



Article

Evaluating the COVID-19 Impacts on Sustainable Procurement: Experiences from the Australian Built Environment Sector

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Abstract: The COVID-19 pandemic has brought global economies to a standstill and created challenges for a variety of sectors, including housing, building and infrastructure. Many business and government organisations have experienced some form of supply chain disruption—either through suppliers going offline, a sudden spike in demand or both. While embedding sustainability in procurement is a powerful tool for bringing about positive change in an organisation’s supply chains, this global pandemic has had a myriad of impacts on these procurement processes. Through focus group discussions with industrial practitioners and government decision makers from the Australian built environment sector, this study presents their lived experiences related to COVID-19 impacts on sustainable procurement. The emergent themes are: (1) the effects of COVID-19 on sustainable procurement, (2) the rapid development of reactive procurement responses and (3) levers for post-COVID-19 sustainable procurement. In order to learn from the challenges related to COVID-19, both government and industry need to re-assess their supply chain risks and determine the supply chain design that will deliver the most resiliency in the event of another large-scale disruption. There are several key levers, including developing reliable, transparent and local supply chains, leveraging innovative tools and digital engineering approaches, creating a coalition between government and industry and assessing risks at multiple levels. This study is the first of its kind to evaluate the COVID-19 impacts on sustainable procurement in the Australian building and construction industries. Government and industry practitioners can immediately apply these actionable recommendations to overcome the impacts of the pandemic and other disruptions on sustainable procurement activities.

Keywords: sustainable procurement; pandemic; supply chain; COVID-19 impacts



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1. Introduction

Sustainable procurement is increasingly on the agenda for purchasing and supply managers seeking to demonstrate corporate social responsibility in their supply chains. In simple terms, sustainable procurement is ‘the pursuit of sustainable development objectives through the purchasing and supply process’ [1]. Sustainable procurement aims to satisfy the social, environment and economic aspects of the purchasing and supply process of a business [2]. According to a previous research study, social, environmental and economic aspects are all equally important for sustainable supply chains [3]. This can be achieved by ensuring that the working conditions of its suppliers’ employees are decent, that the products or services purchased are environmentally sustainable, where possible, and that socio-economic issues, such as inequality and poverty, are addressed. Sustainable procurement requires the action and participation of all stakeholders, including government agencies, client organisations and other significant stakeholders [4,5] and top management support [6]. While there has been increasing attention to integrating sustainability into the procurement process, these activities can be impacted by different types of disruptions [7].

Among those disruptions, the COVID-19 crisis has brought global economies to a standstill and has created unprecedented challenges to many sectors including housing, building and infrastructure [8–10]. Many business and government organisations have experienced some form of supply chain disruption—either through suppliers going offline, a sudden spike in demand or both [11]. For example, impacts to trade through transportation limits and production slowdown are impacting business productivity, with 94% of the Fortune 1000 seeing supply chain disruptions [12]. According to a recent survey conducted by the Institute for Supply Chain Management, 75% of companies are reporting supply chain disruptions due to impacts of COVID-19. This crisis and the associated regulatory responses have created another layer of complexity for sustainable procurement due to process delays, loss of efficiencies, and cost impacts [13]. Within this context, many suppliers struggle to meet their contractual obligations with government entities, and this may put their financial viability, ability to retain staff and supply chains at risk. Furthermore, suppliers may not be able to fulfil their contracts due to action taken elsewhere in the public sector and restrictions that are now in place, or that may be in place in the future [14]. These circumstances impact not only industries but also entire economies [15]; it is therefore critical to investigate pathways for mitigating risks and vulnerabilities [16,17] and enhancing the resilience of supply chain operations [18] and supply chain networks [19]. While there is very limited to no precedent of assisting organisations to clearly understand what the potential future impacts may be, it becomes more challenging to be prepared for and adapt for such disruptions [20]. This highlights the critical need for right time, right place procurement decisions to be resilient and better positioned when the pandemic subsides.

Driven by the need to uncover the implications of COVID-19 for sustainable procurement practices, this study aims to examine the COVID-19 impacts on achieving sustainable procurement and how these impacts may be ameliorated. The objective of this paper is to gain a deeper understanding of these phenomena through exploring the experiences of the Australian built environment sector. The findings of this study will have implications across the procurement life cycle and provide practical ways to improve environmental, social and economic sustainability outcomes in the housing, building and infrastructure sectors in Australia. This study is the first of its kind to evaluate the COVID-19 impacts on sustainable procurement of the Australian building and construction industries. Government and industry practitioners can immediately apply the proposed actionable recommendations to overcome the impacts of the pandemic and other disruptions on sustainable procurement activities. The following sections present the analysis of key publications in the literature, as well as the method, findings and framework discussion.

