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**Sustainable supply chain clusters: An integrated framework**

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3 ABSTRACT:
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6 sustainable supply chain clusters (SCC) by providing an instrument for organisations to enhance the
7 three sustainability dimensions in a dynamic environment.
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9 This research proposes a conceptual framework to enhance sustainability and organisational
10 performance through three theoretical lenses: systems theory, extended resource-based view and
11 dynamic capabilities theory. This approach is carried out through a comprehensive review of the
12 existing literature on SCCs.
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14 Four main propositions are formulated and demonstrated using the developed framework, which
15 expands the discussion about SCCs and their key characteristics in a dynamic environment. This is
16 particularly relevant as it allows empirical testing of the theories in a SCC context.
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18 It can be noted that more extensive research is needed to further understand the issues faced in
19 establishing sustainable clusters. Drawing on the theoretical lenses to establish the framework helps
20 to enhance the understanding and operational capabilities of sustainable SCCs during and after
21 disruptions, such as the global disruption created by COVID-19.
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23 This research paves the way to help organisations improve their adaptability to the dynamic business
24 environment by emphasizing the importance of clustering and linking it to sustainability through
25 dynamic capabilities (DC) to establish a sustainable cluster.
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27 CUST_SOCIAL_IMPLICATIONS_(LIMIT_100_WORDS) :No data available.
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29 This research aims to guide organisations' use of SCCs as tools to enhance sustainability in a
30 dynamic environment, given that the relationship among supply chain cluster design characteristics
31 (SCCDCs), DCs and sustainability remains unexplored. The combination of the three theoretical
32 lenses in developing the proposed framework will assist in further understanding the applicability of
33 these theories when they are considered together.
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Sustainable supply chain clusters: An integrated framework

Abstract:

Purpose: This research aims to provide a conceptual framework with the scope to assist in establishing sustainable supply chain clusters (SCC) by providing an instrument for organisations to enhance the three sustainability dimensions in a dynamic environment.

Design/methodology/approach: This research proposes a conceptual framework to enhance sustainability and organisational performance through three theoretical lenses: systems theory, extended resource-based view and dynamic capabilities theory. This approach is carried out through a comprehensive review of the existing literature on SCCs.

Findings: Four main propositions are formulated and demonstrated using the developed framework, which expands the discussion about SCCs and their key characteristics in a dynamic environment. This is particularly relevant as it allows empirical testing of the theories in a SCC context.

Research implications: It can be noted that more extensive research is needed to further understand the issues faced in establishing sustainable clusters. Drawing on the theoretical lenses to establish the framework helps to enhance the understanding and operational capabilities of sustainable SCCs during and after disruptions, such as the global disruption created by COVID-19.

Practical implications: This research paves the way to help organisations improve their adaptability to the dynamic business environment by emphasizing the importance of clustering and linking it to sustainability through dynamic capabilities (DC) to establish a sustainable cluster.

Originality/value: This research aims to guide organisations' use of SCCs as tools to enhance sustainability in a dynamic environment, given that the relationship among supply chain cluster design characteristics (SCCDCs), DCs and sustainability remains unexplored. The combination of the three theoretical lenses in developing the proposed framework will assist in further understanding the applicability of these theories when they are considered together.

Keywords: Resilience, absorptive capacity, sustainability, supply chain cluster, organisational performance.

Paper type: Conceptual paper

1. Introduction

Global supply chains can be disturbed because of trade restrictions that occurs due to disruptive events, (e.g. COVID-19, war, natural disasters, etc.), which leads to issues, such as product unavailability in local markets and great fluctuations in demand for products (Cappelli and Cini, 2020). In some cases, relying on local suppliers can help overcome this problem by securing a steady flow of materials and eventually enhancing organisational financial and non-financial performance (e.g. quality control and sales growth inside organisations operating in a SCC (Huo *et al.*, 2014, Cappelli and Cini, 2020); however, this may not be the case when particular products and services are required. Forming supply chain clusters (SCCs) (Tolossa *et al.*, 2013) can play a significant role in establishing secure, steady flows of resources and skills (Geng *et al.*, 2013a, Tolossa *et al.*, 2013, Porter, 1998). SCCs represent an integration of supply chain management practices and industrial clusters for organisations operating in the same geographical locations (Huang and Xue, 2012).

The connectedness and collaboration among SCCs members can play an important role to enhance productivity and problem solving (Lei and Huang, 2014), leading to stronger local networks (Tolossa *et al.*, 2013) that can contribute in enhancing the efficient use of resources (Foghani *et al.*, 2017). This in turn is envisaged to enhance sustainability (e.g. decrease in purchasing and manufacturing cost (Ruiz-Benitez *et al.*, 2019), decline in toxic materials used and waste (Ruiz-Benitez *et al.*, 2019), and aim for achieving better work conditions (Grimstad and Burgess, 2014, Golicic *et al.*, 2017) and organisational performance (Albuquerque *et al.*, 2020). It should be noted that, in the long run, the frequent occurrence of disruptive events (e.g., pandemic disease and natural disasters (Annarelli and Nonino, 2016)) can severely damage highly connected organisations within a SCC due to cascading failure (Geng *et al.*, 2013a). In order to support organisations' adaptability to the constantly changing business environment, dynamic capabilities are needed to enhance, expand and protect organisations'

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3 tangible and intangible (knowledge base) assets (Teece, 2007, Helfat *et al.*, 2007), as SCC
4 members are highly interconnected and interdependent; therefore, a failure of one organisation,
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6 for example a delay in announcing information, will disrupt the operations of the whole SCC
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8 (Wang and Xiao, 2016a, Geng *et al.*, 2013a). Hence, in order to enhance sustainability (Golicic
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10 *et al.*, 2017) and organisational performance (Riikkinen *et al.*, 2017), it is imperative for SCC
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12 members to consider developing dynamic capabilities (DCs) (Golicic *et al.*, 2017) that will
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14 allow them to improve and protect their assets during disruptions (Teece, 2007, Kraaijenbrink
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16 *et al.*, 2010).

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21 Furthermore, to combat the challenges arising from disruptive events, such as COVID-
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23 19 pandemic (Cappelli and Cini, 2020), organisations and supply chain practitioners must
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25 develop both dynamic capabilities as well as sustainability approaches. However, extant
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27 research on supply chain cluster either focuses on one aspect of dynamic capability (e.g.
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29 resilience, Chowdhury and Quaddus, 2017) or on one dimension of sustainability (e.g.
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31 environmental sustainability, Walton *et al.*, 2020). Comprehensive conceptualization of
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33 dynamic capability and sustainability as well as their interrelationships in the context of supply
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35 chain cluster are still aspects in the literature that require further attention.
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40 Beyond that, to help supply chain practitioners better understand the complex cluster
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42 design, unbundling the structure of supply chain cluster design characteristics (SCCDCs) and
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44 understanding their relations to other factors is of utmost importance. According to (Golicic *et*
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46 *al.*, 2017), with the efficient use of SCCDCs, organisations could successfully enhance
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48 sustainability and performance, thereby manage challenges in business environment (Bag *et*
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50 *al.*, 2019, Golicic *et al.*, 2017).

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54 In such a turbulent era, where COVID-19 and other disruptions keep posing challenges
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56 for business organisations, the way in which SCCDCs, DCs, sustainability and organisational
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58 performance can be linked to each other is a timely issue to delve into. However, there is a
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3 considerable limited understanding of how SCCDCs can affect organisations' performances
4 through DCs and sustainability (Lis and Rozkwitalska, 2020, Golicic *et al.*, 2017). Although
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6 there's much to learn from the extant research on sustainability and organisational performance
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8 based on ST or ERBV/RBV (e.g. Bag *et al.* 2020a, Al-Shammari *et al.* 2022, Jain *et al.* 2022,
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10 Asiaei *et al.*, 2022), limited is known regarding such issues in the context of supply chain
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12 clusters with considerations of DC. There's also a relative absence of research on SCCs and
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14 performance in the existing efforts into DC and sustainability (e.g. Mousavi *et al.* 2018,
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16 Oliveira-Dias *et al.* 2022). Even less is known about how the two aspects (absorptive capacity
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18 and resilience) of DCs are linking SCCDCs and the three dimensions of sustainability, as prior
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20 research has predominantly focused on only one aspect of DC or one dimension of
21
22 sustainability (e.g. Mota *et al.* 2022). The main contribution of this research thus lies in
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24 alleviating these research gaps, by developing a conceptual framework to provide a more
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26 holistic picture. This research is among the first to integrate the three theoretical lenses - system
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28 theory (ST), extended resource-based view (ERBV) and dynamic capability (DC) theory, to
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30 provide a comprehensive conceptualization and analysis on the interrelationships between
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32 SCCDCs, DCs, sustainability and organisational performance.

