

Systematic Literature Review: Factors Influencing Generation Z's Attitudes Toward Environmentally Friendly Products and Their Implications for Green Consumer Behavior

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Abstract

This study examines the factors influencing Generation Z's attitudes toward environmentally friendly products and their implications for green consumer behavior, with a focus on reducing plastic waste in West Java, Indonesia. Through a *Systematic Literature Review*, this study analyzes recent scientific publications to identify patterns of relationships between environmental awareness, environmental knowledge, product availability, environmental policies, attitudes toward environmentally friendly products, and green consumer behavior. The review findings indicate that environmental awareness and knowledge play a fundamental role in shaping positive attitudes toward eco-friendly products. Product availability and effective environmental policies are crucial in bridging the gap between attitudes and behavior. While positive attitudes are a strong predictor of green consumer behavior, there remains a gap between attitudes and actual behavior. Digital technology and social media hold significant potential in influencing the attitudes and behavior of Generation Z. Cultural factors and geographical context also play a significant role. Implementation challenges such as price, convenience, and product availability remain major barriers. In conclusion, a holistic approach is needed that combines increased awareness, the provision of environmentally friendly products, effective policies, and the utilization of digital technology. Further research is required to explore effective strategies in specific contexts and address the attitude-behavior gap.

Keywords: *Generation Z, Environmentally Friendly Products, Green Consumer Behavior, Environmental Attitudes, Plastic Waste.*



A. INTRODUCTION

Global warming is the most critical environmental issue of the 21st century, with far-reaching impacts on the balance of global ecosystems. The rise in global temperatures caused by the accumulation of greenhouse gases has triggered an increase in extreme weather events, rising sea levels, and threats to biodiversity (Amano et al., 2020; Mori et al., 2021). According to the United Nations Environment Programme (UNEP, 2023), industrialized countries generate over 400 million tons of hazardous waste annually, significantly contributing to environmental pollution. In response to this crisis, G20 member countries, including Indonesia, committed at the G20 Summit in Bali in 2022 to reduce carbon emissions by 41% by 2030 and achieve Net Zero Emissions (NZE) by 2060.

The issue of global warming does not stand alone but is intertwined with the dynamics of economic development, urbanization, and massive consumption. Economic development is the primary goal of many countries, but it often comes at

the expense of environmental quality, which shows trend (F. Wang & Taghvaei, 2023; Ulucak et al., 2021). One of the indicators used to monitor environmental quality in Indonesia is the Environmental Quality Index (EQI), compiled by the Ministry of Environment and Forestry (KLHK). Based on KLHK data (2023), the development of national EQI achievements during the 2018–2023 period shows an interesting dynamic. The IKLH value was recorded at 71.67 in 2018, but experienced a significant decline to 66.55 in 2019. This decline indicates heavy pressure on the environment, likely triggered by high economic activity and urbanization that have not been balanced with adequate environmental management. However, since 2020, the IKLH value has shown a positive trend, rising to 70.27 in 2020, 71.45 in 2021, 72.42 in 2022, and stabilizing at 72.54 in 2023.

