD usually consists of several stages, multiple stakeholders and various contingencies that may interact with each other to affect the response actions and performance outcomes. One interesting future research direction would be the use of the system fit approach to identify if there are any conflicting contingencies, i.e. where two or more contingencies suggest contradictory ways of using a particular type of response action, as suggested by Sousa and Voss (2008).

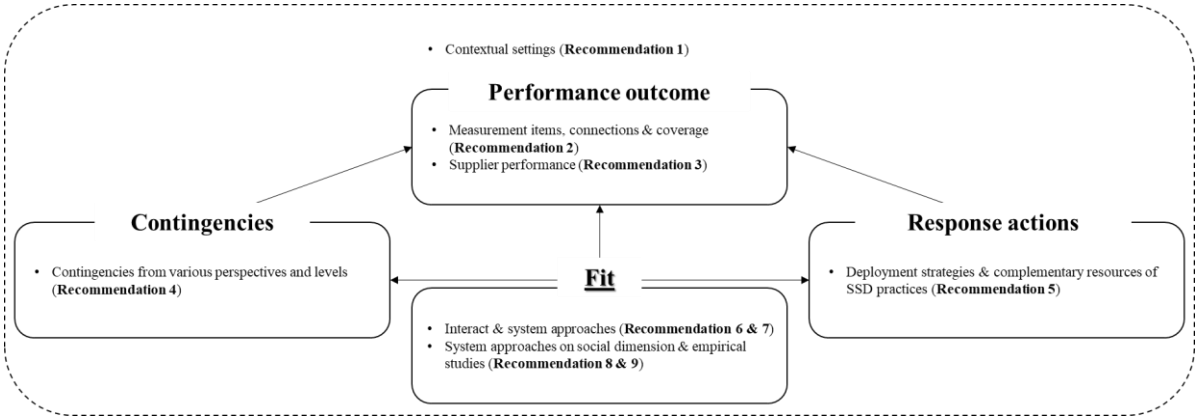
Table 12. Papers employing the *System* fit approach

