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An Integrated VBN-TPB Analysis of Eco-Friendly Cosmetic Adoption and Post-Purchase Experience in a Semi-Urban Emerging Market

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ABSTRACT

Environmental concerns and the rapid expansion of the Indian beauty market have increased consumer interest in eco-friendly personal care and beauty products. Pasighat, Arunachal Pradesh, a semi-urban setting characterised by rich cultural heritage and ecological diversity, provides an important context for examining sustainable consumption behaviour. By integrating the Value-Belief-Norm (VBN) theory and the Theory of Planned Behavior (TPB), the present study examines how awareness influences attitude, subjective norms, perceived behavioural control, and personal moral obligation, which further influence adoption intention and actual adoption behaviour related to eco-friendly personal care and beauty products. The study is based on primary data collected from 384 respondents using a structured questionnaire. Appropriate statistical tools such as descriptive statistics, ANOVA, t-test, correlation, and regression analysis were used for data analysis. The findings reveal that greater awareness positively influences consumers' attitudes, social influence, perceived behavioural control, and moral obligation towards eco-friendly products, leading to stronger adoption intention and actual adoption behaviour. Positive post-purchase experiences further reinforce continued adoption behaviour.

Keywords: Theory of Planned Behavior (TPB), Value-Belief-Norm (VBN) theory, subjective norms, attitude, eco-friendly products.

1. Introduction

Environmental sustainability has become a crucial factor shaping consumer behaviour, particularly in relation to eco-friendly personal care and beauty products in recent years. Eco-friendly personal care and beauty products are designed to reduce or minimise environmental impact through the use of non-toxic, natural, and biodegradable materials that address consumers' health and environmental concerns. Consumers, especially women and younger individuals, are increasingly aware of eco-friendly products because of greater access to information and increased concern for health and environmental sustainability (Rani & Bharatwal, 2022). The Indian beauty and personal care industry is also growing rapidly. By 2027, the market is expected to nearly double from $16 billion to $30 billion, driven by rising income levels, social media influence, and increasing awareness regarding harmful chemicals, animal testing, and environmental impacts associated with conventional products (HBS India, 2025).

Reddy (2023) and Prakash (2024) reported that consumers are motivated to adopt eco-friendly products because of growing concern for personal health and environmental sustainability, reflecting favourable

perceptions towards companies that are ethical, environmentally responsible, and consumer-friendly.
Pasighat, established in 1911 A.D., is the oldest town in Arunachal Pradesh and presently serves as the administrative headquarters of the East Siang District (District Administration East Siang, n.d.; Chaudhuri, 2015). Its inclusion under the Government of India's Smart Cities Mission in 2017 reflects its ongoing urban and infrastructural transformation (Arunachal Observer, 2017). Along with its rich cultural and ecological diversity, the town has also witnessed increasing commercial activities related to organic and eco-friendly products in recent years, including environmentally friendly personal care and beauty products (Cosmetics Manufacturer in Arunachal Pradesh, 2024). In addition, various startups and local enterprises in Arunachal Pradesh have increasingly focused on organic and toxin-free skincare products that support sustainable practices (Startup Arunachal, 2022). These developments make Pasighat an appropriate emerging semi-urban setting for examining consumer awareness, adoption, and experience related to eco-friendly personal care and beauty products.
Many existing studies have investigated isolated factors such as motivation, socio-demographic variables, packaging, consumer opinions, and influencer marketing. However, very few studies have examined awareness, adoption, and consumer experience in an integrated manner. Therefore, the present study aims to investigate consumer awareness, adoption, and experience related to eco-friendly personal care and beauty products in Pasighat, Arunachal Pradesh. By examining these factors, the study offers insights into how consumers become aware of, adopt, and experience eco-friendly personal care and beauty products.
The findings of the study may help consumers enhance awareness and support sustainable choices, while also helping marketers and businesses improve eco-friendly product strategies and reach untapped markets. Policymakers may use the findings to promote sustainable consumption practices. Furthermore, the study contributes to academic research by providing a foundation for future work on integrated frameworks related to awareness, adoption, and consumer experience associated with environmentally friendly consumption.

2. Literature review

Previous studies on eco-friendly and green cosmetics highlight several important consumer-related factors influencing awareness and adoption behaviour. Khan and Salim (2021) found that motivational factors, purchase preferences, and health consciousness significantly influenced Saudi women's attitudes towards green cosmetics. Their study also revealed that working women showed greater brand consciousness and preferred products that were easily available in nearby locations. Mitterer-Daltoé et al. (2023) reported that education significantly influenced the use and expenditure on cosmetic creams, with postgraduate women showing greater awareness and preference towards natural and eco-friendly cosmetics, although the overall level of awareness remained low. Similarly, Rastogi et al. (2024) observed that women in Lucknow possessed limited knowledge regarding organic cosmetics, but their willingness to purchase such products increased under the influence of friends and social groups.
Perret et al. (2025) found that sustainable packaging positively influenced consumers' willingness to pay and attitudes towards green cosmetics. Recycled, bio-based, and minimalistic packaging designs generated favourable emotional and sustainability-related responses among consumers. Yusiana et al. (2023) emphasised the importance of digital marketing, reporting that influencer marketing and online advertising significantly affected the purchase of green beauty products, while green brand awareness alone had only a limited impact. Collectively, these studies indicate that motivation, education, social influence, sustainable packaging, and digital marketing play important roles in shaping consumer perceptions and

behaviour towards eco-friendly cosmetics, although gaps in awareness continue to exist.

