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Resource Orchestration and Supply Chain Resilience under Climate Disruptions: A Systematic Literature Review Approach

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Abstract
Climate disruptions are affecting global supply chain, compelling firms to realign, re-bundle and re-orchestrate resources and capabilities. Although supply chain Resilience (SCR) have achieved an increasing momentum in relevant body of knowledge, some fragmented theoretical synthesis still persist. This paper systematically review literature on resource orchestration and supply chain resilience under climate disruptions. Based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 framework, authors analyzed 21 publications from Scopus and Web of Science Index Journals. Our research synthesises how an organizations orchestrate and leverage their resources under climate disruptions. This research found that internal dynamic sensing, reconfiguration and bundling capabilities, are significantly related to supply chain resilience. A conceptual framework linking resource orchestration and supply chain resilience under climate disruption is proposed. Authors recommended nine propositions for empirical testing. The study informs supply chain managers, logistics strategists, policymakers and logistics leaders on effective approach for building climate change resilience system.

Keywords: Supply chain resilience, resource orchestration, dynamic capabilities, Climate disruption, sustainability, PRISMA, logistics

Introduction

Climate change has proved to be one of the most disruptive phenomena confronting global supply chains. Extreme weather is affecting production, transportation, supplier reliability and global flows, causing uncertainty and fragility in logistics systems. Increased intensity of floods, droughts, hurricane and rising temperatures have revealed the structural fragility of lean, Just-In-Time and global supply chain (IPCC, 2023). To counter such disruptions, supply chain resilience (SCR) has emerged as a focal strategic issue in the study of operations and logistics management.

Supply Chain Resilience (SCR) is a firm's ability to predict, prepare for, respond to, recover from disruptions, while maintaining ongoing operations (Ponomarov & Holcomb, 2009). However, empirical studies on supply chain resilience under climate change disruptions is disjointed and theoretically underdeveloped. Three theories dominate the literature. First, The Resource-Based View (RBV) accounts for resilience through its focus on the firms possession of valuable, rare, and inimitable resources, such as logistic infrastructure, digital technologies, or skilled human capital (Barney, 1991). Despite this, the RBV has been criticised for being static and unable to explain how firms operate when faced with strategic, complex, and volatile environments. Second, The Dynamic Capabilities View (DCV) builds on RBV by measuring the firms ability to sense, leverage, and reconfiguring capabilities (Teece, 2007). Although focused on the issue of adaptation, this theory does not account for how resources are structured and deployed by actors within the firm. Third, Resource Orchestration Theory (ROT) overcome this limitation by explaining how managers can structure, bundle, and leverage resources to create value and resilience (Sirmon et al., 2011). Notwithstanding these theoretical developments, no complete synthesis of RBV, DCV, and ROT has been developed, taking into consideration the effect of climate-related disruptions on supply chain. There has been few exploration of how firms intentionally orchestrate their resources to enable resilient logistics systems under uncertain environment. This research aims to fill this gap in the literature by using the PRISMA 2020 systematic literature review (SLR) guidelines and integrating the current body of knowledge on resource orchestration and supply chain resilience in the context of climate disruptions. Through this SLR analysis, an integrated conceptual framework of this phenomenon is developed, clarifying how firms can use resource structuring, capabilities and strategic mechanisms of orchestration to achieve supply chain resilience. Theoretically, this study contributes to the field by integrating three dominant theories into a unifying framework. Practically, the study provides valuable insights into how a firm can build resilience under climate disruptions. This study systematically synthesises literature to answer:

RQ1: What resources do firms orchestrate to enhance supply chain resilience in response to climate-related disruptions?

RQ2: How do RBV, DCV and ROT together explain the mechanisms through which firms develop supply chain resilience under climate disruption?

RQ 3: What is the conceptual framework that will underlie future research and practice?

Theoretical Background

Supply Chain Resilience (SCR)

From a management perspective, supply chain resilience (SCR) became a key construct in operations and logistics management owing to the rising scales and magnitudes of disruptions and shocks worldwide. SCR is defined as the ability of supply chains to proactively prepare for unexpected events, respond to disruptions, recover and reconfigure (adapt) themselves in response to external disruptions in a timely and cost-effective manner (Ponomarov & Holcomb 2009). SCR ic6k8mzs a dynamic process and ongoing ability, not a mere outcome (Ivanov & Dolgui 2021). Four interdependent factors of SCR (such as anticipation, absorption, adaptation and recovery) are widely acknowledged in the existing literature. Anticipation refers to expected early detection of risks based on forecasts and intelligence systems. Absorption is operational continuity amidst disruption. Adaptation is characterized by modifications to the structure or operational procedures to new environment condition. Recovery is the possibility for the restoration or enhancement of performance following a disruption. Disruptions associated with climate are different in nature from traditional supply chain risks. Whereas demand shifts or underperforming suppliers may be isolated events, climate-related disruptions tend to be systemic, cascading, and simultaneous across a network (e.g., multiple nodes). For instance, the impact of extreme weather event on production facility, transportation logistics, and distribution channels can have ripple effects on global supply chains (Ivanov & Dolgui, 2021; Tukamuhabwa et al., 2015).