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40 The failure of one organisation in the SCC to deliver materials and/or information on
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42 time will disrupt the operations of all other organisations in the SCC because they are
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44 interdependent and interconnected (Wang and Xiao, 2016b, Geng *et al.*, 2013b). However,
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46 through developing dynamic capabilities organisations can adapt and respond to market
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48 changes (Teece, 2016a, Teece, 2007), become more sustainable (Zahra and George, 2002,
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50 Riiikinen *et al.*, 2017). In addition, organisations tend not to focus on sustainability during
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52 destructive or disruptive events (Mari *et al.*, 2016), dynamic capabilities (Teece, 2007), such
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54 as resilience and absorptive capacity (Shubham and Murty, 2018), are particularly important
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56 in helping organisations achieve long-term sustainability in constantly changing environments
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3 through modifying their environmental, social and economic sustainability processes whenever
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5 the market changes (Fiksel *et al.*, 2014).
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8 Finally, it is very important to implement sustainable practices in supply chain clusters
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10 as the concentration of industrial and logistics activities such as transportation raise
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12 environmental issues and harm the surrounding communities (UNIDO, 2016b). In other
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14 words, the conceptual framework of this research can serve as a tool to help organizations
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16 identify areas that need specific improvement and manage SCCs in a more sustainable, efficient
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18 and productive way. In addition, it will support small and medium enterprises through clusters
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20 to enhance their global competitive position (Foghani *et al.*, 2017). Finally, the proposed
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22 framework supports sustainability development in the post COVID-19 era, especially that the
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24 recession caused by COVID-19 forced some governments to neglect enforcing laws regulating
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26 sustainability practices implementation in order to make more rapid economic recovery
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28 (Sarkis, 2021). Therefore, this research presents the conceptual framework as a tool to manage
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30 SCC efficiently, in order to enhance value creation and eventually sustainability. This
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32 framework can also arguably help governments achieve sustainable development goals (SDGs)
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34 (UN, 2018a).
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40 The findings of this particular research will benefit organization's decision makers who
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42 are operating in a supply chain cluster with knowledge of the elements required to ensure
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44 sustainability and performance as well as the strategies to overcome business vulnerabilities.
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46 Another contribution of this study is to unwind the impact of DCs on the three dimensions of
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48 sustainability (economic, social and environmental dimensions) in an SCC context (Golicic *et*
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50 *al.*, 2017, Albort-Morant *et al.*, 2018, Aboelmaged and Hashem, 2019) as well as the impact of
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52 sustainability dimensions on organizational financial and non-financial performance (Das *et*
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54 *al.*, 2019) which are limited in the existing supply chain management literature. The framework
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56 proposed in this study is expected to help organizations understand the interplay between DCs
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3 and performance with the three dimensions of sustainability, thus developing effective
4 sustainability approaches through DCs for supply chain clusters. This study not only can assist
5 industry practitioners in establishing sustainable clusters through implementation of
6 sustainable practices in SCCs, but also highlight the importance of other stakeholders (e.g.
7 government, universities and industrial associations) in supporting activities such as job
8 creation, economic enhancement, and environmental and resource conservation within a supply
9 chain cluster.
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19 The remainder of this paper discusses the theoretical lenses that the framework will be
20 built on. Then, it discusses the rationale for using these lenses that link SCCDCs, DCs
21 (resilience and absorptive capacity), sustainability and organizational performance (financial
22 and operational). A review of the literature is then presented, followed by a summary of the
23 identified research gaps and the proposed conceptual framework. Then, the paper discusses the
24 research model and propositions. Finally, theoretical and practical contributions and
25 recommendations for future research are presented.
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37 **2. Theoretical foundation**

38 **2.1 Systems theory**

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40 System Theory focuses on coordinating subsystems to observe the performance of the entire
41 system (Forrester, 1961), which can be applied in organisations by investigating individual
42 parts to add value to an entire organisation (Emery and Trist, 1965). However, this theory can
43 be extended beyond individual firms' boundaries to reach their business partners within the
44 supply chain (Rigby *et al.*, 2000, Fantazy *et al.*, 2016, Bag *et al.*, 2020a, Tipi, 2021), where
45 individual organisations are coming together to form a system of analysis and adapt to their
46 external dynamic environments to survive (Baier *et al.*, 2020, Bag *et al.*, 2020a). ST stresses
47 on a holistic approach, where the focus moves from individual organisational performance
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(subsystem) to value creation for the whole supply chain (the whole system) (Fatorachian and Kazemi, 2021). Since the risk associated with market changes and uncertainty is the link that connects organisations (Peck, 2005), it can be argued that, under ST perspective, an organisation's interaction with the external environment (Baier *et al.*, 2020) can eventually help in enhancing its internal structure and functions to deal with the constantly changing business environment (Thompson and Valentinov, 2017), which could lead to an increase in the performance of the entire supply chain (Fatorachian and Kazemi, 2021).

In this sense, it is proposed that supply chain members should collaborate to enhance the value of the supply chain system under analysis; the focus should not only be on a subsystem within their boundaries (Cooper *et al.*, 1997), but it should be on the entire system (Tipi, 2021). System theory is associated with supply chain management (Fantazy *et al.*, 2016) because it promotes the efficient flow of information, materials and capital throughout the supply chain (Mentzer *et al.*, 2001) and encourages the analysis to be considered at system level, where all sets of flows and operations are taken into account (Hassan, 2006). The integration and collaboration of supply chain subsystems (supply chain members and their different functions) help enhance their performance and, eventually, the overall performance of a supply chain (Flynn *et al.*, 2010, Michalski *et al.*, 2018).

2.2 Extended resource-based view

The resource-based view (RBV) or resource-based theory focuses on how a firm can sustain a competitive advantage by achieving superior performance (Bag *et al.*, 2019, Xi *et al.*, 2014) using internal resources and the factors that enable a firm to outperform its peers in the same industry (Kraaijenbrink *et al.*, 2010). Internal resources are unique to every firm and encompass tangible assets and intangible assets, such as the organisation's skills, information and knowledge. Organisations can control these resources to sustain their competitive advantage (Barney, 1991). RBV considers networking as a resource that can enhance organisational

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3 performance (Ye *et al.*, 2020), as networks allow organisations to have access to resources
4 required to enhance their performance (Loi, 2016). This falls in line with the RBV supply chain
5 approach as it assumes that the resources needed to enhance organisational performance are at
6 the supply chain level, making the supply chain a competitive advantage tool (Ketchen and
7 Hult, 2007).
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12 This notion is discussed in the ERBV, which stresses the fact that organisations mine for
13 resources that can be outside their boundaries to enhance their competitive advantages (Son *et*
14 *al.*, 2014). The ERBV focuses on how organisations need to extend their resources through
15 forming alliances with other entities, such as their suppliers (Popli *et al.*, 2017, Mishra *et al.*,
16 2019), governmental agencies and other entities inside the same geographical area or region
17 (Mishra *et al.*, 2019).
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30 **2.3 Dynamic capabilities theory**

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32 Through the ERBV, organisations can create value—an important aim—by acquiring
33 resources that exist outside their boundaries (Son *et al.*, 2014, Mishra *et al.*, 2019). Because
34 the external environment of any organisation is extremely volatile (Ponomarov, 2012),
35 organisations can only create value if they manage to integrate resources to seize opportunities
36 and overcome uncertainties that present themselves in their surrounding dynamic environments
37 (Barney, 1991, Chowdhury and Quaddus, 2017). Market uncertainties make it difficult for
38 organisations to sustain a competitive advantage (Eisenhardt and Martin, 2000) and enhance
39 organisational performance (Bag *et al.*, 2019, Xi *et al.*, 2014) because they need to focus on
40 responding to unexpected fluctuations in demand and supply and not only to survive
41 (Ponomarov, 2012).
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56 However, organisations can still sustain their competitive advantages when they
57 strategically apply DCs (Eisenhardt and Martin, 2000). These capabilities allow organisations
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to reconfigure their resources (Teece, 2019) to quickly adapt to market changes and leap in front of competitors (Eisenhardt and Martin, 2000). DC theory focuses on sustaining competitive advantage in a dynamic business environment (Bag *et al.*, 2020b) through building DCs that will allow organisations to reconfigure and reallocate their resources (Breidbach *et al.*, 2015). In addition, it is argued that DCs can enhance organisations' ability to create resources to enhance sustainability in a constantly changing environment (Bag *et al.*, 2019). This perspective encourages organisations within a supply chain network to strengthen their alliances in order to be more adaptable to the dynamic business environment (Piprani *et al.*, 2020). In a SCC context, the resources (tangible and intangible) shared among SCC members can be a tool for organisations to respond to market changes through building DCs (Ye *et al.*, 2020). Based on these three theories, the theoretical framework will be developed in the following section.

2.4 Theoretical framework

Based on the research presented above and the definition of the theories illustrated in subsections 2.1, 2.3 and 2.4, Figure 1 was formulated to present a corresponding theoretical framework.

