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# Construction supply chain - A systematic review

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ABSTRACT

A comprehensive review of the Construction Supply Chain (CSC) has been undertaken to establish a robust theoretical foundation and to identify emerging trends, key challenges, and strategic solutions for advancing the CSC toward sustainability and optimization. A systematic review of 398 scholarly articles published between 2010 and 2025 was carried out using major databases including Emerald, IEEE Xplore, and ScienceDirect. The analysis highlights prominent research directions such as green construction supply chains, risk management, carbon emission control, digital technology integration, modular construction, prefabricated buildings, procurement and collaboration practices, and performance improvement. Technologies such as Building Information Modeling (BIM), Internet of Things (IoT), Blockchain, and Artificial Intelligence (AI) are playing an increasingly critical role in enhancing transparency, real-time monitoring, and risk forecasting. The CSC has been recognized as a strategic development pathway in the context of globalization, contributing to emission reduction, resource optimization, and sustainable development. However, the study also reveals major challenges including fragmentation, risks, and limited capabilities of supply chain participants. Stabilization, strategies such as circular economy integration, resilience enhancement, and performance-based policy design are recommended. The findings serve as a significant scientific and practical basis for the development of the construction supply chain in Vietnam.

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## 1. Introduction

Vietnam is rapidly industrializing, modernizing, and developing urban infrastructure, with the construction sector goals playing a pivotal role in realizing the national strategy. However, despite rapid development, the industry faces systemic challenges such as rising costs, unstable project schedules, high environmental emissions, and a lack of integration among supply chain participants. Developed countries and many regions have recognized the construction supply chain as a strategic domain, where digital technologies, circular economy principles, and public-private partnerships are applied to optimize value and enhance sustainability. In contrast, in Vietnam, theoretical and practical research on construction supply chains remains fragmented, unsystematic, and has yet to align with international trends. Therefore, conducting a comprehensive systematic review is not only academically significant in clarifying the structure, trends, and knowledge gaps but also practically valuable in guiding effective supply chain management solutions tailored to the socio-economic development conditions and digital transformation demands of Vietnam's construction industry.

## 2. Research methods

The systematic mapping process of [1]and the guidelines for systematic literature review of [2]were consulted for the research methodology of this study. This study explores the existing studies related to CSC, a research model established as shown in Figure 1. The selected data were collected over time from 1/1/2010 ÷ 2/3/2025 from Emerald, IEEE Xplore, and Sciencedirect as shown in Figure 2.

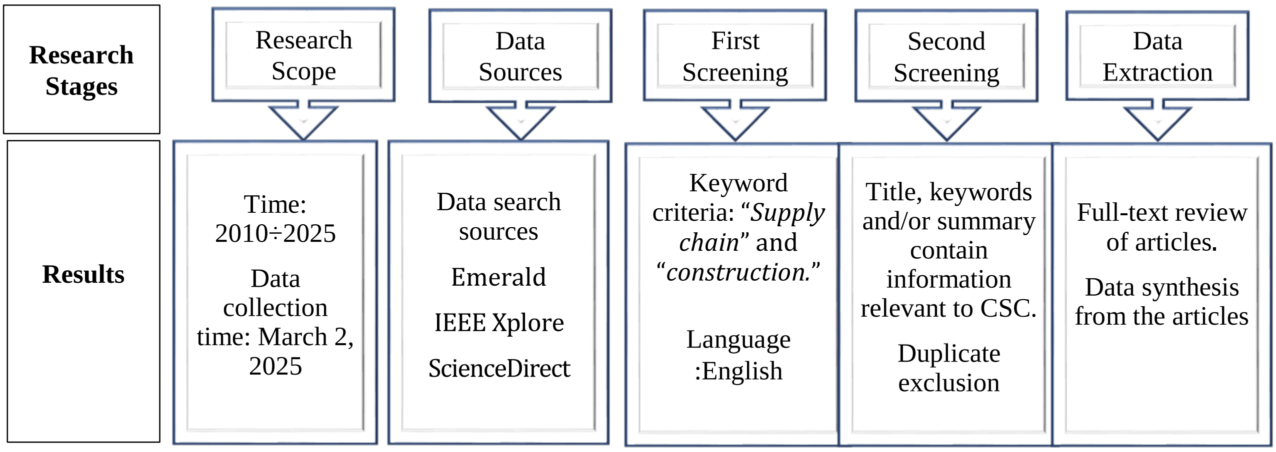

**Figure 1 .** System mapping process diagram.

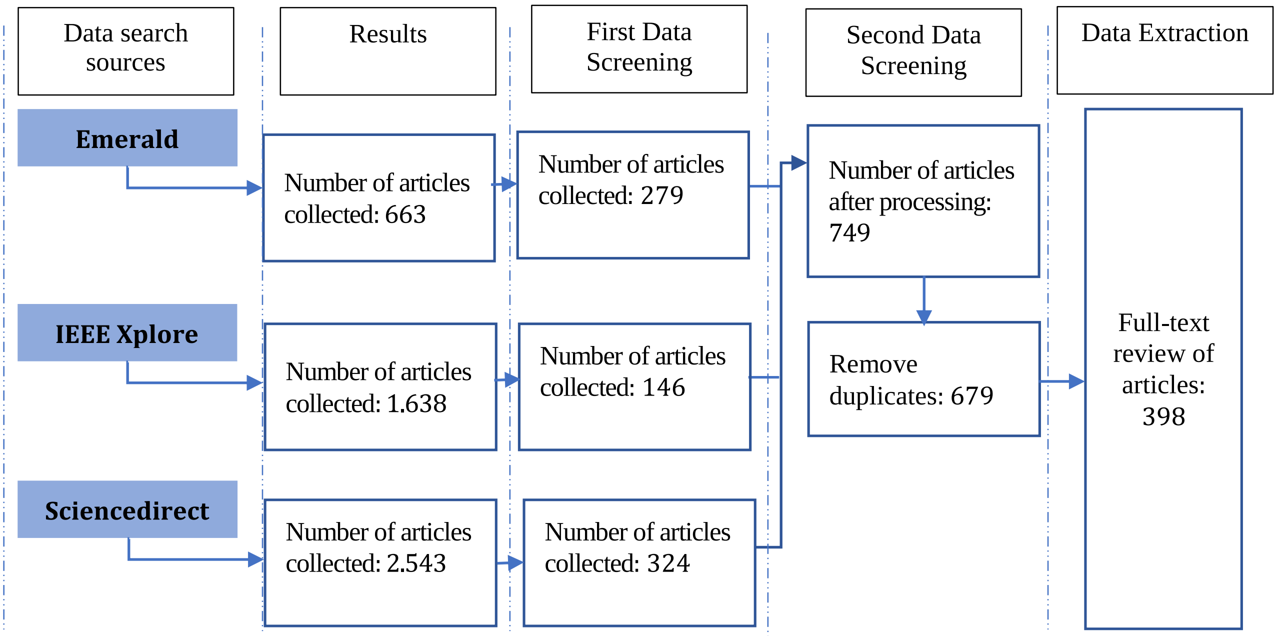

**Figure 2.** Data across research phases

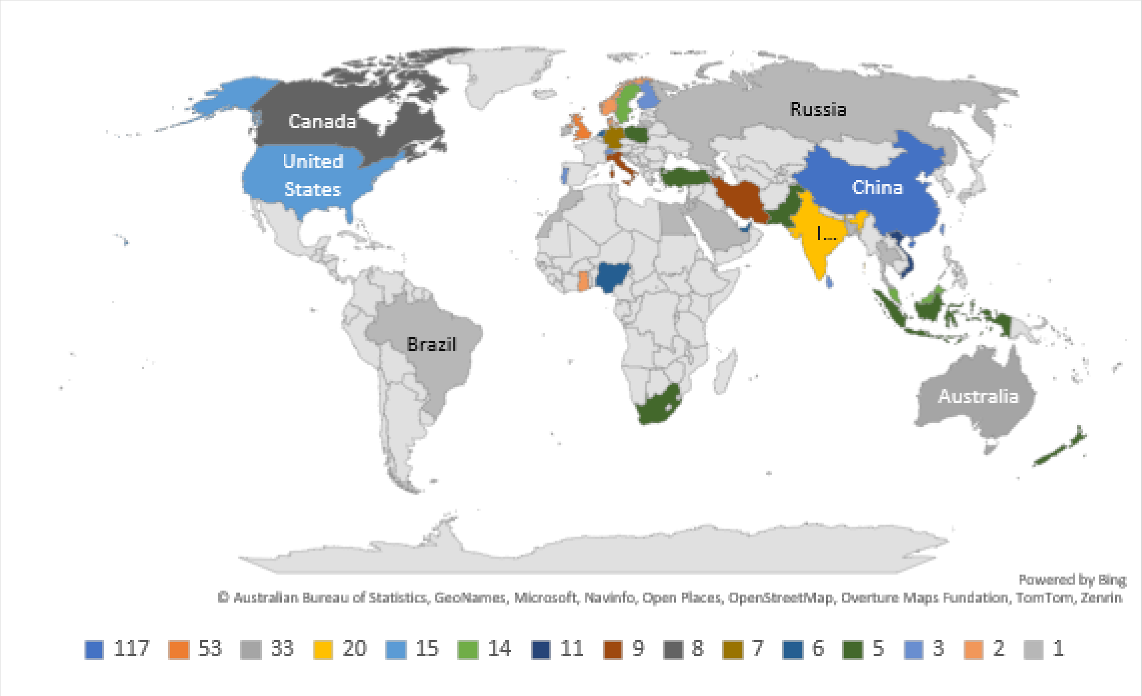

**Figure 3.** Map of research contributions by Nation.

The map of statistical data collection of 398 research works by country is shown in Figure 3 and Table 1. Figure 4 shows the research works by year of publication; Figure 5 shows statistics by journal/conference of publication.

**Table 1.** Statistical table of research works by country.

| Nation | Quantity | Nation | Quantity | Nation | Quantity | Nation | Quantity |
|---|---|---|---|---|---|---|---|
| China | 117 | Germany | 7 | Taiwan | 3 | Lithuania | 1 |
| UK | 53 | Korea | 6 | Sri Lanka | 3 | Russia | 1 |
| Australia | 33 | Nigeria | 6 | Finland | 3 | Singapore | 1 |
| India | 20 | United Arab Emirates | 6 | Portugal | 3 | Qatar | 1 |
| USA | 15 | Turkey | 5 | Switzerland | 3 | Saudi Arabia | 1 |
| Malaysia | 14 | New Zealand | 5 | Ghana | 2 | Thailand | 1 |
| Sweden | 14 | South Africa | 5 | Denmark | 2 | Jordan | 1 |
| Vietnam | 11 | Poland | 5 | Norway | 2 | Egypt | 1 |
| Iran | 9 | Indonesia | 5 | Bangladesh | 1 | Slovenia | 1 |
| Italy | 9 | Pakistan | 5 | Brazil | 1 | Morocco | 1 |
| Canada | 8 | Netherlands | 6 | Ireland | 1 | | |

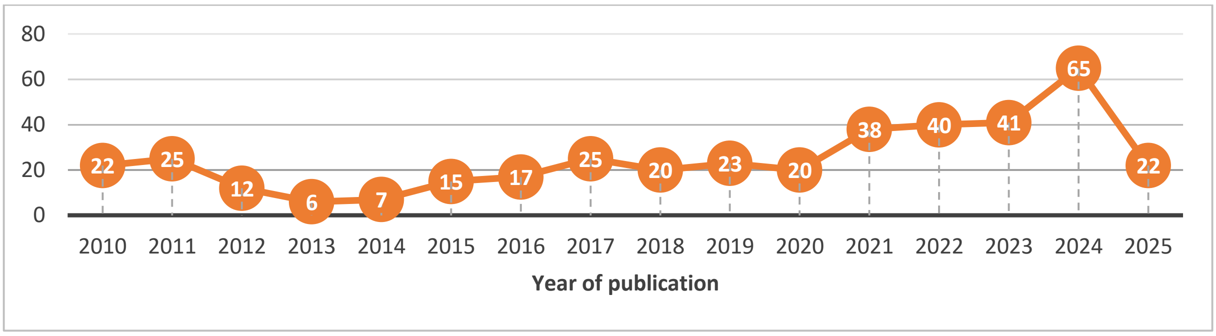

**Figure 4.** Chart statistics of research works according to the year of publication.

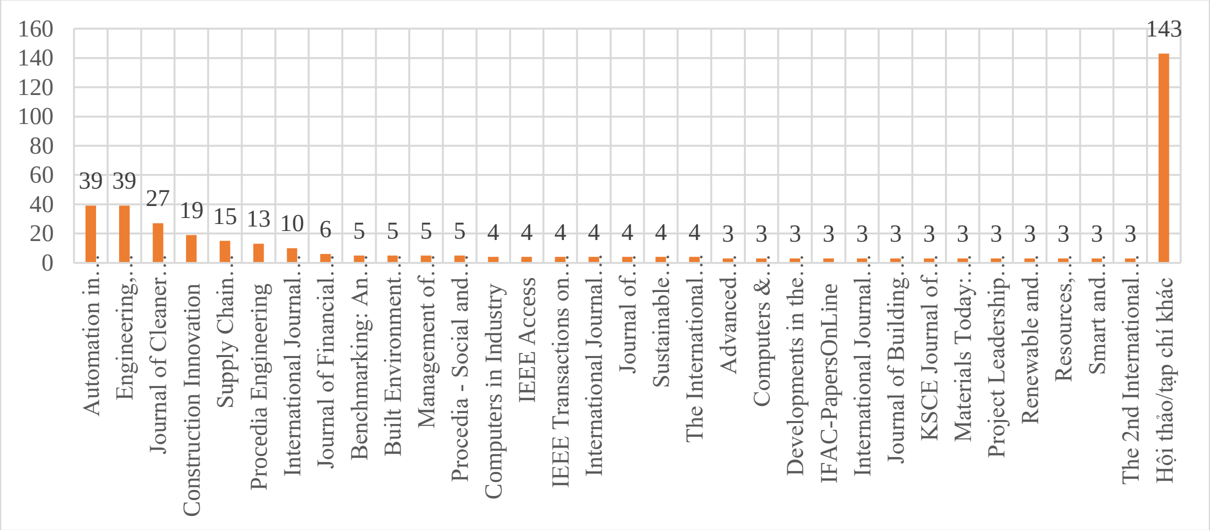

**Figure 5.** Chart statistics of research works according to the magazine/conference.

## 3. Research scopes

An analysis based on VOSviewer allows the creation of a network map based on the frequency of occurrence and the degree of association between the keywords of the synthesized studies, as shown in Figure 6. The software helps identify main research topic clusters, group topics by color, and identify prominent research trends in a specific field. According to Table 2, the research scope is identified in Figure 7.

