
PSYCHOLOGICAL APPROACH OF ECO-FRIENDLY PACKAGING IN SUSTAINABLE PROSPECTIVE: FUZZY MODEL

Rahul Kumar Upadhyay¹, Mohammad Raghieb Sayeed² and Ajhar Hussain^{3*}¹Faculty of Management Studies, University of Delhi, Delhi, India 110007²Department of Business Administration, Aligarh Muslim University, Aligarh, UP, India 202002³Department of Geology, Aligarh Muslim University, Aligarh, UP, India 202002³glyazhar@gmail.com**ABSTRACT**

The global environmental crisis has prompted a paradigm shift towards sustainable practices, with eco-friendly packaging emerging as a crucial component. This research article critically reviews the psychological aspects surrounding the adoption and acceptance of eco-friendly packaging from a sustainable perspective. By examining consumer behaviour, attitudes, and perceptions, this study aims to provide insights into the factors influencing the success of eco-friendly packaging initiatives and their implications for sustainable development. In response to the escalating global environmental crisis, this critical review delves into the psychological intricacies surrounding the adoption and acceptance of eco-friendly packaging within the context of sustainability. As societies grapple with the adverse effects of climate change, resource depletion, and plastic pollution, the imperative for sustainable practices in packaging has gained prominence. Understanding the psychological dimensions of this paradigm shift is fundamental to navigating the complex interplay of consumer behaviour, brand perceptions, and marketing strategies in the pursuit of eco-friendly alternatives. The first focal point of this review centers on consumer behaviour, elucidating the psychological factors that guide individuals in their choices regarding eco-friendly packaging. Moving beyond individual choices, the second facet investigates the symbiotic relationship between eco-friendly packaging and brand perception. An in-depth examination of how sustainability practices contribute to positive brand images and engender brand loyalty forms a crucial aspect of this review. The third dimension of this review focuses on marketing and communication strategies employed by businesses to promote eco-friendly packaging. The findings aim to contribute to a more sustainable and environmentally responsible future by fostering informed decision-making and strategic interventions. The fuzzy mathematical model effectively captures consumer perceptions of eco-friendly packaging, revealing that visual appeal, eco-label credibility, and environmental concern significantly influence sustainable purchasing behaviour, while price and functionality act as moderating factors guiding sustainable marketing, policy formulation, and eco-design strategies in emerging green markets like India.

Keywords: Eco-friendly packaging, Sustainability, Psychology, Environmental awareness, Businesses, Fuzzy model.

1. INTRODUCTION

The escalating environmental concerns, including climate change and plastic pollution, have led to an increased focus on sustainable practices across various industries. Packaging, being a significant contributor to environmental degradation, has drawn attention to the need for eco-friendly alternatives. This article explores the psychological dimensions underlying the acceptance and adoption of eco-friendly packaging, emphasizing its role in fostering sustainability. In the past decade, environmentalism has evolved into a crucial business movement, driven by growing concerns about acid rains, ozone layer depletion, land degradation, and numerous other urgent environmental issues, as highlighted by Dhiraj in 2014. The global environmental landscape is undergoing a profound transformation as concerns about climate change, resource depletion, and plastic pollution continue to escalate. In response to this environmental crisis, there has been a growing recognition of the need for sustainable practices across various industries. One area that has come under intense scrutiny is packaging, a ubiquitous component of modern consumer culture and commerce. As societies grapple with the consequences of excessive waste and ecological degradation, the demand for eco-friendly packaging solutions has surged, marking a pivotal shift in the way products are packaged, distributed, and consumed. The extensive presence of plastic bags in landfills poses a threat to environmental degradation. While consumer behaviour, particularly improper disposal of product waste, contributes to environmental harm, the implementation of green marketing by businesses has the potential to significantly reduce product waste, as emphasized by Kassey in 2001.