Paul and Sarma (2024) examined the impact of social media on cosmetic product selection among females in Pasighat. The study identified the popularity of social media platforms such as YouTube, Instagram, Facebook, and Twitter in influencing cosmetic product choices. It further reported that factors such as brand reputation, affordability, influencer recommendations, and product reviews significantly influenced purchase decisions. The findings revealed that females in Pasighat frequently used social media platforms to engage with beauty-related content such as tutorials, reviews, and influencer endorsements, which played an important role in shaping their cosmetic product preferences.

3. Theoretical framework

Understanding consumer behaviour towards eco-friendly personal care and beauty products requires examining both the motivational factors underlying such behaviour and the decision-making processes that translate motivation into action. To explain this relationship, the study integrates two well-established theories: the Value-Belief-Norm (VBN) theory (Stern et al., 1999) and the Theory of Planned Behavior (TPB) (Ajzen, 1991). The integration of these theories provides a comprehensive framework for understanding consumer awareness, adoption intention, actual adoption behaviour, and post-purchase experience related to eco-friendly personal care and beauty products.

The VBN theory explains why consumers engage in environmentally responsible and sustainable practices. According to the theory, individuals with stronger environmental values and beliefs are more likely to develop awareness regarding eco-friendly products and a sense of moral obligation to act responsibly. In the present study, awareness includes knowledge related to sustainability, green labelling, product quality, and the contribution of eco-friendly products towards environmental protection. Thus, awareness serves as the motivational foundation influencing adoption-related decisions.

While the VBN theory primarily explains motivational aspects, the TPB describes how motivation is translated into behavioural intention and action. According to TPB, an individual's intention to adopt a product is influenced by three major factors: attitude, subjective norms, and perceived behavioural control (PBC). In this context, attitude reflects consumers' evaluation of eco-friendly products as safe, desirable, and high quality. Subjective norms represent social influences from friends, relatives, social groups, and eco-influencers, while PBC reflects consumers' perceptions regarding the ease or difficulty of adopting eco-friendly products based on factors such as price, availability, product variety, and promotional influence. In addition, personal norms or moral obligation derived from the VBN framework are incorporated to strengthen consumers' adoption intention.

The integrated framework positions awareness derived from VBN theory as an antecedent influencing attitude, subjective norms, and perceived behavioural control within the TPB framework. These factors collectively influence adoption intention, which subsequently leads to actual adoption behaviour. Positive post-purchase experiences, including satisfaction and continued use, further reinforce consumers' attitudes and future adoption intentions towards eco-friendly products. Figure 1 presents the conceptual framework guiding the development of the study hypotheses.

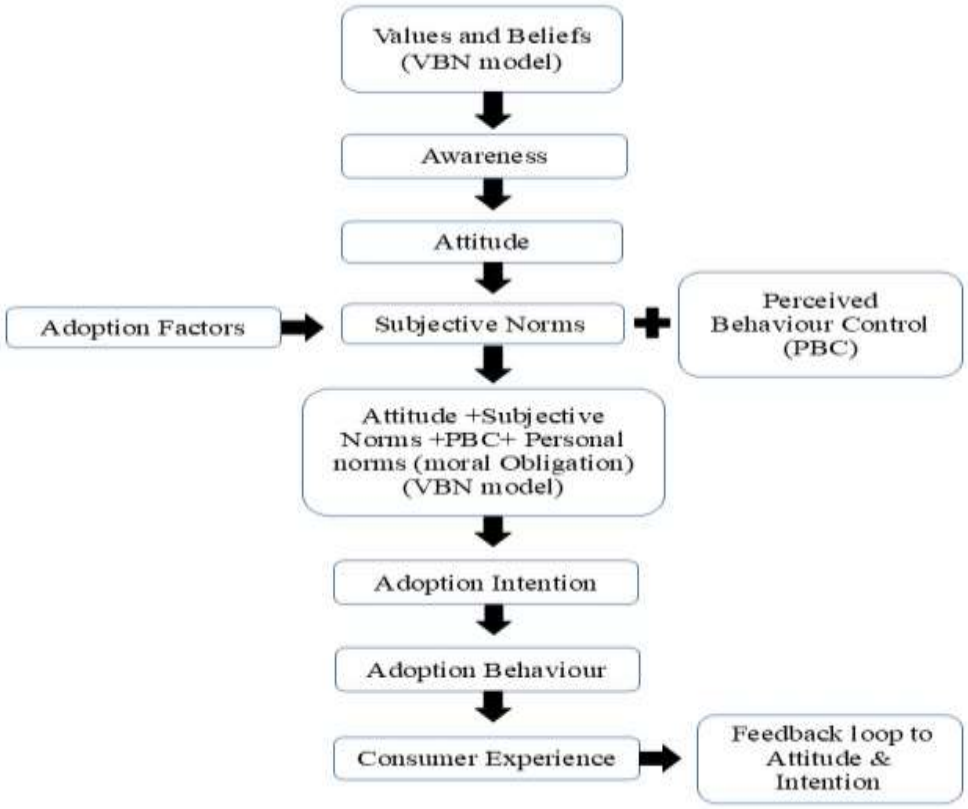

Fig. 1: Conceptual framework based on the Theory of Planned Behaviour and Value Belief Norms for eco-friendly products.

4. Hypothesis development

Based on the theoretical framework, the following hypotheses examine the relationships among awareness, TPB constructs, adoption intention, behaviour, and post-purchase experience of eco-friendly personal care and beauty products.

4.1 Awareness and TPB Constructs

- H1: Consumer awareness of eco-friendly personal care and beauty products positively influences their attitude towards these products.
- H2: Consumer awareness positively influences subjective norms regarding the adoption of eco-friendly personal care and beauty products.
- H3: Consumer awareness positively influences perceived behavioural control towards adopting eco-friendly personal care and beauty products.

4.2 TPB Constructs and Adoption Intention

- H4: Attitude towards eco-friendly personal care and beauty products positively affects consumers' intention to adopt them.
- H5: Subjective norms positively influence consumers' intention to adopt eco-friendly personal care and beauty products.
- H6: Perceived behavioural control positively influences adoption intention towards eco-friendly personal care and beauty products.

4.3 Integration of VBN

- H7: Consumers who are more aware of eco-friendly product benefits, green labelling, and sustainable

contributions report a stronger sense of personal moral obligation (personal norm) to adopt these products.

4.4 Adoption Intention and Behaviour

- H8: Adoption intention positively affects actual adoption behaviour of eco-friendly personal care and beauty products.

4.5 Post-Purchase Experience

- H9: Positive post-purchase experience (satisfaction and continued use) strengthens consumers' attitude towards eco-friendly personal care and beauty products.
- H10: Positive post-purchase experience reinforces consumers' intention for continued adoption of eco-friendly personal care and beauty products.

5. Research Methodology

The study adopts a descriptive research approach to investigate consumer awareness, adoption, and experience related to eco-friendly personal care and beauty products in Pasighat, Arunachal Pradesh. The research is based on both primary and secondary data. Primary data were collected from consumers using a structured questionnaire, while secondary data were gathered from research articles, published reports, and other relevant sources. The population of the study comprised consumers who used eco-friendly personal care and beauty products in Pasighat. Since the exact number of such consumers was unknown, the population size was considered undefined.

Therefore, the study used Cochran's (1977) sample size formula for an undefined population. Assuming maximum variability ($p = 0.5$), a 95% confidence level ($z = 1.96$), and ±5% precision level ($e = 0.05$), the required sample size was calculated as follows: $n_0 = (1.96)^2 \times (0.5) \times (0.5) / (0.05)^2 = 384.16 \approx 384$ respondents. As the population size was undefined and preparing a sampling frame was difficult, the study adopted the convenience sampling technique to reach the respondents. The sampling unit of the study was an individual consumer who had used eco-friendly personal care and beauty products. Appropriate statistical tools such as descriptive statistics, ANOVA, t-test, correlation, and regression analysis were used for data analysis.

6. Results

6.1 Reliability Analysis

Table 6.1: Cronbach's Alpha Values for Awareness, Adoption and consumer Experience

Constructs	No. of Items	Cronbach's Alpha
Awareness	4	0.818
Adoption	9	0.924
Consumer experience	8	0.918

The Cronbach's Alpha values show that all three constructs—awareness (0.818), adoption (0.924), and consumer experience (0.918)—have high reliability.

6.2 Demographic Profile of the Respondents

The demographic profile of the respondents shows that the majority are female (84.9%) and primarily young adults, with 41.1% aged 18–24 and 37% aged 25–34, while the remaining respondents are distributed across the 35–44 (20.1%) and 45–54 (1.8%) age groups. In terms of income, most respondents (83.9%) earn less than ₹1.25 lakh annually, with higher income categories minimally represented.

Regarding education, a significant portion of the sample is well-educated, comprising graduates (33.1%) and postgraduates or higher (33.6%), while smaller percentages have completed high school (25.8%), diploma (4.2%), or lower levels of education. Overall, the sample is predominantly female, young, lower-income, and well-educated, which provides context for interpreting their awareness, adoption, and experience with eco-friendly personal care and beauty products.

Table 6.2: Demographic Profile of the Respondents

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Female	326	84.90
	Male	58	15.10
Age	18-24	158	41.10
	25-34	142	37.00
	35-44	77	20.10
	45-54	7	1.80
Income	Less than ₹1.25 lakh	322	83.90
	₹1.25 lakh - ₹5 lakh	42	10.90
	₹5 lakh - ₹15 lakh	14	3.60
	₹15 lakh - ₹30 lakh	6	1.60
Education	No formal education	4	1.00
	Primary Education	9	2.30
	High school (10 or 12 passed)	99	25.80
	Diploma	16	4.20
	Graduate	127	33.10
	Post-Graduation or higher	129	33.60

6.3 Use of Eco-Friendly Personal Care and Beauty Products

Table 6.3 shows that eco-friendly skincare (Mean = 3.60) and cosmetics/makeup (Mean = 3.50) are the most frequently used products, followed by haircare (Mean = 2.96). In contrast, body care (Mean = 2.39) and oral care (Mean = 2.34) are used less often. This indicates a higher consumer preference for skincare and cosmetic eco-friendly products compared to other categories.

Table 6.3: Use of Eco-Friendly Personal Care and Beauty Products

Products category	Mean	Std. Deviation
Skincare	3.60	1.341
Haircare	2.96	1.295
Body care	2.39	1.310
Oral care	2.34	1.297
Cosmetics/makeup	3.50	1.418

H1: Consumer awareness of eco-friendly personal care and beauty products positively influences their attitude towards these products.

A simple linear regression was conducted to assess the effect of awareness on attitude toward eco-friendly

personal care and beauty products. As shown in Table 6.4, there is a strong positive relationship (R = 0.769), with awareness explaining 59.1% of the variance in attitude ($R^2 = 0.591$). The model is statistically significant according to Table 6.4.1 (F = 551.559, p = 0.000). Table 6.4.2 indicates that awareness has a positive and significant effect on attitude (B = 0.853, t = 23.485, p = 0.000). Table 6.4.3 shows that residuals are normally distributed and within acceptable limits, confirming the assumptions of linear regression are met.

Therefore, the hypothesis H1 is accepted, confirming that consumer awareness of eco-friendly personal care and beauty products positively influences their attitude towards these products.

Table 6.4: Model Summary of Linear Regression (Awareness → Attitude)

Model	R	R Square	Adjusted R Square	St. Error of the Estimate	Durbin-Watson
1	.769	.591	.590	.69845	1.462

Table 6.4.1: ANOVA – Significance of the Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	269.065	1	269.065	551.559	.000
Residual	186.349	382	.488		
Total	455.414	383			

Table 6.4.2: Coefficients of Regression Model

Variable	B	Std. Error	Beta	t	Sig.
Constant	.430	.137	-	3.135	.002
Awareness	.853	.036	.769	23.485	.000

Table 6.4.3 Descriptive Statistics of Residuals and Predicted Values for Linear Regression (Dependent Variable: Attitude)

Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.2825	4.6932	3.5391	.83816	384
Residual	-3.05367	1.93852	.00000	.69753	384
Std. Predicted Value	-2.692	1.377	.000	1.000	384
Std. Residual	-4.372	2.775	.000	.999	384

H2: Consumer awareness positively influences subjective norms regarding the adoption of eco-friendly personal care and beauty products.

As shown in Table 6.5, awareness has a strong positive relationship with subjective norms (R = 0.769, $R^2 = 0.591$), with no autocorrelation issues (Durbin-Watson = 1.462). Table 6.5.1 confirms the model is significant (F = 138.827, $p < 0.001$). Table 6.5.2 shows awareness significantly and positively affects subjective norms (B = 0.547, t = 11.782, $p < 0.001$). Table 6.5.3 shows that the residuals are normally distributed and within acceptable limits, confirming that the regression assumptions are met.

Therefore, H2 is accepted, confirming that consumer awareness positively influences subjective norms regarding the adoption of eco-friendly personal care and beauty products.

Table 6.5: Model Summary of Linear Regression (Awareness → Subjective norms)

Model	R	R Square	Adjusted R Square	St. Error of the Estimate	Durbin-Watson
1	.769	.591	.590	.69845	1.462

Table 6.5.1: ANOVA – Significance of the Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	110.706	1	110.706	138.827	.000
Residual	304.623	382	.797		
Total	415.329	383			

Table 6.5.2: Coefficients of Regression Model

Variable	B	Std. Error	Beta	t	Sig.
Constant	.926	.175		5.281	.000
Awareness	.547	.046	.516	11.782	.000

Table 6.5.3: Descriptive Statistics of Residuals and Predicted Values for Linear Regression (Dependent Variable: Subjective norms)

Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.4727	3.6604	2.9201	.53763	384
Residual	-2.52370	2.04026	.00000	.89183	384
Std. Predicted Value	-2.692	1.377	.000	1.000	384
Std. Residual	-2.826	2.285	.000	.999	384

H3: Consumer awareness positively influences perceived behavioural control towards adopting eco-friendly personal care and beauty products.

