

Green Product Analysis and Ecotourism Awareness Tourist Loyalty with Tourist Satisfaction as a Mediator

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ABSTRACT

This study aims to examine the influence of awareness of green products and ecotourism on tourist loyalty in Nglanggeran Tourism Village, with tourist satisfaction as an intervention variable. This study uses a quantitative approach using variance-based Partial Least Square Structural Equation Model (PLS-SEM) analysis, with SmartPLS 4.0 software. The data was collected through a structured questionnaire that was distributed to 115 tourists who had visited Nglanggeran Tourism Village at least twice. The sampling technique used is purposive sampling based on special criteria. Green products and ecotourism awareness have a positive and significant effect on tourist satisfaction and loyalty. Tourist satisfaction has also been shown to have a positive and significant effect on loyalty, the mediating factor of tourist satisfaction can be a mediator of the influence of green products and ecotourism awareness on tourist loyalty. The findings of this study provide benefits in the fields of sustainable tourism management, ecotourism development, and green marketing strategies. It can be applied to the study of tourism, environmental economics, and hospitality management, especially in the context of community-based tourism. This study also presents a comprehensive model that integrates green products, ecotourism awareness, and tourist satisfaction in explaining tourist loyalty. These findings provide new insights into the role of satisfaction as a mediator in building tourism loyalty in rural ecotourism destinations.

Keywords: Green products, ecotourism awareness, tourist satisfaction, tourist loyalty.

1. INTRODUCTION

The tourism industry continues to experience rapid development, especially with the increasing awareness of environmental issues in the global community. Climate change, natural destruction, and increasing pollution have prompted many parties to pay more attention to the environmental impacts of various sectors, including tourism. Along with that, there is a trend of green tourism or sustainable tourism that encourages tourism industry players to offer environmentally friendly products, known as green products. As threats to the environment increase, more and more people are starting to pay attention to sustainable development to protect the environment and society. The concept of green buying and green marketing is gradually becoming popular. Green purchasing refers to the activity of purchasing green products carried out by consumers to save resources and protect the environment (Zhang and Dong 2020).

Green products in the tourism sector include a variety of initiatives, such as reducing carbon emissions, using renewable energy, water conservation, and sustainable waste management. Environmentally friendly product offerings are products sold by business actors that have an environmentally friendly focus and are expected to meet the needs of tourists who are increasingly aware of the importance of protecting the environment (Hasman et al. 2024). According to Husniyah, Dewanti and Cahyani (2024) In their findings, they stated that ecotourism awareness is an important factor in encouraging

tourists to choose tourist destinations in Nglanggeran village that support the principles of environmental sustainability. Ecotourism development is a sustainable process and requires cross-sectoral collaboration and long-term commitment. Through a good approach, ecotourism can be a sustainable source of income for local communities while preserving unique nature and culture (Angela 2023 release).

According to Husniyah, Dewanti, and Cahyani (Husniyah et al., 2024) In their findings entitled "Evaluation of the Application of Ecotourism in Ecotourism Development in Nglanggeran Tourism Village, Yogyakarta" stated that Indonesia has many ecotourism destinations spread across several regions, one of which is in Yogyakarta where many destinations with ecotourism labels are developing. Nglanggeran Tourism Village is one of the destinations that calls itself an ecotourism destination. This destination is located in Patuk District, Gunung Kidul. Nglanggeran Tourism Village has a unique tourist attraction because it provides Ancient Volcanoes and Nglanggeran Pond. The development of ecotourism in Nglanggeran Tourism Village begins with community awareness in protecting the surrounding environment. However, some studies reveal the challenges and problems faced in its development. According to Brilliana and Mustofa (2024) The main problems identified are environmental damage due to tourism, vulnerability to drought disasters (especially in these areas there are ancient volcanoes that experience drought conditions due to the absence of trees), and dependence on the agricultural sector. In carrying out these principles, Nglanggeran Tourism Village makes various efforts such as preserving the natural and cultural environment by greening and teaching local culture to tourists; the community participates in carrying out tourism activities; and take advantage of opportunities to develop their tourist destinations in order to increase local economic growth (Widaningsih et al. 2024).

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Based on some of the studies above, it shows that ecotourism awareness and the application of eco-friendly products have the potential to increase tourist loyalty. However, there are differences in the results of the study on how ecotourism awareness affects tourist loyalty. In some studies, ecotourism awareness has a positive effect on tourist loyalty, where tourists who have a high level of awareness of the importance of environmental preservation are more likely to remain loyal to destinations that support ecotourism principles (Hardani HD 2019).

In the findings, Friskila Angela (Angela 2023 release) said that ecotourism awareness has a positive impact on tourist loyalty. Other studies by Warmadewa and Paramita (2021) showed different results that ecotourism awareness had no effect on tourist loyalty. Therefore, this study aims to fill this gap by exploring the role of tourist satisfaction as an intervention variable, in order to clarify the relationship between green products, ecotourism awareness, and tourist loyalty in Nglanggeran Tourism Village.

2. THEORETICAL FOUNDATIONS

2.1 Theory of *Planned Behavior* (TPB)

2.1.1. Planned Behavior Theory

Planned Behavior Theory (Ajzen, 1991) is a psychological theory that is often used to understand and predict consumer behavior as well as included in the context of travelers' decision-making when buying eco-friendly products (Bosnjak et al., 2020). According to TPB, a person's intention to perform an action, such as a purchase decision, is influenced by three main factors: attitude, social or subjective norms (subjective norms), and perception of control over the behavior. In the context of this study, the relationship between the SDGs and the variables mentioned is as follows:

2.1.2. Ecotourism awareness

Awareness of the importance of ecotourism can form subjective norms that encourage individuals to participate in sustainable tourism activities. Like tourists who realize that littering can damage the ecosystem will be more likely to bring back their trash or use available bins (Husniyah et al., 2024).

2.1.3. Green product

Green products in tourism refer to environmentally friendly products and services, such as eco-lodge concepts, restaurants with organic ingredients, or low-emission transportation. In addition, a positive attitude towards eco-friendly products can increase the intention to buy, leading to more sustainable consumer behavior. Research shows that awareness of environmental impacts can influence this attitude (Fauzi et al., 2024).

2.1.4. Tourist loyalty

Loyalty can be influenced by a positive attitude and satisfaction. Tourist loyalty refers to the tendency of tourists to return to a destination and recommend it to others. So that by triggering this behavior, tourists will continue to feel interested in visiting again (Biswas et al., 2020).

2.1.5. Tourist satisfaction

High satisfaction can strengthen the intention to return, which goes hand in hand with behavioral control. If tourists are satisfied with the ecotourism experience, they are more likely to recommend and return to the destination (Arismayanti et al., 2024).

2.1. Ecotourism Awareness (X1) with Tourist Loyalty (Y)

According to Üzülmöz and İstin (2023) In their research entitled "Environmental Awareness, Ecotourism Awareness and Ecotourism Perception of Tour Guides" said that ecotourism awareness or ecotourism is defined as public awareness of environmental problems and the desire to solve or contribute to solving these problems. Ecotourism is currently one of the options to promote a well-maintained typical environment as well as a tourist visit area. The potential that exists is the concept of environmental development based on approaches, maintenance and conservation of nature which has great potential for the development of ecotourism (Erika et al. 2024).

According to Mengkebayaer, Nawaz, and Sajid (2022) It shows that tourists who have a positive perception of a destination's eco-friendly attributes tend to show higher loyalty because they appreciate the ecological values offered by the destination. In this case, ecotourism awareness has a positive effect on tourist loyalty.

Meanwhile, according to Warmadewa and Paramita (Warmadewa and Paramita, 2021), In their case study, which was to find out the influence of environmental awareness and green marketing on the purchase decision of stainless steel straws of young consumers, it was stated that ecotourism awareness (environmental awareness) did not have a significant influence on the level of tourist loyalty.

Based on previous research, the hypotheses proposed are:

H1: Ecotourism Awareness (X1) has a significant positive effect on tourist loyalty (Y)

2.2. Green Producers (X2) with Tourist Loyalty (Y)

Green products are goods that are not harmful to ecosystems are those that are made and maintained in such a way as to limit impacts that can harm and damage the climate,

whether they are ongoing, spreading or utilizing them (Djanir 2022). According to Hasman et al., (Hasman et al., 2024) In their research entitled "The Influence of Green Products and Green Prices on Wikstea Product Purchase Decisions in Students of the Faculty of Forestry, University of North Sumatra" states that green products are products that are designed, produced, and distributed with environmental and sustainability impacts in mind.

