

Closing the Green Gap: Attitude Drives Green Consumer Behavior among Gen Z in West Java

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Abstract

The issues of global warming and the accumulation of hazardous waste, particularly plastic waste (18.55% of the national waste composition), demand serious commitment from Indonesia in achieving its Net Zero Emission target. This study focuses on Generation Z in West Java, the largest population segment with great potential as agents of change in sustainable consumption (Green Consumer Behavior or GCB). The objective is to analyze the influence of Environmental Awareness, Environmental Knowledge, Product Availability, and Environmental Policy on GCB, with the mediating role of Attitudes toward Environmentally Friendly Products. Using a quantitative causal research design, data were collected from 385 Gen Z respondents in 14 cities/districts in West Java and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that this model has a very high explanatory power, covering 92.7% of GCB variation. All direct and indirect hypotheses (H1–H13) were proven positive and significant. Environmental Knowledge was the most dominant factor shaping attitudes (path coefficient 0.475) and directly influencing GCB (path coefficient 0.352). A crucial finding confirms that Attitudes toward Environmentally Friendly Products play a significant psychological mediating role, bridging the influence of Awareness, Knowledge, Availability, and Policy toward green consumption behavior. These results underscore the urgency of improving environmental literacy and product availability as keys to encouraging Gen Z participation in plastic waste mitigation efforts in West Java.

Keywords: *Green Consumer Behavior, Generation Z, Environmental Attitude, Environmental Knowledge, Plastic Waste.*

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INTRODUCTION

Global warming has become a crucial environmental issue of this century, marked by an increase in global temperatures that directly impacts ecosystem balance, extreme weather, sea level rise, and threats to biodiversity. A report by the United Nations Environment Programme (UNEP) highlights that more than 400 million tons of hazardous waste are generated annually by industrialized countries, contributing significantly to global pollution. In response, the G20 countries, including Indonesia, at the 2022 G20 Bali Summit, set a commitment to reduce carbon emissions by 41% by 2030 and achieve Net Zero Emissions (NZE) by 2060. This issue is closely related to the conflict between economic development goals and the declining quality of the environment. One quantitative parameter for evaluating pollution is the Environmental Quality Index (IKLH), which is measured using the Air Pollution Standard Index (ISPU) by the Ministry of Environment and Forestry (KLHK).

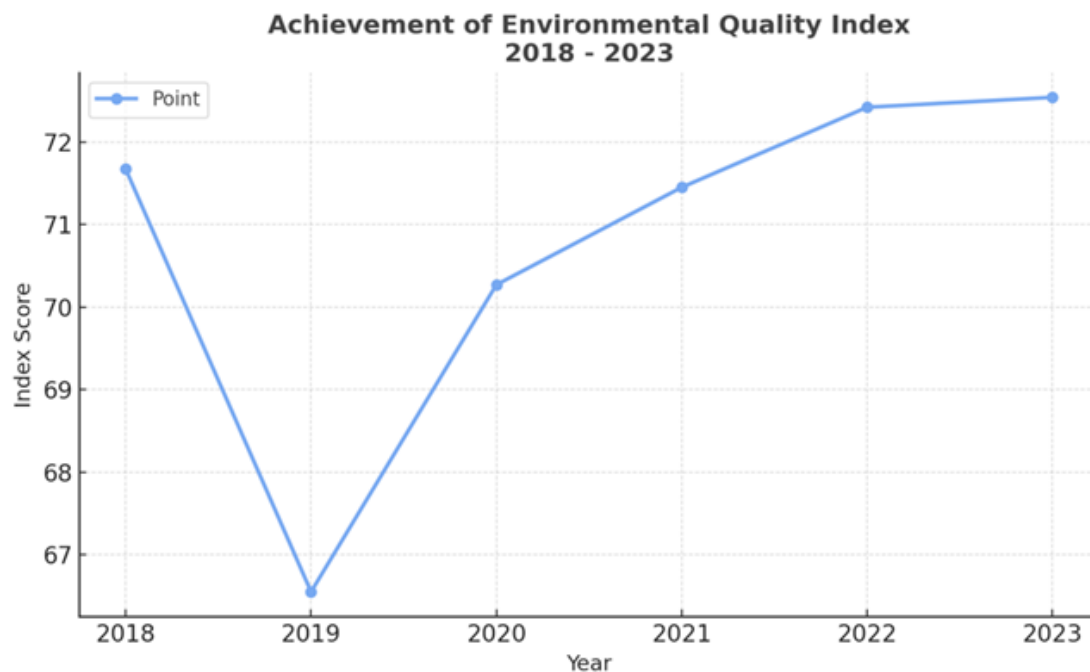


Figure 1. Achievements of the Environmental Quality Index 2018–2023

KLHK (2023) data presents the dynamics of national IKLH achievements for the 2018–2023 period. The IKLH value in 2018 was 71.67, but it dropped significantly in 2019 to 66.55. This decline is interpreted as the impact of economic activity and urbanization pressures that were not balanced by adequate environmental management. However, since 2020, the IKLH trend has shown consistent improvement: 70.27 (2020), 71.45 (2021), 72.42 (2022), and reaching 72.54 (2023). The IKLH is a comprehensive benchmark that reflects environmental conditions, combining air quality, water quality, and noise pollution (Listyarini et al., 2022). One important component that affects IKLH is waste management. Inadequate waste management causes soil, water,

and air pollution, as well as environmental damage. Therefore, understanding the relationship between IKLH and waste is crucial for sustainable development. A case study in China shows that improved environmental quality can be achieved through intensive waste management, coordinating environmental governance and community participation in reduction, separation, and recycling (3R) programs. This significantly improves air and water quality in urban areas (Liu et al., 2021).

This phenomenon shows a strong correlation between governance effectiveness, community participation, and environmental quality improvement. However, in East and Southeast Asia, including ASEAN, waste management challenges, especially plastic, remain urgent. Plastic use in the ASEAN Plus Three (APT) region has increased sharply from 17 million tons (1990) to 152 million tons (2022), with an average per capita consumption of ± 67 kg/person per year. Indonesia, although still below average (29 kg/person per year), has a high rate of mismanaged plastic waste. OECD projections warn that plastic waste volumes in Southeast Asia could double without firm policies and increased environmental literacy. The results of the 2023 Census by the Nusantara River Research Agency (BRUIN) in 64 locations (13 provinces, including West Java) confirm plastic waste as a major problem. A total of 25,733 plastic waste items were found, dominated by single-use sachets, most of which came from the food sector, packaging, and household supplies.

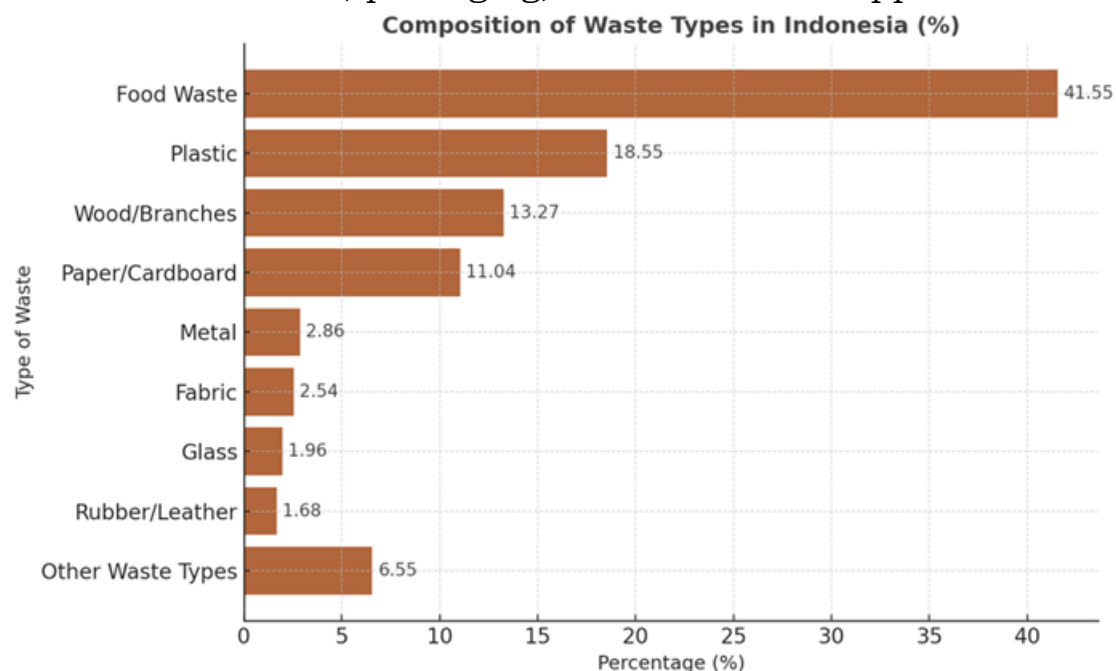


Figure 2. Waste Composition by Waste Type

Source: National Waste Management Information System (SIPSN) of the Ministry of Environment and Forestry (KLHK), 2022

Data from the KLHK's National Waste Management Information System (SIPSN) in 2022 shows that the composition

of national waste is dominated by food waste (41.55%). Plastic waste ranks second at 18.55%, which is a serious concern due to its non-biodegradable nature. Other significant types of waste are wood/branches (13.27%) and paper/cardboard (11.04%). The high percentage of plastic (18.55%) indicates the need for policies to reduce single-use plastics and increase recycling capacity. This data confirms the urgency of integrated waste management involving the government, the private sector, and the community. Plastic pollution threatens the environment, ecosystems, and human health, and contributes to the loss of biodiversity (Sarker et al., 2022).

At the provincial level, the West Java Provincial Government has demonstrated its commitment through West Java Provincial Regulation No. 1 of 2016 on Waste Management. The West Java Provincial Government has also established a Regional Policy and Strategy (Jakstrada) for Waste Reduction, targeting a 30% reduction by 2025 through a 3R approach and waste data digitalization. Flagship programs in West Java include the "Digital Waste Management Synergy with the Citarum Harum Program," which integrates digital technology into waste banks and Citarum watershed monitoring. Additionally, the "SampahKita" platform was launched for reporting, education, and economic incentives for household waste management.

At the city/district level, Bandung City (Perwal No. 37 2019) has imposed restrictions on plastic bags. Sukabumi City (Perwal No. 19 2019) has become a pioneer, successfully reducing 98 tons of plastic waste per year from modern markets. Bekasi, Tasikmalaya, and Cimahi cities have also drafted similar regulations. However, the effectiveness of these policies still faces challenges in terms of consistency of implementation, public awareness, and the availability of recycling infrastructure. One solution approach is Green Consumer Behavior (GCB) (Chang et al., 2024). Generation Z (Gen Z), as the main consumer group today, plays an important role in reducing the impact of plastic waste through environmentally friendly product choices.

West Java Province, with its various environmental challenges (air pollution, waste), requires a deep understanding of GCB (Guo et al., 2024). This behavior is influenced by consumer awareness and knowledge of environmental issues. Environmental awareness is a key aspect driving sustainable consumption behavior change (Štofejová et al., 2023). Consumers with high awareness tend to have a positive attitude towards sustainable products. This awareness includes emotional, cognitive, and behavioral dimensions (Dos Santos Leite Gonella et al., 2024). Gen Z shows significant potential as agents of change due to their exposure to global sustainability issues through social media. However, research shows that high awareness is not always directly proportional to GCB. There is a gap influenced by other

factors such as financial capacity, social pressure, and the availability of environmentally friendly products (Tudu & Mishra, 2021).

Environmental information and knowledge form the foundation for understanding the ecological impact of consumption. Consumers with good environmental knowledge are more open to sustainable products, even at higher prices, because they understand the long-term value (Ewe & Tjiptono, 2023). However, knowledge alone is not enough; supporting factors such as social norms and access are also necessary. Gen Z in Indonesia has great potential as agents of change. Research shows that 78% of Gen Z want to contribute to society, and their willingness to engage in pro-environmental behavior is influenced by knowledge, attitudes, and social motives (Hudayah et al., 2023). Environmental knowledge (understanding of raw materials, production processes, impacts) increases the likelihood of consumers choosing sustainable products.

Another influencing variable is the availability of green products. When environmentally friendly products are easily accessible, consumers are more likely to choose them. Wide availability can increase interest and purchases. Attitudes toward green products are a major factor. Positive attitudes significantly influence consumers' tendency to buy and use these products. Environmental policies (certification, fiscal incentives) also have a significant impact on consumer behavior (Baltaci et al., 2024). In addition, green marketing and regulations also play a role. Sustainable consumer behavior includes the process of selecting to disposing of products and the willingness to pay more (X. Li et al., 2024). The main factors shaping this are attitudes in the Theory of Planned Behavior, where evaluative attitudes toward actions influence intentions and actual behavior. Positive attitudes can encourage consumers to choose sustainable products even if they require sacrificing price or convenience (Štofejová et al., 2023).

Attitude plays a strong mediating role between environmental awareness and green purchasing behavior, especially among Gen Z (Baltaci et al., 2024; Rütelionė & Bhutto, 2024). Therefore, this study focuses on examining the factors of environmental awareness, environmental knowledge, product availability, and environmental policies that influence GCB related to plastic waste among Gen Z in West Java. Special focus will be placed on the role of attitudes toward environmentally friendly products as a factor that motivates GCB. This study is relevant to the global issue of reducing environmental impact, particularly plastic waste. The urgency of researching Gen Z in West Java is very high. As a province with a large population and complex environmental issues, West Java has Gen Z as its largest population segment (more than 27% according to BPS 2020). Gen

Z is known to be closely associated with technology and high access to information, as well as being the main actor in shaping future consumption patterns. The issues of GCB and plastic waste are very relevant to Gen Z as the driving force behind sustainable lifestyle changes. When the demographic dominance of Gen Z meets the high ecological burden of the West Java region, studies on their awareness, attitudes, and behaviors towards the consumption of environmentally friendly products become urgent. The research findings are expected to significantly contribute to efforts to maintain a sustainable environment and address plastic waste issues.

This study stems from the identification of a number of research gaps found in previous studies related to green consumer behavior (GCB). First, the relationship between attitudes and green consumer behavior (GCB) has been proven to have a positive influence in several studies. However, the focus of these studies is still limited to the general population and does not specifically highlight Generation Z in the local Indonesian context, particularly in relation to the issue of plastic waste as an urgent contemporary environmental phenomenon. Second, research findings on attitudes towards pro-environmental behavior show inconsistent results. There is a positive relationship, but the effect is often influenced by situational factors, social pressure, and contextual environment, making the causal relationship weak and not universal (Miller & Rice, 2024; Niu et al., 2023). Third, the relationship between environmental awareness and green behavior also shows mixed results. High levels of awareness are not always followed by concrete actions (Aukhoon et al., 2024; Yu, 2024). The main barriers identified include limited access to environmentally friendly products, relatively high prices, and a lack of credible information (Chu, 2020).