2. Literature Review

Global public health has been recently becoming more vulnerable to emerging pandemics caused by novel pathogens (i.e., recent outbreaks of COVID-19, Zika and Ebola). These pandemics cause disruptions (e.g., shortage of supplies, highly volatile demand) to procurement operations and hence it is important to increase the capacity of supply chains to overcome damaging effects quickly and cost effectively [21,22]. Therefore, critical response planning activities are vital for dealing with such unpredictable events and in designing resilient global supply chains [23,24]. Previous studies have explored sustainability and resilience in impacts on supply chain and organizational performance. Some have recently indicated that incorporating sustainability into business operations can result in improved firm performance. A stepwise weight assessment ratio analysis (SWARA) method was previously used for identifying the significant factors for enhancing the survivability of SSCs in a pandemic [25]. It is evident that resilience should be considered as a pathway for achieving competitive advantage rather than a mere tool for risk reduction [26]. Organizations need to fully understand the inter-relationships between resilience and competitive advantage and harvest opportunities arising from a supply chain management approach

that is sustainable and resilient [27]. A decision-making and trade-off implementation model has been established for identifying and prioritizing the contradictory attributes of sustainability and resilience [28].

While there were more efforts directed towards resilient supply chains, the impacts of COVID-19 were something many organisations were unprepared for [8]. However, this crisis has created an impetus for some businesses to benefit from pivoting to more localized value chains, and some toward global supply chains. After COVID-19, relationships between public granting authorities and private contractors will possibly change, with more focus on investing in delivery in a collaborative way. Previous studies have claimed that in buyers' views and anticipations regarding service sourcing, a counteractive movement towards objectification of services seems equally apparent [29]. In order to achieve a more interest-aligned approach as opposed to an adversarial contractual relationship, both the public and the private sector should be investing in productivity measures, training, skills and capability, different risk allocations and new methods of construction and contracting. For the private sector, there will be a substantial difference between investing in availability-based projects as opposed to demand-based projects. For the latter, the dramatic decline in traffic will pose a significant challenge [24].

Looking at some international examples, the UK government is expecting to see supply chains in the infrastructure sector become more locally based in order to increase resilience. One of the main changes stemming from this crisis will be the way in which governments will contract for infrastructure. Some of the factors to consider will include which projects will provide the substantial increase in productivity and will rely more on modern methods of construction. Infrastructure projects such as fast broadband, 5G and net zero carbon are gaining momentum and are expected to attract more interest and investments. For instance, the private sector in Japan is increasingly playing a more prominent role in the fulfilment of national development and sustainable growth goals, and it will be expected to bring into the execution of infrastructure projects its expertise and cross-sectoral knowledge in areas such as urban planning, technology, environmental protection, health and safety [24].

In order to learn from the challenges related to COVID-19, government and industry need to re-assess their supply chain risks and determine the supply chain design that will deliver the most resiliency in the event of another large-scale disruption. It is evident that complex global supply chains demand a paradigm shift from traditional risk management thinking to cope with extreme vulnerabilities, uncertainties and unforeseen disruptions [30,31]. There should be transformation through a positive lens in order to improve supply chains and logistics management in order to provide high value and even more outstanding services to society, since it has now been made abundantly clear that supply chains are the veins of an economy [32,33].

To create resilient supply chains, there are multiple immediate and end-to-end sustainable supply chain actions that should be considered. These actions will enable government authorities and industrial practitioners to develop targeted responses to address COVID-19 impacts and better prepare for possible future disruptions [34–37]. These actions include: (1) creating transparency in multi-tier supply chains; (2) optimizing production and distribution capacity; (3) assessing realistic final-customer demands; (4) leveraging technologies to support goals; (5) utilizing multi-level risk assessment; and (6) ensuring that the organisations are aligned with the most innovative initiatives to support sustainability and the green economy [38]. These actions will uncover opportunities for sustainable procurement [14] through improving productivity, assessing value and performance, enabling communication between purchasers, suppliers and stakeholders, and encouraging innovation [39].

The responses to COVID-19 have demonstrated parallel responses to climate change. Delayed efforts to action on climate change may also lead to impacts such as destroyed livelihoods and shrinking economies. Whether it is a global pandemic or extreme climate events, supply chains in which businesses pivot their procurement towards cheaper labour

and materials located in one or two locations may no longer be cost-effective. Instead, businesses may well be willing to pay an upfront premium to futureproof their supply chains, by spending more on mapping and angling procurement towards certified and sustainable sources that are better equipped to deal with the challenges posed by climate change and natural disasters [8].