Meanwhile, according to Angeline Soh, Ellen Engelica and David L Samosir (2021), Green products are destinations that care about the environment around the village and will certainly affect the loyalty of tourists who have high environmental concerns. The use of green products in the tourism industry certainly has a big influence on the loyalty of tourists to visit. According to Rustam & Sukati (2023), The use of green products has a significant positive effect on tourist loyalty, where tourists tend to be more loyal to destinations that apply environmentally friendly products. Based on previous research, the hypotheses that can be put forward are:

H2: Green products (X2) have a significant positive effect on tourist loyalty (Y)

2.3. Ecotourism Awareness (X1) with Tourist Satisfaction (Z)

Adequate environmental carrying capacity in a tourist destination can increase tourist satisfaction by maintaining a balance between the number of visitors and ecological, socio-cultural, and comfortable tourism experiences. Ecotourism awareness implemented through appropriate policies will ensure that the number of visitors does not exceed the capacity of the environment, so that tourists can enjoy a more quality and sustainable experience without damaging important aspects of the destination (Sobhani et al. 2022).

According to Üzülmmez and Istin (Üzülmmez and Istin 2023) The main goal of ecotourism is to minimize the negative impact of tourism on the environment and culture, as well as to raise awareness through training for locals and tourists on nature protection. By providing economic and social benefits to local communities, ecotourism encourages the creation of a more sustainable tourism industry and increases tourists' understanding of the impact of their travel on the environment. If this is fulfilled in the ecotourism area, it will certainly encourage the intuition of tourists to extend their visit and create a sense of satisfaction for tourists.

According to Masjhoer and Dzulkifli (2019) In their case study, namely the Analysis of Tourist Satisfaction in Pancho Ecotourism Village, Sleman Regency, stated that the diversity of activities that can be carried out by tourists in Pancoh Ecotourism Village is fulfilled and tourists are satisfied because in general this village is considered to have succeeded in developing the Attractions, Accessibility, and Facilities (A3) component that suits the needs of tourists during activities. Some of the things suggested to be improved by village managers include ease of access to online information, completeness of facilities in homestays, and the variety and uniqueness of souvenir products. Although there are shortcomings in the facility component, this does not reduce overall tourist satisfaction, as long as the attraction and accessibility components still meet the expectations of tourists.

According to Mengkebayaer, Nawaz and Sajid (Mengkebayaer et al., 2022) It shows that tourists who have a positive perception of a destination's eco-friendly attributes tend to

show higher loyalty because they appreciate the ecological values offered by the destination. In this case, ecotourism awareness has a positive effect on tourist satisfaction.

Based on previous research, the hypotheses proposed are:

H3: Ecotourism Awareness (X1) has a significant positive effect on Tourist Satisfaction (Z)

2.4. Green Products (X2) with Tourist Satisfaction (Z)

The term 'ecotourism' is increasingly used in various discussions that include the fundamental triangle (economic, environmental, social) as a characteristic of sustainable tourism. In general, the concept of ecotourism can be associated with eco-friendly consumerism, which can be defined as individuals seeking refuge for themselves and their world through the power of their purchasing decisions (Djanir 2022). Meanwhile, according to Shidiq and Jokowi (2018), Green products are environmentally friendly products that are designed and processed in such a way as to reduce the impact that can pollute the environment, both in the production, distribution, and consumption processes.

According to Zhuang, Luo and Riaz (Zhuang et al., 2021) states that green products in the context of the tourism industry are products or services that are designed, produced, and managed with regard to environmental impact and sustainability principles that not only reduce risks to the environment but also provide a high standard of living for tourists and the community. According to Triana Putra et al. (2024) shows that eco-friendly practices, such as the sustainable use of products in tourist destinations, increase visitor satisfaction through positive image aspects and more immersive tourism experiences. In its case study, Green Company in Kampung Batik Malon shows that eco-friendly practices, such as the use of sustainable products in tourist destinations, increase visitor satisfaction through positive image aspects and more immersive tourism experiences. Visits to environmentally conscious destinations encourage positive perceptions of tourists to visit again

Based on previous research, the hypotheses proposed are:

H4: Green products (X2) have a significant positive effect on tourist satisfaction (Z)

2.5. Tourist Satisfaction (Z) with Tourist Loyalty (Y)

According to Nia Lefiani and Selvie Revirani (Nia Lefiani and Selvie Revirani 2024) Tourist satisfaction is defined as the response of tourists in the form of feelings of happiness or disappointment after enjoying a tourism product, in measuring tourist satisfaction using measurement categories based on satisfaction with the experience, conformity with expectations, satisfaction with the decision to visit, and appropriate service and price. According to Pepy Afriliani and Givara Oksafa Silvandi (2022) In their research case study, namely "Destination Image for Tourist Loyalty through Tourist Satisfaction in Indah Pariangan Village" stated that tourist satisfaction directly has a significant effect on tourist loyalty in Nagari Tuo Pariangan. In this case, tourist satisfaction has a positive effect on tourist loyalty.