Resource-Based View (RBV)

The Resource-Based View (RBV) is one of the foundational theory for explaining competitive advantage that is rooted in firm-specific resources. Barney (1991) agues that firms can sustain competitive advantage if they have Valuable, Rare, Inimitable, and non-Substitutable (VRIN) resources. In the supply chain and logistics context this may include physical infrastructure, information systems, network and supplier relationships, cash and financial reserves and human capital. VRIN resources are reflected in the logistics systems of these firms in the form of high biased distribution centres locations, integrated transportation systems, unique data systems and establishing long-term relationships with suppliers. With these resources, firms can achieve greater efficiency, shortened lead times, and more reliable services. Despite this, RBV has been criticised for its static assumptions, ignoring environmental dynamics and treats resource value as stable. This is problematic in volatile environment such as supply-chain climate disrupted environments. Consider a geographically optimised set of warehouses becoming easily compromised under climate shocks, floods or wildfires. Recently, the supply chain literature criticizes the RBV for its inability to deal with uncertainty, calling for the integration of additional theories (Barney et al, 2021). This limitation has led to growing attention to Dynamic Capabilities Theory and Resource Orchestration Theory, which extends the RBV by addressing how firm can reconfigure resources and build resilience in a dynamic and uncertain environments.

Dynamic Capabilities View (DCV)

Building on RBV, the Dynamic Capabilities View (DCV) emphasizes firm adaptation, integration, and reconfiguration of both internal and external resources in response to rapidly changing market requirements (Teece, 2007). The DCV is most useful in uncertain, volatile, complex supply chain scenarios, as is the case with climate change. Teece (2007) outlines three fundamental processes of dynamic capabilities: sensing, seizing, and reconfiguring. Sensing involves firms' foresight into new risks and opportunities, such as severe weather or political instability that could impact key logistics corridors. Seizing is the mobilization of resources to seize these opportunities or counter those risks, such as shifting logistics flows or establishing alternative sources of supply. Reconfiguring is the re-organisation of organisation structure, processes, and resource bases to sustain competitiveness in a dynamic environment. In supply chain resilience context, DCV shows how firms alter their buying practices, use multiple supply sources and increase investment in digital forecasting technologies to cope with volatility. Existing research has argued that firms with dynamic capabilities are more agile to recover from disruptions, build resilience and achieve long-term performance (Teece et al. 2016; Ambrosini & Bowman, 2009). Nevertheless, DCV has been criticised for being overly abstract and too complex in explaining how managers organise and utilize various resources at operational levels. DCV explains "what" organizations do within the strategic framework, but does not explain "how" resources are simply organized in practice (i.e. in what manner does the orchestraction take place). These issues are resolved by Resource Orchestration Theory.

Resource Orchestration Theory (ROT)

Resource Orchestration Theory (ROT) offers a micro-foundational view on how managers organize, bundle and leverage resources as a way to generate capabilities and strategic results (Sirmon et al, 2011). Beyond RBV focusing on resource endowment, and DCV focusing on adaptation, ROT stresses on managerial behaviour as the key driver for value creation. ROT is composed of three key processes:

1. Resource Structuring: Managing the acquisition, accumulation, and disinvestment of resources in order to develop the resource base for the strategic posture. In supply chains, this may mean investing in more resilient infrastructure, broadening the supplybase, or disinvesting from high risk geographic regions.
2. Resource Bundling: Integration of resources for building capabilities. For example a digital tracking platform, a team of trained personnel and a logistics partner to develop a real time visibility platform.
3. Resource Leveraging: Using combined capabilities to reach strategic intent, like diversion of logistics flows in during disruptions, or switching on hold of alternative supply sources in climate shocks.

In the context of climate disruptions, ROT offers a pragmatic perspective to how firms actually implement resilience by linking dynamic capability (DCV) with resource endowments (RBV), through how managers ‘match and coordinate logistics infrastructure, human capital and technology systems.

RBV, DCV and ROT integrations

The integration of RBV, DCV and ROT offers a holistic, multi-level theoretical framework for a holistic view of SCR under climate-disruption. They offer unique but complementary explanations.
From RBV stance, firms' strategic resources provide the foundation for resilience by identifying the resources most critical to sustaining competitive advantage under disruption, including logistics infrastructure, digital platforms, financial resources, and human capital. It explains why these resources may be valuable, rare or inimitable, and how they generate market power for the firm. Nonetheless, RBV does not explain how these resources change under environmental strain. Dynamic Capabilities View (DCV) addresses this gap by explaining how a firm learns and adapts its capabilities, for sensing, seizing and reconfiguring. Nonetheless, it is still weak at explaining how resources are deployed in the micro-level. ROT completes this theoretical triad by articulating how managers strategically coordinate resources through structuring, bundling, and leveraging processes. It is this combination which explains resilience:

a) Resource Foundation (RBV) → asset base

b) Transformation of capability (DCV) ---adaptive process

c) Resource Orchestration (ROT) which is about execution of business.

