FAKTOR-FAKTOR KUNCI KEBERHASILAN RANTAI PASOK PADA IKM MAKANAN TRADISIONAL: PENDEKATAN NATURAL RESOURCES BASED VIEW

(*FACTORS INFLUENCING SUPPLY CHAIN SUCCESS IN TRADITIONAL FOOD SMEs: NATURAL RESOURCES-BASED VIEW APPROACH*)

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ABSTRAK

IKM makanan tradisonal mempunyai peran yang sangat penting bagi perekonomian negara karena memilikim potensi tinggi untuk menciptakan lapangan kerja, pengentasan kemiskinan, mendorong stabilitas sosial, serta mendukung transisi menuju masa depan yang berkelanjutan. Namun demikian, literatur telah menyoroti munculnya berbagai faktor yang mengancam keberlanjutan IKM termasuk keterkaitan sektor ini dengan permasalahan-permasalahan lingkungan. Kondisi semacam ini telah memunculkan tantangan untuk mendukung transisi hijau pada IKM ini. Penelitian ini bertujuan untuk mengisi kesenjangan dalam literatur dengan membangun model visual yang memperlihatkan peta jalan untuk mengembangkan rantai pasok berbasis NRBV pada IKM makanan tradisional. Penelitian ini menggunakan metode survei dengan pendekatan campuran kualitatif dan kuantitatif untuk mengumpulkan data. Perusahaan tersurvei adalah 12 perusahaan pengolah Wajit yang berlokasi di Kabupaten Bandung Barat, Provinsi Jawa Barat. Penelitian ini melibatkan 12 orang responden pakar dan 64 konsumen sebagai sumber data. Metode analisis yang digunakan adalah metode Delphi, MICMAC, ISM, dan DEMATEL. Hasil penelitian mengindikasikan adanya 14 elemen yang relevan dengan rantai pasok berbasis NRBV. Elemen-elemen ini dapat disusun dalam struktur hirarki yang terdiri dari lima level. Elemen-elemen ini juga dapat dipilah menjadi tiga kategori: dependen (empat elemen), linkage (lima elemen), dan independen (lima elemen). Hasil penelitian membawa implikasi akan pentingnya komitmen manajemen hijau, dukungan pemerintah untuk transformasi hijau pada IKM, pemilihan pemasok hijau, kapabilitas inovasi hijau, dan SDM hijau dalam mengembangkan rantai pasok berbasis NRBV. IKM yang mengikuti hasil penelitian ini akan mendapatkan manfaat dalam menyusun kebijakan dan rencana strategis untuk memperoleh keunggulan kompetitif yang berkelanjutan melalui pengembangan rantai pasok berbasis NRBV.
(Kata kunci: Rantai pasok berbasis NRBV, IKM makanan tradisional, ISM, DEMATEL).

ABSTRACT

Traditional food SMEs play a crucial role in the national economy due to their high potential for job creation, poverty alleviation, social stability, and the transition to a sustainable future. However, the literature has highlighted the emergence of various factors that threaten the sustainability of SMEs, including the sector's linkages to environmental issues. These conditions have created challenges in supporting the green transition of these SMEs. This study aims to fill this gap in the literature by developing a visual model that displays a roadmap for developing a NRBV-based supply chain for traditional food SMEs. This study used a survey method with a mixed qualitative and quantitative approach to collect data. The surveyed companies were 12 Wajit processing companies located in West Bandung Regency, West Java Province. This study involved 12 expert respondents and 64 consumers as data sources. The analytical methods used were the Delphi method, MICMAC, ISM, and DEMATEL. The results indicate 14 elements relevant to an NRBV-based supply chain. These elements can be arranged in a hierarchical structure consisting of five levels. These elements can also be categorized into three categories: dependent (four elements), linkage (five elements), and independent (five elements). The research findings imply the importance of green management commitment, government support for green transformation in SMEs, green supplier selection, green innovation capabilities, and green human resources in developing NRBV-based supply chains. SMEs that

follow this research will benefit from developing policies and strategic plans to achieve sustainable competitive advantage through NRBV-based supply chain development.
(Keywords: NRBV-based supply chain, traditional food SMEs, ISM, DEMATEL)