Fourth, studies on environmental knowledge and green behavior generally emphasize direct influences (De Silva et al., 2025; Surahman et al., 2023). However, there is still a gap in research that examines the mediating role of environmental attitudes as a psychological mechanism that bridges the relationship between knowledge and environmentally friendly behavior. Fifth, research on the availability of environmentally friendly products and purchase interest is still dominated by conceptual approaches. The importance of availability has not been thoroughly examined in terms of how perceptions of availability influence actual purchase interest in the context of young consumer behavior (Mishra & Farooqi, 2024; Weissmann & Hock, 2021). Sixth, studies on the interaction between public policy and consumer choice are still limited. Public policy has the potential to strengthen green behavior, but the relationship between policy intervention and individual psychological factors such as attitudes and environmental awareness has rarely been

explored empirically (C. Li et al., 2023). Finally, research shows that digital exposure has a positive effect on GCB among Generation Z, but these studies have not yet considered the geographical context of West Java and the interaction between digital exposure and psychological variables such as attitudes, knowledge, and environmental awareness (Elgammal et al., 2024; Suhaeni et al., 2024). Therefore, this study aims to address this gap by integrating psychological, structural, and digital dimensions to explain the mechanisms of green consumer behavior among Generation Z in West Java in the context of plastic waste reduction.

LITERATURE REVIEW

Theory of Planned Behavior (TPB)

In consumer behavior studies, a widely used theoretical framework is the Theory of Planned Behavior (TPB), which is an extension of the Reasoned Action Theory by Fishbein and Ajzen in 1975. This theory states that an individual's intention to perform an action is influenced by their attitude toward the behavior and subjective norms (Pradana et al., 2024; Sadeli et al., 2022). The Theory of Planned Behavior (TPB) is a widely used framework for understanding consumer behavior in the context of environmentally friendly products. Several empirical studies have shown how TPB can be effectively applied to explain consumer intentions and actions towards more sustainable products (Elgammal et al., 2024; R. Kumar et al., 2022). Through these various studies, TPB has proven to be an effective framework for explaining consumer behavior toward environmentally friendly products, with the variables of attitude, social norms, and perceived behavioral control playing a central role in determining consumer intentions and actions (Braksiek et al., 2021).

Value-Belief-Norm (VBN) Theory

The Value-Belief-Norm (VBN) theory is a psychological approach that explains why individuals engage in pro-environmental actions based on their personal value systems, beliefs, and norms. This theory states that personal values influence beliefs about the environment, which then shape personal norms and ultimately encourage individuals to act in an environmentally friendly manner. VBN views environmentally friendly behavior as not purely rational or control-based, but rooted in moral values and individual concern for the social and ecological impacts of their actions (Pelcher et al., 2023 ; Le et al., 2021).

In the context of green consumer behavior, this theory suggests that individuals who have altruistic or biospheric values (caring for living things and the environment) tend to develop the belief that human activities have a serious impact on the environment (New Ecological Paradigm/NEP). This belief then fosters a personal responsibility to act,

such as choosing environmentally friendly products or reducing unnecessary consumption. Therefore, personal norms act as an internal trigger for sustainable consumption behavior (Farzin et al., 2023; Javed et al., 2024).

Green Consumer Behavior (GCB)

Green consumer behavior reflects individuals' actions in choosing and using products and services while considering their impact on the environment. Factors such as attitudes toward the environment, a lifestyle oriented toward sustainability, and willingness to pay for green products significantly influence purchasing behavior and future purchase intentions (Štofejová et al., 2023). Furthermore, eco-friendly labels play a crucial role in promoting sustainable consumption, especially in regions where green consumerism is still developing (Alhamdi et al., 2024). The importance of green marketing and green customer value also greatly influences the promotion of environmentally conscious consumer behavior, with brand awareness and environmental concern as mediators in this relationship (L. Chen et al., 2023; Setiadi et al., 2025).

The emotional appeal of advertisements significantly influences consumer attitudes toward green products, especially when negative emotions such as fear and guilt can have a positive impact on purchase intent (Balaskas et al., 2023). Green advertising and environmental knowledge also form an important basis for increasing consumers' intention to purchase environmentally friendly products, with factors such as green brand image, eco-friendly labeling, and consumer innovation further driving sustainable purchasing tendencies (D. Li, 2025). These findings reveal the multifaceted nature of green consumer behavior and the various elements that influence it.

In understanding green consumer behavior, it is important to identify the dimensions that shape their environmentally friendly purchasing and consumption decisions. The GCB dimension can be measured through five main components (Vuong et al., 2024; S. Wu et al., 2025; Zhang et al., 2023), search behavior, purchase behavior, post-purchase behavior, social responsibility, and satisfaction and loyalty towards environmentally friendly products. The indicators of each of these dimensions represent the stages of consumer attitudes and consumption decisions in supporting sustainable products.

Attitudes Toward Environmentally Friendly Products

The Theory of Planned Behavior (TPB), developed by Ajzen in 1991, states that individual behavior is driven by behavioral intention, which is influenced by attitudes toward the behavior, subjective norms, and perceived behavioral control. In the context of sustainable products, attitudes reflect consumers' positive or negative evaluations of the use of environmentally friendly goods. Additionally, customer perceived value, an important component of the expanded TPB model in several studies, significantly influences the intention to purchase environmentally

friendly products. This perceived value encompasses both the quality and environmental benefits of the product, making it a significant driver of purchase intention (Ong et al., 2023 ; Dangelico et al., 2024). Consumers who have a positive perception of environmentally friendly products tend to show positive attitudes and increase their loyalty to brands that uphold sustainability principles. This is evident in studies exploring various factors that influence consumer behavior towards environmentally friendly products (Ko & Jeon, 2024).

The dimension of Attitude toward Environmentally Friendly Products can be measured through (Ahn, 2023; Burkov et al., 202 ; Setiadi et al., 2025) and consists of three main components: cognitive, affective, and conative. Each has relevant measurement indicators in the context of green consumer behavior.

Environmental Awareness

Environmental awareness is an important approach to understanding the vulnerability of ecosystems around us and the urgency of preserving and protecting them (Y. Chen et al., 2022; H. Li & Song, 2021). This level of awareness plays a role in shaping behavior towards the selection and use of environmentally friendly products. Environmental awareness among consumers refers to a growing understanding and concern for environmental issues related to the products and services they consume. This includes recognition of the negative impacts of excessive consumption, choosing environmentally friendly products, and understanding sustainability. Consumers with environmental awareness tend to choose more environmentally friendly products, which encourages companies to develop sustainable products and support green practices (Štofejová et al., 2023).

This awareness plays a role in supporting sustainable practices through product choices and participation in green initiatives. In addition, raising social and educational awareness about sustainability can catalyze collective action toward positive change (Lopes et al., 2024). Environmental awareness can also influence policy by encouraging policymakers to strengthen environmentally friendly regulations and increase demand for green products (Li, 2025). Thus, environmental awareness contributes not only to environmental preservation but also to social welfare and public health (Gajdzik et al., 2024).

In this study, environmental awareness is measured using dimensions that refer to the Value-Belief-Norm (VBN) Theory framework, which consists of egoistic, altruistic, and biospheric concerns (Khan et al., 2024; Trautwein et al., 2021; Wang et al., 2023). These dimensions indicate the level of individual concern based on their focus: personal interests, social welfare, and ecosystem preservation.

Environmental Knowledge

Environmental knowledge is also considered an important factor driving environmentally friendly attitudes and behaviors. Consumers with high knowledge tend to be better able to evaluate products based on

sustainability values and make more conscious purchasing decisions (Grymshi et al., 2021). Good knowledge about the environmental benefits and consequences of a product can strengthen the intention to purchase environmentally friendly products and avoid greenwashing (De Sio et al., 2022). Environmental knowledge develops in two ways: (1) educating consumers to understand the effects of a product on the environment and (2) consumer knowledge about products produced using environmentally friendly methods.

Environmental knowledge can be defined as the basic understanding that individuals have about various actions that can be taken to support environmental conservation efforts. This knowledge includes an understanding of ecosystems, biodiversity, environmental issues, and sustainable practices. Environmental knowledge is very important for making decisions that support environmental health, conservation, and sustainability (Hossain et al., 2022; Lindsey et al., 2021).

In this study, environmental knowledge was measured through three main dimensions: declarative knowledge, procedural knowledge, and effectiveness knowledge (Hennecke & Bürgler, 2023; Teng et al., 2021).

Availability of environmentally friendly products

The availability of environmentally friendly products refers to the existence of products that meet ecological, social, and economic sustainability criteria. Environmentally friendly products are not only based on efforts to minimize negative impacts on the environment, but must also take into account social responsibility and contribute to sustainable economic development. This can be achieved through green marketing strategies, increased environmental awareness, and innovation in developing more sustainable products (Reddy et al., 2023; Wijekoon, 2021). These products are designed not only to meet consumer needs but also to minimize negative impacts on the environment.

The company's commitment to providing sustainable products has a positive impact on environmental health and human well-being, and plays a role in increasing consumer awareness of the importance of using environmentally friendly products (Sathasivam et al., 2021). In this study, the availability of environmentally friendly products is measured through three main dimensions, namely: product diversity, market accessibility, and the quality of environmentally friendly products (M. M. Hossain et al., 2024; Jayasinghe et al., 2020; A. Kumar & Basu, 2023).

Environmental policy

Environmental policy is defined as a set of rules, strategies, and government interventions designed to regulate economic activities so as not to damage the environment (Newman et al., 2023). Governments in various countries have begun to implement regulations aimed at reducing the negative impact of consumption on the environment, including through policies that regulate the production and distribution

of environmentally friendly products. Government policies that encourage the use of environmentally friendly products can indeed increase consumer awareness and influence their preferences in choosing more environmentally friendly products.

Increased environmental awareness among consumers is driving demand for environmentally friendly products, which in turn is encouraging companies to adopt environmental innovation strategies in their product development and production. Proactive eco-friendly product innovation can have a positive impact on a company's sales growth, and consumers show a greater preference for environmental innovation in eco-friendly design than for products with ecological use (Aibar-Guzmán & Somohano-Rodríguez, 2021). In this study, environmental policy is measured through the main dimensions (Bozatli & Akca, 2024; J. Wu et al., 2025) namely: regulations and incentives, as well as education and campaigns for environmentally friendly products.

Research Hypothesis

After analyzing the literature review discussed above, the author formulates the following research hypotheses:

H1: Environmental awareness influences attitudes toward environmentally friendly products

H2: Environmental knowledge influences attitudes toward environmentally friendly products.

H3: Product availability has a positive effect on attitudes toward environmentally friendly products

H4: Environmental policies have a positive influence on attitudes toward environmentally friendly products

H5: Environmental awareness has a positive effect on green consumer behavior.

H6: Environmental knowledge has a positive effect on green consumer behavior

H7: The availability of environmentally friendly products has a positive effect on green consumer behavior

H8: Environmental policies have a positive effect on green consumer behavior

H9: Attitudes toward environmentally friendly products have a positive and significantly on green consumer behavior

H10: Environmental awareness influences green consumer behavior mediated by attitudes toward environmentally friendly products environment

H11: Environmental knowledge influences green consumer behavior mediated by attitudes toward environmentally friendly products environment

H12: Product availability influences green consumer behavior mediated by attitudes toward environmentally friendly products environment

H13: Environmental policies influence green consumer behavior mediated by attitudes toward environmentally friendly

products environmentally friendly products.

The research framework is illustrated in the following figure, which presents a visual representation of the relationship between the variables studied. This framework is based on the theoretical basis and previous research results that have been discussed.

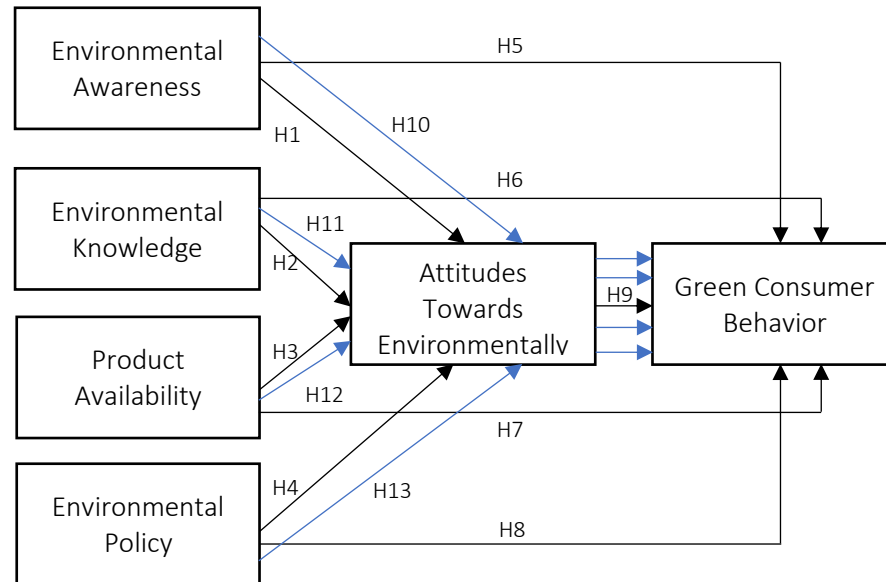


Figure 3. Research framework

METHOD

This study aims to empirically analyze the influence of environmental awareness, environmental knowledge, product availability, and environmental policies on green consumer behavior through attitudes toward environmentally friendly products. The research design uses a causal approach with explanatory properties to test the relationship between variables and explain the phenomenon of green consumer behavior. This study is quantitative in nature, with data collected through questionnaires. The research location is in West Java Province, which has a large population, high consumption levels, and faces serious problems related to plastic waste. The research focuses on Generation Z because this group has high digital consumption levels and great potential in encouraging sustainable behavior.

To increase representativeness and reduce location bias, respondents were taken from 14 cities/districts in West Java that reflect demographic, geographic, and socio-cultural diversity. The selection of areas was based on three criteria: (1) a significant Generation Z population (based on the 2020 BPS Population Census), (2) plastic consumption and urbanization levels, and (3) access to technology and digital media. The sample size was set at 385 respondents using the Cochran formula.

