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SUSTAINABILITY OF INFLUENCE MARKETING: ROLE OF AI IN DETECTING AUTHENTIC VS GREENWASHED CONTENT

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ABSTRACT

The rapid growth of influencer marketing has positioned and acted as powerful vehicle to drive brand communication, with sustainability emerging as a central theme used to build consumer trust and engagement. However, as more influencers and brands publish sustainability themed content, concerns over greenwashing the practice of overstating and misrepresenting environmental credentials to have intensified, and undermine the credibility of the influencer marketing ecosystem. AI becomes the promising factor as a emerging solution to the credibility gap. The study examines with the secondary data collected from the period of 2021 to 2025. The data will help to investigate the relationship between the volume of the sustainability focused influencer content, an AI based greenwashing risk score, a greenwash index and authentication index. Using Correlation and regression analysis the study finds that as genuine sustainability posts increased from 12% to 33%. The greenwash index declined from 42% to 29%. While the AI greenwash risk score fell from 58 to 43 and the authentication index rose from 4.8 to 6.8. correlation results show the extremely strong positive relationship among all four variables. The regression analysis confirmed that both hypothesized relationships are statistically significant.

The finding suggests that as brands and influencers publish more substantiated, evidence-based sustainability content, greenwashing risk decreases while perceived authenticity increases. The study concludes that AI functions as a credibility layer within influencer marketing, helping distinguish authentic sustainability communication from misleading claims and offers suggestions for integrating

AI driven detection into content approval workflows.

KEYWORDS: Artificial Intelligence, Sustainability Index, AI Greenwash Risk Score, Influencer Marketer, Authentication Index, Greenwash Index and brand Communication.

INTRODUCTION

Influencer market emerging as a boom in this digital era and becoming powerful marketing tools for brand communication, with sustainability increasing core message as ton build trust and drive engagement. As increased influencer and brands publish sustainability-themed content, there is concern about greenwashing. Greenwashing is the term used to describe the way the brand or influencer makes their services, products look like an eco-friendly, nature organic than it contributes to environment. This will lead to eroding consumer trust and undermine credibility of the influencer marketing ecosystem.

Artificial Intelligence has emerged as a promising solution to this credibility gap. AI- Driven tools can now analyze influencer content at scale, screening claims, sentiment and visual cues to flag exaggerated or misleading sustainability practices. This creates a measurable link between the volume of sustainability content being posted, the extent to greenwashing present in that content, and the degree to trust or authenticity consumers and platforms can place it in. This study examines the data from the year 2021 to 2025. It also tracks how growth in sustainability focused influencer posts correlates with changes in a greenwash index, an Ain based greenwashing risk score and am authentication index.

REVIEW OF LITERATURE:

Israfilzade, K. (2026). The study investigates how ad source and source label and environmental claim strength jointly influence perceived greenwashing and green trust among Generation Z consumers. AI attribution consistently elevated greenwashing perceptions and depressed green trust, while strong claims significantly reduced greenwashing perceptions and elevated trust within both correctly disclosed conditions. The findings reveal transparency paradox with significant implications for AI disclosure regulations and sustainable marketing practices.

OKACHA, S. (2026). The document says how AI – generated content alters consumer trust and brand authenticity in digital marketing, particular with relevance for entrepreneurs and sustainable brand development. The framework of the study consists of three layers they are the generation layer, perception layer and outcome layers. Practically it offers actionable guidance for practitioners navigating marketing in an AI-enhanced environment.

Singh, A. (2026) The study employs a qualitative content analysis approach, analyzing purposely selected AI driven green campaigns by IKEA, Coca-Cola and TATA motors to identify the patterns of transparency, accountability and authenticity in sustainability communication. The finding emphasizes that while AI can transform sustainability communication into a data – driven, measurable and engaging practices, ethical oversight remains essential to prevent deceptive automation and rebuild public trust.