Going forward, business entities and governments will seek to modernize supply chain practices, regardless of whether they are global or local. Key approaches such as Industry 4.0 enable these entities to create more transparency in supply chains [40]. For example, large retail businesses (e.g., M&S and Primark) have launched digital supply chain mapping exercises to enhance transparency and disclosure, while some other organisations (e.g., Unilever and Sainsbury's) have opted to use blockchain technology to enhance the sustainability of supply chains. The Turbo Carbon tool has also emerged as a popular method of streamline carbon reporting [8,36]. Within this context, digitally enabled transparency facilitates data-driven decision making and provides deeper insights to decision makers in government and industry for making sustainable procurement decisions. Emerging technologies such as artificial intelligence (AI), building information modelling (BIM) and other digital engineering (DE) technologies are paving the way forward, enabling decision makers to mitigate risk and drive value. Examples include utilizing digital tools to audit supply chains and tracking emission footprints through energy management suites and AI, which can drive efficiency [8,11,36].

The construction sector is a large contributor to employment and the economy, and COVID-19 has had significant implications for government, owners, principals, contractors and the entire supply chain that need to be dealt with commercially, respectfully and pragmatically. It is important to understand how COVID-19 may affect the procurement processes of government authorities and business organisations and how to position it to be resilient for future challenges [41]. While this global pandemic has created unprecedented challenges, it has also prompted governments and industries around the world to develop more resilient approaches and leverage digital technologies to make more data-driven decisions.

3. Methods

Due to the exploratory nature of the research objectives of this paper, a qualitative research approach was chosen. The data collection strategy involved focus group discussions (FGDs). During these sessions, a deeper understanding of COVID-19 impacts on sustainable procurement was sought. Focus groups allowed the researchers to interact directly with respondents and the respondents to react to and build upon the responses of other group members [42]. FGDs have been widely applied in qualitative research in order to investigate and understand in-depth social issues [43]. The method is used to collect qualitative data such as verbal interviews and transcripts or minutes from a group of people who are usually experts in their field. Focus groups provide a safe environment for groups of individuals who have a mutual interest in a given theme. The advantage of FDG is that it leverages the group context to create discussion and interaction among participants. Since the objective was to understand the impact of COVID-19 on the built environment sector, FGDs were deemed appropriate. This method was previously applied in similar research [29].

3.1. Data Collection

The participants of the focus groups were not selected randomly or as a statistical sample of a larger population. Instead, the groups were formed by the researchers intentionally with a specific synthesis and size in accordance with the aims and objectives of the research [43]. Sustainable procurement embraces the social dimension and involves specific stakeholders who play a critical role in decision making in the construction supply chain. Participants of the focus group discussions were identified by the Project Steering Group of this industry collaborative project (through the Sustainable

Built Environment National Research Centre, Australia) and through the researchers' professional networks. Five industry representatives from commonwealth government, state government, private organisations and industry associations were recruited for the focus group discussions.

FGD schedules were developed to guide the discussions. The discussions were centred around the theme of "Post COVID-19 impacts for achieving sustainable procurement and how these impacts may be ameliorated". Specifically, the discussions were guided by seven key questions. These questions were as follows. (1) How has COVID-19 impacted your industry and your organisation? (2) How does COVID-19 impact achieving sustainability goals in the construction industry? (3) What challenges have been brought about by COVID-19 to your organisation's sustainability practices? (4) How can the impacts be ameliorated? (5) How can you use these COVID-19-related lessons to create an opportunity for more robust supply chains through Australian Government initiatives? (6) What are the roles of stakeholders (governments, clients, contractors, suppliers and users) in shaping sustainable procurement practices in a post-COVID-19 world? (7) Learning from the COVID-19 realities, how can you leverage your experience for future opportunities?

3.2. Data Analysis

The Gioia methodology [44] was adopted to analyse the data collected from FGDs. The data analysis process involved five steps: (a) performing initial data coding while maintaining the integrity of 1st-order (informant-centric) terms; (b) developing a comprehensive compendium of 1st-order terms; (c) organizing 1st-order codes into 2nd-order (theory-centric) themes; (d) distilling 2nd-order themes into overarching theoretical dimensions; and (e) assembling terms, themes and dimensions into a "data structure" [44].

After the focus group discussions had been conducted and transcribed, the data were organized into 1st- and 2nd-order categories to facilitate their assembly afterward into a more structured form. In the 1st-order analysis, we tried to adhere faithfully to informant terms and made little attempt to distil categories, which led to a large number of 1st-order terms.

In the 2nd-order analysis, the authors were firmly in the theoretical realm and focused on organizing the 1st-order terms into researcher-driven concepts and themes. We then examined the structure and interrelationships of the 2nd-order themes and further organized them into 2nd-order aggregate dimensions. It is important to create a robust data structure for rigorous qualitative research for two reasons: the first is that it enables a better understanding and visualization of the research data flow, while the second is that it may underpin the formation of new theoretical concepts, e.g., 'theoretical saturation' [45]. The full set of 1st-order terms and 2nd-order themes and aggregate dimensions formed the basis for building a data structure, which then informed the development of the emergent actions framework for addressing challenges related to COVID-19.

