"FLAVORS OF SUSTAINABILITY: INVESTIGATING THE IMPACT OF GREEN SUPPLY CHAIN PRACTICES ON FAST-FOOD BUSINESSES IN QUETTA"

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Abstract

This study undertakes an examination of the nuanced impact of green supply chain management (GSCM) practices, encompassing green manufacturing, green distribution, green purchasing, and reverse logistics, on the perceived firm performance within the fast-food restaurant industry situated in Quetta, Pakistan. Employing a rigorous cross-sectional design, data acquisition transpired through a meticulously structured questionnaire administered to 150 employees actively engaged in the fast-food sector. The ensuing dataset underwent meticulous analysis via Statistical Packages Software for Social Sciences (SPSS). The empirical findings of this study underscore the pivotal role of GSCM practices in significantly enhancing the perceived performance of fast-food establishments. Moreover, the investigation reveals a discernible variability in the impact of GSCM on perceived firm performance contingent upon the size of the restaurant. Noteworthy is the observation that larger establishments demonstrate a more pronounced accrual of benefits from the incorporation of GSCM practices into their operational paradigms. In conclusion, this research underscores the imperative for fast-food establishments, irrespective of their scale, to integrate GSCM practices into their operational frameworks. This imperative is substantiated by the study's identification of tangible competitive advantages and environmental sustainability benefits associated with the adoption of GSCM practices. Thus, this academic endeavor provides a substantive contribution to the discourse on sustainable business practices, advocating for the strategic integration of GSCM as a means to achieve both competitive success and environmental responsibility within the fast-food industry in Quetta and beyond.

1. Introduction

1.1 Background of study:

Green Supply Chain Management (GSCM) is a strategic approach that systematically incorporates environmentally conscious practices into supply chain management, with the dual aim of achieving profitability and market share objectives while mitigating environmental risks and impacts (Khan et al., 2022). The escalating negative environmental consequences of anthropogenic activities constitute a pressing global challenge, demanding urgent attention from all nations. Companies, in particular, confront formidable challenges amidst an increasing global awareness of environmental issues (Huang et al., 2023). GSCM emerges as a pivotal concept emphasizing environmental sustainability as an integral component of overall firm performance (Imam et al., 2022). It transcends the traditional supply chain management paradigm, which primarily focuses on cost reduction and service improvement, often neglecting environmental considerations (Huang et al., 2023). The adoption of green practices within the supply chain is strategically aligned to yield positive impacts on both environmental preservation and financial performance (Zhang et al., 2024).

The Theory of Stakeholders posits that stakeholders, comprising individuals or groups capable of influencing a company's performance while being affected by its actions, exert substantial influence. Corporations, therefore, generate externalities that can prompt stakeholders to advocate for the reduction of harmful effects (Sarkis et al., 2011). Additionally, suppliers may cease providing materials to firms that acquire a reputation for environmental negligence or non-green business practices.

While extant studies have predominantly employed unidimensional metrics to gauge Green Supply Chain Management (GSCM) as a construct, our study acknowledges GSCM as a multi-dimensional construct, encompassing diverse activities (Kazancoglu et al., 2018). Consequently, this research endeavors to bridge methodological gaps by adopting a multi-dimensional model for comprehensive GSCM assessment.

In pursuit of heightened environmental, economic, and strategic performance, an increasing number of manufacturing and service companies have been compelled to 'green' their supply chain operations. Despite significant discourse among practitioners underscoring the importance of GSCM in enhancing firm performance, cross-cultural investigations, especially within the Quetta context, remain limited. This study, therefore, adopts a cross-cultural perspective to offer an integrated insight into how GSCM influences the performance of fast-food establishments in Quetta.

Moreover, there exists a dearth of cross-cultural research, particularly within the Quetta context, exploring the impact of GSCM on firms' performance, specifically within the realm of fast-food restaurants. Consequently, this study aims to address this research gap, assessing the influence of green supply chain management (GSCM) practices on organizational performance within the fast-food restaurant sector in Quetta. The study endeavors to answer the following research questions:

- What role does GSCM play in influencing various facets of a restaurant's performance?

▪ How does GSCM contribute to a restaurant's financial, ecological, and competitive performance?

2. Literature Review and Hypothesis

The implementation of eco-friendly practices in supply chains is a contemporary concept aimed at protecting the environment while improving business performance, as described by Khan et al. (2022). With increasing globalization and competition among corporate networks, supply chain management has become a crucial strategy for companies to remain competitive. To balance these competing goals, Green Supply Chain Management (GSCM) has emerged as a method, according to Imam et al. (2022). GSCM's main characteristics, as identified by H'Mida and Lakhal (2007), are focused on improving supply chain performance throughout a product's life cycle, drawing on the vast body of knowledge on the subject. The commonly adopted components of GSCM, such as Green Purchasing, Green Manufacturing, Green Distribution, and Reverse Logistic, are explored, while empirical examination of other components are limited.

2.1 Green Purchasing:

Green purchasing is a sustainable procurement strategy that aims to fulfill a company's eco-friendly requirements by ensuring that the materials or products purchased promote waste elimination, reprocessing, regeneration, resource reduction, and recycled content, as explained by Khan et al. (2022). However, implementing sustainability principles in the procurement process may present significant challenges and complexity. Purchasers must consider environmental attributes, price, waiting time, quality, and convenience when evaluating suppliers, as noted by Yook et al. (2018).

As Wang et al. (2018) indicate, companies that comply with environmental regulations and adopt eco-friendly practices may face increased costs, which can negatively impact their competitiveness. Implementing environmentally sustainable practices can also divert resources from a company's primary business, leading to a decrease in profitability (Lu et al., 2022). However, greening a company's supply chain can result in several benefits, such as cost savings and involving suppliers in participatory decision-making processes that promote environmental innovatio. When environmental concerns take center stage, conflicts may arise among consumer and organizational stakeholders, leading to regional and global collaboration challenges across various domains.

2.2 Green Manufacturing:

Green manufacturing involves adopting the best resources to achieve a competitive edge through the production of high-quality products at the lowest possible cost. Green and lean manufacturing both aim to reduce waste, minimize manufacturing steps, and increase production efficiency, as highlighted by Prajogo et al. (2012). Firms can implement principles such as lean manufacturing, clean production, and remanufacturing during product development to minimize a product's ecological impact throughout its entire lifecycle, as described by Imam et al. (2022). Baines et al. (2012) argue that green manufacturing plays a significant role in promoting green supply chain practices by reducing the harmful effects of manufacturing activities and minimizing waste in

overall manufacturing systems. Green manufacturing also helps enterprises improve process efficiency, which results in economic and environmental benefits, as supported by a vast literature.

Nowadays, many business executives believe that prioritizing sustainability will help them compete more successfully in the future. Green manufacturing can benefit fast-food restaurants not only through long-term cost reductions but also by increasing brand awareness, improving regulatory interactions, and attracting more investors, as highlighted by Dubey et al. (2015). Adopting green and waste reduction methods can benefit both the environment and a company's financial bottom line, and sustainable performance represents a company's environmental responsibilities, as noted by Zhan et al. (2016).

Hajmohammad et al. (2013) investigated the number of green practices utilized in lean management and supply chain management strategies and their mediation effect on environmental performance. Bustinza et al. (2024) suggest that green performance and excellence, staff development, and lean approaches all help a company and its competitors maintain competitiveness. However, several barriers to green manufacturing have been identified by researchers, such as a lack of ecological awareness and green concerns, senior management commitment, and a temporary policymaking orientation, as indicated by Govindan et al. (2014).

2.3 Green Distribution:

Carbon footprints and emissions present a major challenge in supply chain management. Transportation is the biggest contributor to greenhouse gas emissions, accounting for 89% of emissions in supply chain logistics. To tackle this issue, companies can adopt strategies that minimize their carbon footprint while keeping supply chain costs at optimal levels. According to Imam et al. (2022), it is possible to select a strategy that does not significantly increase costs, as supply chain expenditures remain relatively consistent across different strategies. By implementing such strategies, companies can reduce their carbon emissions and contribute to environmental sustainability (Hu & Zhao, 2024).