RESEARCH GAP:

most of the study examines their intersection specifically how the volume of sustainability related influencer content and little research related to measurable greenwashing risk. The most greenwashing literature focuses on the corporate ESG reporting and traditional advertising rather than the informal, visual and trust driven content typical of influencers. likewise existing AI marketing research emphasis engagement prediction or fake follower detection rather than verifying the substantive truthfulness sustainability claims. There is minimal quantitative work linking to the AI based greenwashing risk score to an authentication trust metric using statistically testable indices. The study analyses the correlation and regression analysis of secondary data from 2021 to 2025.

OBJECTIVE:

1. To identify the impact of sustainability post on greenwash index in the influencer market.
2. To analyses the relationship between AI Greenwashing Risk Score and the Authentication Index.

HYPOTHESES:

H1: There is significant relationship between the Sustainability post and Greenwash Index.

H0: there is no significant relationship between the Sustainability Post and Greenwash Index.

H2: There is significant relationship between the AI Greenwashing Risk Index and Authentication Index.

H0: There is no significant relationship between the AI Greenwashing Risk Index and Authentication Index.

METHODOLOGY:

The study follows correlational and inductive research methodology The study is fully based on secondary data, and no primary data is used for the study. The study is quantitative secondary data, and the collected data undergoes descriptive statistics analysis, correlation analysis and regression analysis for the different factors. The source of secondary data is from articles and online databases.

INTERPRETATION:

Table 1.1: Data for the sustainability post and Greenwash index of Influence Marketing

Year	Sustainability Post (%)	Greenwash Index (%)	AI Greenwashing Risk (0-100)	Authentication Index (0-10)
2021	12	42	58	4.8
2022	16	39	55	5.2
2023	21	36	51	5.7
2024	27	32	47	6.3
2025	33	29	43	6.8

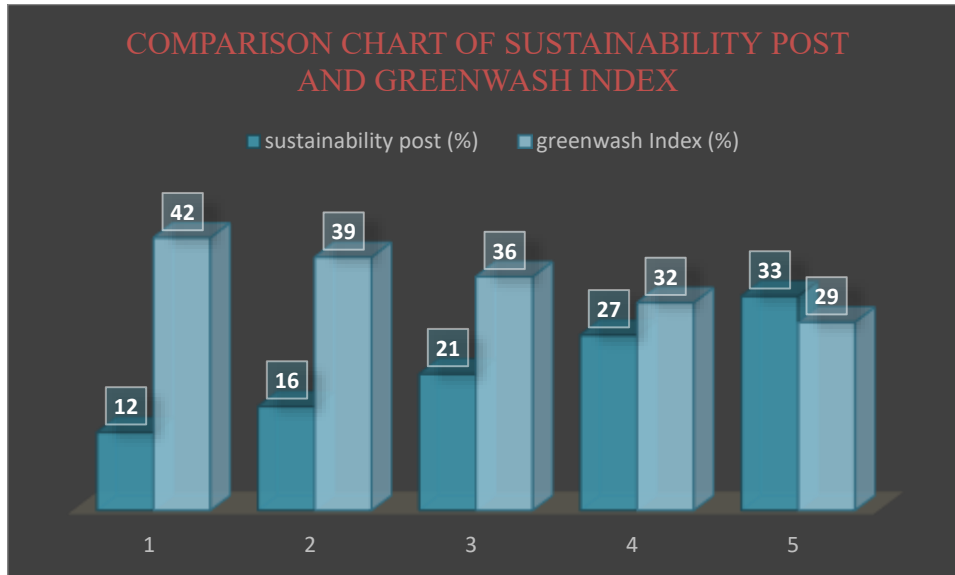
(Source: Secondary Data)

From the above table 1.1, the sustainability post is gradually rising from 12% in 2021 to 33% in 2025. When sustainability post is gradually increasing, greenwash index is gradually decreasing from 42% to 29% in 2021 to 2025. From 2021 to 2025, AI- Greenwashing Risk ranging from 0-100, 58 in 2021 to 43 in 2025. And correspondingly Authentication Index is gradually increasing in 2021 from 4.8 to 6.8 in 2025.