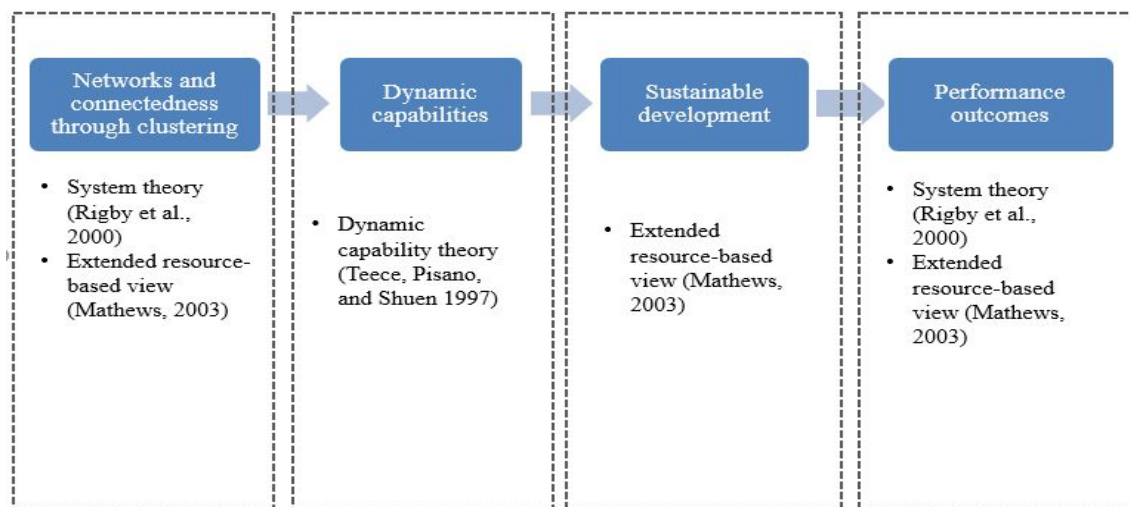


Figure 1: Theoretical framework

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3 ERBV focuses on the notion that infrastructure of resources can be used to enhance
4 sustainability (Al-Shammari *et al.*, 2022) and remove stakeholders pressure to focus on
5 sustainability issues, which eventually enhances their satisfaction (Munir *et al.*, 2020). This
6 enhanced sustainability (Albuquerque *et al.*, 2020), along with infrastructure of resources,
7 organisations can increase their performance levels (Loi, 2016, Battisti *et al.*, 2022). RBV
8 stresses on the fact that internal resources and capabilities of the organisations are essential for
9 their sustainable competitive advantage (Hermundsdottir and Aspelund, 2022). Combining ST
10 logic to the above argument, organisations can have access to infrastructure of resources
11 available through the integration and collaboration of supply chain subsystems (supply chain
12 members and their different functions), which helps in enhancing overall performance of the
13 supply chain (Flynn *et al.*, 2010, Michalski *et al.*, 2018, Tipi, 2021). In addition, collaboration
14 with entities, such as suppliers, governmental agencies and other entities in the same
15 geographical area or region, can help in extending organisational resources (Popli *et al.*, 2017,
16 Mishra *et al.*, 2019). In this sense, supply chains' integration helps members maximise their
17 overall value through quick processing of information, joint learning and knowledge creation
18 (Fantazy *et al.*, 2016). However, for organisations to protect and develop their resources and
19 maintain a high degree of sustainability in a constantly changing environment, they need to
20 build DCs (Teece *et al.*, 1997). This justifies the introduction of DC theory to the framework,
21 as organisations will be able to enhance sustainability through developing, renewing and
22 protecting their resources to cope with the disruptions in the market (Teece *et al.*, 1997, Teece,
23 2007) and their supply chain (Tipi, 2021). In return, high sustainability performance will give
24 organisations a competitive edge and eventually enhance their performance (Munir *et al.*, 2022).

3. Literature review

3.1 SCCDCs

Supply chain management helps align SCC members' efforts and enhance their cooperation (Huang and Xue, 2012). In this sense, competitors, as well as business partners, work together to enhance overall cluster development (Xin and Li-ying, 2013). The importance of supply chain management to clusters pushed the integration and creation of SCCs (Huang and Xue, 2012, Geng *et al.*, 2013a). Collaboration among competitors inside the same SCC is possible and beneficial (Porter, 1998). Competitors can face similar operational issues in the surrounding environment (Hurmelinna - Laukkanen, 2012), such as common technological problems (Endres *et al.*, 2020); sharing selective knowledge among competitors can promote collaborative research and development (Hurmelinna - Laukkanen, 2012), which can then help in maintaining their performance (Hurmelinna - Laukkanen, 2012, Alves and Galina, 2021). However, there is a debate of how information sharing through networked collaboration can affect organisational competitive advantage, as some organisations tend not to share valuable information in order to protect their comparative advantage (Lei and Huang, 2014). In addition, the cost of sharing information among competitors might outweigh its benefits, as illustrated through the empirical study of Yuan *et al.* (2021). Still, there is empirical evidence that supports the positive impact of networked collaboration on organisational performance in a supply SCC context (Ye *et al.*, 2020). It can be argued that using trust (Geng *et al.*, 2013a) to manage and promote competition as a win-win situation (Monteiro, 2016) can facilitate innovation and value creation (Mikhaylov, 2013, Lu and Shin, 2018). This can eventually lead to continuous cluster development (Xin and Li-ying, 2013, Dana *et al.*, 2013, Yuan *et al.*, 2021) and positively affect economic growth (Monteiro, 2016, Dong, 2011).

The importance of SCCs shifted the focus to their characteristics and design. Huang

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2
3 and Xue (2012) and Tolossa *et al.* (2013) proposed three main characteristics: geographical
4 concentration, networked collaboration and supporting services. Geographical concentration is
5 very critical when creating a SCC because the close physical proximity of its members makes
6 it possible to increase cost efficiency, competitive advantage, trust and innovation (He, 2016,
7 Huang and Xue, 2012, Tolossa *et al.*, 2013). Networked collaboration means that upstream and
8 downstream vertical cooperation exists within the supply chain, and horizontal integration
9 exists among different supply chains. This horizontal and vertical collaboration yields a
10 competitive advantage and helps organisations achieve a higher degree of organisational
11 performance that they could not reach on their own through interactive activities, such as
12 sharing resources and information (Xue *et al.*, 2012). Supporting service systems are entities
13 that enhance SCC members' collaboration by increasing coordination with related companies,
14 facilitating access to information and increasing productivity (Huang and Xue, 2012, Tolossa
15 *et al.*, 2013). Geng *et al.* (2013a) argued that these characteristics give an advantage to entities
16 in SCCs, make them more adaptive to sudden changes in the market and provide international
17 support to their competitive advantages, in addition to enhancing support among members.
18 Thus, these characteristics can provide a fertile environment for improving sustainability
19 (Grimstad and Burgess, 2014, Golicic *et al.*, 2017) because the coordination efforts among
20 SCC members can help maintain significant sustainability (Lin *et al.*, 2020).

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 **3.2 Sustainability**

47 Market conditions are constantly changing, which leads to an inefficient use of resources and
48 negative impact on sustainability activities' progress (Herstatt and Tiwari, 2020), as market
49 volatility forces some organisations to focus on economic aspects at the expense of
50 environmental and economic sustainability (Rajeev *et al.*, 2017). This emphasizes the fact that
51 organisations need to embed their sustainability activities into their strategic plan (Sarkis,
52 2021) in order to gain a competitive edge (Ozturkoglu *et al.*, 2021), especially that

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3 governments, customers and other stakeholders are pressuring organisations and are willing to
4 coordinate in order to support organisations focus on all aspects of sustainability issues (Munir
5 *et al.*, 2020). This coordination of efforts can be facilitated through sustainable clusters because
6 they primarily focus on the collaborative efforts among organisations, governments and
7 communities to work together and promote the three aspects of sustainability (economic, social
8 and environmental) (Hong and Gasparatos, 2020).
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17 Economic sustainability focuses on efficient and effective use of resources, which
18 means using the minimum amount of resources to achieve maximum output and using
19 resources in the best way possible (Agrawal *et al.*, 2016). This can be achieved by decreasing
20 operational, logistics and energy use cost (Agrawal *et al.*, 2016), in addition to preserving
21 renewable resources (Tam, 2018). Environmental sustainability revolves around avoiding
22 damage to the nature in the surrounding environment through focusing on waste management,
23 emission, saving energy consumption, resources, switching to renewable energy and
24 complying with environmental standards (Agrawal *et al.*, 2016). Social sustainability focuses
25 on the responsibility of the organisation towards the community (improving relationships and
26 life quality of the community (Abdul-Rashid *et al.*, 2017) by promoting equality, social justice,
27 customer safety and employees' benefits and stability (Workforce health and safety) (Agrawal
28 *et al.*, 2016).
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46 **3.3 Sustainability and organisational performance**

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48 Researchers have highlighted that organisations should attempt to enhance their efforts to
49 improve the local economy; efficiently use resources and decrease waste, water, and air
50 pollution (Panyathanakun *et al.*, 2013) to reduce cost and energy consumption (Hollo *et al.*,
51 2012) and enhance operational (Reuter *et al.*, 2010) and financial performance (Albuquerque
52 *et al.*, 2020). Such measures are also expected to enhance job creation and better work
53 conditions and generally improve a community's quality of life (Panyathanakun *et al.*, 2013).
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3 Furthermore, these effects are expected to contribute in increasing overall organisational
4 performance and economic growth (Panyathanakun *et al.*, 2013). It is therefore relevant for
5 individuals within the community to focus on investments that support environmental and
6 social aspects, spread awareness, and apply pressure as customers on the public and private
7 policy makers (UNIDO, 2016a). The overall organisational performance is divided into
8 operational performance and financial performance as the key performance measures (Ferreira
9 and Otley, 2009). The focus of operational performance is on the quality enhancement,
10 efficiency, productivity and customer satisfaction (Gligor and Holcomb, 2014, Huo *et al.*,
11 2014). Regarding for financial performance, it focuses on market share, sales and return on
12 investment (Huo *et al.*, 2014).
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28 **3.4 DCs and sustainability**