Green distribution is a critical aspect of the relationship between environmental innovation and economic advantage, according to case studies conducted by Hasan (2013). The studies found that businesses benefited from higher productivity, cost savings, improved risk management, better service, and increased revenue. However, some companies may not be able to take advantage of this image advantage due to customers' inability to identify the sustainability of items in their supply chain (Delmas & Montiel, 2009). Improved packaging and reorganized loading patterns, associated with green distribution, reduce material consumption and increase warehouse and trailer usage, according to Amemba et al. (2013). Both studies suggest that breaking down products into smaller pieces for efficient storage and transportation can save space and resources while improving warehouse efficiency.

2.4 Reverse Logistic:

Reverse logistics refers to the process of taking back products and materials from the point of consumption and returning them to the supply chain for purposes such as reprocessing, reuse, renovation, restoration, or safe disposal (Masudin, 2019). This process can take many forms, including collecting and shipping products back to the supply chain, disassembling products to

reuse the collected parts, and shredding used products to produce raw materials for new products (Khan et al., 2022). While reverse logistics has gained significant attention in recent years, it should not be considered the sole solution to greening efforts, as it only addresses one aspect of the supply chain.

Lower raw material consumption, lower energy consumption, fewer production stages, reduced environmental and occupational safety expenses, and a more positive corporate image are some of the benefits of green manufacturing. Green manufacturing can be complemented with reverse logistics, which adds value to customers while reducing supply chain costs, as noted by Green et al. (2003). The supply chain's cost, quality, flexibility, and delivery components should all reflect improved value. Reverse logistics services promote customer loyalty and allow organizations to build strong customer relationships. However, reverse logistics can also place financial pressure on supply chain performance and decrease product quality. Green et al. (2006) investigated the relationship between reverse logistics and competitive advantage. They found that reverse logistics is significantly and positively associated with organizational performance, allowing businesses to differentiate themselves through social services, reliability, and strong customer connections.

H1. Green Supply Chain Management has a positive relationship with Perceived Firm Performance
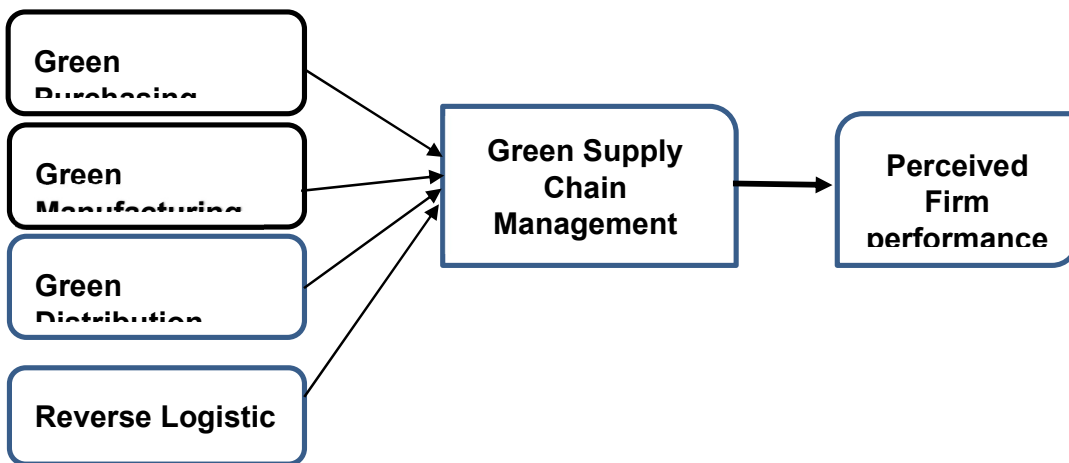

Figure1: Conceptual Framework for the study

3. Research Methodology:

3.1 Research Design:

In pursuit of examining the potential relationships between variables, this study adopted a robust research design incorporating a cross-sectional analysis. The data, deemed suitable and relevant for the research objectives, was collected from respondents within the fast-food restaurant industry, employing a structured questionnaire as the primary data collection tool. This methodological choice aligns with the questionnaire survey approach, particularly effective in exploring links between specified variables and constructs (Salkind, 2012).

3.2 Hypothesis Testing:

The study conceptualized the four GSCM activities as independent constructs, evaluating their potential impact on the dependent variable, Perceived Firm Performance, in line with the conceptual framework established by Çankaya & Sezen (2019). Recognizing the sensitivity of objective financial data, the research gauged respondents' subjective perceptions of Perceived Firm Performance, covering economic, social, and environmental aspects. Both independent and dependent constructs were measured on a 5-point Likert scale, ranging from 'strongly agree' to 'strongly disagree'. Relevant tests were subsequently conducted to assess the formulated hypotheses.

3.2 Reliability:

To ensure the reliability of the data, Cronbach's alpha value was employed, with a threshold set at a value greater than 0.70.

3.3 Target Population:

The target population for this study comprised employees working within the fast-food industry in Quetta.

3.4 Sampling Unit:

The sampling unit consisted of employees with a work tenure of more than two months in fast-food restaurants.

3.5 Sampling Technique:

A convenience sampling procedure was employed to select respondents for the study. Recognizing the non-probability nature of convenient sampling, this method was deemed appropriate for the study's context of an unlisted population.

3.6 Sample Size:

Initially, 150 questionnaires were distributed, and 80 were returned, with 70 deemed filled and correct. Therefore, the final sample size for analysis was determined to be 70, achieving a response rate of 46.66 percent. This sample size aligns with existing research standards, affirming adequacy for the current investigation.

3.7 Data Analysis Technique:

For data analysis and the derivation of descriptive statistics, the Statistical Package for Social Sciences (SPSS) was employed, ensuring a systematic and rigorous approach to draw meaningful insights from the collected data.

4 Results:

4.1 Profile of the Respondent:

The profile of the 70 respondents in the study, representing the fast-food restaurant industry in Quetta, is characterized by a diverse range of demographic and professional attributes. Participants are aged between 20 and 40 years, with a gender distribution of approximately 60% male and 40% female. Their educational backgrounds vary, encompassing high school graduates, diploma holders, and individuals with bachelor's degrees. With a work experience range of 2 months to 5

years, respondents hold diverse occupational roles, including front-line staff, chefs, managers, and customer service representatives. The majority are full-time employees, affiliated with different fast-food restaurants across various localities in Quetta.

Table 1 .Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square change	F change	Df1	Df2	Sig. F change
1	.811	.657	.625	.37117	.657	20.152	6	63	<.001

As depicted in the aforementioned Table 1, the coefficient of multiple determination (R) serves as a metric denoting the robustness of the relationship between the independent variable and the dependent variable. In this instance, the R value stands at 0.811, signifying that approximately 81.1% of the variability in the dependent variable (Perceived Firm Performance) finds elucidation through the independent variable(Green Supply Chain Management) incorporated within the model. Furthermore, the coefficient of determination (R Square) delineates the proportion of variability in the dependent variable that can be ascribed to the independent variable. Consequently, R Square registers at 0.657, denoting that around 65.7% of the variance in Perceived Firm Performance can be clarified by Green Supply Chain Management.

Moreover, the adjusted R Square, a refinement of R Square that factors in the number of predictors and sample size, aims to mitigate overfitting risks. As demonstrated, the adjusted R Square attains a value of 0.625, accommodating the model's intricacy and indicating that roughly 62.5% of the variability in Perceived Firm Performance can be illuminated by Green Supply Chain Management. Additionally, the standard error of the estimate embodies the average gap between observed values and those predicted by the regression model, manifesting as 0.37117 in this specific case.

Furthermore, these metrics contribute to the overall significance evaluation of the regression model. The R Square change (0.657) and the F change (20.152) signify the alterations in R Square and F value upon the introduction of the independent variable into the model. Notably, the F change value of 20.152, accompanied by degrees of freedom (Df1 = 6, Df2 = 63), attests to the statistical significance of the overall regression model, with a p-value below 0.001.

Table 2. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.658	6	2.776	20.152	<.001

Residual	8.680	63	.138
Total	25.338	69	

As depicted in Table 2, the regression analysis reveals crucial insights into the variance components within the model. The sum of squares (SS) for the regression stands at 16.658, accompanied by 6 degrees of freedom (df). Calculating the mean square (MS) involves dividing the sum of squares by the corresponding degrees of freedom, yielding a mean square value of 2.776.

The Residual row represents the unexplained variance, residual after considering the regression model. The sum of squares for the residual is 8.680, with 63 degrees of freedom, leading to a mean square of 0.138, symbolizing the variability unaccounted for by the model.

