


# Explaining and Modeling Strategic Alignment with Environmental Performance and Green Innovation Approach in the Food Industry

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## ABSTRACT

**Objective:** To investigate the relationship between strategic alignment and environmental performance.

**Methodology:** This study employed a descriptive-correlational research design. Data were collected from senior and middle managers of publicly traded companies in the food industry using adapted questionnaires. Hypotheses were tested using the partial least squares (PLS) method and analyzed through SPSS 23 and Smart PLS software.

**Findings:** The results demonstrated that strategic alignment positively and significantly impacts green capacity, environmental strategy, green innovation, and green human resource management. Furthermore, green capacity, environmental strategy, green innovation, and green human resource management each positively and significantly influence environmental performance. The overall model fit was found to be excellent, with a calculated GOF value of 0.741.

**Conclusion:** Strategic alignment plays a critical role in enhancing environmental performance by fostering green capacity, promoting innovative environmental practices, and integrating green strategies within organizational processes. This study provides a foundational framework for understanding how strategic alignment can be leveraged as a powerful tool for improving organizational sustainability and competitiveness.

**Keywords:** Green human resource management, strategic alignment, environmental performance, green strategy

## 1 Introduction

Due to increasing competition in today's business world, managers have been compelled to adopt measures such as internal organizational integrations to establish alignment among different units, aiming to achieve the organization's long-term objectives. Organizations, in fact, have no choice but to create proper alignment among various departments and divisions as a strategic resource to meet their strategic goals, which gives meaning to the concept of strategic alignment (Wang et al., 2023). If organizational units are not coordinated, each will move in a different direction, making the implementation of strategy impossible. Therefore, it is essential that all organizational units align their goals and plans to pursue similar objectives. This alignment leads to the emergence of the concept of strategic alignment. Strategic alignment refers to the alignment of organizational units with the core objectives of the company. These actions ensure that all individuals and decision-making teams are informed about the company's strategy and design their activities and plans in line with it (Adama et al., 2024).

On the other hand, environmental problems have become significant global issues, with manufacturers bearing the greatest responsibility. According to a recent report by the United Nations, global manufacturing companies consume 35% of the world's electricity and emit 20% of the world's carbon dioxide, which is highly detrimental to the environment (Shang et al., 2024). Empirical evidence suggests that in the supply chain context, greenness largely depends on strategic alignment with supply chain partners. In this regard, green supply chain strategy alignment represents a crucial approach to addressing environmental challenges within supply chains, encouraging companies to collaboratively develop and adjust green programs and objectives with their supply chain partners to establish an adaptable green strategy (Bhat et al., 2024).

Although companies have long recognized the positive impact of strategic alignment on operational performance, it is unclear how companies can leverage such alignment to achieve environmental objectives (Dahinine et al., 2024). Regarding the outcomes of green strategic alignment, it remains unexamined whether it can bring direct benefits to companies by improving environmental performance. Since environmental performance is a vital indicator for commercial companies, exploring the relationship between strategic alignment and environmental performance can highlight the importance of strategic alignment as a powerful

tool for shaping supply chain competition (Huo et al., 2021). Many studies have examined the effects of strategic alignment on performance, revealing positive relationships between strategic alignment and market performance, economic performance, business performance, and financial performance (Tjahjadi et al., 2023).

Chen et al. (2024), in their study, investigated the drivers of green IT strategy and corporate green strategy. Their findings supported four shared effects: (1) individual identity orientation and coercive pressure positively influence green IT practices; (2) collective identity orientation and normative pressure positively influence green strategy practices; (3) cost reduction orientation positively influences green IT practices; and (4) revenue expansion orientation and normative pressure positively influence green strategy practices (Chen & Roberts, 2024). Simmou et al. (2023) conducted a study on the alignment between corporate social responsibility strategy, green innovation, and environmental performance. The findings showed that external (environment and society) and internal (employees) CSR approaches significantly influence environmental performance. Additionally, this study demonstrated a mediating effect of green innovation on the relationship between CSR strategy and environmental performance (Simmou et al., 2023). Pesce and Neirotti (2023) examined the impact of alignment between IT and business strategies on firm performance. Their survey study revealed that strategic alignment significantly affects business performance, with environmental uncertainty acting as a moderating factor (Pesce & Neirotti, 2023).

Nevertheless, limited empirical evidence exists regarding the relationship between strategic alignment and environmental performance. Such a research gap may hinder our understanding of the benefits of green strategic alignment. Moreover, a substantial portion of prior research has focused on the alignment of business and IT, while the potential effects of strategic alignment on green practices and environmental performance have received relatively little attention. Given this, the present study seeks to explain the influence of strategic alignment on environmental performance. This study is among the first in the country to link the two concepts of "environmental performance" and "strategic alignment," potentially paving the way for new research directions in organizational management.

## 2 Methods and Materials

This study aims to explain and model strategic alignment with environmental performance and the green innovation approach. The research method is descriptive-correlational, and given its practical results, it is categorized as applied research conducted on a cross-sectional basis. The statistical population consists of all senior and middle managers of publicly traded companies in the food industry, totaling 719 individuals. Since the population size is 719 (one manager per company), the minimum required sample size, calculated using Cochran's formula, was determined to be 251 participants.

The data required to address the research questions were collected through an adapted questionnaire. To measure strategic alignment, the questionnaire by Nassani and Aldakhil et al. (2023) was used. Environmental strategy was assessed using Banerjee's (2002) scale with nine items. Green innovation was evaluated using the questionnaire by Chen et al. (2006). Green human resource management was measured using a five-item questionnaire by Shah et al. (2023). Green capacity was assessed using Andriopoulos' (2001) questionnaire, and environmental performance was measured using the questionnaire by Bhat et al. (2024) (Andriopoulos, 2001; Bhat et al., 2024; Nassani & Aldakhil, 2023; Shah & Soomro, 2023).

The questionnaire items were structured on a five-point Likert scale. To evaluate the validity of the questionnaire,

construct validity (outer model), convergent validity (AVE), and discriminant validity were assessed. Reliability was calculated using composite reliability (CR) and Cronbach's alpha coefficients for each factor. Descriptive statistical methods, such as frequency distribution tables, were used to describe the general characteristics of the respondents. Inferential statistical methods and the partial least squares technique were employed to test the research hypotheses. Data analysis was conducted using SPSS 23 and Smart PLS software.

### 3 Findings and Results

To examine the normality of the data in this study, the Kolmogorov-Smirnov test was used. The significance level of the Kolmogorov-Smirnov test for all research variables was smaller than 0.05. As a result, all research variables have a non-normal distribution. For better understanding, the results of the confirmatory factor analysis, including factor loadings, t-statistics, Cronbach's alpha, composite reliability, and average variance extracted (AVE) for each index, are presented in Table 1. Based on the results, it is evident that the measurement instrument possesses satisfactory validity and reliability.

**Table 1**

*Summary of Construct Validity Assessment Based on the Outer Model*

Indicator	Factor Loading	t-Statistic	Cronbach's Alpha	Composite Reliability (CR)	Rho Coefficient (Rho)	AVE
Q01 --> Strategic Alignment	0.796	36.708	0.780		0.780	0.602
Q02 --> Strategic Alignment	0.776	32.503				
Q03 --> Strategic Alignment	0.749	27.555				
Q04 --> Strategic Alignment	0.782	33.340				
Q05 --> Environmental Strategy	0.744	29.906	0.882	0.905	0.882	0.516
Q06 --> Environmental Strategy	0.786	22.632				
Q07 --> Environmental Strategy	0.733	26.684				
Q08 --> Environmental Strategy	0.704	25.307				
Q09 --> Environmental Strategy	0.722	28.678				
Q10 --> Environmental Strategy	0.742	28.455				
Q11 --> Environmental Strategy	0.703	26.226				
Q12 --> Environmental Strategy	0.797	23.461				
Q13 --> Environmental Strategy	0.729	27.822				
Q14 --> Green Innovation	0.758	30.970	0.835	0.850	0.836	0.549
Q15 --> Green Innovation	0.746	29.683				
Q16 --> Green Innovation	0.736	25.350				
Q17 --> Green Innovation	0.752	30.308				
Q18 --> Green Innovation	0.712	22.979				

Q19 --> Green Innovation	0.739	28.110				
Q20 --> Green HRM	0.754	29.625	0.812	0.879	0.812	0.570
Q21 --> Green HRM	0.756	29.007				
Q22 --> Green HRM	0.764	28.835				
Q23 --> Green HRM	0.738	25.590				
Q24 --> Green HRM	0.765	29.756				
Q25 --> Green Capacity	0.726	26.361	0.855	0.889	0.855	0.535
Q26 --> Green Capacity	0.705	23.613				
Q27 --> Green Capacity	0.721	23.775				
Q28 --> Green Capacity	0.718	25.099				
Q29 --> Green Capacity	0.743	30.019				
Q30 --> Green Capacity	0.750	32.580				
Q31 --> Green Capacity	0.755	33.216				
Q32 --> Environmental Performance	0.721	27.512	0.749	0.841	0.749	0.549
Q33 --> Environmental Performance	0.732	25.250				
Q34 --> Environmental Performance	0.761	29.517				
Q35 --> Environmental Performance	0.740	28.755				
Q36 --> Environmental Performance	0.750	30.711				