This research embarks on a critical examination of the psychological dimensions inherent in the adoption and acceptance of eco-friendly packaging within the broader framework of sustainability. The intersection of

psychology and environmentalism is a burgeoning field of study, and understanding the intricacies of consumer behaviour, perceptions, and attitudes towards eco-friendly packaging is integral to the successful implementation of sustainable practices. As such, this critical review aims to shed light on the psychological underpinnings of the eco-friendly packaging paradigm, offering insights into the factors influencing consumer choices and the implications for sustainable development. Consumer behaviour lies at the heart of this exploration, as individuals play a pivotal role in shaping market trends and influencing the decisions of businesses. The first objective of this research is to delve into the psychological factors that guide consumers in their preferences for or against eco-friendly packaging. By examining the role of environmental awareness, perceived benefits, and social influence, this study seeks to unravel the complex interplay of cognitive, emotional, and social factors that drive consumer choices in the realm of sustainable packaging. Beyond the individual level, the impact of eco-friendly packaging extends to the corporate realm, influencing how brands are perceived by consumers. The second objective of this research is to assess the relationship between eco-friendly packaging and brand perception, investigating how sustainability practices contribute to positive brand images and, subsequently, foster brand loyalty. As businesses increasingly recognize the importance of aligning their practices with environmental values, understanding the psychological dynamics of brand perception becomes essential for strategic decision-making.

Effectively communicating the benefits of eco-friendly packaging is a critical aspect of encouraging its adoption. Therefore, the third objective of this research is to scrutinize the marketing and communication strategies employed by businesses to promote eco-friendly packaging. By examining the role of information framing, visual appeals, and the influence of social media, this study aims to unravel the communication mechanisms that resonate with consumers and drive positive perceptions of sustainable packaging options. Green marketing has gained popularity in developed nations, but its application could yield substantial benefits for developing countries by embracing the three R's of environmentalism: Reduce waste generation, Reuse old items through donation or repair, and Recycle as much as possible, including supporting the purchase of recycled products. This insight is highlighted by Dhiraj in 2014. The environmental impact and cost efficiencies in supply chains are significantly influenced by the packaging industry, spanning the phases of packaging design development, materials procurement, and end-of-life treatment, as emphasized by Pålsson and Hellström in 2016. There is a growing momentum towards sustainable packaging, driven by stakeholder demands for change across various sectors, as noted by Kozik (2020). Moreover, an escalating number of organizations are transitioning towards establishing an ethical packaging industry that encompasses environmental and social considerations alongside economic aspects, as highlighted by Marsh and Bugusu in 2007. Schwartz (1977) suggests that within the realm of environmentalism or sustainable behaviour, moral norms come into play when individuals recognize the negative consequences for both themselves and others. It involves acknowledging the responsibility that their actions can either prevent or influence these consequences.

The synthesis of these objectives will contribute to a comprehensive understanding of the psychological approach to eco-friendly packaging. As businesses navigate the complex terrain of sustainable practices, policymakers develop regulations, and consumers make choices that align with their values, this critical review seeks to provide valuable insights that can guide these diverse stakeholders towards a more sustainable and environmentally responsible future. By critically examining the psychological facets of eco-friendly packaging, this research aims to foster a deeper appreciation for the interconnectedness of human behaviour, environmental consciousness, and the imperative for sustainable development.

In recent years, eco-friendly packaging has emerged as a critical factor influencing consumer behaviour and brand perception within sustainable markets. Beyond functional benefits, packaging exerts a psychological impact, shaping purchase intentions and willingness to pay for environmentally responsible products (Magnier & Schoormans, 2015; Silayoi & Speece, 2007). However, consumer perceptions of sustainability are often vague and subjective, influenced by visual cues, eco-label credibility, and social norms. Fuzzy logic provides a robust framework to model such uncertainty, translating qualitative judgments into quantitative insights, thereby enabling firms to align packaging strategies with consumer psychology and sustainability goals (Zadeh, 1965; Jang, 1993).

2. OBJECTIVES OF THE STUDY

- To analyse the psychological factors influencing consumer behaviour towards eco-friendly packaging.
- To evaluate the impact of eco-friendly packaging on brand perception and loyalty.