The Total row encapsulates the overall variance in the data, with a sum of squares for the total reaching 25.338. Degrees of freedom correspond to the total number of observations minus 1 (69 in this case).

The F-statistic, a pivotal metric, is derived by dividing the mean square for the regression by the mean square for the residual. In the ANOVA table, the F-value stands at 20.152, signifying the ratio of explained variance to unexplained variance. This value serves as a critical determinant of the regression model's statistical significance.

The reported significance level (Sig.) of the F-statistic is denoted as "<.001," affirming the statistical significance of the regression model at a level less than 0.001. This conveys robust evidence, suggesting that the independent variable(s) (Green Supply Chain Management) significantly contribute to predicting the dependent variable (Perceived Firm Performance). In essence, the model exhibits strong explanatory power, reinforcing the relevance of Green Supply Chain Management in forecasting and understanding Perceived Firm Performance.

Table 3. Coefficients

Model		Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig
1	(Constant)	.724	.405		1.788	.079
	Green Supply Chain Management Practices	.571	.091	.631	6.295	<.001

   a. Dependent Variable: Perceived Firm Performance

As shown in Table 3. The constant term in the regression model signifies the estimated value of the dependent variable (Perceived Firm Performance) when all independent variables are zero. In this instance, the constant is 0.724, with a standard error of 0.405.

Green Supply Chain Management Practices: The coefficient associated with the independent variable "Green Supply Chain Management Practices" is 0.571. This implies that, holding all other factors constant, a one-unit increase in "Green Supply Chain Management Practices" is estimated to result in a 0.571 unit increase in the dependent variable. The standard error for this coefficient is 0.091. in addition, Beta represents the estimated change in the dependent variable (Perceived Firm Performance) in terms of standard deviations for each standard deviation increase in the independent variable. In this context, the Beta coefficient for "Green Supply Chain Management Practices" is 0.631. Moreover, the t-value gauges the significance of the coefficient estimate, calculated by dividing the coefficient estimate by its standard error. A higher absolute t-value signifies a more substantial relationship. In Table 3, the t-value for "Green Supply Chain Management Practices" stands at 6.295, indicating strong statistical significance. In addition, the significance level (p-value) reflects the probability of observing the coefficient estimate by chance, assuming no true relationship between the independent and dependent variables. As per Table 3, the significance level for "Green Supply Chain Management Practices" is reported as "<.001," denoting statistical significance at a level less than 0.001.

Conclusively, based on this coefficient table, it is deduced that there exists a positive and statistically significant relationship between "Green Supply Chain Management Practices" and "Perceived Firm Performance." The evidence suggests that as the implementation of Green Supply Chain Management Practices increases, there is a corresponding positive impact on the perceived performance of the firm."

Table 4. Hypothesis Testing

Hypothesis	Relationship	Beta	Mean	SD	T-value	P-value	Decision
H1	GSM impact on PFP	.40	1	1.03	2.785	0.002	Supported

As illustrated in Table 4, Hypothesis H1, asserting that "Green Supply Chain Management (GSM) impacts Perceived Firm Performance (PFP)," has garnered support through rigorous statistical analysis. The interpretation of the results is elucidated as follows:

The Beta coefficient serves as a standardized measure, signifying the estimated change in the dependent variable (PFP) in terms of standard deviations for each standard deviation increase in the independent variable (GSM). In our context, the Beta coefficient is 0.40.The mean represents the average value of the independent variable (GSM) in this scenario, articulated as 1. The standard deviation measures the variability or spread of the data for the independent variable (GSM), reported as 1.03. The t-value is a metric assessing the significance of the coefficient estimate. In

this case, the t-value is denoted as 2.785. in addition, the p-value signifies the probability of observing the coefficient estimate (or a more extreme value) under the null hypothesis, assessing the statistical significance of the relationship. The reported p-value is 0.002.

Consequently, the conclusion drawn is that the hypothesis is substantiated. The p-value of 0.002 falls below the conventional significance level of 0.05, providing robust evidence to reject the null hypothesis in favor of the alternative hypothesis. Therefore, it can be confidently asserted that there is strong statistical support for the notion that Green Supply Chain Management (GSM) significantly impacts Perceived Firm Performance (PFP).

5. Discussion

Green Supply Chain Management (GSCM), encompassing green purchasing, green manufacturing, green distribution, and reverse logistics, has emerged as a critical paradigm for enhancing operational efficiency and environmental sustainability in the fast-food restaurant industry in Quetta. The empirical investigation conducted in this study sheds light on the multifaceted impact of GSCM practices on perceived firm performance.

The findings underscore that the adoption of GSCM practices, including green manufacturing, green purchasing, green distribution, and reverse logistics, plays a pivotal role in shaping various dimensions of firm performance. The positive outcomes reported in terms of increased sales, enhanced product quality, and improved delivery processes resonate with the assertions of previous studies. As noted by Ninlawan (2010), businesses strategically coordinating their distribution networks stand to benefit from higher load capacity, thereby optimizing transportation efficiency. This optimization contributes to lower transportation costs, aligning with the current findings indicating a positive correlation between GSCM practices and increased profit margins (Lu et al., 2022).

Moreover, the study affirms that green distribution practices signify managerial commitment to embracing environmentally conscious manufacturing and distribution strategies. This proactive approach, as highlighted by Hasan (2013), not only allows businesses to control their distribution patterns but also results in cost savings in the production process. The alignment of distribution practices with green principles is consistent with the conclusions drawn by Muma (2014), affirming the favorable relationship between green distribution and perceived firm performance.

In light of these positive correlations, it is evident that GSCM practices, particularly green manufacturing, green purchasing, green distribution, and reverse logistics, wield substantial influence over a company's competitiveness. The interplay of these practices contributes to a holistic approach that not only enhances environmental sustainability but also positively impacts key performance indicators.

In conclusion, the empirical evidence presented in this study underscores the significance of integrating GSCM practices into the operations of fast-food restaurants in Quetta. The positive correlations between green manufacturing, green purchasing, green distribution, and reverse logistics with perceived firm performance not only validate existing literature but also provide actionable insights for businesses seeking to enhance both their environmental sustainability and competitive positioning in the marketplace. The identification of nuanced relationships calls for

continued research to refine and tailor GSCM strategies to the unique dynamics of the fast-food restaurant industry in Quetta.

6. Conclusion

In the contemporary landscape of intense business competition, Fast Food Restaurants are compelled to concurrently prioritize both their business and environmental performance. The imperative to stay competitive mandates a continuous evaluation of business practices, with a particular emphasis on environmentally sustainable strategies, as superior performance in these domains confers a distinct competitive advantage. A study conducted by Zhang et al. (2024) posits that Green Supply Chain Management (GSCM) emerges as a transformative force, steering organizational culture towards sustainable and environmentally conscious practices. GSCM, as an encompassing process, stands as a proactive approach aimed at mitigating both environmental and economic repercussions. It achieves this by systematically minimizing waste products, curbing pollution, mitigating toxins, and conserving energy throughout operational processes. The pervasive influence of GSCM extends across various facets of a firm, making it a crucial element in contemporary business strategies. This present study delves into the intricate relationships between success criteria of Green Supply Chain Management and performance metrics through a comprehensive analysis. The findings of the study underscore a significant correlation between various GSCM components and organizational outcomes. Correlation analysis, in particular, illuminates the tangible benefits derived from investments and interventions in these GSCM components. Crucially, the structural model employed in the study reveals that performance indicators wield a substantial influence on overall business performance compared to other contributing elements. The adept prediction of dependent variables in the research underscores the efficacy of GSCM practices in shaping favorable business outcomes. Moreover, a sensitivity analysis conducted further validates the robustness of the model while pinpointing specific areas that warrant management attention. The implications of this research extend beyond theoretical insights, offering practical guidance for firms to identify and prioritize areas demanding heightened attention within their GSCM frameworks. By accentuating the impact of performance indicators on business outcomes, the study reinforces the value of strategic investments in GSCM practices for Fast Food Restaurants seeking to fortify their competitive positions and navigate the evolving landscape of consumer expectations and environmental responsibility. In conclusion, this study contributes to the growing body of knowledge emphasizing the pivotal role of GSCM in fostering both environmental sustainability and business success. As Fast-Food Restaurants navigate the intricate intersection of business and environmental imperatives, the insights gleaned from this research serve as a compass for informed decision-making, fostering a harmonious balance between competitive prowess and ecological responsibility.

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