29 The requirements of adaptation to environmental uncertainty (Di Stefano *et al.*, 2014, Teece,
30 2016b, Chowdhury *et al.*, 2019) and the influence of sustainability on survival and growth
31 (Kolk and Pinkse, 2008) urge organisations to develop sustainability (Chowdhury *et al.*, 2019,
32 Teece, 2016b) through DCs (Di Stefano *et al.*, 2014, Teece, 2016b), such as resilience and
33 absorptive capacity (Shubham and Murty, 2018), which allows them to seize opportunities in
34 the market (Di Stefano *et al.*, 2014) and effectively align their strategies and capabilities to
35 develop sustainability (Amui *et al.*, 2017), which falls in line with the achievement of (SDGs
36 (UN, 2018a)). Absorptive capacity (AC) is considered to be playing an important role in
37 enhancing sustainability (Chowdhury *et al.*, 2019) through collaborative practices (Kauppi *et al.*,
38 2013), as it incentivises organisations to share sustainability knowledge (Beske *et al.*,
39 2014). Therefore, absorptive capacity (AC) is needed to implement strategic proactive
40 sustainability practices (Saenz *et al.*, 2014) as it allows organisations to identify and acquire
41 knowledge-related sustainability, such as new environmental compliance requirements outside
42 its boundaries, from regulators and research institutions (Shubham and Murty, 2018). The
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3 acquired knowledge from the external environment is exploited to refine sustainability
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5 practices within the organisation (Reuter *et al.*, 2010).
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8 It is argued that sustainability can also be achieved by implementing resilience
9
10 practices, such as a flexible supply base, information control system, disaster recovery plan,
11
12 contingency planning, alternative transportation routing, connectedness and others (Ruiz-
13
14 Benitez *et al.*, 2019). Resilience in the supply chain is seen as the capability of the system, and
15
16 in this case the supply chain system, to recover to full operational capacity after disruptions
17
18 (Tipi and Elgazzar, 2021). These practices could decrease purchasing and manufacturing costs,
19
20 which eventually enhances economic sustainability (Ruiz-Benitez *et al.*, 2019). In addition,
21
22 used toxic materials and wastes could decline, which directly enhances environmental
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24 sustainability. Finally, resilience practices help reduce the negative impact on society by
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26 allowing business partners to recover quickly using a well-established coordinated plan to
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28 ensure public safety and a healthy environment (Ruiz-Benitez *et al.*, 2019).
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34 **3.1 Research Gaps**

35 **3.1.1 Empirical**

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38 Previous literature on SCC has primarily focused on how firms in a cluster can develop DCs,
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40 such as resilience (Fagundes *et al.*, 2020) and absorptive capability (Chandrashekar and
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42 Mungila Hillemane, 2018, Presutti *et al.*, 2017). For example, Belso-Martínez *et al.* (2016)
43
44 examined the relationship between network density, reciprocity and transitivity, and absorptive
45
46 capacity. Lis and Rozkwitalska (2020) investigated how being in a cluster can affect
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48 organisational technological capability through accumulation of knowledge, which is
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50 facilitated by absorptive capacity. Lei and Huang (2014) focused on geographical
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52 concentration and knowledge sharing, while Presutti *et al.* (2017) focused on close proximity
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54 to customers and its impact on absorptive capacity. Other research studies focused on specific
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3 clusters to investigate how organisations' resilience or absorptive capacity can be affected
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5 when they are operating inside a cluster. In addition, organisations in these clusters were mostly
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7 operating in high-tech industries located in developed countries. For example, Belso-Martínez
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9 *et al.* (2016) and Martínez-Sánchez *et al.* (2019) conducted the research on high-tech industrial
10
11 cluster and absorptive capacity in Spain. The authors concluded that absorptive capacity can
12
13 positively enhance innovative performance of organisations inside clusters, whereas Conz *et*
14
15 *al.* (2017) investigated how organisations can enhance their resilience in wine clusters located
16
17 in Europe. Golicic *et al.* (2017) also focused on wine clusters and resilience; however, the
18
19 research scope was USA, Australia, Italy and New Zealand. Walton *et al.* (2020) focused on
20
21 learning and knowledge sharing and green practices, while Riiikinen *et al.* (2017) focused on
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23 absorptive capacity and green purchasing practices.
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30 Based on the above discussion, it can be concluded that previous research focused on
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32 the relationship between information sharing among SCC members and absorptive capacity
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34 (e.g. Belso-Martínez *et al.*, 2016) or close proximity to customers and absorptive capacity (e.g.
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36 Presutti *et al.*, 2017), in addition to the relationship between local networks and absorptive
37
38 capacity (Chandrashekar and Mungila Hillemane, 2018). Furthermore, researchers investigated
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40 how organisations operating in a cluster can develop resilience or absorptive capacity.
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42 However, the focus was on organisations; there was no investigation on how being in a cluster
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44 can affect their resilience or absorptive capacity (Taslimi *et al.*, 2020, Martínez-Sánchez *et al.*,
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46 2019). In other words, the focus is mainly on organisations, and relatively less is known on
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48 how being in a cluster (i.e. SCCDCs) may affect the cluster members' DCs (Martínez-Sánchez
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50 *et al.*, 2019, Taslimi *et al.*, 2020). Finally, the impact of resilience on financial sustainability
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52 was investigated in wine industry, without including SCCDCs in the investigation (e.g. Golicic
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54 *et al.*, 2017).
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3 In the supply chain management literature, there have been substantial research efforts
4 on the relationship between DCs (resilience and absorptive capability) of organisations and
5 their sustainability (Aboelmaged and Hashem, 2019, Albort-Morant *et al.*, 2018, Golicic *et al.*,
6 2017). The focus has been predominantly placed on environmental sustainability (Walton *et*
7 *al.*, 2020), while there is a lack of comprehension of the underlining dimensions of
8 sustainability (i.e. economic, social and environmental) and how they are linked with DCs
9 (Ruiz-Benitez *et al.*, 2019, Touboulic and Walker, 2015). Furthermore, emerging research
10 argues that the relationships between sustainability dimensions and organisational performance
11 remain ambiguous and controversial (Paulraj *et al.*, 2017). A more nuanced understanding of
12 the impact of sustainability on organisational performance (including financial and non-
13 financial measures) is thus needed, which is also called for by other scholars (Das *et al.*, 2019),
14 especially that the relationship between sustainability and organisational performance in supply
15 chain management literature is under debate (Paulraj *et al.*, 2017). In addition, research
16 investigating the impact of sustainability and organisational performance focused on green
17 practices and financial performance (Albuquerque *et al.*, 2020, Song and Choi, 2018).

3.1.2 Theoretical

18 Although there are fruitful studies on supply chain management and sustainability, these
19 studies were either based on system theory, resource-based view (or extended resource based
20 view) or DC theory (Fantazy *et al.*, 2016, Son *et al.*, 2014, Teece, 2019). However, research
21 efforts combing these theories to develop a conceptual framework for a more holistic
22 understanding of organisations in a SCC context are limited. For example, Ye *et al.* (2020)
23 focused on resources sharing and collaboration among cluster members and their impact on
24 members' performance through utilizing DC theory. Gupta *et al.* (2019) and Quaye and
25 Mensah (2019) also utilized RBV and DC theory to investigate resources sharing and
26 collaboration impact on organisational performance. However, there was no focus on SCCs or

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3 sustainability. While Al-Shammari *et al.* (2022) and Asiaei *et al.* (2022) utilized RBV to
4 investigate the impact of CSR on performance, and Barakat *et al.* (2022) used RBV to test the
5 impact of information sharing on value creation; however, the focus of this study was not on
6 SCCs context. Jain *et al.* (2022) also utilized RBV to investigate the impact of information and
7 collaboration facilitation on CSR. ERBV was used by Popli *et al.* (2017) investigating the
8 impact of networking on organisational performance. Bag *et al.* (2020a) investigated the impact
9 of green practices on organisational performance using ST, while Ni and Sun (2019) used
10 ERBV to investigate the impact of sustainability on organisational performance. Mousavi *et*
11 *al.* (2018) and Oliveira-Dias *et al.* (2022) investigated the impact of DCs on sustainability using
12 DC theory, while Mota *et al.* (2022) utilized DC theory to investigate the impact of resilience
13 on performance.

14
15 Therefore, a holistic approach is needed to understand the impacts of DCs on
16 sustainability, and of sustainability on financial and non-financial performance measures of an
17 organisation (Das *et al.*, 2019), particularly in the context of SCCs (Das *et al.*, 2019, Golicic *et*
18 *al.*, 2017). This is being approached with developing the theoretical framework presented in
19 section 5.

20 21 22 **4. Research methodology**

23
24 This research focuses on constructing a framework that combines three theoretical lenses:
25 systems theory, extended resource-based view and dynamic capabilities theory and brings
26 empirical evidence from existing literature. In order to explain and establish the relationships
27 between SCCDCs, DCs, three dimensions of sustainability and financial and non-financial
28 performance, this framework introduces a novel approach where DCs is imbedded into SCCs
29 to create a sustainable SCC. This can help in the prediction and explanation of the relationships
30 among SCCDCs, DCs, sustainability and organisational performance. This can be done by
31 linking DC to SCCDCs in order to be able to enhance sustainability and eventually enhance

organisational performance. Based on the aim of this research, the model approach for the conceptual views proposed by Jaakkola (2020) will be adapted. The framework will illustrate how better outcomes (enhanced sustainability and performance) can be achieved through specific antecedents (SCCDCs and DCs) with a logical causal linkages and mechanisms supported by empirical evidence and theoretical lenses (Bouzzine and Lueg, 2022). This will help in developing propositions that introduce new combinations of the relationships between these constructs in order to be empirically investigated in the future (Jaakkola, 2020). In addition, it will help in bridging the gap between the combination of the theoretical lenses ST, DC theory and ERBV and the combination of the research constructs SCCDCs, DCs, sustainability and organisational performance (Cornelissen, 2017).

5. Integrated framework

A corresponding conceptual framework is formulated on the basis of the previous discussion and is presented in Figure 2.

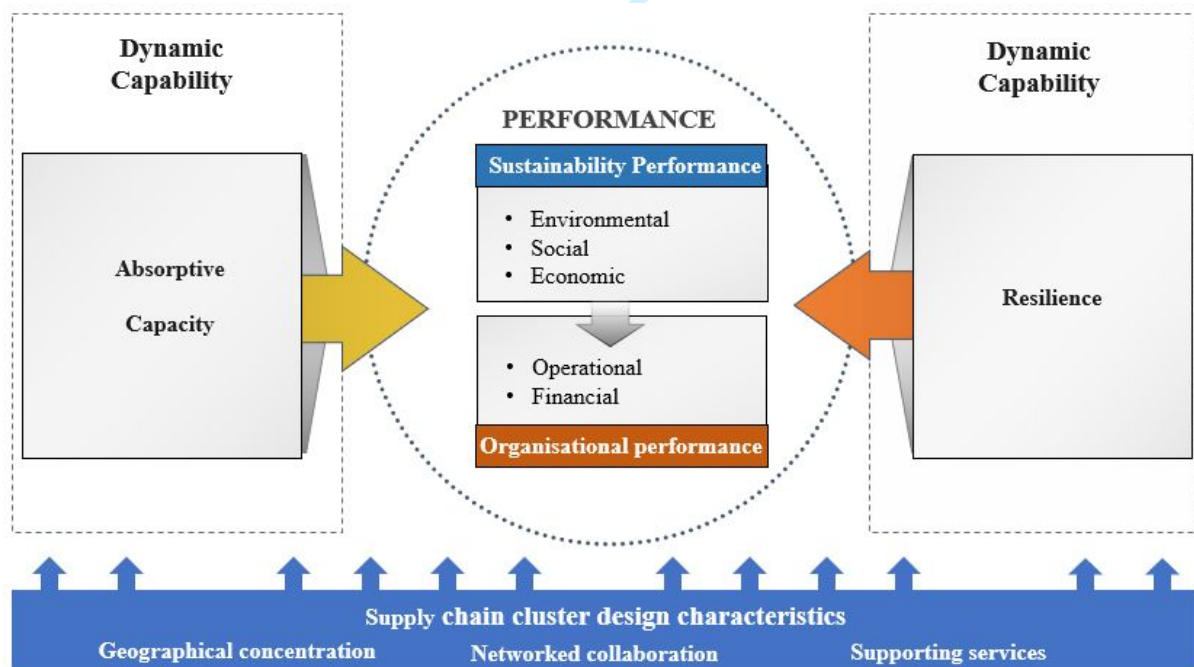


Figure 2: Research model– sustainable clusters– “The role of supply chain cluster design characteristics in sustaining organisational performance through dynamic capabilities”

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3 Supply chains are considered to be systems with subsystems (supply chain members)
4 that can collaborate to enhance their performance and that of the overall system (Flynn *et al.*,
5 2010, Michalski *et al.*, 2018). The collaboration established among subsystems also helps them
6 overcome market risks (Peck, 2005). Following the same logic, this research posits that SCCs
7 represent systems in which the close proximity and connectedness among their members are
8 the pillars that hold the systems together and facilitate collaboration and sharing information
9 and resources to mitigate risk and enhance sustainability and organisational performance.
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19 Based on previous studies presented, in addition to the benefits of SCCDCs mentioned
20 in the previous sections, this research, arguably, presents SCCDCs as tools to maintain
21 competitive advantages (Kraaijenbrink *et al.*, 2010) by increasing sustainability, thus
22 improving organisational performance (Bag *et al.*, 2019, Xi *et al.*, 2014). This notion is
23 supported by ERBV because organisations can acquire the resources needed to enhance
24 sustainability and, eventually, organisational performance by being engaged in links outside
25 their boundaries (Xi *et al.*, 2014). In other words, ERBV argues that organisational competitive
26 advantage can be achieved when organisations acquire resources from the external
27 environment (Son *et al.*, 2014). In addition, empirical evidence suggests that organisations can
28 perform better than their peers (Albuquerque *et al.*, 2020) if they were focusing on
29 sustainability, as it increases customer loyalty, makes their products less price elastic and
30 allows organisations to maintain their revenue growth (Albuquerque *et al.*, 2019). It can be
31 argued that enhancing sustainability can lead to a better performance outcome (Albuquerque
32 *et al.*, 2020) as sustainability gives organisations a competitive edge through enhancing
33 customer loyalty and trust (Albuquerque *et al.*, 2019, Albuquerque *et al.*, 2020).
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53 Drawing on ST and ERBV, in addition to the fact that supply chains contain the
54 resources needed to sustain a competitive advantage (Ketchen and Hult, 2007), a unique bundle
55 of resources can arguably be located on the SCC level. This argument is supported by the
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3 advantages that SCCs provide to organisations (Mitchell *et al.*, 2010, Grimstad and Burgess,
4 2014). However, because organisational environments are dynamic (Eisenhardt and Martin,
5 2000, Bag *et al.*, 2020a), resources might become obsolete over time (Teece, 2007,
6 Kraaijenbrink *et al.*, 2010). Therefore, organisations' reliance only on available resources will
7 not be enough to maintain a competitive advantage (Kraaijenbrink *et al.*, 2010) because they
8 need to develop their assets by developing DCs to manage a dynamic business environment
9 (Teece, 2007, Kraaijenbrink *et al.*, 2010). This concept introduces DC theory (Teece *et al.*,
10 1997, Teece, 2007) to the integrated framework, given that this research proposes two DCs:
11 resilience (Geng *et al.*, 2013a) and AC (Riikinen *et al.*, 2017). Organisations can use these to
12 manage a dynamic business environment and eventually sustain their competitive advantages
13 (Bag *et al.*, 2019, Xi *et al.*, 2014, Teece, 2007) by increasing organisational performance (Bag
14 *et al.*, 2019, Xi *et al.*, 2014). Therefore, the DC theory was proposed to help organisations
15 maintain a competitive advantage in a dynamic business environment (Teece *et al.*, 1997,
16 Teece, 2007).

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36 This framework can help establish sustainable clusters by focusing on sustainability
37 because it proposes that an SCC can be considered to be a system with subsystems (clusters
38 members) that can form alliances by being interconnected in the same geographical location
39 (ST (Rigby *et al.*, 2000)). The formation of an SCC can help organisations acquire a unique
40 bundle of resources to enhance their sustainability (ERBV (Mathews, 2003)). This
41 collaboration and availability of resources can help organisations eventually achieve desirable
42 performance outcomes by enhancing sustainability (ST (Rigby *et al.*, 2000) and ERBV
43 (Mathews, 2003)). However, to maintain sustainability development in a constantly changing
44 environment, organisations need to protect and develop resources by developing DCs (DC
45 theory (Teece *et al.*, 1997)).

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The main focus of this research is to propose a conceptual framework derived by operationalising and measuring general concepts from the theories mentioned above through the specific constructs of SCCDCs, DCs, sustainability and organisational performance. The following section illustrates additional details on the relationships among the research constructs.

6. Research Model and Propositions

This section discusses the proposed relationships illustrated in the conceptual framework (Figure 2). This section also formulates four main propositions (see Figure 3) on the impact of SCCDCs on AC and resilience, the impact of AC and resilience on sustainability, the impact of sustainability on financial and operational performance and the mediating role of AC and resilience between SCCDCs and sustainability.

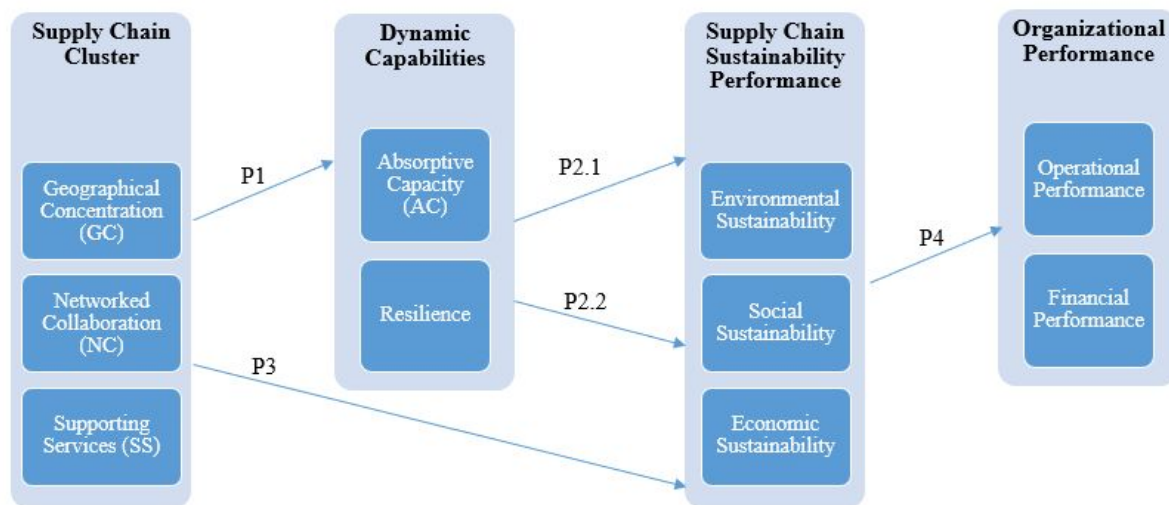


Figure 3: Research propositions

6.1 SCCDCs and DCs

Drawing on systems theory, organisations inside a system need to be interconnected to overcome the dynamic business environment (Tipu *et al.*, 2019). The integration and coordination of resources among a system's members are essential as they enhance organisations' capabilities (Fantazy *et al.*, 2016). In this sense, through introducing DC theory

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3 (Teece *et al.*, 1997), organisations will be able to use this advantage until they build DCs in
4
5 order to renew and protect their resources to cope with the disruptions in the market (Teece,
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7 2007, Helfat *et al.*, 2007). Based on this argument, this research posits SCC as a system where
8
9 its subsystems (cluster's members) can use the established alliances and availability of
10
11 resources to cope with the business environment through building DCs.
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15 Because SCCDCs can help organisations acquire resources and collaborate, forming
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17 clusters can arguably help organisations build sustainability (Mitchell *et al.*, 2010, Grimstad
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19 and Burgess, 2014). Geographical concentration and networked collaboration allow members
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21 to focus on specialisation because they can rely on each other through cooperation and facilitate
22
23 the optimal flow of information and skilled labor (Tolossa *et al.*, 2013), which builds trust and
24
25 allows them to be more flexible in adapting to dramatic changes in the dynamic business
26
27 environment (Geng *et al.*, 2013a). The close proximity also allows for an easy access to
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29 resources and information (Tolossa *et al.*, 2013), including skilled employees and reliable
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31 suppliers, thus increasing their productivity (Patti, 2006).
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35 Networked collaboration creates synergies by allowing members to use their collective
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37 skills and resources in harmony (Porter, 1998), enhancing the ability to face risks and limiting
38
39 the impact of shocks (Chowdhury and Quaddus, 2017). A high collaboration level among
40
41 organisations inside SCC does not only allow for an easier access for information (Tolossa *et*
42
43 *al.*, 2013), but it also reduces the cost of obtaining information and limits the disorientation of
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45 information (Wang and Sun, 2020). Clusters also give their members access to public
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47 institutions (Patti, 2006), which provide managerial knowledge, training and specialized
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49 training (Porter, 1998). Research institutions and universities provide knowledge that can
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51 uniquely help organisations to quickly update their products and services to cope with the
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53 volatile demand change (Ind *et al.*, 2017).
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3 Trust, collaboration, the availability of skilled labor, knowledge, training and support
4 from the government, research institutions and industry associations enhance organisations'
5 ability to adapt to changes and seize opportunities, in turn helping organisations facilitate AC
6 (Elbaz *et al.*, 2018), build resilience (Golicic *et al.*, 2017) and eventually enhance
7 organisational performance (Lin, 2018). SCCDCs provide organisations with increased
8 accessibility to resources (Niu, 2010) and facilitation of vertical and horizontal integration
9 among clusters' members (Wang and Xiao, 2016a), which enhances their resilience (Ye *et al.*,
10 2020). In addition, it promotes knowledge creation and sharing (Hurmelinna-Laukkanen, 2012,
11 Mitchell *et al.*, 2010, Grimstad and Burgess, 2014, Niu, 2010), which eventually leads to a
12 better absorptive capacity (Naqshbandi, 2016).
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26 Recent empirical studies utilized DC theory and ST to explain the benefits of
27 networking and collaboration (sharing of resources and information). For example Ye *et al.*
28 (2020) used DC theory to explain how networking can lead to a better allocation of resources
29 and eventually performance in a supply chain cluster context. Tipu *et al.* (2019) also focused
30 on networking between supply chain members and its impact on performance through utilizing
31 ST. Wang and Sun (2020) also utilize ST to explain how collaboration can lead to an enhanced
32 AC and eventually better performance. Ye *et al.* (2020), Wang and Sun (2020) and Tipu *et al.*
33 (2019) explained that collaboration leads to exchange of information and resources and allow
34 organisations to acquire external knowledge, which enhances speed of adaptation to market
35 changes and eventually performance. Through extending previous research work and its
36 conceptualizations of ST and DC theory along with the benefits of SCCDCs discussed above,
37 it can be argued that combining systems theory and DC theory can support the notion that
38 SCCDCs can facilitate the development of DC (Golicic *et al.*, 2017). Organisations inside a
39 system can enhance their capabilities through integrating their resources (Fantazy *et al.*, 2016);
40 therefore, the shared infrastructure and resources among SCC members (Tolossa *et al.*, 2013,
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3 Lis and Rozkwitalska, 2020, Lei and Huang, 2014) allow organisations to have access to
4 resources that can be used to cope with the dynamic business environment (Lei and Huang,
5 2014) and hence develop their DCs (Golicic et al., 2017).
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10 P1. *When geographically concentrated organisations maintain horizontal and vertical*
11 *collaboration and receive support from organisations, such as governmental institutions,*
12 *universities and research institutions, and trade/industry associations, they can thrive in a*
13 *dynamic business environment by enhancing their resilience and AC.*
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21 **6.2 Dynamic capabilities and sustainability**

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23 DCs allow organisations to cope with the constantly changing environment through acquiring,
24 reconfiguring, integrating and releasing resources (Vanpoucke *et al.*, 2014). By using and
25 having access to control resources, organisations have a better opportunity to create new
26 resources (Helfat *et al.*, 2007, Vanpoucke *et al.*, 2014), in addition to recombining resources
27 owned by them to enhance their competitiveness (Vanpoucke *et al.*, 2014). DCs allow
28 organisations to acquire knowledge, anticipate market changes and seize opportunities in the
29 market, which helps them in enhancing their sustainability (Song and Choi, 2018). Previous
30 research utilized DC theory to explain how DCs can enhance sustainability. For example,
31 Mousavi *et al.* (2018) and Oliveira-Dias *et al.* (2022) used DC theory to explain how DCs can
32 enhance sustainability. While Mota *et al.* (2022) used the theory to explain how DCs can
33 enhance organisational responsiveness to market changes. In the studies from Mousavi *et al.*
34 (2018), Oliveira-Dias *et al.* (2022) and Mota *et al.* (2022), the main idea was that DCs allow
35 organisations to reconfigure resources and competence; in return, this allows organisations to
36 cope with market changes and enhance sustainability levels, which will eventually give
37 organisations a competitive edge. Therefore, drawing on the results of previous studies and
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3 following the logic of DC theory, organisations can use DCs to create and develop new
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5 resources that can help enhance sustainability.
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9 6.2.1 AC and sustainability

10 To develop sustainability, organisations may need to change some of their business processes
11 (Delmas *et al.*, 2011, Riikkinen *et al.*, 2017). Acquiring external knowledge and being in a
12 position to assess this knowledge form a part of absorptive capacity (Shubham and Murty,
13 2018, Zahra and George, 2002). Sustainability adaptation needs a high level of absorptive
14 capacity (Riikkinen *et al.*, 2017) in order to exploit sustainability related knowledge and
15 information (Abareshi and Molla, 2013, Haugh and Talwar, 2010). This means that absorptive
16 capacity facilitates the implementation of sustainability practices (Delmas *et al.*, 2011, Kauppi
17 *et al.*, 2013).
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29 Sustainability adaptation requires a high level of AC to exploit sustainability-related
30 knowledge and information. The manner in which organisations search for and acquire
31 knowledge allows them to understand stakeholders' demands regarding sustainability and
32 customers' expectations regarding the service and/or product (Riikkinen *et al.*, 2017).
33 Organisations might not own the sustainability-related knowledge needed to enhance
34 sustainability, which pushes organisations to enhance their AC to acquire the missing
35 knowledge to enhance sustainability (Pace, 2016). Sustainability-related information could be
36 new standards, certificates, materials, and environmentally friendly resources (Riikkinen *et al.*,
37 2017) and new requirements for corporate social responsibility (Boyd *et al.*, 2007). AC is
38 considered to be an antecedent for green practices because it allows information about the
39 product's life cycle to flow smoothly among supply chain members (Riikkinen *et al.*, 2017). In
40 addition, AC helps organisations collect sustainability-related information from trade/industry
41 associations/and third-party organisations (Boyd *et al.*, 2007).
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3 DC theory and absorptive capacity give organisations the ability to combine acquired
4 information from external sources with existing knowledge effectively (Albort-Morant *et al.*,
5 2018) and allows them to use this combined knowledge to enhance sustainability and spread it
6 within and across organisations (Upstill-Goddard *et al.*, 2016). Therefore, it can be argued that
7 developing absorptive capacity can enhance sustainability (Lee *et al.*, 2014).
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14 P2.1. *Once organisations develop the ability to reconfigure their resources and*
15 *augment their capabilities to cope with the constantly changing environment through*
16 *enhancing AC, they will be able to increase the three dimensions of sustainability.*
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23 6.2.2 Resilience and sustainability