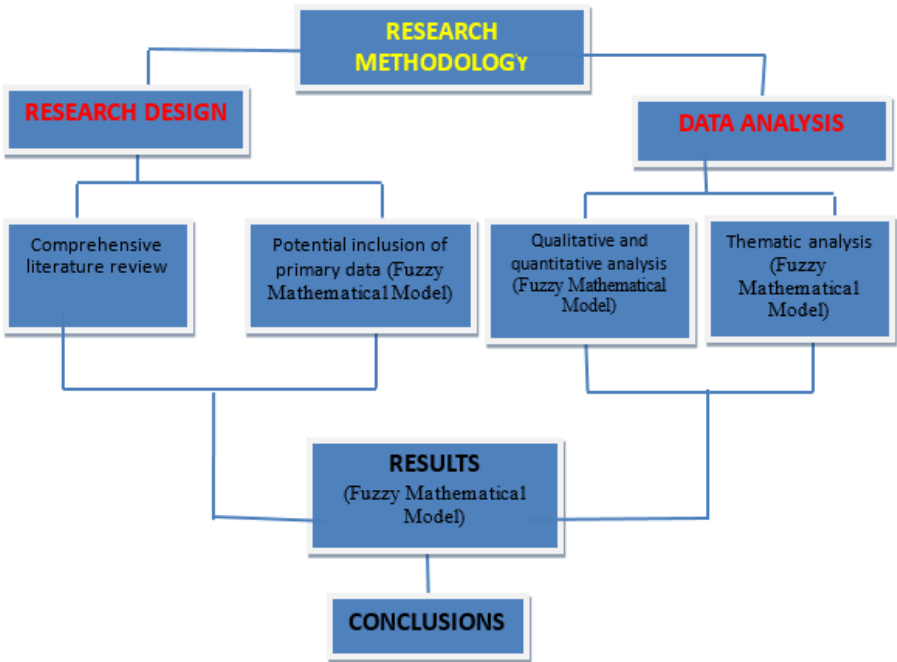
- To assess the role of marketing and communication strategies in promoting eco-friendly packaging.
- To discuss the implications of psychological insights for sustainable packaging initiatives.

3. LITERATURE REVIEW

According to some researchers different observations have different opinions regarding this exciting outcome. The definition of eco-friendly or sustainable packaging provided by Svanes et al. (2010) emphasizes two key aspects: materials and economic sustainability. The purpose of this study was to find out if sustainable packaging can be used as a marketing tool, along with who consumes sustainable packaging (Gonzalez, Van Huynh and Yousef, 2009). Understanding the green elements of packaging and dividing them into structural cues, graphical cues and informational cues (Magnier and Crie 2015). Ajzen 1991, state that the Theory of Planned Behaviour with a discussion on the relationship between attitudes, subjective norms, perceived behavioural control and consumer behaviour. Understanding the various elements of packaging and dividing them into graphic and structural categories. Discussions about how consumers perceive sustainable packaging along with some common misconceptions (Ampuero and Vila 2006). Bem 1967, possible relationship between buying and disposal behaviour. Exploring the factors that drive consumers to opt for green packaging and investigating whether socio-economic demographics play a role in shaping their choices, as discussed by Rokka and Uusitalo in 2008. Thøgersen's perspective in 1999 sheds light on comprehending consumer attitudes when confronted with packaging choices. The discussion delves into how consumers' moral norms impact their decisions and offers insights into the influence of sustainable packaging on consumer behaviour, particularly in terms of purchasing and disposal actions. The exploration also involves scrutinizing the connection between buying and disposal behaviours, as articulated by Van Birgelen, Semeijn, and Keicher in 2009.

4. METHODOLOGY

This research employs a comprehensive review of existing literature, incorporating studies from psychology, marketing, and environmental sciences. Primary data may also be collected through surveys and interviews to gain insights into current consumer attitudes towards eco-friendly packaging.



5. RESULTS AND DISCUSSION

5.1 Consumer Behaviour and Eco-Friendly Packaging: Understanding consumer behaviour is pivotal for the success of eco-friendly packaging initiatives. This section reviews existing literature on the psychological factors shaping consumer attitudes and intentions towards sustainable packaging. Key factors such as environmental awareness, perceived benefits, and social influence are explored in depth.

5.1.1. Environmental Awareness

Consumer behaviour is increasingly influenced by environmental awareness, especially regarding eco-friendly packaging. As consumers become more conscious of sustainability, they prefer products with recyclable,

biodegradable, or minimal packaging (Singh & Pandey, 2018). Studies reveal that perceived environmental benefits and personal values significantly affect purchasing decisions (Testa et al., 2021). Companies adopting green packaging not only improve brand image but also foster consumer loyalty. However, price sensitivity and lack of information can hinder adoption. Educating consumers and promoting visible eco-labelling are vital to bridging the attitude-behaviour gap (Magnier & Schoormans, 2015).