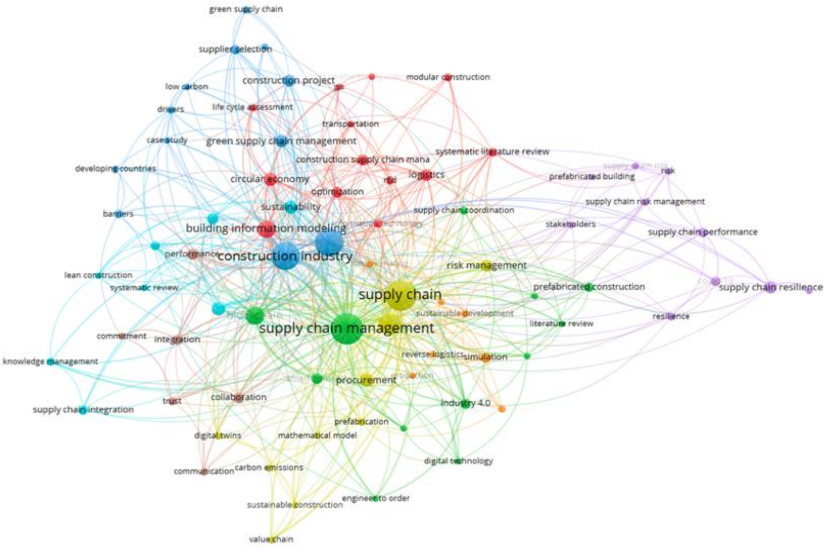

**Figure 6.** Model of keyword association appearing by frequency in research from the VOSviewer software.

**Table 2.** Keyword groups are collected by the VOSviewer software.

| **Cluster 1** | **Cluster 2** |
|---|---|
| Building information modeling (26); Circular economy (14); Logistics (12); Construction supply chain management (11); Optimization (10); Systematic literature review (7); Information technology (6); Modular construction (6) ;RFID (6); Life cycle assessment (5) ;Sustainable supply chain management (4); GIS (4); Transportation (4). | Supply chain management (81); Blockchain (29); Smart contract (11); Industry 4.0 (9); Prefabricated construction (8); Supply chain coordination (6); Bibliometric analysis (4); Blockchain technology (4); Digital technology (4); Engineer to order (4); Literature review (4); Modular integrated construction (4). |
| **Cluster 3** | **Cluster 4** |
| Construction industry (65); Construction supply chain (64); Green supply chain management (13); Construction project (12); Supplier selection (8); Barriers (6); Drivers (5); Green supply chain (5) ; Low carbon (4); Multi criteria decision making (4); Developing countries (4); Case study (4). | Supply chain (76); Construction (40); Procurement (17); Risk management (12); Carbon emissions (5); Digital twins (5); Prefabrication (5); Value chain (5); Mathematical model (4); Sustainable construction (4). |
| **Cluster 5** | **Cluster 6** |
| Supply chain resilience (13); Supply chain performance (8); COVID-19 (8); Resilience (6); Stakeholders (5); Supply chain risk management (5); Industrialized construction (4); Prefabricated building (4). | Project management (14); Sustainability (14); Construction management (11); Supply chain integration (8); Innovation (7); Knowledge management (6); Lean construction (4); Systematic review (4). |
| **Cluster 7** | **Cluster 8** |
| Environmental performance (4); Information sharing (5); Production (4); Reverse logistics (4); Simulation (9); Sustainable development (5); System dynamics (5). | Performance (11); Collaboration (9); Commitment (4); Communication (5); Integration (8); Trust (6). |

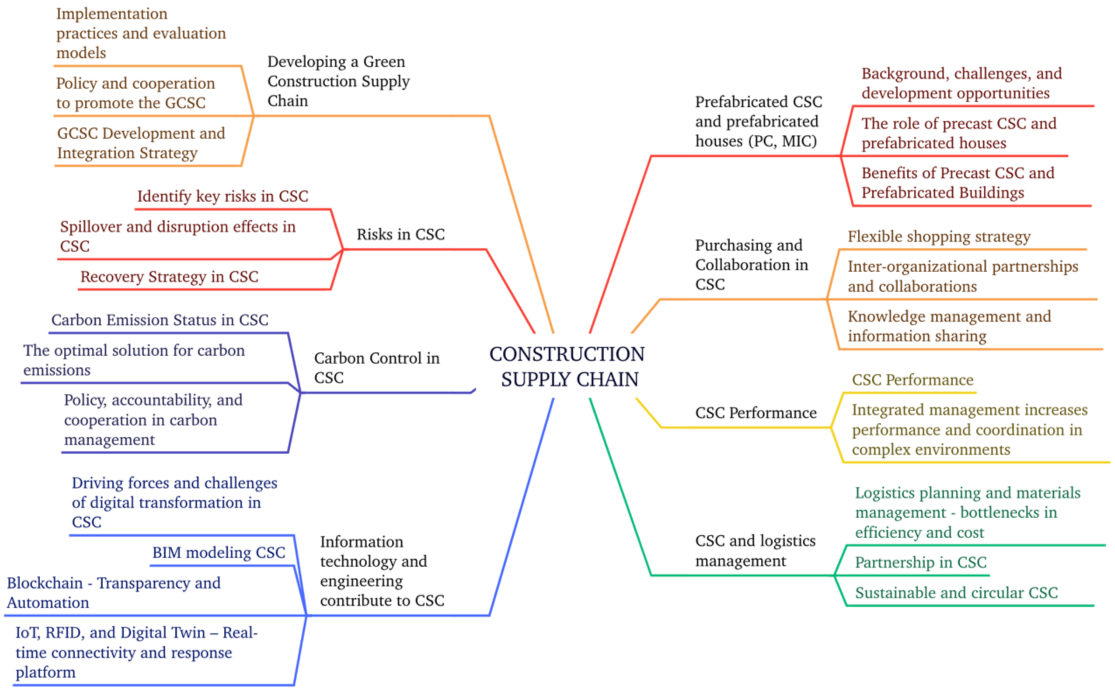

**Figure 7.** CSC research scope structure model.

## 4. Discussion

### *4.1. Developing a green construction supply chain*

### *4.1.1. Implementation and evaluation models*

The Green Construction Supply Chain (GCSC) model integrates environmental factors into every stage of the construction value chain from design, materials, construction, operation, to demolition. Unlike traditional construction emphasizing cost and time, GCSC aims to use resources efficiently, minimize carbon emissions, and promote sustainable development [3][4]. Greening this chain requires a change in thinking in design, supplier selection, construction, and operation management [5], [6]. Practice shows significant differences between countries. In Korea, large enterprises have actively applied the GCSC model with government support, environmental standards, long-term contracts with friendly suppliers, and digital technology in management [7]. [6]In the UK, Italy, and some countries, BREEAM, LEED standards, and national emission reduction strategies are the main driving forces for contractors to cooperate sustainably [5]. At the same time, India and China are in transition with initiatives such as prefabricated housing, recycled materials, and public-private partnerships to promote GCSC [8], [9], [10]. However, key barriers include high initial investment costs, lack of emissions data, limited technical capacity, and lack of stakeholder linkages.

The studies have provided theoretical frameworks and recommendations for GCSC implementation, emphasizing the roles of policy, technology, and inter-organizational collaboration [4], [11], [12]. Some models and methods for GCSC assessment are summarized from the studies in Table 3.

**Table 3.** Some models/methods for GCSC assessment.

| TT | Model/method | Main function | References |
|---|---|---|---|
| 1 | Balanced Scorecard (BSC) + PCA + GA | Comprehensive green performance assessment | [13] |
| 2 | Fuzzy-AHP- TOPSIS | Environmental assessment in uncertain environments | [14] |
| 3 | BSC + SCOR | Measuring CSC performance across multiple dimensions | [15] |
| 4 | Multi-objective mathematical programming | Optimize profits & emissions | [16] |
| 5 | Evolutionary Game Modeling & Simulation | Analyzing cooperative behavior in CSC | [17], [18] |
| 6 | Evaluation system based on digital data & participation level | Supplier assessment and environmental performance based on data | [12],[19] |
| 7 | Regenerated CSC (RCS) | Recycling resources, design for environmental restoration | [12] |

### *4.1.2. Policy and cooperation to promote the GCSC*

Policy and public-private partnership (PPP) models play a central role in promoting GCSC implementation at the national scale. Many studies have shown that a transparent policy ecosystem, financial support, and market incentives are necessary to promote green behavior [20], [21] and emphasize the role of government in creating green markets through tools such as standardization, tax incentives, emission disclosure requirements, and green building procurement. PPPs allow for risk sharing, co-investment, and long-term public-private cooperation [11]. Pioneering countries such as Korea, Sweden, and the UK have national GCSC strategies combined with policies on transparency of emissions information and mandatory use of environmentally-friendly materials in public projects [5], [7]. In developing countries, the application of green policies is hindered by a lack of transparency, low technical capacity, and incomplete legal frameworks. However, research [8], [20]shows that pilot models such as green contractor alliances or environmentally friendly construction industrial clusters can be practical directions. In addition to policies, the document [6], [22]emphasizes that organizational culture, trust, and communication between parties are the foundation for the successful implementation of GCSC.

#### *4.1.3. GCSC Development and Integration Strategy*

A key element of the GCSC is the shift from a linear model to a circular economy, where waste from the construction process is reused. Studies [23], [24]highlight the potential for reducing emissions and saving resources by recycling steel, concrete, glass, and building components. The study [25]analyzes the use of industrial waste such as steel slag and fly ash to produce new building materials such as alkaline activated concrete, which reduces $CO_2$ emissions by up to 68% and logistics costs. The study [26], [27]focuses on designing infrastructure with a life cycle that can be disassembled, replaced, and reused.

Studies [18], [28] argue that the success of GCSC depends on the level of integration and coordination among actors. The paper [29]proposes a BIM-WMS integration model that helps synchronize material data and warehouse operations in CSC, thereby improving efficiency and reducing waste. Meanwhile, [30]shows that implementing digital technology in construction in Jordan has improved chain response capabilities and environmental data transparency.

Studies show that GCSC is emerging as an indispensable requirement for the sustainable development of the construction industry. GSCM brings multi-dimensional benefits and can transform the entire construction value chain in a greener direction. Although GCSC is still a new model in Vietnam, initiatives such as using recycled materials, prefabricated housing, or green contractor alliances show significant potential for development. A national strategy on GCSC is needed, including investment support policies, standardization of environmental data, development of specialized human resources, and especially strengthening coordination between parties throughout the project life cycle. Thus, GCSC will not only be a trend but will become a new standard in the modern construction industry, towards a green, circular, and sustainable economy.

### *4.2. Risks in CSC*

#### *4.2.1. Identify key risks in CSC.*

The classification and identification of risks in CSC are essential in designing effective prevention and response strategies. The risks in CSC mentioned in the studies are summarized in Table 4.