As shown in Table 6.6, awareness has a strong positive relationship with perceived behavioural control (PBC) ($R = 0.762$, $R^2 = 0.581$), and the Durbin-Watson value of 1.139 indicates no autocorrelation issues. Table 6.6.1 confirms the model is significant ($F = 530.413$, $p < 0.001$). Table 6.6.2 shows that awareness has a positive and significant effect on PBC ($B = 0.869$, $t = 23.031$, $p < 0.001$). Table 6.6.3 indicates that residuals meet regression assumptions.

Thus, H3 is accepted, confirming that consumer awareness positively influences perceived behavioural control toward adopting eco-friendly personal care and beauty products.

Table 6.6: Model Summary of Linear Regression (Awareness → PBC)

Model	R	R Square	Adjusted R Square	St. Error of the Estimate	Durbin-Watson
1	.762	.581	.580	.72568	1.139

Table 6.6.1: ANOVA – Significance of the Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	279.323	1	279.323	530.413	.000
Residual	201.167	382	.527		
Total	480.490	383			

Table 6.6.2: Coefficients of Regression Model

Variable	B	Std. Error	Beta	t	Sig.
Constant	-.048	.142		-.338	.735
Awareness	.869	.038	.762	23.031	.000

Table 6.6.3: Descriptive Statistics of Residuals and Predicted Values for Linear Regression (Dependent Variable: PBC)

Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.8206	4.2957	3.1198	.85399	384
Residual	-1.99253	2.09345	.00000	.72473	384
Std. Predicted Value	-2.692	1.377	.000	1.000	384
Std. Residual	-2.746	2.885	.000	.999	384

H4: Attitude towards eco-friendly personal care and beauty products positively affects consumers' intention to adopt them.

As shown in Table 6.7, the model summary indicates R = 0.575, with $R^2 = 0.331$, suggesting that 33.1% of the variation in intention to adopt eco-friendly personal care and beauty products is explained by attitude. The Durbin-Watson value = 1.280 shows no serious autocorrelation. Table 6.7.1 indicates that the model is significant ($F = 189.111$, $p < 0.001$). From Table 6.7.2, attitude positively and significantly predicts intention ($B = 0.541$, $t = 13.752$, $p < 0.001$). Residuals (Table 6.7.3) are approximately normally distributed and centred around zero. Therefore, H4 is accepted, confirming that attitude positively influences consumers' intention to adopt eco-friendly products.

Table 6.7: Model Summary of Linear Regression (Attitude→ Intention to adopt)

Model	R	R Square	Adjusted R Square	St. Error of the Estimate	Durbin-Watson
1	.575	.331	.329	.83963	1.280

Table 6.7.1: ANOVA – Significance of the Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	133.321	1	133.321	189.111	.000
Residual	269.304	382	.705		
Total	402.625	383			

Table 6.7.2: Coefficients of Regression Model

Variable	B	Std. Error	Beta	t	Sig.
Constant	1.658	.146		11.381	.000
Attitude	.541	.039	.575	13.752	.000

Table 6.7.3: Descriptive Statistics of Residuals and Predicted Values for Linear Regression (Dependent Variable: Intention to adopt)

Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.1991	4.3634	3.5729	.59000	384

Residual	-2.82231	2.25981	.00000	.83854	384
Std. Predicted Value	-2.328	1.340	.000	1.000	384
Std. Residual	-3.361	2.691	.000	.999	384

H5: Subjective norms positively influence consumers' intention to adopt eco-friendly personal care and beauty products.

As shown in Table 6.8, the model summary indicates R = 0.570, with $R^2 = 0.325$, suggesting that 32.5% of the variation in intention to adopt eco-friendly personal care and beauty products is explained by subjective norms. The Durbin-Watson value = 1.425 indicates no serious autocorrelation. Table 6.8.1 shows that the regression model is significant ($F = 183.927$, $p < 0.001$). From Table 6.8.2, subjective norms positively and significantly predict intention ($B = 0.561$, $t = 13.562$, $p < 0.001$). Residuals are approximately normally distributed and centred around zero. Therefore, H5 is accepted, confirming that subjective norms positively influence consumers' intention to adopt eco-friendly products.

Table 6.8: Model Summary of Linear Regression (Subjective norms → Intention to adopt)

Model	R	R Square	Adjusted R Square	St. Error of the Estimate	Durbin-Watson
1	.570	.325	.323	.84347	1.425

Table 6.8.1: ANOVA – Significance of the Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	130.854	1	130.854	183.927	.000
Residual	271.771	382	.711		
Total	402.625	383			

Table 6.8.2: Coefficients of Regression Model

Variable	B	Std. Error	Beta	t	Sig.
Constant	1.934	.128		15.073	.000
Subjective norms	.561	.041	.570	13.562	.000

Table 6.8.3: Descriptive Statistics of Residuals and Predicted Values for Linear Regression (Dependent Variable: Intention to adopt)

Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.1991	4.3634	3.5729	.59000	384
Residual	-2.82231	2.25981	.00000	.83854	384
Std. Predicted Value	-2.328	1.340	.000	1.000	384
Std. Residual	-3.361	2.691	.000	.999	384

H6: Perceived behavioural control positively influences adoption intention towards eco-friendly personal care and beauty products.

As shown in Table 6.9, the model summary indicates R = 0.549, with $R^2 = 0.302$, suggesting that 30.2% of the variation in intention to adopt eco-friendly personal care and beauty products is explained by

perceived behavioural control (PBC). The Durbin-Watson value = 1.204 indicates no serious autocorrelation. Table 6.9.1 shows that the regression model is significant ($F = 164.988$, $p < 0.001$). From Table 6.9.2, PBC positively and significantly predicts intention ($B = 0.503$, $t = 12.845$, $p < 0.001$). Residuals are approximately normally distributed and centred around zero. Therefore, H6 is accepted, confirming that perceived behavioural control positively influences consumers' intention to adopt eco-friendly products.

Table 6.9: Model Summary of Linear Regression (PBC→ Intention to adopt)

Model	R	R Square	Adjusted R Square	St. Error of the Estimate	Durbin-Watson
1	.549	.302	.300	.85795	1.204

Table 6.9.1: ANOVA – Significance of the Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	121.444	1	121.444	164.988	.000
Residual	281.181	382	.736		
Total	402.625	383			

Table 6.9.2: Coefficients of Regression Model

Variable	B	Std. Error	Beta	t	Sig.
Constant	2.004	.130		15.452	.000
PBC	.503	.039	.549	12.845	.000

Table 6.9.3: Descriptive Statistics of Residuals and Predicted Values for Linear Regression (Dependent Variable: Intention to adopt)

Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.5072	4.5182	3.5729	.56310	384
Residual	-2.76406	2.11574	.00000	.85683	384
Std. Predicted Value	-1.893	1.679	.000	1.000	384
Std. Residual	-3.222	2.466	.000	.999	384

H7: Consumers who are more aware of eco-friendly product benefits, green labelling, and sustainable contributions report a stronger sense of personal moral obligation (personal norm) to adopt these products.

As shown in Table 6.10, the model summary indicates $R = 0.593$, with $R^2 = 0.352$, suggesting that 35.2% of the variation in personal norm is explained by consumers' awareness of eco-friendly product benefits, green labelling, and sustainable contributions. The Durbin-Watson value = 1.423 indicates no serious autocorrelation. Table 6.10.1 shows that the regression model is significant ($F = 207.295$, $p < 0.001$). From Table 6.10.2, awareness positively and significantly predicts personal norm ($B = 0.619$, $t = 14.398$, $p < 0.001$). Residuals are approximately normally distributed and centred around zero. Therefore, H7 is accepted, confirming that greater consumer awareness is associated with a stronger sense of personal moral obligation to adopt eco-friendly products.

Table 6.10: Model Summary of Linear Regression (Awareness→ Personal norm)

Model	R	R Square	Adjusted R Square	St. Error of the Estimate	Durbin-Watson
1	.593	.352	.350	.82658	1.423

Table 6.10.1: ANOVA – Significance of the Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	141.630	1	141.630	207.295	.000
Residual	260.995	382	.683		
Total	402.625	383			

Table 6.10.2: Coefficients of Regression Model

Variable	B	Std. Error	Beta	t	Sig.
Constant	1.317	.162		8.117	.000
Awareness	.619	.043	.593	14.398	.000

Table 6.10.3: Descriptive Statistics of Residuals and Predicted Values for Linear Regression (Dependent Variable: Intention to adopt)

Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.9357	4.4102	3.5729	.60811	384
Residual	-3.25559	2.60032	.00000	.82550	384
Std. Predicted Value	-2.692	1.377	.000	1.000	384
Std. Residual	-3.939	3.146	.000	.999	384

H8: Adoption intention positively affects actual adoption behaviour of eco-friendly personal care and beauty products.

As shown in Table 6.11, adoption intention has a positive relationship with actual adoption behaviour ($R = 0.411$, $R^2 = 0.169$), explaining 16.9% of the variance in actual adoption behaviour. The Durbin-Watson value = 1.033 indicates no serious autocorrelation issues. Table 6.11.1 confirms that the regression model is statistically significant ($F = 77.763$, $p < 0.001$). Table 6.11.2 shows that adoption intention positively and significantly predicts actual adoption behaviour ($B = 0.424$, $t = 8.818$, $p < 0.001$). Table 6.11.3 indicates that the residuals are normally distributed and within acceptable limits, confirming that the assumptions of linear regression are met. Therefore, H8 is accepted, indicating that stronger adoption intention leads to higher actual adoption behaviour.

Table 6.11: Model Summary of Linear Regression (Intention to adopt → Actual behaviour)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.411	.169	.167	.93508	1.033

Table 6.11.1: ANOVA – Significance of the Regression Model

Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	67.995	1	67.995	77.763	.000
Residual	334.013	382	.874		

Total	402.007	383			

Table 6.11.2: Coefficients of Regression Model

Variable	B	Std. Error	Beta	t	Sig.
Constant	1.621	.159		10.217	.000
Intention to adopt	.424	.048	.411	8.818	.000

Table 6.11.3: Descriptive Statistics of Residuals and Predicted Values for Linear Regression (Dependent Variable: Actual behaviour)

Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.0453	3.7419	2.9557	.42135	384
Residual	-2.31777	2.15350	.00000	.93386	384
Std. Predicted Value	-2.161	1.866	.000	1.000	384
Std. Residual	-2.479	2.303	.000	.999	384

H9: Positive post-purchase experience (satisfaction and continued use) strengthens consumers' attitude towards eco-friendly personal care and beauty products.

As shown in Table 6.12, the model summary indicates R = 0.555, with $R^2 = 0.308$, suggesting that 30.8% of the variation in positive post-purchase experience is explained by consumers' attitude towards eco-friendly personal care and beauty products. The Durbin-Watson value = 0.904 indicates no serious autocorrelation. Table 6.12.1 shows that the regression model is significant ($F = 169.928$, $p < 0.001$). From Table 6.12.2, attitude positively and significantly predicts post-purchase experience ($B = 0.494$, $t = 13.036$, $p < 0.001$). Residuals are approximately normally distributed and centered around zero. Therefore, H9 is accepted, confirming that a stronger consumer attitude is associated with a more positive post-purchase experience, including satisfaction and continued use.

Table 6.12: Model Summary of Linear Regression (Attitude→ Experience)

Model	R	R Square	Adjusted R Square	St. Error of the Estimate	Durbin-Watson
1	.555	.308	.306	.80882	.904

Table 6.12.1: ANOVA – Significance of the Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	111.164	1	111.164	169.928	.000
Residual	249.898	382	.654		
Total	361.062	383			

Table 6.12.2: Coefficients of Regression Model

Variable	B	Std. Error	Beta	t	Sig.
Constant	1.911	.140		13.620	.000
Attitude	.494	.038	.555	13.036	.000

Table 6.12.3: Descriptive Statistics of Residuals and Predicted Values for Linear Regression (Dependent Variable: Experience

Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.4054	4.3817	3.6599	.53874	384
Residual	-2.44060	2.10049	.00000	.80776	384
Std. Predicted Value	-2.328	1.340	.000	1.000	384
Std. Residual	-3.017	2.597	.000	.999	384

H10: Positive post-purchase experience reinforces consumers' intention for continued adoption of eco-friendly personal care and beauty products.

As shown in Table 6.13, the model summary indicates R = 0.862, with $R^2 = 0.743$, suggesting that 74.3% of the variation in positive post-purchase experience is explained by consumers' intention for continued adoption of eco-friendly personal care and beauty products. The Durbin-Watson value = 1.275 indicates no serious autocorrelation. Table 6.13.1 shows that the regression model is significant ($F = 1101.889$, $p < 0.001$). From Table 6.13.2, intention to adopt positively and significantly predicts post-purchase experience ($B = 0.816$, $t = 33.195$, $p < 0.001$). Residuals are approximately normally distributed and centered around zero. Therefore, H10 is accepted, confirming that a stronger intention for continued adoption is associated with a more positive post-purchase experience, including satisfaction and continued use.

Table 6.13: Model Summary of Linear Regression (Intention to adopt→ Experience)

Model	R	R Square	Adjusted R Square	St. Error of the Estimate	Durbin-Watson
1	.862	.743	.742	.49328	1.275

Table 6.13.1: ANOVA – Significance of the Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	268.114	1	268.114	1101.889	.000
Residual	92.949	382	.243		
Total	361.062	383			

Table 6.13.2: Coefficients of Regression Model

Variable	B	Std. Error	Beta	t	Sig.
Constant	.744	.091		8.146	.000
Intention to adopt	.816	.025	.862	33.195	.000

Table 6.13.3: Descriptive Statistics of Residuals and Predicted Values for Linear Regression (Dependent Variable: Experience)

Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.5603	4.8244	3.6599	.83668	384
Residual	-2.35243	1.53561	.00000	.49263	384
Std. Predicted Value	-2.509	1.392	.000	1.000	384