Papers	Contingency – response pairs	Specific contingencies – response actions – performance outcomes	Method/Dimension/ Form
Busse et al. 2016	External/buyer-supplier dyad – Actions taken to complement the use of SSD practices	Complexity of sustainability/socio-economic /spatial/linguistic/cultural distance – Build good buyer-supplier relationships – Improved sustainability situation at suppliers	Empirical Sustainability in general System-partial
Ni and Sun 2018	External – Configuration in the use of SSD practices	Environmental dynamism/stakeholder pressure – Combined use of different SSD practices – Improved environmental, social and economic performance at buyers	Empirical Sustainability in general System-partial
Thakker and Rane 2018	Buyer side/external – Actions taken to complement the use of SSD practices	Commitment to sustainability/sustainability relevant capability and knowledge/supportive resources/institutional pressure/characteristics of SSD process/practices – Dynamic perspective of the process – Performance outcome on environment aspect at suppliers	Analytical Environmental System-partial
Lechler, Canzaniello, and Hartmann 2019	Buyer-supplier dyad – Actions taken to complement the use of SSD practices/collaboration with other organizations	Goal conflict/information asymmetry – Standardisation of SSD process/horizontal collaboration with other buyers – Address agency problems/improved compliance at suppliers	Empirical Sustainability in general System-partial
Lee and Klassen 2008	Supplier side – Configuration in the use of SSD practices	Size & commitment to sustainability & sustainability relevant capability and knowledge – Differentiate between direct/indirect SSDs – Improved environmental management capabilities at suppliers	Empirical Environmental System-full
Bai and Sarkis 2010	Buyer side/supplier side – Configuration in the use of SSD practices	Buyer sustainability relevant capability and knowledge & supplier size & profitability &industry – Rank of SSD practices – Performance outcome on environmental and operational aspects at suppliers	Analytical Environmental System-full
Bai, Sarkis, and Wei 2010	Buyer side/supplier side – Configuration in the use of SSD practices	Buyer sustainability relevant capability & supplier size/profitability/industry – Rank of SSD practices – Performance outcome on environmental and operational aspects at suppliers	Analytical Environmental System-full
Bai, Dhavale, and Sarkis 2016	Buyer side/supplier side – Configuration in the use of SSD practices	Buyer sustainability relevant capability & supplier learning ability/size/profitability – Rank of SSD practices – Performance outcome on environmental and operational aspects at suppliers	Analytical Environmental System-full
Rodríguez et al. 2016	Buyer side/buyer-supplier dyad/external – Collaboration with other organisations	Buyer sustainability relevant capability and knowledge/supportive resources & fair relationship & NGOs knowledge and bridging capability – Collaboration with external stakeholders – Improved social condition at suppliers	Empirical Social System-full
Karaer, Kraft, and Khawam 2017	Buyer-supplier dyad/external – Configuration in the use of SSD practices	The characteristic of supply base & market opportunity – Combined use of different SSDs – Performance outcome on environment aspect at suppliers	Analytical Environmental System-full
Tong et al. 2018	Buyer side/supplier side/external – Actions taken to complement the use of SSD practices/collaboration with other organizations	Behaviour factors of the buyer & supplier & impact of external organizations – Dynamic perspective of the process & collaborate with external stakeholder – Performance outcome at suppliers	Analytical Sustainability in general System-full
Awasthy and Hazra 2019	Buyer side/supplier side – Configuration in the use of SSD practices	Sustainability relevant capability & commitment to sustainability of the buyer & supplier – Differentiate between direct/indirect SSDs – Performance outcome on social and economic aspects at buyer & suppliers	Analytical Social System-full
Bai et al. 2019	Supplier side/external – Configuration in the use of SSD practices	The characteristics of the SSD practices & supplier sustainability relevant capability and knowledge – Rank of SSD practices – performance outcome on environmental performance at suppliers	Analytical Environmental System-full
Nguyen, Donohue, and Mehrotra 2019	Supplier side/external – Configuration in the use of SSD practices	Sustainability relevant capability and knowledge & impact of external organizations – Differentiate between direct/indirect SSDs – Performance outcome on environmental performance at suppliers	Analytical Environmental System-full

5. Discussion

This section presents a summary of the research gaps identified and proposes an agenda for future research derived from addressing the two research questions above. A conceptual framework that connects the proposed research opportunities is also presented (Figure 3).

Figure 3. Conceptual framework of SSD for future research



In answering RQ1, it was found that increasing attention has been paid to the social dimension of sustainability in recent years. However, most research still tends to investigate SSD in general terms, without going into more depth on either the environmental or social dimension to distinguish between the different strategies suitable for each dimension or their impact on performance outcomes. It is important to distinguish between the social and environmental dimensions of sustainability as they require different efforts and investments (Wilhelm et al. 2016) and are also found to attract different levels of attention from decision-makers (Rogers, Carter, and Kwan 2019). Hence, the deployment of SSD should first be contextualised according to the types of sustainability issues being addressed and the goals of SSD (Ni and Sun 2018). Meanwhile, it is also acknowledged that the research context under study has evolved in recent years, from developed countries to developing countries and cross-country contexts. This may raise the importance of considering contextual differences and also calls for research that employs a multi-stakeholder perspective to consider the roles of suppliers

and other collaborators (e.g. NGOs, local authorities, and professional agencies). Thus, future research should go beyond the dyadic buyer-supplier relationship to consider multiple stakeholders. More specifically, incorporating upstream lower tiers beyond the first-tier supplier will help to address end-to-end sustainability issues in supply chains; and it will also help to understand how pressures exerted by downstream consumers affect decision-making, including in terms of the investments made in and the focus of SSD, at the upstream end of the supply chain (Kraft, Valdés, and Zheng 2020). Furthermore, SSD in triadic (Friedl and Wagner 2016) or even quadratic (Meqdadi, Johnsen, and Pagell 2020) relationships, consisting of traditional and non-traditional supply chain actors such as competing buyers, NGOs and social enterprises in global supply chains, requires further investigation. This indicates the following future research recommendation:

- **Research recommendation 1.** Future research on SSD should give greater consideration to specific contextual factors, including the type of sustainability issue to be addressed, the tiers of the supply chain to reach, the country context and the roles of the various stakeholders involved in global supply chains.