Consumer behaviour plays a pivotal role in shaping the trajectory of sustainability initiatives, particularly concerning the adoption of eco-friendly packaging. Within the realm of environmental awareness, consumers are increasingly cognizant of the ecological footprint associated with traditional packaging materials, propelling a demand for more sustainable alternatives. This shift in consumer consciousness is underpinned by a heightened awareness of environmental issues, such as climate change, plastic pollution, and resource depletion. As individuals become more informed about the consequences of their consumption patterns, there is a growing inclination to align purchasing decisions with eco-conscious values. Research indicates that consumers who prioritize environmental considerations in their decision-making processes are more likely to opt for products packaged in materials with minimal ecological impact. This attitudinal shift is reflective of a broader societal movement towards responsible consumerism, where individuals seek to minimize their environmental impact through sustainable choices. Key psychological factors influencing consumer behaviour in the context of eco-friendly packaging and environmental awareness include the perceived benefits associated with sustainable choices. Consumers often weigh factors such as recyclability, biodegradability, and overall environmental friendliness when evaluating packaging options. The psychological phenomenon of cognitive dissonance further emphasizes the internal conflict that arises when individuals recognize the misalignment between their values and unsustainable consumption practices. To alleviate this dissonance, consumers are more likely to opt for eco-friendly packaging options that align with their environmental values. An integral element of advancing sustainable packaging is the need to inform consumers about its role in sustainable development and the broader environmental benefits it offers. This undertaking demands effort and dedication from diverse stakeholders who stand to gain from cultivating a consumer perception that views packaging as more than mere waste or disposable material (Doyle, 1996). Social influence also plays a crucial role in shaping consumer behaviour in the realm of eco-friendly packaging. As sustainability becomes a shared value within communities and social circles, individuals are more likely to adopt environmentally friendly practices to conform to societal norms. The influence of peer groups, social media, and community dialogues contributes to the normalization of eco-conscious choices. Companies that effectively communicate their commitment to sustainability through eco-friendly packaging capitalize on this social influence, leveraging consumer desire for alignment with shared values.

In last, consumer behaviour in the context of eco-friendly packaging is intrinsically linked to environmental awareness. As consumers become more conscious of the environmental impact of their choices, they are inclined to favour products packaged sustainably. The psychological factors at play, including perceived benefits, cognitive dissonance, and social influence, collectively shape consumer attitudes and drive the demand for eco-friendly packaging options. Businesses that understand and respond to these psychological dimensions can strategically position themselves to meet the evolving expectations of environmentally conscious consumers, contributing to both ecological sustainability and corporate success.

5.1.2. Perceived Benefits of Eco-Friendly Packaging

Consumer behaviour in the realm of eco-friendly packaging is intricately linked to the perceived benefits associated with sustainable choices. As environmental concerns continue to gain prominence, consumers are increasingly evaluating the ecological impact of their purchasing decisions, including the packaging that accompanies products. The perceived benefits of eco-friendly packaging encompass a multifaceted spectrum, influencing consumer attitudes and preferences. One of the primary perceived benefits is the positive environmental impact of utilizing materials that are biodegradable, recyclable, or made from renewable resources. Consumers who prioritize sustainability often perceive eco-friendly packaging as a means to reduce their carbon footprint and contribute to the broader goal of environmental conservation. Frequently, packaging is regarded as a key contributor to the growth of the waste stream, prompting many sustainability initiatives to concentrate on diminishing both the volume of packaging waste and lowering energy consumption through strategies such as material and resource reduction, alternative fuels, and improved transportation methods (Kalkowski, 2007). Additionally, the health and safety considerations associated with eco-friendly packaging contribute to its perceived benefits. Traditional packaging materials, often derived from petrochemicals, may

contain harmful substances that can leach into the environment or the packaged products themselves. In contrast, eco-friendly packaging options, such as those made from natural fibres or plant-based materials, are perceived as safer alternatives. This perception resonates with health-conscious consumers who prioritize the well-being of both themselves and the environment.