In the findings of the case study Fahmi et al.(Fahmi et al., 2022) titled "Destination Image and Destination Experience Towards Loyalty: The Mediating Role of Tourism Satisfaction" states that Satisfaction has a significant positive effect on loyalty. In other

findings by (Aziz, Suprpto, and Sudaryoto 2022) entitled "The Influence of Facilities and Visitor Experience on Visitor Loyalty Mediated by Visitor Satisfaction (Umbul Ponggok Klaten Tourism Visitor Survey)" stated that tourist satisfaction has a positive effect on tourist loyalty.

Based on previous research, the hypotheses proposed are:

H5: Tourist Satisfaction (Z) has a significant positive effect on Tourist Loyalty (Y)

3. METHODS

This research aims to examine the influence of ecotourism awareness, green products, and tourist satisfaction on tourist loyalty in the Nglanggeran Tourism Village, Yogyakarta. The subject of this study consists of tourists visiting Nglanggeran, while the object of the research includes variables such as ecotourism awareness, green products, tourist satisfaction, and tourist loyalty. The population for this study is all tourists visiting Nglanggeran, and the sample was selected using purposive sampling technique, involving 100 respondents who meet specific criteria, namely having visited the village at least twice and being 17 years of age or older. Data collection was carried out through the distribution of a Likert scale 1-5 questionnaire, which was distributed both directly and via an online platform (Google Forms). Prior to utilization, the research instruments were tested for validity and reliability to ensure accurate measurement. Data analysis was conducted using descriptive and inferential approaches, with Partial Least Squares Structural Equation Modeling (PLS-SEM) applied using SmartPLS software. Path analysis was employed to identify direct, indirect, and total effects between independent, mediating, and dependent variables, with tourist satisfaction serving as the intervening variable in the relationship between ecotourism awareness, green products, and tourist loyalty.

4. RESULTS

4.1 Respondent Analysis

The demographic characteristics of respondents can be described as follows:

Table 1. Description of Respondent Data

GROUP	REACH/DESCRIPTION	F	%	TOTAL (F)	TOTAL (%)
Number of Visits	2 times	69	60%	115	100%
	> 2 times	46	40%		
Age	17-25 Years	26	23%	115	100%
	26-40 Years	63	55%		
	> 40 years old	26	23%		
Gender	Man	74	64%	115	100%
	Woman	41	36%		
Education	High School / Equivalent	11	10%	115	100%
	Diploma	21	18%		
	Bachelor 's degree	61	53%		

Work	Postgraduate	22	19%	115	100%
	Civil Servant / Military	56	49%		
	Businessman	42	37%		
	Student	17	15%		
Expenses During the Visit	< 2 Million	32	28%	115	100%
	2-4 Million	19	17%		
	> 4 Million	64	56%		

Source: Primary data processed by researchers (2025)

This study involved 115 respondents who had visited Nglanggeran Tourism Village with diverse demographic and behavioral characteristics. Most respondents (60%) visited this destination twice, while another 40% visited more than twice, indicating high loyalty. Respondents were dominated by the age group of 26-40 years (55%), with the rest of the age distribution relatively even. Men dominated the number of respondents (64%), while women 36%. The majority of respondents have a bachelor's degree (53%), followed by postgraduate education (19%) and diploma (18%). The respondents' jobs were dominated by civil servants/TNI/Polri (49%), as well as the self-employed (37%) and students (15%). In terms of spending, 56% of respondents spent more than Rp 4 million, indicating that the majority of visitors are tourists with high budgets. This data shows the great market potential for tourist destination managers and the importance of paying attention to the needs of various visitor segments.

4.2 Descriptive Analysis of Respondents

Table 2. Descriptive Analysis Data of Respondents

Variable	Statement	STS	TS	N	S	SS	Entire	Middle
Ecotourism Awareness (X1)	X1_1	0%	2 %	5%	47 %	46 %	115	4.4
	X1_2	0%	2 %	7%	34 %	57 %	115	4.5
	X1_3	0%	2 %	8%	53 %	37 %	115	4.3
	X1_4	0%	2 %	10 %	54 %	34 %	115	4.2
	X1_5	0%	2 %	3%	47 %	48 %	115	4.4
	X1_6	0%	2 %	7%	44 %	47 %	115	4.4
Green Products (X2)	X2_1	0%	2 %	10 %	58 %	30 %	115	4.2
	X2_2	0%	2 %	10 %	57 %	31 %	115	4.2
	X2_3	0%	1 %	15 %	53 %	31 %	115	4.1
	X2_4	0%	2 %	17 %	50 %	31 %	115	4.1

	X2_5	0%	2	8%	57	34	115	4.2
			%		%	%		
	X2_6	0%	2	10	52	36	115	4.2
			%	%	%	%		
Traveller Satisfaction (Z)	Z1_1	0%	2	10	55	33	115	4.2
			%	%	%	%		
	Z1_2	0%	0	9%	56	36	115	4.3
			%		%	%		
	Z1_3	0%	1	9%	57	34	115	4.2
			%		%	%		
	Z1_4	0%	2	10	53	35	115	4.2
			%	%	%	%		
	Z1_5	0%	2	7%	57	34	115	4.2
			%		%	%		
Tourist Loyalty (Y)	Z1_6	0%	3	13	52	32	115	4.1
			%	%	%	%		
	Z1_7	0%	0	9%	56	36	115	4.3
			%		%	%		
	Z1_8	0%	2	10	56	33	115	4.2
			%	%	%	%		
	Z1_9	0%	0	10	53	37	115	4.3
			%	%	%	%		
	Y_1	0%	2	3%	53	43	115	4.4
			%		%	%		
	Y_2	0%	2	3%	44	50	115	4.4
			%		%	%		
	Y_3	0%	1	14	51	34	115	4.2
			%	%	%	%		
	Y_4	0%	2	9%	49	41	115	4.3
			%		%	%		
	Y_5	0%	2	7%	53	38	115	4.3
			%		%	%		
	Y_6	0%	3	10	51	37	115	4.2
			%	%	%	%		
	Y_7	0%	0	5%	54	41	115	4.4
			%		%	%		
	Y_8	0%	3	9%	50	38	115	4.2
			%		%	%		

Source: Primary data processed by researchers (2025)

Table 2 shows the results of the descriptive analysis of respondents related to the variables of Ecotourism Awareness (X1), Green Products (X2), Tourist Satisfaction (Z), and Tourist Loyalty (Y). On the Ecotourism Awareness variable, most of the statements had an average above 4.2, with the X1_2 statement ("Ecotourism in Nglanggeran Tourism Village prioritizes environmental conservation") had the highest score of 4.5, indicating a strong understanding of the respondents about the importance of environmental conservation. For Green Product, the statement related to the implementation of eco-friendly design and waste reduction efforts also showed a high average, around 4.1 to 4.2, with the X2_1 statement

("Nglanggeran Tourism Village has implemented eco-friendly design in the development of its tourism products") having an average value of 4.2. In the Tourist Satisfaction variable, the majority of statements had an average above 4.2, with Z1_2 ("Officers in Nglanggeran Tourism Village are polite and polite in providing services") got the highest average of 4.3. Meanwhile, on the Tourist Loyalty variable, most of the statements showed a good average, around 4.2 to 4.4, with the statements Y_1 ("The positive experience I felt before increased my desire to return to Nglanggeran Tourism Village") and Y_2 ("After visiting Nglanggeran Tourism Village, I feel interested in visiting again") each received the highest score of 4.4. Overall, the data showed that respondents had a high level of awareness, satisfaction, and loyalty to these tourist destinations.

4.3 Outdoor Models

Table 3. Results of Outdoor Model Test

Test	Variable	Value
Convergent Validity	Ecotourism Awareness	> 0.7 for all indicators
	Green Products	> 0.7 for all indicators
	Tourist Loyalty	> 0.7 for all indicators
	Tourist Satisfaction	> 0.7 for all indicators
Discriminatory Validity	Green Products	$\sqrt{\text{AVE}} = 0.875$
	Tourist Satisfaction	$\sqrt{\text{EFA}} = 0.845$
	Ecotourism Awareness	$\sqrt{\text{AVE}} = 0.875$
	Tourist Loyalty	$\sqrt{\text{ET}} = 0.854$
Cross-Loading	Ecotourism Awareness	Loading value factor ≥ 0.5
	Green Products	Loading value factor ≥ 0.5
	Tourist Loyalty	Loading value factor ≥ 0.5
	Tourist Satisfaction	Loading value factor ≥ 0.5
HTMT (Heterocharacter-Mo nocharacter)	Green Product ↔ Awareness	0.683
	Green Product ↔ Satisfaction	0.627
	Consciousness ↔ Satisfaction	0.745
	Green Loyalty ↔ Products	0.703
AVE (Average Variance Extracted)	Green Products	0.766
	Tourist Satisfaction	0.713
	Ecotourism Awareness	0.766
	Tourist Loyalty	0.729
Reliability	Green Products	Cronbach alpha = 0.938, Composite reliability = 0.941
	Tourist Satisfaction	Cronbach alpha = 0.949, Composite reliability = 0.959
	Ecotourism Awareness	Cronbach Alpha = 0.939, Composite Reliability = 0.949

Tourist Loyalty
Cronbach alpha = 0.947, Composite
reliability = 0.949

Source: Primary data processed by researchers (2025)

The results of the test model using SmartPLS showed that all indicators tested met the convergent validity standard with an external load value above 0.7, indicating that all indicators were valid for use in further analysis. The discriminant validity test using the Fornell-Larcker Criterion also showed adequate results, with the $\sqrt{\text{AVE}}$ value for each variable greater than the correlation between variables, indicating that the model had good discriminant validity. In addition, the cross-loading results show that each indicator has a higher loading value on the relevant construct compared to the other, supporting the validity of the indicator. The HTMT (Heterotrait-Monotrait Ratio) test results show values lower than 0.85, which means there are no problems with multicollinearity between variables. The Average Variance Extracted (AVE) test shows an AVE value above 0.5 for all variables, indicating that the construct is able to explain more than 50% of the variance of the indicator. Finally, the results of reliability tests with alpha reliability and Cronbach composites showed that all variables had values above 0.7, suggesting that this model is reliable and reliable for further research. Overall, the models tested showed good validity and reliability for further analysis.

4.4 Inner Model Test

Table 4. Results of Inner Model Test

Test	Variable	Value	Description
Suitable Models	SRMR	0.081	Appropriate
	d_ ULS	2.860	Appropriate
	d_ G	3.313	Appropriate
	Chi-square	1.567.690	Appropriate
	NFI	0.661	Marginal pass
R-Square Value (R2)	Tourist Satisfaction	0.554	-
		0.546 (Customized)	-
	Tourist Loyalty	0.658	-
		0.649 (Customized)	-
Effect Size f2	Satisfaction → Green Products	0.068	Weak effects
	Green Products → Loyalty	0.106	Weak effects
	Satisfaction → Loyalty	0.202	Moderate effects
	Ecotourism Awareness → Satisfaction	0.433	Powerful effect
	Ecotourism Awareness → Loyalty	0.085	Weak effects

Q-Square (Compatibility Benefits)	Tourist Satisfaction	0.38	The model has predictive relevance
	Tourist Loyalty	0.468	The model has predictive relevance

Source: SmartPLS 4.0 Results, Processed by Researchers (2025)

The results of the model's internal tests showed that the model was a good fit, with SRMR (Standardized Root Mean Square Residue) values of 0.081, d_ULS (least unweighted square distance) 2,860, d_G (geodesic distance) 3,313, and Chi-squared 1567,690, all indicating a suitable model. However, an NFI (Normed Fit Index) value of 0.661 indicates that the model is only in the marginal fit category. The R-Square values (R²) for the Tourist Satisfaction variable are 0.554 and 0.546 (adjusted), while for Tourist Loyalty are 0.658 and 0.649 (adjusted), indicating that the model is quite good at explaining the variance of endogenous variables. The f² effect size test revealed that Green Products had a weak influence on Tourist Satisfaction (0.068) and Tourist Loyalty (0.106), while Tourist Satisfaction had a moderate influence on Tourist Loyalty (0.202), and Ecotourism Awareness had a strong influence on Tourist Satisfaction (0.433), but the effect on Tourist Loyalty was relatively weak (0.085). The results of the Q-Square test showed that the model had predictive relevance, with a Q² value of 0.380 for Tourist Satisfaction and 0.468 for Tourist Loyalty, suggesting that it could predict endogenous variables significantly. Overall, the model showed good results in terms of validity and predictive power, although there were some associations with weak influence.

4.5 Hypothesis Test Results (Estimated Path Coefficient)

Table 5. Hypothesis Test Results

Test Type	Influence	Coefficient	P-Value	Description
Direct Influence	Green Products → Tourist Satisfaction	0.228	0.01	Supported
	Green Products → Tourist Loyalty	0.258	0.003	Supported
	Tourist Satisfaction → Tourist Loyalty	0.393	0	Supported
	Awareness → Satisfaction of Ecotourism Tourists	0.576	0	Supported
	Ecotourism Awareness → Tourist Loyalty	0.268	0.004	Supported
Indirect Influence	Green Products → Tourist Satisfaction → Tourist Loyalty	0.09	0.019	Supported
	Ecotourism Awareness → Tourist Satisfaction → Tourist Loyalty	0.227	0	Supported

Source: SmartPLS 4.0 results processed by researchers (2025)

The results of the hypothesis testing showed that all the tested relationships, both direct and indirect influences, were accepted with strong significance. The direct influence between Green Products and Tourist Satisfaction (0.228) and between Green Products and Tourist Loyalty (0.258) proved to be significant with p-values of 0.01 and 0.003 respectively, suggesting that eco-friendly products play an important role in increasing tourist satisfaction and loyalty. Tourist Satisfaction was also shown to have a significant influence on Tourist Loyalty (0.393), with a p value of 0, which was the strongest influence in this model. In addition, Ecotourism Awareness has a significant influence on Tourist Satisfaction (0.576) and Tourist Loyalty (0.268), with p values of 0 and 0.004, respectively. Indirect influences were also proven to be significant, with Green Products through Tourist Satisfaction affecting Tourist Loyalty (0.09, p-value = 0.019), and Ecotourism Awareness through Tourist Satisfaction affecting Tourist Loyalty (0.227, p-value = 0). Overall, all hypotheses in this model are accepted, suggesting that Green Product Awareness and Ecotourism have a positive influence on tourist satisfaction and loyalty, both directly and through mediation.

5. DISCUSSION

5.1 The Influence of Ecotourism Awareness (X1) on Tourist Loyalty (Y)

The results of the first hypothesis test show that ecotourism awareness has a positive and significant effect on tourist loyalty, with a path coefficient of 0.268, which means that every increase in one unit of ecotourism awareness will increase tourist loyalty by 0.268 units. This effect was statistically significant, with a statistical t-value of 2.899 and a p-value of 0.004, which is smaller than the significance level of 0.05. These findings are in line with the view of Üzülmmez and Istin (2023) who stated that ecotourism awareness reflects sensitivity to environmental issues and commitment to sustainable solutions. Research by Mengkebayaer, Nawaz, and Sajid (2022) also supports these findings by finding that positive perceptions of eco-friendly attributes increase tourist loyalty. This is reinforced by Erika et al. (2024) who affirm that ecotourism can integrate environmental preservation with tourism values that create meaningful experiences. However, these results contradict the research of Warmadewa and Paramita (2021) which stated that environmental awareness does not significantly affect loyalty, likely due to differences in the context of research that focus more on consumer products. These findings reinforce the argument that ecotourism awareness is an important factor in building tourist loyalty, relevant to sustainable tourism development.

5.2 The Effect of Green Results (X2) on Tourist Loyalty (Y)

Research shows that green products have a positive and significant influence on tourist loyalty, with a line coefficient of 0.258 indicating that each increase in the implementation of eco-friendly products increases tourist loyalty by 0.258 units. A statistical t-value of 2.932 and a p-value of 0.003 reinforce the evidence that the effect is statistically significant. These findings support the view that green products reinforce the image of sustainability-oriented and environmentally conscious destinations, which drives tourist loyalty. This is consistent with the research of Rustam and Sukati (2023) who found that green products have a positive effect on tourist loyalty, as well as Angeline Soh et al. (2021)

who affirm that destinations that pay attention to sustainability attract tourists with environmental concerns. Research by Hasman et al. (2024) also states that green products provide added value in consumer decisions and play an important role in building loyalty. The practical implications of these findings are the need for tourism industry players to continue to develop and promote environmentally friendly products as a marketing strategy and strengthen loyalty.

5.3 The Influence of Ecotourism Awareness (X1) on Tourist Satisfaction (Z)

This study shows that ecotourism awareness has a positive and significant influence on tourist satisfaction, with a line coefficient of 0.576 which shows that every increase in one unit of ecotourism awareness increases tourist satisfaction by 0.576 units. These results are supported by a statistical t-value of 6.915 and a p-value of 0.000, which confirms the significance of the relationship. These findings reinforce the view that increasing ecotourism awareness, either through an understanding of environmental conservation or sustainable policies in tourist destinations, can create a more satisfying experience for tourists. Sobhani et al. (2022) stated that ecotourism policies that consider the carrying capacity of the environment can improve the quality of tourist experience. Üzülmöz and İstin (2023) add that consistent ecotourism education strengthens tourist satisfaction by giving them a sense of appreciation for its contribution to nature conservation. Research by Masjhoer and Dzulkifli (2019) also shows that fulfilling the elements of environmentally friendly attraction can increase tourist satisfaction. In addition, Mengkebayaer, Nawaz, and Sajid (2022) found that positive perceptions of eco-friendly attributes increase tourist satisfaction and loyalty. The practical implications of these findings are that destination managers need to continue to develop educational strategies, strengthen local community participation, and maintain environmental quality to create tourism experiences that reflect sustainability and environmental responsibility.