The sampling technique used was non-probability sampling with the convenience sampling method, chosen for its time efficiency, respondent accessibility, and resource limitations. The data were analyzed using validity and reliability tests, as well as descriptive and inferential statistical analyses, which included an assessment of the outer model and inner model. Through this approach, the study is expected to provide a comprehensive understanding of Generation Z's green consumer behavior in the context of plastic waste reduction in West Java.

RESULTS AND DISCUSSION

Descriptive Analysis

Descriptive statistical analysis in this study was used to provide an overview, summarize, and systematically present data characteristics related to the green consumer behavior of Generation Z in West Java Province, covering variables of environmental awareness, environmental knowledge, product availability, and environmental policy. The responses of Generation Z green consumers reflect the extent to which they are able to utilize environmental awareness, environmental knowledge, product availability, and environmental policies to form sustainable consumption strategies. In this context, green behavior is not only influenced by positive attitudes towards environmentally friendly products, but also by external support such as the accessibility of green products and the effectiveness of environmental policies that reinforce sustainable consumption intentions and actions.

Table 1. Summary of Variable Responses

No	Variable	Dimension	Score Obtained	Maximum Score	Percentage of Maximum Score	Category
1	Environmental Awareness	Selfish Concern	3281	3850	85.2	Very Good
		Altruistic Concern	3263	3850	84.8	Very Good
		Biospheric Concern	1628	1925	84.6	Very Good
	Total Score		8172	9625	84.9%	Very Good
2	Environmental Knowledge	Declarative Knowledge	3281	3850	85.2	Very Good
		Procedural Knowledge	3263	3850	84.8	Very Good
		Effectiveness Knowledge	1628	1925	84.6	Very Good
	Total Score		8172	9625	84.9%	Very Good
3	Product Availability	Product Diversity	3264	3850	84.8	Very Good
		Market Accessibility	3206	3850	83.3	Good

		Green Product Quality	1641	1925	85.2	Very Good
	Total Score		8111	9625	84.3%	Very Good
4	Environmental Policy	Regulations and Incentives	3221	3850	83.7	Good
		Education and Campaigns	1573	1925	81.7	Good
	Total Score		4794	5775	83.0%	Good
5	Attitude toward environmentally friendly products	Cognitive	3246	3850	84.3	Very Good
		Affective	3267	3850	84.9%	Very Good
		Conative	3284	3850	85.3	Very Good
	Total Score		9797	11,550	84.8%	Very Good
6	Green Consumer Behavior	Search Behavior	3326	3850	86.4	Good
		Purchase Behavior	3277	3850	85.1	Good
		Post-Purchase Behavior	3243	3850	84.2	Good
		Social Responsibility	3266	3850	84.8	Good
		Satisfaction and Loyalty	3282	3850	85.2	Good
	Total Score		16394	19,250	85.2%	Good

The results of the descriptive analysis show that all research variables are in the good to very good category, indicating high awareness and participation of West Java's Generation Z in green consumption. Environmental awareness and environmental knowledge each scored 84.9% (very good), reflecting high concern and understanding of environmental issues. Product availability scored 84.3% (very good), with a note that accessibility still needs to be improved. Environmental policy scored 83.0% (good), indicating the effectiveness of regulations and campaigns. Attitudes towards environmentally friendly products scored 84.8% (very good), reinforcing the intention to consume green. Finally, green consumer behavior scored 85.2% (good), confirming positive behavior in the search for, purchase of, and loyalty to green products.

Structural Equation Model-Partial Least Square (SEM-PLS) Analysis

This study includes six latent variables with a total of thirty-two manifest variables (indicators). The analysis was conducted through testing the measurement model (Outer Model) and structural model (Inner Model) using the Partial Least Squares (PLS) approach to evaluate the relationships

between variables in the Structural Equation Model (SEM).

Outer Model Test

Using PLS software, convergent validity was assessed through the factor loading of each construct indicator. A construct was considered valid if the factor loading value exceeded 0.70, and the Average Variance Extracted (AVE) and communality values were each greater than 0.50.

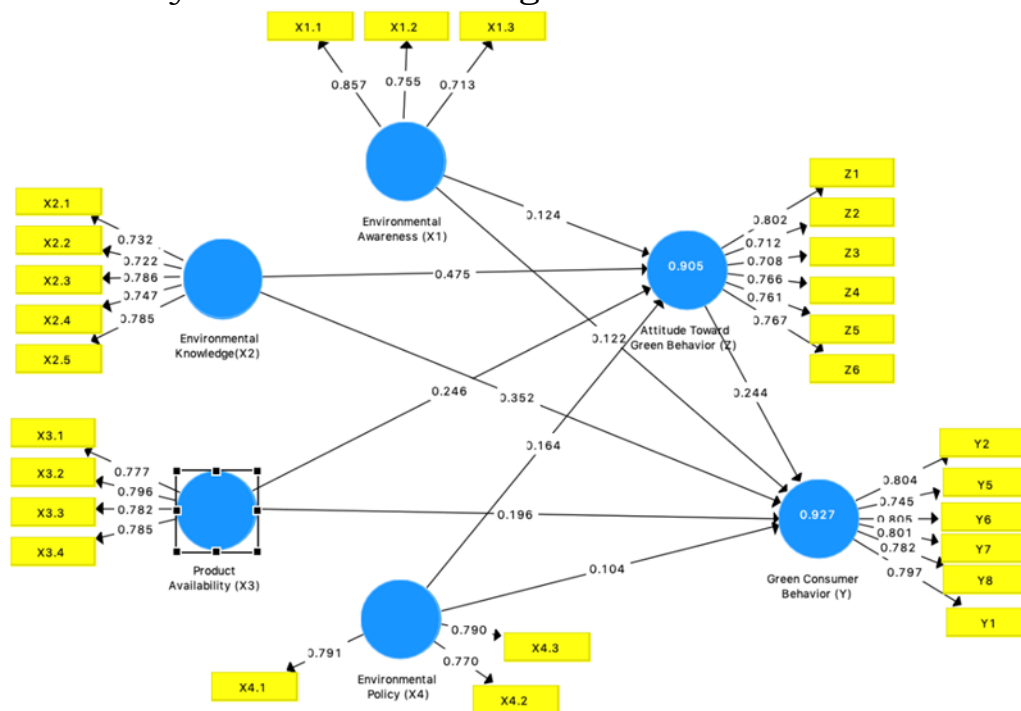


Figure 4. Final factor loading

Figure 4 shows the factor loading values of each manifest variable. If all indicators have a factor loading value for the latent variable higher than 0.70, then the indicator is declared valid and capable of representing the construct being measured.

Table 2. Average Variance Extracted (AVE)

Variable	Average Variance Extracted (AVE)
Environmental Awareness (X1)	0.604
Environmental Knowledge (X2)	0.570
Product Availability (X3)	0.616
Environmental Policy (X4)	0.614
Attitude Toward Green Behavior (Z)	0.567
Green Consumer Behavior (Y)	0.623

The data shows that all six latent variables meet the convergent validity criteria with AVE values above 0.5. This means that all manifest variables have met the construct- t suitability requirements, so that the research instrument is valid in measuring the aspects intended by each construct.

Discriminant Validity

Discriminant validity is assessed by comparing factor loadings between constructs with AVE values and latent variable correlations. If an indicator has the highest correlation with its main construct compared to other constructs, then that variable meets the criteria for strong discriminant validity.

Table 3. Cross Loading Factor

Variable	Indicator	X1	X2	X3	X4	Y	Z
<i>Environmental Awareness</i> (X1)	X1.1	0.857	0.663	0.689	0.656	0.720	0.693
	X1.2	0.755	0.684	0.682	0.655	0.706	0.687
	X1.3	0.713	0.501	0.566	0.522	0.549	0.568
<i>Environmental Knowledge</i> (X2)	X2.1	0.445	0.732	0.603	0.592	0.633	0.635
	X2.2	0.568	0.722	0.643	0.624	0.689	0.674
	X2.3	0.664	0.786	0.671	0.653	0.741	0.731
	X2.4	0.677	0.747	0.668	0.664	0.728	0.724
	X2.5	0.648	0.785	0.640	0.647	0.712	0.714
<i>Product Availability</i> (X3)	X3.1	0.631	0.601	0.777	0.587	0.661	0.689
	X3.2	0.657	0.673	0.796	0.684	0.701	0.698
	X3.3	0.689	0.687	0.782	0.649	0.721	0.696
	X3.4	0.646	0.721	0.785	0.666	0.747	0.715
<i>Environmental Policy</i> (X4)	X4.1	0.588	0.641	0.609	0.791	0.666	0.672
	X4.2	0.661	0.695	0.671	0.770	0.706	0.706
	X4.3	0.610	0.645	0.658	0.790	0.672	0.656
<i>Green Consumer Behavior</i> (Y)	Y1	0.706	0.738	0.729	0.673	0.797	0.746
	Y2	0.661	0.763	0.701	0.694	0.804	0.755
	Y5	0.682	0.693	0.686	0.641	0.745	0.711
	Y6	0.649	0.765	0.717	0.717	0.805	0.760
	Y7	0.723	0.732	0.747	0.720	0.801	0.758
	Y8	0.628	0.711	0.690	0.674	0.782	0.702
<i>Attitude Toward Green Behavior</i> (Z)	Z1	0.656	0.704	0.683	0.689	0.717	0.802
	Z2	0.607	0.666	0.634	0.632	0.681	0.712
	Z3	0.616	0.677	0.639	0.616	0.673	0.708
	Z4	0.640	0.715	0.692	0.671	0.727	0.766
	Z5	0.663	0.703	0.689	0.654	0.714	0.761
	Z6	0.615	0.708	0.691	0.651	0.716	0.767

The indicators used to measure latent variables meet the criteria for discriminant validity because the *cross-loading* value of each indicator is higher in its construct than in other latent constructs.

Reliability Test

Composite Reliability (CR) and Cronbach's Alpha (CA) are two approaches used to assess the level of reliability in Partial Least Squares (PLS) analysis.

Table 4. Reliability Test Results

Variable	Cronbach's Alpha	Composite Reliability	Note
Environmental Awareness (X1)	0.670	0.820	Reliable
Environmental Knowledge (X2)	0.811	0.869	Reliable
Product Availability (X3)	0.792	0.865	Reliable
Environmental Policy (X4)	0.686	0.827	Reliable
Attitude Toward Green Behavior (Z)	0.847	0.887	Reliable
Green Consumer Behavior (Y)	0.879	0.908	Reliable

The test results show that the data has good reliability, as indicated by a Composite Reliability (CR) value above 0.7 and a Cronbach's Alpha (CA) exceeding 0.6, meaning that all indicators consistently measure their respective constructs.

Inner Model Test

The structural model was evaluated to assess the relationships between latent variables through path analysis and significance testing. The t-statistic values were obtained using the bootstrapping method, as shown in the following figure.

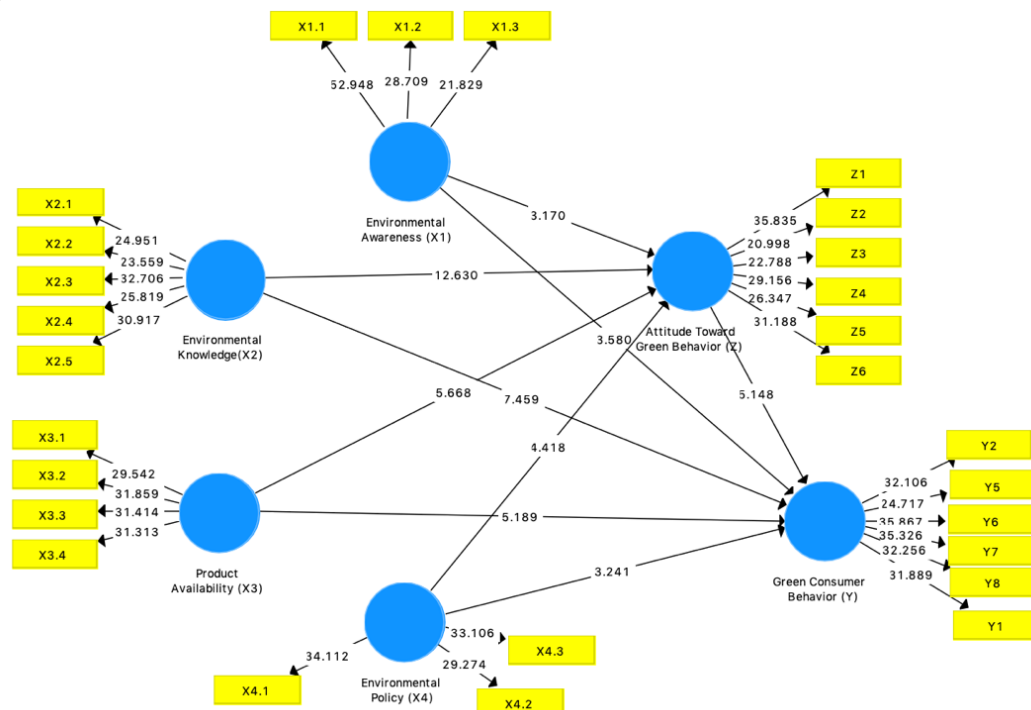


Figure 5. Bootstrapping Result

Hypothesis

Path coefficients, *t-statistic* values, *p-values*, and parameter coefficients were used to assess the significance of the research hypotheses. The results of this test describe the strength and direction of the influence between variables, with a summary of the findings presented in the following table.

