



(REVIEW ARTICLE)



## Sustainable Procurement Research: A systematic literature review

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### Abstract

Sustainable Procurement Research: A Systematic Literature Review] This study aims to conduct a systematic review of the development and implementation of sustainable procurement (SP) with the main focus on the supplier evaluation process. This study analyzed 17 selected articles from the scopus database using the PRISMA approach to ensure a comprehensive and relevant literature selection process. The results of the study show that in recent years there has been a significant increase in academic interest in SP, especially in the context of supplier evaluation, with four main dimensions of supplier evaluation, namely: economic, environmental, social, and governance. The economic dimension includes cost efficiency and investment in green supply chains, while the environmental dimension includes carbon emission reduction and waste management. Social and governance aspects are also important considerations. Analytical techniques such as Fuzzy Decision-Making and AHP are widely used to support more objective supplier evaluations. This study recommends the development of standardized evaluation models and the use of digital technologies to support sustainable procurement practices in the future.

**Keywords:** Sustainable Procurement; Supplier Evaluation; Systematic Review; Green Supply Chain

### 1. Introduction

Procurement is a process or activity to obtain and provide various products and services needed [1]. The procurement process includes several steps, such as identifying needs, exploring resources, market analysis, determining suppliers, drafting agreements, receiving goods or services delivered, and monitoring and assessing the quality of supplier performance [2], [3]. The role of procurement in supporting organizational performance has grown rapidly, from merely a tactical and passive function to a proactive strategic function [4]. Procurement is important because it can have a direct impact on the performance of an organization, both public and private. The implementation of good procurement practices can have a positive impact, such as cost efficiency, improved quality and delivery accuracy, better relationships with suppliers, and encouragement to innovate. The ability to fine-tune procurement processes and strategies has become a top priority for an organization aiming to improve their overall performance [5], [6].

The transition from conventional procurement to sustainable procurement (SP) is becoming increasingly important as awareness of the environmental and social impacts of business activities increases. Sustainable procurement is considered a strategic approach that has the principle that organizations can achieve profits simultaneously, combining aspects of profitability, Environmental Responsibility, and social contribution. The integration of these three aspects, the organization not only obtain economic benefits, but also can have a positive impact on the environment and society [7]. SP policies and practices generally focus on reducing packaging and waste, evaluating suppliers based on environmental performance, the ability to develop environmentally friendly products, and their contribution to reducing carbon emissions generated during the transportation of goods [8]. The success or failure of SP

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implementation is largely determined by the willingness, involvement, support, and strong commitment of all stakeholders, both within the organization and external parties related to the procurement process [9].

Research by [10] has analyzed SP-related developments from 1997 to July 2023, highlighting the importance of sustainable procurement in addressing environmental and social challenges. SP is not only a tool to reduce environmental impact, but also as a strategic approach in creating long-term value for the economy and society. Then [11] revealed the project management office (PMO) contributes significantly to the sustainable procurement process in the private sector. The private sector is starting to show an increase in adopting SP, mainly due to pressure from consumers, investors and increasingly stringent environmental-related regulations. In the field of construction [12] explained that the implementation of SP was able to improve project performance and minimize losses in four of the six Design and Build (DB) projects studied. The integration of sustainability principles into the procurement process can not only reduce environmental impacts, but also improve cost efficiency, project quality, and stakeholder relationships. SP has great potential to transform the construction sector which is known as one of the major contributors to global carbon emissions and waste [13]. While [14] adopts sustainable procurement practices in supplier selection in Brazilian manufacturing companies. The implementation of social aspects by suppliers is still low and less structured, this shows the need for a more systematic approach so that social aspects can be a more serious concern. Sustainable procurement practices can also be adopted in the energy sector, [15] has developed a stochastic optimization model to improve coal procurement efficiency, this model has proven to be able to significantly reduce carbon emissions and operating costs. This study proves that sustainable procurement pays great attention to environmental aspects without sacrificing economic aspects.

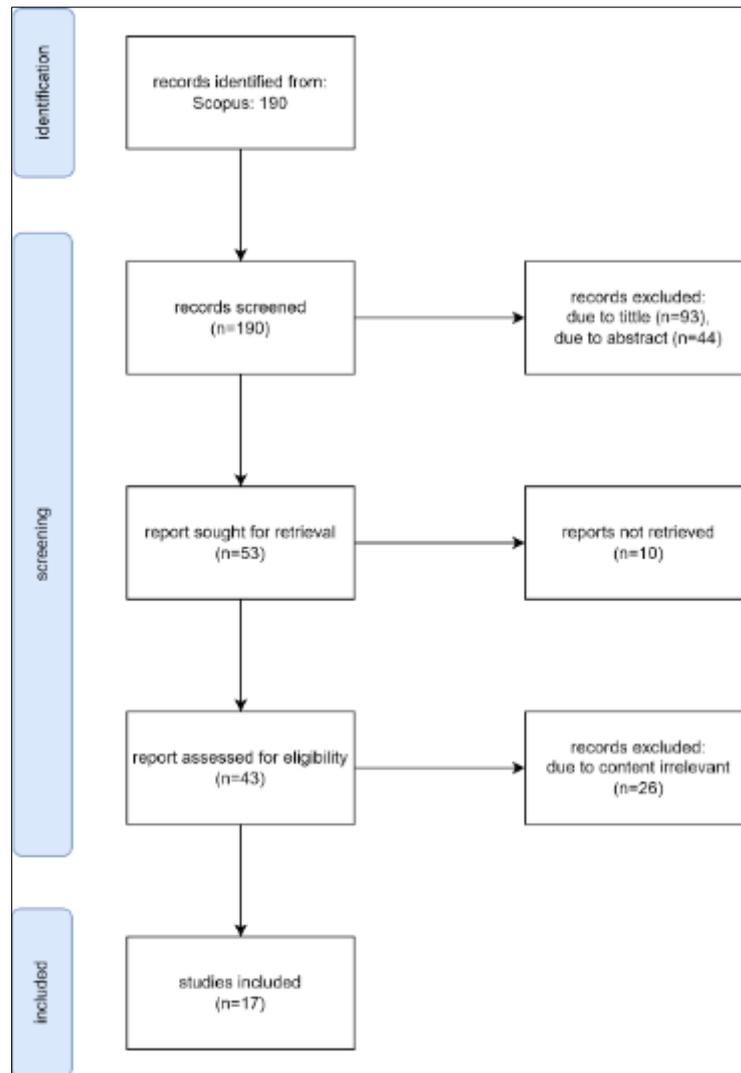
Although empirical evidence has proven the magnitude of the benefits of SP, challenges in the implementation of SP are still a major obstacle. The main obstacles in the implementation of SP include the lack of supportive policies, limited organizational resources, lack of understanding of sustainable procurement, as well as the perception of high costs [16]. The need for strong policies and effective institutional support to achieve success in sustainable procurement. Institutions have a role as mediators between policy and implementation of sustainable procurement [17].