The psychological phenomenon of cognitive dissonance plays a role in shaping consumer preferences for eco-friendly packaging based on perceived benefits. When consumers recognize a misalignment between their values and unsustainable choices, cognitive dissonance arises, prompting them to seek resolutions that alleviate this internal conflict. Eco-friendly packaging, perceived as a more ethical and responsible choice, provides a resolution to this cognitive dissonance for environmentally conscious consumers. Moreover, the perceived benefits of eco-friendly packaging extend to the broader societal and cultural context. As sustainability becomes a cultural value, consumers may choose eco-friendly packaging as a way to align with prevailing social norms and demonstrate their commitment to responsible consumption. This social dimension of perceived benefits is particularly evident in the age of social media, where individuals share and showcase their sustainable lifestyle choices, further influencing and normalizing eco-friendly behaviours. Consumer behaviour regarding eco-friendly packaging is strongly influenced by the perceived benefits associated with sustainable choices. The positive environmental impact, health considerations, resolution of cognitive dissonance, and alignment with social norms collectively contribute to the attractiveness of eco-friendly packaging options. Understanding and effectively communicating these perceived benefits are pivotal for businesses seeking to cater to the growing demand for sustainable packaging and align with the values of environmentally conscious consumers.

5.1.3. Social Influence on Consumer Choices

Consumer behaviour in the realm of eco-friendly packaging is significantly influenced by social factors that shape individual choices. Social influence plays a pivotal role in the adoption and normalization of sustainable practices, including the preference for eco-friendly packaging. As consumers navigate the complex landscape of environmental consciousness, the impact of peer groups, community dialogues, and broader societal trends becomes increasingly evident in shaping purchasing decisions. The concept of social influence draws attention to the power of conformity, where individuals tend to align their behaviours with prevailing social norms and the actions of others.

Consumer behaviour toward eco-friendly packaging is increasingly shaped by social influence, including peer pressure, social norms, and environmental awareness campaigns. Consumers are more likely to choose sustainable products when these are endorsed by their social circles or align with perceived societal expectations (White et al., 2019). Eco-conscious branding and peer approval can significantly sway purchasing decisions, especially among younger demographics (Grankvist & Biel, 2007). As environmental concerns rise, the role of social identity and normative influence in promoting eco-friendly packaging becomes critical for marketers and policymakers (Peattie & Crane, 2005)

In the context of eco-friendly packaging, social influence manifests in various ways. Peer groups, both offline and online, contribute to the dissemination of information and the cultivation of shared values. As sustainability becomes a shared societal goal, individuals are more likely to adopt eco-friendly packaging options to conform to the expectations of their social circles. Social media platforms, in particular, amplify the influence of peers and influencers, allowing for the rapid spread of sustainable practices and the normalization of eco-friendly choices. Community dialogues and local initiatives further contribute to the social influence on consumer choices related to eco-friendly packaging. Events, discussions, and awareness campaigns within communities foster a collective sense of responsibility towards the environment. Consumers are more likely to adopt eco-friendly packaging when they perceive it as a means to align with community values and contribute to shared sustainability goals.

Corporate social responsibility (CSR) initiatives also leverage social influence to shape consumer preferences. Companies that actively communicate their commitment to sustainable practices, including the use of eco-friendly packaging, resonate with consumers who seek alignment with socially responsible brands. The positive association between brands and sustainability practices, when effectively communicated, can lead to increased consumer trust and loyalty, further reinforcing the impact of social influence on consumer choices. Finally, social influence is a powerful driver of consumer behaviour regarding eco-friendly packaging. The influence of peer groups, community values, and societal trends collectively shape individual choices, fostering a consumer culture that prioritizes sustainability. As businesses navigate this landscape, understanding the dynamics of social influence becomes crucial for developing effective marketing strategies and communication campaigns

that resonate with the values of environmentally conscious consumers. By aligning with prevailing social norms, businesses can leverage social influence to promote eco-friendly packaging and contribute to a broader societal shift towards sustainable consumption.