The factor loadings observed were greater than 0.50, and the t-statistics exceeded 1.96. Therefore, the outer (measurement) model is confirmed.

using the partial least squares method. The path coefficients and their significance results are illustrated in below figures, and a summary of the results is presented in Table 2.

To test significance, the path coefficients between variables were extracted from the PLS3 software output

**Table 2**

*Results of Structural Model Evaluation*

Hypothesis	Hypotheses	Path Coefficient	Significance Value	Result
1	The company's strategic alignment has a positive and significant impact on green capacity.	0.805	12.007	Confirmed
2	The company's strategic alignment has a positive and significant impact on environmental strategy.	0.814	12.360	Confirmed
3	The company's strategic alignment has a positive and significant impact on green innovation.	0.774	9.110	Confirmed
4	The company's strategic alignment has a positive and significant impact on green human resource management.	0.780	9.408	Confirmed
5	Green capacity has a positive and significant impact on environmental performance.	0.486	6.684	Confirmed
6	Environmental strategy has a positive and significant impact on environmental performance.	0.404	5.979	Confirmed
7	Green innovation has a positive and significant impact on environmental performance.	0.493	6.835	Confirmed
8	Green human resource management has a positive and significant impact on environmental performance.	0.460	6.342	Confirmed

The overall fit criterion (GOF) was calculated using the geometric mean of the average shared variance and  $R^2$ , yielding a value of 0.741 in this study. Based on this finding,

it can be concluded that the tested model has an excellent fit in the examined sample.

Figure 1

Structural Equation Model with Standardized Factor Loadings



Figure 2

Structural Equation Model with Significance Statistics



#### 4 Discussion and Conclusion

The first hypothesis test showed that the company's strategic alignment has a positive and significant impact on green capacity. Green capacity refers to creating internal conditions within the organization to facilitate environmental actions. This is achieved through resource allocation planning. Therefore, alignment among various organizational units and full alignment between IT and the organization's environmental strategies can potentially foster this green capacity within a company. From a resource-based view, an organization's success in achieving its goals (in this case, environmental goals) depends on having sufficient internal resources. Hence, strategic alignment enables the reallocation of resources to provide the capacity necessary to pursue environmental goals. Supporting this result, Gluch et al. (2009) argued that using digital technologies and IT-based innovations enhances coordination among units, playing a vital role in building green capacity (Gluch et al., 2009). Similarly, Nagy et al. (2021) reported a positive relationship between strategic alignment and organizational green capacity, which is consistent with the findings of this study (Nagy et al., 2021).

Strategic alignment also has a positive and significant impact on environmental strategy. Achieving success in an organization's environmental strategies requires designing and implementing action plans—an executable strategy consisting of actions and programs that are likely to be pursued with strong commitment. Designing action plans is impossible without alignment among various organizational units. Additionally, IT and digital technologies must be employed to gather and analyze environmental information to provide the organization's management with an accurate roadmap. In such conditions, alignment between the IT unit and other organizational units becomes crucial. In this regard, Bhat et al. (2024) also stated that without sufficient alignment among organizational units, implementing organizational strategies becomes very costly and even impossible (Bhat et al., 2024).

This study also showed that strategic alignment has a positive and significant impact on green innovation. In contemporary times, strategic alignment serves as the foundation for green innovations, making it impossible to gain a competitive advantage without alignment between organizational strategies and innovation. The alignment of strategy and innovation refers to the harmonious integration of an organization's strategic objectives with its innovative

efforts. This alignment ensures that implementing innovative ideas, initiatives, and projects aligns seamlessly with the overall goals and vision set by the company's senior management. Moreover, without strategic alignment among various organizational units, innovative environmental ideas cannot be realized. It has been stated that strategic alignment facilitates the identification and selection of the best innovations, enabling the organization to pursue environmental goals more effectively (Sun et al., 2023). Furthermore, empirical evidence supports the proposition that green innovation is positively influenced by strategic alignment among different organizational units (Coreynen et al., 2024).

Strategic alignment has a positive and significant impact on green human resource management (HRM). Alignment between the IT unit and the HRM unit is inevitable. To respond to current challenges and changes, human resources must adopt a new approach, and HR managers must abandon outdated habits, methods, ideas, and practices. On the other hand, they must assist organizations in formulating strategies and developing programs to enhance human capital. In this regard, strategic alignment improves HRM productivity through more effective practices in recruitment, organizational communication, employee engagement, and skill enhancement for HR managers. However, not all HR professionals work strategically in the HR domain. Many HR managers are still under pressure to perform administrative tasks and do not utilize their time and energy optimally. This result aligns with the prior findings (Dias & Silva, 2022; Huo et al., 2021) which highlight the impact of strategic alignment on green HRM.

Green capacity has a positive and significant impact on environmental performance. As previously mentioned, an organization's environmental performance largely depends on its internal capacities and resources. Green capacity refers to a combination of tangible and intangible resources, such as environmental concerns of managers, green behaviors of employees, and others, that provide the necessary foundation for environmentally friendly actions. From a business dynamics perspective, the high level of environmental uncertainty in modern times necessitates that internal green capacities be highly flexible to pursue organizational environmental goals, even in turbulent conditions. Supporting this finding, prior research has highlighted the role of internal resources in achieving green organizational goals (Bhat et al., 2024).

Environmental strategy has a positive and significant impact on environmental performance. According to Barney and Arikan (2001), the natural resource-based view (NRBV) does not encompass an environmental perspective when assessing an organization's performance. Environmental strategy integrates the resource-based view with the organization's environmental perspectives, charting the path to achieving environmental performance. Supporting this finding, Novitasari and Agustia (2023) also showed a positive correlation between environmental strategies and organizational environmental performance (Novitasari & Agustia, 2023).

The seventh hypothesis test revealed that green innovation has a positive and significant impact on environmental performance. Green innovation is a critical success factor for organizations seeking to protect the environment. Examples of green innovation include developing equipment designed to reduce electricity consumption, air pollution, and waste production while promoting energy and water conservation. The concept of green innovation is intricately linked to organizational environmental strategies and serves as an essential catalyst for achieving environmental benefits. Additionally, implementing green development strategies and creating innovative products reduces the negative environmental impacts of businesses, enhances an organization's financial and social benefits, and simultaneously lowers costs and waste. Ferreira et al. (2020) further emphasized that the transfer of inventions and equipment can sometimes reduce environmental impacts, highlighting green innovation's role in improving organizational environmental performance (Ferreira et al., 2020).

Green HRM has a positive and significant impact on environmental performance. Regardless of an organization's size and resources, its performance largely depends on its human resources. Specifically, in terms of environmental performance, it is the behaviors and actions of human resources—both managers and employees—that determine the organization's ability to achieve environmental goals. Green behaviors among employees, a willingness to minimize energy consumption, reduce waste production, environmental concerns of senior managers, and even employees' civic behaviors and mental commitment to environmental responsibility collectively impact an organization's environmental performance. When HRM aligns with the organization's environmental goals (green HRM), the groundwork for improving environmental

performance is established. This finding aligns with the prior results (Bhat et al., 2024; Tolliver et al., 2021).

This study is among the first to establish a link between strategic alignment and organizational environmental performance. Numerous factors were examined to explain this relationship. It is evident that further research will enhance our understanding of the relationship between strategic alignment and organizational green performance. Based on the findings, the following recommendations are proposed:

For hypotheses 1 to 4, emphasizing the importance of strategic alignment, managers are advised to adopt a participatory management approach and foster greater collaboration among units to achieve higher levels of alignment. Additionally, enhancing IT skills among employees in various units can provide the foundation for strategic alignment.

Regarding green capacity, organizations (particularly publicly traded companies, which are the focus of this study) are encouraged to allocate more budgets to environmentally friendly activities. Institutionalizing an environmentally conscious culture within the organization can also be effective.

Regarding green strategy, it is recommended that the organization's goals and visions be designed to include environmental considerations in at least part of the planned objectives.

For green HRM, it is suggested that more attention be paid to employees' green behaviors and environmentally supportive actions in job promotion and performance evaluation systems.

Regarding green innovation, organizations are encouraged to contribute more to environmental protection by purchasing low-emission equipment.

### Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

### Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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## Declaration of Interest

The authors report no conflict of interest.

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## Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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