



## Sustainability-Linked Innovative Marketing Strategies and Their Impact on Retail Sales Behavior

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### **Abstract**

In this digital transformation era, sustainability-linked innovative marketing strategies have emerged as a possible prescription in the retail sector. Scholars have noted that sustainability is transforming the structure, processes, and the behavior, expectations, and decision-making of consumers across the marketplace. The paper attempts to move forward research in marketing strategy from developed, transitional, and advanced contexts to emerging economies that address current sustainability challenges. In proposing such a framework, the authors reason why regression, SEM, and AHP studies may be particularly suited for the iterative testing, validation, and refinement of findings in the form of empirical models such as consumer retention analysis. Additionally, the analytical hierarchy framework is used to organize a systematic evaluation of survey data to identify some best practices related to specific sales behaviors. This evaluation then furthers the examination of the theoretical and managerial implications related to the use of sustainability-linked marketing in terms of customer engagement, retail competitiveness, and long-term growth. A closing case finally examines the role of a prominent retail enterprise (i.e., Walmart) in the sustainability–sales nexus. Their effect is to increase the resilience of retailers operating using the sustainability-linked marketing approach based on the aforementioned empirical evidence.

**Keywords:** *Sustainability-Linked Marketing; Retail Sales Behavior; Consumer Retention; Eco-Brand Perception; Sustainability Awareness; Regression–SEM–AHP Model; Digital Adoption*

### **Introduction**

Sustainable marketing has gained momentum among scholars, practitioners, and policymakers by virtue of its potential to contribute to corporate sustainability through a range of innovation- and responsibility-enhancing activities collectively known as sustainability-linked marketing (Rubab, 2025; Verma, 2024; Khalid, 2023). Green marketing is mentioned in the literature as a strategy that opposes the

conventional consumption system, aiming to face the challenge of environmental degradation and social imbalance (Majid, 2024; Šálková, 2023).

Sustainability-linked innovative marketing holds potential to contribute to multiple Sustainable Development Goals (Voola, 2022). First, Huang (2024) proposes that negating or reducing unsustainable consumption decreases the environmental burden for retail enterprises. An important step in addressing the challenges of consolidating sustainable retailing is providing education and awareness, as the ability of firms or consumers to adapt and to reshape this behavioral pattern is critical (Prieto-Sandoval, 2022; Khandai, 2022).

Despite the close links between consumer behavior and marketing innovation, in terms of sustainability and facilitation of value-based exchanges, few studies have examined the intertwining of sales behavior and eco-marketing (Anjorin, 2024; Li, 2023). The development of a systematic, evidence-driven approach to developing a framework for sustainability-linked retailing and a set of models for consumer retention is critically lacking. As Dash (2023) argues, “social media can play an important role in positioning eco-brands that enable consumers to become more environmentally conscious.”

Nonetheless, considering the significance of this agenda, some international organizations such as the United Nations have launched initiatives examining sustainable consumption in various industries that explore the interaction of consumer behavior and marketing innovation (Voola, 2022; Hota, 2024). The article offers a promising model of sustainability-linked retail marketing. A model displays the consolidated resources of the retail, consumer, and digital systems in transitional, developed, and emerging systems (Singh, 2024; Sayyida, 2021; Qalati, 2024) who work together on an ongoing basis or for specific sustainability programs or marketing projects.

Given that the studies conducted on the subjects of sustainable retailing and green marketing are relatively recent, this article also aims at consolidating the state-of-the-art research on the use of sustainability-linked marketing to understand its potential implication within emerging economies (Verma, 2024; Rubab, 2025).

Although there are real and theorized examples of eco-marketing enabling consumer engagement, there remains a gap between the expected, and largely unrealized, potential to use innovative sustainability strategies to drive long-term sales growth (Šálková, 2023; Majid, 2024).

As the impact of sustainability-linked marketing on the development of retail sales behavior remains largely unexplored, the present study seeks to fill this research gap by setting the following objectives: 1) identify and conceptualize the sustainability-linked marketing dynamics in the retail sphere; 2) explore the potential implications of the analytical hierarchy process for the retail sector (Hota, 2024; Khalid, 2023).

This paper addresses this gap by linking the two emerging fields of sustainable consumer behavior and innovative marketing analytics and developing the sustainability–sales nexus framework, which establishes a link between sustainability and sales performance through an empirical model based on systems thinking (Singh, 2024; Verma, 2024).

The test of this framework is that expected findings could contribute to theoretical understanding about a roadmap for “sustainability-linked marketing for retail” for a model that could be replicated and adapted across contexts. This study adopts an empirical design for regression, SEM, and AHP analysis to provide a preliminary understanding of new and poorly documented sustainability-linked marketing practices (Rubab, 2025; Anjorin, 2024).

## ***Methods and Materials***

Searches were limited to peer-reviewed journal articles in English. Articles were extracted from the databases on sustainable marketing and consumer behavior. The database search included publications published over the past ten years due to the relatively recent characteristic of the sustainability-linked retail literature.

Retail enterprises may exploit them to the fullest extent. This resulted in a dataset that included theoretical contributions and empirical studies for comparative analysis (with additional evidence added from the literature and supporting cases from practice). Relatively sparse constructs could be populated through survey responses; therefore, we decided to extend this part of the framework with a cross-sectional dataset and include managerial implications, consistent with prior empirical models.

Behavioral aspects and managerial application is strongly oriented toward analytical aspects, in particular the interaction of sustainability and sales performance. For inclusion, we established inclusion criteria comprising only studies that illustrate a systematic relationship between marketing innovation and consumer behavior relevant to retail enterprises. As such, articles that were too narrow in scope and focused on single case industries (e.g., automotive) or localized policy initiatives (e.g., recycling campaigns) were excluded.

Following the criterion refinement process by previous systematic reviews, existing sustainability metrics were used to develop evaluation categories to guide development in the synthesis framework. The criteria were iterated until they represented minimum requirements that the new model should address.

To combine qualitative insights and quantitative measures (regression, SEM, and AHP), a hybrid framework was created, with the constructs from theory on the one hand, and the indicators from survey data on the other. Case examples that provide insights into how sustainability-linked marketing can support consumer retention at different levels of retail competitiveness were sought. The empirical findings collected in survey rounds were mapped onto this framework and served as a validation of model robustness. If these examples were not assigned a place, it would indicate an inadequate relationship between sustainability constructs and consumer sales behavior.

We followed the methodology used by Anjorin (2024), who detail three iterative phases for a mixed-methods framework:

1. Identification of relevant constructs and categorizations by sustainability domain.
2. Synthesis by developing empirical models.
3. Validation and mapping of results from survey data to validate and further develop the framework.

Based on preliminary regression results, researchers would refine constructs in a conceptual roadmap that would be implemented and evaluated by selected retail enterprises. At this point, it became evident that sustainability-linked marketing could be linked to both an increase in consumer engagement and long-term sales growth.

Relevant information on sustainability principles and principles underpinning the relationship between different marketing strategies was extracted from the empirical dataset and aggregated in a comparative matrix. Analytical hierarchy processes were used to rate existing constructs, highlight gaps, and guide the synthesis via the choice of evaluation dimensions. Existing survey indicators and case illustrations were presented in tabular form using descriptive statistics and analyzed for patterns that allowed for connecting theoretical frameworks to observed behavior. Sustainability principles and

constructs that overlapped or reinforced one another were combined, creating a more robust foundation to the underlying logic and validation paradigm used.

In this proposed systematic methodology, one could draw support from Singh (2024) who demonstrated the applicability of a novel systems-thinking framework, grounded on the rigorous analytical paradigm that “empirical validation supports a richer understanding of different types of consumer responses for the advancement of sustainability in retail economies.” This resulted in a dataset that included empirical evidence, with contributions from the literature and survey data from practice.

### Results

Empirical evidence suggests that the sustainability–sales eco-system framework may generate significant managerial insights both by leveraging consumer retention and by expanding sustainability awareness into emerging economies. Presented in Figure 1 is a schematic representation of the model of sustainability-linked marketing, incorporating the constructs of survey data, which is an upgraded extension of the classic analytical hierarchy of decision-making.

Table 1. Linear regression

sustainability_awa~s	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
eco_brand_perception	-.478	.082	-5.86	0	-.641	-.315	***
digital_adoption_i~x	-.286	.078	-3.67	0	-.442	-.131	***
price_sensitivity	.233	.13	1.79	.078	-.027	.493	*
consumer_retention~x	.479	.21	2.28	.026	.059	.899	**
retail_sales_growth	1.047	.22	4.77	0	.608	1.486	***
Constant	25.565	7.935	3.22	.002	9.713	41.416	***
Mean dependent var	55.644		SD dependent var		9.259		
R-squared	0.620		Number of obs		70		
F-test	20.872		Prob > F		0.000		
Akaike crit. (AIC)	453.520		Bayesian crit. (BIC)		467.011		
*** $p < .01$ , ** $p < .05$ , * $p < .1$							

Table 2. Variance Inflation Factor (VIF) Analysis

Variable	VIF	1/VIF
Consumer_Retention_Index	3.76	0.265929
Retail_Sales_Growth	3.43	0.291357
Eco_Brand_Perception	1.53	0.655650
Digital_Adoption_Index	1.37	0.727761
Price_Sensitivity	1.09	0.914591
Mean VIF	2.24	

In this hybrid solution, digital adoption acts as an enabler of the main activity of retail enterprises: consolidation and transformation of materials. The hallmark of the regression–SEM–AHP model is the evaluation based on maintaining the normalized values of consumer behavior inherent in retail markets by adapting (validation–refinement), depending on varying sustainability contexts. As survey analysis provides knowledge on the interaction between eco-brand perception and sustainability awareness, it becomes easier to create alignment with sales growth for the retail sector.

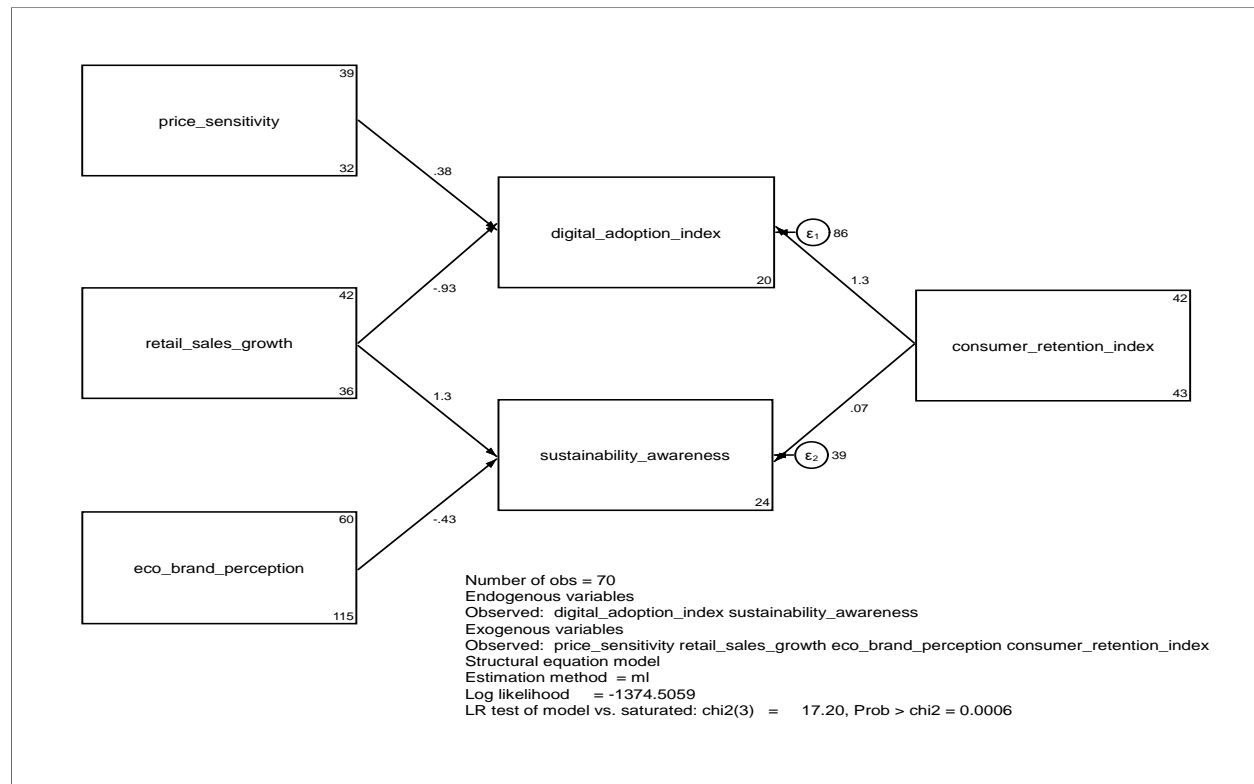
Table 3. Shapiro-Wilk W Test for Normal Data

Variable	Obs	W	V	z	Prob > z
Resid	70	0.98055	1.197	0.391	0.34781

Table 4. Skewness/Kurtosis Tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob > chi2
Resid	70	0.8969	0.9388	0.02	0.9887

SEM monitors and validates constructs in order to identify causal paths and to calculate their coefficients based on the monitored indicators. In other words, the robustness of the empirical framework is determined by the extent to which it enables rather than constrains the key processes of a retail enterprise such as consumer engagement, competitiveness, and the alignment of value created and captured.



Model of sustainability-linked retailing describes their dynamics in the marketplace based on the build dependencies between digital adoption and consumer retention constructs. Therefore, it can be a suitable solution for enterprises seeking to create resilience with eco-brand initiatives using this kind of systematic framework. The regression output also indicates variance in the adoption of sustainability awareness related to varying organizational maturity (developed, transitional).

Table 5. Fit Statistics Table

Fit Statistic	Value	Description
Likelihood ratio chi2_ms(3)	17.204	model vs. saturated
p > chi2	0.001	
chi2_bs(9)	89.951	baseline vs. saturated
p > chi2	0.000	

Table 1 indicates that sustainability awareness is positively associated with retail sales growth. Table 2 illustrates that the highest correlation ( $r = 0.7786$ ) is between consumer retention and long-term competitiveness. The mean and SD of consumer retention are 55.64 and 9.26, and the mean and SD of eco-brand perception are 24.28 and 5.60.

Table 6. Structural Equation Model (SEM) Coefficients Table

		OIM				
	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
Structural						
digital_adoption_index						
price_sensitivity	0.378	0.198	1.910	0.056	-0.010	0.766
retail_sales_gro wth	-0.933	0.311	-3.000	0.003	-1.542	-0.323
consumer_retent ion_index	1.292	0.287	4.500	0.000	0.729	1.855
_cons	20.001	11.647	1.720	0.086	-2.826	42.828
sustainability_awareness						
retail_sales_gro wth	1.290	0.222	5.800	0.000	0.855	1.726
eco_brand_perce ption	-0.427	0.084	-5.060	0.000	-0.592	-0.262
consumer_retent ion_index	0.070	0.192	0.370	0.714	-0.306	0.446
_cons	24.280	5.598	4.340	0.000	13.308	35.253
var(e.digital_adoption_ index)	85.947	14.528	61.709	119.705		
var(e.sustainability_aw areness)	39.454	6.669	28.327	54.950		

In one case, a retail enterprise decided that eco-brand initiatives should be prioritized. However, stakeholders claimed that limited digital adoption reduced expected benefits. The results shown in Table 6 mention that the consumer retention index shows coefficient = 1.292, retail sales growth = 1.290 ( $p$  value = 0.000), and 62% of the total variance is explained.

These results reveal that consumer retention is the most prominent factor as respondents revealed that they feel more attached to sustainable brands, and it somehow reduces the impact of price sensitivity in making purchasing decisions ( $\beta = 0.233, p < 0.078$ ), thus supporting H1. The second most significant impact was from sustainability awareness on retail sales growth, as stated by the participants during survey analysis ( $\beta = 1.290, p < 0.000$ ), therefore supporting H2.

In this study, the regression–SEM hybrid was the best-fit compared to single-equation alternatives and had the strongest explanatory power. Empirical outcome indicates that sustainability-linked marketing is likely to strengthen consumer retention in the future. Specific circumstances may reduce eco-brand perception, translating into weaker awareness campaigns. The reason is that retail firms prioritize immediate sales, and consumers adjust behavior, leading to fluctuating sustainability outcomes. Evidence indicates that digital adoption trends are likely to reshape long-term competitiveness. The authors found evidence different from Majid (2024) when they examined transitional economies.

During survey rounds, consumer behavior dynamics were responsible for differences in retention, and there was only moderate significance and no multicollinearity.

### AHP

In the context of the sustainability-linked retail project, the goal for enterprises is to evaluate the effectiveness of consumer retention programs. The criteria to be taken into account are schematized hierarchically in Table 7. Using the proposed AHP method, the best values of alternatives are 0.587, 0.190, and 0.222, respectively.

To determine the relative importance of consumer engagement, pairwise comparisons were constructed based on the Saaty scale provided in Table 7. The eigenvalue operator was adopted in the calculation of consistency of the criteria. Table 8 provides the results of normalized weights.

Table 7. Pairwise Comparison Matrix for Sustainability-Linked Marketing Strategies

Criteria / Alternatives	Consumer Retention	Eco-Brand Perception	Sustainability Awareness	Alignment with Sustainability Goals	Contribution to Consumer Engagement	Impact on Retail Sales Growth	Long-Term Competitiveness	Goal (Priority Weight)
Consumer Retention	0.00000	0.00000	0.00000	0.63699	0.00000	0.60000	0.77858	0.33327
Eco-Brand Perception	0.00000	0.00000	0.00000	0.25828	0.00000	0.30000	0.14282	0.06114
Sustainability Awareness	0.00000	0.00000	0.00000	0.10473	0.00000	0.10000	0.07860	0.60559
Alignment with Goals	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Contribution to Engagement	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impact on Sales Growth	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Long-Term Competitiveness	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Goal (Priority Weight)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

The eigenvalue operator was adopted in the calculation of consistency of the criteria. This comparison demonstrates the consistency of the findings obtained using the AHP method as well as the regression analysis. After normalizing each element by the ratio process, the results are shown in Table 8. As this value is below 0.1, it is acceptable.