The results of SSD can be complex and affected by various factors. It is acknowledged that performance outcomes are not limited to the sustainability dimension and that a buyer's performance is affected by supplier improvements (Sancha et al. 2015). As the final aim of SSD is to reduce risks and improve sustainability for the entire chain (Busse et al. 2016), it is suggested that research should continue to expand the focus from the buyer side to the supplier side as improvements on the supplier side may be a prerequisite for the SSD effort to fully pay off on the buyer side (Subramaniam et al. 2019). Meanwhile, the interrelationship amongst different dimensions of performance requires further investigation using consistent and comparable measurement items (Yawar and Seuring 2017). In doing so, the economic and

operational rationale behind certain attitudes and behaviours towards carrying out or participating in SSD (Yawar and Seuring 2017) can be further revealed. This will enable a better understanding of participants' motivations, attitudes and behaviours towards implementing and being involved in SSD. Thus, we recommend researchers consider the following in future research on SSD:

- **Research recommendation 2.** When measuring the performance outcomes of SSD, it is important to consider specific improvements, such as relating to the different dimensions of sustainability, broader improvements that can be expected by supply chain members, as well as the interconnections between different improvement aspects.
- **Research recommendation 3.** Future research should consider examining the performance outcomes of SSD for the supply side first, as supplier improvements are considered a prerequisite for ensuring the SSD effort fully pays off on the buyer side.

In addressing RQ2, the remaining two elements of the contingency fit perspective – contingencies and response actions – were first examined. It has been found that the literature provides an exhaustive list of contingencies. However, less attention has been paid to the supply side, especially suppliers' commitment to sustainability, which has been identified as a critical contingency (Dou, Zhu, and Sarkis 2018) that affects performance outcomes. In fact, commitment from first-tier suppliers was found to significantly influence sustainability performance improvements in multi-tier supply chains (Aßländer, Roloff, and Nayır 2016). Factors that will affect collaboration with first-tier suppliers and with other intermediaries in extending SSD further up the supply chain also requires investigation. For example, leadership style – an indicator of the top management commitment of the focal firm – is worthy of further investigation as this may affect the level of support provided by the focal firm in the multi-tier SSD process (Dou, Zhu, and Sarkis 2018). Besides, almost all contingencies identified are at

the organisational level, with very limited attention having been given to the role of individual-level contingencies. SSD includes interactions between individuals in the participating organisations (e.g. audit personnel, sustainability managers, etc.), meaning that these individuals' perceptions, judgments, and preferences will significantly affect SSD (Rogers, Carter, and Kwan 2019). It is thus necessary to take contingencies such as individual motivation, commitment, and relational resources into consideration. In addition, factors from the end-consumer side are also worthy of further exploration as recent SSCM research (e.g. Kraft, Valdés, and Zheng 2020) has revealed that consumer demand and consumer consciousness of sustainability affect whether buyers/focal firms support or invest in the supply base.