1. INTRODUCTION

Small and medium-sized enterprises (SMEs) play a crucial role in a country's economy. This is due to their potential to create numerous jobs, alleviate poverty, and promote social stability. SMEs also provide the foundation for local economies and communities, enhance a region's competitiveness, and support the transition to a sustainable future (Jantapoon et al., 2025). In the context of traditional food SMEs, this sector also plays a crucial role in cultural preservation, economic growth, and food security. From a cultural and social perspective, traditional food SMEs play a crucial role in preserving cultural heritage, facilitating social bonds, and serving as a medium for intergenerational learning regarding traditional recipes and cooking techniques. This sector also plays a crucial role in enhancing food security and promoting sustainable practices by producing and supplying food from local ingredients and traditional knowledge (Aworh, 2023; Nyholm et al., 2024).

While traditional food SMEs are widely cited as crucial business entities for economic and social growth and food security, the literature has highlighted the emergence of various factors that threaten their sustainability (Ghosh et al., 2020). Furthermore, the literature also highlights the link between traditional food SMEs and environmental issues. Many experts have highlighted the environmental impacts of traditional food SMEs, from raw material procurement, production and processing, packaging, to logistics and distribution. Consumers also impact the environment through dietary choices, food wastage, and other irresponsible actions. These conditions have presented challenges for developing more sustainable traditional food SMEs (Mengoni et al., 2024; Rojas-Reyes et al., 2024).

The literature has proposed several approaches to support the sustainability of SMEs, including developing more environmentally friendly supply chain models. This supply chain model is crucial for the sustainability of SMEs through its potential to improve economic, environmental, and social performance. Sustainable practices in the supply chain will open up opportunities for SMEs to gain competitive advantage and contribute to broader development goals (Kankam & Dza, 2025). Several theories or perspectives exist that are useful for developing more environmentally friendly supply chains (Wang et al., 2024). Referring to Sumrit (2025), this study draws theoretical support from the Natural Resource-Based View (NRBV) in developing a roadmap for developing supply chains for traditional food SMEs. According to Islam et al. (2024), the NRBV theory is an extension of the traditional Resource-Based View (RBV) theory by adding an environmental dimension to the development of a company's resources and capabilities. This theory highlights the importance of environmental capabilities and responsibilities for companies to achieve competitive advantage and long-term success. The NRBV offers a framework that integrates environmental considerations into developing policies and strategic plans to promote sustainable excellence and positive contributions to society and the environment. Furthermore, Andersen (2021) suggests that the NRBV promotes three strategies for achieving competitive advantage: pollution control, product management, and sustainable development. Pollution control refers to strategies and practices to minimize environmental impacts by eliminating waste at the source, not at the end of the process. Product management focuses on efforts to develop environmentally friendly products and processes, from product design through production, and through to end-of-life. Sustainable development aims to align business processes with economic growth, environmental performance, and social responsibility.

While the literature has cited the NRBV as a strategic perspective for achieving corporate sustainability (Andersen, 2021; Sumrit, 2025), a review of the literature indicates that its implementation in the supply chain remains relatively limited. Therefore, many experts have called for further studies on how to develop an NRBV-based supply chain model to achieve sustainable competitive advantage (Johnson-Hall & Hall, 2022; Salsabila et al., 2024). This study aims to fill this gap in the literature by developing a hierarchical model that illustrates the roadmap for building an NRBV-based supply chain for traditional food SMEs. Referring to Ahmed et al. (2024), this study argues that building an NRBV-based supply chain model is a complex challenge and problem. This complexity arises from various factors, including the involvement, interrelationships, and interests of various supply chain elements, from upstream to downstream. To address this complex issue, this study combines the MICMAC, ISM, and DEMATEL methods to understand how each supply chain element is interconnected and influences each other, and to develop a roadmap for developing an NRBV-based supply chain for traditional food SMEs.