Table 5. Path Significance Test

Variable	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistic (O/STDEV)	P Values
Environmental Awareness (X1)→ Attitude Toward Green Behavior (Z)	0.124	0.128	0.041	2.998	0.003
Environmental Knowledge (X2)→ Attitude Toward Green Behavior (Z)	0.475	0.477	0.036	13.113	0,000
Product Availability (X3)→ Attitude Toward Green Behavior (Z)	0.246	0.245	0.044	5.591	0.000
Environmental Policy (X4)→ Attitude Toward Green Behavior (Z)	0.164	0.159	0.036	4.528	0,000
Environmental Awareness (X1)→ Green Consumer Behavior (Y)	0.122	0.126	0.035	3.507	0.000
Environmental Knowledge (X2)→ Green Consumer Behavior (Y)	0.352	0.351	0.043	8.282	0.000
Product Availability (X3)→ Green Consumer Behavior (Y)	0.196	0.197	0.036	5.408	0.000
Environmental Policy (X4)→ Green Consumer Behavior (Y)	0.104	0.104	0.032	3.226	0.001
Attitude Toward Green Behavior (Z)→ Green Consumer Behavior (Y)	0.244	0.240	0.048	5.069	0,000

Table 6. Hypothesis Test Matrix

H	Variable	Correlation	T-Statistic	T-Table	Note
H1	Environmental Awareness (X1)→ Attitude Toward Green Behavior (Z)	0.124	2.998	1.96	Influential
H2	Environmental Knowledge (X2)→ Attitude Toward Green Behavior (Z)	0.475	13.113	1.96	Influential
H3	Product Availability (X3)→ Attitude Toward Green Behavior (Z)	0.246	5.591	1.96	Influential
H4	Environmental Policy (X4)→ Attitude Toward Green Behavior (Z)	0.164	4.528	1.96	Influential

H5	<i>Environmental Awareness (X1) → Green Consumer Behavior (Y)</i>	0.122	3.507	1.96	Influential
H6	<i>Environmental Knowledge (X2) → Green Consumer Behavior (Y)</i>	0.352	8,282	1.96	Influential
H7	<i>Product Availability (X3) → Green Consumer Behavior (Y)</i>	0.196	5.408	1.96	Influential
H8	<i>Environmental Policy (X4) → Green Consumer Behavior (Y)</i>	0.104	3.226	1.96	Influential
H9	<i>Attitude Toward Green Behavior (Z) → Green Consumer Behavior (Y)</i>	0.244	5.069	1.96	Influential

Based on the results of the Partial Least Squares (PLS) analysis listed in the table, all hypotheses (H1–H9) show t-statistic values greater than the t-table (1.96) at a significance level of 5%, so all are significantly influential. The following is a detailed explanation:

H1: Environmental Awareness → Attitude Toward Green Behavior ($\beta = 0.124$; $t = 2.998$). Environmental awareness has a positive and significant effect on attitudes toward green behavior. This means that the higher an individual's awareness of environmental issues, the more positive their attitude toward environmentally friendly behavior.

H2: Environmental Knowledge → Attitude Toward Green Behavior ($\beta = 0.475$; $t = 13.113$). Environmental knowledge is the most dominant factor that shapes attitudes toward green behavior. A good understanding of environmental impacts encourages individuals to be more pro-environment.

H3: Product Availability → Attitude Toward Green Behavior ($\beta = 0.246$; $t = 5.591$). The availability of green products has a positive effect on environmentally friendly attitudes. When green products are easily accessible, consumers are more motivated to adopt green behavior.

H4: Environmental Policy → Attitude Toward Green Behavior ($\beta = 0.164$; $t = 4.528$). Effective environmental policies can increase positive attitudes toward green behavior. Government regulations and campaigns strengthen awareness and encourage environmentally friendly behavior.

H5: Environmental Awareness → Green Consumer Behavior ($\beta = 0.122$; $t = 3.507$). Environmental awareness also directly encourages green consumption behavior. Individuals who are aware of the importance of protecting the environment tend to buy environmentally friendly products.

H6: Environmental Knowledge → Green Consumer Behavior ($\beta = 0.352$; $t = 8.282$). Environmental knowledge has a significant effect on green consumer behavior. Understanding the benefits of green products strengthens the decision to buy sustainable products.

H7: Product Availability $\rightarrow$ Green Consumer Behavior ($\beta = 0.196$; $t = 5.408$)

The availability of green products facilitates the adoption of green behavior. Product accessibility is a practical factor that strengthens green purchasing decisions.

H8: Environmental Policy $\rightarrow$ Green Consumer Behavior ($\beta = 0.104$; $t = 3.226$). Environmental policy has a positive effect on green consumer behavior. The implementation of public policy encourages community participation in environmentally friendly consumption.

H9: Attitude Toward Green Behavior $\rightarrow$ Green Consumer Behavior ($\beta = 0.244$; $t = 5.069$). Attitudes toward green behavior play a significant role in predicting green consumer behavior. The more positive an individual's attitude toward green behavior, the greater their tendency to act in an environmentally friendly manner.

R-Square Test, Direct and Indirect Effects and Specific Indirect Effects

The R Square value describes the degree of influence of the independent variable on the dependent variable, with the results shown in the following table.

Table 7. R Square Result

	R Square
Attitude Toward Green Behavior	0.905
Green Consumer Behavior	0.927

The R Square value of 0.905 for Attitude Toward Green Behavior indicates that 90.5% of the variability in attitudes toward green behavior is explained by the independent variables. Meanwhile, the value of 0.927 for Green Consumer Behavior indicates that 92.7% of the variation in green consumer behavior is explained by this research model.

Table 8. Direct and Indirect Influence

Direct Influence		Indirect Influence		Total
Environmental Awareness (X1) $\rightarrow$ Attitude Toward Green Behavior (Z)	0,124			0.124
Environmental Knowledge (X2) $\rightarrow$ Attitude Toward Green Behavior (Z)	0.475			0.475
Product Availability (X3) $\rightarrow$ Attitude Toward Green Behavior (Z)	0.246			0.246
Environmental Policy (X4) $\rightarrow$ Attitude Toward Green Behavior (Z)	0.164			0.164
Attitude Toward Green Behavior (Z) $\rightarrow$ Green Consumer Behavior (Y)	0.244			0.244
Environmental Awareness (X1) $\rightarrow$ Green Consumer Behavior (Y)	0.122	X1 - Z - Y (0.124 x 0.244)	0.030	0.152
Environmental Knowledge (X2) $\rightarrow$ Green Consumer Behavior (Y)	0.352	X2 - Z - Y (0.475 x 0.244)	0,116	0.468
Product Availability (X3) $\rightarrow$ Green Consumer Behavior (Y)	0.196	X3 - Z - Y (0.246 x 0.244)	0.060	0.256

Environmental Policy (X4)→ Green Consumer Behavior (Y)	0.104	$X4 - Z - Y$ (0.164 x 0.244)	0.04	0.144
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The results of the indirect effect test show that Environmental Awareness and Product Availability have a greater total effect than their direct effects. This confirms the significant mediating role in strengthening the relationship between the two on Green Consumer Behavior.

Table 9. Specific Indirect Effects

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
Environmental Awareness (X1)→ Attitude Toward Green Behavior (Z)→ Green Consumer Behavior (Y)	0.030	0.030	0.011	2.80	0.005
Environmental Knowledge (X2)→ Attitude Toward Green Behavior (Z)→ Green Consumer Behavior (Y)	0.116	0.114	0.024	4.760	0.000
Product Availability (X3)→ Attitude Toward Green Behavior (Z)→ Green Consumer Behavior (Y)	0.060	0.059	0.017	3,631	0.000
Environmental Policy (X4)→ Attitude Toward Green Behavior (Z)→ Green Consumer Behavior (Y)	0.040	0.039	0.013	3.118	0.002

Based on the bootstrapping test results in the table above, all indirect influence paths show t-statistic values > 1.96 and p-values < 0.05, so it can be concluded that all mediating relationships are statistically significant. The following is a detailed interpretation:

H 10: Environmental Awareness → Attitude Toward Green Behavior → Green Consumer Behavior. The coefficient value of 0.030 with $t = 2.800$ and $p = 0.005$ indicates that the influence of environmental awareness on green consumer behavior is significantly mediated by attitudes toward green behavior. This means that environmental awareness encourages green behavior through an increase in positive attitudes toward such behavior.