In terms of the response actions, the use of either direct and/or indirect SSD practices was mostly proposed in response to various contingencies. Specific deployment actions and necessary adjustments regarding the implementation of different SSD practices (e.g. tailoring them according to the supplier capability gap), and the development of a portfolio of diversified SSD practices and tools, require further investigation. Besides, collaboration with other actors that are situated beyond the dyadic buyer-supplier relationship has been less discussed. Thus, response actions and adjustments regarding collaborating with multiple actors both internal and external to the supply chain in a triadic or quadric relationship is also worthy of further investigation as successful SSD requires aligned goals, values, and routines between multiple actors (Rodríguez, Gimenez, and Arenas 2016). For example, SSD practices adopted and deployed by the buyer interact with any assistance received from a third-party, jointly affecting the improvements at the supplier side (Nguyen, Donohue, and Mehrotra 2019). In addition, horizontal collaboration with other buyers (Friedl and Wagner 2016) in sharing supplier development investments and collaboration with NGOs or other business partners to address tensions between social and commercial goals (Meqdadi, Johnsen, and Pagell 2020) also

represent promising future research directions in the context of SSD. Thus, we propose the following recommendations for future research:

- **Research recommendation 4**. It is important to consider and further examine the impact of contingencies on SSD, both from the upstream supplier side/perspective and the downstream consumer side. Individual level contingencies and how they interact with organisational level contingencies should also be given more attention.
- **Research recommendation 5**. More research is needed to investigate the buyers' portfolios of SSD practices and the tools they use across different settings in responding to the various goals of SSD. Further exploration into collaboration with the multiple actors involved in different SSD projects is also needed.

Further, SSD is a complex process involving multiple actors and stages that requires a holistic approach to be adopted (Liu et al. 2018). It is found that more than half of the papers employed the selection form of fit, which does not include an analysis of performance outcomes. This is deemed a reductionist approach (Sousa and Voss 2008) that breaks SSD down into its constituent parts, arguably oversimplifying the inter-related nature of different aspects of SSD. Non-reductionist approaches for examining all aspects of SSD are advocated, and thus the use of interaction and system approaches are proposed to further advance our understanding of SSD and its effectiveness. Such approaches provide a more genuine and system oriented perspective instead of examining each aspect independently. Future research would benefit from explicitly employing the contingency theory perspective, instead of an enabling or impeding perspective, to investigate contingencies, response actions, and how they fit. For example, Sancha, Wong, and Gimenez (2019) examined the performance outcomes of different types of SSD practices before concluding that direct SSD practices are needed to successfully extend sustainability up the supply chain. Moreover, SSD projects usually require

substantial investments and resources from the buying firm meaning a thorough analysis of the performance outcomes is important when making decisions about the SSD process (Bai, Dhavale, and Sarkis 2016). Besides, SSD involves knowledge transfer processes, with all participants learning from (and interacting with) each other through participating in SSD (Liu et al. 2018). Interactions evolve and take place between different actors over time (Hultman and Elg 2018). For example, there can be multiple rounds of decision making in the SSD process where regulatory inspections by a local authority interact with the assistance provided by the buyer, affecting the decisions of the buyer (Tong et al. 2018). In addition, upfront investments in SSD usually take time to pay off, thus requiring a multiple-stage perspective to be adopted in order to capture the decision dynamics (Nguyen, Donohue, and Mehrotra 2019). Thus, the adaptive and dynamic nature of SSD should also be taken into consideration. It, therefore, becomes important that research frameworks and SSD practices also evolve. Thus, we propose the following research recommendations:

- **Research recommendation 6.** All aspects of SSD, including the contingencies, response actions and performance outcomes, and their interrelationships should be considered when investigating SSD and its effectiveness.
- **Research recommendation 7.** More use of the interaction and system fit perspectives is needed in research to capture the complex, dynamic and evolving nature of SSD.

Papers employing an interaction approach have mainly examined the impact of a single contingency-response pairing and the corresponding performance outcome while multiple inter-related contingency-response pairs exist in SSD. Prior research (Grimm, Hofstetter, and Sarkis 2018) has shown that the multiple contingencies in SSD are inter-related and that they have different degrees of influencing power. Research however has adopted a select fit approach, which does not consider the performance outcome. Therefore, more research is