This integrated approach is especially useful for climate disrupted supply chains, as resilience in this context will require the control of complex logistics flows rather than simply possession of resources or the flexibility to adapt. Recent work support this convergence with literature suggesting that resilience is a multi-level bundle of resources, capabilities and managerial action simultaneously (Teece et al., 2016; Ivanov and Dolgui, 2021).

Climate Disruptions and Supply Chain Complexity

Climate change also presents systemic and non-linear risks which considerably enhances the complexity of supply chains. As revealed by Intergovernmental Panel on Climate Change (IPCC, 2023), the nature of extreme weather events has become more recurrent, stronger, and more unpredictable. Climate-induced disruptions are shockwaves, unlike most disruptions that are originating from a single shock. A shockwave is a sequence of events, a chain reaction, which can lead to many failures at varying points (production, transport, and distribution). For instance, a specific flood could interrupt raw materials, production and global shipping all at the same time. Recent study have pointed out that climate disruptions affect inventory fluctuation, supplier instability and transportation delays (Wieland & Durach, 2021). Climate disruptions also reveal the weaknesses in globalised just-in-time supply chain which build on efficiency rather than on redundancy. In addition, climate risks are usually correlated with several other systemic risks, such as geopolitical risk or energy shortage, which exacerbate the uncertainty of the logistics systems. Highly enhanced resilience measures are therefore expected, other than the classic risk management. How the firms gain such advanced status depends on their advanced sensing capability. Arguably, firms adopt new digital technologies such as AI forecasting, blockchain traceability and IoT-enabled monitoring to improve the agility between the actors in the supply chain. Nonetheless, new technology without resource orchestration and dynamic capability is not enough. Thus, complex supply chains in uncertain environment with its inherent limitations call for comprehensive theoretical framework comprising RBV, DCV and ROT to develop resilience capabilities.

Methodology

This research use a Systematic Literature Review (SLR) approach based on the PRISMA 2020 guidelines. SLR ensure transparent identification, screening and synthesis of relevant literature on resource orchestration and supply chain resilience during climate-induced disruptions. The use of the SLR method is motivated by the need for a systematic, transparent and replicable method to synthesize widely dispersed theoretical views on the Resource-Based View (RBV), Dynamic Capabilities View (DCV), and Resource Orchestration Theory (ROT) spread across operations management, logistics and strategic management literature. This study employs deductive and inductive research approach. The study begin with a deductive analytical framework grounded in RBV, DCV and ROT. This is followed by inductively guided synthesis of literature to identify emerging themes. This combination of theory-driven framing and data driven synthesis of literature is widely used in supply chain resilience reviews (Tukamuhabwa et al. 2015; Ivanov & Dolgui, 2021).

Data Sources and Search Strategy

Scopus and Web of Science databases were selected for their reputation for indexing quality academic literature. The search terms were created from Boolean operators and keywords representing the main constructs of the research. The final search string was: “resource orchestrations” OR “dynamic capabilities” OR “resource-based view” AND “supply chain resilience” OR “logistics resilience” AND “climate change” OR “environmental disruption”. The search was limited to titles, abstracts and keywords to retrieve relevant articles. The years of publication was limited to 2000–2025. The selected publication period captures the evolution of resilience thinking, from its origins in risk management to contemporary research on digitally enabled and climate-resilient supply chains. This period captures the conceptual and theoretical developments that have influenced supply chain resilience research over time.

Inclusion and Exclusion Criteria

A strict set of inclusion and exclusion criteria was used to ensure analytical quality. Studies had to be peer-reviewed journal articles in English, and explicitly in the field of supply chain resilience, logistics disruption or climate/environmental risk. They also had to consider at least one of the three lenses RBV, DCV or ROT. The inclusion criteria were based on empirical studies that mentioned supply chain, logistics or transportation and issues associated with their resilience. Other articles such as conference proceedings, editorials, opinions and book chapters as well as those not directly related to supply chain or logistics resilience were excluded. Articles that focused on financial markets, specific health systems or studies, or general studies related to the environment were removed.