Std. Residual	-4.769	3.113	.000	.999	384

7. Findings

Skincare and cosmetic products were the most used eco-friendly items, followed by moderate use of haircare products, with body care and oral care products used the least. The study revealed that awareness has a significant and positive impact on consumer behaviour towards eco-friendly products. Higher awareness was found to strongly influence attitude, subjective norms, and perceived behavioural control. Additionally, increased awareness was associated with a stronger personal moral obligation, or personal norm, encouraging consumers to use eco-friendly products. Attitude, subjective norms, and perceived behavioural control significantly predict the intention to adopt eco-friendly products. Adoption intention positively influences actual adoption behaviour, with a moderate explanatory effect. Positive post-purchase experiences enhance consumers' attitudes toward eco-friendly products and strengthen their intention to continue using them, with satisfaction in quality, safety, environmental benefits, and availability driving continued use. The study supports the integration of the Theory of Planned Behaviour (TPB) and Value-Belief-Norm (VBN) theory, showing that awareness influences TPB factors—attitude, subjective norms, and perceived behavioural control—which drive adoption intention and behaviour, further reinforced by positive post-purchase experiences.

8. Discussion

The research gives an important understanding of consumer awareness, adoption, and experience regarding eco-friendly personal care products in Pasighat. In line with Khan and Salim (2021), the engagement is affected by demographic factors, like age, gender, education, income, and young educated women are the largest consumers. The most common products are skincare and cosmetics, followed by haircare, and body care and oral care are less common, which correlates with Daltoe et al. (2023) and Rastogi et al. (2024) as the social influence and peer networks increased product adoption.

The influence of awareness is strongly positively related to attitudes, perceived behavioural control, and personal moral obligation, in accordance with TPB and VBN theories, which is consistent with Perret et al. (2025) and Yusiana et al. (2023). Favourable post-purchase engagement, such as quality of the product, safety and environmental advantages, solidifies persistence and loyalty. Social media such as YouTube, Instagram, and Facebook are important in influencing awareness, attitudes, and social desirability, which is in line with Paul and Sarma (2024).

In general, eco-friendly consumption is a multidimensional concept that is motivated by awareness, social and digital impacts, perception of control, moral norms, and experience satisfaction. These results draw attention to the importance of marketers and policymakers as combining education, sustainable practices, and digital interaction is necessary to increase uptake and the final adoption of the use of personal care products that are friendly to the environment.

9. Implication

9.1 Implications for Businesses and Marketers

The study suggested that companies and marketers increase the attractiveness of sustainable products by addressing the aspects of sustainable packaging, good quality of products, and ethical sourcing that drive consumer attitude and satisfaction. The use of social media and online platforms will be useful to attract young and tech-aware consumers and tap unexploited sectors of the market. These measures will be able

to promote adoption, repeat buying, and brand loyalty and promote expansion in the green market.

9.2 Implications for Policymakers

The policymakers can facilitate the adoption of sustainable consumption through programs that will help raise awareness on the effects of consumption and encourage responsible consumption behaviour. Green labelling and sustainable package regulations could also help in the implementation of eco-friendly products by providing incentives to purchase these products.

9.3 Implications for Academic Research

The study adds to the academic research by establishing a connection between awareness, adoption intention, and consumer experience, which is a foundation for further studies of green marketing and sustainable consumption. It also demonstrates how TPB and VBN theories can be used together to explain consumer motivations and post-purchase behaviour.

10. Limitations and Scope for Future Research

This study has certain limitations. It was geographically limited only to Pasighat, Arunachal Pradesh, thus the results might not be applicable to other areas having different demographic, cultural or socio-economic backgrounds. Data was self-reported, and this might have brought in social desirability or response bias. Also, the research was based specifically on personal care and beauty products, and it did not cover other green categories, which narrows down the information on the overall green consumption behaviour.

In future studies, it may be necessary to extend to various regions of India or other parts of the world in order to compare consumer behaviours that are eco-friendly and increase the generalizability. Such an increase in the area of focus to other green products like household products, food products, or fashion, would give a better idea of sustainable consumption. The effects of digital and social media marketing on the promotion of eco-friendly products can also be investigated in future studies, including the discussion about the efficacy of individual strategies, the involvement of influencers, and online marketing. Further, behavioural and psychological motivators, including the concern with the environment, moral values, and perceived social responsibility, may be further investigated to explain the factors that impact adoption and post-purchase behaviour.

11. Conclusion

The study highlights that young, female, and well-educated shoppers in Pasighat are quite aware and interested in using eco-friendly personal care and beauty products, but the most used products are skincare and cosmetics. The awareness has a strong effect on attitude, subjective norm, perceived behavioural control and personal moral obligation, which are determinants of adoption intention and, to a moderate degree, actual use. The continued use is also reinforced by a positive post-purchase experience.

The combination of TPB and VBN theories is justified, with it being demonstrated that awareness and consumers experience contribute to sustainable behaviour. Education, incentives, and green labelling can help to encourage eco-friendly consumption by policymakers and marketers. Although the study is geographically narrow and concentrated on one type of product, the research can be used in future studies to be conducted in the regions, products, and digital marketing approaches to gain a better insight into the idea of sustainability.

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