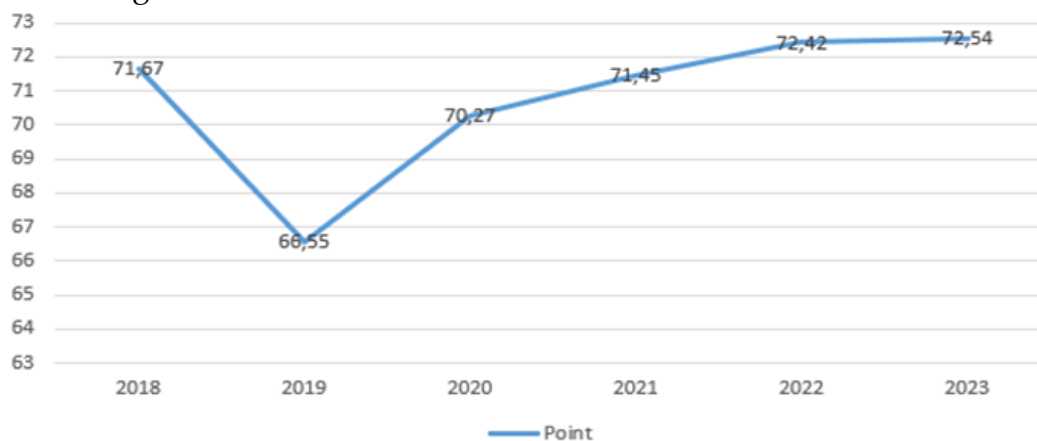


Figure 1. Achievements of the Environmental Quality Index 2018–2023

The improvement in IKLH achievements over the past four years reflects improvements in environmental management, although major challenges remain, particularly in the management of plastic waste. Plastic waste has become a global concern due to its non-biodegradable nature, contributing to soil, water, and air pollution, and threatening terrestrial and marine ecosystems. One of the key components of IKLH is waste management. Improperly managed waste can cause air, water, and soil pollution, and exacerbate the environmental crisis. A study in China shows that improvements in environmental quality can be achieved through good waste management, including reduction, sorting, and recycling. These findings are relevant for Indonesia, given that the Nusantara River Research Agency (BRUIN, 2023) found that plastic waste remains a major problem in various provinces, including West Java. Of the 25,733 plastic waste items found in 64 survey locations, most were single-use packaging from the food and beverage sector.

Data from the National Waste Management Information System (SIPSN, 2022) shows that food waste dominates national waste generation (41.55%), followed by plastic (18.55%). Plastic, with its non-biodegradable nature, poses a serious threat to both terrestrial and marine ecosystems. This composition underscores the urgency of policies to reduce single-use plastics and enhance national recycling capacity. The high volume of plastic waste is not merely a technical issue but also closely linked to

consumer behavior. In this context, environmentally friendly consumer behavior or Green Consumer Behavior has emerged as a strategic approach to address these issues (Lopes et al., 2024; Saif et al., 2023; Chen et al., 2023).

Generation Z (born 1995–2010) is the dominant population segment in West Java, comprising more than 27% of the population (BPS, 2020). This generation grew up in a digitally connected environment, has high access to information, and is a potential target for sustainable consumption campaigns. Research indicates that environmental awareness and knowledge can encourage Generation Z to choose environmentally friendly products (Mahasuweerachai & Suttikun, 2022; Tran et al., 2022; Ewe & Tjiptono, 2023). Environmental awareness involves emotional, cognitive, and behavioral dimensions, which together form the readiness to act in an environmentally friendly manner. However, some studies also highlight the existence of an attitude–behavior gap, where awareness does not always translate into actual behavior (Wang & Mangmeechai, 2021; Tang et al., 2022; Si et al., 2022).

Environmental knowledge plays a crucial role in shaping green consumer behavior. Consumers with a comprehensive understanding of a product's ecological impact are more likely to be selective and willing to pay more for sustainable products (Hossain et al., 2022; Kamalanon et al., 2022; Lee & Haley, 2022). However, environmental literacy alone is insufficient. Factors such as social norms, personal values, availability of eco-friendly products, and public policies play a crucial role in transforming attitudes into concrete actions (Aydin & Aydin, 2022; Khan, 2023).

Attitude toward environmentally friendly products is one of the most consistent antecedents in predicting green consumer behavior (Dhir et al., 2020; Chanda et al., 2023). In the context of the Theory of Planned Behavior, attitude refers to an individual's overall assessment whether favorable or unfavorable toward engaging in a specific behavior, which then influences intention and actual behavior. Positive attitudes toward environmentally friendly products can encourage consumers to choose products aligned with sustainability values, even if this requires sacrificing price or convenience (Sun & Yoon, 2022; Balaskas et al., 2023; Kumar et al., 2023). This confirms that attitudes play a strong mediating role between environmental awareness and green purchasing behavior, particularly among Generation Z (Borah et al., 2024; Agrawal et al., 2023).

Beyond internal determinants, external elements such as public policy, green marketing initiatives, and social influence can either enhance or diminish the linkage between attitudes and green behavior (Setiadi et al., 2025). Environmental certification policies and fiscal incentives can encourage consumers to choose more environmentally friendly products (Lee & Haley, 2022; Pop et al., 2020). Meanwhile, effective green marketing can shape positive perceptions and increase consumer trust in product sustainability claims (Majeed, 2022; Akram, 2024).