Screening Process (PRISMA Framework)

The flow process followed in the screening was based on the PRISMA 2020 diagram. The two search databases produced 312 records initially. When duplicates were removed, 241 records remained. The screening of titles and abstract resulted in 146 relevant articles. After screening full-text, 71 documents were excluded for poor methodology quality, lack of relevance to objectives and limited theoretical contribution. This resulted to 21 articles that were used for the review. This approach ensured that only studies with sound methodological quality and strong theoretical contribution were included (see Figure 1)

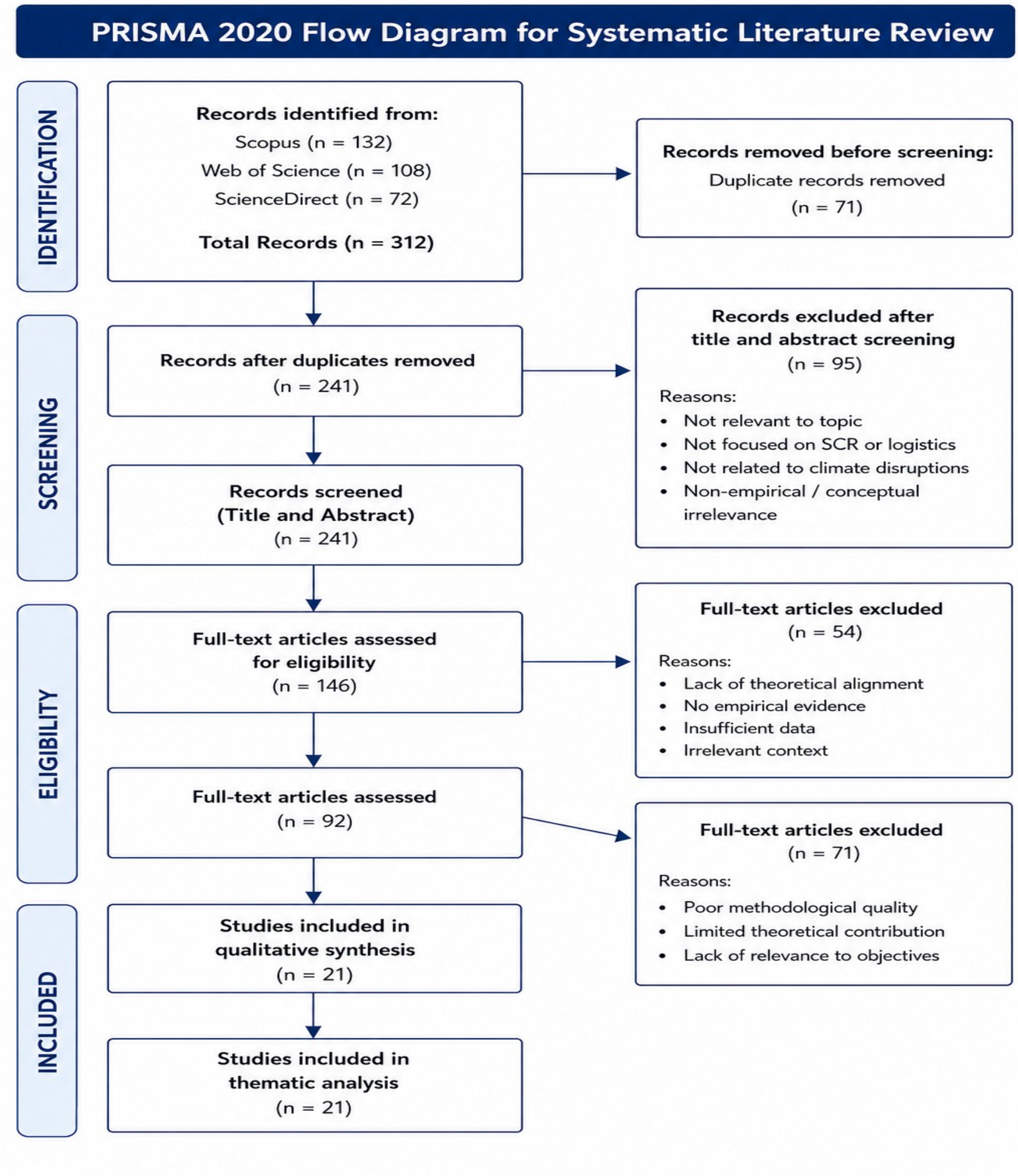

Figure 1. PRISMA Diagram

Source: (Authors, 2026)

Data Extraction and Analysis

A data extraction matrix was created for systematically recording important details of each article (author(s), year of publication, theoretical approach (RBV, DCV, ROT), methodology, geographical location, industry, results). The data were thematically synthesized through an iterative approach to coding. First, open coding was used to extract ideas from the texts, which were combined into axial categories (e.g., resource structuring, capability building, digital transformation and resilience outcomes). A process of selective coding was later used to synthesize themes into a set of higher order constructs as prescribed by the theoretical framework.

Quality Appraisal

In order to prioritise relevant high-quality evidence, article inclusions were primarily decided against the ranking of the journal and also by methodological quality, strength of theoretical contribution and the number of citation.

Analytical Approach

The last analytical stage integrated thematic synthesis and conceptual mapping methodology. The synthesis seek to examine causal links between resource orchestration mechanisms, dynamic capabilities and resilience effects. The synthesis identified three clusters structural resource configurations, generation of evolving capabilities and the process of strategic orchestration.

Results

The thematic synthesis of 21 refereed papers indicates that global supply chains resilience under climate shocks is a comprehensive phenomena that is influenced by the (resource) configurations, capabilities, digitalization, human capital, and managerial orchestration mechanisms. The following sections present a comprehensive analysis and discussion of the study's findings.