**Table 4. Risk groups.**

| TT | Risk group | Describe | References |
|---|---|---|---|
| 1 | Strategy | Choosing CSC model, cooperation policy with parties, market development strategy. | [31], [32], [33]. |
| 2 | Operate | Activities in CSC such as: delivery, material quality, production interruption or limited capacity. | [34], [35]<br>[36], [37] |
| 3 | Finance | Due to interrupted cash flow, fluctuations in raw material prices or late payments from the investor. | [38], [39] |
| 4 | Environment | Including natural disasters, epidemics, changes in legal policies, and geopolitical instability. | [40], [41], [42]. |

In addition, some studies have proposed more in-depth risk classification models, such as grouping by project phase [43], [44]or by logistics function [45], [46]. Technological tools such as AI, simulation models, or social network analysis methods are currently being studied to support the identification and assessment of multidimensional risks in the built environment [38], [47].

#### *4.2.2. Spillover and disruption effects in CSC*

In a volatile environment, a single risk at one point in the CSC chain can quickly spread, severely affecting the entire system, known as a spillover effect. An initial failure at one point causes a chain of disruptions, losses, and extended chain reactions [42], [48], [49]. The spillover can originate from small factors such as material delays, shipping errors, or technical errors in design, but affects the entire chain due to the high interconnectivity of construction work [42], [50]. Studies in Hong Kong and Malaysia show that risk spillover is particularly evident in integrated CSCs, where a small bottleneck can lead to weeks of disruption on site [50], [51].

Disruptions in CSCs are further complicated by systemic events such as natural disasters, epidemics, economic crises, or political upheavals. The COVID-19 pandemic is a clear example, with lockdowns, transport suspensions, and labor shortages that have virtually paralyzed CSCs, causing massive delays and cost overruns in construction projects [40], [41], [42]. System simulation studies show that spillover effects are not only physical. Still, they can also be indirect risks such as loss of trust between parties, delays, or adverse reactions from customers and the community [45], [49], [52]. To mitigate these effects, experts recommend building early forecasting and rapid response capabilities through real-time monitoring systems, linking risk analysis models, critical material reserves, and continuous communication between parties in the chain.

#### *4.2.3. Recovery Strategy in CSC*

In increasingly complex global fluctuations, resilience becomes central to CSC risk management. This is the ability of the CSC system to prepare for, respond to, and recover quickly from disruptive events such as pandemics, natural disasters, political instability, or raw material crises [49], [50], [53]. Common resilience strategies include: (i) Diversifying suppliers and supply regions; (ii) Maintaining safety stock levels; (iii) Establishing contingency plans and risk scenarios; (iv) Strengthening internal communications and linkages; and (v) Investing in organizational and technological capabilities [49], [50], [53].

Resilience in CSC is understood as the ability of the system to anticipate, respond, adapt, and recover quickly from shocks. The elements that make up resilience include: supplier diversification, maintaining strategic inventory levels, flexibility in scheduling, and investing in transparent and accurate information platforms [54], [55]. Research in Hong Kong, the UK, and Malaysia shows that businesses that are resilient to risks often adopt a strategic partnership model, use digital tools to monitor CSC in real time, and have a distributed but synchronized decision-making process [56], [57]. Intelligent monitoring systems that combine IoT data, AI, and logistics forecasting have helped businesses identify risks early and quickly adjust their procurement, transportation, and resource allocation strategies [58], [59]. Resilience is also linked to organizational culture and collaborative behavior. A working environment of trust, transparency, willingness to share information, and support for each other helps shorten crisis response time, while speeding up the recovery of the entire chain [60], [61], [62].

Research in Malaysia and the UK shows that resilient CSCs maintain flexible coordination among parties, proactively adjust plans, and quickly mobilize alternative resources when incidents occur [39], [51]. Projects that apply BIM and early collaboration models between stakeholders are more resilient during and after the COVID-19 crisis [37], [41]. Solutions such as AI, numerical simulation, and real-time data-based early warning systems are increasingly being integrated to increase the ability to respond promptly to potential disruptions [49], [63], [64]. These systems provide risk trend analysis data and support decision-making on logistics strategy adjustments. Many studies have proposed quantitative models to measure resilience, such as Fuzzy-MCDA models or system simulations to assess recovery speed after incidents [65], [66].

### *4.3. Carbon Control in CSC*

### *4.3.1. Carbon Emission Status in CSC*

The construction industry is currently one of the sectors with the highest carbon emissions globally, contributing about 37% of total annual greenhouse gas emissions, of which indirect emissions from CSC account for the majority [67]. Carbon emissions appear in the construction phase and extend from material production, transportation, and assembly to the dismantling, processing, and recycling of works. The sources of carbon emissions in CSC can be divided into three main groups: (i) Direct emissions; (ii) Indirect emissions from energy and (iii) Other indirect emissions account for the most significant proportion and are the most difficult to control, including emissions from materials, transportation, logistics, construction equipment production and waste treatment [67], [68]. Research [69]shows that the production stage of cement, the primary material in construction works, contributes to 65÷75% of $CO_2$ emissions in the entire chain. The steel industry also emits significantly, but has great potential for reuse [24].

The study [70]found that without a low-emission design and operations strategy, total emissions from an infrastructure project can be 25–30% higher. In contrast, green technologies in transportation and materials and CSC organizations reduce emissions by up to 40%. From a systems perspective, the study [68]highlights the importance of cross-sectoral collaboration to control unknown emission points.

### *4.3.2. The optimal solution for carbon emissions*

Effective carbon management requires accurate measurement and modeling tools to identify, control, and reduce emissions across the CSC. Some tools have been widely deployed in the construction industry, such as LCA, carbon footprint, value chain analysis models, and decision support systems. LCA is the most popular tool, allowing a comprehensive assessment of carbon emissions from raw materials to demolition of buildings [67]. However, LCA requires complete and standardized data, which is lacking in many developing countries like Vietnam. To overcome this, [71]a framework for integrating real-time data between parties in the chain is proposed, allowing monitoring and decision-making based on transparent carbon data. The study [23], [26]applied a comparative model between the linear and circular chains, showing that the circular chain can significantly reduce emissions if optimally designed. Meanwhile, [25]a GIS-LCA hybrid model was developed to optimize linearity to determine the most efficient recycled material supply network. A more in-depth approach is to model scenarios that evolve.

The study [25]details using industrial waste such as fly ash, blast furnace slag, and landfill bottom ash to produce alkaline-activated concrete. If CSC is optimized, this approach can reduce $CO_2$ emissions by up to 68% and reduce logistics costs by 63%. The reuse of materials, especially steel, is mentioned in the study [24] when linked to the building design. With an effective recovery and sorting system, steel can be reused often. The papers [28], [72] emphasize the role of integrated design, in which stakeholders such as designers, contractors, and suppliers are involved early in the pre-construction phase to select low-emission materials and construction solutions.

### *4.3.3. Policy, accountability, and cooperation in carbon management*

Effective carbon emission reduction cannot be separated from the role of policy, market mechanisms, and coordination strategies among parties in the CSC. The study [73]analyzes three CRA models: supplier responsibility (PR), consumer responsibility (CR), and shared responsibility (SR). The results show that SR is the best way to reduce emissions, but it requires policy support to ensure fairness and market incentives. In addition, research [70]in Sweden shows that the government's guiding role in setting mandatory emission requirements for public projects is a factor that promotes green innovation in the construction industry.

Effectively controlling $CO_2$ in CSCs requires long-term strategic alignment, data sharing, joint planning, and a shared vision for sustainability. Studies show that regulating carbon emissions in the construction supply chain requires a comprehensive and cross-sectoral approach. The focus is on reducing emissions at the high-volume stages, and focusing only on the construction site without managing the material supply chain will miss a large part of the $CO_2$.

### *4.4. Information technology and engineering contribute to CSC*

#### *4.4.1. Driving forces and challenges of digital transformation in CSC*

Digital transformation in CSC is not just a process of updating technology, but a comprehensive reshaping of how actors organize, coordinate, and make decisions. The driving force of this process comes from increasing competitive pressure, requirements for information transparency, construction productivity, quality control, as well as global sustainable development trends [74], [75], [76]. BIM, IoT, RFID, Blockchain, and Digital Twin are key technologies reshaping CSC. When properly integrated, they help transform from a manual, fragmented operating model to a data-connected and automated platform [76], [77], [78], [79]. However, the current state of practice still shows a significant gap between potential and application level. Research [80], [81], [82]shows that many construction enterprises, especially in developing markets, still face: (i) high system investment costs; (ii) limited digital capabilities; (iii) lack of common data standards; and (iv) organizational cultural barriers, reluctance to share information. Decentralized material management systems are proposed [83]to partly overcome the dependence on the central system and allow lower-level units to access decentralized data, suitable for multi-site construction models. Another challenge is the asymmetric information conditions in CSC, especially between investors and suppliers. The document [84]shows that parties often make suboptimal decisions on material allocation in an environment lacking transparency, leading to excess inventory, inefficient transportation, and cost increases. Blockchain, although still in the testing phase, is expected to improve transparency and traceability of materials in the chain, thereby minimizing fraud, poor quality goods, or legal risks [85], [86]. Emerging technologies and real-time intelligent monitoring systems [33], [53], [63]are considered to have the potential to support risk mitigation in CSC.

#### *4.4.2. BIM modeling CSC*

BIM is key in reshaping CSC through digitalization and data integration throughout the project lifecycle. Research papers show that BIM can not only support design and simulation, but can also directly connect to logistics and supply operations [87], [88], [89]. Implementing 4D BIM allows for material supply and delivery planning to be synchronized with construction progress, helping to reduce material shortages or wrong deliveries [88], [90]. Instead of relying on manual reporting, data from on-site sensors or delivery vehicles can be fed directly into the BIM model, helping managers promptly detect deviations from the plan, such as late material delivery, changes in installation locations, or warehouse overload [87], [91].

The most extraordinary ability of BIM is to support the synchronization of technical and management data between stakeholders. When combined with Blockchain, changes in design or progress are stored transparently and immutably, creating the premise for the activation of smart contracts and automatic payments [76], [92], [93]. Research [94]shows that integrating BIM with bidding and document management systems helps control the origin of material requirements, approval processes, and contract information, thereby improving transparency and reducing delays. Organizational and human resources factors are no less important.

#### *4.4.3. Blockchain - Transparency and Automation*

With its decentralized, immutable, and transparent features, blockchain is reshaping how CSCs are operated and controlled through traceability, transaction authentication, and contract automation. Blockchain becomes a technological platform that helps establish a digital trust infrastructure between non-peer and unknown actors [95], [96]. This technology is instrumental in authenticating material quality certificates, transaction contracts, and payment progress between parties [33], [53]. Thanks to its anti-counterfeiting and high security capabilities, blockchain helps prevent fraud, payment delays, and data loss, common risks in multi-agent projects [63], [97]. According to [98], [99], combining Blockchain with QR codes or RFID helps track the journey of components from production, transportation, to installation.

Blockchain also supports smart contracts, allowing automatic payment, acceptance, and late penalties according to pre-programmed conditions. When integrated with BIM, IoT, or Digital Twin, real-world situations such as volume completion, quality, or safety are triggered on-chain, creating decentralized, accurate, and transparent transaction flows [76], [92], [93]. Research from [83], [96]shows that sharing data via Blockchain networks reduces information barriers, improves management capacity for subcontractors, and helps investors monitor comprehensively without deep intervention in each unit. Blockchain is also applied in reverse logistics management, where materials are recovered, reused, or processed after construction. According to [100], the system of recording and analyzing material return data, determining arising responsibilities, and optimizing recycling flows can be implemented more effectively on the blockchain platform.

### *4.4.4. IoT, RFID, and Digital Twin – Real-time connectivity and response platform*

In the journey to build a smart CSC, three key technologies, IoT, RFID, and Digital Twin, act as the foundation for creating real-time connections between data, materials, and management decisions. The integration of these technologies is transforming CSC from a passive system to a responsive, flexible, and automated model [77], [79], [101]. RFID is a central technology in material tracking and control. When attached to components, RFID tags help track the journey of materials from the factory to the construction site, supporting inventory monitoring, delivery reconciliation, and ensuring on-time installation [101], [102], [103]. Research from [104]also proposes combining RFID with wireless sensor networks (WSN) to enhance monitoring capabilities in difficult-to-connect environments such as high-rise buildings or infrastructure construction sites. IoT plays a role in collecting real-time data from the construction site, such as machine location, temperature, humidity, vibration, environmental conditions, and even occupational safety through personal wearable devices [105]. The synthesis of data from IoT and RFID integrated into the Digital Twin reflects the dynamic state of the construction. Digital Twin simulates progress and enables failure prediction, quality compliance checks, and operational efficiency evaluation [77], [79]. When combined with Blockchain, all sensor data is recorded transparently and cannot be tampered with, creating a solid basis for compliance monitoring and automated payments [93], [99].

However, deploying IoT and sensor systems also poses a significant challenge to data security. Research [4] proposes a key protection model based on secret sharing, which allows units in the chain to share data encryption keys without revealing all information to any party. This model helps to enhance anti-tampering and improve security in the construction wireless sensor system. Another noteworthy aspect is the role of data providers in the circular chain. According to [106], not all contractors have the same level of data sharing; there are differences between engineering units, material suppliers, and operating units.