To ensure the credibility of the research findings, four key guidelines were used. These guidelines were: recording the chain of evidence [45], building explanations [46], using a focus group protocol [46] and using relevant publications to relate our findings to previously established knowledge [47,48].

4. Results

4.1. Findings of the First-Order Analysis

Through the FDGs with representatives from federal and state governments, private organisations and industry bodies, it was evident that all participants understood the importance of sustainable procurement in their long-term business aspirations. However, a number of them acknowledged that they are still in the infancy of their sustainability journey. As per the Gioia method explained in Section 3.2, the research team performed initial data coding, while maintaining the integrity of first-order (informant-centric) terms and then developed a comprehensive compendium of first-order terms. A total of 83 first-

order concepts emerged through the first-order analysis of the FDGs. The following paragraphs describe the emergent first-order concepts related to COVID-19 according to the three procurement stages, namely planning, sourcing and contracting.

Within the planning stage, a variety of impacts were discussed in relation to supply chain disruptions, sudden spikes in demand, emerging innovative approaches, leveraging digital tools, rapid shifts of practice and the implementation of safety measures. Particularly, there was a major emphasis on rapid interactions and tasks such as pre-start checks and cleaning activities. For example, P4 from the private sector shared, “The first impact I noticed there was really around having to work very quickly with supplies on their working practices, prestart checks, cleaning all of those sorts of things about immediate safety measures and how safety took precedence over other priorities”. From a governmental perspective, P2 pointed out a positive cultural impact that emerged from the COVID-19 pandemic. For example, “Perhaps the positives have been more on the cultural side. People are open to change in this time, and this is more generic. But one positive that’s comes out is this virtual working situation with been able to resource more, I guess, waste specialists”.

In the sourcing stage, a range of insights were obtained related to feedback from contractors about limited supply, impacts including affecting the timely delivery by contractors, stalled maintenance activities and risk management through shifting the private organisation’s program to allow for limited resources. For example, P1 from the private sector emphasized managing risks, “So, I guess how, in terms of risk, we manage the risk by shifting our program or extending our program to allow for the limited resources in certain areas. So, the industry would share, and I guess that would also maintain a certain level of cost for everyone”. A government participant explained that they are very risk averse and therefore have over-purchased resources. They have also rapidly transitioned to single-use plastics as a COVID-19 safety measure. It is important to note that while local manufacturing was highlighted as a potential opportunity, participants also raised their concerns about the associated costs. For example, P1 mentioned that “So you’re always driven onto the manufacturing ability locally and price, you know, can that happen? You know, do you push for a local manufacturer. We can perhaps prompt it as a developer, but we could definitely not, you know, entice our contractors or our suppliers to start local manufacturing”.

The contract management phase captured a variety of COVID-19 impacts, including the possible adoption of digital approaches and the introduction of a new system to electronically process information, proactive actions from contractors’ specific initiatives and scope, and the purposeful integration of Modern Slavery requirements to the contract. The purposeful integration of the Modern Slavery Act, with a particular focus on indigenous engagement, was emphasized by several participants. For example, P1 stated that “We ask our suppliers to complete a series of questions disclose; and for, they had to disclose on this database, which the consortium had access to, who they supply with, where they get their products from, how do they ensure that, you know, Modern Slavery’s met, you know, that they’re not buying from Bangladesh where a five-year old is, you know, building something, you know, and in importing it. So, obviously we have to rely on their disclosures because we can’t go and visit and check”.

Table 1 presents a summary of selected first-order concepts and exemplary quotes to demonstrate its applicability across the procurement stages of planning, sourcing and contract management.

Table 1. First-order analysis.