One of the key aspects in the implementation of SP is the evaluation and selection of suppliers. Suppliers have an important role in the supply chain, and their performance in environmental, social, and governance aspects can influence the success of SP. Evaluating suppliers holistically is not easy, organizations are often faced with the complexity of measuring and comparing supplier performance. This study aims to fill the literature gap by conducting a systematic review of recent developments in the field of sustainable procurement. By analyzing trends, challenges, and opportunities in SP implementation, this study is expected to provide a more comprehensive understanding of how SP can be optimized to achieve sustainability goals. The study also aims to identify effective decision support tools that can be used to evaluate suppliers holistically, what criteria should be considered in evaluating suppliers to achieve sustainable procurement, and how the role of supplier evaluation in supporting the successful implementation of sustainable procurement.

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## 2. Methods

This study uses Scopus as the principal source for gathering articles pertinent to the research issue. Scopus was selected because of its status as one of the largest and most reputable academic databases, encompassing a diverse array of fields. While Scopus provides extensive coverage, potential limitations include the exclusion of non-English sources and articles outside indexed journals, which could marginalize relevant findings. A search was performed utilizing the following query: \*TITLE-ABS-KEY ("sustainable procurement" OR "green procurement") AND TITLE-ABS-KEY (evaluation OR assess)\*\*. This combination was crafted to ensure that the selected articles focus on sustainable and green procurement practices while incorporating elements of evaluation and assessment. The keywords were chosen based on their relevance to the research topic and their capacity to encompass a broad range of studies related to procurement sustainability assessments. To maintain the quality and relevance of the collected literature, the search was refined by restricting the results to English-language articles and excluding non-article document types. This approach ensures that the selected studies align with academic rigor while minimizing linguistic and format-based biases. A total of 190 articles that met the criteria were successfully identified at the completion of the search process through Scopus. Subsequently, the study implemented a series of filtering procedures to ensure that the examined papers aligned with the research topic. Figure 1 illustrates the article filtration procedure employed in this study utilizing the PRISMA framework. The initial filtering phase involved title screening, where publications with irrelevant titles were excluded. Criteria for exclusion included topics that were not aligned with the research focus, leading to the removal of 93 articles.



**Figure 1** Filtering Process

This process resulted in 97 articles being considered for further evaluation. The second filtering phase concentrated on the abstracts. At this stage, the abstracts of each publication were reviewed to determine their relevance to the research topic. A total of 44 papers were excluded as their abstracts did not meet the study criteria. Consequently, 53 articles proceeded to the next phase. A retrieval process was then conducted to obtain the full text of the selected articles. However, 10 reports were not accessible, reducing the number of articles available for assessment to 43. The final filtering stage involved a thorough review of the full-text articles. Each article was carefully examined to verify its relevance to the research subject. At this stage, 26 articles were removed due to their content being deemed irrelevant. Following this systematic filtration process, a total of 17 studies were included in the final analysis. Figure 1 depicts the PRISMA procedure.

### 3. Results and discussion

In the results and discussion section, the researcher will analyze the final findings of 190 documents that will be examined from Scopus results using VOSviewer software

#### 3.1. Scopus Analysis

##### 3.1.1. Title Abs Key

The search results yielded a total of 190 articles in format \*TITLE-ABS-KEY ("sustainable procurement" OR "green procurement") AND TITLE-ABS-KEY (evaluation OR assess)\*\*

3.1.2. Annual Publication

Figure 2 illustrates the number of publications per year related to supplier assessment using a sustainability approach, based on the literature review conducted in this study. The trend shows fluctuations in publication frequency over the years, with a noticeable increase in recent years, particularly in 2024. This indicates a growing academic interest in the topic. The data reveal that research on sustainable supplier assessment has gained more attention in the past few years, suggesting an increasing recognition of its importance, suggesting an increasing recognition of its importance. Figure 2 presents a distribution of journals that have published articles related to sustainable procurement. The Journal of Cleaner Production stands out as the most prolific source, indicating its strong focus on sustainability-related topics. This aligns with the journal’s reputation for publishing research on sustainable development, environmental management, and circular economy practices.