Although cultural and technical barriers still exist to overcome, the digital transformation trend in CSC is irreversible. To compete and develop sustainably with developing countries like Vietnam, construction enterprises must proactively grasp new technologies and build a close cooperation strategy with partners in CSC. Investing in information infrastructure, common data standards, and human resource training will bring long-term benefits, creating an innovative, highly integrated CSC ecosystem. More specific research is needed to promote digital transformation in CSC, which suits Vietnam's conditions.

### *4.5. Prefabricated CSC and prefabricated houses (PC, MIC)*

#### *4.5.1. Background, challenges, and development opportunities*

In the past two decades, PC and MIC have transformed from an alternative construction method to a strategic solution in the industrialization of the construction industry. PC and MIC allow construction activities to be transferred from the construction site to the factory, the environment is better controlled, thereby improving the quality of components, reducing dependence on human resources, and minimizing work accidents [107], [108]. According to research in Hong Kong, the MIC model can reduce up to 87% of waste at the construction site, 36% of resource exploitation, and nearly 16% of $CO_2$ emissions [109]. In Australia, applying prefabricated houses helps increase the supply of social housing by 6÷9%, supporting the need for affordable rental housing more effectively [110]. However, the successful implementation of PC/MIC is not simply a technical issue; it requires a comprehensive restructuring of the CSC from design, production, and logistics to installation and maintenance [107], [111]. Therefore, understanding the characteristics and challenges of CSC PC is a prerequisite for the sustainable development of this model.

Despite its many advantages, CSCs with PC/MIC still face operational, organizational, and institutional challenges. Early or late delivery causes damage; prefabricated components must be delivered on time according to the erection schedule. Early delivery will cause a lack of storage space, incurring buffer warehouse rental costs, and late delivery will affect progress and lead to penalty fees due to machinery and labor waiting [108], [112]. Reports from China show that double processing costs account for 7÷12% of the total cost of components if not well coordinated [112]. In industrial projects, investors cannot grasp the location and status of components, leading to unexpected shortages, causing construction delays [113]. Furthermore, many CSCs still use manual management methods, not applying digital technology to monitor component status in real time [107], [111]. Lack of skilled human resources and limited technology in production and operation also cause errors and delays [107], [108].

#### *4.5.2. The role of precast CSC and prefabricated houses*

CSC PC/MC is not simply a material flow, but a network of connections between many independent components, including designers, factories, logistics, construction contractors, and supervisors [107]. In large cities such as Hong Kong, Singapore, or Shenzhen, CSC also reaches national borders, where components are manufactured in China and transported across borders to the special zone for assembly [109], [111].

CSC acts as the glue that binds together sustainable development strategies, such as circular economy, carbon emission reduction, and resource saving, as every design, manufacturing, transportation, and construction decision can be programmed and optimized on an integrated platform [109], [111]. Therefore, CSC is a supporting tool and the operating center of the modern precast construction model.

#### *4.5.3. Benefits of Precast CSC and Prefabricated Buildings*

An effective CSC PC/MIC brings comprehensive benefits to construction projects. These benefits can be divided into four main groups: time, cost, quality, and environment. CSC PC/MIC significantly shortens construction time, thanks to parallel production at the factory while the infrastructure is being deployed, project completion time is reduced by 20÷50% compared to traditional construction [107], [110]. Just-in-Time (JIT) transportation and assembly eliminates material waiting time, while optimizing the construction process [111], [112]. Although the initial investment cost may be higher, the total life cycle cost is reduced by optimizing time and workforce and reducing errors. A study in Hong Kong showed that PC construction application saves 84.7% of material costs and 3.2% of total life cycle costs [109].

When components are pre-tested, on-site installation becomes simpler, cleaner, and safer for workers [107], [108]. Modern CSC contributes to environmental protection and sustainable development. Efficient material flow management reduces waste, $CO_2$ emissions, and resource consumption. CSC also facilitates the integration of the circular economy by designing reusable components, planning for material recovery, or using green materials [109], [111].

### *4.6. Purchasing and Collaboration in CSC*

#### *4.6.1. Flexible shopping strategy*

Procurement plays a central role in the CSC structure, as a strategic tool for creating value, enhancing resilience, promoting innovation, and realizing sustainable development goals [55], [114], [115]. A prominent trend is the integration of sustainability criteria into the supplier selection process, with a focus on environmental performance, social responsibility, and corporate governance [54], [116], [117]. Decision-making tools such as AHP, TOPSIS, and MCDM are widely used for systematic and quantitative assessment [117], [118], [119].

Implementations in Ireland and Malaysia show that main contractors tend to prioritize cooperation with suppliers who share the same sustainable values, and at the same time, build capacity development programs for smaller suppliers to meet the overall CSC standard [56], [120], [121]. Effective procurement strategies cannot be separated from CSC planning. Optimization models such as integrated supplier scheduling [122] or multi-agent systems in location management [123]help to closely link procurement and construction implementation closely, thereby reducing lead times, increasing resource efficiency, and minimizing indirect emissions [124], [125].

#### *4.6.2. Inter-organizational partnerships and collaborations*

CSC is a multi-layered system of linkages between actors such as investors, main contractors, subcontractors, material suppliers, consultants, and regulatory agencies. Inter-organizational cooperation is considered a mechanism to enhance transparency, reduce conflicts of interest, and improve CSC performance through information sharing, goal synchronization, and risk management [126], [127], [128]. One of the most common obstacles is the imbalance in CSC; the main contractor's excessive dominance leads to passivity and a lack of creativity from subcontractors [60], [129]. Establishing strategic partnerships instead of just contractual relationships is recommended to create a collaborative environment based on shared values and overall efficiency [62], [126], [127].

Effective collaboration models in modern construction often follow two directions: (i) Stable collaboration that emphasizes sustainability and longevity among key partners; (ii) Dynamic innovation collaboration that focuses on technology testing, process improvement, and product co-development [56], [127], [130]. Research using multi-group communication and negotiation models shows that creating an open space for exchange helps parties clearly understand their roles, responsibilities, and mutual expectations [131], [132], [133]. Furthermore, studies in China, Portugal, and Thailand confirm the role of leadership. Effective leadership can moderate conflict, enhance trust, and maintain cooperation momentum under high-pressure conditions [133], [134], [135].

The fragmentation, uncertainty, and high dependence on humans in CSCs have led to the need for digital transformation to improve transparency, efficiency, and coordination among parties [56], [58], [126]. Research [56], [118], [126], [136]shows that emerging technologies help improve demand forecasting, optimize supply planning, support logistics data analysis, and make quick decisions in a constantly changing environment. Cloud platforms enable the integration of supplier information, capability profiles, and performance history, making the process of selecting and monitoring suppliers more transparent and accurate [56], [118], [119]. A system that tracks vehicles on site using IoT sensors helps coordinate timely material deliveries, reduce waste, and increase construction efficiency [137]. Although still in its early stages in the construction industry, blockchain has demonstrated great potential in innovative contract management, material traceability management, and ensuring data integrity throughout the CSC [58], [126]. However, digital transformation faces many barriers, especially among SMEs in developing countries. Research in Malaysia and Nigeria highlights the role of government support policies, training initiatives, and financial risk-sharing mechanisms to promote more comprehensive digital transformation [56], [126], [138].

#### *4.6.3. Knowledge management and information sharing*

In modern CSC, construction projects are large-scale, long-term, highly non-repetitive, and involve multiple parties. The ability to share knowledge and information among actors is a key factor in determining the effectiveness of cooperation, minimizing risks, and increasing overall productivity [130], [139], [140]. Knowledge management is the ability to exploit and transfer tacit knowledge, the knowledge accumulated through experience that is difficult to codify into clear documents or procedures [140]. This knowledge is often located in engineers, operators, and long-term contractors. Due to the characteristics of personnel turnover and fragmentation of projects, this knowledge is usually not stored or shared effectively, leading to waste and repeated errors [130], [135].

Studies in the Netherlands, Malaysia, and New Zealand have identified common barriers to knowledge sharing, including lack of incentives, closed competitive environments, disconnection between management and the field, and inadequate technology infrastructure [56], [135], [141]. To overcome these barriers, initiatives have been implemented, including monitoring mechanisms that encourage knowledge sharing [139], flexible collaboration frameworks [142], [143], and centralized digital platforms where project information is updated in real time and shared in a controlled manner [56], [126]. In addition to technology, a culture of sharing is also key. Advanced organizations are moving from knowledge management to knowledge socialization, encouraging interaction, dialogue, and continuous learning between departments and partners [126], [139]. Platform-based organizational models in the Netherlands and Singapore have proven to be highly effective in spreading knowledge [126], [144], [145].

Applying multi-criteria decision-making methods MCDM, AHP, TOPSIS, and hybrid variants to evaluate and select suppliers, strategic partners, and procurement strategies [117], [119], [146]. Evaluation criteria are increasingly expanding, not only including cost, quality, schedule, but also integrating sustainability factors such as emissions, material recycling, environmental compliance, and social responsibility [116], [117], [118]. However, applying these models requires construction enterprises to have a qualified technical team, adequate data infrastructure, and an organizational culture ready to accept algorithmic support in decision making. Therefore, to be effective, the integration of decision-making tools must be accompanied by investment in people, data, and organizational processes.

### *4.7. CSC Performance*

#### *4.7.1. CSC Performance*

CSC performance reflects the entire chain's effectiveness in achieving a construction project's cost, time, quality, and sustainability goals. Lean and Agile methods are key strategies to improve CSC performance in a volatile and complex context. Lean emphasizes eliminating waste and optimizing the value stream, while Agile emphasizes responding quickly to change and maintaining high flexibility during construction. Combining Lean and Agile into an Agile-Lean strategy model has effectively improved CSC performance in residential projects in Iran by maintaining a balance between flexibility and optimization [147]. However, the main challenges are the lack of standardization, cultural barriers, and organizational fragmentation in the value chain.

#### *4.7.2. Integrated management increases performance and coordination in complex environments.*

Organizational integration also plays a decisive role in maintaining effective CSC. Integrated management models that integrate processes, information, resources, and changes significantly impact project time, cost, and quality [148]. One of

CSC's biggest challenges is coordinating in urban environments and highly complex projects. Timely delivery requirements, urban infrastructure constraints, stakeholder diversity, and market volatility create high uncertainty. Research in Szczecin (Poland) shows that traditional delivery models such as centralized procurement are often preferred because they are easy to control and optimize costs [149]. However, modern models such as consolidation centers or logistics outsourcing can help reduce traffic congestion and emissions, but are discouraged due to high costs and a lack of implementation knowledge [149].

At the significant project level, effective coordination requires using Lean tools such as LPS combined with real-time information systems and risk simulation [150], [151]. Advanced enterprises are experimenting with discrete event simulation to identify bottlenecks and optimize value streams before construction [151]. Research [149], [150], [151]shows that effective coordination in complex environments requires simultaneous coordination between logistics management, simulation technology, and real-time information sharing. This is the premise for building a lean, adaptive, and efficient CSC. To overcome bottlenecks, many strategic solutions have been proposed, notably the JIT model, subcontracting, logistics improvements and close collaboration between parties.

The JIT model is considered the central solution to optimize CSC PC, components are produced and delivered just in time for installation, limiting inventory, reducing double processing costs [111], [112]. However, JIT puts tremendous pressure on foundries due to the need to quickly adjust production plans, reserve transportation and storage capacity. Therefore, some studies have proposed the SP contract mechanism to balance the interests between contractors and suppliers [112]. This contract consists of 3 parts: (1) fixed surcharge, (2) cost sharing for on-time delivery, and (3) rewards and penalties based on delivery time. On the other hand, countries such as Singapore and Hong Kong have piloted cluster CSC linkage, meaning that many projects share a standard foundry, logistics route, tracking software, and cooperation mechanism [109], [111].

### *4.8. CSC and logistics management*

#### *4.8.1. Logistics planning and materials management - bottlenecks in efficiency and cost*

In CSC, logistics and materials are central to ensuring construction progress and efficiency. However, the planning, coordination and management of materials is often unsynchronized, lacks accurate data and is subject to many operational risks, leading to transportation, storage, waiting for materials or emergency procurement costs becoming constant financial burdens for contractors and increasing the risk of delay [152], [153], [154]. Many projects still maintain the traditional method: discrete material planning, which is not integrated with the overall construction schedule, leading to a supply situation not meeting demand or untimely surplus [89], [154]. Current logistics management lacks strategies and optimization tools. In many construction sites, transportation and delivery activities still reactively take place, meaning that adjustments are only made when problems arise, instead of proactive planning.