Although there are many studies on the influence of attitudes on green consumer behavior, the findings are still diverse. Some studies have found significant influences (Hossain et al., 2022; Kumar et al., 2023; Duong, 2023; Balaskas et al., 2023),

while other studies indicate weak or insignificant influences (Duong, 2023; Chaihanchai & Anantachart, 2022; Liao, 2020). This inconsistency suggests the presence of contextual factors moderating the relationship, such as subjective norms, regulation, product availability, and cultural factors.

Research gaps are also evident in the topic of the availability of environmentally friendly products. Many studies assume that increased availability automatically increases demand, yet this relationship has not been extensively tested empirically (Kim & Lee, 2023; Mustafa et al., 2022). Similarly, the impact of environmental policies on consumer behavior has not been fully explored, particularly the interaction between policies and psychological and social factors (Parker et al., 2022; Sun & Shi, 2022; Kim & Lee, 2023).

Based on these phenomena and gaps in the literature, this article aims to conduct a Systematic Literature Review (SLR) that maps empirical findings related to the relationship between attitudes toward environmentally friendly products and green consumer behavior among Generation Z. The research focuses on the context of plastic waste reduction in West Java, but with a global literature review to obtain a comprehensive picture. Specifically, this study will identify patterns of relationships between attitudes and green consumer behavior among Generation Z. Examine driving and inhibiting factors, including contextual variables such as knowledge, product availability, policies, and social norms. Integrate cross-study findings to address the attitude–behavior gap in sustainable consumption. Providing strategic recommendations for policymakers, businesses, and educators in promoting environmentally friendly consumption. This study is expected to produce an accurate, transparent, and replicable literature synthesis. The main contribution of this article is to provide integrated scientific evidence that can serve as a reference in formulating educational strategies and policy interventions to reduce plastic waste through changes in Generation Z's consumption behavior.

B. METHOD

This research adopts the Systematic Literature Review (SLR) method, a structured and transparent process designed to identify, assess, and synthesize all pertinent studies addressing a specific research question, theme, or phenomenon. This approach was adopted to build theoretical understanding and gather empirical evidence regarding the relationship between environmental awareness, environmental knowledge, product availability, environmental policies, and attitudes toward environmentally friendly products on green consumer behavior (Dangi et al., 2020; Stroumpoulis & Kopanaki, 2022; Herrmann et al., 2021)

Literature search was conducted on international and national indexed scientific databases, including Scopus, Web of Science, ScienceDirect, SpringerLink, Emerald Insight, ProQuest, and Google Scholar. Keywords were combined with Boolean operators (AND, OR) and truncation to expand the search results, including:

1. "Attitude toward environmentally friendly products" OR "Attitude toward green products"
2. "Green consumer behavior" OR "Pro-environmental behavior"
3. "Generation Z" AND "Plastic waste" AND "Indonesia" OR "Southeast Asia"

Publication timeframe is limited to 2013–2024 to ensure relevance and capture recent research developments. Articles must be written in English or Indonesian and primarily focused on empirical or theoretical investigations of key variables relevant to the research objectives.

Articles are included in this systematic review if they meet the following criteria:

1. Empirical research articles (quantitative, qualitative, or mixed) discussing attitudes toward environmentally friendly products and green consumer behavior.
2. Studies focusing on Generation Z or age groups that can be identified as Generation Z.
3. Publications in English or Indonesian.
4. Articles published in peer-reviewed journals or indexed conference proceedings.

Articles are excluded from analysis if they meet the following criteria:

1. Conceptual articles without empirical data.
2. Studies focusing on other generations (X, Y, Baby Boomers) without specific analysis of Generation Z.
3. *Grey literature* publications such as organizational reports or unpublished theses.

The Systematic Literature Review process follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework, which consists of four main stages :

1. Identification: Collecting all relevant articles from databases.
2. Screening: Removing duplicates and assessing relevance based on titles and abstracts.
3. Eligibility: Reviewing the full text of articles to ensure they meet the inclusion criteria.
4. Inclusion: Including articles that meet all criteria for final analysis.

These steps are illustrated using the PRISMA Flow Diagram, which visually represents the number of records identified, screened, excluded, and included in the final review.

The data were analyzed using three main approaches:

1. Descriptive Analysis: Describing the distribution of articles based on year of publication, geographical location of research, and methodological approach (quantitative, qualitative, or mixed methods).