Table 1.2: Comparison of Sustainability post and Greenwash Index

Year	Sustainability Post (%)	Greenwash Index (%)
2021	12	42
2022	16	39
2023	21	36
2024	27	32
2025	33	29

(Source: Secondary Data)



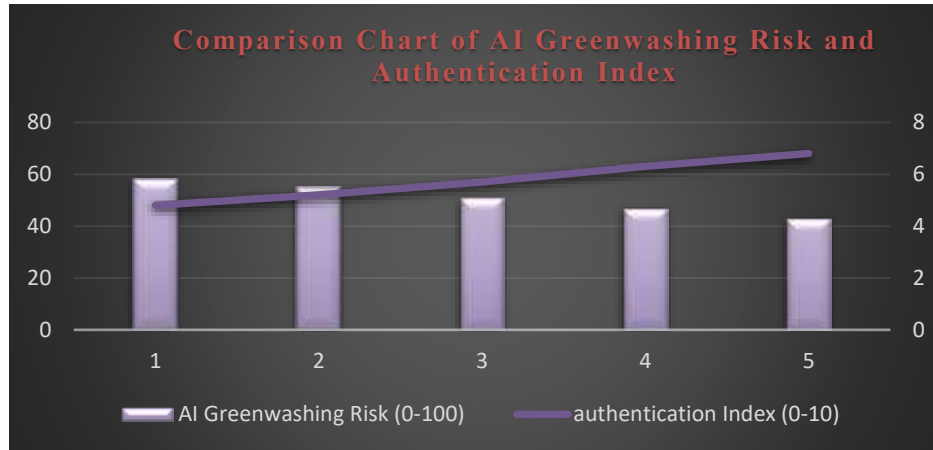
(Source: Author) Figure 1.1: Comparison chart of Sustainability post and Greenwash Index

The Chart 1.1 shows the gradual impact of sustainability post on Greenwash Index, and both factors are the reciprocal in nature. Sustainability shows great increase in nature over the years from 12 to 33 during the period of 2021 to 2025.

Table 1.3: Comparison of AI Greenwashing Risk and Authentication Index

Year	AI Greenwashing Risk (0-100)	Authentication Index (0-10)
2021	58	4.8
2022	55	5.2
2023	51	5.7
2024	47	6.3
2025	43	6.8

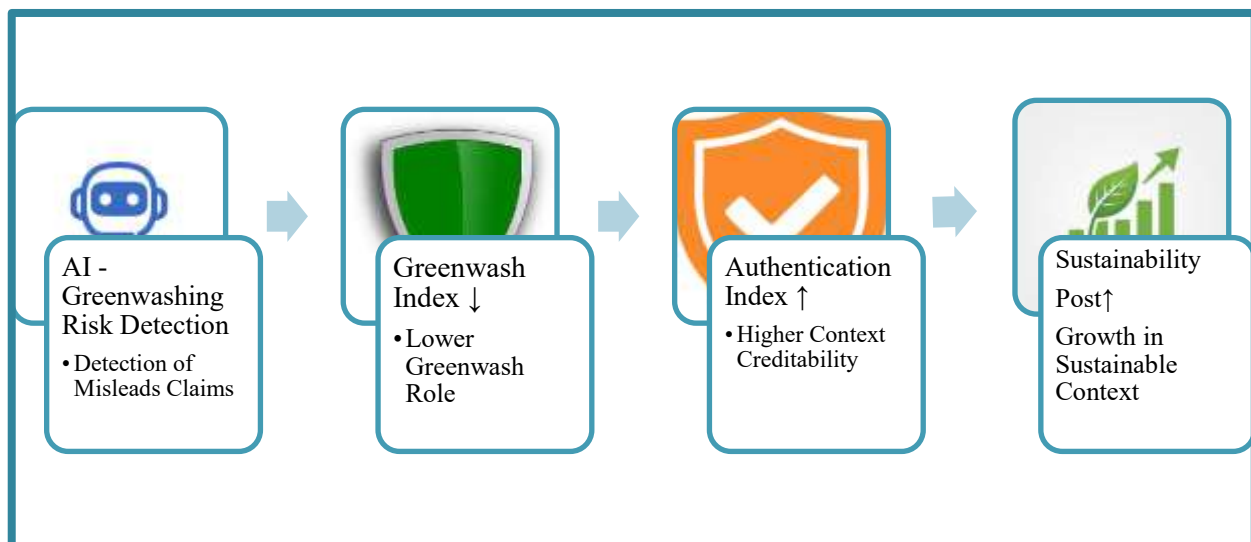
(Source: Secondary Data)



(Source: Author) Figure 1.2: Comparison chart of AI Greenwashing Risk and Authentication Index

The above chart 1.2 shows the inverse relationship between the AI Greenwashing Risk and Authentication Index from the year 2021 to 2025. The 58 points of AI Greenwashing Risk to 43 points of AI Greenwashing Risk and in parallel Authentication Index rises from 4.8 to 6.8 over the years.

CONCEPTUAL MODEL OF AI – DRIVEN SUSTAINABILITY INFLUENCE MODEL



(Source: Author) Figure 1.3: AI – Driven Sustainability Influence Model

In detecting the Greenwashing AI is more effective than the human. The declination of overall AI Greenwashing role score will lead to fewer misleading sustainability claims of the brand by the audience. This reduction directly lowers the Greenwash Index, indicating cleaner and more transparent influence content in the market. AI deceptive claims decrease the Authentication Index rises reflecting

stronger credibility and more evidence based on the sustainability communication higher authenticity then encourages, influence and brands to produce more sustainability posts focusing on creating a positive cycle where AI – driven monitors improve content quality, boosts.

RESULTS AND SUGGESTIONS:

Table 1.4: Descriptive Analysis of all four factors

<i>Sustainability Index</i>		<i>Greenwash Index</i>		<i>AI Greenwashing Risk (0-100)</i>		<i>Authentication Index (0-10)</i>	
<i>Variables</i>	<i>Value</i>	<i>Variables</i>	<i>Value</i>	<i>Variables</i>	<i>Value</i>	<i>Variables</i>	<i>Values</i>
Mean	109	Mean	178	Mean	50.8	Mean	5.76
Standard Error	18.801	Standard Error	11.68	Standard Error	2.690	Standard Error	0.361
Median	105	Median	180	Median	51	Median	5.7
Mode	#N/A	Mode	#N/A	Mode	#N/A	Mode	#N/A
Standard Deviation	42.041	Standard Deviation	26.124	Standard Deviation	6.016	Standard Deviation	0.808
Sample Variance	1767.5	Sample Variance	682.5	Sample Variance	36.2	Sample Variance	0.653
Kurtosis	-1.292	Kurtosis	-1.497	Kurtosis	-1.410	Kurtosis	-1.543
Skewness	0.286	Skewness	-0.095	Skewness	-0.157	Skewness	0.175
Range	105	Range	65	Range	15	Range	2
Minimum	60	Minimum	145	Minimum	43	Minimum	4.8
Maximum	165	Maximum	210	Maximum	58	Maximum	6.8
Sum	545	Sum	890	Sum	254	Sum	28.8
Confidence Level (95.0%)	52.201	Confidence Level (95.0%)	32.438	Confidence Level (95.0%)	7.470	Confidence Level (95.0%)	1.003

(Source: Computed Data)

All the distributions are roughly symmetric because the skewness is nearly equal to zero. All show the negative kurtosis which means platykurtic that says the data are spread out flatter than a normal distribution with no heavy tails or outliers. Sustainability index has the widest spread relative to its mean (SD = 38% of its mean), the most variable of the factors.

Table 1.5: Correlation Analysis between the different factors

<i>Variables</i>	<i>Sustainability Index</i>	<i>Greenwash Index</i>	<i>AI Greenwashing Risk (0-100)</i>	<i>authentication Index (0-10)</i>
<i>Sustainability Index</i>	1			
<i>Greenwash Index</i>	-0.998	1		
<i>AI Greenwashing Risk (0-100)</i>	-0.999	0.998	1	
<i>authentication Index (0-10)</i>	0.999	-0.999	-0.999	1

(Source: Computed Data)

The correlation analysis of the four factors reveals extremely strong relationship among all various pairs. The sustainability Index shows the strong negative relationship with Greenwash Index ($r=-0.998$), and AI Greenwash Risk indicating that as an organization's genuine sustainability performance increases, indicators of greenwashing and AI-detected greenwashing risk decrease sharply. Conversely, the sustainability Index shows the strong positive correlation with Authentication Index with $r=0.999$ shows that higher sustainability performance is closely associated with greater perceived authenticity. Similarly, Greenwash Index and AI – Greenwashing Risk sharing positively correlated relationship between them with ($r=0.998$). this confirms that both measures the capturing the overlapping aspects of the greenwashing behavior, while both shows negative correlation with Authentication index with ($r=-0.999$).

TABLE 1.6: Regression Analysis of Sustainability Index and Greenwash Index

Summary Output

<i>Regression Statistics</i>	
Multiple R	0.894919339
R Square	0.800880623
Adjusted R Square	0.550880623
Standard Error	89.5657407
Observations	5

(Source: Computed Data)

The Sustainability Index was used to predict the Greenwash Index. The model produced an R^2 value of 0.801 (Multiple R = 0.895), indicating that approximately 80% of the variation in the Greenwash Index can be explained by the Sustainability Index; however, the Adjusted R^2 dropped considerably

to 0.551, reflecting the limitation imposed by the very small sample size ($n = 5$). The overall model was statistically significant ($F = 16.09$, Significance $F = 0.028$), and the regression coefficient for the Sustainability Index ($\beta = 1.393$, $t = 4.01$, $p = 0.015$) was also significant, meaning that for every one-unit increase in the Sustainability Index, the Greenwash Index is predicted to rise by approximately 1.39 units.

ANOVA					
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	129061.9124	129061.9124	16.08845175	0.027807044
Residual	4	32088.08763	8022.021907		
Total	5	161150			

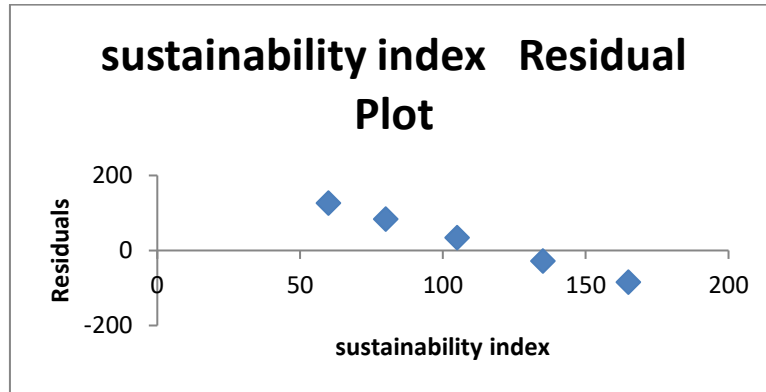
(Source: Computed Data)

<i>Variables</i>	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
sustainability index	1.393	0.347	4.011	0.015	0.428	2.357	0.428	2.357

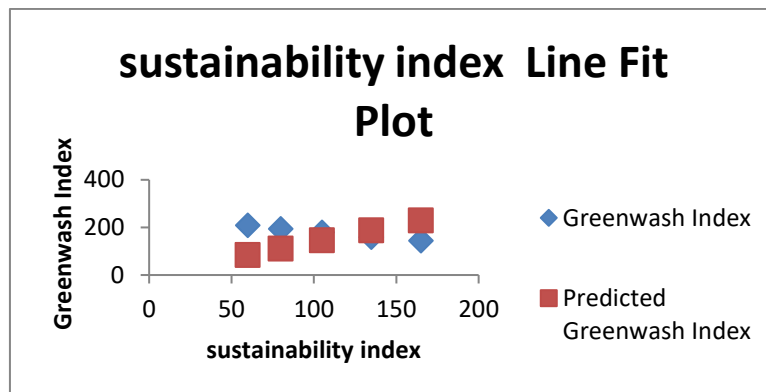
(Source: Computed Data)

RESIDUAL OUTPUT			
<i>Observation</i>	<i>Predicted Greenwash Index</i>	<i>Residuals</i>	<i>Standard Residuals</i>
1	83.602	126.397	1.577
2	111.470	83.52	1.0426
3	146.305	33.69	0.420
4	188.106	-28.10	-0.350
5	229.90	-84.907	-1.059

(Source: Computed Data)



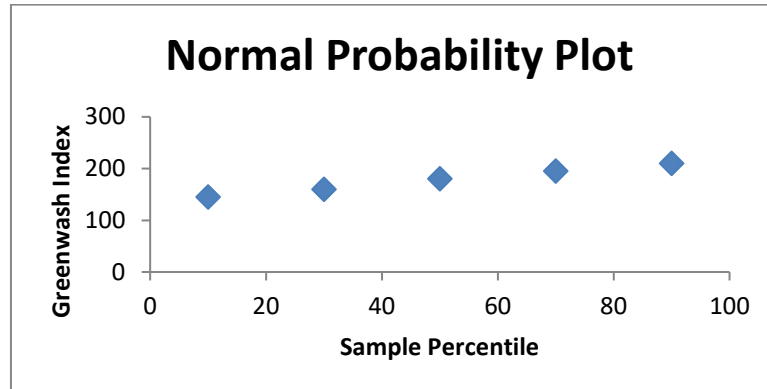
(Source: Computed Data) Figure 1.4: Sustainability Index Residual plot



(Source: Computed Data) Figure 1.5: Sustainability Index Line Fit plot

PROBABILITY OUTPUT	
<i>Percentile</i>	<i>Greenwash Index</i>
10	145
30	160
50	180
70	195
90	210

(Source: Computed Data)



(Source: Computed Data) Figure 1.6: Normal Probability Plot

Table 1.7: Regression Analysis of AI -Greenwashing Risk and Authentication Index Summary Output:

<i>Regression Statistics</i>	
Multiple R	0.973587
R Square	0.947872
Adjusted R Square	0.697872
Standard Error	13.03994
Observations	5

(Source: Computed Data)

The Authentication Index was used to predict AI Greenwashing Risk. This model showed a stronger fit, with an R^2 of 0.948 (Multiple $R = 0.974$) and an Adjusted R^2 of 0.698, and was highly significant overall ($F = 72.73$, Significance $F = 0.0034$). The regression coefficient for the Authentication Index ($\beta = 8.567$, $t = 8.53$, $p = 0.001$) was also highly significant, indicating a strong predictive relationship between authentication and AI-detected greenwashing risk.

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	12367.84	12367.84	72.73483	0.003387
Residual	4	680.1605	170.0401		
Total	5	13048			

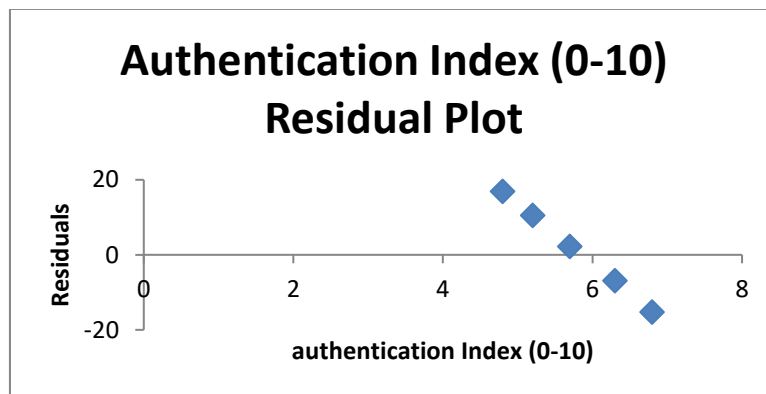
(Source: Computed Data)

<i>Variables</i>	<i>Coefficient s</i>	<i>Standar d Error</i>	<i>t Stat</i>	<i>P- valu e</i>	<i>Lowe r 95%</i>	<i>Uppe r 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Authentication Index (0-10)	8.567	1.00456	8.528	0.001	5.778	11.35	5.778	11.356