needed to take multiple pairs into consideration, to determine if any pairing appears to be the most critical one in a given context, and if there are any conflicting contingencies, i.e. where two or more contingencies suggest a conflicting way of using a particular type of response action. More specifically, if a certain contingency-response action coupling is found to be critical and contributes greatly to achieving a favourable outcome, then resources should be allocated in this direction (Sousa and Voss 2008). Papers employing a system fit approach contribute to identifying effective actions in response to various contingencies. For example, Ni and Sun (2018) found that the combined use of different types of SSD practices leads to better performance in a high stakeholder pressure situation. However, a large proportion of prior studies (e.g. Bai et al. 2019) adopted an analytical approach to evaluating different pairs of contingency-response action relationships in terms of environmental sustainability only. More research is thus needed to expand the focus to the social dimension of sustainability or investigate both dimensions simultaneously. Meanwhile, empirical studies may add richness, further explaining the fit identified by analytical papers. The above analysis thus indicates the following recommendations for research:

- **Research recommendation 8**. Multiple contingency-response pairs should be taken into consideration simultaneously as such use of the contingency fit perspective could identify either multiple ways of achieving fit or critical contingency-response action pairs, thereby informing decision-making surrounding SSD.
- **Research recommendation 9**. More use of the system fit perspective is needed in SSD to address social sustainability issues. Moreover, more empirical data could contribute to further understanding the fit identified among different contingency-response pairs.

6. Conclusions

This paper set out to review the literature on SSD. The systematic approach we followed provided a transparent and replicable platform for our subsequent analysis and classification using the contingency theory lens. The paper complements prior reviews from Table 1 by providing in-depth coverage of all aspects of SSD. In response to RQ1, we find that SSD has received increasing attention over time but that there is scope to further investigate many specific contextual factors, such as the sustainability issues to be addressed, the country context and the involvement of other stakeholders. It is also important to further investigate the specific items used to measure performance outcomes from SSD. In response to RQ2, analysis regarding the two elements of the contingency perspective – contingencies and response actions – shows that more attention needs to be paid to contingencies from the supplier or the buyer-supplier dyad perspective, and that more research is needed to further unpack the response actions. Besides, by reviewing the papers using the contingency fit framework, it is suggested that future research should make more use of the interaction and system approaches to capture the complex, dynamic and evolving nature of SSD.

This paper makes three main contributions to the literature. First, it is the only SLR specifically on SSD that investigates all aspects of SSD, and thus complements other relevant SLRs with a holistic perspective to present the state-of-the-art in this field. Second, it applies the contingency theory lens to shed light on how the performance outcomes of SSD can be impacted by contingency factors, response actions and the fit between the two. It has identified a promising theory lens – the contingency fit perspective – for studying the complex and dynamic SSD process, which goes beyond many prior SSD studies that have focused on contingency factors only without considering the corresponding response actions and their impact on performance outcomes. In doing so, the paper also responds to calls to generate a comprehensive list of contingencies within a given field of research to establish a foundation

for further research that identifies critical contingencies that explain the greatest variance in performance (Sousa and Voss 2008). Third, it provides a framework for future SSD research and has proposed various promising avenues for further study.

The paper also offers three key managerial implications. First, it shows that it is necessary to establish a comprehensive performance measurement framework that can fully capture the benefits derived from SSD. Second, it reminds managers that the deployment of SSD projects requires a holistic and adaptive view, which considers the various contingencies, especially from the supplier side, and the deployment strategies that could fit those contingencies to attain better performance. For example, when initiating a training session for suppliers in another country, it may be useful to consult local professional agencies and customise the training to fit local sustainability requirements and supplier needs. Third, the paper has highlighted the importance of identifying critical contingencies of SSD, which informs managerial decision-making in terms of how best to invest resources to support SSD.

Finally, it is important to acknowledge the limitations in our work. Although we sought to be inclusive in our approach to searching, evaluating and selecting papers, it is possible that our search criteria limited the breadth of our sample, thereby leading to some omissions. We did however attempt to overcome this by augmenting our database organically and cross-checking our set of papers against those from prior literature reviews.

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