Meanwhile, logistics costs often account for up to 11% of total construction costs, a significant proportion if not managed effectively [153]. To overcome this situation, recent studies propose applying modern optimization algorithms to establish a material supply schedule close to the actual demand. For example, the material planning model combining Dragonfly Algorithm and Particle Swarm Optimization balances purchasing, inventory, and transportation costs, significantly saving the total material cost [152]. At the network level, CSC also faces the challenge of choosing the optimal location of the transit warehouse, delivery frequency, and supplier role. The integrated multi-project - multi-supplier - multi-resource supply network design model shows that reasonably adjusting factors such as supply point location, delivery schedule, and inventory level can significantly reduce the overall operating cost [155]. In particular, applying the Vendor Managed Inventory model, where the supplier actively coordinates the inventory at the construction site, helps reduce delays and improve CSC reliability [153]. In addition, reverse logistics, the recovery of excess materials, construction waste, or reused components, is an increasingly important factor in projects aiming at sustainable development. However, due to the lack of standardization and monitoring mechanisms, the organization of reverse material flows is still facing many difficulties [156], [157].

### *4.8.2. Partnership in CSC*

In CSCs where participants are often only connected for a limited project-by-project basis, building strategic partnerships and establishing long-term coordination mechanisms is frequently overlooked. However, many studies have shown that the lack of sustainable cooperation is one of the root causes of inefficiencies, conflicts of interest, and increased risks in the chain [158]. Parties often only optimize their own goals, such as low cost and short-term profits, ignoring the overall efficiency of the chain. This leads to a lack of trust, transparency, and information sharing, causing disruptions in schedules, supply, and quality plans [87], [159].

A case study in Denmark has shown that when general contractors and suppliers establish cross-project strategic partnerships, they can better coordinate production, delivery, and construction schedules, thereby reducing waste, delays, and conflicts [158]. Scholars propose a flexible approach called organizational hybridization, which combines traditional project management methods and elements from modern CSC management [158]. Under this model, enterprises need not change the entire management structure immediately. Still, they can gradually integrate plan synchronization, performance contracts, and data sharing platforms into existing relationships. [158], [160]. The relationship between enterprises and suppliers and multi-stakeholder coordination within the entire CSC network, including local governments, logistics units, residential communities, and investors, is also increasingly emphasized.

### *4.8.3. Sustainable and circular CSC*

Sustainable and circular CSC is no longer an ideal trend but has become essential in modern construction management. This model emphasizes waste reduction, material reuse, resource life extension, and ecological efficiency, while ensuring cost-effectiveness and competitiveness [161]. In contrast to traditional linear construction, the circular model in construction aims to close the material loop through strategies such as recycling, reuse, component recovery, or design for dismantling [157], [161]. However, implementing circular chains in construction still faces many challenges regarding techniques, processes, and organizations. In addition, the capacity to measure and evaluate the effectiveness of circular strategies in CSC is still limited. A set of circular economy indicators specific to the construction industry, including 18 project-level and 20 organizational-level indicators, of which 16 can be applied at both levels [162]. These indicators assess the level of reuse, recycled content, or carbon emissions and reflect the depth of organizational change, such as the ability to restructure the supply network, integrate reverse logistics systems, and internal incentives from the enterprise [161].

## 5. Conclusion

The construction supply chain is a complex, multi-layered system strongly influenced by internal and external factors, especially in today's globalized, volatile, and strongly digitalized economy. Through a systematic overview method, the author has classified and analyzed research works published from 2010 to 2025, clarifying a comprehensive picture of the main research directions, technology trends, organizational models, risks, and supply chain development strategies in the construction industry in the world and Vietnam.

The results show that the prominent research directions in CSC today include: GCSC development, risk management, carbon emission control, digital technology integration, PC, MiC, procurement, collaboration, and performance. These topics reflect the shift from traditional models focused on cost and progress to technology-integrated, sustainability-oriented, and resilient CSC models. The studies highlight the increasingly important role of information and engineering technologies in enhancing transparency, traceability, risk prediction, and coordination among stakeholders in CSC. Platforms such as BIM, Digital Twin, intelligent monitoring systems, and smart contracts on Blockchain are changing how construction projects are organized and managed. At the same time, the integration of circular economy, low-emission design, and public-private partnership models has demonstrated the potential to improve both environmental and economic performance for the construction industry.

The study has identified significant challenges hindering the development of CSC, including organizational fragmentation, lack of close coordination mechanisms, risks in material supply and construction, limited capacity of small and medium enterprises, and lack of data and standardization in operations. These factors require further in-depth, directional studies appropriate to actual conditions and local characteristics, especially in areas with increasing urbanization and construction investment. From the overall analysis, it can be affirmed that CSC is no longer a purely technical issue, but has become a strategic content in modern construction management. Developing effective, sustainable, and flexible CSC is an inevitable requirement to improve the competitiveness of Vietnam's construction industry in the context of digital transformation, international integration, and commitment to reducing greenhouse gas emissions. This study is an essential theoretical basis to guide further in-depth studies.

## Contributions of authors in this article

**Tran Phu Loc:** Methodology, Data management, Formal analysis, Investigation, Validation, Visualization, Feedback on peer review, Writing – original manuscript. **Tran Quang Phu**: Data compilation, Data analysis, Verification, Writing – original manuscript. **Huynh Thi Yen Thao:** Methodology, Manuscript Editing.

## Declaration of competing interest and delication to copyright

We have no conflicts of interest to disclose and confirm that this work has not been previously published.

## Data available

Data will be provided upon request.

## References

[1] K. Petersen, R. Feldt, M. Mattsson, and S. Mujtaba, "Systematic Mapping Studies in Software Engineering," 2008.

[2] B. Kitchenham and S. M. Charters, "Guidelines for performing Systematic Literature Reviews in Software Engineering," 2007. [Online]. Available: https://www.researchgate.net/publication/302924724

[3] N. M. A. Mohamed Abdul Ghani, G. Egilmez, M. Kucukvar, and M. K. S. Bhutta, "From green buildings to green supply chains: An integrated input-output life cycle assessment and optimization framework for carbon footprint reduction policy making," *Management of Environmental Quality: An International Journal*, vol. 28, no. 4, pp. 532–548, 2017, doi: 10.1108/MEQ-12-2015-0211.

[4] S. Badi and N. Murtagh, "Green supply chain management in construction: A systematic literature review and future research agenda," *J Clean Prod*, vol. 223, pp. 312–322, Jun. 2019, doi: 10.1016/j.jclepro.2019.03.132.

[5] P. Dadhich, A. Genovese, N. Kumar, and A. Acquaye, "Developing sustainable supply chains in the UK construction industry: A case study," *Int J Prod Econ*, vol. 164, pp. 271–284, Jun. 2015, doi: 10.1016/j.ijpe.2014.12.012.

[6] C. Woo, M. G. Kim, Y. Chung, and J. J. Rho, "Suppliers' communication capability and external green integration for green and financial performance in Korean construction industry," *J Clean Prod*, vol. 112, pp. 483–493, Jan. 2016, doi: 10.1016/j.jclepro.2015.05.119.

[7] S.-H. Chun, H. J. Hwang, and Y.-H. Byun, "Green Supply Chain Management in the Construction Industry: Case of Korean Construction Companies," *Procedia Soc Behav Sci*, vol. 186, pp. 507–512, May 2015, doi: 10.1016/j.sbspro.2015.04.192.

[8] A. Mojumder and A. Singh, "An exploratory study of the adaptation of green supply chain management in construction industry: The case of Indian Construction Companies," *J Clean Prod*, vol. 295, May 2021, doi: 10.1016/j.jclepro.2021.126400.

[9] Q. Du, Q. Pang, T. Bao, X. Guo, and Y. Deng, "Critical factors influencing carbon emissions of prefabricated building supply chains in China,"

*J Clean Prod*, vol. 280, Jan. 2021, doi: 10.1016/j.jclepro.2020.124398.

[10] A. Singh and S. C. Misra, "Ordering drivers of green supply chain management practices in Indian construction industry: An impact assessment framework," *International Journal of Quality and Reliability Management*, vol. 39, no. 8, pp. 1869–1895, Aug. 2022, doi: 10.1108/IJQRM-03-2019-0076.

[11] S. Ball, C. A. Booth, A. M. Mahamadu, and P. Manu, "A roadmap for sustainable development through responsible sourcing in construction," *Proceedings of the Institution of Civil Engineers: Engineering Sustainability*, vol. 175, no. 6, pp. 267–282, Dec. 2021, doi: 10.1680/jensu.21.00043.

[12] O. N. Oyefusi, W. I. Enegbuma, A. Brown, and M. P. Zari, "From green to regenerative supply chain management in construction: Towards a conceptual framework," *Environ Dev*, vol. 52, Dec. 2024, doi: 10.1016/j.envdev.2024.101097.

[13] Zhang Yunning and Wu Rong, "Performance evaluation of green construction supply chain based on improved BSC," in *The 2nd International Conference on Information Science and Engineering*, IEEE, Dec. 2010, pp. 408–411. doi: 10.1109/ICISE.2010.5690647.

[14] W. Q. Liang, K. H. Gui, Z. P. Fei, B. Y. Hong, and C. Dong, "Study on evaluation for green construction supply chain," in *2011 International Conference on Electronics, Communications and Control (ICECC)*, IEEE, Sep. 2011, pp. 3930–3933. doi: 10.1109/ICECC.2011.6068016.

[15] Y. Liu, J. Xu, and M. Xu, "Green Construction Supply Chain Performance Evaluation Based on BSC-SCOR," in *2018 15th International Conference on Service Systems and Service Management (ICSSSM)*, IEEE, Jul. 2018, pp. 1–6. doi: 10.1109/ICSSSM.2018.8465071.

[16] Wang Qiuliang, Kang Haigui, Chen Dong, and Zhou Pengfei, "A mathematical programming model in Green Construction Supply Chain Management," in *2011 International Conference on System science, Engineering design and Manufacturing informatization*, IEEE, Oct. 2011, pp. 67–70. doi: 10.1109/ICSSEM.2011.6081234.

[17] N. Wnag, S. Wang, and B. Zhang, "Game analysis for the framework of green supply in construction industry," in *2011 International Conference on Electric Technology and Civil Engineering (ICETCE)*, IEEE, Apr. 2011, pp. 1283–1286. doi: 10.1109/ICETCE.2011.5775351.

[18] N. Zhang and K. Bin Lu, "The evolutionary game and simulation of key players in the green supply chain of construction industry," *Modern Supply Chain Research and Applications*, vol. 4, no. 3, pp. 223–237, Nov. 2022, doi: 10.1108/mscra-01-2022-0003.

[19] S. Balasubramanian, V. Shukla, and J. Chanchaichujit, "Firm size implications for environmental sustainability of supply chains: evidence from the UAE," *Management of Environmental Quality: An International Journal*, vol. 31, no. 5, pp. 1375–1406, Jul. 2020, doi: 10.1108/MEQ-01-2020-0004.

[20] M. Ahmed, M. J. Thaheem, and A. Maqsoom, "Barriers and opportunities to greening the construction supply chain management: Cause-driven implementation strategies for developing countries," *Benchmarking*, vol. 27, no. 3, pp. 1211–1237, Apr. 2020, doi: 10.1108/BIJ-04-2019-0192.

[21] "Green construction supply chain management: integrating governmental intervention and public-private partnerships through ecological modernisation."

[22] E. Taghavi, A. Fallahpour, K. Y. Wong, and S. Amirali Hoseini, "Identifying and prioritizing the effective factors in the implementation of green supply chain management in the construction industry," *Sustainable Operations and Computers*, vol. 2, pp. 97–106, Jan. 2021, doi: 10.1016/j.susoc.2021.05.003.

[23] M. H. A. Nasir, A. Genovese, A. A. Acquaye, S. C. L. Koh, and F. Yamoah, "Comparing linear and circular supply chains: A case study from the construction industry," *Int J Prod Econ*, vol. 183, pp. 443–457, Jan. 2017, doi: 10.1016/j.ijpe.2016.06.008.

[24] C. F. Dunant, M. P. Drewniok, M. Sansom, S. Corbey, J. M. Allwood, and J. M. Cullen, "Real and perceived barriers to steel reuse across the UK construction value chain," *Resour Conserv Recycl*, vol. 126, pp. 118–131, 2017, doi: 10.1016/j.resconrec.2017.07.036.

[25] A. Komkova and G. Habert, "Optimal supply chain networks for waste materials used in alkali-activated concrete fostering circular economy," *Resour Conserv Recycl*, vol. 193, Jun. 2023, doi: 10.1016/j.resconrec.2023.106949.

[26] Hermawan, P. F. Marzuki, M. Abduh, and R. Driejana, "The Sustainable Infrastructure through the Construction Supply Chain Carbon Footprint Approach," in *Procedia Engineering*, Elsevier Ltd, 2017, pp. 312–322. doi: 10.1016/j.proeng.2017.01.339.

[27] S. Balasubramanian and V. Shukla, "Green supply chain management: an empirical investigation on the construction sector," *Supply Chain Management*, vol. 22, no. 1, pp. 58–81, 2017, doi: 10.1108/SCM-07-2016-0227.