24 In order to enhance sustainability and maintain sustainable activities during disruptions,
25 resilience is needed as it allows organisations to proactively cope with market changes
26 (Winnard, 2014). In other words, as any system is vulnerable and unable to maintain long-run
27 sustainability, organisation must focus on building resilience (Anderies *et al.*, 2013). It is
28 important to strategically enhance resilience in order to protect the process, activities and
29 resources that help in increasing sustainable activities during disruptions (Marchese *et al.*,
30 2018). In this sense, resilience is needed to maintain organisations' and their supply chains'
31 sustainability before (Loh Hui *et al.*, 2017), during and after disruptions (Park *et al.*, 2013).
32 This can be achieved through incorporating sustainability practices into resilience capabilities
33 (Winnard *et al.*, 2018). Because organisations struggle to sustain their operations, resilience
34 can allow a solution to adapt to the business environment (Golicic *et al.*, 2017). For example,
35 labor strikes create the inability to fulfill delivery commitments, and organisations become
36 unable to meet their contractual agreements (Blackhurst *et al.*, 2005). Implementing resilience
37 could help organisations keep original production schedules at the lowest cost possible (Tang,
38 2006), while reducing waste and emissions by establishing strategies, such as a recovery plan
39 and sharing of information and resources (Eshetu *et al.*, 2017). The flexibility that resilience
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3 offers to organisations, such as flexible transportation (Golicic *et al.*, 2010) and flexible
4 sourcing (Stevenson and Spring, 2007), enhances the transportation network quality, which
5 decreases costs, enhances economic sustainability (Golicic *et al.*, 2010) and reduces CO₂
6 emissions, which increases environmental sustainability (Christopher *et al.*, 2011). Flexibility
7 can enhance organisational ability to reconfigure resources to cope with demand changes with
8 the lowest cost possible (Ullah and Narain (2020). In addition, it eliminates waste, which
9 decreases the negative impact on society and the environment, and improves social conditions
10 (Ruiz-Benitez *et al.*, 2019). All of these benefits of building resilience help organisations
11 achieve their main goal of enhancing sustainability (economic, environmental, and social)
12 (Anderies *et al.*, 2013, Golicic *et al.*, 2017). Based on the empirical evidence illustrated above,
13 in addition to the underlying logic of DC theory, it can be argued that developing resilience
14 can lead to enhanced sustainability (Anderies *et al.*, 2013, Golicic *et al.*, 2017).

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32 P2.2. *Once organisations develop the ability to reconfigure their resources and*
33 *augment their capabilities to cope with the constantly changing environment through*
34 *enhancing resilience, they will be able to increase the three dimensions of sustainability.*

35 36 37 38 39 40 **6.3 Relationship between SCCDCs and sustainability through DCs**

41 Because SCCs promote working toward common goals and sharing information through
42 networked collaboration (Hoof, 2014), supporting services (government, universities, and
43 industrial associations) (Grimstad and Burgess, 2014) and geographical concentration
44 (Grimstad and Burgess, 2014, Mitchell *et al.*, 2010), working inside a cluster can arguably help
45 organisations maintain their operations (Grimstad and Burgess, 2014). These characteristics
46 allow for easier access to resources, information (Tolossa *et al.*, 2013, Grimstad and Burgess,
47 2014) and knowledge generation (Lei and Huang, 2014, Mitchell *et al.*, 2010). Because
48 SCCDCs are also related to DCs (Golicic *et al.*, 2017) as organisations seek to join a SCC to
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3 manage constantly changing market needs (Huang and Xue, 2012), arguably, the creation of
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5 SCCs allows organisations to maintain their performance during and after crises (Geng *et al.*,
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7 2013a). Therefore, building DCs through SCCDCs can help organisations develop
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9 sustainability (Golicic *et al.*, 2017) and promote sustainability practices, policies and
10
11 regulations (Grimstad and Burgess, 2014). DCs are essential for sustainability because they
12
13 help facilitate sustainability practices (Zahra and George, 2002, Riikkinen *et al.*, 2017, Teece,
14
15 2007). They are also important in realising the full potential of collaboration (Agostini and
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17 Nosella, 2020) in an SCC context (Golicic *et al.*, 2017). AC helps organisations acquire new
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19 knowledge and integrate it with existing knowledge (Wang and Sun, 2020). AC can help
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21 organisations transform combined knowledge to implement new technologies (Agostini and
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23 Nosella, 2020), promote innovation (Huang *et al.*, 2018), (Agostini and Nosella, 2020) and
24
25 creativity (Fong *et al.*, 2018), through enhancing their business activities (Cozza and Zanfei,
26
27 2016) to develop sustainability (Riikkinen *et al.*, 2017). AC does not only enhance knowledge
28
29 acquisition but it also helps organisations create new useful knowledge (Khan *et al.*, 2020) that
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31 promotes sustainable activities (Riikkinen *et al.*, 2017). In other words, in order to strategically
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33 implement sustainability (Saenz *et al.*, 2014), AC is needed as it helps organisations implement
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35 necessary strategic developments (Khan *et al.*, 2020). Resilience is also related to sustainability
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37 as it promotes flexible supply base and contingency planning, which allow organisations to
38
39 maintain sustainability (Ruiz-Benitez *et al.*, 2019). Resilience helps a system capability retain
40
41 its full operational capacity after disruptions (Tipi and Elgazzar, 2021). The total cost
42
43 reduction, transportation flexibility and quick recovery eventually enhance economic as well
44
45 as social and environmental sustainability (Ruiz-Benitez *et al.*, 2019).

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54 As mentioned earlier, Popli *et al.* (2017) investigated the impact of networking on
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56 organisational performance through utilizing ERBV, where organisations gain access to unique
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58 access of resources through networking that can be used to enhance their competitiveness.
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3 While Ye *et al.* (2020) utilized DC theory to explain how clusters can facilitate resources
4 sharing in order to better allocate resources, which enhance organisations' ability to cope with
5 the dynamic business environment. Based on the fact that DC theory is presented as an
6 extension for RBV (Teece *et al.*, 1997, Barney, 1991), it can be argued that through ERBV,
7 organisations can acquire resources from the external environment, which can be suppliers,
8 governmental agencies and other entities in the same geographical area or region (Popli *et al.*,
9 2017). While DCs can allow organisations to reconfigure these acquired resources to cope with
10 market changes and enhance sustainability levels (Oliveira-Dias *et al.*, 2022). In this sense,
11 SCCDCs can give organisations access to resources that enhance their DCs (Golicic *et al.*,
12 2017). In return, the enhanced DCs can be used to develop sustainability, as AC facilitates
13 acquiring and developing of necessary knowledge (Kim and Park, 2017) in a cluster (Ferras-
14 Hernandez and Nylund, 2019) to enhance sustainability (Sirilertsuwan *et al.*, 2018). In addition,
15 resilience also facilitates networks' collaboration (Randolph, 2016) to develop sustainability
16 (Park *et al.*, 2013) because without resilience, risk leads to fragile sustainability (Anderies *et*
17 *al.*, 2013).

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38 P3. *Utilizing SCCDCs (geographical concentration, networked collaboration, and*
39 *supporting services) can help organisations enhance the three dimensions of sustainability by*
40 *developing DC. Doing so will allow organisations to maintain and increase the degree of*
41 *sustainability during and after a crisis.*

42 43 44 45 46 47 48 **6.4 Sustainability and organisational performance**

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50 Reaching high levels of sustainability can be achieved through collaborative efforts, as
51 customers hold organisations responsible for not abiding by sustainable standards, even if the
52 problem originated from the supplier (Paulraj *et al.*, 2017). This means that supply chain
53 members need to help each other and work jointly to achieve high levels of sustainability
54 (Luzzini *et al.*, 2015). Sustainability development through collaborative activities will
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3 eventually lead to better organisational performance (Xi *et al.*, 2014) as they create value to
4 the customers and increase their willingness to pay (Priem *et al.*, 2012). In other words,
5
6 organisations need to seek alliances to acquire resources outside their boundaries in order to
7
8 enhance their sustainability (Miemczyk and Luzzini, 2019) and eventually achieve higher
9
10 organisational performance (Ni and Sun, 2019). This notion is discussed in systems theory and
11
12 extended resource-based view as systems theory emphasises the integration and collaboration
13
14 among organisations to enhance their performance (Flynn *et al.*, 2010, Michalski *et al.*, 2018).
15
16 Regarding extended resource-based view, it can be argued that a higher organisational
17
18 performance can be achieved when combining acquired external resources with organisational
19
20 internal resources (Yang *et al.*, 2019). The combination of external resources acquired through
21
22 collaboration and internal resources can help in enhancing sustainability, which creates value
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24 to the customer and eventually leads to higher organisational performance (Ni and Sun, 2019).
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31 The relationship between sustainability and organisational performance in a SCC
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33 context is supported through the combination of the theoretical lenses, systems theory (Rigby
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35 *et al.*, 2000) and ERBV (Mathews, 2003), especially that these theories were utilized by Ni
36
37 and Sun (2019) and Bag *et al.* (2020a) to explain the relationship between sustainability and
38
39 performance, as the collaboration and availability of resources achieved through clustering can
40
41 help in increasing organisational performance through enhancing sustainability. The fact that
42
43 operational performance is related to quality enhancement, efficiency and productivity and
44
45 financial performance is related to market share, sales and return on investment (Huo *et al.*,
46
47 2014), rationalise the positive impact of sustainability on enhancing operational (Reuter *et al.*,
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49 2010) and financial performance (Albuquerque *et al.*, 2020). Economic sustainability focuses
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51 on decreasing operational and logistics cost (Agrawal *et al.*, 2016). Environmental
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53 sustainability focuses on recycling, waste management and renewable energy (Agrawal *et al.*,
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55 2016). While social sustainability focuses on promoting equality, social justice, customer
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3 safety and employees' benefits and stability (Workforce health and safety) (Agrawal *et al.*,
4
5 2016).
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8 In general, sustainability enhances the organisational image (Reuter *et al.*, 2010)
9
10 because it allows organisations to focus on environmental and social aspects and not only
11
12 economic aspects (Bag *et al.*, 2019). Such a focus has a positive impact on organisations'
13
14 financial performance as they gain investors' trust and attract more investments (Albuquerque
15
16 *et al.*, 2019, Albuquerque *et al.*, 2020). In addition, sustainability increases customer loyalty,
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18 which secures a steady flow of revenue due to the low price of demand elasticity (Albuquerque
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20 *et al.*, 2019). Monitoring operational performance is also important because the overall
21
22 financial performance measure is not enough, given that it is influenced by other factors (Pettit
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24 *et al.*, 2019). Investing in enhancing sustainability also enhances operational performance
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26 (Reuter *et al.*, 2010) by focusing on increased productivity with lower costs, energy and
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28 resources and a longer product lifespan (Holloos *et al.*, 2012).
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33 P4. *Organisations that focus on economic, social and environmental sustainability can*
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35 *have higher levels of financial and operational performance and, thus, be more competitive.*
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39 **7. Conclusion and future research**