Procurement Stage	First-Level Concepts (Selected)	Supporting Quotes	Participant Code
Planning	Rethinking innovative approaches	One of the things these matters do is have a rethink about some of the innovation that we were asking to look at around more just in time.	P3
	Rapid interactions and tasks on prestart checks and cleaning	The first impact I notice there was really around having to work very quickly with supplies on their working practices, prestart checks, cleaning all of those sorts of things	P4
	Positive cultural changes such as virtual work engagements	Perhaps the positives have been more on the cultural side. People are open to change in this time, and this is more generic. But one positive that's comes out is this virtual working situation with been able to resource more, I guess, waste specialists.	P2
	Continuous efforts to put safety measures in place through cleaning, increasing resources or people	You know, it was really very fortunate rather other than the supply chain change in how we operate like split shifts, for example, you know, we had to maintain distancing and hygiene. How is that are going to operate, increase the cleaning, increase resources or people, resources to deliver. And there wasn't that much of an impact.	P1
	Prioritized and conducted on-site engagement as needed and where electronic alternatives were not viable	It was really very fortunate rather other than the supply chain change in how we operate like split shifts, for example, you know, we had to maintain distancing and hygiene. How is that are going to operate, increase the cleaning, increase resources or people, resources to deliver. And there wasn't that much of an impact.	P1
	Positively nudged the organisations to adopt IT tools	Because it's so hard to get a change made; so, COVID-19 has been very positive actually. Cause it's just pushed that button, you know! It's really sped up a lot of the IT stuff out of necessity.	P2
Sourcing	Received feedback from contractors about limited supply	Once COVID hit, we realised well, because we've got a lot of feedback from our contractors with limited supply, and obviously they do not stockpile, and a lot of the supply was coming from overseas and that all stopped.	P1
	Processes in this private organisation were insulated because of vertical integration	I guess we're structurally we're kind of insulated a bit because we about vertical integration. So, we start at the quarries in it, all the way through to the concrete. I think looking at where we're at now that the stimulus is changed. It's flipped it on its head. We're doing bigger numbers than we've ever done	P5
	Variety of impacts including affecting the timely delivery by contractors, maintenance activities, limited supply of products	So that's what we found, you know, was the supply chain stock to the supply chain, which affected our contractors in being able to deliver, let alone, you know, and in the maintenance space, obviously, you know, running out of, out of products was, it was a big thing	P1

Table 1. Cont.

Procurement Stage	First-Level Concepts (Selected)	Supporting Quotes	Participant Code
	Potential price barrier for local manufacturing	Yes, I guess that isn't when it goes on price, right. So you're always driven onto the manufacturing ability locally and price, you know, can that happen? You know, do you pushful a local manufacturer? You know, we can perhaps prompt it as a developer, but we could definitely not, you know, entice our contractors or our suppliers to start local manufacturing.	P1
	Managed risk through shifting the private organisation's program to allow for limited resources	So, I guess how, in terms of risk, we manage the risk by shifting our program or extending our program to allow for the limited resources in certain areas. So, the industry would share, and I guess that would also maintain a certain level of cost for everyone.	P1
	Rapid transition to single-use plastics in the government organisation as a COVID-19 safety measure	the main one, which was switching to a lot of disposable options at the safety. You know, it's harder when you suggest any alternative, I suppose.	P2
	Changes to the supply chain timeframes and overbuying as a preparatory measure	And I think that was a big one really, and then supply chain timeframes. I haven't heard specific examples of this, but Defence has a tendency to be very risk adverse, and I would guess that there's probably areas in Defence where you've probably done a bit of overbuying, because of this situation to sort of prepare for the worst.	P2
	Possible adoption of digital approaches and introduction of a new system to electronically process information	So, but anything else that wasn't required was done electronically. we introduced a new system to embrace you know, more processes electronically, and more information. So outside of 'Econex'.	P1
	Impacts on the timely delivery by contractors' maintenance activities	So that's what we found, you know, was the supply chain stock to the supply chain, which affected our contractors in being able to deliver, let alone, you know, and in the maintenance space, obviously, you know, running out of, out of products was, it was a big thing	P2
Contract management	Some contractors are proactive from their end and approach the government organisations with specific initiatives and scope	We've got Veolia is our main waste management contractor and they've been very proactive, and they'll come to us with, initiatives and scope it up and they'll just say, they know we've got money sitting around and then now we want to do this. So, they're proactive and they go, come to us.	P2
	Prompt action and rapid forecasting to manage supply chains as well as contractors	We acted very fast internally in our project teams to identify, you know, straightaway as soon as something happens. It's you know, you're looking at the risks and you're looking at the forecast of program with the contractors.	P1
	Proactive actions were in place to manage the supply chain as well as contractors	I mentioned earlier and how we manage the supply chain as well as people, as well as contractors, as well as split shifts, et cetera, we staggered the program, which then allowed us time and allowed everything time. To manufacturer deliver, you know and arrive.	P1

Table 1. Cont.

Procurement Stage	First-Level Concepts (Selected)	Supporting Quotes	Participant Code
	Embedding Modern Slavery requirements to the contract	Embedded Modern Slavery requirements in the contract itself. How you do business. For instance, in [private organisation], we have a policy called 'What [name of the private organisation] Expects from its Suppliers', which is on our website and which we published to say, you know, Human Rights, Modern Slavery, you know, embedded Code of Conducts, you know, the Geneva Convention requirements like we really stepped through all of it right through.	P1

4.2. Findings of the Second-Order Analysis

This section presents the synthesis of the participant-driven themes into researcher-driven themes and the emergent aggregate categories. According to the Gioia method, the research team organized first-order codes into second-order (theory-centric) themes and distilled second-order themes into overarching theoretical dimensions. The 83 first-order concepts then informed 11 s-order themes. These second-order themes include:

1. Supply chain disruptions;
2. Sudden spikes in demand;
3. Triggers for cultural and structural changes;
4. Immediate safety and sourcing measures;
5. Fair and progressive operational approaches;
6. Selective on-site and digital engagement;
7. Reliable, transparent and local supply chains;
8. Leveraging innovative tools and DE approaches;
9. Coalition between government and industry;
10. Purposeful integration of Modern Slavery Act and procurement guidelines;
11. Multi-level risk assessment.

