INTERNATIONAL JOURNAL OF ECONOMICS AND FINANCE STUDIES
Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215
Received: 11.04.2026 | **Accepted:** 20.5.2026 | **Published Online:** 18.06.2026

-RESEARCH ARTICLE-

ADOPTION OF SUSTAINABLE BENCHMARKING AS AN APPROACH TO ENHANCING GREEN STRATEGIES: AN APPLIED STUDY ON A SAMPLE OF INDUSTRIAL COMPANIES

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Citation (APA): Ubaid, A. M., Jawad, A. G., Malk, M. H., Nayef, T. N., Flayyih, H., H. (2026). Adoption of Sustainable Benchmarking As an Approach to Enhancing Green Strategies: An Applied Study on a Sample of Industrial Companies. *International Journal of Economics and Finance Studies*, 18(02), 346-374. doi: 10.34109/ijefs.2026180215

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

─Abstract─

The current paper presents an analysis of how the process of Sustainable Benchmarking (SB) helps to enhance the green strategic orientation of economic entities based on an integrated dual-model framework. According to the first model, SB is perceived as the explanatory variable and analysed through sixteen indicators, such as financial performance, non-financial measures and sustainability criteria. The second model includes green strategies (SG) as the dependent variable and identifies four fundamental dimensions of SG, namely environmentally responsible manufacturing, sustainable product development, green sourcing activities and organisational green culture. The empirical analysis of the research question was undertaken through a purposive sample of major economic actors from the Middle East, namely Almarai (Saudi Arabia), Baghdad Soft Drinks (Iraq), and Al-Hilal Industrial (Iraq) for the period from 2020 to 2024. The results obtained during the study indicate that SB not only continues to function as a tool for increasing operational effectiveness but has turned into a strategic management technique which ensures the connection of environmental goals and achievements related to the sustainability. Thus, it becomes clear that SB helps organisations to decrease the "performance gap" between green strategies and achieved environmental success. In the current sample of economic entities, Almarai became the most advanced benchmark in relation to the efficiency of energy management and sustainability disclosure. At the same time, other firms from Iraq showed less progress in comparison with the leader, as the process of environmental reporting continued to develop. Overall, the current study proves the idea that the application of SB allows organisations to transform environmental pressures and requirements into sustainable competitive advantages and the redesign of green business models. Economic organisations should therefore shift from the environmental management approach focused on compliance to the strategic approach, based on SB.

Keywords: Sustainable Benchmarking, Green Strategies, Environmental Disclosure, Resource Efficiency, Green Competitive Advantage.

INTRODUCTION

The contemporary world of economics is now undergoing deep changes due to sustainability needs and increasing involvement in international environmental agreements. The result of these processes is the formation of a business environment in which there are many aspects of complexity and uncertainty, together with growing environmental issues. In such a situation, economic actors are under pressure that necessitates deep changes in their strategic direction and managerial structure for survival and sustainable development (Fernández-Miguel et al., 2025). As a result of these processes, the disciplines of management and accounting are moving from traditional means to more strategic ones like SB that are viewed as a basic ability for increasing organizational resilience rather than as some additional managerial tool. This

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

is one of the most important factors in solving the existing problem of disconnect between green strategy and its environmental performance (Bourini et al., 2024).

In the case of the Middle Eastern region, specific challenges related to the limited availability of green knowledge resources and growing international pressure to contribute to the transition to sustainable economic systems emerge (Sadiq et al., 2023). ese factors make the implementation of GS through such areas as environmentally-friendly production processes, sustainable products development, green procurement, and organisational culture indispensable in terms of maintaining competitiveness and meeting international environmental standards (Opoku, 2025). Furthermore, the lack of a universal system of benchmarking in the regional business environment makes the identification of examples of reference organisations that would excel in efficient resource use and waste reduction important (Mir et al., 2026). Accordingly, this research examines the influence of SB adoption as a strategic Consequently, the paper analyses the impact of the SB adoption as a means of progressing towards GS. In particular, the research explores the way in which the implementation of the proposed measures helps organisations of the region to integrate their sustainability-related changes and minimize the gaps in performance when compared with successful industry practices, including those of Almarai company (Almeflh & Almofleh, 2026).

Earlier literature has shown how beneficial benchmarking-based approaches are for achieving sustainability results. One such DEA-based approach has led to the development of a sustainability efficiency model that considers desirable outputs, such as profitability, and undesirable outputs, for instance, emissions and wastes, as well. The assessment of 16 foreign chemical manufacturing plants has proved that such an approach is useful for making decisions strategically and allows companies to detect inefficiencies by making a comparison with industry-specific benchmarks (Leu et al., 2020). Another example is provided by the paper written by Cappelletti et al. (2023) on the issue of assessing and decreasing mobility-related emissions in the community of the University of Foggia, Italy. Using the LCA approach, the researchers have designed the SMI for performance comparison with environmentally optimal options. Thus, the categorization of sustainability performance has helped to communicate about environmental performance among stakeholders and align with the 2030 SDGs.

Also, Alzlzly and Radhi (2024) researched the contribution of benchmarking to achieving SDG 7 (Affordable and Clean Energy). The authors used the conceptual and case-based analysis to show that benchmarking is helpful in identifying the weak points of performance compared to other companies in the world while promoting evidence-based decision-making, accountability, and knowledge transfer between organizations. In addition, Olanrewaju (2025) considered sustainable construction management through international benchmarking. By constructing a global framework for sustainable construction management based on CSFs, the author used PCA analysis and more than 600 companies to reveal nine basic dimensions of benchmarking, including

Vol: 18 No: 02 Year: 2026 ISSN: 1309-8055 (Online) (pp. 346-374) Doi: 10.34109/ijefs.2026180215

environmental ethics and digitization. It was found out that the adoption of the internationally accepted standards (LEED and BREEAM) is a way to align organizational processes with net-zero objectives and improve competitive advantages in the international market.

In another research, (Abbas, 2020) studied the influence of GS on environmental and financial performance, as well as the mediation role of product quality. With the help of the answers of 648 people, the author concluded that GS has a significant influence on environmental performance; meanwhile, the role of product quality as a mediator helps to enhance the long-term economic gains of green innovation. In addition, Jin and Chorda (2025) considered the combined effect of entrepreneurial orientation and green learning orientation within hybrid GS on SME performance. With the help of SEM analysis based on the data of 364 start-ups from Shanghai, the author demonstrated that the use of hybrid strategies brings positive financial and environmental effects; meanwhile, business model innovation becomes a mechanism for achieving performance.

Thus, the existing literature on sustainability can be divided into three main research streams. First, the research stream is devoted to the investigation of green strategic performance and includes such concepts as entrepreneurial capabilities and learning-oriented approach. Second, the research stream is concerned with the application of SB and the methods of quantitative assessment (DEA) to identify the differences in performance and to monitor the progress towards sustainable objectives. Third, the research stream discusses the constant gap between sustainability investments and the real achievements of improving resource efficiency. Building on these research directions, the present paper adds to the literature by solving several unsolved problems.

Although numerous studies paid special attention to the developed or economically stable environments (Shanghai, European Union countries), little attention has been paid to the Iraqi and Middle Eastern environments which are characterized by some particularities, especially concerning the governance system, the lack of green expertise, and growing international pressure to apply sustainable economic practices. Unlike other papers that consider GS as an independent variable or benchmarking as a general method of evaluation, the present study defines SB as a proactive process of learning and development that facilitates the formation and improvement of GS within environmentally-sensitive industrial sectors. The importance of the research is in the possibility to reduce the gap between sustainability intentions and environmental accomplishments. In particular, the study develops the literature by establishing the link between SB and hybrid GS and lacks of the comprehensive evidence of performance optimization.

Moreover, the study offers managers of economic entities, especially the emerging ones, some useful information about how to use the mechanisms of benchmarking to find out

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

environmental weak points and make decisions according to international best practices. The research problem is associated with the inability of traditional strategic approach to address growing sustainability requirements and the international environmental standards. A lot of economic entities, especially the emerging and small-scale ones, face some difficulties in translating the green strategic intentions into measurable accomplishments because of the limited resources and lack of knowledge about the comparison with international benchmarks. Thus, there is a constant gap between environmental investment decisions and the achievement of resource efficiency.

In this regard, the absence of the SB framework leads to fragmented, inconsistent, and ineffective GS and prevents from creating the sustainable economic value. This study is designed to solve the following research problems:

Q1) How does adopting SB contribute to identifying and reducing environmental performance gaps through the adoption of global best practices?

Q2) To what extent can sustainable KPIs reconcile economic benefits, including profitability, with undesirable environmental outcomes such as waste generation?
Q3) How does SB contribute to strengthening hybrid GS and improving green investment effectiveness to achieve enhanced resource efficiency?

Based on these research questions, the study hypotheses are formulated as follows:

H1: *Adopting and implementing SB enhances the effectiveness of green (environmental) strategies in economic entities, ensuring a balance between economic and environmental dimensions.*
H2: *There is a statistically significant positive correlation at the 0.05 significance level between the adoption of SB dimensions and the implementation of GS in the sampled companies.*
H3: *There is a statistically significant positive impact at the 0.05 significance level of SB dimensions on the adoption and implementation of GS in the sampled companies.*

AN INTEGRATED THEORETICAL APPROACH TO SUSTAINABLE BENCHMARKING

Shortcomings of Traditional Benchmarking

Benchmarking models based on traditional financial and quantifiable measures of performance have numerous deficiencies preventing the approaches from being used to meet needs of modern business environment (Tomašević, 2021). The primary flaw of such approaches is their extreme focus on financial results, because these approaches measure tangible economic performance while ignoring important non-financial parameters, such as quality of products/services, client satisfaction, organizational

Vol: 18 No: 02 Year: 2026 ISSN: 1309-8055 (Online) (pp. 346-374) Doi: 10.34109/ijefs.2026180215

flexibility, employee development, and environmental sustainability (Tomašević, 2021). Limited scope of conventional benchmarking may lead to an incomplete evaluation of organizational effectiveness, because financial measures cannot be sufficient enough to reveal the general performance, resource efficiency, and sustainability (Sakyi et al., 2022). Besides, another important issue related to traditional benchmarking is a possible contribution of the approach to greenwashing. Organizations may concentrate on rapid results that will satisfy their stakeholders' expectations or regulatory bodies without making necessary changes to achieve sustainability. As a result, organizations ignore problems of the environment and interests of future generations (Edwards, 2021). Besides, performance models focusing on productivity improvement and profit maximization can negatively affect long-term well-being of society and the environment, because they ignore the responsibility of organizations for environmental sustainability and well-being of people (Xu & Tan, 2020).

Another aspect related to benchmarking which needs attention is that it may serve as an instrument for greenwashing. Organizations can be more concerned with quick results to meet their obligations instead of making any structural changes, thus failing to deal with real problems and neglecting the needs of future generations (Lashitew, 2021). Moreover, performance models oriented only on productivity improvement and profit maximization may adversely affect societal and environmental well-being because organizations will neglect their responsibility towards environmental protection and social welfare (Omazić, 2023).

Sustainable Benchmarking: Origins and Definition

Historically, performance efficiency assessment had theoretical foundations rooted in the basic findings regarding the measurement of productive unit efficiency. The history of benchmarking developed under the productivity-based paradigm when companies were interested in achieving maximum profitability through resource allocation and utilization. The expansion of benchmarking was associated with Japanese experience when, after WWII, the country used the "Dantotsu" ("the best among the best") concept as a strategic tool for beating competitors and gaining better market positions (Ayduğ et al., 2020). Afterward, in 1979, Xerox Corporation institutionalized benchmarking as a practice of systematic competitive analysis and turned it into a management tool.

The move toward SB received impetus after 2015-2026 when the UN 2030 Agenda for Sustainable Development stimulated the incorporation of sustainability considerations in strategic planning and decision-making in organizations. Between 2020 and 2026, SB was increasingly incorporated in international regulations, including European ESRS requirements when performance evaluation started to move from financial metrics to the concept of double materiality. That is, it included not only the financial consequences of organizational actions but also the environmental and social impacts.

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

The latest stage of SB development is associated with its role as the tool for building the resilience and long-term sustainability of organization, promoting intergenerational continuity, and evaluating energy efficiency improvements and net-zero goals (Loos & Adant, 2025).

SB may be defined as a strategy to improve performance of organizations through systematic analysis and comparison of current practices with leading performers. Thus, organizations have the opportunity to gain information about leading practices and implement the necessary changes associated with both environmental and economic benefits, including initiatives aimed at reducing energy and industrial sustainability improvement. In the manufacturing context, SB is a management tool oriented on the development of the whole policy and improvement of economic performance through performance comparisons among economic units in terms of production efficiency, energy usage, and resources consumption.

In addition, SB gives an opportunity to organizations to use the common framework for assessing the performance against the industry benchmarks and the best practices, which helps in identifying improvement areas and tracking the progress toward the sustainable development. It allows measuring sustainable energy accessibility and efficiency and making decisions based on data. Moreover, SB is a continuous organizational improvement process during which the internal and external best practices are identified, analyzed, adjusted and incorporated to improve sustainable market performance and contribute to the development of the world through responsible resources management. Finally, SB may be considered as a strategic capability for achieving sustainable development through strategic alignment, organizational resilience development, and sector best practices implementation, for example, in the tourism industry.

The Importance of Sustainable Benchmarking

SB is a form of strategic management that goes beyond traditional business views in terms of making decisions based on environmental and social responsibilities. Its importance can be explained from various angles.

Global Sustainability Tracking

SB presents a standard approach to the assessment of sustainable energy efficiency in various industries, thereby allowing organizations and interested parties to detect inefficiencies, measure progress and determine the efficacy of emission reduction efforts. (Tasdemir et al., 2020).

Enhancing Environmental Performance and Reducing Carbon Footprint

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

SB assists in the harmonization of business processes with environmental goals through its facilitation of emission reduction initiatives, increased resource effectiveness, reduced inefficiencies, and decreased fuel wastage (Ahmed & Ahmed, 2026).

Transparency and Accountability

SB enhances stakeholder trust through environmental compliance, improved disclosures, and incorporation of considerations of public health and ecosystem preservation into reputation management (Sari & Muslim, 2024).

Innovation and Resilience

SB assists organizations in creating innovations that will help solve the problems of global sustainability through the application of sustainable manufacturing processes (Sasso et al., 2025).

Progress Tracking

SB creates a systematic approach to measuring sustainability progress through its assistance in measuring organizational strategic success and striking a balance between economic performance and sustainability (Thomas et al., 2025).

Types of Sustainable Benchmarking

SB uses the concept of triple bottom line whereby economic, environmental, and social elements are considered through varied benchmarking techniques aimed at improving organizational best practices. Internal Benchmarking entails the sharing of good practices within the organization from one branch to another in order to ensure uniformity and efficiency. Competitive Benchmarking involves comparison with rival companies to identify weaknesses, strength areas, and the degree of movement towards being a leader in the industry. International Benchmarking is an extension of competitive benchmarking whereby organizations compare themselves to renowned organizations in the world to identify success factors that will help them overcome geographic and other challenges. Process Benchmarking involves improvement in the performance of various activities through comparison with good efficiency models (Roh et al., 2023).

Sustainable Benchmarking Tools

Several techniques are being used to assess performance gaps and increase resource efficiency. They include:

1. Data Envelopment Analysis (DEA): The most common technique used in assessing relative efficiency by allowing economic entities to maximize desirable

Vol: 18 No: 02 Year: 2026 ISSN: 1309-8055 (Online) (pp. 346-374) Doi: 10.34109/ijefs.2026180215

output like profits while minimizing undesirable outputs like emissions and waste without converting them into money before.

2. Life Cycle Assessment (LCA - ISO 14040): It is a standardized technique used to assess the impacts of a product or process on the environment across its full life cycle, from extraction of raw materials to final disposal by analyzing the flow of material and energy.

3. Analytic Hierarchy Process (AHP), Fuzzy Logic: Quantitative techniques that help in assessing sustainability by allocating weights to criteria used in the assessment based on expert judgments and taking into account uncertainties involved in qualitative information on sustainability.

4. Advanced Digital Technologies: Tools used to facilitate benchmarking activities, increase data availability and enhance transparency in managing environmental and social performance information.

5. Sustainable Balanced Scorecard (SBSC) and KPI Scorecard: Integrated framework that links organizational objectives with both financial and non-financial performance measures such as customer satisfaction, operations management, and sustainability performance.

6. Sustainable AI Model: State-of-the-art technology used to conduct real-time benchmarking using Big Data to increase accuracy in environmental risk assessment and forecasting.

7. Lean and Six Sigma: Techniques of continuous improvement linked with benchmarking to find out how sustainable performance could be improved. This is especially important for industrial and construction sectors (Tasdemir et al., 2020).

Steps for Implementing Sustainable Benchmarking

Goal Setting

Establishing the scope of analysis and defining strategic sustainability objectives.

Indicator Selection

Identifying suitable KPIs for measuring and evaluating performance outcomes.

Data Collection

Obtaining accurate, reliable, and verifiable information from trustworthy sources.

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

Benchmark Identification

Establishing appropriate reference standards or selecting high-performing units for comparative assessment.

Comparative Analysis

Evaluating current performance against identified benchmarks to determine existing gaps and improvement areas.

Implementation and Monitoring

Applying corrective strategies and continuously assessing progress towards defined objectives.

Closing the Loop

Revising strategies and conducting further evaluations based on monitoring outcomes to support continuous improvement.

AN INTEGRATED THEORETICAL APPROACH TO GREEN STRATEGIES

Concept and Definition of Green Strategies

Environmental consciousness started to be observed at the end of the nineteenth century; its early bases are linked to research. It is appreciated among the first attempts to prove scientifically the link between CO2 emissions and temperature change.

The Modern Era (Growth and Consolidation)

The rise in international environmental pressures has necessitated economic entities to shift from traditional methods of managing pollution and adopt more proactive measures that emphasize the prevention of pollution and sustainability. The GS concept became a strategy after the signing of the Paris Agreement in 2015 by organisations that intend to help reduce global temperatures by 2°C.

GS can be defined as the process of integrating environmental perspectives into the decision-making process of an organization for developing an environment-responsible organizational culture in line with overall business strategies. The GS framework entails strategic activities aimed at reducing the impact of operations on the environment by means of reducing pollution, building capabilities, optimizing resources, cutting carbon emissions and adopting cleaner technologies. As a sustainability-oriented framework, GS enables organizations to develop a pathway of integrating their environmental goals into their operations. The GS framework is also viewed from an academic point of view as a hybrid perspective that integrates green entrepreneurship and organizational

Vol: 18 No: 02 Year: 2026 ISSN: 1309-8055 (Online) (pp. 346-374) Doi: 10.34109/ijefs.2026180215

learning. Through this strategy, organizations become capable of acquiring sustainable knowledge and translating their environmental intentions into better performance (Smol, 2022).

Objectives of Green Strategies

Objective of GS is to reduce the negative effects on the environment caused by industrial activities through constant assessment and maintaining ecological standards. Firms strive for a sustainable position in the market through the creation of eco-friendly products. These approaches not only help in maintaining the international and national environmental regulations but also assist firms in establishing a green organizational image that would improve their legitimacy in the eyes of the stakeholder community. In addition, GS is dedicated to increasing energy efficiency and encouraging the use of renewable energy sources, reducing carbon footprint, and using Big Data technology for pollution prevention.

Tools and Mechanisms of Green Strategies

Green Strategy makes use of diverse sets of instruments to transform environmental goals into specific and tangible results:

1. Business model innovation - a strategic approach to rethinking and remodeling the value creation and delivery process in order to ensure a perfect balance between economic and environmental performance.
2. Green intellectual capital – knowledge-based asset consisting of three types of capital: human, structural and relational that is designed for preserving the environment.
3. Clean technology – a strategy of strategic investment in innovative technologies to obtain significant environmental results.
4. Life Cycle Assessment (LCA) - a strategic instrument for assessing the environmental impact of a product through all its life span from raw materials extraction to consumption and final disposal.
5. Green Supply Chain Management (GSCM) – an integrated framework integrating environmental practices into all supply chain activities including sustainable product development and reverse logistics.
6. Lean and green manufacturing – a strategic tool for integrating Kaizen and other waste reducing methods with environmental management.
7. Green accounting - a specific method of measuring and managing the environmental costs and benefits which contributes to energy efficiency (Tian et al., 2025).

The Relationship between Sustainable Benchmarking and Green Strategies

The integration of SB and GS provides a critical framework for evaluating organisational performance through the following dimensions:

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

Assessing Environmental Performance Effectiveness

The SB approach is effective as an evaluation tool for assessing the success of GS, as it helps economic entities measure their environmental success against industry standards and best practices.

Ensuring Long-Term Sustainability

The SB approach creates a system that enables the continuous assessment of sustainability in terms of both the financial and environmental performance of introduced GS, thus supporting systematic sustainability.

Establishing Emission Reduction Baselines

The SB approach creates an important foundation for the evaluation within GS in terms of the creation of benchmarks for the reduction of carbon emissions connected with any new projects and initiatives.

Enhancing Competitive Advantage through Continuous Evaluation

Through benchmarking, companies have an opportunity to evaluate their current performance against advanced environmental practices and sustainable solutions, thus helping to improve GS and increase efficiency and competitiveness of firms.

Evaluating Green Strategy Alternatives

The SB approach creates an effective tool that helps planners choose between GS options by taking into account competing factors such as social, economic, environmental and technical issues (Starostka-Patyk et al., 2024).

METHODOLOGY

Study Tools Description

The research is based on an extensive review of scientific literature and prior studies related to SB and GS to develop a comprehensive theoretical framework that provides support for the empirical investigation. For the empirical analysis, a descriptive analytical approach was employed to collect primary and secondary data. This included the use of sources such as published financial and administrative reports to analyse relevant information, examine the research hypotheses, and determine the nature of relationships and effects among the study variables.

Data Collection Method: Scope of the Study

Conducted in the industrial segment of Iraq and the Middle East, the research will investigate how the selected firms, including Baghdad Soft Drinks, Al-Hilal Industrial

Vol: 18 No: 02 Year: 2026 ISSN: 1309-8055 (Online) (pp. 346-374) Doi: 10.34109/ijefs.2026180215

and Almarai (Saudi Arabia) respond to the challenges that arise from the environment. The study period will be five years (2020-2024). This is based on analyzing the financial, administrative and cost related documents, which have been collected during this period to form an appropriate basis for measuring performance.

Validity and Reliability

As far as reliability is concerned, the reliability of the research will be achieved since the research is based on financial data, which will be measured using the audited financial statements that have been confirmed and approved by the relevant authorities. Validity of the research will be achieved by using the financial ratios used in past literature.

Research Model

Figure (1) illustrates the conceptual model demonstrating the relationship between SB and GS.

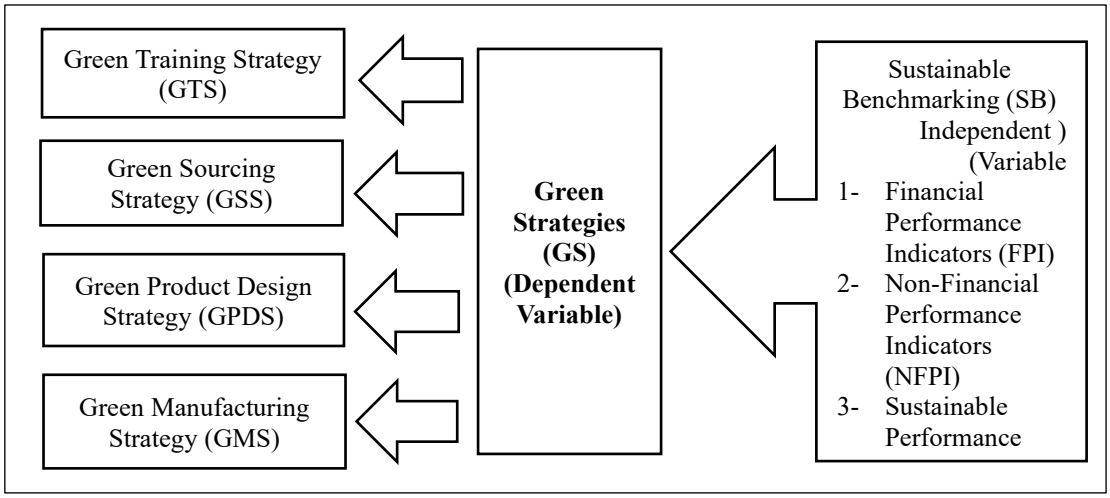

Figure 1: Conceptual Model Linking SB and GS

RESULTS

The empirical component involves analysing the research variables using a sample of Middle Eastern companies, specifically Baghdad Soft Drinks Company, Al-Hilal Industrial Company, and the Saudi Almarai Company.

Measurement of Sustainable Benchmarking

The developed model includes three major categories, which include 16 sub-indicators. Environmental and sustainability performance indicators of SB will be applied to assess the impact of SB on the selected firms as illustrated in Tables (1) to (3).

Vol: 18 No: 02 Year: 2026 ISSN: 1309-8055 (Online) (pp. 346-374) Doi: 10.34109/ijefs.2026180215

Analysis of Table (1) reveals that the firm's financial and performance over 2020 – 2024 demonstrated various trends in several aspects. Financially, ROA grew significantly from 12.58% to 21.15%, which indicates high performance and effective use of the company's assets. This growth is associated with decreasing of the current ratio from 4.4 to 3.39, which implies the effective management of liquidity due to the productive use of financial resources, instead of having extra cash. Additionally, the increase in the leverage ratio up to 13.96% demonstrates the reasonable usage of financing for gaining the maximum return and keeping financial stability. Moreover, the stable gross profit margin at 21.47% and balanced inventory turnover at 5.66 times were observed.

Table 1: Performance Indicators for Baghdad Soft Drinks Company Using Internal SB for the Years 2020 to 2024

	Description	2020	2021	2022	2023	2024	Average Performance
FPI for SB							
1	Return on Assets (ROA) Indicator	12.58%	9.55%	14.82%	15.94%	21.15%	14.81%
2	Debt-to-Equity Ratio (Financial Leverage)	10.20%	11.74%	12.37%	14.97%	13.96%	12.65%
3	Current Ratio	4.4	3.92	3.48	3.22	3.39	3.682
4	Gross Profit Margin	22.85%	17.70%	18.18%	23.85%	21.47%	20.81%
5	Inventory Turnover Rate	5.26	6.09	5.72	6.01	5.66	5.748
for SB Non-financial performance measurement indicators							
1	Production Volume Indicator	83.39%	81.03%	82.01%	81.21%	72.46%	80.02%
2	Production Defect Rate Indicator	0.31%	0.54%	0.70%	0.33%	0.31%	0.44%
3	Maintenance Efficiency Indicator	46.67%	58.23%	0.00%	83.94%	71.27%	52.02%
4	Employee Training Intensity Indicator	0.59	0.46	2.5	0.45	0.00	0.80
5	Innovation and Product Development Indicator	1.26%	0%	0.01%	5.98%	8.90%	3.23%
.performance indicators for SB Environmental and sustainability							
1	Renewable Energy Consumption Rate Indicator	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	Corporate Social Responsibility (CSR) Index	2.21%	3.51%	0.42%	0.16%	1.06%	1.47%
3	Local Employment Rate Indicator	100.00 %	99.08%	97.43%	100.00 %	98.15%	98.93%
4	Sustainability Disclosure Index	19.57%	33.86%	10.00%	10.00%	10.00%	16.69%
5	Resource Efficiency Index	0.10	0.35	0.44	0.6	0.81	0.46
6	Employee Services Index	2.15%	6.28%	6.76%	3.73%	3.26%	4.44%

As seen from Table (1) above, there are some differences between the financial and operational performances. Firstly, the production utilization in relation to maximum capacity decreased from 83.39% to 72.46%. It is caused by increased production capacity that is not used. At the same time, this disadvantage was partly compensated by improvement of operations, such as decreased production defect ratio from 0.70%

Vol: 18 No: 02 Year: 2026 ISSN: 1309-8055 (Online) (pp. 346-374) Doi: 10.34109/ijefs.2026180215

(in 2022) to 0.31% (in 2024). In addition, maintenance efficiency increased to 43.88% and, thus, provided production continuity and protection of operational resources. Even with this positive tendency, employee training decreased to 0.00% in 2024 and, therefore, became a threat to knowledge development in organization. The limitation was partly compensated by the increase of innovation and product development index to 8.90%.

From the environmental and sustainability indicators in Table (1), it is clear that the company has made little progress in some specific areas. First, the company maintained a constant renewable energy index of 0.00% during the entire period under analysis. It indicates that there was no progress regarding the use of renewable energy sources. Besides, the resource efficiency index of the company rose from 0.10 to 0.81. It implies the inefficient use of resources and increasing environmental effects caused by production activities. In turn, some of the social and labour indicators in Table (1) reveal the company's challenges. Specifically, both the CSR index and Employee Services index have declined from 1.07% and 3.63% to 1.06% and 3.26%, respectively. In addition, the sustainability disclosure index dropped to 10.00%. Thus, there is a lack of transparency of environmental reporting. Nevertheless, the company keeps a positive level of local employment with the employment rate staying higher than 98%.

The analysis of Table (2) suggests that the period 2020-2024 was marked by substantial financial recovery for Al-Hilal Industrial Company, despite the fact that many operational and liquidity problems were also revealed. Financially speaking, ROA was improved substantially from a negative indicator of -24.64% to 17.47% in 2024, and thus there was a clear recovery in the use of assets and profitability. At the same time, gross profit margin became higher by reaching 65.50%, while the inventory turnover improved from 0.118 to 9.457, thus reflecting more successful sales and better inventory management. Still, Table (2) draws attention to the fact that financial risks are still very high because of the consistently poor liquidity ratios, and the current ratio stayed at the extremely low average level of 0.190. As for the leverage ratio, it kept being high enough, staying at the level of 75%.

The operational factors shown in Table (2) demonstrate the problem with production capacity utilization, since it reached only 5.13% of the maximum capacity, but there was a major improvement in quality management: the defect rate decreased greatly from 55.89% in 2022 to 0.07% in 2024, and thus there were major improvements in production control. Also, innovation index grew gradually, and in 2024, it reached 5%, and thus there are some efforts made to improve products and production processes. Regarding sustainability factors shown in Table (2), one can observe both strengths and weaknesses of Al-Hilal Industrial Company. First of all, the company demonstrated extremely high percentage of local employment of around 99%, and thus it makes an impressive contribution to the development of the national workforce. However, the company has to pay much attention to improving its environmental performance

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

because renewable energy index and sustainability disclosure index equal 0%, thus there is no development in clean energy adoption

Table 2: Performance Indicators for Al-Hilal Industrial Company Using Internal SB for the Years 2020 to 2024

DESCRIPTION		2020	2021	2022	2023	2024	Average Performance
FPI for SB							
1	Return on Assets (ROA) Indicator	-24.64%	-20.86%	-2.08%	31.00%	17.47%	0.18%
2	Debt-to-Equity Ratio (Financial Leverage)	75.46%	74.93%	76.82%	72.93%	77.22%	75.47%
3	Current Ratio	0.166	0.124	0.155	0.162	0.340	0.190
4	Gross Profit Margin	-25.20%	-8.74%	16.26%	22.31%	65.50%	14.03%
5	Inventory Turnover Rate	0.118	2.482	2.189	8.339	9.457	4.517
for SB Non-financial performance measurement indicators							
1	Production Volume Indicator	2.11%	0.20%	3.33%	16.67%	3.33%	5.13%
2	Production Defect Rate Indicator	1.03%	0.23%	55.89%	0.09%	0.07%	11.46%
3	Maintenance Efficiency Indicator	1.94%	29.46%	15.35%	4.26%	74.68%	25.14%
4	Employee Training Intensity Indicator	0.10	0.26	1.63	3.88	4.53	2.081
5	Innovation and Product Development Indicator	0.00%	0.00%	0.00%	4.00%	5.00%	1.80%
.performance indicators for SB Environmental and sustainability							
1	Renewable Energy Consumption Rate Indicator	0	0	0	0	0	0.00%
2	Corporate Social Responsibility (CSR) Index	-1.12%	-1.72%	-55.99%	4.38%	3.21%	-10.25%
3	Local Employment Rate Indicator	99.23%	99.23%	98.98%	98.98%	98.67%	99.02%
4	Sustainability Disclosure Index	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
5	Resource Efficiency Index	0.0082	0.0005	0.0016	0.0055	0.0031	0.004
6	Employee Services Index	-25.89%	-37.81%	-291.93%	19.99%	12.84%	-64.56%

Overall, Table (2) demonstrates that although Al-Hilal Industrial Company has achieved considerable improvements in profitability, sales performance, and quality control, significant challenges remain regarding liquidity management, production capacity utilisation, environmental commitment, and sustainable operational practices. Addressing these issues is essential for strengthening its long-term competitiveness and achieving a more balanced sustainable performance profile.

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

The analysis in the Table 3 shows the Saudi Almarai Company highlights its strong institutional maturity and balanced performance, positioning it as an industry benchmark in comparison with Al-Hilal Industrial Company's unstable recovery pattern and Baghdad Company's variable performance trends.

Financial Perspective

Table (3) demonstrates that Almarai maintains a strong and stable financial position, with ROA remaining consistent at an average of 5.85% and the gross profit margin maintaining a high average level of 31.92%. Unlike the other examined companies, Almarai preserves a stable liquidity position, reflected by a current ratio averaging 1.055. Furthermore, the company demonstrates continuous operational improvement through enhanced inventory turnover, which reached 2.920 in 2024. The strategic reduction in leverage from 0.746 in 2020 to 0.577 in 2024 further indicates improved financial solvency and reduced dependence on debt financing.