Resource Structuring for Resilience

The body of literature also extends the understanding of supply chain resilience by demonstrating that firms can build their supply chain in a way that minimizes climate shock vulnerability through resource structuring. Resource structuring entails designing the supply network in a flexible way by building redundancy, diversification, and geographic dispersion into the supply chain. Accordingly, firms implement multi-sourcing strategy, dual sourcing and nearshoring to buffer climate shocks (floods, wild fires, hurricanes) (Chowdhury et al., 2019). It has been argued that companies engaged in agriculture, energy and manufacturing are especially susceptible to environmental shocks due to high exposure to climate-sensitive inputs. Companies mitigate these by developing redundant suppliers networks and flexible infrastructure. Additionally, digital infrastructure such as cloud-based supply chain IT and analytics boost visibility and enhances inter-node coordination (Ivanov & Dolgui, 2021). Some research emphasizes the importance of available slack resources and strategic buffering as a strategy to cope with shocks without operational failures (Ambulkar et al., 2015). Yet, excessive redundancy and resource buffers can increase operational expenses, highlighting the inherent trade-off between efficiency and resilience. Accordingly, the structure of resources can be seen as a basic but costly dimension of resilience.

Resource Bundling and Capability Development

Resource bundling is another strategy used by firms to resilience capabilities. Resource bundling enables firms to integrate discreet resources into resilience capabilities by creating systems of logistics infrastructure, human capital, and digital technologies into a unified system that enhances a firm‘s adaptive capacity (Sirmon et al., 2011). Previous research shows that the combination of advanced analytics with people and collaborative supply networks lead to greater supply chain resilience (Queiroz et al., 2021; Dubey et al., 2021). For instance, the implementation of AI-based forecasting systems together with cross-departmental teams enables firms to better anticipate and manage disruptions (Ivanov & Dolgui, 2021). In same vein, making use of Enterprise Resource Planning (ERP) systems with collaboration platforms among suppliers and buyers enhances coordination and minimizes information asymmetry across different levels of supply chains. Resource bundling promote organisation learning by broadening firm's routines to cope with disruption quickly (Teece et al., 2016).

Resource Leveraging for Adaptive Response

Resource leveraging involves the use of bundle capabilities to achieve strategic and operational resilience during disruptions. Arguably, firms that effectively leverage their capabilities demonstrate greater agility and respond more rapidly to climate-driven disruptions. Main leveraging opportunities consist of redirected logistics flows, supplier switching, inventory repositioning and emergence plans. Use of data analytics and digital control towers have been found to significantly accelerate the speed of decision making process under disruptive situations (Queiroz et al., 2020). Companies that have established high leveraging capabilities will be able to eliminate the effects of environmental risks. Several design elements such as agility decision-making processes, devolved governance systems, and strong linkages between the centralized and decentralized governance systems improved responsiveness and adaptability under climate disruptions (Pettit, Fiksel & Croxton, 2010; Dubey et al., 2021). However, the effectiveness of leverage in enabling an effective response is highly dependent on pre-existing resource structuring and bundling activities. In the absence of such integration, leveraging efforts tend to be reactive rather than proactive. Arguably, leveraging represents the operational dimension of resilience that supports system survival under climate disruptions.

Dynamic Capabilities in Climate Contexts

Dynamic capabilities are key mechanisms in which firms adapt to unstable environmental changes. According to Teece (2007), dynamic capabilities are 'sensing, seizing and reconfiguring potential resources to match changing environmental conditions'. Sensing capabilities allows firms to identify early indicators of climate risks through environmental scanning, predictive analytics and monitoring systems. Seizing capabilities enables firms to rapidly deploy resources to mitigate the impact of disruptions or take advantage of new opportunities. Reconfiguring capabilities is the structural change of supply networks in term of redeployment of production plants and reconfigurations of logistics paths (Teece et al., 2016). According to Wieland and Wallenburg, (2013), strong dynamic capabilities allow firms to experience less severe disruption impacts and achieve faster recovery. Yet, capability development at the individual level is not adequate without resource orchestration, especially within the framework of ROT. The volatility of climate conditions underscores the need to strengthen capabilities essential for long-term sustainability.

Role of Digital Technologies

Digital transformation has become the most common enabler of supply chain resilience. Artificial intelligence (AI), Internet of Things (IoT), blockchain and digital twins play a major role in increasing visibility, traceability and prediction throughout supply chains. AI-based analytics can allow companies to predict climate disruptions and plan logistics accordingly (Ivanov & Dolgui, 2021). IoT technology gives life to transportation status and inventories condition in real time, helping to adapt more quickly to shocks. Blockchain technology can be used to share data transparently and ensure trust among supply chain system collaborators (Kshetri, 2018). Digital twin enables firms to simulate various disruption scenarios and options for response prior to real execution. However, the literature cautions that technology alone is insufficient to build resilience; it must be aligned with organisational capability maturity, human comptencies and appropriate managerial practices. In this context, digital transformation should be understood as an enabler of supply chain rather than a standalone solution.