5.2 Brand Perception and Loyalty: The relationship between eco-friendly packaging and brand perception is examined, considering how consumers perceive brands adopting sustainable practices. Loyalty, as a consequence of positive brand perception, is discussed in the context of eco-friendly packaging, highlighting the long-term benefits for businesses committed to sustainability. Eco-friendly packaging significantly influences consumer behaviour, shaping brand perception and loyalty. Environmentally conscious consumers tend to associate sustainable packaging with responsible corporate practices, leading to positive brand evaluations and repeat purchases (Magnier & Schoormans, 2015). Studies indicate that green packaging enhances trust, especially among millennials and Gen Z, who prioritize ethical consumption (Ng et al., 2014). Brands adopting biodegradable or recyclable materials can foster emotional connections and brand loyalty (Steenis et al., 2017). As sustainability becomes a market differentiator, companies must align packaging strategies with consumer values to remain competitive in eco-conscious markets.

5.2.1 Relationship Between Eco-Friendly Packaging And Brand Perception

Throughout the history of marketing, packaging has consistently held a crucial role within the diverse marketing mix. Beyond its primary function of shielding the product from external elements, packaging facilitates convenient transportation and has demonstrated its impact on consumer choices during the purchasing process (Kuvykaite et al., 2009). The relationship between eco-friendly packaging and brand perception is a dynamic interplay that has profound implications for businesses in the contemporary marketplace. Eco-friendly packaging serves as a tangible expression of a company's commitment to sustainability, environmental responsibility, and corporate social responsibility (CSR). When companies adopt eco-friendly packaging practices, consumers often perceive them as socially conscious entities that prioritize environmental well-being over profit margins. This positive association contributes significantly to brand perception, influencing how consumers view and connect with a brand. Businesses that embrace eco-friendly packaging are often seen as ethical and forward-thinking, aligning their values with the growing environmental consciousness of consumers.

The positive relationship between eco-friendly packaging and brand perception extends beyond the immediate environmental impact to encompass broader societal expectations. As consumers increasingly demand corporate accountability and ethical business practices, eco-friendly packaging becomes a symbol of a company's dedication to reducing its ecological footprint. This commitment resonates with environmentally conscious consumers, creating a positive halo effect that elevates the overall perception of the brand. Moreover, studies suggest that consumers are more likely to develop a sense of brand loyalty when they perceive a company as environmentally responsible through its adoption of eco-friendly packaging practices. On the contrary, businesses that neglect sustainability in their packaging may face negative repercussions in brand perception. Instances of environmental harm or the use of non-recyclable materials can lead to reputational damage, eroding consumer trust and loyalty. In an era where transparency is valued, consumers are increasingly scrutinizing brands for their environmental practices, making it imperative for companies to align their packaging strategies with sustainability goals.

The communication of a brand's commitment to eco-friendly packaging is equally crucial in shaping brand perception. Transparent and authentic communication about sustainable initiatives fosters a sense of trust between the brand and consumers. Companies that effectively communicate the rationale behind their eco-friendly packaging choices, highlight the environmental benefits, and showcase their dedication to sustainability contribute to a positive brand image. In conclusion, the relationship between eco-friendly packaging and brand perception is symbiotic, with each influencing the other in profound ways. The adoption of sustainable packaging practices not only reflects a commitment to environmental stewardship but also enhances brand perception by appealing to the values of socially conscious consumers. The positive association between eco-friendly packaging and a brand's image underscores the strategic importance for businesses to prioritize sustainability in their packaging choices, contributing to long-term brand loyalty and success in an environmentally conscious market.

5.2.2 Influence of Sustainability Practices on Brand Loyalty

The influence of sustainability practices on brand loyalty is a critical dimension in contemporary consumer behaviour and corporate strategy. Sustainability, encompassing eco-friendly practices, ethical sourcing, and