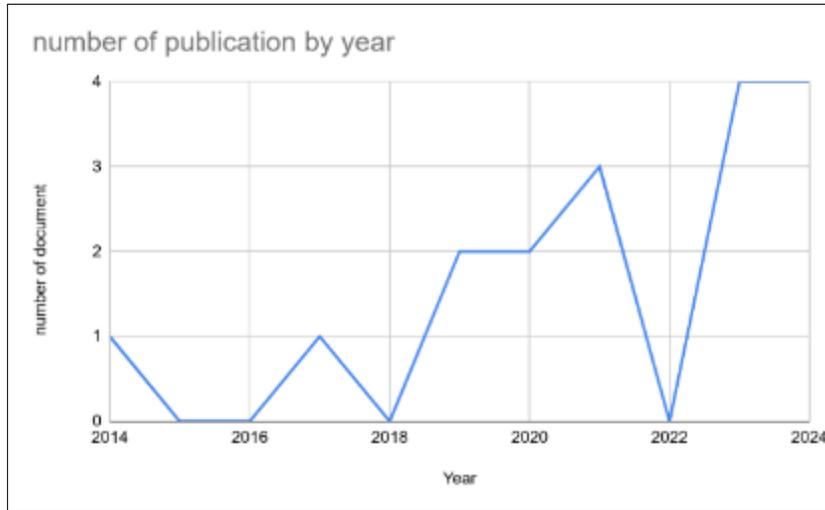


Figure 2 Annual Publication

3.1.3. Most Cited Article

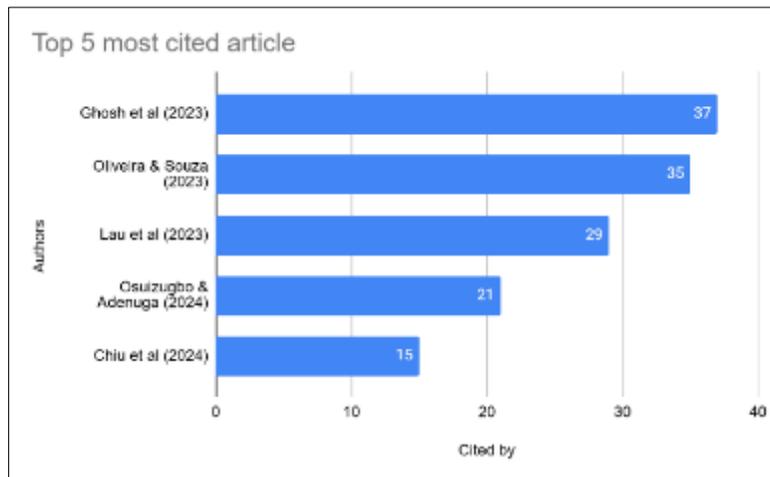


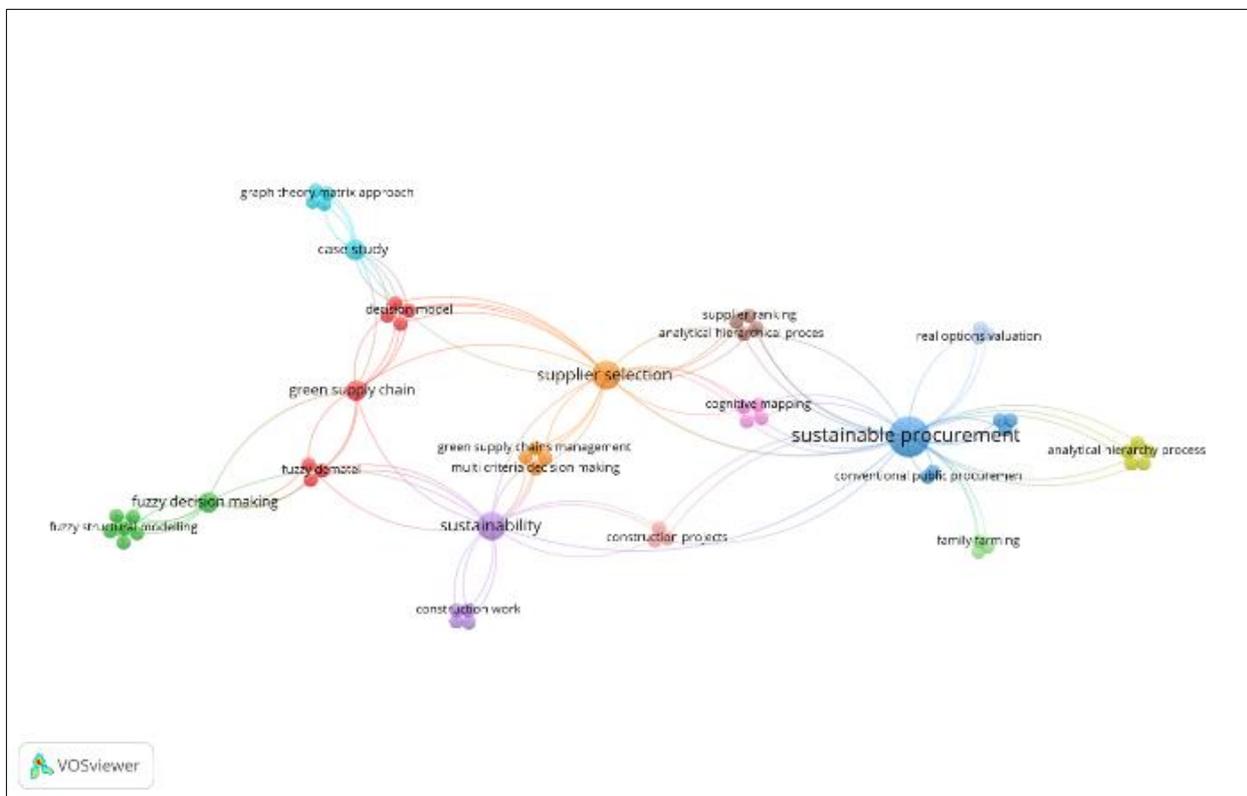
Figure 3 Most Cited Article

Figure 3 showcases the top five most cited articles related to sustainable procurement, highlighting the key authors who have made significant contributions to this research area. The most cited work is by [18] with 37 citations, followed closely by [19] with 35 citations. Other notable contributions come from [20], [21], and [22], demonstrating a growing interest in sustainable procurement research over the past two years. The dominance of recent publications in the citation count suggests an increasing academic focus on this topic, with these authors playing a crucial role in shaping the discourse. Their studies likely provide foundational insights or innovative frameworks that are widely referenced within the field. Identifying these influential researchers can guide further exploration of key concepts, methodologies, and emerging trends in sustainable procurement.

### 3.2. Vosviewer Analysis

#### 3.2.1. Keyword Co-Occurrence

The findings of the network visualization highlight multiple facets, such as sustainable procurement, supplier selection, decision-making models, and green supply chain management. Each cluster represents a distinct perspective, providing valuable insights for further research. This thematic diversity underscores the complexity of sustainability in procurement and supply chain management, emphasizing the need for a comprehensive approach to studying and promoting sustainable practices in supplier evaluation and procurement strategies. An overlay visualization was also generated to illustrate the temporal dynamics of term occurrences. Figure 4 presents this visualization, depicting the average year of keyword occurrences with a color gradient ranging from blue for earlier terms to yellow for more recent terms. This analysis reveals emerging research topics, such as supplier ranking, cognitive mapping, and real options valuation, indicating a growing interest in developing systematic approaches to supplier evaluation and procurement decision-making. These findings align with recent global sustainability trends and efforts to integrate multi-criteria decision-making methods and fuzzy modeling into procurement practices. The results emphasize the importance of establishing standardized sustainability assessment frameworks to ensure accountability and enhance the effectiveness of supplier evaluation processes. While the keyword groupings mostly aligned with our thematic analysis, some unexpected patterns emerged. Certain terms, such as "family farming" and "construction work," appeared in multiple clusters rather than forming distinct groups, indicating their cross-cutting relevance across various sustainability domains. Additionally, terms related to "graph theory matrix approach" and "analytical hierarchy process" showed strong interconnections, suggesting that structured decision-making techniques are increasingly being integrated into sustainable procurement and supply chain management research. These findings highlight the evolving nature of sustainable procurement research, showcasing the shift toward quantitative assessment methods, supplier performance ranking, and advanced decision-support frameworks. Understanding these trends can help researchers and practitioners develop more effective and adaptable sustainability strategies in supplier selection and procurement.



**Figure 4** Visualization of Keyword Co-Occurance

#### 3.2.2. Overlay Visualization Keyword Co-Occurrence

The results categorized the terms into twelve groups based on proximity and connection, illustrating the primary themes of this research. Table 1 presents a comprehensive analysis of the keywords in each cluster. These clusters highlight key themes, including 'decision-making models,' 'green supply chain management,' 'public procurement

policies,' 'sustainability assessment,' 'construction industry sustainability,' and 'supplier evaluation.' These themes reflect distinct yet interconnected focal points in sustainable procurement research. The analysis of term clustering enables researchers to discern principal subject areas and their interconnections, offering a systematic view of academic discourse around sustainable procurement and supplier selection. Table 1 presents a comprehensive analysis of the keywords in each cluster. These clusters represent separate yet interrelated research domains, reflecting diverse focal points in sustainable procurement research.