[28] S. Kesidou and B. K. Sovacool, "Supply chain integration for low-carbon buildings: A critical interdisciplinary review," Oct. 01, 2019, *Elsevier Ltd*. doi: 10.1016/j.rser.2019.109274.

[29] P. H. Chen and T. C. Nguyen, "A BIM-WMS integrated decision support tool for supply chain management in construction," *Autom Constr*, vol. 98, pp. 289–301, Feb. 2019, doi: 10.1016/j.autcon.2018.11.019.

[30] R. Matarneh and B. M. Mohsen, "Exploring the Implementation of Digital Technologies in Supply Chain Management within the Jordanian Construction Industry," in *Procedia Computer Science*, Elsevier B.V., 2024, pp. 519–527. doi: 10.1016/j.procs.2024.06.055.

[31] L. Martin and L. Benson, "Relationship quality in construction projects: A subcontractor perspective of principal contractor relationships," *International Journal of Project Management*, vol. 39, no. 6, pp. 633–645, Aug. 2021, doi: 10.1016/j.ijproman.2021.05.002.

[32] M. Jagtap and S. Kamble, "An empirical assessment of relational contracting model for supply chain of construction projects," *International Journal of Managing Projects in Business*, vol. 13, no. 7, pp. 1537–1560, Oct. 2020, doi: 10.1108/IJMPB-05-2018-0097.

[33] M. C. Okika, A. Vermeulen, and J. H. C. Pretorius, "A systematic approach to identify and manage supply chain risks in construction projects," *Journal of Financial Management of Property and Construction*, 2024, doi: 10.1108/JFMPC-09-2023-0057.

[34] R. Kadan and J. A. Wium, "Dominant risk factors (DRFs) in construction-specific supply chains: a systematic review," *Frontiers in Engineering and Built Environment*, vol. 4, no. 2, pp. 130–145, May 2024, doi: 10.1108/febe-06-2023-0030.

[35] C. A. Rudolf and S. Spinler, "Key risks in the supply chain of large scale engineering and construction projects," *Supply Chain Management*, vol. 23, no. 4, pp. 336–350, Aug. 2018, doi: 10.1108/SCM-09-2017-0292.

[36] I. Y. Wuni and G. Q. Shen, "Exploring the critical production risk factors for modular integrated construction projects," *Journal of Facilities Management*, vol. 21, no. 1, pp. 50–68, Jan. 2023, doi: 10.1108/JFM-03-2021-0029.

[37] I. Y. Wuni and G. Q. Shen, "Exploring the critical success determinants for supply chain management in modular integrated construction projects," *Smart and Sustainable Built Environment*, vol. 12, no. 2, pp. 258–276, Feb. 2023, doi: 10.1108/SASBE-03-2021-0051.

[38] S. Chen, D. R. Eyers, J. Gosling, and Y. Huang, "Supply chain risks for SMEs in construction projects: a structured literature review and research agenda," 2025, *Emerald Publishing*. doi: 10.1108/IJLM-12-2023-0548.

[39] C. F. Dunant, M. P. Drewniok, M. Sansom, S. Corbey, J. M. Cullen, and J. M. Allwood, "Options to make steel reuse profitable: An analysis of cost and risk distribution across the UK construction value chain," *J Clean Prod*, vol. 183, pp. 102–111, May 2018, doi: 10.1016/j.jclepro.2018.02.141.

[40] P. K. Tarei, J. J. Thakkar, and B. Nag, "A hybrid approach for quantifying supply chain risk and prioritizing the risk drivers: A case of Indian petroleum supply chain," *Journal of Manufacturing Technology Management*, vol. 29, no. 3, pp. 533–569, Mar. 2018, doi: 10.1108/JMTM-10-2017-0218.

[41] F. A. Ghansah and W. Lu, "Evaluating the impact of COVID-19 mitigation measures on quality assurance of cross-border construction logistics and supply chain," *International Journal of Quality and Reliability Management*, Nov. 2024, doi: 10.1108/IJQRM-01-2024-0024.

[42] N. A. Zainal Abidin and B. Ingirige, "Identification of the 'pathogenic' Effects of Disruptions to Supply Chain Resilience in Construction," in *Procedia Engineering*, Elsevier Ltd, 2018, pp. 467–474. doi: 10.1016/j.proeng.2018.01.060.

[43] W. Xiao, Z. Liu, and W. Zhong, "Multi-level fuzzy synthesis evaluation on construction supply chain risk," in *2011 Chinese Control and Decision Conference (CCDC)*, IEEE, May 2011, pp. 266–269. doi: 10.1109/CCDC.2011.5968184.

[44] X. Wei, V. Prybutok, and B. Sauser, "Review of supply chain management within project management," Dec. 01, 2021, *Elsevier Ltd*. doi: 10.1016/j.plas.2021.100013.

[45] C. Vidalakis, J. E. Tookey, and J. Sommerville, "Logistics simulation modelling across construction supply chains," *Construction Innovation*, vol. 11, no. 2, pp. 212–228, 2011, doi: 10.1108/14714171111124176.

[46] J. Shen, M. Xu, and H. Sun, "Logistics Systems Function Deployment Model for Construction Project and application," in *2010 IEEE 17Th International Conference on Industrial Engineering and Engineering Management*, IEEE, Oct. 2010, pp. 1356–1359. doi: 10.1109/ICIEEM.2010.5646011.

[47] C. Z. Li, J. Hong, F. Xue, G. Q. Shen, X. Xu, and M. K. Mok, "Schedule risks in prefabrication housing production in Hong Kong: a social network analysis," *J Clean Prod*, vol. 134, no. Part B, pp. 482–494, Oct. 2016, doi: 10.1016/j.jclepro.2016.02.123.

[48] A. T. B. Duong *et al.*, "Ripple effect of disruptions on performance in supply chains: an empirical study," *Engineering, Construction and Architectural Management*, vol. 31, no. 13, pp. 1–22, 2023, doi: 10.1108/ECAM-10-2022-0924.

[49] Z. Chen, A. W. A. Hammad, and M. Alyami, "Building construction supply chain resilience under supply and demand uncertainties," *Autom Constr*, vol. 158, Feb. 2024, doi: 10.1016/j.autcon.2023.105190.

[50] E. M. A. C. Ekanayake, G. Q. Shen, M. Kumaraswamy, and E. K. Owusu, "Critical supply chain vulnerabilities affecting supply chain resilience of industrialized construction in Hong Kong," *Engineering, Construction and Architectural Management*, vol. 28, no. 10, pp. 3041–3059, Nov. 2021, doi: 10.1108/ECAM-06-2020-0438.

[51] N. A. Zainal Abidin and B. Ingirige, "The dynamics of vulnerabilities and capabilities in improving resilience within Malaysian construction supply chain," *Construction Innovation*, vol. 18, no. 4, pp. 412–432, Nov. 2018, doi: 10.1108/CI-09-2017-0079.

[52] A. S. Butt, "Coopetition in supply chains: A case study of Australian construction industry in supplier market," *J Bus Res*, vol. 189, Feb. 2025, doi: 10.1016/j.jbusres.2024.115111.

[53] M. Baghalzadeh Shishehgarkhaneh, R. C. Moehler, Y. Fang, H. Aboutorab, and A. A. Hijazi, "Construction supply chain risk management," Jun. 01, 2024, *Elsevier B.V.* doi: 10.1016/j.autcon.2024.105396.

[54] H. Ghamari, H. Abbasianjahromi, and S. M. Mirhosseini, "Providing a framework to optimize the sustainable construction material supply chain with the possibility of horizontal transfers," *Sustainable Futures*, vol. 8, Dec. 2024, doi: 10.1016/j.sftr.2024.100328.

[55] C. Jian-hua and T. Wan, "Time-cost trade-off problem in construction supply chain: A bi-level programming decision model," in *2010 International Conference on Management Science & Engineering 17th Annual Conference Proceedings*, IEEE, Nov. 2010, pp. 212–217. doi: 10.1109/ICMSE.2010.5719807.

[56] N. B. Ab. Aziz, R. B. Ahmad, and D. D. Dominic, "e-Supply Chain (e-SC) trust model for B2B collaboration- A case study of Malaysian construction industry," in *2014 International Conference on Computer and Information Sciences (ICCOINS)*, IEEE, Jun. 2014, pp. 1–4. doi: 10.1109/ICCOINS.2014.6868426.

[57] T. M. M. P. Tennakoon, N. Chileshe, R. Rameezdeen, J. Ochoa Paniagua, A. Samaraweera, and L. Statsenko, "Uncertainties affecting the offsite construction supply chain resilience: a systematic literature review," 2023, *Emerald Publishing*. doi: 10.1108/CI-04-2023-0075.

[58] P. Dallasega, "Industry 4.0 fostering construction supply chain management: Lessons learned from engineer-to-order suppliers," *IEEE Engineering Management Review*, vol. 46, no. 3, pp. 49–55, 2018, doi: 10.1109/EMR.2018.2861389.

[59] F. Ying, J. Tookey, and J. Seadon, "Measuring the invisible: A key performance indicator for managing construction logistics performance," *Benchmarking*, vol. 25, no. 6, pp. 1921–1934, Aug. 2018, doi: 10.1108/BIJ-11-2016-0176.

[60] E. Manu, N. Ankrah, E. Chinyio, and D. Proverbs, "Trust influencing factors in main contractor and subcontractor relationships during projects," *International Journal of Project Management*, vol. 33, no. 7, pp. 1495–1508, Oct. 2015, doi: 10.1016/j.ijproman.2015.06.006.

[61] U. Ryciuk, "Identification of Factors Related to Trust Formation in Construction Supply Chains," in *Procedia Engineering*, Elsevier Ltd, 2017, pp. 627–634. doi: 10.1016/j.proeng.2017.03.168.

[62] E. Yao, Y. M. Lim, C. M. Leong, W. C. Lee, and C. K. Pek, "Dataset describing problem factors of partnering relationships in the Malaysian construction industry," *Data Brief*, vol. 45, Dec. 2022, doi: 10.1016/j.dib.2022.108733.

[63] M. B. Shishehgarkhaneh, R. C. Moehler, Y. Fang, A. A. Hijazi, and H. Aboutorab, "Transformer-Based Named Entity Recognition in Construction Supply Chain Risk Management in Australia," *IEEE Access*, vol. 12, pp. 41829–41851, 2024, doi: 10.1109/ACCESS.2024.3377232.

[64] Z. A. Bin Ismail, "Hybrid intelligent vehicle system for managing construction supply chain in precast concrete building construction projects," *World Journal of Engineering*, vol. 18, no. 4, pp. 538–546, 2020, doi: 10.1108/WJE-08-2020-0361.

[65] E. M. A. C. Ekanayake, G. Shen, M. Kumaraswamy, E. K. Owusu, and J. Xue, "Capabilities to withstand vulnerabilities and boost resilience in industrialized construction supply chains: a Hong Kong study," *Engineering, Construction and Architectural Management*, vol. 29, no. 10, pp. 3809–3829, Dec. 2022, doi: 10.1108/ECAM-05-2021-0399.

[66] Z. Chen and A. W. A. Hammad, "Mathematical modelling and simulation in construction supply chain management," Dec. 01, 2023, *Elsevier B.V.* doi: 10.1016/j.autcon.2023.105147.

[67] P. Toufani, M. Kucukvar, and N. C. Onat, "Carbon Footprints of Construction Industries: A Global, Supply Chain-linked Analysis," in *2018 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*, IEEE, Dec. 2018, pp. 11–16. doi: 10.1109/IEEM.2018.8607513.

[68] J. Xu, Y. Huang, Y. Shi, and Y. Deng, "Supply chain management approach for greenhouse and acidifying gases emission reduction towards construction materials industry: A case study from China," *J Clean Prod*, vol. 258, Jun. 2020, doi: 10.1016/j.jclepro.2020.120521.

[69] M. Ö. Arıoğlu Akan, D. G. Dhavale, and J. Sarkis, "Greenhouse gas emissions in the construction industry: An analysis and evaluation of a

concrete supply chain," *J Clean Prod*, vol. 167, pp. 1195–1207, Nov. 2017, doi: 10.1016/j.jclepro.2017.07.225.

[70] I. Karlsson, J. Rootzén, and F. Johnsson, "Reaching net-zero carbon emissions in construction supply chains – Analysis of a Swedish road construction project," *Renewable and Sustainable Energy Reviews*, vol. 120, Mar. 2020, doi: 10.1016/j.rser.2019.109651.

[71] J. C. Cheng, "A web service framework for measuring and monitoring environmental and carbon footprint in construction supply chains," in *Procedia Engineering*, 2011, pp. 141–147. doi: 10.1016/j.proeng.2011.07.016.

[72] S. L. Kesidou and S. Sorrell, "Low-carbon innovation in non-domestic buildings: The importance of supply chain integration," *Energy Res Soc Sci*, vol. 45, pp. 195–213, Nov. 2018, doi: 10.1016/j.erss.2018.07.018.