H 11: Environmental Knowledge → Attitude Toward Green Behavior → Green Consumer Behavior. This mediation path has the strongest influence, with a coefficient of 0.116, $t = 4.760$, and $p = 0.000$. These results indicate that environmental knowledge not only directly influences green behavior but also through the formation of positive attitudes toward green behavior. This confirms the importance of environmental education and literacy as drivers of green behavior.

H 12: Product Availability → Attitude Toward Green Behavior → Green Consumer Behavior. A coefficient of 0.060 with $t = 3.631$ and $p = 0.000$ indicates that the availability of green products significantly influences green consumer behavior through positive attitudes toward green behavior. In other words, the ease of obtaining environmentally friendly products strengthens consumers' positive attitudes and encourages

them to behave in a green manner.

H 13: Environmental Policy → Attitude Toward Green Behavior → Green Consumer Behavior. This path has a coefficient of 0.040 with $t = 3.118$ and $p = 0.002$, indicating that environmental policy also indirectly influences green consumer behavior through attitudes toward green behavior. Effective regulations and policies reinforce the public's positive perception of the importance of environmentally friendly behavior.

Responding to this urgency, this study focuses on Generation Z in West Java, a region with a large population and complex environmental issues. West Java has a regional commitment through the Regional Regulation on Waste Management and Regional Policy and Strategy (Jakstrada) which targets a 30% reduction in waste by 2025, supported by leading digital-based programs. A key solution to support this policy is the adoption of Green Consumer Behavior (GCB) by Gen Z as the main consumer group today. Descriptive analysis results show that Generation Z in West Java has a very positive response to all research variables, falling into the good to very good category. Specifically, environmental awareness and environmental knowledge achieved a total score of 84.9% (very good), while attitudes towards environmentally friendly products scored 84.8% (very good), and Green Consumer Behavior scored 85.2% (good). These high scores indicate that Gen Z in West Java shows strong awareness, understanding, and intention to participate in green consumption.

Structural model analysis using Partial Least Squares (PLS) tested the direct and indirect relationships between variables, with the results of hypothesis testing (H1–H9) showing a significant and positive effect on all paths.

Environmental awareness (H1) was found to have a positive and significant effect on attitudes toward green behavior ($\beta=0.124$; $t=2.998$). This is consistent with the literature stating that high awareness encourages positive attitudes toward sustainable products. This awareness includes egoistic, altruistic, and biospheric dimensions, which are the pillars of the Value-Belief-Norm (VBN) Theory. Environmental knowledge (H2) emerged as the most dominant factor shaping attitudes toward green behavior ($\beta=0.475$; $t=13.113$). This finding reinforces the view that a good understanding of the ecological benefits and consequences of a product (declarative, procedural, and effectiveness knowledge) is crucial in strengthening the intention to purchase environmentally friendly products. Knowledge enables consumers to accept long-term value, even if the product is more expensive.

Product availability (H3) also has a positive effect on environmentally friendly attitudes ($\beta=0.246$; $t=5.591$). When

green products are easily accessible, it strengthens consumers' motivation to adopt green behavior. Although descriptive scores indicate availability in the very good category, market accessibility remains an area for improvement. Furthermore, effective environmental policies (H4) have been proven to increase positive attitudes toward green behavior ($\beta=0.164$; $t=4.528$). Government regulations and campaigns strengthen awareness and behavioral incentives, a relationship that confirms the importance of public policy interventions in shaping consumer choices.

Environmental awareness (H5) directly encourages green consumption ($\beta=0.122$; $t=3.507$), indicating that individuals who are aware of the importance of environmental preservation tend to act directly in their purchases. Environmental knowledge (H6) has a significant and strong direct influence on GCB ($\beta=0.352$; $t=8.282$), emphasizing that understanding the benefits of green products strengthens the decision to purchase sustainable products. Product availability (H7) facilitates the adoption of green behavior as a practical factor that strengthens green purchasing decisions ($\beta=0.196$; $t=5.408$).

Environmental policy (H8) also has a positive direct effect on GCB ($\beta=0.104$; $t=3.226$), indicating that public policy can encourage community participation in environmentally friendly consumption. In relation to GCB, attitudes toward green behavior (H9) act as a significant predictor of green consumer behavior ($\beta=0.244$; $t=5.069$). The more positive an individual's attitude, the greater their tendency to act in an environmentally friendly manner, which is in line with the core of the Theory of Planned Behavior (TPB) that evaluative attitudes toward an action influence intentions and actual behavior. In addition, a direct relationship was also found between the independent variables and GCB.

Furthermore, mediation effect analysis (H10–H13) provides in-depth insights into the psychological role of Attitude toward Environmentally Friendly Products (Z). Bootstrapping test results confirm that attitude acts as a statistically significant mediator in all paths.

The mediating effect of Environmental Awareness (H10) on GCB ($\beta=0.030$; $t=2.800$), which means that environmental awareness promotes green behavior through an increase in positive attitudes. Additionally, attitude mediates the relationship between Environmental Knowledge (H11) and GCB with the strongest coefficient among other mediation paths ($\beta=0.116$; $t=4.760$). This confirms that knowledge not only influences GCB directly but also through the formation of positive attitudes, highlighting the urgency of environmental literacy. Interestingly, the test results show that for Environmental Awareness (X1) and Product Availability (X3), the

total effect is greater than the direct effect. This is very important because it underscores the mediating role of Attitude (Z) in strengthening the relationship between structural (availability) and psychological (awareness) factors on actual consumer behavior.

Product availability (H12) significantly influences GCB through positive attitudes ($\beta=0.060$; $t=3.631$), indicating that the ease of obtaining environmentally friendly products strengthens positive attitudes and encourages green actions. Similarly, environmental policy (H13) indirectly influences GCB through attitude ($\beta=0.040$; $t=3.118$), where effective regulations strengthen the public's positive perception of the importance of environmentally friendly behavior.

Overall, this research model has a very high explanatory power, where 92.7% of the variation in Green Consumer Behavior is explained by the variables in the model. This contributes significantly to efforts to maintain environmental sustainability and address plastic waste issues, particularly by targeting Generation Z. These findings fill a gap in previous research, which has often been inconsistent regarding the relationship between awareness/knowledge and GCB, by showing that attitudes play an effective psychological role in bridging this relationship, especially in the context of Generation Z in West Java. Priority should be given to education to increase knowledge, as knowledge has the most dominant influence, and ensuring the availability of green products, which is an important practical factor for Gen Z.

CONCLUSION

The conclusions of this study targeting Generation Z in West Java reinforce their role as key actors in addressing environmental issues, particularly those related to plastic waste. Descriptively, Generation Z shows excellent concern and participation in green consumption. The analysis shows that Environmental Knowledge is the most decisive predictor in shaping positive consumer attitudes and strongly encourages green consumer behavior. All variables studied, Environmental Awareness, Product Availability, and Environmental Policy, have a positive relationship in directing the adoption of sustainable behavior. Specifically, Attitudes toward Environmentally Friendly Products have been proven to play an important mediating role. These positive attitudes function as an effective psychological mechanism, bridging the influence of knowledge, awareness, and external factors (such as product availability and government regulations) toward the realization of environmentally friendly consumption behavior. These findings contribute significantly to efforts to maintain

environmental sustainability and plastic waste management in West Java.

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