social responsibility, has emerged as a key factor shaping consumer preferences and influencing brand loyalty. Consumers today are not merely making purchasing decisions based on the quality and price of products; they are increasingly considering the ethical and environmental footprint of the brands they support. Brands that integrate sustainability practices, including environmentally friendly initiatives, resonate with a growing segment of socially conscious consumers. The positive impact of such practices on brand loyalty is evident in studies that show consumers are more likely to remain loyal to brands that align with their values and contribute to social and environmental well-being. Brundtland Commission 1987 defined Sustainable Development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'; this would involve three principles of sustainability to be addressed namely economic, social and environmental (Nordin and Selke, 2010). In the context of packaging, it would mean integrating the broad aspects of sustainable development in the business and strategies which would affect the life cycle of product/systems throughout each stage of the supply chain. The adoption of sustainability practices, particularly in the context of eco-friendly packaging and responsible sourcing, creates a narrative that extends beyond the product itself. It becomes a powerful tool for building a brand image centered around ethical and responsible business conduct. Companies that prioritize sustainability are perceived as forward-thinking and socially responsible entities, fostering a sense of trust and connection with their customer base. This positive association not only attracts new customers but also solidifies the loyalty of existing ones who appreciate the brand's commitment to making a positive impact on the world. The impact of sustainability practices on brand loyalty is magnified in industries where environmental and social concerns are paramount. For example, in the fashion and food industries, consumers are increasingly gravitating towards brands that demonstrate ethical and sustainable practices, including fair labour, cruelty-free processes, and eco-friendly packaging. Loyalty in such cases is not merely transactional but is rooted in a deeper connection between the consumer and the brand's values.

Effective communication of sustainability efforts is pivotal in leveraging their influence on brand loyalty. Brands that transparently convey their commitment to sustainability, backed by tangible actions, create a narrative that resonates with consumers. This communication fosters a sense of authenticity, crucial for building trust and reinforcing the brand-consumer relationship. Companies that greenwash, merely projecting a sustainable image without substantive action, risk eroding trust and compromising brand loyalty. In conclusion, the influence of sustainability practices on brand loyalty underscores the evolving expectations of consumers who seek more than just products – they seek a shared commitment to ethical, environmental, and social values. As sustainability becomes integral to brand identity, businesses that authentically embrace and communicate their sustainable practices are poised not only to attract conscientious consumers but also to cultivate enduring brand loyalty in an era where ethical considerations weigh heavily in purchasing decisions.

5.3 Marketing and Communication Strategies: Effective communication is essential for conveying the benefits of eco-friendly packaging to consumers. This section reviews literature on marketing and communication strategies employed by companies to promote sustainable packaging. The role of information framing, visual appeals, and social media in influencing consumer perceptions is discussed. Understanding consumer behaviour is crucial in promoting eco-friendly packaging through marketing and communication strategies. Consumers are increasingly influenced by environmental concerns, preferring brands that demonstrate sustainable practices (Smith & Brower, 2012). Eco-labels, green packaging, and transparent communication enhance trust and purchase intent (Magnier & Schoormans, 2015). Effective marketing strategies must align with consumers' values, using emotional appeals, information transparency, and visual cues to reinforce eco-consciousness (Ng & Paladino, 2020). Companies adopting such approaches not only fulfill social responsibility but also gain competitive advantage.

5.3.1 Role of Information Framing: The role of information framing in eco-friendly packaging is a critical aspect of shaping consumer perceptions and influencing purchasing decisions. Information framing refers to the strategic presentation of information to emphasize particular aspects and guide interpretations. In the context of eco-friendly packaging, how information is framed—whether emphasizing environmental benefits, reduced carbon footprint or the use of sustainable materials—can significantly impact consumer attitudes and behaviours. Effective information framing leverages psychological principles to convey the positive attributes of eco-friendly packaging. When information is framed positively, highlighting the environmental advantages and the positive impact on sustainability, consumers are more likely to perceive eco-friendly packaging as an attractive and responsible choice. For instance, framing messages in terms of "reducing plastic waste" rather

than "avoiding non-eco-friendly materials" tends to resonate more positively with consumers, emphasizing the positive environmental outcome of their choice. Furthermore, the framing of information plays a crucial role in overcoming potential barriers to the adoption of eco-friendly packaging. By addressing perceived inconveniences, such as higher costs or changes in familiar packaging formats, through positive framing, companies can mitigate resistance and encourage consumer acceptance. Emphasizing the long-term benefits and societal contributions of choosing eco-friendly packaging can help shift consumer perceptions, framing sustainability as an investment rather than a sacrifice.

The psychological phenomenon of loss aversion also comes into play in information framing. Presenting eco-friendly packaging as an opportunity to avoid environmental harm and contribute to positive change rather than framing it as avoiding negative consequences can be more persuasive. This positive framing taps into consumers' desire to make choices that align with their values and contribute to a better future, making them more receptive to eco-friendly packaging options.