[73] B. Wang, L. GENG, and V. W.Y. Tam, "Effective carbon responsibility allocation in construction supply chain under the carbon trading policy," *Energy*, vol. 319, Mar. 2025, doi: 10.1016/j.energy.2025.135059.

[74] V. Getuli, S. M. Ventura, P. Capone, and A. L. C. Ciribini, "A BIM-based Construction Supply Chain Framework for Monitoring Progress and Coordination of Site Activities," in *Procedia Engineering*, Elsevier Ltd, 2016, pp. 542–549. doi: 10.1016/j.proeng.2016.11.656.

[75] Q. Shi, X. Ding, J. Zuo, and G. Zillante, "Mobile Internet based construction supply chain management: A critical review," Dec. 01, 2016, *Elsevier B.V.* doi: 10.1016/j.autcon.2016.08.020.

[76] Y. Celik, I. Petri, and Y. Rezgui, "Integrating BIM and Blockchain across construction lifecycle and supply chains," *Comput Ind*, vol. 148, Jun. 2023, doi: 10.1016/j.compind.2023.103886.

[77] S. K. Yevu, E. K. Owusu, A. P. C. Chan, S. M. E. Sepasgozar, and V. R. Kamat, "Digital twin-enabled prefabrication supply chain for smart construction and carbon emissions evaluation in building projects," Nov. 01, 2023, *Elsevier Ltd.* doi: 10.1016/j.jobe.2023.107598.

[78] A. Alsehaimi *et al.*, "Building a sustainable future: BIM's role in construction, logistics, and supply chain management," *Ain Shams Engineering Journal*, Dec. 2024, doi: 10.1016/j.asej.2024.103103.

[79] S. Bakhshi *et al.*, "Digital twin applications for overcoming construction supply chain challenges," Nov. 01, 2024, *Elsevier B.V.* doi: 10.1016/j.autcon.2024.105679.

[80] A. K. Singh, V. R. P. Kumar, G. Dehdasht, S. R. Mohandes, P. Manu, and F. Pour Rahimian, "Investigating barriers to blockchain adoption in construction supply chain management: A fuzzy-based MCDM approach," *Technol Forecast Soc Change*, vol. 196, Nov. 2023, doi: 10.1016/j.techfore.2023.122849.

[81] T. T. Okanlawon, L. O. Oyewobi, and R. A. Jimoh, "Assessment of barriers to the implementation of blockchain technology in construction supply chain management in Nigeria," *Frontiers in Engineering and Built Environment*, vol. 4, no. 1, pp. 59–73, Mar. 2024, doi: 10.1108/febe-04-2023-0017.

[82] M. Halicki, "Project supply chain management and risk - analysis and IT support," in *Procedia Computer Science*, Elsevier B.V., 2024, pp. 4058–4065. doi: 10.1016/j.procs.2024.09.244.

[83] M. Basheer, F. Elghaish, T. Brooks, F. Pour Rahimian, and C. Park, "Blockchain-based decentralised material management system for construction projects," *Journal of Building Engineering*, vol. 82, Apr. 2024, doi: 10.1016/j.jobe.2023.108263.

[84] H. Lu, H. Wang, C. Qi, Y. Xie, and D. Liu, "Incentive schemes for centralized material planning and allocation with asymmetric information in construction supply chain," *IEEE Access*, 2021, doi: 10.1109/ACCESS.2020.3009151.

[85] S. Wang, J. Shi, D. Jiang, and Z. Qi, "Research for traceability model of material supply quality in construction project," in *Proceedings - 2012 5th International Symposium on Computational Intelligence and Design, ISCID 2012*, 2012, pp. 398–401. doi: 10.1109/ISCID.2012.250.

[86] M. Ogunnusi, T. Omotayo, M. Hamma-Adama, B. O. Awuzie, and T. Egbelakin, "Lessons learned from the impact of COVID-19 on the global construction industry," *Journal of Engineering, Design and Technology*, vol. 20, no. 1, pp. 299–320, Oct. 2021, doi: 10.1108/JEDT-05-2021-0286.

[87] P. Dallasega, E. Rauch, and C. Linder, "Industry 4.0 as an enabler of proximity for construction supply chains: A systematic literature review," Aug. 01, 2018, *Elsevier B.V.* doi: 10.1016/j.compind.2018.03.039.

[88] S. Mitra and A. Wee Kwan Tan, "Lessons learned from large construction project in Saudi Arabia," *Benchmarking: An International Journal*, vol. 19, no. 3, pp. 308–324, May 2012, doi: 10.1108/14635771211242978.

[89] C. Gschwendtner, A. Fischer, J. Fottner, and I. D. Tommelein, "Evaluating Supply-And Reverse Logistics Alternatives in Building Construction Using Simulation," in *2021 Winter Simulation Conference (WSC)*, IEEE, Dec. 2021, pp. 1–12. doi: 10.1109/WSC52266.2021.9715426.

[90] M. Ghasri, M. Maghrebi, T. H. Rashidi, and S. T. Waller, "Hazard-based model for concrete pouring duration using construction site and supply chain parameters," *Autom Constr*, vol. 71, no. Part 2, pp. 283–293, Nov. 2016, doi: 10.1016/j.autcon.2016.08.012.

[91] J. Teizer, "Right-time vs real-time pro-active construction safety and health system architecture," *Construction Innovation*, vol. 16,

no. 3, pp. 253–280, Jul. 2016, doi: 10.1108/CI-10-2015-0049.

[92] E. Papadonikolaki, R. Vrijhoef, and H. Wamelink, “Supply chain integration with BIM: a graph-based model,” *Structural Survey*, vol. 33, no. 3, pp. 257–277, Jul. 2015, doi: 10.1108/SS-01-2015-0001.

[93] F. Elghaish, M. R. Hosseini, T. Kocaturk, M. Arashpour, and M. Bararzadeh Ledari, “Digitalised circular construction supply chain: An integrated BIM-Blockchain solution,” *Autom Constr*, vol. 148, Apr. 2023, doi: 10.1016/j.autcon.2023.104746.

[94] M. Ajam, M. Alshawi, and T. Mezher, “Augmented process model for e-tendering: Towards integrating object models with document management systems,” *Autom Constr*, vol. 19, no. 6, pp. 762–778, Oct. 2010, doi: 10.1016/j.autcon.2010.04.001.

[95] A. A. Hijazi, S. Perera, R. N. Calheiros, and A. Alashwal, “A data model for integrating BIM and blockchain to enable a single source of truth for the construction supply chain data delivery,” *Engineering, Construction and Architectural Management*, vol. 30, no. 10, pp. 4645–4664, Nov. 2023, doi: 10.1108/ECAM-03-2022-0209.

[96] X. (Alice) Qian and E. Papadonikolaki, “Shifting trust in construction supply chains through blockchain technology,” *Engineering, Construction and Architectural Management*, vol. 28, no. 2, pp. 584–602, Feb. 2021, doi: 10.1108/ECAM-12-2019-0676.

[97] P. Y. Hsu, M. Aurisicchio, and P. Angeloudis, “Risk-averse supply chain for modular construction projects,” *Autom Constr*, vol. 106, Oct. 2019, doi: 10.1016/j.autcon.2019.102898.

[98] Z. Wang, T. Wang, H. Hu, J. Gong, X. Ren, and Q. Xiao, “Blockchain-based framework for improving supply chain traceability and information sharing in precast construction,” *Autom Constr*, vol. 111, Mar. 2020, doi: 10.1016/j.autcon.2019.103063.

[99] W. van Groesen and P. Pauwels, “Tracking prefabricated assets and compliance using quick response (QR) codes, blockchain and smart contract technology,” *Autom Constr*, vol. 141, Sep. 2022, doi: 10.1016/j.autcon.2022.104420.

[100] R. S. Jayasinghe, N. Chileshe, and R. Rameezdeen, “Information-based quality management in reverse logistics supply chain: A systematic literature review,” Sep. 13, 2019, *Emerald Group Holdings Ltd.* doi: 10.1108/BIJ-08-2018-0238.

[101] N. Kasim, A. Shamsuddin, R. Zainal, and N. C. Kamarudin, “Implementation of RFID technology for real-time materials tracking process in construction projects,” in *2012 IEEE Colloquium on Humanities, Science and Engineering (CHUSER)*, IEEE, Dec. 2012, pp. 699–703. doi: 10.1109/CHUSER.2012.6504402.

[102] V. Hinkka and J. Tätilä, “RFID tracking implementation model for the technical trade and construction supply chains,” *Autom Constr*, vol. 35, pp. 405–414, 2013, doi: 10.1016/j.autcon.2013.05.024.

[103] J. Du, V. Sugumaran, and B. Gao, “RFID and multi-agent based architecture for information sharing in prefabricated component supply chain,” *IEEE Access*, vol. 5, pp. 4132–4139, 2017, doi: 10.1109/ACCESS.2017.2665778.

[104] T. H. Shin, S. Chin, S. W. Yoon, and S. W. Kwon, “A service-oriented integrated information framework for RFID/WSN-based intelligent construction supply chain management,” in *Automation in Construction*, Oct. 2011, pp. 706–715. doi: 10.1016/j.autcon.2010.12.002.

[105] S. I. Khan, B. R. Ray, and N. C. Karmakar, “RFID localization in construction with IoT and security integration,” Mar. 01, 2024, *Elsevier B.V.* doi: 10.1016/j.autcon.2023.105249.

[106] B. S. Byers, K. Stengele, and C. De Wolf, “Data carriers for circular construction supply chains: An exploratory quantitative analysis,” *J Clean Prod*, vol. 494, Feb. 2025, doi: 10.1016/j.jclepro.2025.145053.

[107] Y. Han, X. Yan, and P. Piroozfar, “An overall review of research on prefabricated construction supply chain management,” *Engineering, Construction and Architectural Management*, vol. 30, no. 10, pp. 5160–5195, Nov. 2023, doi: 10.1108/ECAM-07-2021-0668.

[108] Z. Wang, H. Hu, J. Gong, X. Ma, and W. Xiong, “Precast supply chain management in off-site construction: A critical literature review,” Sep. 20, 2019, *Elsevier Ltd*. doi: 10.1016/j.jclepro.2019.05.229.

[109] I. Y. Wuni and G. Q. Shen, “Developing critical success factors for integrating circular economy into modular construction projects in Hong Kong,” *Sustain Prod Consum*, vol. 29, pp. 574–587, Jan. 2022, doi: 10.1016/j.spc.2021.11.010.

[110] S. MacAskill, S. Mostafa, R. A. Stewart, O. Sahin, and E. Suprun, “Offsite construction supply chain strategies for matching affordable rental housing demand: A system dynamics approach,” *Sustain Cities Soc*, vol. 73, Oct. 2021, doi: 10.1016/j.scs.2021.103093.

[111] Y. Zhang, M. Pan, W. Pan, Y. Yang, and J. Wu, “Enhancing modular construction supply chain: Drivers, opportunities, constraints, concerns, strategies, and measures,” *Developments in the Built Environment*, vol. 18, Apr. 2024, doi: 10.1016/j.dibe.2024.100408.

[112] L. Zeng, Q. Du, L. Zhou, X. Wang, H. Zhu, and L. Bai, “Side-payment contracts for prefabricated construction supply chain coordination under just-in-time purchasing,” *J Clean Prod*, vol. 379,

p. 134830, Dec. 2022, doi: 10.1016/j.jclepro.2022.134830.

[113] V. Dharmapalan, W. J. O'Brien, D. Morrice, and M. Jung, "Assessment of visibility in industrial construction projects: a viewpoint from supply chain stakeholders," *Construction Innovation*, vol. 21, no. 4, pp. 782–799, Oct. 2021, doi: 10.1108/CI-07-2020-0114.

[114] H. Gou, Z. Liu, and Z. Li, "A procurement model with material purchasing value analysis in construction supply chain," in *2011 Chinese Control and Decision Conference (CCDC)*, IEEE, May 2011, pp. 3858–3863. doi: 10.1109/CCDC.2011.5968895.

[115] I. Martek and C. Chen, "Value chain supply procurement strategies in international construction: Cases of foreign constructors in China," *Management Decision*, vol. 54, no. 2, pp. 501–521, Mar. 2016, doi: 10.1108/MD-01-2015-0018.

[116] M. Marzouk and M. Sabbah, "AHP-TOPSIS social sustainability approach for selecting supplier in construction supply chain," *Cleaner Environmental Systems*, vol. 2, Jun. 2021, doi: 10.1016/j.cesys.2021.100034.

[117] Z. N. Tushar, A. B. M. M. Bari, and M. A. Khan, "Circular supplier selection in the construction industry: A sustainability perspective for the emerging economies," *Sustainable Manufacturing and Service Economics*, vol. 1, p. 100005, Apr. 2022, doi: 10.1016/j.smse.2022.100005.