5.4 Green Products (X2) with Tourist Satisfaction (Z)

The results of the study showed that green products have a positive and significant influence on tourist satisfaction, with a path coefficient of 0.228 which means that every increase in tourists' perception of environmentally friendly products increases satisfaction by 0.228 units. This influence was statistically significant with a statistical t-value of 2.594 and a p-value of 0.010. These findings are in line with the concept of sustainable tourism that prioritizes a balance between economic, social, and environmental aspects, as explained by Djanjar (2022), who states that eco-friendly consumerism reflects self-protection and the environment through wise consumption decisions. Shidiq and Jokowi (2018) also emphasized that eco-friendly products are designed to reduce pollution, which increases the satisfaction of tourists who feel part of environmental conservation efforts. Zhuang, Luo, and Riaz (2021) support these findings, stating that green products improve the quality of life of tourists and the surrounding community through sustainability-oriented management. In addition, research by Triana Putra et al. (2024) at Green Company Kampung Batik Malon shows that the use of sustainable products improves the tourist experience and their satisfaction. These findings reinforce the importance of integrating eco-friendly practices in tourist destination management strategies, where destination managers are advised to

expand the use of sustainable products and educate tourists about environmental sustainability.

5.5 Tourist Satisfaction (Z) with Tourist Loyalty (Y)

The results of the H5 hypothesis test showed that tourist satisfaction had a positive and significant influence on tourist loyalty, with a line coefficient of 0.393 which means that every one unit increase in tourist satisfaction increased loyalty by 0.393 units. This effect was statistically significant with a statistical t-value of 4.439 and a p-value of 0.000. These findings support the research of Pepy Afriliani and Givara Oksafa Silvandi (2022), who stated that tourist satisfaction has a significant effect on tourist loyalty, and Fahmi et al. (2022), who also found that satisfaction has a positive effect on tourist loyalty. Aziz, Suprpto, and Sudaryoto (2022) also supported these findings, revealing that tourists who were satisfied with the facilities and experiences they experienced were more likely to be loyal. However, these findings contradict research by Warmadewa and Paramita (2021), who stated that visitor satisfaction is not significant to loyalty in the context of a particular product. This difference may be due to differences in the context of research that do not involve travel experiences. The results of this study strengthen the argument that tourist satisfaction is a key factor in building loyalty, which has implications for tourist destination managers to continue to improve the tourist experience with quality services, adequate facilities, and competitive prices.

6. CONCLUSION

The conclusions of this study show that ecotourism awareness, green products, and tourist satisfaction all have a significant effect on tourist loyalty. Increasing ecotourism awareness increases tourist loyalty through a deeper understanding of environmental conservation and sustainable policies. Green products applied in tourist destinations also increase tourist loyalty and satisfaction, by giving them a sense of appreciation for their contribution to sustainability. Additionally, tourist satisfaction has proven to be a key factor in increasing loyalty, with travelers who are satisfied with their facilities and experience more likely to return and recommend the destination. These findings reinforce the importance of destination management that integrates ecotourism and sustainability principles, which can improve the traveller experience and drive long-term loyalty. Therefore, tourist destination managers are advised to continue to develop environmentally friendly policies and products and improve the quality of services and facilities offered.

This study has several limitations that should be considered for future research. The variables used in this study are limited to ecotourism awareness, green products, tourist satisfaction, and tourist loyalty. Therefore, it is recommended that future research include additional variables such as Green Behavior, Environmental Awareness, Digital Service Quality, and Electronic Word of Mouth (e-WOM) to enrich the understanding of how green products, tourism services, ecotourism, and tourist loyalty influence the sustainability of destinations. Additionally, the study subjects, which only include tourists, should be expanded to include tourism industry players and local communities. This would provide a more comprehensive perspective on the role of community innovation and digital services in the tourism industry. Future research is also advised to focus on millennials and Gen Z, who

are more influenced by technology, to analyze their attitudes and behaviors regarding ecotourism and green products.

Further research should use a multidisciplinary approach with a more complex research model. This approach is expected to make a significant contribution to the development of sustainable tourism literature as well as a more adaptive destination marketing strategy in the digital transformation era. Future research should also develop a further understanding of the dynamics of changing tourist attitudes through digital engagement and pro-environmental behavior. This is very important to adapt to the changes that occur in the tourism industry.

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