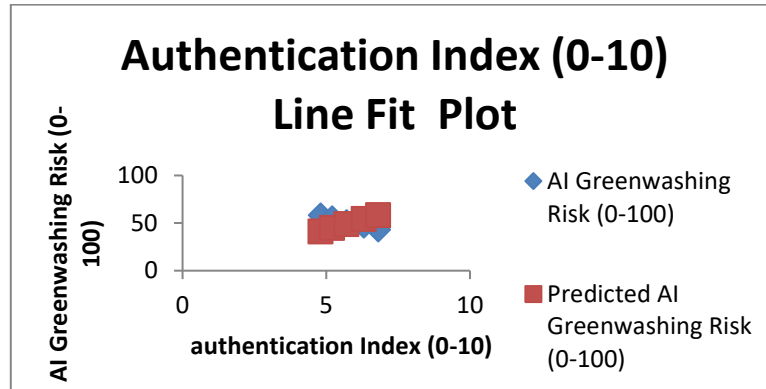
(Source: Computed Data)

RESIDUAL OUTPUT			
<i>Observation</i>	<i>Predicted AI Greenwashing Risk (0-100)</i>	<i>Residuals</i>	<i>Standard Residuals</i>
1	41.12332	16.87668	1.446992
2	44.55027	10.44973	0.895951
3	48.83395	2.166053	0.185716
4	53.97436	-6.97436	-0.59798
5	58.25804	-15.258	-1.30821

(Source: Computed Data)



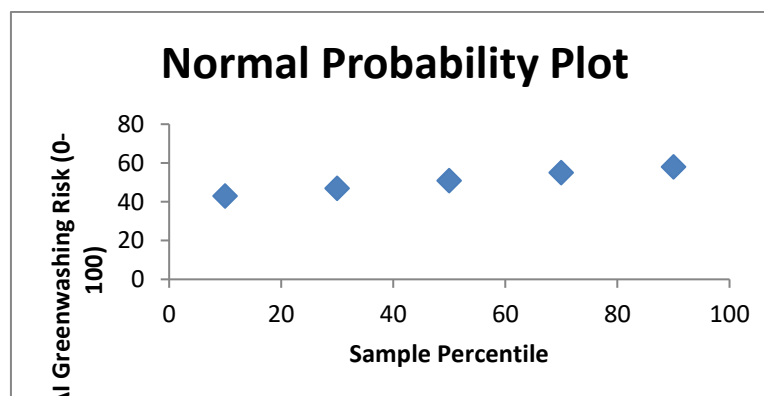
(Source: Computed Data) Figure 1.7: Authentication Index Residual Plot



(Source: Computed Data) Figure 1.8: Authentication Index Line Fit Plot

PROBABILITY OUTPUT	
Percentile	AI Greenwashing Risk (0-100)
10	43
30	47
50	51
70	55
90	58

(Source: Computed Data)



(Source: Computed Data) Figure 1.9: Normal Probability Plot

SUGGESTIONS:

1. The brand and influencers should integrate an AI greenwashing – detection tools into their content approval workflow rather than relying only on manual review.

2. The Sustainability Index shows a strong negative correlation with the Greenwash Index ($r = -0.998$), brands should prioritize claims backed by certifications, data, or third-party verification rather than vague or aspirational language.
3. The mandating of AI-based greenwashing checks for sponsored sustainability content for the social media platforms and advertising regulators to avoid greenwash complaints.
4. Influencers should be educated on what constitutes greenwashing, so that content creation itself becomes more compliant before AI screening is even needed.

CONCLUSION

The study sets out to examine the relationship between sustainability focused influencer content, greenwashing indicators, and AI driven authentication using secondary data from 2021 to 2025. The findings show that there is a statistically significant trend as the proportion of genuine sustainability posts increased from 12% to 33%. From the analysis the study accepts both alternative hypotheses and both null hypotheses are rejected.

These results indicate that as brands and influencers publish more substantiated evidence based on sustainability content, greenwashing risk decreases while perceived authenticity increases and that AI based monitoring can meaningfully track and reinforce this shift. In effect AI acts as credibility layer within influencer marketing helping distinguish authentic sustainability communication from misleading claims.

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