[118] G. Hemanth, C. Sidhartha, S. Jain, P. Saihanish, and V. Rohit, "AHP analysis for using cloud computing in supply chain management in the construction industry," in *2017 2nd International Conference for Convergence in Technology (I2CT)*, IEEE, Apr. 2017, pp. 1228–1233. doi: 10.1109/I2CT.2017.8226323.

[119] S. Y. Kim and V. T. Nguyen, "An AHP Framework for Evaluating Construction Supply Chain Relationships," May 01, 2018, *Springer Verlag*. doi: 10.1007/s12205-017-1546-1.

[120] D. Ewuga and M. Adesi, "Integrating sustainability practices into the Irish construction supply chain: main contractors' perspective," *Built Environment Project and Asset Management*, vol. 13, no. 1, pp. 105–122, Jan. 2023, doi: 10.1108/BEPAM-01-2022-0005.

[121] A. S. A. Shukor, M. F. Mohammad, R. Mahbub, and F. Halil, "Towards Improving Integration of Supply Chain in IBS Construction Project Environment," *Procedia Soc Behav Sci*, vol. 222, pp. 36–45, Jun. 2016, doi: 10.1016/j.sbspro.2016.05.172.

[122] H. F. Rahman, R. K. Chakrabortty, and M. J. Ryan, "An Optimised Supplier Selection Plan for Supply Chain Integrated Project Scheduling Problem," in *2019 IEEE Technology & Engineering Management Conference (TEMSCON)*, IEEE, Jun. 2019, pp. 1–6. doi: 10.1109/TEMSCON.2019.8813610.

[123] F.-S. Hsieh, "Location-aware workflow scheduling in supply chains based on multi-agent systems," in *2015 Conference on Technologies and Applications of Artificial Intelligence (TAAI)*, IEEE, Nov. 2015, pp. 441–448. doi: 10.1109/TAAI.2015.7407087.

[124] Y. Niu, R. Huang, and W. Shi, "Reschedule procurement of major equipment on the base of construction supply chain," in *Proceedings - 4th International Joint Conference on Computational Sciences and Optimization, CSO 2011*, 2011, pp. 668–671. doi: 10.1109/CSO.2011.220.

[125] W. Elmughrabi, O. Ben Sassi, T. M. Dao, and A. Chabaane, "Collaborative supply chain planning and scheduling of construction projects," in *IFAC-PapersOnLine*, Elsevier B.V., 2020, pp. 10761–10766. doi: 10.1016/j.ifacol.2020.12.2858.

[126] S. Grabham and E. Manu, "Diffusion of platform thinking as an innovation in the construction supply chain," *Proceedings of Institution of Civil Engineers: Management, Procurement and Law*, vol. 175, no. 3, pp. 119–130, Jan. 2022, doi: 10.1680/jmapl.21.00019.

[127] Z. Pablo and K. A. London, "Stable relationality and dynamic innovation: two models of collaboration in SME-driven offsite manufacturing supply chains in housing construction," *Engineering, Construction and Architectural Management*, vol. 27, no. 7, pp. 1553–1577, Jul. 2020, doi: 10.1108/ECAM-07-2019-0346.

[128] M. Hadid, M. Gunduz, and Y. H. Kwak, "Assessing Interorganizational Relationships Among Key Supply Chain Partners (KSCPs) in Public Construction Projects," *IEEE Trans Eng Manag*, vol. 71, pp. 8839–8856, 2024, doi: 10.1109/TEM.2023.3293469.

[129] R. Pal, P. Wang, and X. Liang, "The critical factors in managing relationships in international engineering, procurement, and construction (IEPC) projects of Chinese organizations," *International Journal of Project Management*, vol. 35, no. 7, pp. 1225–1237, Oct. 2017, doi: 10.1016/j.ijproman.2017.05.010.

[130] W. Grenzfurtner and M. Gronalt, "Developing a continuous improvement perspective for subcontractor involvement in the industrialised housebuilding supply chain," *Supply Chain Management*, vol. 26, no. 2, pp. 174–191, Feb. 2021, doi: 10.1108/SCM-12-2019-0435.

[131] Y. Feng, "A Blackboard-Based Negotiation for Collaboration in Construction Supply Chain System," in *2010 International Conference on Management and Service Science*, IEEE, Aug. 2010, pp. 1–3. doi: 10.1109/ICMSS.2010.5575793.

[132] C. Xie, D. Wu, J. Luo, and X. Hu, "A case study of multi-team communications in construction design under supply chain partnering," *Supply Chain Management*, vol. 15, no. 5, pp. 363–370, 2010, doi: 10.1108/13598541011068279.

[133] A. Rehan, D. Thorpe, and A. Heravi, "A framework for leadership practices and communication in the context of the construction sector," *Project Leadership and Society*, vol. 5, Dec. 2024, doi: 10.1016/j.plas.2024.100142.

[134] A. Arantes, L. M. D. F. Ferreira, and A. A. Costa, "Is the construction industry aware of supply chain management? The Portuguese contractors' perspective," *Supply Chain Management*, vol. 20, no. 4, pp. 404–414, Jun. 2015, doi: 10.1108/SCM-06-2014-0207.

[135] A. A. Othman, S. A. Rahman, V. P. K. Sundram, and M. A. Bhatti, "Modelling marketing resources, procurement process coordination and firm performance in the Malaysian building construction industry," *Engineering, Construction and Architectural Management*, vol. 22, no. 6, pp. 644–668, Nov. 2015, doi: 10.1108/ECAM-02-2014-0030.

[136] E. O. Ibem and S. Laryea, "Survey of digital technologies in procurement of construction projects," 2014, *Elsevier*. doi: 10.1016/j.autcon.2014.07.003.

[137] F. Ying, J. Tookey, and J. Roberti, "Addressing effective construction logistics through the lens of vehicle movements," *Engineering, Construction and Architectural Management*, vol. 21, no. 3, pp. 261–275, 2014, doi: 10.1108/ECAM-06-2013-0058.

[138] N. Umeokafor, "An appraisal of the barriers to client involvement in health and safety in Nigeria's construction industry," *Journal of Engineering, Design and Technology*, vol. 15, no. 4, pp. 471–487, 2017, doi: 10.1108/JEDT-06-2016-0034.

[139] Q. Wang and Q. Shi, "The incentive mechanism of knowledge sharing in the industrial construction supply chain based on a supervisory mechanism," *Engineering, Construction and Architectural Management*, vol. 26, no. 6, pp. 989–1003, Jul. 2019, doi: 10.1108/ECAM-05-2018-0218.

[140] M. Saini, M. Arif, and D. J. Kulonda, "Challenges to transferring and sharing of tacit knowledge within a construction supply chain," *Construction Innovation*, vol. 19, no. 1, pp. 15–33, Mar. 2019, doi: 10.1108/CI-03-2018-0015.

[141] J. F. Ying, J. Tookey, and J. Roberti, "SCM competencies in construction: issues and challenges in New Zealand," *Journal of Engineering, Design and Technology*, vol. 13, no. 4, pp. 522–538, Oct. 2015, doi: 10.1108/JEDT-01-2013-0002.

[142] R. H. Lavikka, R. Smeds, and M. Jaatinen, "Coordinating collaboration in contractually different complex construction projects," *Supply Chain Management*, vol. 20, no. 2, pp. 205–217, Mar. 2015, doi: 10.1108/SCM-10-2014-0331.

[143] R. Sariola and M. Martinsuo, "Enhancing the supplier's non-contractual project relationships with designers," *International Journal of Project Management*, vol. 34, no. 6, pp. 923–936, Aug. 2016, doi: 10.1016/j.ijproman.2016.04.002.

[144] F. Y. Y. Ling, B. G. Y. Toh, M. Kumaraswamy, and K. Wong, "Strategies for integrating design and construction and operations and maintenance supply chains in Singapore," *Structural Survey*, vol. 32, no. 2, pp. 158–182, 2014, doi: 10.1108/SS-02-2013-0015.

[145] M. Venselaar, V. Gruis, and F. Verhoeven, "Implementing supply chain partnering in the construction industry: Work floor experiences within a Dutch housing association," *Journal of Purchasing and Supply Management*, vol. 21, no. 1, pp. 1–8, Mar. 2015, doi: 10.1016/j.pursup.2014.07.003.

[146] M. Ershadi, M. Jefferies, P. Davis, and M. Mojtahedi, "Barriers to achieving sustainable construction project procurement in the private sector," *Clean Eng Technol*, vol. 3, Jul. 2021, doi: 10.1016/j.clet.2021.100125.

[147] S. Sadeghi, A. Akbarpour, and H. Abbasianjahromi, "Provide a Lean and Agile Strategy for an Antifragile Sustainable Supply Chain in the Construction Industry(residential complex)," *Cleaner Logistics and Supply Chain*, vol. 5, Dec. 2022, doi: 10.1016/j.clscn.2022.100079.

[148] S. Demirkesen and B. Ozorhon, "Impact of integration management on construction project management performance," *International Journal of Project Management*, vol. 35, no. 8, pp. 1639–1654, Nov. 2017, doi: 10.1016/j.ijproman.2017.09.008.

[149] O. Osypchuk and S. Iwan, "Construction site deliveries in urban areas, based on the example of Szczecin," in *Transportation Research Procedia*, Elsevier B.V., 2019, pp. 389–397. doi: 10.1016/j.trpro.2019.06.041.

[150] A. Ibrahim, T. Zayed, and Z. Lafhaj, "Trends and gaps in lean construction practices for construction of megaprojects: A critical review," Apr. 01, 2025, *Elsevier B.V.* doi: 10.1016/j.aej.2025.01.046.

[151] S. Mostafa, N. Chileshe, and T. Abdelhamid, "Lean and agile integration within offsite construction using discrete event simulation A systematic literature review," 2016, *Emerald Group Publishing Ltd.* doi: 10.1108/CI-09-2014-0043.

[152] P. V. H. Son, N. H. C. Duy, and P. T. Dat, "Optimization of Construction Material Cost

through Logistics Planning Model of Dragonfly Algorithm — Particle Swarm Optimization," *KSCE Journal of Civil Engineering*, vol. 25, no. 7, pp. 2350–2359, Jul. 2021, doi: 10.1007/s12205-021-1427-5.

[153] X. Zhang, M. Zhao, and J. Yu, "Discussing Construction Supply Chains in China," in *2010 2nd International Workshop on Intelligent Systems and Applications*, IEEE, May 2010, pp. 1–4. doi: 10.1109/IWISA.2010.5473533.

[154] M. Thunberg, M. Rudberg, and T. K. Gustavsson, "Categorising on-site problems A supply chain management perspective on construction projects," 2017, *Emerald Group Publishing Ltd.* doi: 10.1108/CI-10-2015-0059.

[155] H. Golpîra, "Optimal integration of the facility location problem into the multi-project multi-supplier multi-resource Construction Supply Chain network design under the vendor managed inventory strategy," *Expert Syst Appl*, vol. 139, Jan. 2020, doi: 10.1016/j.eswa.2019.112841.

[156] R. V. Silva, J. de Brito, and R. K. Dhir, "Availability and processing of recycled aggregates within the construction and demolition supply chain: A review," Feb. 01, 2017, *Elsevier Ltd*. doi: 10.1016/j.jclepro.2016.12.070.

[157] A. Sobotka, J. Sagan, M. Baranowska, and E. Mazur, "Management of reverse logistics supply chains in construction projects," in *Procedia Engineering*, Elsevier Ltd, 2017, pp. 151–159. doi: 10.1016/j.proeng.2017.11.033.

[158] N. Frederiksen, L. Fredslund, and S. C. Gottlieb, "The hybridity of strategic partnerships and construction supply chain management," in *Emerald Reach Proceedings Series*, vol. 2, Emerald Group Holdings Ltd., 2019, pp. 77–83. doi: 10.1108/S2516-285320190000002029.

[159] V. R. Battula, S. K. Namburu, and V. Kone, "A study on factors involved in implementation of supply chain management in construction industry," in *Materials Today: Proceedings*, Elsevier Ltd, Jan. 2020, pp. 446–449. doi: 10.1016/j.matpr.2020.04.900.

[160] A. Errida, B. Lotfi, and E. Semma, "Supply chain management and organizational change: Integrating an activity after its subcontracting in a Moroccan construction company," in *2017 International Colloquium on Logistics and Supply Chain Management (LOGISTIQUA)*, IEEE, Apr. 2017, pp. 112–117. doi: 10.1109/LOGISTIQUA.2017.7962883.

[161] F. Ciccullo, M. Pero, and A. S. Patrucco, "Designing circular supply chains in start-up companies: evidence from Italian fashion and construction start-ups," *International Journal of Logistics Management*, vol. 34, no. 3, pp. 553–581, Apr. 2023, doi: 10.1108/IJLM-04-2022-0158.

[162] S. Jayakodi, S. Senaratne, S. Perera, and K. Bamdad, "Circular economy assessment using project-level and organisation-level indicators for construction organisations: A systematic review," Jul. 01, 2024, *Elsevier B.V.* doi: 10.1016/j.spc.2024.05.025.