2. Thematic Analysis: Synthesizing findings from various studies into comprehensive themes, such as the impact of ethical behavior on creativity or the role of empathy in improving organizational performance.
3. Critical Assessment: Evaluating the methodological quality of the included articles using tools such as *the Critical Appraisal Skills Programme (CASP)* or the *Joanna Briggs Institute (JBI) Checklist* to ensure the credibility and validity of the analyzed findings.

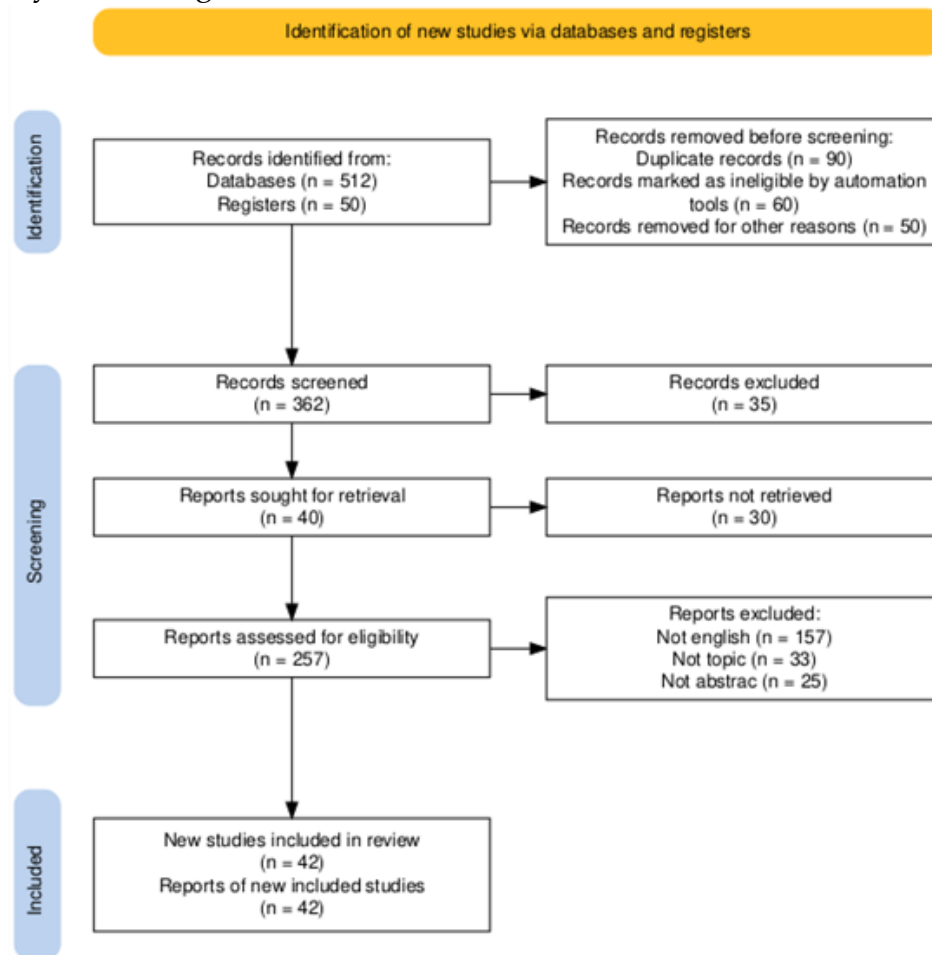


Figure 2. Prisma Research Flow Chart

Source: process data

C. RESULTS AND DISCUSSION

1. Literature Distribution

Analyzing the distribution of literature is an important first step in understanding the dynamics of scientific research on topics such as environmental awareness, environmental knowledge, product availability, environmental policy, and attitudes toward environmentally friendly products and green consumer behavior. By evaluating the number of articles published each year, researchers can identify trends, scientific momentum, and the extent to which these topics are receiving attention in the academic community. Fluctuations in the number of

publications can also reflect academics' responses to social phenomena and the evolving needs of organizations on a global scale. The following figure presents a visualization of the publication trends of scientific articles from 2013 to 2024.