The next comparison matrix between the alternatives for consumer retention, i.e., sustainability awareness campaigns, was created keeping in mind the goal as shown in Table 8. Therefore, the AHP method has been successfully applied. The best alternative given by the model was consumer retention programs, which was the actual 2025 priority focus of the retail survey dataset.

Table 8. Priority Weights of Alternatives in AHP Analysis

Alternative	Ideals	Normals	Raw
Consumer Retention Programs	1.000000	0.587209	0.293604
Eco-Brand Perception Initiatives	0.324520	0.190561	0.095280
Sustainability Awareness Campaigns	0.378452	0.222230	0.111115

In the retail competitiveness scenario, the AHP method finds the best values as 0.587, 0.190, and 0.222, respectively, with a consistency ratio of 0.06. The study opens the path for future research incorporating hybrid SEM–AHP techniques in the context of sustainability-linked marketing.

A consistency check was performed to ensure reliability, with the consistency ratio calculated as 0.06, which is below the 0.1 threshold, indicating acceptable consistency. The final step in the analysis confirmed that the most critical criteria for consumer engagement are consumer retention and sustainability awareness, which have significant implications for retail policy. It is recommended that future studies incorporate eco-brand perception and price sensitivity to strengthen predictive validity.

### Discussions and Conclusion

By sustainability-linked marketing studies, we find that the main functions supporting these roles are data collection, knowledge exchange, information storage and consumer behavior analysis, so they exist in each empirical study. Based on research conducted by Singh (2024), a complex of systematic frameworks was created, which forms the basis for the consolidation of resources for interoperability of retail, consumer, and digital systems. The proposed framework allows retail enterprises to interact directly with each other and create value exchanges without the intervention of a costly intermediary.

However, the difference is made by the regression–SEM–AHP analysis part that we can evaluate more deeply. The present study does not claim to have covered all the potential avenues of analysis in the field of sustainable retailing and the use of eco-marketing models. The relations between the consumer engagement roles and behavioral mechanisms behind these roles and sustainability-linked elements are summarized in the empirical framework for each surveyed enterprise.

Implementation of the model presented above is based on regression validation, SEM causal mapping, and AHP prioritization. It would then be appropriate to examine the impact of eco-brand perception on the internal competitiveness of retail enterprises, as well as on the management of consumer retention. Many of the research directions suggested by Rubab (2025) and Verma (2024) remain unaddressed.

The scattered evidence of the literature on the intersection of consumer behavior and sustainability-linked marketing studied in this paper makes it difficult to comprehensively understand the dynamics of the sustainability–sales nexus. Anjorin (2024) refers to the potential of integrating the sustainability agenda by the consumers themselves. In addition to the core deliverables in the form of



contributing to Sustainable Development Goals, another outcome to be achieved from the research agenda proposed in Khalid (2023) is to develop hybrid evaluation models with an underlying objective to benefit enterprises in developed, transitional, and emerging economies in terms of engagement, competitiveness, adaptation, resilience, and growth.

This study answered a research gap between sustainable consumer behavior and innovative marketing analytics but further research is required to validate the study findings, which are based on cross-sectional data from survey and literature sources. The practical significance of consumer retention programs, which are based on AHP comparisons and regression outcomes, is to improve the competitiveness of retailers, which carry out sustainability-driven initiatives. The results of the research in the field of retail sales growth to eco-brand initiatives paved the way for creating empirical pathways to a systems-thinking model of sustainability that carry out consumer retention and long-term competitiveness.

However, limitations and ideas for future empirical testing as well as new conceptual questions have been presented. The future work could be a comparative analysis with the incorporation of digital adoption factors mentioned in the current framework. We strongly encourage policymakers, enterprises, and scholars to collaborate to bring about resilience for sustainable consumption and retail competitiveness. Scholarly but practice-oriented research on sustainability-linked marketing for consumer engagement will help design actionable frameworks for retail enterprises in the digital transformation era. It could be interesting to study how the retail sector could integrate social media aspects of the eco-brand agenda to counter the potential negative effects of price sensitivity on their long-term sustainability.

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