2. METHODS

2.1. Research Method

Following Runtuk et al. (2024), this study employed mixed methods to investigate the elements influencing the success of NRBV-based supply chains in traditional food SMEs. The mixed methods approach aimed to obtain quantitative and qualitative data to gain a comprehensive understanding of the supply chain in this sector. This data and understanding played a crucial role in developing a visual model that illustrates the roadmap for developing an NRBV-based green supply chain.

2.2. Data Collection

In general, this study employed several methods to collect data, including a literature review, in-depth interviews, questionnaires, and field surveys. This approach aimed to gain a comprehensive understanding of the business processes and actors of SMEs, identify elements relevant to an NRBV-based supply chain, create a visual model showing the categorization and hierarchical structure of the elements, and construct a visual model showing a cause-and-effect map of the elements. Respondents included industry practitioners, academics, and stakeholders with sufficient competence in the field of NRBV-based supply chains, as well as a number of consumers. A field survey was conducted at 12 traditional food SMEs in West Bandung Regency, West Java Province. The survey was conducted from July to September 2025.

2.3. Analysis Method

Referring to McDougall et al. (2021), this study believes that developing a supply chain based on NRBV is a complex issue. Therefore, this study combined four approaches to achieve its objectives. First, the Delphi method (Sharma et al., 2024) was used to assess the relevance of supply chain elements derived from the literature to the context of traditional food SMEs. Second, the MICMAC method (Primadasa et al., 2025) was applied to classify supply chain elements into autonomous, dependent, linkage, and independent elements. The ISM method (Li et al., 2023) was used to create a visual model showing the hierarchical structure of NRBV-based supply chain elements. Finally, the DEMATEL method (Jalwani & Choudhury, 2023) aims to develop a visual model that shows the cause-and-effect relationships of green supply chain elements in traditional food SMEs.

2.4 Research Variables

Referring to Sumrit (2025), this study argues that an NRBV-based supply chain model should encompass three dimensions reflecting three key strategic capabilities: pollution control, product management, and sustainable development. Table 1 below presents a list of the NRBV-based supply chain elements proposed in this study.

Table 1. Elements of NRBV-based chain supply proposed in this study

Dimensions	Elements		References
	Coding	Descriptions	
Pollution control	PC-1	Green technology	Li et al. (2023); Herzallah et al. (2025)
	PC-2	Waste management	Dzikriansyah et al. (2023); Rasheed et al. (2024); Herzallah et al. (2025)
	PC-3	Green logistics	Li et al. (2023); Chen (2025)
Product Stewardship	PS-1	Green supplier selection	Debnath et al. (2023); Abuzaid et al. (2024); Li & Zhong (2024)
	PS-2	Green innovation	Agrawal et al. (2024); Picaud -Bello et al. (2024); Rasheed et al. (2024);
	PS-3	Green marketing	Li et al. (2023); Herzallah et al. (2025)
	PS-4	Green human resources	Mustafa et al. (2023); Maqsood et al. (2022)
	PS-5	Green procurement	Jantapoon & Saenchaiyathon (2025)
	PS-6	Green finance	Debnath et al. (2023); Maqsood et al. (2022)
Sustainable Development	SD-1	Government support	Agyapong et al. (2023); Chen et al. (2023); Dzikriansyah et al. (2023); Wang (2024)
	SD-2	Green management commitment	Adu et al. (2023); Agyapong et al. (2023); Chen et al. (2023)
	SD-3	Green networking	Adu et al. (2023); Li et al. (2023); Mubarik et al. (2025)
	SD-4	Fulfillment of green requirements	Debnath et al. (2023); Maqsood et al. (2022)

3. RESULTS AND DISCUSSION

3.1. Delphi Analysis

Developing a supply chain for traditional food SMEs is a complex issue, involving numerous factors, including resource constraints, management commitment, government support, human resource quality, and other factors worth considering (Sharma et al., 2024). Referring to Primadasa et al. (2024), this study believes that assessing the validity and relevance of elements supporting supply chain success is a crucial step, particularly in developing a roadmap for developing a NRBV-based supply chain for traditional food SMEs. Therefore, this study applies the Delphi method to assess the validity and relevance of supply chain elements (derived from literature studies) in the context of traditional food SMEs. The Delphi method provides comprehensive input to ensure that all elements relevant

to supply chain development are thoroughly explored and assessed, resulting in a reliable set of elements.