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41 This paper introduced a conceptual framework that provides organisations with a guide to
42
43 establish sustainable clusters through the efficient reliance on local networks and resources to
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45 sustain their organisational performance by developing DCs to thrive in a dynamic business
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47 environment. The developed framework presents a novel approach that creates the foundation
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49 for the abstract ideas combined in ST, ERBV and DC theory by conceptualizing them using
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51 research constructs that will help extend their views by combining them in a SCC context. This
52
53 was discussed in relation with previous work on how these three theories have been
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55 implemented. DC theory is an extension of RBV, where DCs protect and reconfigure acquired
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57 resources to enhance sustainability (Teece *et al.*, 1997, Barney, 1991). ERBV focuses on
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3 acquiring resources from the external environment (Popli *et al.*, 2017), and this can be
4
5 facilitated through the infrastructure of resources created in a system (supply chain system)
6
7 (Flynn *et al.*, 2010, Michalski *et al.*, 2018). Since SCCDCs enhance collaboration and sharing
8
9 of resources, the framework developed in this study promotes SCC as a system in which its
10
11 sub-elements (clusters members) can form links and depend on each other to create a pool of
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13 resources (ST focuses on collaboration (Cooper *et al.*, 1997)). This pool of resources can be
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15 combined with organisations' internal resources to create a unique bundle of resources required
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17 to enhance sustainability, thus leading to improved organisational performance (ERBV
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19 (Mishra *et al.*, 2019)). However, as organisations operate in a constantly changing
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21 environment, they need to take advantage of the availability of resources to build DCs. These
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23 capabilities can help organisations enhance sustainability and increase organisational
24
25 performance by protecting and developing organisational resources (DC theory (Xi *et al.*,
26
27 2014)). Forming alliances and creating a pool of shared resources will allow organisations to
28
29 combine external and internal resources to create DCs and extend these capabilities across their
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31 boundaries (Huo *et al.*, 2014, Yu and Huo, 2019). The results of this research make a number
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33 of theoretical and practical contributions.
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41 **7.1 Theoretical implications**

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43 Empirical studies used ST, ERBV and DC theory (e.g., Bag *et al.*, 2019, Chen *et al.*, 2019,
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45 Hong *et al.*, 2018, Bag *et al.*, 2020) but did not combine them. Combining these theories,
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47 particularly in an SCC context, can potentially extend their understanding and applications by
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49 applying them in an SCC context. This research demonstrates that organisations can take
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51 advantage of being in an SCC system and use resource availability to enhance organisational
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53 performance by building DCs and developing these resources to maintain the desirable
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55 sustainability. This conceptual study also addresses the lack of theoretical understanding of
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57 how being in a cluster (i.e. SCCDCs) may affect the cluster members' DCs (Martinez-Sanchez
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3 *et al.*, 2019, Taslimi *et al.*, 2020). The proposed conceptual framework prompts industry
4 practitioners and policy makers to the idea that an effective design of SCC with appropriate
5 geographical concentration, networked collaboration and necessary supporting services can
6 help cluster members to enhance their DCs, thus improving organisational performance.
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12 Another contribution of this conceptual study is to advance the knowledge of
13 sustainability dimensions and how economic, social and environmental sustainability can be
14 enhanced through DCs (Ruiz-Benitez, López, & Real, 2019; Touboulic & Walker, 2015). In
15 addition, it illustrates how the three sustainability dimensions can positively affect
16 organisational performances (Das, Rangarajan, & Dutta, 2019). Previous studies have a
17 predominant focus on environmental sustainability (Walton *et al.*, 2020), a gap has been
18 identified that highlights a need for further comprehension of the underlining dimensions of
19 sustainability (i.e. economic, social and environmental) and how they link with DCs (Ruiz-
20 Benitez *et al.*, 2019, Touboulic and Walker, 2015) and organisational performance (Paulraj *et*
21 *al.*, 2017, Das *et al.*, 2019). This also contributes to the debate in literature regarding the
22 relationship between sustainability and organisational performance in supply chain
23 management literature (Paulraj *et al.*, 2017).
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40 This study highlights that by nurturing DCs (resilience and absorptive capability), not
41 only the economic sustainability of a firm but also the environmental and social sustainability
42 can be enhanced. Also, all the three dimensions of sustainability could have an influence on
43 organisational performance in a SCC context, especially that further attention is needed to
44 investigate the impact of DCs on sustainability (Pettit *et al.*, 2019, Golicic *et al.*, 2017,
45 Aboelmaged and Hashem, 2019) and eventually organisational performance (Pettit *et al.*,
46 2019), in addition to the impact of the three dimensions of sustainability on organisational
47 performance (Croom *et al.*, 2018, Das *et al.*, 2019, Ni and Sun, 2019). Testing these
48 relationships, especially in an SCC context, reveals the answer to the call from Das *et al.*
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(2019), Golicic *et al.* (2017), and Lis and Rozkwitalska (2020) regarding investigating the impact of clustering on AC and resilience. Furthermore, such a test contributes to the link between SCCDCs and DCs because it will pave the way to investigating their relationships. Empirically testing these relations will theoretically contribute to the literature gap highlighted by (Lis and Rozkwitalska, 2020, Golicic *et al.*, 2017), especially that there is relatively less known on how being in a cluster (i.e. SCCDCs) may affect the cluster members' DCs (Martinez-Sanchez *et al.*, 2019, Taslimi *et al.*, 2020).

7.2 Practical implications

The findings of this research are particularly important for managers who operate in a SCC to nurture not just the economic sustainability of a firm, but also social and economic sustainability under market disruptions. This will give organizations a competitive edge and eventually increase their performance especially in the post COVID-19 era. During this period some governments suspended sustainability related laws and regulations to achieve a quick economic recovery (Sarkis, 2021). In this sense, the conceptual framework and its propositions can assist policy makers in the improvement of SCC design and management, with considerations of DCs and sustainability.

The developed framework can help governments develop clusters continuously (Xin and Li-ying, 2013, Dana *et al.*, 2013, Yuan *et al.*, 2021) as DCs can help organisations overcome the trade-off between connectedness and adaptability (Geng *et al.*, 2013b, Simmie and Martin, 2010), which will eventually help in achieving SDGs (UN, 2018b) and enhance economic growth (Monteiro, 2016, Dong, 2011, Panyathanakun *et al.*, 2013). The framework shows the importance of developing DCs for SCC members to enhance sustainability, in addition, it incentives them through linking it to their performance (Esfahbodi *et al.*, 2016). Therefore, the framework provides practitioners and decision makers with a holistic approach to enhance sustainability by highlighting the benefits of enhancing sustainability to

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3 performance. In addition, it illustrates how stakeholders' collaboration and support helps in job
4 creation, improving community's quality of life (Panyathanakun *et al.*, 2013) and enhances
5 value creation through innovation (Mikhaylov, 2013, Lu and Shin, 2018). Especially, that
6 cluster activities raise environmental issues and harm the surrounding communities (UNIDO,
7 2016b), in addition, stakeholders are pressuring organizations to focus and sustainability issues
8 (Munir *et al.*, 2020). This means that enhancing sustainability will give organizations a
9 competitive edge (U-Dominic *et al.*, 2021), even under a volatile market changes as
10 organizations that focus on sustainability issues gain customer and investors trust and loyalty
11 (Albuquerque *et al.*, 2019, Albuquerque *et al.*, 2020).

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24 Notably, the developed framework in this research has significant practical
25 implications, as it helps managers increase their organizations' efficiency, sustainability and
26 global competitiveness in a dynamic business environment through identifying areas that need
27 specific improvement. Especially that collaboration enhances enhancement of technology and
28 timely and efficient flow of information (Wang and Sun, 2020). This can be achieved through
29 promoting local networking, and the use of local knowledge, materials and resources (Porter,
30 1998), which can help organizations overcome disruptions caused by events such as COVID-
31 19 (Cappelli and Cini, 2020). The quick spread of COVID-19 required trade restrictions which
32 caused fluctuations in demand and supply and global supply chain disruptions (Cappelli and
33 Cini, 2020). Arguably this emphasizes the importance of SCCDCs to improve collaboration
34 between organizations and the local government to establish a sustainable clusters (Hong and
35 Gasparatos, 2020).

52 53 **7.3 Further Research**

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55 The proposed framework needs to be investigated in developing and developed countries, in
56 addition to different regions and industries (Lis and Rozkwitalska, 2020, Golicic *et al.*, 2017)
57 because previous studies focused on wine and high-tech industries. Future research can use
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3 simulation/ different scenarios to test the propositions. Testing this framework can also rebrand
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5 SCCs as tools to enhance organisations' sustainability by increasing their adaptability in a
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7 dynamic business environment. In addition, this framework is expected to help develop the
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9 theories (ST, ERBV, and DC theory) by testing their applicability during disruptions, such as
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11 COVID-19, in an SCC context.
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