Human Resource Management and Organisational Resilience

Human capital contributes significantly to strengthening the supply chain resilience. Empirical evidence reveal that companies with skilled and flexible employees and managers have a better are able to adapt and respond to disruptions (Wang et al., 2018). Leadership agility, training programmes and sharing of knowledge within the organisation are important to improve its responsiveness. Green human resource management (GHRM) practices enhance resilience since they align sustainable values with the firm's behaviours (Renwick et al., 2013). Flexibility of the human capital allows rapid role adaptation during a crisis. Human capital-based capabilities rely heavily on organisational culture and leadership commitment, the firms that value employees and provide opportunities for learning and empowerment are inherently more resilient to climate-induced shocks. Arguably, human resource management (HRM) functions as a socio-behavioural component of supply chain risk management (SCRM).

Integration Patterns Across Studies

Three types of prominent integration pattern are distinguishable in the literature. First is technology-led resilience, attributable to adoption of digital-enabled technologies including AI, IoT and blockchain, to boost supply chain response. Second is human-capital-enabled resilience, which emphasises employee skill adaptability, organizational agility and senior management commitment to learning. The third human-centered integration pattern is strategy-led orchestration. This involves integrating resource structuring, bundling and leveraging processes to ensure that resources effectively match environmental demands. In light of the above, resilience is a multi-dimensional construct requiring the integration of technological, people, and strategic elements. Most current literature advocate the importance of socio-technical system integration to develop resilience to under climate disruption (Ivanov & Dolgui, 2021; Wieland & Durach, 2021).

Discussion

The findings of this study reinforce the proposition that supply chain resilience under climate-induced disruptions is a complex, multi-dimensional phenomenon that cannot be sufficiently explained through a single theoretical perspective. Rather, it emerges from the complementary interaction of the Resource-Based View (RBV), Dynamic Capabilities View (DCV), and Resource

Orchestration Theory (ROT), each contributing distinct but interdependent explanatory value to understanding how firms build and sustain resilience in volatile environmental conditions. From an RBV perspective, resilience is grounded in the possession and control of valuable, rare, inimitable, and non-substitutable (VRIN) resources such as advanced logistics infrastructure, digital technologies, financial slack, and skilled human capital (Barney, 1991). These resource endowments form the baseline upon which firms can respond to disruptions. However, RBV alone is insufficient because it assumes relative resource stability and does not adequately account for how firms respond when climate shocks render existing resource configurations obsolete or inefficient. In the context of increasing climate volatility, static resource ownership provides limited explanatory power for resilience outcomes.

The Dynamic Capabilities View extends this understanding by shifting attention from resource possession to the firm's ability to integrate, build, and reconfigure resources in response to environmental turbulence (Teece et al., 1997; Teece, 2007). Nevertheless, while DCV explains *what* capabilities are required for adaptation, it provides limited insight into *how* these capabilities are operationalised at the managerial and process levels. This creates a conceptual gap between strategic capability development and day-to-day execution.

ROT addresses this limitation by providing a micro-foundational explanation of how managers structure, bundle, and leverage resources to achieve desired resilience outcomes (Sirmon et al., 2007). In this framework, managerial orchestration is the central mechanism through which resources and capabilities are transformed into resilience performance. Structuring involves acquiring and accumulating critical resources. Bundling refers to integrating resources into coherent capability systems. Leveraging reflects the deployment of these bundles in response to disruptions. Our findings suggest that firms with strong orchestration capabilities are better positioned to translate both tangible and intangible resources into adaptive responses during climate shocks. This highlights that resilience is not merely a function of what firms possess or what they are capable of doing, but critically depends on how effectively managers coordinate and deploy these elements under pressure. The integration of RBV, DCV, and ROT thus produces a more comprehensive theoretical framework in which resilience emerges as a layered construct: RBV explains the *resource base*, DCV explains the *adaptive capability development*, and ROT explains the *executional mechanisms* that convert resources and capabilities into operational resilience. This integrated view aligns with recent supply chain resilience literature, which emphasises the importance of multi-level and multi-theoretical explanations (Tukamuhabwa et al., 2015; Pettit et al., 2010). The study further demonstrates that climate disruptions intensify the need for rapid and continuous reconfiguration of supply chain systems. Firms operating in high climate-sensitive environments must move beyond efficiency-driven models toward adaptive and flexible supply chain architectures. The results show that firms with high orchestration capability are more effective in integrating digital technologies such as predictive analytics, IoT-enabled tracking systems, and AI-based demand forecasting with human judgment and experiential knowledge. This integration enhances situational awareness and enables faster recovery from disruptions, thereby reducing both downtime and financial losses. Digital transformation emerges as a critical enabler of resilience;

however, the findings caution against viewing technology as a standalone solution. Instead, digital tools must be embedded within socio-technical systems that combine technological infrastructure with human cognitive and relational capabilities. Digital investments may underperform or fail to translate into meaningful supply resilience outcomes due to inadequate human capability development. This aligns with socio-technical systems theory, which emphasises joint optimisation of technical and social subsystems for effective organisational performance (Trist & Bamforth, 1951). Furthermore, the study highlights that managerial orchestration plays a pivotal role in aligning digital capability and human resources. Managers act as integrators who ensure that technological capabilities are implemented and meaningfully embedded into organisational routines and decision-making structures. This finding extends prior research by emphasising that resilience is not solely an organisational attribute but also a managerial practice embedded in everyday decision-making processes.