Moreover, the framing of information extends to visual representations, packaging design, and labelling. The use of eco-friendly symbols, certifications, and images that convey a connection to nature can enhance the positive framing of eco-friendly packaging, reinforcing the message of sustainability and environmental responsibility. Visual elements, when aligned with positive information framing, create a holistic and compelling narrative that resonates with consumers. In conclusion, the role of information framing in eco-friendly packaging is a strategic imperative for businesses seeking to promote sustainable choices. By strategically presenting information in a positive light, companies can influence consumer perceptions, overcome potential barriers, and foster a positive attitude towards eco-friendly packaging. Understanding the psychological nuances of information framing allows businesses to effectively communicate the environmental benefits of their packaging choices and encourage consumers to make more sustainable decisions.

5.3.2 Visual Appeals and Packaging Design: The role of visual appeals and packaging design in eco-friendly packaging is a vital aspect of influencing consumer choices and fostering sustainable behaviours. In an era where first impressions significantly impact consumer decision-making, the visual presentation of eco-friendly packaging plays a pivotal role in capturing attention and conveying a brand's commitment to sustainability. Visual aesthetics, colour schemes, and design elements all contribute to shaping consumer perceptions and attitudes towards eco-friendly packaging options.

A well-designed eco-friendly packaging not only conveys a brand's dedication to environmental responsibility but also enhances the overall consumer experience. Visual appeals can evoke positive emotions, creating a connection between the consumer and the product. Employing nature-inspired colours, images of sustainability, and eco-friendly symbols can instill a sense of harmony with the environment, reinforcing the message of responsible consumption. The design elements should be cohesive with the brand's identity, creating a visual narrative that aligns with the values of eco-conscious consumers. Moreover, visual appeals can also serve to differentiate eco-friendly packaging from traditional counterparts on the shelf. Clear communication of sustainability features through design elements, such as highlighting recyclability or the use of biodegradable materials, helps consumers make informed choices quickly. Visual cues that convey a sense of freshness, healthiness, and ethical sourcing can further enhance the appeal of eco-friendly packaging, especially in markets where health and sustainability are integral to consumer preferences. In the context of eco-friendly packaging, the importance of transparency is paramount. Visual appeals should not only be aesthetically pleasing but also convey clear and truthful information about the sustainability attributes of the packaging. This transparency builds trust with consumers, reinforcing the authenticity of a brand's commitment to eco-friendly practices. Packaging design extends beyond the visual realm to incorporate functional aspects that enhance the eco-friendly nature of the packaging. User-friendly designs, easy recyclability, and instructions for proper disposal contribute to the overall appeal of eco-friendly packaging. Consumers are more likely to embrace sustainable choices when the packaging design aligns with their values and provides a seamless and positive user experience.

In last, visual appeals and packaging design are integral components of successful eco-friendly packaging strategies. By leveraging visual aesthetics, nature-inspired elements, and transparent communication, businesses can create packaging that not only stands out on the shelf but also resonates with environmentally conscious consumers. Packaging design, when aligned with sustainable values and user-friendly features, becomes a powerful tool for promoting eco-friendly choices and contributing to the broader shift towards sustainable consumption patterns.

5.3.3 Social Media in Promoting Eco-Friendly Packaging: Social media has emerged as a powerful tool in promoting eco-friendly packaging, playing a pivotal role in shaping consumer perceptions, influencing behaviours, and fostering sustainability awareness. The dynamic nature of social media platforms facilitates the rapid dissemination of information, enabling businesses to communicate their commitment to eco-friendly practices and engage with a diverse audience. Companies leveraging social media effectively can harness its potential to create a positive impact on consumer choices, encouraging the adoption of sustainable packaging options. One of the primary ways in which social media promotes eco-friendly packaging is by providing a platform for companies to share their sustainability initiatives and practices. Through posts, videos, and interactive content, businesses can showcase their efforts towards adopting environmentally conscious packaging materials, reducing waste, and implementing recycling programs. Such transparency resonates with consumers who are increasingly interested in the ethical and sustainable dimensions of the brands they support.

Moreover, social media facilitates direct communication between brands and consumers, creating an avenue for educating the audience about the environmental benefits of eco-friendly packaging. Companies can use social media channels to disseminate information about the life cycle of their packaging materials, the reduction of carbon footprint, and the positive impact on ecosystems. