Beyond Green Promises: The Influence of Sustainable Packaging, Carbon-Emission Reduction, and Transparent Communication on Consumer Perception towards Corporate Sustainability Practices

Hafirda Akma Musaddad[1*], Nur Syahira Mohd Nafi[2], Wan Anis Wan Mohd Assrudin[3], Nadiah Mahmad Nasir[4], Suraya Husin[5], Norsilawati Mohd Hassan[6]

[1,5,6]*Faculty of Business and Management, Universiti Teknologi Mara, Cawangan Kelantan, Kampus Machang, 18500, Machang, Kelantan, Malaysia*
[2,4]*Faculty of Business & Communication, Universiti Malaysia Perlis, Kampus UniCITI Alam, Sungai Chuchuh, 02100, Padang Besar, Perlis, Malaysia*
[3]*Islamic Business School, Universiti Utara Malaysia, 06010, Sintok, Kedah, Malaysia*

Authors' Email Address: *[1]hafirda@uitm.edu.my, [2]syahira0598@gmail.com, [3]wananis18@gmail.com.my, [4]nadiahnasir@unimap.edu.my, [5]surayahusin@uitm.edu.my, [6]norsi963@uitm.edu.my,*

*Corresponding Author

ABSTRACT

In recent years, growing environmental concerns have pushed consumers to question whether companies genuinely practice sustainability or merely use it as a marketing tool. This study investigates how corporate sustainability practices influence consumer perception, focusing on Nestlé Malaysia as a leading example in the food and beverage industry. Guided by Stakeholder Theory and the Theory of Planned Behaviour (TPB), the study aims to examine the effects of sustainable packaging, carbon-emission reduction, and transparency in communication on consumer perception. Using quantitative research design, data were collected from 370 undergraduate students through structured questionnaires and analysed using SPSS with descriptive statistics, Pearson correlation, and multiple regression analysis. Findings show that all three sustainability dimensions significantly and positively affect consumer perception, with sustainable packaging exerting the strongest influence, followed by transparency and carbon-emission reduction. The study highlights that consumers respond best to sustainability actions that are visible, credible, and well communicated. It offers valuable insights for FMCG companies to strengthen brand trust through authentic practices aligned with Sustainable Development Goals (SDGs) 12 and 13 on responsible consumption and climate action.

Keywords: c*arbon emission reduction, consumer perception, stakeholder theory, sustainable packaging, theory of planned behaviour*

Hafirda Akma Musaddad, Nur Syahira Mohd Nafi, Wan Anis Wan Mohd Assrudin,
Nadiah Mahmad Nasir, Suraya Husin, Norsilawati Mohd Hassan

INTRODUCTION

In the last two decades, sustainability has evolved from a voluntary initiative to an essential business strategy for global corporations. It reflects a company's ability to balance profitability with the preservation of environmental resources and the improvement of social welfare. According to Ortiz-Martínez et al. (2022) c, sustainability ensures that economic growth does not occur at the expense of future generations' well-being or the planet's ecological systems. The growing public concern over environmental degradation, climate change, and unethical production practices has compelled industries to integrate sustainability into their core operations (Rastogi et al., 2024).

The establishment of the United Nations Sustainable Development Goals (SDGs) in 2015 provided a universal framework for measuring and implementing sustainable practices across sectors and nations. Of the 17 goals, SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action) are particularly relevant to the manufacturing and food industries, where issues of resource use, packaging waste, and greenhouse-gas emissions are prevalent. SDG 12 seeks to ensure sustainable patterns of production and consumption by reducing waste and promoting efficient use of resources. SDG 13 calls for urgent action to mitigate climate change and its impacts through emissions reduction and environmental restoration.

Nestlé, as the world's largest food and beverage company, has positioned sustainability at the centre of its business philosophy. The company has pledged that by 2025, all its packaging will be either recyclable or reusable and that the use of virgin plastics will be reduced by one-third (The Edge Malaysia, 2025). These commitments demonstrate direct alignment with SDG 12, which advocates waste minimisation and sustainable material cycles. Furthermore, Nestlé Malaysia has implemented Project RELeaf, an ambitious reforestation programme that aims to plant three million trees by 2025 as part of its broader plan to achieve net-zero greenhouse-gas emissions by 2050 (Vritimes, 2023). Through such initiatives, the company contributes actively to SDG 13, mitigating climate change through carbon sequestration and ecosystem rehabilitation.

Equally important to its environmental initiatives is Nestlé's emphasis on transparent communication. The company publishes detailed sustainability reports and communicates progress through online and product-level disclosures to strengthen public accountability. Transparency allows consumers to understand, evaluate, and trust corporate sustainability claims. Hartmann and Apaolaza-Ibáñez (2012) argue that openness in reporting builds credibility and reduces scepticism, which is vital for consumer acceptance of corporate environmental messages.

While Nestlé's sustainability initiatives have been widely publicized, an important question remains: how do consumers perceive these efforts? A company's environmental achievements can only generate behavioural change and competitive advantage if they are recognised and valued by consumers. Research has shown that positive perceptions of sustainability initiatives enhance brand loyalty, trust, and purchase intention (Taufique & Vaithianathan, 2018). However, a lack of consumer awareness or belief in corporate sincerity can weaken these effects. Therefore, understanding consumer perception is fundamental to evaluating the real impact of sustainability initiatives on market outcomes and corporate reputation.

This study investigates how three key sustainability dimensions sustainable packaging, carbon-emission reduction, and transparency in communication influence consumer perception of Nestlé's sustainability practices in Malaysia. By situating the research within the framework of SDGs 12 and 13, the study seeks to connect academic insights on sustainability marketing with practical strategies that corporations can adopt to enhance consumer engagement and trust.

Hafirda Akma Musaddad, Nur Syahira Mohd Nafi, Wan Anis Wan Mohd Assrudin,
Nadiah Mahmad Nasir, Suraya Husin, Norsilawati Mohd Hassan

Problem Statement

In recent years, companies around the world have made visible progress toward sustainability through greener operations, innovative packaging, and climate initiatives. However, a consistent gap remains between corporate sustainability performance and consumer perception. While many organizations publicize their environmental achievements, consumers do not always interpret these actions as credible or meaningful. For instance, although Nestlé's sustainability reports document measurable progress in packaging innovation, carbon-emission reduction, and environmental restoration, limited empirical evidence exists on whether consumers are genuinely aware of or influenced by these initiatives. Previous studies suggest that consumers often perceive sustainability claims as abstract, inconsistent, or marketing-driven rather than authentic commitments (Taufique & Vaithianathan, 2018).

This perception gap presents a critical challenge for companies. When consumers fail to understand or trust sustainability efforts, firms risk losing the opportunity to inspire behavioural change, foster brand loyalty, or achieve market differentiation. In Nestlé's case, the effectiveness of its environmental strategies particularly in packaging design and carbon-reduction programs may be weakened by insufficient communication or transparency, which can fuel skepticism and concerns of "greenwashing."

Therefore, this study addresses the limited understanding of how Malaysian consumers perceive and respond to corporate sustainability initiatives, focusing on three key dimensions: visible (sustainable packaging), systemic (carbon-emission reduction), and communicative (transparency). By analysing these relationships, the research aims to provide empirical evidence on how different aspects of corporate sustainability influence consumer attitudes, and to determine which dimensions most effectively enhance perceived authenticity and trust in sustainability practices.

Scope of the Study

This research examines consumer perceptions of Nestlé Malaysia's sustainability initiatives, focusing on three core dimensions: sustainable packaging, carbon-emission reduction, and transparent communication. The study is grounded in the Malaysian context, where environmental awareness has grown in parallel with rapid economic development and urbanisation. Nestlé was selected as the focal company due to its strong market presence, broad consumer base, and well-documented sustainability commitments, which make it an appropriate case for analysing how consumers respond to corporate sustainability actions.

The research specifically targets consumer's familiar with Nestlé's products, particularly university students, who represent an educated, informed, and environmentally conscious segment of the population. As emerging opinion leaders, this group often shapes public discourse and influences broader market behaviour towards sustainable consumption.

A quantitative research design was employed, using structured questionnaires to measure consumer perceptions across the defined variables. Data were analysed using correlation and multiple regression techniques to identify the strength and direction of relationships among sustainability dimensions and consumer perception.

Focusing on these three sustainability practices allows for a manageable yet meaningful scope. Sustainable packaging captures the tangible and visible aspects of environmental responsibility; carbon-emission reduction reflects long-term corporate commitment to climate goals; and transparency in communication represents the trust-building element that bridges corporate actions and consumer belief.

LITERATURE REVIEW

A critical review of prior studies and theoretical perspectives concerning corporate sustainability and consumer perception, focusing specifically on Nestlé's sustainability strategies. The discussion examines how three key sustainability practices sustainable packaging, carbon-emission reduction, and transparency in communication influence consumer perception. Each of these practices represents a pillar of Nestlé's broader sustainability agenda, which aligns with the United Nations Sustainable Development Goals (SDGs), particularly SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action). The review also discusses the underlying theories that frame this study Stakeholder Theory and the Theory of Planned Behaviour (TPB) and concludes with the development of a conceptual framework and research hypotheses.

Consumer Perception of Corporate Sustainability

Consumer perception refers to the way individuals interpret, evaluate, and form judgments about a company's environmental and social responsibility. In today's marketplace, perception is as important as actual performance because consumers increasingly equate sustainability with corporate credibility and trust. Abdou et al. (2022) emphasised that consumers, especially in developing countries, now consider sustainability as a deciding factor in purchase decisions. Their study revealed that ethical business conduct, environmental stewardship, and labour fairness substantially enhance brand image. For a global brand like Nestlé, which has made public commitments to reduce plastic waste and eliminate child labour in its supply chain, these expectations translate directly into reputational value.

Foroudi et al. (2023) further identified seven dimensions that define consumer perception of corporate sustainability community well-being, responsible production, responsible consumption, clean energy, economic growth, sustainable innovation, and gender equality. Nestlé's sustainability programmes, such as responsible sourcing, carbon-footprint reduction, and renewable-energy investment, align closely with these dimensions. However, the perceived authenticity of such initiatives depends largely on how transparently and effectively they are communicated. Abdou et al. (2022) cautioned that many firms struggle to translate technical sustainability information into language that resonates with the public. To address this gap, Nestlé must frame its sustainability communication in simple, verifiable, and relatable terms to sustain consumer trust.

In summary, consumer perception of sustainability is influenced by awareness, trust, relevance, and clarity of communication. When these elements are present, consumers tend to associate sustainability efforts with corporate responsibility and are more likely to develop favourable attitudes toward the brand.

Sustainable Packaging

Packaging is often the most visible manifestation of a company's sustainability performance. It not only protects and markets the product but also conveys the company's values and environmental responsibility. Omidiran et al. (2024) argued that packaging design and material choices directly influence consumer attitudes toward a brand's ecological commitment. In a similar vein, Jain and Hudnurkar (2022) described sustainable packaging as a core determinant of consumer trust and purchase intention in the food and beverage industry.

Sustainable packaging is typically designed to minimise environmental impact throughout its life cycle covering sourcing, production, distribution, and disposal. Ibrahim et al. (2022) noted that such packaging employs recyclable, biodegradable, or renewable materials to reduce waste and dependence on virgin resources. Nestlé has increasingly adopted these principles through initiatives to replace single-use plastics with recyclable materials and to promote packaging that supports a circular economy. Empirical evidence supports the link between sustainable packaging and positive consumer perception.

Arthi and Maruthavijayan (2025) found that consumers evaluate packaging not only for functionality and appearance but also for its environmental attributes, such as eco-labels and recyclability. Products packaged responsibly are often perceived as more trustworthy and socially responsible. Nonetheless, cost remains a challenge, as environmentally friendly packaging can increase production expenses, potentially influencing product prices. Despite this limitation, sustainable packaging remains a powerful signal of corporate integrity and environmental awareness, strengthening brand loyalty and long-term customer relationships.

Carbon-Emission Reduction

Reducing carbon emissions has become a fundamental element of corporate sustainability. As global awareness of climate change intensifies, consumers now expect companies to demonstrate measurable progress in mitigating their carbon footprint. Butt (2024) emphasised that carbon-emission reduction has evolved from a regulatory obligation to a strategic necessity for maintaining competitiveness and brand reputation.

Nestlé has made significant progress toward achieving carbon neutrality by 2050 through the adoption of renewable energy, improved energy efficiency, and the reduction of emissions across its supply chain. The company's Net Zero Roadmap includes sourcing deforestation-free raw materials, investing in low-carbon logistics, and supporting reforestation projects (Pfeiffer & Cooper, 2022). Moreover, advanced data analytics and digital monitoring systems now enable real-time tracking of emissions (Anozie et al., 2024). These technological integrations allow Nestlé to identify high-impact areas, enhance operational efficiency, and publicly share transparent sustainability metrics.

Consumer perception is strongly affected by the visibility of these initiatives. When companies demonstrate verifiable progress toward emission reduction, consumer trust and admiration increase significantly (Butt, 2024). Therefore, for Nestlé, carbon-emission reduction is not merely an environmental necessity it is a strategic communication tool that reinforces the company's image as an environmentally responsible global leader.

Transparency in Communication

Transparency in communication is central to maintaining consumer trust and credibility in sustainability efforts. Borges et al. (2023) define transparency as the honest, timely, and accessible disclosure of information about a company's operations, environmental impact, and ethical standards. Duan et al. (2021) further explained that effective sustainability communication should use positive and goal-oriented framing to foster optimism and engagement among consumers.

In practice, transparency involves more than publishing sustainability reports; it requires continuous, multi-channel communication through social media, product labels, and websites to ensure that consumers can verify sustainability claims. Borges et al. (2023) observed that consistent and clear messages across platforms reduce the risk of perceived "greenwashing" and enhance brand loyalty. In the food and beverage industry, where supply chains are complex, consumers demand reliable information about sourcing, production methods, and environmental footprints.

However, transparency is not only about quantity but also about quality the clarity, depth, and authenticity of disclosed information. Duan et al. (2021) showed that consumers respond more positively to positively framed statements such as "90% of ingredients are sustainably sourced" rather than negative frames like "10% are not sustainable." When companies such as Nestlé maintain transparency by sharing both achievements and challenges, they enhance brand credibility and foster a stronger emotional connection with consumers.

Hafirda Akma Musaddad, Nur Syahira Mohd Nafi, Wan Anis Wan Mohd Assrudin,
Nadiah Mahmad Nasir, Suraya Husin, Norsilawati Mohd Hassan

Interrelationship among Sustainability Factors

Sustainable packaging, carbon-emission reduction, and transparent communication collectively define the strength of a company's sustainability perception. Each dimension reinforces the others, forming a comprehensive corporate image of responsibility and authenticity. Igbomor (2024) found that eco-friendly packaging significantly boosts consumers' green purchase intentions when combined with trustworthy communication. Laheri et al. (2024) similarly demonstrated that carbon-emission initiatives elevate consumer evaluations of environmentally proactive companies.

Nevertheless, these efforts are only effective when communicated transparently. Tolegenov et al. (2024) and Monfort et al. (2025) confirmed that transparency acts as the mediating factor linking sustainable practices to positive consumer attitudes. Nestlé's consistent disclosure of sustainability milestones, verified data, and community programmes therefore strengthens public confidence and supports its reputation as a responsible global brand. The synergy among these three sustainability components underlines that consumer perception is holistic rooted in tangible environmental actions and authentic corporate communication.

Theoretical Foundations

Stakeholder Theory

Stakeholder Theory, originally formulated by Freeman, provides the ethical foundation for understanding corporate sustainability. It posits that companies are accountable not only to shareholders but also to all stakeholders affected by their operations, including customers, employees, suppliers, and local communities (Mahajan et al., 2023). In the sustainability context, this means that corporations must balance economic performance with environmental protection and social welfare.

Nestlé's adoption of sustainable packaging and its commitment to carbon-emission reduction exemplify responsiveness to stakeholder expectations for ethical and responsible business conduct. Mwandembo (2024) highlighted that transparent communication is integral to maintaining stakeholder trust because it allows for open dialogue and shared accountability. Similarly, Zainudin et al. (2022) found that clear and consistent communication of sustainability goals enhances consumer trust, especially among younger audiences. By embracing stakeholder-oriented practices, Nestlé not only strengthens its legitimacy but also ensures that its sustainability objectives contribute to both corporate and societal well-being.

Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB), introduced by Ajzen (2020), explains how individual attitudes, subjective norms, and perceived behavioural control shape behavioural intentions. In the context of sustainability, TPB is a valuable framework for understanding why consumers choose to support environmentally responsible brands. Brookes (2023) described attitudes as consumers' positive or negative evaluations of a behaviour, subjective norms as social pressures or expectations, and perceived behavioural control as the individual's belief in their ability to perform the behaviour.

When consumers perceive Nestlé's sustainability initiatives such as eco-friendly packaging and carbon-reduction commitments as beneficial to society and the environment, they develop favourable attitudes. As sustainable consumption becomes a social expectation, subjective norms further encourage these positive perceptions. Moreover, Nestlé's transparent communication empowers consumers by enhancing their sense of control over making sustainable choices. Research by Laheri et al. (2024) and Kumar and Jain (2024) confirmed that TPB remains a strong predictor of sustainable behaviour, particularly when environmental awareness and perceived corporate integrity are high. In this study,

the theory provides a behavioural foundation for linking Nestlé's sustainability actions to consumer attitudes and perceptions.

Together, Stakeholder Theory and TPB establish a comprehensive explanatory framework: the former addresses why companies should act responsibly, while the latter explains how consumers respond to those actions through their attitudes and behavioural intentions.

Conceptual Framework

Drawing from the reviewed literature and theoretical foundations, the conceptual framework illustrates the hypothesised relationships among the variables examined in this study. It posits that sustainable packaging, carbon-emission reduction, and transparency in communication each exert a positive influence on consumer perception of Nestlé's sustainability practices. This framework integrates the organisational perspective of Stakeholder Theory with the behavioural insights of TPB, demonstrating that both corporate action and consumer interpretation shape sustainability perception.
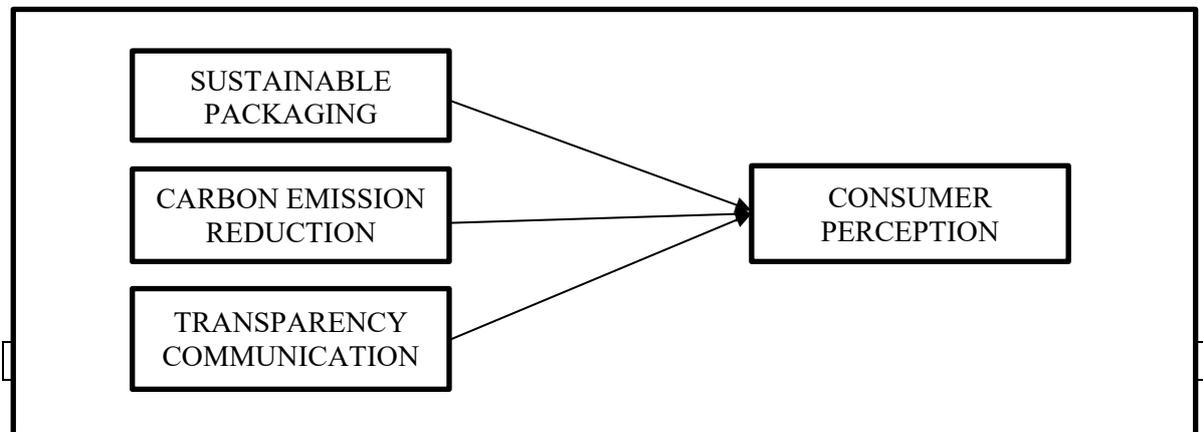

Figure 1: Conceptual Framework

Research Hypotheses

Based on the theoretical and empirical review, the following hypotheses were formulated:
- **H1:** Sustainable packaging positively influences consumer perception of Nestlé's sustainability practices.
- **H2:** Carbon-emission reduction positively influences consumer perception of Nestlé's sustainability practices.
- **H3:** Transparency in communication positively influences consumer perception of Nestlé's sustainability practices.

RESEARCH METHODOLOGY

Research Design and Approach

This study adopted a quantitative, cross-sectional, descriptive design to examine how sustainability factors sustainable packaging, carbon emission reduction, and transparency in communication influence consumer perception of Nestlé's sustainability practices in Malaysia. The quantitative approach enabled the systematic collection and analysis of numerical data, ensuring objectivity and allowing the researcher to test hypotheses through statistical modelling. The cross-sectional element, where data were gathered at a single point in time, provided a snapshot of consumers' current perceptions of Nestlé's ongoing sustainability initiatives. This design was appropriate for

identifying statistical relationships among variables and producing results that are both measurable and replicable.

Population and Sampling

The population of this study consisted of undergraduate students at Universiti Malaysia Perlis (UniMAP) who were familiar with or had previously purchased Nestlé products. According to university records, the total student population is approximately 11,276 individuals. This group was chosen because young adults represent an increasingly sustainability-aware consumer segment and are often more receptive to environmental messages and responsible consumption practices. Their perspectives provide valuable insights into how corporate sustainability initiatives are perceived and evaluated.

A non-probability convenience sampling technique was employed due to its practicality in reaching respondents who were readily accessible and willing to participate. The survey was administered through student communication platforms, including WhatsApp and Telegram, to ensure wide and efficient distribution. Based on Krejcie and Morgan's (1970) sampling table, a minimum of 370 respondents was determined as sufficient to represent the target population and appropriate for quantitative analyses such as multiple regression.

Although convenience sampling limits the statistical generalizability of findings, it remains an effective and time-efficient method for behavioural research conducted within university settings, enabling researchers to gather relevant data quickly while maintaining reasonable representativeness.

Research Instrument

Data were collected using a structured self-administered questionnaire designed in English and hosted on Google Forms. The instrument was developed based on previously validated measures to guarantee accuracy and reliability. It consisted of five sections aligned with the study objectives:

- **Section A:** Demographic information (age, gender, and faculty).
- **Section B:** Consumer perception.
- **Section C:** Sustainable packaging.
- **Section D:** Carbon emission reduction.
- **Section E:** Transparency in communication.

Each construct (Sections B–E) was measured using items adapted from established sources such as Martinho et al. (2015), Bekaroo et al. (2019), and Díez and Zamanillo (2015). Respondents rated their agreement using a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). This format was chosen because it allows respondents to express varying degrees of opinion while enabling quantitative analysis of attitudes and perceptions.

Table 1 presents the constructs and their respective measurement sources.

Table 1: **Constructs and Measurement Sources**

Construct	Number of Items	Source
Consumer Perception	7	AI (2025)
Sustainable Packaging	7	Martinho et al. (2015)
Carbon Emission Reduction	8	Bekaroo et al. (2018)
Transparency in Communication	5	Díez & Zamanillo (2015)

Validity and Reliability

Content validity was established through expert evaluation. The questionnaire was reviewed by academic specialists to ensure item clarity, relevance, and consistency with the research framework. To confirm reliability, a pilot test was conducted among a small group of UniMAP students who shared similar characteristics with the intended respondents. The pilot data were analysed using Cronbach's Alpha, a measure of internal consistency. The results indicated that all constructs exceeded the recommended threshold of 0.70, demonstrating strong reliability: consumer perception ($\alpha = 0.826$), sustainable packaging ($\alpha = 0.816$), carbon emission reduction ($\alpha = 0.848$), and transparency in communication ($\alpha = 0.739$). These values confirm that the questionnaire items were stable and consistently measured their respective variables, ensuring that the instrument was ready for large-scale data collection.

Table 2 summarises the reliability results.

Table 2: **Reliability Coefficients for Pilot Test**

Variable	Number of Items	Cronbach's Alpha	Interpretation
Consumer Perception	7	0.826	Good reliability
Sustainable Packaging	7	0.816	Good reliability
Carbon Emission Reduction	8	0.848	Strong reliability
Transparency in Communication	5	0.739	Acceptable reliability

Data Collection Procedure

The online questionnaire was disseminated through UniMAP's student communication networks. Respondents received an explanation of the study's objectives, assurances of anonymity and confidentiality, and guidance for completing the form. Participation was entirely voluntary, and respondents could withdraw at any time. Data collection remained open for several weeks to achieve the target sample size. Completed responses were screened for completeness and accuracy before being coded and exported into SPSS for analysis.

Data Analysis

Quantitative data were analysed using the Statistical Package for the Social Sciences (SPSS). The analysis proceeded in three main stages. First, descriptive statistics (frequencies, percentages, means, and standard deviations) were used to describe the demographic characteristics of respondents and to summarise their responses to each construct. This provided an overview of the data distribution and general trends.

Second, Pearson's correlation analysis examined the strength and direction of relationships among the independent variables (sustainable packaging, carbon emission reduction, and transparency in communication) and the dependent variable (consumer perception). This step identified whether the relationships were positive or negative and determined their magnitude.

Third, multiple linear regression analysis was applied to evaluate the extent to which the independent variables could predict consumer perception. This statistical model allowed comparison of the relative contribution of each sustainability factor by analysing their standardised beta (β) coefficients, the model's R-squared (R^2) value, and F-statistics. Regression analysis was chosen because it provides a robust means of identifying the most influential predictor while controlling for other variables.

Hafirda Akma Musaddad, Nur Syahira Mohd Nafi, Wan Anis Wan Mohd Assrudin,
Nadiah Mahmad Nasir, Suraya Husin, Norsilawati Mohd Hassan

Ethical Considerations

Participation was voluntary, and no identifying information was collected. Respondents were informed that their answers would remain confidential and would be used solely for academic purposes. The study adhered to general research ethics standards for informed consent and data privacy.

RESULTS AND FINDINGS

This section presents the empirical results of the study examining the factors that influence consumer perceptions of Nestlé's sustainability practices in Malaysia. The data were analysed using the Statistical Package for the Social Sciences (SPSS) to ensure accuracy, consistency, and validity. The analyses included reliability testing, descriptive statistics, correlation analysis, and multiple regression analysis. A total of 370 valid responses were collected from Universiti Malaysia Perlis (UniMAP) students, representing a diverse academic and demographic profile. The results provide valuable insights into how sustainable packaging, carbon emission reduction, and transparency in communication affect consumer perception.

Reliability Analysis

A reliability test was conducted to assess the internal consistency of the measurement instruments used for each variable. Cronbach's Alpha coefficient was used as an indicator, where values above 0.70 are generally considered acceptable, and values above 0.90 indicate excellent reliability (Hair et al., 2020).

Table 3 below presents the reliability coefficients for all four constructs.

Table 3: Reliability of Measurement Items

Variable	Number of Items	Cronbach's Alpha	Interpretation
Consumer Perception	7	0.969	Excellent
Sustainable Packaging	7	0.969	Excellent
Carbon Emission Reduction	8	0.973	Excellent
Transparency in Communication	5	0.955	Excellent

The Cronbach's Alpha values ranged from 0.955 to 0.973, indicating very high reliability across all constructs. This demonstrates that the questionnaire items consistently measured the intended variables. Such strong internal consistency enhances the credibility of the dataset and ensures that subsequent statistical analyses are valid and robust.

Descriptive Analysis

Respondents' Demographic Profile

The demographic data of the respondents provided essential context for interpreting the results. Table 4 summarises the age, gender, and faculty distribution of participants.

Hafirda Akma Musaddad, Nur Syahira Mohd Nafi, Wan Anis Wan Mohd Assrudin,
Nadiah Mahmad Nasir, Suraya Husin, Norsilawati Mohd Hassan

Table 4: Demographic Characteristics of Respondents (n = 370)

Demographic	Category	Frequency	Percentage (%)
Age	Below 20	43	11.6
	20–22	230	62.2
	23–24	76	20.5
	25–26	21	5.7
Gender	Male	187	50.5
	Female	183	49.5
Faculty	Business & Communication	72	19.5
	Chemical Engineering & Technology	32	8.6
	Civil Engineering & Technology	30	8.1
	Electrical Engineering & Technology	47	12.7
	Electronic Engineering & Technology	65	17.6
	Mechanical Engineering & Technology	124	33.5

Most respondents (62.2%) were aged 20–22, a group considered digitally active and socially aware of corporate sustainability initiatives. The gender balance (approximately 50:50) ensures that the perspectives of both male and female consumers are well represented. The largest group of respondents were from engineering disciplines (71%), followed by business and communication (19.5%). This diversity allows the study to capture opinions from both technical and managerial perspectives students of engineering may focus on environmental impact and technical innovation, whereas business students may emphasise ethical marketing and corporate responsibility.

Descriptive Statistics of Study Variables

Descriptive statistics were used to evaluate respondents' overall attitudes toward each construct.

Table 5: Descriptive Statistics of Study Variables

Variable	N	Mean	Std. Deviation	Minimum	Maximum
Consumer Perception	370	25.30	8.06	7.0	35.0
Sustainable Packaging	370	25.12	8.15	7.0	35.0
Carbon Emission Reduction	370	28.68	9.34	8.0	40.0
Transparency in Communication	370	18.03	5.83	5.0	25.0

Overall, the mean values indicate that respondents had moderately positive perceptions of Nestlé's sustainability practices. Carbon Emission Reduction recorded the highest mean (M = 28.68), suggesting strong acknowledgment of Nestlé's environmental initiatives, such as energy efficiency and emission control. Sustainable Packaging also received a high mean (M = 25.12), reflecting consumer appreciation for visible eco-friendly packaging. Transparency in Communication recorded a slightly lower mean (M = 18.03), suggesting that while consumers recognise Nestlé's sustainability efforts, they may desire clearer and more frequent communication about these initiatives.

Correlation Analysis

Pearson's correlation analysis was conducted to determine the strength and direction of the relationships between the independent variables (Sustainable Packaging, Carbon Emission Reduction, and Transparency in Communication) and the dependent variable (Consumer Perception).

Table 6: Correlation Matrix Among Variables

Variables	Consumer Perception	Sustainable Packaging	Carbon Emission Reduction	Transparency in Communication
Consumer Perception	1			
Sustainable Packaging	0.980**	1		
Carbon Emission Reduction	0.971**	0.978**	1	
Transparency in Communication	0.971**	0.973**	0.969**	1

Note. Correlation is significant at the 0.01 level (2-tailed).

All correlations were positive and significant ($p < 0.001$), indicating that higher levels of sustainability initiatives correspond with higher consumer perception scores. The strongest relationship was between Sustainable Packaging and Consumer Perception ($r = 0.980$), implying that visible packaging improvements most strongly shape consumer attitudes. The equally high correlations for Carbon Emission Reduction ($r = 0.971$) and Transparency in Communication ($r = 0.971$) suggest that all three variables are interconnected, reinforcing each other's impact on consumer evaluations.

Regression Analysis and Hypothesis Testing

A multiple regression analysis was performed to determine the predictive power of each independent variable on Consumer Perception.

Table 7: Multiple Regression Results

Predictor	β	t-value	Sig. (p)	R²	F
Sustainable Packaging	0.555	10.711	<0.001		
Carbon Emission Reduction	0.173	3.542	<0.001		
Transparency in Communication	0.263	5.986	<0.001	0.967	3615.25***

Note: p < 0.001 = significant at 1 percent

The regression model was statistically significant ($F = 3615.25$, $p < 0.001$) and explained 96.7% of the variance in Consumer Perception ($R^2 = 0.967$), indicating a strong model fit. Sustainable Packaging had the largest standardized coefficient ($\beta = 0.555$), showing that it is the strongest predictor of how consumers evaluate Nestlé's sustainability performance. Transparency in Communication ($\beta = 0.263$) and Carbon Emission Reduction ($\beta = 0.173$) also had significant but comparatively smaller effects. These findings confirm that consumers' perceptions are largely shaped by tangible and communicable sustainability actions. When companies make their environmental efforts visible such as through recyclable packaging or clear sustainability messaging consumer trust and brand image improve significantly.

Hypothesis Testing Summary

Based on the regression results, all three hypotheses were supported, as summarised in Table 8.

Table 8: Hypothesis Testing Results

Hypothesis	Statement	Significance (p)	Decision
H1	There is a significant relationship between sustainable packaging and consumer perception.	<0.001	Supported
H2	There is a significant relationship between carbon emission reduction and consumer perception.	<0.001	Supported
H3	There is a significant relationship between transparency in communication and consumer perception.	<0.001	Supported

All relationships were positive and significant ($p < 0.05$), confirming that sustainable packaging, carbon emission reduction, and transparent communication all enhance consumer perception toward Nestlé's sustainability initiatives.

Summary of Findings

In summary, the statistical analyses provide strong empirical support for the study's conceptual framework. The measurement instruments demonstrated high reliability and internal consistency, while the regression model exhibited solid explanatory power. Among the three sustainability dimensions examined, sustainable packaging emerged as the most influential predictor of consumer perception, emphasizing the importance of visible and practical initiatives that consumers can directly observe and relate to. Transparency in communication also proved significant, as open and consistent disclosure enhances consumer trust and reduces skepticism toward corporate sustainability claims. Meanwhile, carbon-emission reduction, though less visible to consumers, remains an important indicator of corporate commitment to climate action and environmental responsibility. Overall, the findings confirm that corporate sustainability practices exert a significant and positive influence on consumer perception, thereby supporting both the Stakeholder Theory and the Theory of Planned Behaviour (TPB). These results provide a strong foundation for the subsequent discussion on managerial implications, policy relevance, and directions for future research.

DISCUSSION

The study investigated how sustainable packaging, carbon emission reduction, and transparency in communication influence consumer perceptions of Nestlé's sustainability practices in Malaysia. Drawing on the Stakeholder Theory and the Theory of Planned Behavior (TPB), the findings revealed that all three factors significantly and positively affect consumer perception, with sustainable packaging exerting the strongest influence. This suggests that consumers respond most favorably to tangible, visible sustainability actions especially those directly related to packaging design and material use. The result aligns with prior research by Jain and Hudnurkar (2022), who highlighted that eco-friendly packaging enhances perceptions of corporate responsibility.

Transparency in communication also emerged as a critical determinant of consumer perception, confirming earlier work by Borges et al. (2023) and Duan et al. (2021). Transparent reporting and sustainability disclosures foster consumer trust and mitigate skepticism toward greenwashing. Nestlé's commitment to open communication through reports, labels, and digital media appears to strengthen its brand credibility and public trust. Carbon emission reduction, while statistically significant, exhibited a comparatively smaller effect possibly due to its limited visibility to consumers. Nevertheless, initiatives such as Project RELeaf and Nestlé's net-zero goals remain vital, signaling the brand's broader environmental commitment.

Overall, the results reinforce the theoretical framework. Stakeholder Theory underscores the obligation of firms to consider the expectations of all stakeholders, while TPB emphasizes that credible, observable actions shape attitudes and behavioral intentions. Nestlé's sustainability practices, therefore, not only meet stakeholder expectations but also influence consumer behavior by enhancing perceptions of authenticity and responsibility.

Implications

Theoretical Implications

This study contributes to the growing body of literature on sustainability and consumer behaviour by extending the application of Stakeholder Theory and the Theory of Planned Behaviour (TPB) within the Malaysian context. The findings provide empirical validation that visible and transparent sustainability practices significantly enhance consumer perceptions, reinforcing the theoretical link between corporate responsibility, consumer attitudes, and behavioural intentions. By focusing on the fast-moving consumer goods (FMCG) sector, this research also broadens understanding

Hafirda Akma Musaddad, Nur Syahira Mohd Nafi, Wan Anis Wan Mohd Assrudin,
Nadiah Mahmad Nasir, Suraya Husin, Norsilawati Mohd Hassan
Jurnal Intelek Vol. 21, Issue 1 (Feb) 2026

of how sustainability communication and tangible environmental actions shape consumer trust in emerging markets.

Practical Implications

From a managerial perspective, the results offer valuable insights for firms seeking to strengthen their sustainability strategies. Companies should prioritize initiatives that are both visible and relatable, particularly in sustainable packaging design, as these have the greatest influence on consumer perception. Maintaining consistent and transparent communication across digital and physical platforms is equally crucial for building credibility and reducing consumer skepticism. Additionally, firms should enhance the visibility of their carbon-emission reduction efforts through clearer reporting and public engagement to reinforce brand reputation among environmentally conscious consumers.

Limitations and Future Research

Despite its contributions, the study has several limitations. The data were collected from Universiti Malaysia Perlis (UniMAP) students, limiting generalizability across broader demographic groups. Future studies should incorporate more diverse samples to capture differences across age, income, and regional backgrounds. Additionally, as this study employed a cross-sectional design, it could not assess changes in perception over time. Longitudinal research would allow observation of evolving consumer attitudes as sustainability practices develop. Incorporating qualitative methods such as interviews or focus groups could also offer richer insights into consumer motivations and emotional engagement. Further research might explore other determinants such as ethical sourcing, water management, or product quality and conduct cross-industry or cross-country comparisons to strengthen external validity.

CONCLUSION

In summary, the study concludes that sustainable packaging, communication transparency, and carbon emission reduction all play vital roles in shaping consumer perceptions of corporate sustainability. Among these, sustainable packaging has the greatest influence, underscoring the importance of visible and relatable environmental actions. The findings highlight that aligning corporate sustainability goals with consumer expectations, and communicating them transparently, enhances both brand credibility and consumer trust. By offering empirical evidence from the Malaysian context, this study contributes to the broader discourse on corporate sustainability, consumer perception, and sustainable development goals (SDGs 12 and 13). It reinforces the view that informed, environmentally aware consumers can drive companies toward greater accountability and environmental stewardship.

ACKNOWLEDGEMENT

Hafirda Akma Musaddad, Nur Syahira Mohd Nafi, Wan Anis Wan Mohd Assrudin,
Nadiah Mahmad Nasir, Suraya Husin, Norsilawati Mohd Hassan
Jurnal Intelek Vol. 21, Issue 1 (Feb) 2026

FUNDING

AUTHORS' CONTRIBUTION

Hafirda Akma Musaddad providing overall guidance, academic supervision, and critical feedback throughout the research process. Nur Syahira Mohd Nafi was responsible for developing the research framework, collecting and analyzing data, and drafting the main manuscript. Wan Anis Wan Mohd Assrudin contributed to editing, proofreading, and refining the manuscript to ensure clarity, coherence, and adherence to academic standards. Nadiah Mahmad Nasir provided input on data analysis techniques and assisted in interpreting the statistical results. Suraya Husin contributed to the literature review and the development of the theoretical framework. Norsilawati Mohd Hassan offered valuable insights on sustainability practices and helped strengthen the discussion and practical implications. All authors discussed the findings, provided intellectual input, and approved the final version of the manuscript for submission.

CONFLICT OF INTEREST DECLARATION

We, the authors, hereby certify that this manuscript is the original work of the Authors and Co-Authors and has not been published or submitted for publication elsewhere, either in whole or in part. All authors have contributed significantly to the conception, execution, and preparation of this research and manuscript. We also confirm that there is no conflict of interest financial, personal, or institutional in the subject matter or materials discussed in this paper. The data and interpretations presented are authentic and have been prepared with academic integrity for submission to *Jurnal Intelek*.

REFERENCES

Abdou, H., Hassan, M. K., & Naifar, N. (2022). Consumer perception and corporate sustainability: Insights from emerging markets. *Journal of Business Ethics, 181*(4), 899–915. https://doi.org/10.1007/s10551-022-05045-3

Aggarwal, R. (2024). Consumer perception and brand image in sustainable marketing. *International Journal of Management Research, 12*(1), 55–68.

Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies, 2*(4), 314–324. https://doi.org/10.1002/hbe2.195

Anozie, N. U. C., Obafunsho, N. O. E., Toromade, N. R. O., & Adewumi, N. G. (2024). Harnessing big data for sustainable supply chain management (SSCM): Strategies to reduce carbon footprint. *International Journal of Science and Research Archive, 12*(2), 1099–1104. https://doi.org/10.30574/ijsra.2024.12.2.1344

Arthi, K., & Maruthavijayan, S. (2025). A study on food packaging in Nestlé. *Indian Journal of Legal Review, 5*(6), xx–xx.*

Bekaroo, G., Bokhoree, C., Pattisson, C., Phillips, M. R., & Polidano, K. (2019). Investigating personal carbon emissions of employees of higher education institutions: Insights from Mauritius. *Journal of Cleaner Production, 209*, 581–594. https://doi.org/10.1016/j.jclepro.2018.10.238

Borges, E., Campos, S., Teixeira, M. S., Lucas, M. R., Ferreira-Oliveira, A. T., Rodrigues, A. S., & Vaz-Velho, M. (2023). How do companies communicate sustainability? A systematic literature review. *Sustainability, 15*(10), 8263. https://doi.org/10.3390/su15108263

Brookes, E. (2023, October 11). *The Theory of Planned Behavior: Behavioral intention.* Simply Psychology. https://www.simplypsychology.org/theory-of-planned-behavior.html

Butt, U. I. (2024). Nestlé's role in global food security, climate change and consumer health. *International Journal of Social Sciences and English Literature, 8*, 7–15. https://doi.org/10.55220/2576683x.v8.182

Duan, Y., Aloysius, J. A., & Mollenkopf, D. A. (2021). Communicating supply chain sustainability: Transparency and framing effects. *International Journal of Physical Distribution & Logistics Management, 52*(1), 68–87. https://doi.org/10.1108/ijpdlm-04-2020-0107

Etukudoh, P. E., Mensah, C. O., & Asiedu, K. (2024). Corporate approaches to carbon emission reduction: Strategies and challenges. *Journal of Cleaner Production, 439*, 140655. https://doi.org/10.1016/j.jclepro.2024.140655

Foroudi, P., Marvi, R., Cuomo, M. T., Bagozzi, R., Dennis, C., & Jannelli, R. (2022). Consumer perceptions of Sustainable Development Goals: Conceptualization, measurement and contingent effects. *British Journal of Management, 34*(3), 1157–1183. https://doi.org/10.1111/1467-8551.12637

Hartmann, P., & Apaolaza-Ibáñez, V. (2012). Consumer attitude and purchase intention toward green energy brands: The roles of psychological benefits and environmental concern. *Journal of Business Research, 65*(9), 1254–1263. https://doi.org/10.1016/j.jbusres.2011.11.001

Ibrahim, I. D., Hamam, Y., Sadiku, E. R., Ndambuki, J. M., Kupolati, W. K., Jamiru, T., Eze, A. A., & Snyman, J. (2022). Need for sustainable packaging: An overview. *Polymers, 14*(20), 4430. https://doi.org/10.3390/polym14204430

Igbomor, E. (2024). The effect of green packaging on consumers' buying behavior. *Ekonomika a Spoločnosť, 25*(1), 111–123. https://doi.org/10.24040/eas.2024.25.1.111-123

Jain, P., & Hudnurkar, M. (2022). Sustainable packaging in the FMCG industry. *Cleaner and Responsible Consumption, 7*, 100075. https://doi.org/10.1016/j.clrc.2022.100075

Karakan, H. (2024). Global sustainability governance and the evolution of the SDGs. *Sustainability Management Review, 9*(2), 211–230.

Kee, D. M. H., Teo, P. L., & Low, W. Y. (2021). Assessing Malaysian consumers' environmental awareness and green purchase behavior. *Journal of Asian Business and Economic Studies, 28*(4), 300–315. https://doi.org/10.1108/JABES-03-2021-0035

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610. https://doi.org/10.1177/001316447003000308

Kumar, S., & Jain, E. (2024). Role of Theory of Planned Behavior in interpreting sustainable consumption behavior: A meta-analysis. *Indian Journal of Marketing, 54*(10), 63–75. https://doi.org/10.17010/ijom/2024/v54/i10/174605

Laheri, V. K., Lim, W. M., Arya, P. K., & Kumar, S. (2024). A multidimensional lens of environmental consciousness: Towards an environmentally conscious Theory of Planned Behavior. *Journal of Consumer Marketing, 41*(3), 281–297. https://doi.org/10.1108/jcm-03-2023-5875

Mahajan, R., Lim, W. M., Sareen, M., Kumar, S., & Panwar, R. (2023). Stakeholder theory. *Journal of Business Research, 166*, 114104. https://doi.org/10.1016/j.jbusres.2023.114104

Manzoor, F., Wei, L., & Asif, M. (2024). The role of multinational corporations in achieving the Sustainable Development Goals. *Corporate Social Responsibility and Environmental Management, 31*(2), 512–526. https://doi.org/10.1002/csr.2528

Martinho, G., Pires, A., Portela, G., & Fonseca, M. (2015). Factors affecting consumers' choices concerning sustainable packaging during product purchase and recycling. *Resources, Conservation and Recycling, 103*, 58–68. https://doi.org/10.1016/j.resconrec.2015.07.012

Mistry, R. (2024). Sustainable packaging design and its impact on consumer perception. *International Journal of Environmental Management, 12*(1), 45–58.

Monfort, A., López-Vázquez, B., & Sebastián-Morillas, A. (2025). Building trust in sustainable brands: Revisiting perceived value, satisfaction, customer service, and brand image. *Sustainable Technology and Entrepreneurship, 100105*. https://doi.org/10.1016/j.stae.2025.100105

Mwandembo, F. (2024). Navigating the storm: Effective crisis communication strategies. *International Journal of Innovative Science and Research Technology, 9*(3), 2685–2697. https://doi.org/10.38124/ijisrt/ijisrt24mar2080

Nestlé Malaysia: Helping to shape a greener future for all. (2025, October). *The Edge Malaysia.* https://theedgemalaysia.com/node/591612

Omidiran, A. T., Martins, I. E., Obadina, A. O., & Bogueva, D. (2024). Consumer perception of food packaging. In *Consumer Perception of Food Packaging* (pp. 491–511). Springer. https://doi.org/10.1007/978-981-97-7870-6_24

Ortiz-Martínez, E., Marín-Hernández, S., & Santos-Jaén, J. (2022). Sustainability, corporate social responsibility, non-financial reporting and company performance: Relationships and mediating effects in Spanish small and medium-sized enterprises. *Sustainable Production and Consumption, 35*, 349–364. https://doi.org/10.1016/j.spc.2022.11.015

Rastogi, T., Agarwal, B., & Gopal, G. (2024). Exploring the nexus between sustainable marketing and customer loyalty with the mediating role of brand image. *Journal of Cleaner Production, 440*, 140808. https://doi.org/10.1016/j.jclepro.2024.140808

Taufique, K. M. R., & Vaithianathan, S. (2018). A comprehensive model of sustainable consumer behavior: Integrating values, attitudes, and eco-label knowledge. *Journal of Environmental Psychology, 60*, 9–23. https://doi.org/10.1016/j.jenvp.2018.10.005

Titova, T., & Subkhonberdiev, K. (2023). Corporate approaches to carbon neutrality and emission control. *Environmental Economics and Policy Studies, 25*(3), 455–470. https://doi.org/10.1007/s10018-023-00369-2

Tolegenov, B., Rafif, K., Rafi, M., Herawati, R., Abdullah, A., & Sari, L. K. (2024). Digital transparency and consumer awareness: Digital platforms for educating consumers about product origins and sustainability. *Al-Muzara'ah, 12*(2), 277–287. https://doi.org/10.29244/jam.12.2.277-287

VRITIMES. (2023). *VRITIMES – Press Release Distribution Service.* https://www.vritimes.com/my/articles/dd199155-0fe2-11ee-9300-0a58a9feac02

Zainudin, N., Wei, L. K., Osman, S., & Munusami, C. (2022). Assessing young adult consumers' responses to green personal care products: Insights from the extended Theory of Planned Behavior. *International Journal of Academic Research in Business and Social Sciences, 12*(12), 123–137. https://doi.org/10.6007/ijarbss/v12-i12/16006