Operational Perspective

As shown in Table (3), Almarai demonstrates superior operational efficiency by utilising more than 90% of its production capacity, representing a significant advantage compared with Al-Hilal Industrial Company, which operated with only 5% capacity utilisation. The company maintains exceptional quality performance through a consistently low defect rate, averaging 1.16%, supported by strong maintenance efficiency that reached 93.30% in 2024. Moreover, Almarai demonstrates a strong commitment to human capital development by increasing training intensity from 9.22 to 14.06 hours while maintaining a stable innovation index of approximately 1.34%.

Sustainability & Transparency

As follows from Table (3), Almarai serves as the regional benchmark in the sphere of sustainability performance and environmental disclosure. The corporation demonstrates strong sustainability disclosure practices with sustainability disclosure index varying between 85% and 87% according to international GRI standards, while Al-Hilal Industrial Company has no sustainability disclosure practices at all (0%) and Baghdad Company demonstrates low sustainability disclosure index of 16%. Furthermore, Almarai is making efforts towards green transformation through the growth of the level of using of the renewable energy from 1.2% to 3.2%. Despite the lower level of local employment of approximately 30% (in comparison with other corporations sampled because of the size of the corporation and diverse personnel needs), the corporation has strong employee services with average index of 21.84%.

In contrast to the sampled companies experiencing strong changes and facing considerable liquidity and capacity-related difficulties, Almarai shows the continuous improvement of its financial and operating indicators and proves to be the most

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

interesting investment with the lowest risk (Table 4). As follows from the external SB results shown in Table (4), there are considerable performance gaps between the economic entities operating in Iraq and the benchmarking corporation – Almarai, which confirms the importance of SB for identifying weaknesses and implementation of leading practices for improvement of environmental and financial performance. It can be seen that Almarai performs better in sustainability-related performance indicators, which is proved by its sustainability disclosure index (85.80%) and renewable energy index (2.22%). In turn, Baghdad Soft Drinks Company demonstrates large negative deviations with the gap of the sustainability disclosure index equal to -69.11% and without any use of renewable energy.

Table 3: Performance Indicators for Saudi Almarai Industrial Company Using Internal SB for the Years 2020 to 2024

	DESCRIPTION	2020	2021	2022	2023	2024	Average Performance
FPI for SB							
1	Return on Assets (ROA) Indicator	6.15%	4.92%	5.52%	6.10%	6.58%	5.85%
2	Debt-to-Equity Ratio (Financial Leverage)	0.746	0.634	60.62%	0.721	0.577	0.657
3	Current Ratio	0.940	1.104	1.01	1.114	1.111	1.055
4	Gross Profit Margin	36.90%	31.85%	27.68%	30.91%	32.26%	31.92%
5	Inventory Turnover Rate	2.428	2.605	2.716	2.852	2.920	2.704
for SB Non-financial performance measurement indicators							
1	Production Volume Indicator	90.06%	89.29%	92.59%	90.91%	91.36%	90.84%
2	Production Defect Rate Indicator	1.15%	1.25%	1.15%	1.15%	1.13%	1.16%
3	Maintenance Efficiency Indicator	87.17%	86.22%	90.35%	91.38%	93.30%	89.68%
4	Employee Training Intensity Indicator	9.22	11.44	12.06	13.29	14.06	12.012
5	Innovation and Product Development Indicator	1.55%	1.43%	1.212%	1.20%	1.30%	1.34%
.performance indicators for SB Environmental and sustainability							
1	Renewable Energy Consumption Rate Indicator	1.200%	1.800%	2.500%	2.400%	3.200%	2.22%
2	Corporate Social Responsibility (CSR) Index	1.08%	1.17%	1.20%	1.08%	1.07%	1.12%
3	Local Employment Rate Indicator	30.18%	30.94%	28.86%	29.52%	31.74%	30.25%
4	Sustainability Disclosure Index	85.00%	85.00%	85.00%	87.00%	87.00%	85.80%
5	Resource Efficiency Index	0.392	0.413	0.420	0.456	0.502	0.437
6	Employee Services Index	18.25%	24.62%	23.62%	21.52%	21.22%	21.84%

It is evident from Table (4) that Baghdad Soft Drinks Company performs better than the benchmark in some of the operational and financial indicators like defect ratio being 0.44%, and ROA being 14.81%. Nonetheless, there is no integration of these achievements with the environmental sustainability factors, as it demonstrates the current gap between the financial achievements and green strategic maturity of the company. In turn, Al-Hilal Industrial Company exhibits great negative deviations in

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

several indicators, including maintenance efficiency being -64.55%, and resource efficiency being -0.433, thus suggesting the need for extensive process improvement and restructuring using SB. Additionally, the weakness in the Employee Services index, which stands at -86.41% compared to the high performance of Almarai, may reveal some difficulties with regard to the social sustainability aspect.

The results provided in Table (4) allow concluding that the concept of SB can become the strategic tool of alignment of the organisational processes of Iraqi economic entities to international sustainability standards within the framework of the Triple Bottom Line. The company, Almarai, serves as the benchmark standard in terms of the transparency and energy efficiency in sustainability. The gaps revealed for Baghdad Soft Drinks Company and Al-Hilal Industrial Company make it necessary to move from reactive approach to sustainability to more proactive one.

Measurement of Green Strategies

Model of the study has been developed based on four indicators that can be seen from the financial statement of the sampled companies during 2020 to 2024. They are: Green Manufacturing Strategy, Green Product Strategy, Green Procurement Strategy and Green Corporate Culture & Development Strategy. This model will help us understand the effect of SB in improving GS of the selected companies, as shown in Tables (5) to (7).

The evaluation of GS of Baghdad Soft Drinks Company from 2020 to 2024, as shown in Table (5), shows that the performance of GS varies widely depending on how much emphasis the firm has put on green product strategy than the internal environmental culture. The Green Product Strategy had the best performance out of the four indicators and has achieved an impressive average of 88.934% because of its consistent use of recyclable and biodegradable material. Green Procurement Strategy has gradually improved from 2.632% in 2020 to 16.981% in 2024 with an average of 8.768%.