Referring to Di Zio & Gordon (2024), this study employs the Delphi process with the following sequence and stages. The first stage was to develop an initial questionnaire with specific questions related to the elements needed to develop a roadmap for developing an NRBV-based supply chain for traditional food SMEs. The second stage was to distribute the initial questionnaire to nine expert respondents and ask them to respond anonymously. The next stage was to summarize the expert respondents' responses anonymously, including quantitative data or qualitative feedback. The next stage was to distribute a second questionnaire to the expert respondents, complete with a statistical summary of the results of the first questionnaire. In the second questionnaire, the study asked the expert respondents to reconsider their initial opinions based on the statistical summary of the results of the first questionnaire. The final stage was to conduct a final analysis of the questionnaire results to test the relevance of each proposed element. Table 2 presents the outputs of the Delphi process to test the relevance of NRBV-based supply chain elements for traditional food SMEs.

Furthermore, referring to the work of Abdul-Shukor & Nga (2022), this study uses two parameters to determine elements relevant to the development of an NRBV-based supply chain: the weighted average (WA) and the level of consensus (LC). In this case, elements with an LC $\geq$ 0.7 and a WA $\geq$ 4.0 are relevant elements for building an NRBV-based supply chain model in the context of traditional food SMEs. As seen in Table 2, this study found that 14 proposed elements had a WA value higher than 4.0 and an LC value higher than 0.70. Thus, referring to Olsen et al. (2021), this study is of the view that the elements listed in Table 2 are valid and relevant for use in the development of an NRBV-based supply chain in the context of traditional food SMEs.

Table 2. Delphi process output for test relevance elements NRBV-based chain supply on food SMEs traditional .

Elements	Relevance					WA	LC
	1	2	3	4	5		
1	0	0	1	4	4	4.33	0.89
2	0	0	1	3	5	4.44	0.89
3	0	0	2	0	7	4.56	0.78
4	0	0	1	1	7	4.67	0.89
5	0	0	1	5	3	4.22	0.89
6	0	0	0	3	6	4.67	1.00
7	0	0	1	3	5	4.44	0.89
8	0	0	2	2	5	4.33	0.78
9	0	0	1	4	4	4.33	0.89
10	0	0	1	2	6	4.56	0.89
11	0	0	0	1	8	4.89	1.00
12	0	0	3	1	5	4.22	0.67
13	0	0	1	2	6	4.56	0.89
14	0	0	1	4	4	4.33	0.89

3.2. MICMAC Analysis

Referring to Primadasa et al. (2025), this study applies the MICMAC procedure to analyze the level of dependency and driving force of critical success factors for developing a NRBV-based supply chain. This analysis also aims to determine the dominant elements that significantly contribute to the success of NRBV-based supply chain development. Based on the driving force and level of dependency of each element, the MICMAC analysis classifies these elements into four categories: dependent elements, independent elements, autonomous elements, and linkage elements. Figure 1 presents the MICMAC analysis output for the elements that drive success in developing an NRBV-based supply chain for traditional food SMEs.

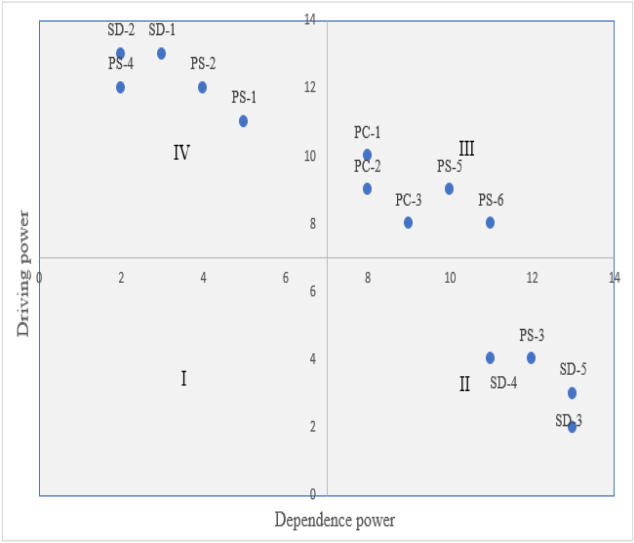

Figure 1. Output MICMAC analysis

As seen in Figure 1, the MICMAC analysis output places the elements that support the success of NRBV-based supply chain development in four quadrants. Quadrant I is the area for autonomous elements, namely elements that are weak in terms of driving force and level of dependency. In this case, none of the elements occupy this quadrant. Quadrant II is for dependent elements, namely elements with low driving force and high levels of dependency. The MICMAC analysis shows that four elements occupy this quadrant: green marketing (PS-3),

green compliance (SD-3), green networking and partnerships (SD-4), and support from green business associations (SD-5). Quadrant III is the area for linkage elements, namely elements with high driving force and high levels of dependency. The analysis results show that there are five elements occupying this quadrant: green technology adoption (PC-1), waste management (PC-2), green logistics (PC-3), green procurement (PS-5), and green financing (PS-6).

Finally, quadrant IV is the area for independent elements, namely elements that have a high driving force but a low level of dependence. MICMAC analysis shows that five elements occupy this quadrant: green supplier selection (PS-1), green innovation (PS-2), green human resources (PS-4), government support for the green transition in SMEs (SD-1), and green management commitment (SD-2). Referring to Li et al. (2023), independent elements are the main elements that have a strong influence on other elements in the system and are critical elements that impact the achievement of system objectives. This finding implies that the development of an NRBV-based supply chain must focus on fulfilling these five elements because of their role as the main drivers for the realization of a sustainable NRBV-based supply chain. The literature also recognizes the important role of these elements in the development of a sustainable supply chain (Agrawal et al., 2024; Picaud-Bello et al., 2024).

3.3. ISM Analysis

The Interpretive Structural Modeling (ISM) method is an effective approach for understanding complex system problems by visually mapping the relationships between the system's elements. This method is sufficient to simplify system complexity, identify crucial elements, and develop problem-solving strategies by transforming poorly defined system problem models into visual models that show the hierarchical structure of the system's elements. The ISM method integrates the perceptions of various stakeholders to generate a shared understanding and more comprehensive solutions (Li et al., 2023). Specifically, this study used the ISM method to break down supply chain problems in traditional food SMEs into simpler components, facilitating a comprehensive understanding of the supply chain in this sector. The next step was to identify critical elements for developing a supply chain based on the NRBV (Non-Regulatory Value-Based Value-Based Value) and the interrelationships between elements. Finally, a visual model was created that shows the hierarchical structure of elements and a roadmap for developing a NRBV-based supply chain. Referring to Sumrit (2025), the implementation of the ISM method briefly involves several stages: identifying all elements relevant to developing an NRBV-based supply chain, constructing a Structural Self-Interaction Matrix (SSIM) by examining the contextual relationships between elements, evolving the SSIM into a Reachability Matrix (RM), ensuring that relationships between elements are transitive, eliminating transitive links, and developing a visual model. Figure 2 presents an ISM model depicting a roadmap for developing an NRBV-based supply chain in the context of traditional food SMEs.

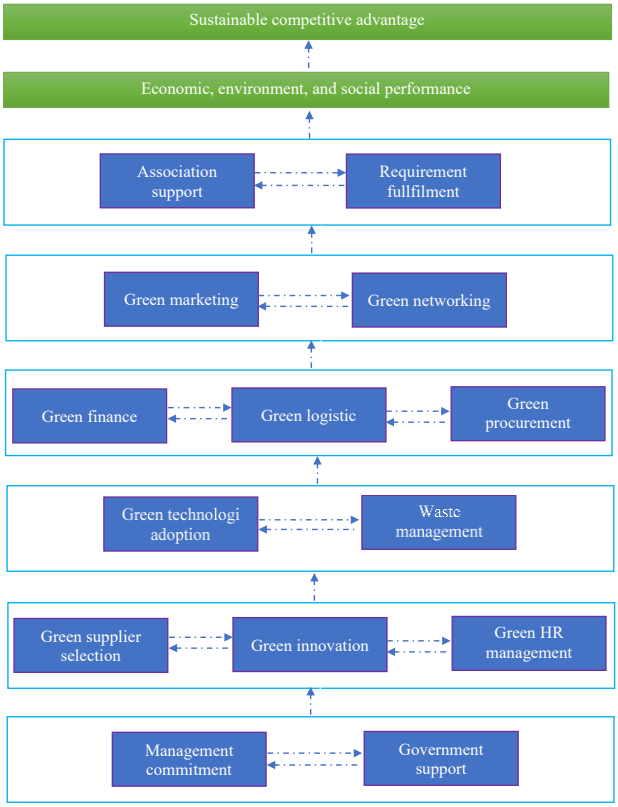

Figure 2. Roadmap for developing a NRBV-based supply chain for traditional food SMEs

As presented in Figure 2, the framework for developing an NRBV-based supply chain consists of five levels. Referring to Vishwakarma et al. (2022), this study categorizes the elements of a successful NRBV-based supply chain into three types based on their criticality: the most crucial elements (located at the bottom of the hierarchy), moderately crucial (occupied in the middle of the hierarchy), and least crucial (occupied in the top of the hierarchy). In this case, the most crucial elements are green management commitment (SD-1), government support for green transformation in SMEs (SD-2), green supplier selection (PS-1), green innovation capability (PS-2), and green human resources (PS-4). Moderately crucial elements include green technology adoption (PC-1), waste

management (PC-2), green logistics (PC-3), green procurement (PS-5), and green financing (PS-6). These five elements have a significant influence on the elements occupying the level above them. At the same time, these five elements are also influenced by the elements occupying the level below them. Meanwhile, the least crucial elements are green marketing (PS-3), compliance with green industry requirements (SD-3), green networks and partnerships (SD-4), and support from green business associations (SD-5). These four elements are directly influenced by the elements occupying the middle part of the hierarchical structure, in addition to receiving indirect influence from the elements occupying the lower part of the hierarchical structure.

3.4. DEMATEL analysis

To complement the outputs of the MICMAC and ISM methods, this study has applied the DEMATEL method. The DEMATEL method is a method that uses expert group opinions to solve system problems by analyzing structural relationships in complex systems (Nyimbili et al., 2023). Specifically, this study applies the DEMATEL method to identify critical or high-prominence elements of the NRBV-based supply chain success, sort the elements involved into elements categorized as drivers and elements categorized as results, and develop a visual model that shows the cause-and-effect relationships between the elements involved. Figure 3 presents the cause-and-effect relationships of the supporting elements of the NRBV-based supply chain, while Figure 4 presents a cause-and-effect map of the supporting elements of the NRBV-based supply chain.

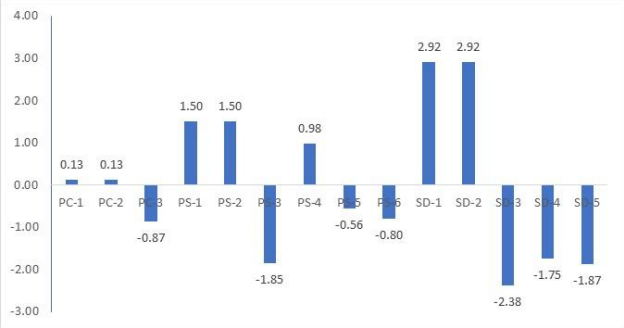

Figure 3. Cause-and-effect relationship of elements supporting NRBV-based supply chain

As seen in Figure 3, the elements of a successful NRBV-based supply chain can be grouped into two groups: the cause group and the effect group. The cause group consists of elements that exert a greater influence than they receive. These elements are drivers that significantly impact other elements and should be prioritized for action or improvement. Addressing these elements will impact many other parts of the system. The effect group consists of elements that receive a greater influence than they contribute. These elements are outcome factors that are significantly influenced by other elements in the system. These factors are often the result of addressing factors in the cause group (Jalwani & Choudhury, 2023).

The findings presented in Figure 3 highlight the importance of the proposed elements in developing an NRBV-based supply chain for traditional food SMEs. Two elements ranked highest: green management commitment (SD-1) and government support for green transformation in SMEs (SD-2), with scores of 2.97 each. These findings underscore the crucial role of these two elements in supporting the success of a NRBV-based supply chain for traditional food SMEs. These two elements can help facilitate the implementation of sustainable supply chain practices and enable SMEs to navigate the complex path towards a more environmentally friendly industry.

The next essential elements are green supplier selection (PS-1) and green innovation capability (PS-2), with scores of 1.50 each. These findings imply the importance of SMEs using NRBV criteria in the supplier selection process. Furthermore, SMEs need to enhance their innovation capabilities to develop new, more environmentally friendly products, processes, and services. These two elements contribute significantly to achieving sustainable economic, environmental, and social performance.

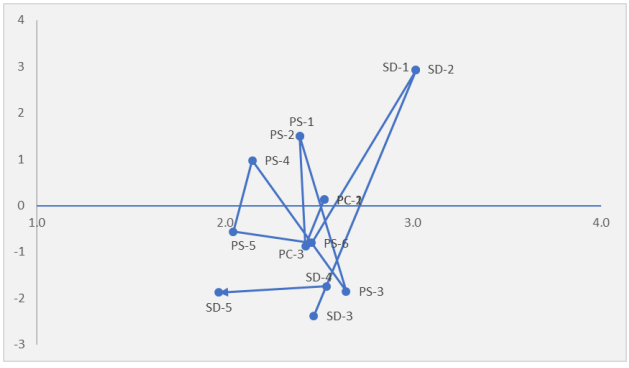

Figure 4. Cause-and-effect map of elements supporting NRBV-based supply chain

Green human resources (PS-4) was the third highest-ranking element, with a score of 0.98. This finding highlights the importance of SMEs developing their employees into more environmentally conscious resources. Green human resources are essential for SMEs to build a committed and sustainable work environment. In addition, green HR practices have the potential to

improve energy efficiency and reduce waste, which will ultimately result in reduced operational costs (Mustafa et al., 2023; Maqsood et al., 2022).

Meanwhile, Figure 2 illustrates the causal relationship among innovative principles in strategies to address green supply chain challenges. As an illustration, the elements of green management commitment (SD-1) and government support for green transformation in SMEs (SD-2) lead directly to the realization of green financing (PS-6) and green networks and partnerships. Conversely, green supplier selection (PS-1) and green innovation capability (PS-2) lead to the establishment of a green logistics system (PC-3) and green marketing (PS-3). These findings indicate that the elements of green management commitment, government support, green supplier selection, and green innovation capability play a crucial role in the success of an NRBV-based supply chain. Understanding the causal relationship between these elements facilitates decision-makers in industry practitioners in prioritizing elements and ensuring that policies and strategies for developing an NRBV-based supply chain can be implemented efficiently and effectively.

4. CONCLUSIONS

The NRBV-based supply chain in traditional food SMEs plays a crucial role in creating sustainable competitive advantage. This supply chain model focuses on how SMEs can generate sustainable competitive advantage through three capability pillars: pollution prevention, product management, and sustainable development. This is achieved through environmentally friendly practices in carrying out their business processes. Several studies have attempted to develop environmentally friendly supply chain models for SMEs. However, research focused on developing NRBV-based supply chain models is still relatively limited. This study fills this gap in the literature by constructing a visual model that shows a roadmap for developing an NRBV-based supply chain in traditional food SMEs. This study makes a significant contribution to the literature by combining MICMAC, ISM, and DEMATEL to identify elements relevant to an NRBV-based supply chain, analyze the interrelationships between elements, construct a hierarchical structure of elements, and define the crucial elements of an NRBV-based supply chain. The research results have implications on the importance of green management commitment, government support for green transformation in SMEs, green supplier selection, green innovation capabilities, and green human resources in developing NRBV-based supply chains. SMEs that follow the results of this research will gain many benefits, especially in developing policies and strategic plans in gaining sustainable competitive advantage through the development of NRBV-based supply chains.

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