Further to revisiting key publications and considering the theoretical constructs, the second-order themes were further refined. The three second-order themes of supply chain disruptions, sudden spikes in demand and triggers for cultural and structural changes were further aggregated into the category of "Effects of COVID-19 on sustainable procurement". The three second-order categories of immediate safety and sourcing measures, fair and progressive operational approaches and selective on-site and digital engagement were categorized into the theme of "Rapid development of reactive procurement responses". Finally, five second-order themes of reliable, transparent and local supply chains, leveraging innovative tools and DE approaches, a coalition between government and industry, the purposeful integration of Modern Slavery Act and procurement guidelines and multi-level risk assessment were aggregated into the category of "Levers for post-COVID-19 sustainable procurement". Figure 1 shows the data structure and how each of the second-order themes is linked to the aggregate dimension. As presented in the figure, the overall data structure is focused on COVID-19 impacts on sustainable procurement. The second-level data are categorized under the three groups of effects of COVID-19 on sustainable procurement, rapid development of reactive procurement measures and levers for post-COVID-19 sustainable procurement. In the second-order analysis, the authors were firmly in the theoretical realm and focused on organizing the first-order terms into researcher-driven concepts and themes. We then examined the structure and interrelationships of the second-order themes and further organized them into second-order aggregate dimensions. These results are further discussed and compared with previous publications in the following section.

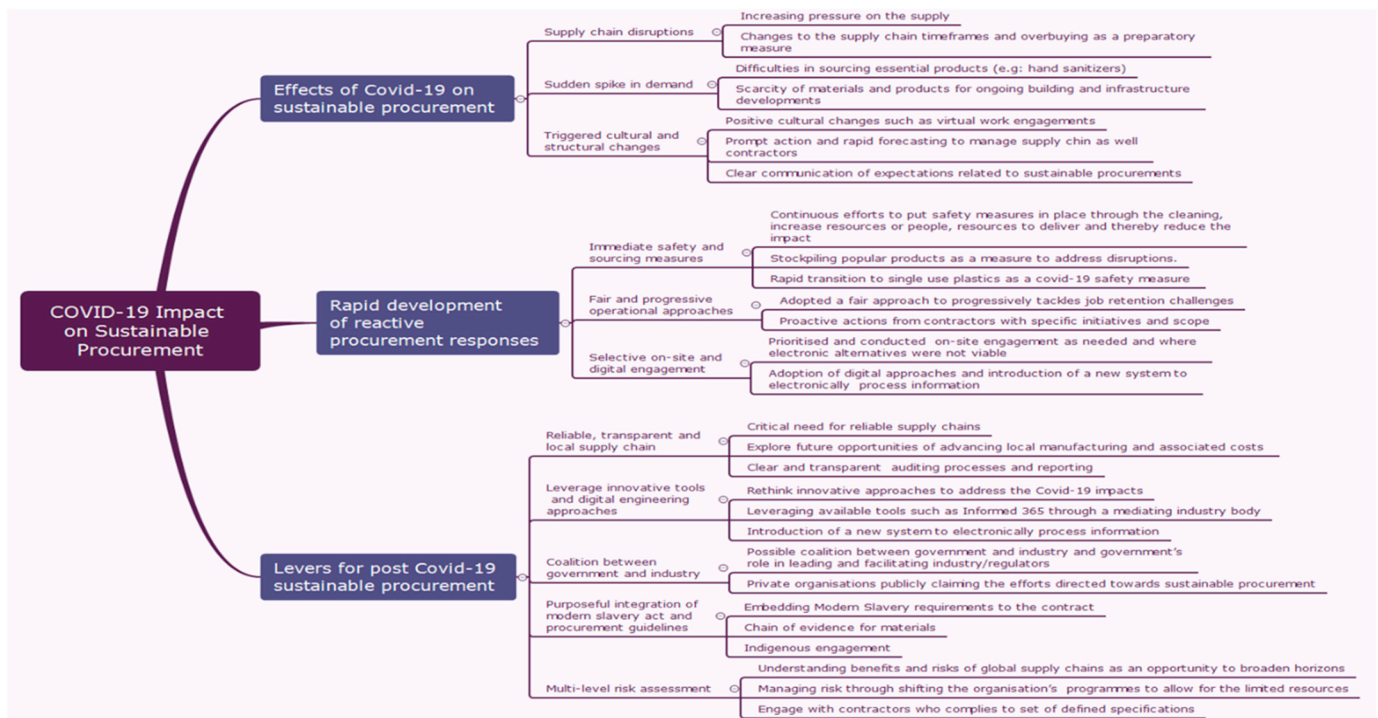


Figure 1. Data structure.