INTERNATIONAL JOURNAL OF ECONOMICS AND FINANCE STUDIES
Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

Table 4: Performance Efficiency of Baghdad Company and Al-Hilal Company Using the Benchmark Standard (Almarai Company) via External SB: Average Performance for the Years 2020 to 2024

	Description	Average Performance Of Baghdad Soft Drinks Company	Average Performance Of Saudi Almarai Company (Benchmark Standard)	Deviation Amount (Or Variance)	Average Performance Of Al-Hilal Industrial Company	Average Performance Of Al-Hilal Industrial Company	Deviation Amount (Or Variance)
1	ROA	14.81%	5.85%	8.96%	0.18%	5.85%	-5.68%
2	Financial Leverage	13%	66%	-53%	75%	65.68%	9.79%
3	Current Ratio	3.6820	1.0553	2.627	0.1896	1.0553	-86.57%
4	Gross Profit Margin	20.81%	31.92%	-11.11%	14.03%	31.92%	-17.90%
5	Inventory Turnover Rate	5.748	2.704	3.044	4.517	2.704	1.813
6	Production Volume Indicator	80.02%	90.84%	-10.82%	5.13%	90.84%	-85.71%
7	Production Defect Rate Indicator	0.44%	1.16%	-0.73%	11.46%	1.16%	10.30%
8	Maintenance Efficiency Indicator	52.02%	89.68%	-37.66%	25.14%	89.68%	-64.55%
9	Employee Training Intensity Indicator	0.801	12.0125	-11.212	2.081	12.012	-9.931
10	Innovation and Product Development Indicator	3.23%	1.34%	1.89%	1.80%	1.34%	0.46%
11	Renewable Energy Consumption Rate Indicator	0.00%	2.22%	-2.22%	0.00%	2.22%	-2.22%
12	Corporate Social Responsibility Index	1.47%	1.12%	0.35%	-10.25%	1.12%	-11.37%
13	Local Employment Rate Indicator	98.93%	30.25%	68.68%	99.02%	30.25%	68.77%
14	Sustainability Disclosure Index	16.69%	85.80%	-69.11%	0.00%	85.80%	-85.80%
15	Resource Efficiency Index	0.460	0.437	0.024	0.004	0.437	-0.433
16	Employee Services Index	4.44%	21.84%	-17.41%	-64.56%	21.84%	-86.41%

Vol: 18 No: 02 Year: 2026 ISSN: 1309-8055 (Online) (pp. 346-374) Doi: 10.34109/ijefs.2026180215

Likewise, the Green Manufacturing Strategy had an average performance of 1.722% and the maximum performance of 4.678% in 2024. This signifies a higher investment on the cleaner technologies and technological advancements. However, the Green Corporate Culture and Development Strategy is found to be the least performing strategy, having a performance of only 0.650% in average and even declined to zero in 2024 because the environmental and safety training costs have been totally cut off by the firm. In general, from Table (5), it is clear that while the firm has successfully performed in developing the green product practices and sustainable purchasing practices, it still lacks in terms of increasing environmental consciousness and green development of employees.

Table 5: Indicators for Measuring Green Strategies for Baghdad Soft Drinks Company for the Years 2020 to 2024

Description	2020	2021	2022	2023	2024	Average Performance
Green Manufacturing Strategy						
Clean Technology Investment Indicator = Capital Invested In Modernizing Machinery To Reduce Pollution / Total Capital Expenditure (Capex)	0.844%	1.145%	1.176%	0.765%	4.678%	1.722%
Green Product Strategy						
Green Product Design Indicator = Number Of Products Designed From Recyclable Or Degradable Materials / Total Number Of Products	89.719%	84.875%	91.445%	87.354%	91.278 %	88.934%
Green Procurement Strategy						
Green Procurement Indicator = Number Of Raw Material Suppliers Holding Environmental Certificates (Iso 14001) / Total Number Of Suppliers	2.632%	7.143%	6.667%	10.417%	16.981 %	8.768%
Green Corporate Culture Strategy						
Green Training Indicator = Number Of Training Hours Allocated To Safety, Environment, And Sustainability / Total Training Hours	0.130%	0.389%	0.286%	2.446%	0.000%	0.650%

The analysis of GS indicators at Al-Hilal Industrial Company during 2020–2024, as presented in Table (6), reveals different levels of development across the examined

Vol: 18 No: 02 Year: 2026 ISSN: 1309-8055 (Online) (pp. 346-374) Doi: 10.34109/ijefs.2026180215

strategies. The Green Product Strategy performed best among all, with an average score of 61.728% and a constant improvement from 47.468% in 2020 to 76.400% in 2024. The company shows an increase in the development of products from recyclable and biodegradable materials. The Green Procurement Strategy became the second best-performing strategy with an average score of 17.707% and an increasing trend from 9.091% in 2020 to 30.435% in 2024, reflecting the growing partnership with environmentally certified suppliers.

The third place in terms of sustainability belongs to the Green Corporate Culture and Development Strategy, which showed stable results without large fluctuations, and its average score is 7.360% due to the constant environmental and safety training for employees. The last place among all strategies goes to the Green Manufacturing Strategy, which was characterized by the lowest performance level with an average of 0.936%. The company did not show any interest in clean technologies for most of the period under analysis. However, there is a positive trend in 2024, when the indicator is 4.678% due to the implementation of the first steps of machinery improvements. Thus, it can be said that according to Table (6), Al-Hilal Industrial Company focuses mainly on green product development and sustainable procurement.

Table 6: Indicators for Measuring Green Strategies for Al-Hilal Industrial Company for the Years 2020 to 2024

Description	2020	2021	2022	2023	2024	Avg Perf
Green Manufacturing Strategy						
Clean Technology Investment Indicator = Capital Invested In Modernizing Machinery To Reduce Pollution / Total Capital Expenditure (Capex)	0.000%	0.000%	0.000%	0.000%	4.678%	0.936%
Green Product Strategy						
Green Product Design Indicator = Number Of Products Designed From Recyclable Or Degradable Materials / Total Number Of Products	47.468%	48.333%	68.000%	68.440 %	76.400 %	61.728%
Green Procurement Strategy						
Green Procurement Indicator = Number Of Raw Material Suppliers Holding Environmental Certificates (Iso 14001) / Total Number Of Suppliers	9.091%	14.286%	12.500%	22.222 %	30.435 %	17.707%
Green Corporate Culture Strategy						
Green Training Indicator = Number Of Training Hours Allocated To Safety, Environment, And Sustainability / Total Training Hours	7.475%	8.876%	8.125%	5.263%	7.059%	7.360%

The analysis of Table (7) demonstrates that Saudi Almarai Company follows a strong and continuously advancing approach towards environmental sustainability, consistently achieving superior performance across all GS dimensions compared with

the other sampled companies. The Green Procurement Strategy recorded the highest performance level, achieving an outstanding average of 84.234% and increasing steadily from 79.560% in 2020 to 90.020% in 2024. This improvement reflects the company's strong commitment to working with environmentally certified suppliers and integrating sustainability considerations into its supply chain activities.

Table 7: Indicators for Measuring GS for Saudi Almarai Industrial Company for the Years 2020 to 2024

Description	2020	2021	2022	2023	2024	Average Performance
Manufacturing Strategy Green						
Clean Technology Investment Indicator = Capital Invested In Modernizing Machinery To Reduce Pollution / Total Capital Expenditure (Capex)	8.500%	9.500%	9.700%	9.900%	10.500%	9.620%
Green Product Strategy						
Green Product Design Indicator = Number Of Products Designed From Recyclable Or Degradable Materials / Total Number Of Products	58.000 %	65.000 %	68.000 %	70.000 %	74.000%	67.000%
Green Procurement Strategy						
Green Procurement Indicator = Number Of Raw Material Suppliers Holding Environmental Certificates (Iso 14001) / Total Number Of Suppliers	79.560 %	81.760 %	84.700 %	85.130 %	90.020%	84.234%
Strategy Green Corporate Culture						
Green Training Indicator = Number Of Training Hours Allocated To Safety, Environment, And Sustainability / Total Training Hours	14.102 %	15.345 %	15.720 %	15.340 %	16.019%	15.305%

The Green Product Strategy emerged as the second-best performing dimension with an average of 67.000% due to the continued growth in its performance from 58.000% to 74.000%. Also, the Green Corporate Culture and Development Strategy maintained its performance with a consistent growing trend with an average of 15.305% owing to

continued investments in environmental training programs for the employees. In the same way, the Green Manufacturing Strategy performed well with an average of 9.620% in the last four years with an increase from 8.500% in 2020 to 10.500% in 2024. Table (7) depicts the competitive advantage of Almarai due to comprehensive implementation of GS practices.