Integrated Conceptual framework For Supply Chain Resilience under Climate Disruptions

The proposed conceptual framework in Figure 2 integrates RBV, DCV, and ROT into a multi-layered model of supply chain resilience under climate disruptions. At the input layer (RB**V)**, firms possess critical resources such as logistics infrastructure, financial capital, human expertise, and digital systems. These resources form the foundational base of resilience capability. The process layer (ROT) explains how these resources are transformed through managerial actions. Resource structuring involves acquiring and reallocating resources to reduce vulnerability. Resource bundling integrates these resources into cohesive operational capabilities, while resource leveraging ensures their deployment during disruption events. Based on ROT, we argue that both resource structuring practices and managerial orchestration will have a positive effect on resilience capabilities. We clarify that resilience is not a given of a set of resources, but rather a consequence of managerial behavior that adapt resources to external conditions. The dynamic capability layer (DCV) acts as a transformation mechanism that enables firms to sense environmental risks, seize opportunities, and reconfigure resource structures in response to climate disruptions. DCV supports the argument that dynamic capabilities can be positively related to supply chain resilience, and act as a moderator between resource and resilience. The final outcome layer is supply chain resilience, defined through four dimensions: anticipation, absorption, adaptation, and recovery. This integrated framework demonstrates that resilience is achieved through the interaction of static resources, dynamic capabilities, and managerial orchestration processes, providing a comprehensive explanation of how firms respond to climate-induced disruptions.

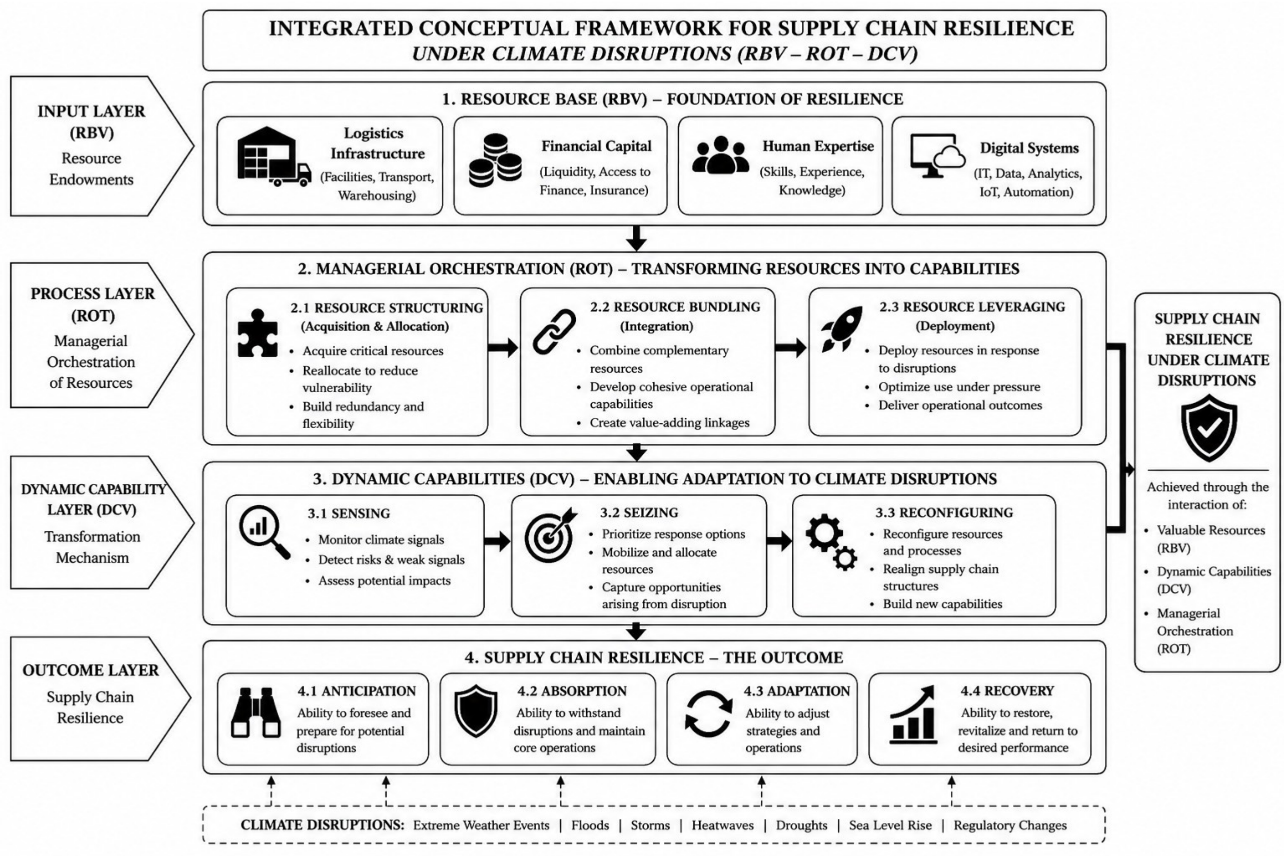

Figure 2. Integrated Conceptual framework For Supply Chain Resilience under Climate Disruptions
Source: (Authors own work, 2026)

The three perspectives together form a layered framework for explaining and developing supply chain resilience system. Arguably, resources developed without orchestration would lead to waste. Orchestration without capability would cause the company to have limited ability to adapt. Yet, capability without depth of resources would limit a firm‘s capacity to respond. We argue that firms would have a ‘compounded resilience advantage’ when the three dimensions are combined. The integration of RBV, ROT, and DCV produces a higher-order effect that enhances supply chain resilience in climate-disrupted supply chains. A structured set of propositions for empirical testing is presented below.

P1: Firms with stronger and more diversified resource bases (e.g., logistics infrastructure, financial capital, skilled human resources, and digital systems) can develop higher levels of supply chain resilience under climate disruptions. (Based on RBV)

P2: The quality and flexibility of firm resources will have a positive effect on their ability to anticipate, absorb, and recover from climate-related supply chain disruptions. (Based on RBV)

P3: The structuring of resources through redundancy, geographic diversification, and flexible sourcing arrangements enhances supply chain resilience under climate disruptions. (Based on ROT)

P4: Managerial orchestration of resources (through coordination, prioritisation, and reallocation) positively influences the development of dynamic resilience capabilities. (Based on ROT)

P5: Dynamic capabilities (sensing, seizing, and reconfiguring) mediate the relationship between resource endowments and supply chain resilience. (Based on DCV)

P6: Firms with stronger sensing capabilities are better able to identify and anticipate climate-related supply chain disruptions. (Based on DCV)

P7: Seizing capability will positively impact the speed and effectiveness of firm responses to climate-induced supply chain disruptions. (Based on DCV)

P8: Reconfiguration capability enhances the long-term adaptive capacity of supply chains by enabling structural and operational adjustments after disruptions. (Based on DCV)

P9: The interaction of resource strength (RBV), managerial orchestration (ROT), and dynamic capabilities (DCV) produces a higher-order resilience effect that exceeds the impact of each component individually.

Authors propose a quantitative research approach and the use of structural equation modelling (SEM) to test propositions P1–P9.

Practical Implications

This research has some practical implications for managers, policymakers and industry practitioners. From a managerial perspective, the results emphasize the value of adopting diversified and redundant supply chain architecture to mitigate against climate risks. Firms need to adopt AI-based forecasting and monitoring platforms to enhance environmental visibility. Moreover, investing in human resources and increasing capacity through training, cross-functional activities and leadership development becomes key managerial issue. Furthermore, managers are recommended to adopt integrated resource orchestration strategies by synthesizing logistics, HRM and digital transformation strategies. Supply chain resilience should not be treated as an isolated function, instead, it should be integrated into strategic planning. For policymakers, the study highlights the importance of investing in logistics infrastructure that is resilient to climate hazards such as freight corridors and digital ecosystems. Governments should also promote adoption of Environmental Social and Governance (ESG) compliant supply chain operations and digital transformation to foster systemic resilience. For business leaders, resilience must become a proactive strategic imperative rather than a reactive fix. Institutionalisation of scenario planning, climate risk analytics, and multi-tier collaboration within supply chain governance structures is important. Companies will also need to build resilient ecosystem-wide collaboration and coordination.

Conclusion

This paper systematically reviewed the literature on resource orchestration and supply chain resilience in the context of climate disruptions. It provides evidence that resilience can be developed through orchestrating a set of dynamic processes of resource structuring, bundling and leveraging, which are enabled by dynamic capabilities. By integrating RBV, DCV and ROT, this study offers a holistic theoretical perspective of how firms achieve supply chain resilience under climate disruptions. The framework synthesizes dispersed theoretical lens and clarifies the valuable role of a resource orchestration theory in understanding responses to climate-induced supply chain disruptions.

Limitations and Future Research

This study used secondary data sourced from the Scopus and Web of Science (WoS) databases, which may have excluded relevant recent studies indexed in other databases. The paper presents nine propositions for empirical testing. Future studies should examine and empirically validate the propositions using SEM-PLS and longitudinal studies in different industry or sector.

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