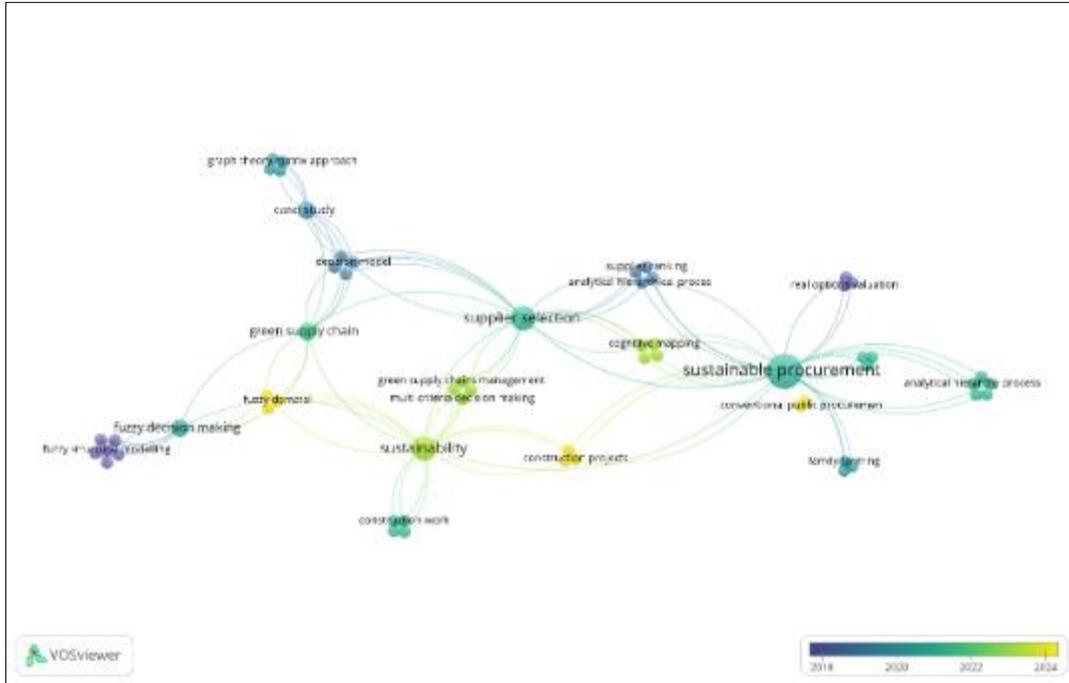


Figure 5 Overlay Visualization

Table 1 Cluster of Keyword

Cluster	Keywords
Cluster 1 (fuzzy decision making in green supply chain)	Decision model; fuzzy dematel; fuzzy topsis; green supplier evaluation; green supply chain; industrial application; krajic; purchasing
Cluster 2 (fuzzy modeling and green procurement)	Dematel; drivers; fuzzy decision making; fuzzy structural modelling; green procurement; structural modelling; theory building
Cluster 3 (sustainable public procurement and transportation)	Conventional public procurement; decision support tool; environmental goals; public-private partnership; sustainable procurement; sustainable transportation
Cluster 4 (decision analysis in innovation and industry)	Analytical hierarchy process; external factors; innovation capabilities; internal factors; oil and gas industry
Cluster 5 (sustainability in construction procurement)	Construction work; developer; principles; procurement; sustainability
Cluster 6 (sustainability practices in logistics)	Case study; graph theory matrix approach; logistics service providers; sustainability index; sustainability practices
Cluster 7 (multi-criteria decision making in supply chains)	Green supply chains management; multi-criteria decision making; multivariate analysis; principal component analysis; supplier selection
Cluster 8 (supplier performance and ranking)	Performance measures; purchasing order allocation; supplier ranking

Cluster 9 (sustainability impact and problem structuring)	Cognitive mapping; life cycle sustainability assessment; problem structuring method; sustainability impact
Cluster 10 (decision making in construction projects)	Costruction projects; decision making; decisive factors
Cluster 11 (sustainable supply chain in public procurement and agriculture)	Family farming; public procurement; sustainable supply chain management
Cluster 12 (supplier evaluation and development)	Real options valuation; supplier development; supplier evaluation

Table 2 presents The literature review's analysis results are based on the prior screening process, which involved reviewing keywords, titles, abstracts, and the complete content of the reading materials. indicates that 17 journals have been chosen for additional examination to elucidate the direction of this research and discover innovations from prior studies.

Most of the journals reviewed share a common framework in evaluating sustainability, primarily through the lens of the triple bottom line: economic, environmental, and social dimensions. Across the economic aspect, there is a noticeable alignment authors such as [23], [24], and [18] consistently highlight elements like profitability, cost efficiency, and financial performance. Several also emphasize long-term considerations, including life cycle costing and strategic supplier relations, underlining the growing attention toward holistic value creation.

Environmental variables show a similar convergence. Topics such as waste management, emission reduction, resource efficiency, and the adoption of renewable energy appear frequently. Research by [25] and [19] offers detailed perspectives on eco-friendly practices, including sustainable packaging and biodiversity protection, while studies like those of [26] incorporate environmental certifications and internal policy enforcement as part of their analysis.

Social sustainability is another consistent theme. Many journals examine workforce well-being, safety standards, rights and inclusion, and community engagement. Notably, [21] and [27] expand this perspective by discussing support for vulnerable populations, such as people with disabilities, and the importance of capacity building and equitable participation in development initiatives.

Nonetheless, the scope and structure of the dimensions vary across studies. Some, like [20] and [26], introduce a governance component, addressing transparency, institutional structure, and regulatory compliance. [27] in particular, presents a broader framework by incorporating ethical trade, SME support, and innovation-based procurement an approach that distinguishes it from others.

There are also studies with more specialized angles. [28], for instance, explores sustainability through organizational and supplier management, emphasizing flexibility, risk, and internal collaboration. Meanwhile, [22] considers external influences like political stability and natural disasters, signaling a shift toward integrating macro-level risks. [29] offers a technical analysis centered on procurement risks and environmental dynamics, further demonstrating the thematic diversity in sustainability research.

In sum, while the core concepts of economic, environmental, and social responsibility remain consistent, each journal brings a unique lens to the discussion, shaped by its methodological approach, sectoral focus, and thematic priorities.

The selection of suppliers and sustainable procurement has been increasingly evolving by considering multiple dimensions, namely economic, environmental, social, and governance aspects. In the economic dimension, research indicates that factors such as price, financial performance, and cost efficiency are the primary considerations in supplier selection [23], [24]. Several studies also emphasize the importance of investing in green products and utilizing life cycle costing to enhance long-term profitability [18], [21].

In the environmental dimension, research extensively highlights the significance of implementing environmental management systems, reducing carbon emissions, and managing waste and recycling as key factors in evaluating green suppliers[18], [19]. Other studies assert that environmental certifications and green procurement policies are increasingly becoming essential standards for suppliers to remain competitive in the global market [24], [26].

Meanwhile, the social dimension of sustainable procurement focuses more on aspects such as workers' rights, occupational health and safety, and community engagement[20], [21]. Social factors often pose challenges in implementing green procurement policies due to the lack of uniform standards across industries and countries.

Beyond these three primary dimensions, several studies also highlight the role of governance and transparency in sustainable procurement. Factors such as organizational governance structures, regulatory compliance, and sustainable procurement policies are becoming increasingly important in ensuring a responsible supply chain [20], [26]. Some studies further suggest that integrating sustainability factors into government procurement policies and Public-Private Partnership (PPP) projects can enhance corporate performance in Environmental, Social, and Governance (ESG) aspects [27], [30].

Overall, these studies demonstrate that multi-criteria approaches such as the Analytic Hierarchy Process (AHP), Fuzzy Decision-Making, and Real Options Valuation are increasingly used to assess suppliers by considering uncertainty and decision-making flexibility [29], [31]. For future research, many studies recommend exploring hybrid methods such as Fuzzy-AHP or Multi-Criteria Decision-Making (MCDM) to improve the accuracy of supplier evaluation and develop broader sustainability indicators [32], [33].

**Table 2** Literature Review

Author	Variable
[23]	1. Economic Dimension : - Quality - Price - Delivery - Production Facilities And Capacity - Financial Situation 2. Environmental Dimension: - Pollution Controls - Pollution Prevention - Environmental Management System - Energy Consumption 3. Social Dimension: - Employment Practices - Health And Safety
[24]	1. Economic Dimension : - Company Age - Capital - Turnover - Profits - Dynamism 2. Environmental Dimension: - Environmental Certification - Transport Optimization - Recycling Rate - Carbon Balance - Eco-Conception 3. Social Dimension: - Safety Certification - Data Sheets Msds Procedure
[21]	1.Social Dimension - Workforce And User Satisfaction - Occupational Health And Safety - Stakeholder Participation (Including Community Engagement)

	<ul style="list-style-type: none"> <li>- Equal Employment Opportunities</li> <li>- Training And Skill Development</li> <li>- Social Inclusion And Security</li> </ul> <p>2.Economic Dimension</p> <ul style="list-style-type: none"> <li>- Value For Money</li> <li>- Use Of Life Cycle Costing</li> <li>- Investment In Green Products And Renewable Energy</li> <li>- Profitability And Competitiveness</li> <li>- Productivity And Financial Performance</li> </ul> <p>3.Environmental Dimension</p> <ul style="list-style-type: none"> <li>- Waste Management And Recycling</li> <li>- Resource Use Efficiency (Water, Energy, And Materials)</li> <li>- Utilization Of Renewable Energy</li> <li>- Healthy Indoor Air Quality</li> <li>- Biodiversity And Landscape Conservation</li> </ul>
[18]	<p>1.Economic Dimension</p> <ul style="list-style-type: none"> <li>- Increased Investment In Green Supply Chain Management (Gscm)</li> <li>- Cost Savings In Total Expenditure</li> </ul> <p>Environmental Dimension</p> <ul style="list-style-type: none"> <li>- Effective Waste Management System</li> <li>- Implementation Of Emission Control Systems</li> <li>- Collaboration With Suppliers For Green Procurement</li> </ul> <p>2.Environmental Planning</p> <ul style="list-style-type: none"> <li>- Implementation Of Strict Environmental Policies</li> <li>- Generation Of Hazardous Waste</li> <li>- Use Of Eco-Friendly Packaging Materials</li> <li>- Top Management Commitment To Gscm Implementation</li> </ul> <p>3.Operational Dimension</p> <ul style="list-style-type: none"> <li>- Utilization Of Energy-Efficient Technology</li> <li>- Material Reuse</li> <li>- Reduction Of Scrap Materials</li> <li>- Design For Optimal Resource Utilization</li> </ul>
[19]	<p>1.Environmental</p> <ul style="list-style-type: none"> <li>- Ecosystem Quality</li> <li>- Climate Change</li> <li>- Resource Depletion</li> <li>- Cumulative Energy Demand</li> </ul> <p>2.Economic</p> <ul style="list-style-type: none"> <li>- Ownership Cost</li> <li>- External Life Cycle Cost</li> </ul> <p>3.Social</p> <ul style="list-style-type: none"> <li>- Impact On Society, Workers, And Local Communities</li> <li>- Human Rights</li> <li>- Workers' Health And Safety</li> <li>- Consumer Transparency And Privacy</li> </ul>
[20]	<p>1.Environmental Impact</p>

	<ul style="list-style-type: none"> <li>- Resource Consumption</li> <li>- Carbon Emissions</li> <li>- Waste And Hazardous Material Management</li> <li>- Circular Economy Principles</li> <li>- Biodiversity Protection</li> </ul> <p>2.Social Responsibility</p> <ul style="list-style-type: none"> <li>- Fair Labor Practices</li> <li>- Human Rights</li> <li>- Workers' Health And Safety</li> <li>- Community Engagement</li> <li>- Responsible Sourcing</li> </ul> <p>3.Economic Consideration</p> <ul style="list-style-type: none"> <li>- Cost Savings</li> <li>- Supplier Relationships</li> <li>- Brand Reputation And Value</li> <li>- Market Access And Compliance</li> <li>- Risk Management</li> </ul> <p>4.Governance And Transparency</p> <ul style="list-style-type: none"> <li>- Organizational Governance Structure</li> <li>- Policies And Procedures Related To Sustainable Procurement</li> <li>- Transparency And Disclosure Of Information To Stakeholders</li> </ul>
[26]	<p>1.Environment (Lingkungan)</p> <ul style="list-style-type: none"> <li>- Environmental Management System</li> <li>- Green Business Goals</li> <li>- Green Products</li> <li>- External Environment Certification</li> <li>- Environmental Violations</li> </ul> <p>2. Society (Sosial)</p> <ul style="list-style-type: none"> <li>- Institution System</li> <li>- Health And Safety</li> <li>- Social Contribution</li> </ul> <p>3. Governance (Tata Kelola)</p> <ul style="list-style-type: none"> <li>- Quality Management</li> <li>- Institution Building</li> <li>- Governance Structure</li> <li>- Business Activities</li> <li>- Operational Risk</li> <li>- External Sanctions</li> </ul>
[27]	<p>1.Environmentally Friendly Procurement (Ef)</p> <ul style="list-style-type: none"> <li>- Energy And Water Consumption</li> <li>- Waste And Pollution Reduction</li> <li>- Use Of Sustainable Raw Materials</li> <li>- Renewable Energy (Solar, Wind, Biomass, Etc.)</li> </ul> <p>2.Circular Economy (Ce)</p> <ul style="list-style-type: none"> <li>- Reuse And Recycling Of Materials</li> <li>- Reduction In Natural Resource Consumption</li> </ul>

	<p>3.Social Return On Investment (S)</p> <ul style="list-style-type: none"> <li>- Increased Employment Opportunities For Vulnerable Groups (Persons With Disabilities, Long-Term Unemployed, Etc.)</li> <li>- Workforce Participation In Projects</li> </ul> <p>4.Ethical Trade (Et)</p> <ul style="list-style-type: none"> <li>- Human Rights And Workers' Rights</li> <li>- Decent Working Conditions</li> <li>- Poverty Reduction</li> </ul> <p>5.Sme-Oriented Public Procurement (Sme)</p> <ul style="list-style-type: none"> <li>- Participation Of Small And Medium Enterprises (Smes) In Projects</li> <li>- Policies Supporting Smes In Public Procurement</li> <li>- Innovation-Oriented Public Procurement (I)</li> <li>- Encouraging Innovation In The Supply Chain</li> <li>- Developing New Markets Through Innovative Procurement</li> </ul> <p>6.Sustainable Label (Sl)</p> <ul style="list-style-type: none"> <li>- Eco-Labeling And Sustainability Standards</li> <li>- Environmental Requirements In Goods And Services Procurement</li> </ul>
[30]	<p>1.Environmental Reduced Greenhouse Gas Emissions</p> <ul style="list-style-type: none"> <li>- Improved Air Quality</li> <li>- Increased Biodiversity And Reduced Eco-Toxicity</li> <li>- Increased Resource Recycling And Reuse</li> <li>- Reduced Acidification</li> <li>- Reduced Eutrophication</li> </ul>
[32]	<p>1.Economic Income Increase</p> <ul style="list-style-type: none"> <li>- Price Support</li> <li>- Productivity Increase</li> <li>- Market Inclusion</li> <li>- Cost Reduction</li> </ul> <p>2.Social Transparency</p> <ul style="list-style-type: none"> <li>- Human Capital</li> <li>- Social Inclusion</li> <li>- Food Security</li> <li>- Living Condition-</li> </ul> <p>3.Environmental More Organic Production</p> <ul style="list-style-type: none"> <li>- CO2 Reduction</li> <li>- Crop Diversification</li> </ul>
[34]	<p>1.Environmental ISO 14001</p> <ul style="list-style-type: none"> <li>- Eco-Friendly Methods</li> <li>- ISO 9001</li> </ul> <p>2.Social OHSAS 18001</p> <ul style="list-style-type: none"> <li>- Occupational Health Insurance</li> <li>- Certification Of Skills</li> <li>- Using Local Labour</li> <li>- Using Labour Wages</li> <li>- Female Workers</li> <li>- Disability Workers</li> </ul>

	<ul style="list-style-type: none"> <li>- CSRR Activities</li> <li>- Permanent Workers</li> <li>- Non-Permanent Workers</li> </ul> <p>3.Economic Bank Support</p> <ul style="list-style-type: none"> <li>- Using Life Cycle Cost</li> <li>- Ownership Of Equipment</li> </ul>
[25]	<p>1.Environmental Use Of Recyclable Packaging</p> <ul style="list-style-type: none"> <li>- Use Of Renewable Energy Sources</li> <li>- Green Procurement</li> <li>- Reduction In Carbon Emission</li> <li>- Use Of CNG/Electric/Hybrid Fleet</li> <li>- Resource Optimization</li> <li>- Digilatization Of Processes</li> <li>- Rainwater Harvesting</li> <li>- Reduction In Fuel Consumption</li> </ul>
[22]	<p>1.Environment</p> <ul style="list-style-type: none"> <li>- Carbon Footprint</li> <li>- Environmental Impact</li> </ul> <p>2.Social</p> <ul style="list-style-type: none"> <li>- Environmental Pollution</li> <li>- Relationship With Stakeholders</li> </ul> <p>3.Governance</p> <ul style="list-style-type: none"> <li>- Political And Economic Stability</li> <li>- Natural Geographical Disasters</li> </ul>
[31]	<p>1. Internal Factors</p> <ul style="list-style-type: none"> <li>- Leadership In Change Management</li> <li>- Project Management Office</li> <li>- Cost Of Infrastructure</li> <li>- Management Strategy</li> <li>- Internal Management Structure</li> </ul> <p>2. External Factors</p> <ul style="list-style-type: none"> <li>- Ethical and Ecological Environment</li> <li>- Social Environment</li> <li>- Economic Environment</li> <li>- Technological Environment</li> <li>- Political Environment</li> </ul> <p>3. Innovation Capability</p> <ul style="list-style-type: none"> <li>- Technology Adoption</li> <li>- Innovation Strategies</li> <li>- Quality Standards</li> <li>- Processes</li> </ul>
[33]	<p>1. Quality Dimensions And Process Management</p> <ul style="list-style-type: none"> <li>- Process Improvement</li> <li>- Quality Related Certificates</li> <li>- Warranties And Claim Policies</li> </ul> <p>2. Economic And Cost Dimensions</p>

	<ul style="list-style-type: none"> <li>- Price-Performance Value</li> <li>- Logistic Cost</li> <li>- Compliance With Sectoral Price Behavior</li> <li>3. Dimensions Of Inventory Management And Responsiveness             <ul style="list-style-type: none"> <li>- Responsiveness</li> <li>- Stock Management</li> <li>- Willingness</li> </ul> </li> <li>4. Environmental And Sustainability Dimensions             <ul style="list-style-type: none"> <li>- Restriction On The Use Of Hazardous Substances</li> <li>- Environment-Related Certificates</li> <li>- Internal Control Process</li> <li>- Green Packaging</li> <li>- Waste Management And Recycling</li> </ul> </li> <li>5. Dimensions Of Technology And Innovation             <ul style="list-style-type: none"> <li>- Technology Level</li> <li>- Capability Of RandD</li> <li>- Capability Of Preventing Pollution</li> </ul> </li> <li>6. Social And Ethical Dimensions             <ul style="list-style-type: none"> <li>- The Rights Of Employees</li> <li>- The Rights Of Stakeholders</li> <li>- Respect For The Policy</li> </ul> </li> </ul>
[28]	<ol style="list-style-type: none"> <li>1. Policy And Regulation Dimensions             <ul style="list-style-type: none"> <li>- Government Policy And Regulations</li> <li>- Total Quality Environmental Management</li> <li>- Management Support</li> <li>- Management Review</li> <li>- Continuous Education Of Employees</li> </ul> </li> <li>2. Dimensions Of Organizational Management             <ul style="list-style-type: none"> <li>- Cross-Functional Team Building</li> <li>- Organisation Culture</li> </ul> </li> <li>3. Dimensions Of Technology And Innovation             <ul style="list-style-type: none"> <li>- Green Process And Technology</li> <li>- Green Design</li> <li>- Information System Infrastructure</li> <li>- Reuse, Reengineering, And Recycling Of Products And Materials</li> </ul> </li> <li>4. Dimensions Of Supplier Management             <ul style="list-style-type: none"> <li>- Supplier Flexibility</li> <li>- Supplier Capability To Innovate</li> <li>- Supply Risk Management</li> <li>- Trust Building In Suppliers</li> <li>- Low Supplier Lead Time</li> </ul> </li> <li>5. Performance And Sustainability Dimensions             <ul style="list-style-type: none"> <li>- Customer Satisfaction</li> <li>- Annual Savings From Green Procurement Practices</li> <li>- Annual Saving Of Natural Resources</li> <li>- Procurement Excellence</li> </ul> </li> </ol>

[29]	1.Procurement Object Analysis - Component Index - Cost Structure 2.Company Environmental Analysis - Dynamic Environmental Factors - Procurement Risks 3.Supplier Development Analysis - Passive-Deterministic Evaluation - Active-Stochastic Evaluation
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#### 4. Conclusion

This study shows a growing academic focus on sustainable procurement, reflected in the rise of related publications. Sustainability is becoming a key consideration in supplier selection and broader procurement strategies. Most of the literature highlights four common dimensions: economic, environmental, social, and governance. Economic factors still dominate, particularly cost efficiency, price-performance value, and investment in green supply chains. However, environmental concerns such as carbon reduction, waste management, and environmental compliance are gaining ground. Social issues, including worker safety and rights, also play a critical role, while governance aspects like regulatory compliance and corporate accountability are increasingly considered.

Alongside these shifts, supplier evaluation methods are becoming more data-driven. Techniques like Fuzzy Logic, AHP, and MCDM are widely used, though challenges remain such as inconsistent data, a lack of standard criteria, and difficulty integrating emerging technologies like AI and blockchain. Balancing cost-efficiency with sustainability goals continues to be a key challenge. To address this, future research should focus on developing standard evaluation models, promoting digital integration in procurement, and reinforcing regulatory frameworks for more transparent and sustainable practices

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#### Compliance with ethical standards

##### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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#### References

- [1] J. Hallikas, M. Immonen, and S. Brax, "Digitalizing procurement: the impact of data analytics on supply chain performance," *Supply Chain Manag.*, vol. 26, no. 5, pp. 629–646, 2021, doi: 10.1108/SCM-05-2020-0201.
- [2] T. F. Mothupi, R. M. Mukonza, and T. Khalo, "Factors hindering the implementation of the procurement plan in a selected national research utility," *J. Transp. Supply Chain Manag.*, vol. 16, pp. 1–11, 2022, doi: 10.4102/jtscm.v16i0.644.
- [3] K. Schütz, M. Kässer, C. Blome, and K. Foerstl, "How to achieve cost savings and strategic performance in purchasing simultaneously: A knowledge-based view," *J. Purch. Supply Manag.*, vol. 26, no. 2, p. 100534, 2020, doi: 10.1016/j.pursup.2019.04.002.
- [4] A. S. Patrucco, H. Walker, D. Luzzini, and S. Ronchi, "Which shape fits best? Designing the organizational form of local government procurement," *J. Purch. Supply Manag.*, vol. 25, no. 3, pp. 1–17, 2019, doi: 10.1016/j.pursup.2018.06.003.
- [5] F. Cao and C. Wang, "An Empirical Study of Determinants of Pay-for-Performance in PPP Procurement," *Sustain.*, vol. 14, no. 19, 2022, doi: 10.3390/su141912738.
- [6] I. H. Mohamud, M. Abdul Kafi, S. A. Shahron, N. Zainuddin, and S. Musa, "The Role of Warehouse Layout and Operations in Warehouse Efficiency: A Literature Review," *J. Eur. des Syst. Autom.*, vol. 56, no. 1, pp. 61–68, 2023, doi: 10.18280/jesa.560109.

- [7] C. Nangpiire, F. O. Gyebi, and T. Nasse, "Sustainable Procurement Practices and Organisational Performance of Small and Medium Enterprises in Ghana," *Int. J. Econ. Financ. Issues*, vol. 14, no. 1, pp. 95–106, 2024, doi: 10.32479/ijefi.15444.
- [8] M. M. Islam, M. W. Murad, A. J. McMurray, and T. S. Abalala, "Aspects of sustainable procurement practices by public and private organisations in Saudi Arabia: an empirical study," *Int. J. Sustain. Dev. World Ecol.*, vol. 24, no. 4, pp. 289–303, 2016, doi: 10.1080/13504509.2016.1209794.
- [9] A. A. Qazi and A. Apolloni, "A systematic review on barriers and enablers toward circular procurement management," *Sustain. Prod. Consum.*, vol. 33, pp. 343–359, 2022, doi: 10.1016/j.spc.2022.07.013.
- [10] D. E. Okonta, "Heliyon The scientometric analysis and visualization of sustainable procurement," *Heliyon*, vol. 9, no. 10, 2023, doi: 10.1016/j.heliyon.2023.e20985.
- [11] M. Ershadi, M. Jefferies, P. Davis, and M. Mojtahedi, "Achieving Sustainable Procurement in Construction Projects: The Pivotal Role of a Project Management Office," *Constr. Econ. Build.*, vol. 21, no. 1, pp. 45–64, 2021, doi: 10.5130/AJCEB.v21i1.7170.
- [12] A. A. Al Fath, D. E. Herwindiaty, M. A. Wibowo, and E. M. Sari, "Readiness for Implemented Sustainable Procurement in Indonesian Government Construction Project," *buildings*, vol. 14, no. 1424, 2024, doi: 10.3390/buildings14051424.
- [13] Y. Zhao, C. Z. Li, G. Q. Shen, Y. Teng, H. Wu, and R. Liu, "Managing carbon emissions in construction: Current status and emerging trends," *Renew. Sustain. Energy Rev.*, vol. 211, 2025, doi: 10.1016/j.rser.2024.115237.
- [14] A. M. Barbanti, R. Anholon, I. S. Rampasso, V. W. B. Martins, O. L. G. Quelhas, and W. Leal Filho, "Sustainable procurement practices in the supplier selection process: an exploratory study in the context of Brazilian manufacturing companies," *Corp. Gov.*, vol. 22, no. 1, pp. 114–127, 2022, doi: 10.1108/CG-10-2020-0481.
- [15] Q. Liu, X. Wang, H. Liu, L. Meng, and C. Hao, "Optimization of sustainable coal procurement for power plants under maritime transportation uncertainty," *Clean. Logist. Supply Chain*, vol. 14, no. January, 2025, doi: 10.1016/j.clscn.2025.100204.
- [16] H. Riadi and R. A. Machfudiyanto, "Critical Success Factor in Applications of Sustainable Procurement to Improve Procurement Performance in Construction Projects," *E3S Web Conf.*, vol. 405, pp. 1–12, 2023, doi: 10.1051/e3sconf/202340504023.
- [17] D. F. Hekmatsyar and R. A. Machfudiyanto, "Influence of Policy and Institutional on Sustainable Procurement in the LRT TOD Apartment Project," *E3S Web Conf.*, vol. 405, 2023, doi: 10.1051/e3sconf/202340503004.
- [18] S. Ghosh, C. Bhowmik, S. Sinha, R. D. Raut, M. C. Mandal, and A. Ray, "An integrated multi-criteria decision-making and multivariate analysis towards sustainable procurement with application in automotive industry," *Supply Chain Anal.*, vol. 3, no. August, p. 100033, 2023, doi: 10.1016/j.sca.2023.100033.
- [19] D. F. de Oliveira and R. G. de Souza, "Life cycle sustainability impact categories for sustainable procurement," *J. Clean. Prod.*, vol. 383, no. November 2022, p. 135448, 2023, doi: 10.1016/j.jclepro.2022.135448.
- [20] K. H. Lau, A. Yadlapalli, M. D. A. Abdulrahman, P. Chhetri, and V. Thai, "Disclosure index development for sustainable procurement: An australian perspective," *J. Clean. Prod.*, vol. 420, no. August, p. 138357, 2023, doi: 10.1016/j.jclepro.2023.138357.
- [21] I. C. Osuizugbo and O. A. Adenuga, "Decisive factors for decision-making to achieving sustainable procurement in construction projects," *Int. J. Build. Pathol. Adapt.*, vol. 42, no. 6, pp. 1185–1202, 2022, doi: 10.1108/IJBPA-04-2022-0065.
- [22] M. C. Chiu, P. Y. Tai, and C. Y. Chu, "Developing a smart green supplier risk assessment system integrating natural language processing and life cycle assessment based on AHP framework: An empirical study," *Resour. Conserv. Recycl.*, vol. 207, no. 1727, p. 107671, 2024, doi: 10.1016/j.resconrec.2024.107671.
- [23] T. Laosirihongthong, P. Samaranayake, and S. Nagalingam, "A holistic approach to supplier evaluation and order allocation towards sustainable procurement," *Benchmarking*, vol. 26, no. 8, pp. 2543–2573, 2019, doi: 10.1108/BIJ-11-2018-0360.
- [24] F. S. Garzon, M. Enjolras, M. Camargo, and L. Morel, "A green procurement methodology based on Kraljic Matrix for supplier's evaluation and selection: a case study from the chemical sector," *Supply Chain Forum*, vol. 20, no. 3, pp. 185–201, 2019, doi: 10.1080/16258312.2019.1622446.

- [25] A. Gupta and R. K. Singh, "Developing a framework for evaluating sustainability index for logistics service providers: graph theory matrix approach," *Int. J. Product. Perform. Manag.*, vol. 69, no. 8, pp. 1627–1646, 2020, doi: 10.1108/IJPPM-12-2019-0593.
- [26] R. Li and F. Cao, "The impact of sustainable public procurement on corporate ESG performance—The Chinese evidence," *PLoS One*, vol. 18, no. 10 October, pp. 1–21, 2023, doi: 10.1371/journal.pone.0292286.
- [27] F. Cao, R. Li, and S. Guo, "Rhetoric and reality of public-private partnerships in China: A sustainable public procurement perspective," *Socioecon. Plann. Sci.*, vol. 92, no. January, p. 101852, 2024, doi: 10.1016/j.seps.2024.101852.
- [28] S. Bag, "Comparison of green procurement framework using fuzzy TISM and fuzzy DEMATEL methods," *Int. J. Procure. Manag.*, vol. 10, no. 5, pp. 600–638, 2017, doi: 10.1504/IJPM.2017.086403.
- [29] S. Ruhrmann, J. Hochdörffer, and G. Lanza, "A methodological approach to evaluate supplier development based on real options," *Prod. Eng.*, vol. 8, no. 3, pp. 373–382, 2014, doi: 10.1007/s11740-014-0529-z.
- [30] A. Lindfors and J. Ammenberg, "Using national environmental objectives in green public procurement: Method development and application on transport procurement in Sweden," *J. Clean. Prod.*, vol. 280, p. 124821, 2021, doi: 10.1016/j.jclepro.2020.124821.
- [31] M. H. AlHashmi, M. M. Khan, and M. M. Ajmal, "Implementing sustainable procurement strategy in the oil and gas sector: Analytic hierarchy process approach," *Int. J. Serv. Sci. Manag. Eng. Technol.*, vol. 12, no. 2, pp. 59–77, 2021, doi: 10.4018/IJSSMET.2021030104.
- [32] M. Cervantes-Zapana, J. L. Yagüe, V. L. De Nicolás, and A. Ramirez, "Benefits of public procurement from family farming in Latin-AMERICAN countries: Identification and prioritization," *J. Clean. Prod.*, vol. 277, 2020, doi: 10.1016/j.jclepro.2020.123466.
- [33] N. Ahamed, G. Dey, T. Ahmed, R. Rahman, H. M. M. Taqi, and S. Ahmed, "Embracing Sustainability in Green Supplier Evaluation: A Novel Integrated Multi-Criteria Decision-Making Framework," *Contemp. Math.*, vol. 5, no. 2, pp. 2220–2246, 2024, doi: 10.37256/cm.5220242779.
- [34] R. Wirahadikusumah, M. Abduh, Y. Messah, and M. Aulia, "Introducing sustainability principles into the procurement of construction works—case of Indonesian developers," *Int. J. Constr. Manag.*, vol. 21, no. 9, pp. 932–944, 2021, doi: 10.1080/15623599.2019.1599559.