Findings Presentation, Discussion, and Research Hypotheses

Table (8) provides the descriptive statistics for the research variables. From the descriptive statistics in Table (8), it is evident that Green Product Strategy (Y2) is the most stable and widely used variable out of all the studied variables due to its highest arithmetic mean value of 0.7410. This result clearly demonstrates its significance in relation to its role as the main strategy through which the companies counteract the environmental challenges and pressures by producing biodegradable and recyclable products. This success of this variable is greatly due to the success achieved by Baghdad Soft Drinks Company and Saudi Almarai Company in this particular area. In addition to that, the similarity of the mean value of the independent variable and the dependent variable (0.3476) indicates their strong relationship and the positive influence of SB on GS. These findings verify that implementation of SB in financial, non-financial, and environmental aspects significantly contributes to green manufacturing, procurement process, and environmental organizational culture.

Table 8: Descriptive Statistics

RESEARCH VARIABLES	MEAN	STD. DEVIATION
FPI	1.354	0.692
NFPI	1.235	1.154
SPI	0.210	0.531
GTS	0.032	0.038
GSS	0.7410	0.141
GPDS	0.354	0.3476
GMS	0.063	0.061

As illustrated in Table (9), which presents the correlation matrix, a strong statistically significant relationship exists between SB and GS at a significance level of ($p = 0.000$). This finding confirms that enhancing sustainability disclosure, improving resource efficiency, and adopting renewable energy practices based on leading benchmarks, particularly the superior performance of Almarai Company with an average sustainability disclosure level of 85.8%, represent key drivers facilitating the adoption and advancement of GS across the sampled companies.

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

Table 9: Correlation Matrix between Variables

DESCRIPTION		GS	FPI	NFPI	SPI
FPI	Pearson Correlation	0.514*	1		
	Sig. (2-Tailed)	0.049			
NFPI	Pearson Correlation	0.768**	0.324	1	
	Sig. (2-Tailed)	0.001	0.239		
SPI	Pearson Correlation	0.822**	-0.115	0.492	1
	Sig. (2-Tailed)	0	0.683	0.062	

Table (10), which contains the results of the ANOVA test, shows that the empirical model used in this research study possesses high statistical significance, given that the significance level (p-value) is at 0.010 and is lower than the critical significance level, which is 0.05. In addition to that, the computed F-statistic obtained is 10.62, which shows the presence of statistical significance between the environmental, financial, and operations dimensions of SB and the green strategic orientation of the examined firms. From Table (10), it can be noted that the SB dimensions, as independent variables, possess high explanatory power as the R^2 value is 0.743. This means that the variations in SB dimensions, such as financial, non-financial, and environment-societal, within the examined firms (Almarai, Baghdad Soft Drinks, and Al-Hilal Industrial) account for 74.3% of the variance in the adoption and implementation of overall GS, which include green manufacturing, green product, green procurement, and green organisational culture. The remaining 25.7% of variance is accounted for by other external factors and variables outside the research model, such as regulatory pressure and competitive pressures. Moreover, the value of the Durbin-Watson statistic is 1.895, indicating no serial correlation among the model residuals.

Table 10: Analysis of Variance (ANOVA)

MODEL	SUM OF SQUARES	F	Sig.	R^2
REGRESSION	0.1592	10.62	0.010	0.862[a]
RESIDUAL	0.0550			

The findings of the regression analysis provided in Table (11) clearly demonstrate the acceptance of the research hypotheses with a high level of statistical significance. Sustainable performance indicators had the strongest impact among all investigated variables with standardised Beta coefficient ($\beta = 0.514$) and significance level of (0.000). Thus, there is statistical and accounting proof that sustainable performance is an essential determinant for improving GS. Moreover, it is proved that companies' intention to apply advanced methods for resource management and sustainable reporting helps to promote green manufacturing and sustainable supply chains.

Moreover, the collinearity diagnostics revealed that the VIF index was equal to 6.886 and thus proves that the regression model has adequate structural reliability and there were no problems with multicollinearity. Therefore, all three hypotheses gained empirical validation. First hypothesis was proven using the application and assessment

Vol: 18 **No:** 02 **Year:** 2026 **ISSN:** 1309-8055 (Online) (**pp.** 346-374) **Doi:** 10.34109/ijefs.2026180215

of financial, non-financial and GS indicators provided in Tables (1)-(7). The second hypothesis was confirmed using correlation matrix provided in Table (9) showing positive and statistically significant relationships at the 0.01 and 0.05 significance levels. Finally, the third hypothesis was proven using the results of ANOVA test provided in Table (11) having statistically significant model with the value of F-statistic equal to 10.62 and significance level of ($p = 0.010$).

Table 11: Coefficients

Model	β	Std. Error	T	Sig
FPI	0.092	0.042	2.190	0.050
NFPI	0.212	0.071	2.985	0.012
SPI	0.354	0.068	5.205	0.000

CONCLUSION

Today, SB has transformed into a strategic approach that helps in closing the gap between being green and sustainable performance results. At the same time, Almarai Company has become the benchmark when it comes to sustainability disclosure and energy efficiency. It should be admitted that the environmental disclosure activities of the sampled companies are much more limited than those of Almarai. This means that the findings prove that financial and operational success do not mean the development of green strategy since the profit may be unrelated to the integration of environmental and social aspects. Also, if the company has substantial production capacities that are unused, it cannot be sustainable since it needs to conduct operational re-engineering in order to minimize material inefficiency and carbon footprint. Therefore, the implementation of GS pillars may be seen as a strategic necessity as it is essential for the company to survive and adjust its operations to new conditions of the unstable global economy. Companies should switch from environmentally responsible practices to sustainable approach by implementing SB principles in their decisions. Moreover, they should implement the Almarai model in non-financial aspects such as green innovations, employee training programs, and environmental disclosure in order to minimize performance gaps. Also, companies should develop green intellectual capital through additional investment in special environmental and safety training programs. The implementation of GRI standards of sustainability disclosure is suggested as a measure to increase stakeholders' trust, improve reporting reliability, and avoid greenwashing. Companies should make investments in clean technologies and renewable energy systems in order to upgrade their production facilities and increase energy efficiency.

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