5. Discussion

Through the focus group discussions, it became evident that COVID-19 crisis has created severe disruptions to supply chains and prompted both private and government organisations to re-think innovative approaches to address disruptions. Particularly, the focus group participants shared their lived experiences related to limited supply, delayed delivery by contractors and disrupted maintenance activities. Representatives from private organisations emphasized the need for targeted approaches to manage risk through shifting the private organisation's program to allow for limited resources. The government representatives described how safety took precedence over other priorities and how they engaged in immediate safety and sourcing activities. These findings are aligned with those in the literature, and it was indeed clear that the COVID-19 crisis and the associated regulatory responses have created another layer of complexity for sustainable procurement due to process delays, loss of efficiencies, and cost impacts [13]. Several private-sector representatives mentioned a few positive impacts mainly connected to the stimulus offered by the government and possible insulation due to vertical integration. However, they also shared their experience of delays in deliveries from contractors and of suppliers struggling to meet their contractual obligations. To overcome this challenge, multi-level risk assessment was suggested as a strategic approach.

Most participants claimed that they were still in the early stages of their sustainable procurement journey and that the COVID-19 crisis forced them to prioritise other safety- and operations-related measures, which sometimes led to overlooking sustainable priorities. However, this crisis has created an impetus for some businesses to benefit from pivoting to more localized value chains, and some toward global supply chains. While the participants highlighted the importance of more local manufacturing, they also mentioned the potential cost barrier. The private-sector participants highlighted the importance of creating a coalition between industry and government so that they can collectively address these challenges. This aligns with the literature on the view that relationships between public granting authorities and private contractors will possibly change, with more focus on investing in delivery in a collaborative way [24].

To achieve a more interest-aligned approach as opposed to an adversarial contractual relationship, both the public and the private sector should be investing in productivity measures, training, skills and capability, different risk allocations and new methods of construction and contracting. A private-sector participant emphasized the importance of using targeted tools such as ‘Informed 365’ through a mediating industry body in order to obtain authentic information from contractors. The authors observed efforts from private- and public-sector colleagues to share information in order to create a joined-up approach to purposefully integrate Modern Slavery requirements and sustainable procurement guidelines.

In order to learn from the challenges related to COVID-19, government and industry need to re-assess their supply chain risks and determine the supply chain design that will deliver the most resiliency in the event of another large-scale disruption. To achieve this, the focus group participants proposed key levers, including developing reliable, transparent and local supply chains, leveraging innovative tools and DE approaches, creating a coalition between government and industry, the purposeful integration of Modern Slavery Act and procurement guidelines and assessing risks at multiple levels. These levers are aligned with the literature on actions to enable government authorities and industrial practitioners to develop targeted responses to address COVID-19 impacts and better prepare for possible future disruptions [34,35,37]. The actions mentioned in this literature include: (1) creating transparency in multi-tier supply chains; (2) optimizing production and distribution capacity; (3) assessing realistic final-customer demands; (4) leveraging technologies to support goals; (5) utilizing multi-level risk assessment; and (6) ensuring that the organisations are aligned with the most innovative initiatives to support sustainability and the green economy [38].

Figure 2, derived from our research (i.e., the literature review and focus group discussions), presents a suite of actions to consider in response to COVID-19. Enterprises can then make their supply chains more resilient, collaborative and networked as they recover from COVID-19 [4].