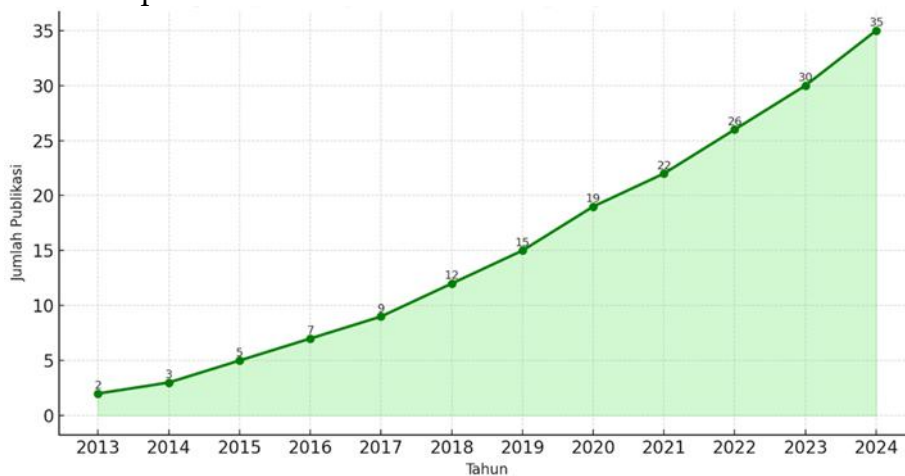


Figure 3. Number of Publications per Year (2013-2024)

Source: Processed Data

Based on Figure 3, there has been a consistent increase in the number of scientific publications related to attitudes toward environmentally friendly products and green consumer behavior during the period 2013–2024. In 2013, publications were still relatively low, with only 2 articles, indicating that this topic was still in the early stages of academic exploration.

From 2015 to 2018, there was a gradual increase from 5 to 12 publications per year, reflecting growing scientific interest in environmental issues, particularly in the areas of sustainable consumption and plastic waste management. A sharper increase was observed starting in 2019 with 15 publications, followed by a significant rise during the 2020–2021 period, reaching 22 publications. This is likely influenced by increased public awareness due to global campaigns to reduce plastic waste and environmental policy initiatives in various countries.

The period 2022–2024 saw the most rapid growth, from 26 publications in 2022 to 35 publications in 2024. This increase indicates that the topics of green consumer behavior and attitudes toward environmentally friendly products have become a mature and globally relevant research focus. The consistent rise in the " " also suggests that this field has strong research momentum and significant opportunities for further development, particularly studies that integrate the context of younger generations such as Generation Z and the influence of digital technology in shaping environmentally friendly behavior.

2. Main Theme

The results of the literature synthesis analyzed in this study reveal a consistent central theme across various studies, namely the close relationship between environmental awareness, environmental knowledge, green product availability, and

environmental policy with the formation of attitudes toward eco-friendly products, which ultimately influence green consumer behavior.

a. Environmental awareness and environmental knowledge

Environmental awareness is an individual's awareness of the importance of protecting and preserving the environment from damage caused by human activities. This level of awareness encourages more responsible behavior, such as reducing the use of single-use plastics, choosing environmentally friendly products, and supporting sustainable policies. Meanwhile, environmental knowledge refers to an individual's understanding of environmental issues, including the causes and impacts of pollution, the life cycle of products, and the benefits of using green products.

Research shows that environmental knowledge strengthens awareness by providing factual and logical information that shapes positive attitudes toward sustainability. The synergy between awareness and environmental knowledge plays an important role in encouraging behavioral change toward green consumer behavior, as individuals who are aware and knowledgeable tend to have internal motivation to act in an environmentally friendly manner.

b. Availability of environmentally friendly products and environmental policies

The availability of green products is a key factor influencing consumer decisions to adopt green behavior. Green products that are easily accessible, of good quality, and affordable will increase the likelihood of consumers switching from conventional products. Without adequate availability, positive attitudes toward sustainability are difficult to translate into real behavior. On the other hand, environmental policies serve as regulatory instruments and incentives that encourage producers and consumers to adopt sustainable practices.

This policy includes regulations on plastic restrictions, tax incentives for environmentally friendly products, and public education campaigns. Synergy between product availability and environmental policies creates an ecosystem that supports green consumer behavior, as consumers not only have internal motivation to adopt but are also facilitated by adequate product choices and a clear regulatory framework.

c. Attitudes toward environmentally friendly products and green consumer behavior

Attitudes toward environmentally friendly products reflect individuals' positive or negative evaluations of products designed to minimize environmental impact. Within the framework of the Theory of Planned Behavior, attitudes play an important role in shaping intentions and actual behavior. Consumers with positive attitudes tend to view green products as solutions that are consistent with their personal values, even if they are more expensive or less convenient. These attitudes serve as a link between awareness, knowledge, and actual actions.

Green consumer behavior encompasses the entire purchasing decision process that considers environmental impacts, from product selection and use to disposal.

When positive attitudes are reinforced by product availability and policy support, consumers are significantly more likely to adopt green behavior.

d. Challenges in implementing attitudes toward environmentally friendly products and green consumer behavior

Although positive attitudes toward environmentally friendly products have been shown to encourage green consumer behavior, their implementation in the field faces a number of challenges. One of these is the attitude-behavior gap, where consumers claim to care about the environment but still choose conventional products due to price, convenience, or limited availability. Other factors include a lack of accurate information about the benefits of green products, low environmental literacy, and the perception that the quality of environmentally friendly products does not justify their price.

In addition, deeply rooted social norms and consumption habits can slow behavioral change. To address these challenges, an integrated approach is needed that includes public education, persuasive green marketing strategies, and government policies that provide incentives and regulations. These themes emerged from a systematic synthesis process that highlighted recurring patterns and theoretical contributions across studies. The following table summarizes the main focus, representative findings, and implications for each theme.

Table 1. Thematic Summary of Literature Review

Theme	Focus of Studies	Key Findings	Implications	Sample Study
Environmental awareness & Environmental knowledge	The influence of environmental awareness and knowledge on green consumption behavior	Environmental awareness and knowledge reinforce each other, promoting positive attitudes and sustainable green consumption behavior in society.	Environmental education needs to be strengthened to enhance awareness and knowledge, thereby promoting sustainable green consumption behavior	(Polas et al., 2021 ; Altassan, 2023 ; Ewe & Tjiptono, 2023 ; Raza & Khan, 2022 ; Kumar et al., 2023 ; Mustafa et al., 2022)
Availability of environmentally friendly products & environmental policies	Availability of products and environmental policies on green behavior.	The availability of environmentally friendly products and synergistic environmental policies encourage consumers to adopt consistent and sustainable green behavior.	Producers and governments need to collaborate to provide affordable green products and effective environmental policies	(Wijekoon, 2021 ; Kabel et al., 2021 ; Lima et al., 2024 ; Saif et al., 2023; Shabbir, 2020 ; C. Lee et al., 2021; Machová et al., 2022)
Attitudes toward environmentally friendly products	The influence of attitudes toward the adoption of	Positive attitudes toward green products increase	Strengthening positive consumer attitudes can	(Sun & Yoon, 2022; Tran et al., 2022 ;

& green consumer behavior	environmentally friendly consumer behavior.	consumers' intentions and behaviors in adopting environmentally friendly behaviors.	encourage widespread adoption of environmentally friendly products	Duong, 2023 ; Kumar et al., 2023 ; Balaskas et al., 2023; Pop et al., 2020)
Challenges in implementing attitudes toward environmentally friendly products and green consumer behavior	Challenges in addressing the gap between attitudes and green consumer behavior.	The green consumer attitude-behavior gap is influenced by price, convenience, information, environmental literacy, and social norms.	Educational approaches, persuasive marketing, and incentive policies are needed to promote green behavior.	(Mustafa et al., 2022; Reddy et al., 2023; Z. Q. Sun & Yoon, 2022)

Source: Process Data

This thematic mapping shows that the formation of green consumer behavior is influenced by a series of interrelated factors. Environmental awareness drives concern for ecological impacts, while environmental knowledge strengthens understanding of the benefits of green products. The availability of environmentally friendly products ensures easy access to choices, and environmental policies create structural support. The combination of these factors shapes positive attitudes toward environmentally friendly products, which ultimately increases consumers' tendency to adopt sustainable consumption behaviors.

Table 2. Keyword Clusters Frequently Co-Occurring in Publications

No	Main Topics	Frequently Used Keywords
1	Environmental Awareness	sustainability, climate change, environmental responsibility, eco-consciousness, public awareness, environmental protection
2	Environmental Knowledge	environmental literacy, eco-education, environmental science, sustainability knowledge, ecological footprint, information sharing
3	Availability of Green Products	green products, eco-label, product accessibility, sustainable supply chain, green innovation, market readiness
4	Environmental Policy	environmental regulation, government policy, green incentives, environmental law, policy enforcement, carbon reduction
5	Attitude Toward Eco-friendly Products	consumer attitude, purchase intention, eco-friendly preference, perceived value, product perception, consumer trust
6	Green Consumer Behavior	sustainable consumption, purchase behavior, recycling, green lifestyle, eco-purchasing, ethical consumption

Source: Process Data

The interrelationship between keywords that frequently appear together in academic publications on green consumer behavior. On the topic of Environmental

Awareness, terms such as sustainability and climate change emphasize the importance of awareness of global issues. Environmental Knowledge contains keywords related to environmental literacy and education that strengthen public understanding. Green Product Availability highlights the accessibility and innovation of environmentally friendly products as determining factors in consumer choice. Environmental Policy focuses on regulations, incentives, and law enforcement as structural support. Attitude Toward Eco-friendly Products features terms related to consumer attitudes, value perceptions, and trust toward green products. Finally, Green Consumer Behavior encompasses sustainable consumption behavior, green lifestyles, and ethical purchasing. The entire table demonstrates that the formation of green behavior is the result of the interaction between awareness, knowledge, product availability, policy, attitude, and consumers' actual actions.

3. Research Gaps

Based on the literature review conducted, several research gaps related to attitudes toward environmentally friendly products and green consumer behavior can be identified as follows: The gap between attitudes and behavior, although many studies show a positive relationship between attitudes toward environmentally friendly products and green consumer behavior, there is still a gap between attitudes and actual behavior. Further research is needed to explore moderating and mediating factors that can explain this gap, particularly in the context of Generation Z (Mustafa et al., 2022; Reddy et al., 2023; Z. Q. Sun & Yoon, 2022).

The Role of Digital Technology: Existing research has not fully explored how digital technology and social media influence the formation of green attitudes and behaviors among Generation Z. Further studies are needed to understand the role of digital platforms in promoting environmentally friendly products and influencing purchasing decisions (Borah et al., 2024; Agrawal et al., 2023).

Cultural and Geographical Context: Most research focuses on developed countries, while studies in developing countries, including Indonesia, are still limited. More cross-cultural research is needed to understand how socio-cultural factors influence green consumer attitudes and behaviors in various geographical contexts (Mahasuweerachai & Suttikun, 2022; Tran et al., 2022; Ewe & Tjiptono, 2023).

The effectiveness of environmental policies, although recognized as an important factor, has been little studied in terms of evaluating the effectiveness of specific policies in promoting green consumer behavior, particularly among Generation Z. Further studies are needed to analyze the impact of various policy instruments on consumer attitudes and behavior (Parker et al., 2022; Y. Sun & Shi, 2022; Kim & Lee, 2023).

Integration of Consumer Behavior Theory: There is a need to integrate various consumer behavior theories in the context of sustainable consumption. Future research could explore how theories such as the Theory of Planned Behavior, Value-

Belief-Norm Theory, and Social Practice Theory can be combined to provide a more comprehensive understanding of green consumer behavior.

D. CONCLUSION

Based on a systematic review of the literature, there are several important findings related to attitudes toward environmentally friendly products and green consumer behavior among Generation Z. First, environmental awareness and knowledge play a fundamental role in shaping positive attitudes toward green products; Generation Z who understand environmental issues are more likely to support environmentally friendly products. Second, product availability and appropriate policy support serve as a bridge to reduce the gap between attitudes and behavior by ensuring easy access to green products. Third, positive attitudes have proven to be a strong predictor of green consumer behavior, although an attitude-behavior gap still exists and requires comprehensive solutions. Fourth, digital technology and social media hold great potential for educating and promoting green products to Generation Z. Fifth, cultural and geographical contexts influence the formation of attitudes and behavior, so strategies must be tailored locally.

Finally, there are implementation challenges such as price, convenience, and product availability, which can be addressed through a combination of education, incentives, and regulation. Overall, a holistic approach is needed that combines awareness raising, product availability, effective policies, and the use of digital technology, tailored to the cultural and geographical context to encourage sustainable consumption behaviors among Generation Z.

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