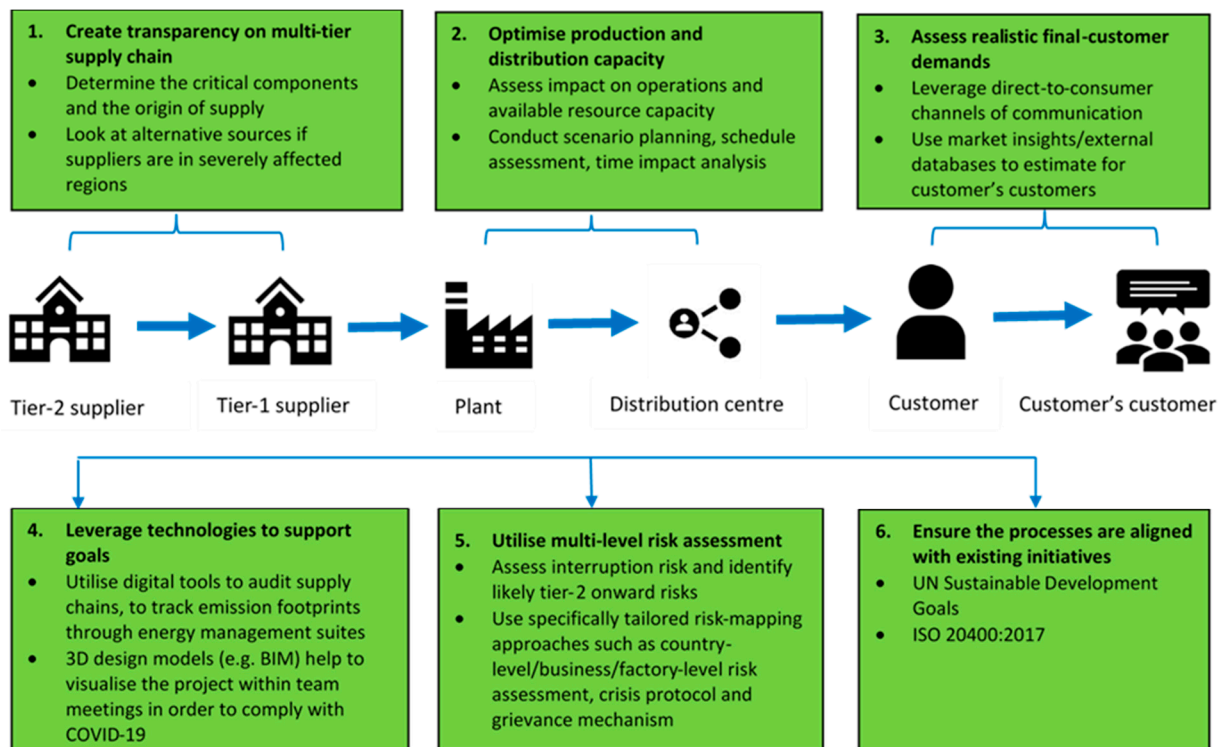


Figure 2. Actions in response to COVID-19 disruptions [4].

As per Figure 2, Tier 1 and 2 suppliers can ensure the transparency of their supply chains by determining the critical components and the origin of their supply. Furthermore, it is important to consider alternative sources and pathways for suppliers in severely affected regions. Operations and distribution centres should assess the impacts on operations and resources through scenario planning, scheduled assessment and time impact analysis. The demands of customers and end users should be assessed through direct communication channels. In addition, marketing insights and external databases could be used to assess realistic final-customer demands. Digital tools and appropriate technologies can be used to audit supply chains, assess environmental impacts and visualize projects. Multi-level risk assessment is also critical for identifying interruptions as well as creating crisis protocols and grievance mechanisms. Finally, it is critical to ensure that the processes are aligned with the existing initiatives of the United Nations Sustainable Development Goals (i.e., responsible consumption and production, sustainable cities and communities, industry innovation and infrastructure) and the ISO 20400:2017 standard guiding the integration of sustainability within procurement.

6. Conclusions

Embedding sustainability in procurement is a powerful tool for bringing about positive change in an organisation's supply chains. This study examined COVID-19 impacts and responses and developed an action framework to enable organisations to make their supply chains more resilient, collaborative and networked as they recover from COVID-19. The COVID-19 crisis has created severe disruptions to supply chains and prompted both private and government organisations to re-think innovative approaches to address disruptions. In order to learn from the challenges related to COVID-19, government and industry need to re-assess their supply chain risks and determine the supply chain design that will deliver the most resiliency in the event of another large-scale disruption. Several key levers were proposed, including developing reliable, transparent and local supply chains, leveraging innovative tools and DE approaches, creating a coalition between government and industry, the purposeful integration of Modern Slavery Act and procurement guidelines and assessing risks at multiple levels.

The findings of this study contribute to the existing body of knowledge with an emergent action framework that includes a suite of actions to consider in response to COVID-19. Practitioners can immediately use these guidelines to direct their efforts, and future research can be carried out to test and validate this framework in the built environment as well as other sectors. Only with more efforts to create transparency in multi-tier supply chains, optimize production and distribution capacity, assess realistic final-customer demands, leverage technologies to support goals and utilize multi-level risk assessment can government authorities and industrial practitioners develop targeted responses to address COVID-19 impacts and better prepare for future disruptions. The findings of this paper could also be applied more extensively to review current and future supply chain vulnerabilities and disruptions. Future research could empirically test and validate the framework through case studies of decision-maker experiences. Such a review and renewal of the sustainable procurement guidelines/recommendations would help to continually improve sustainable procurement processes.

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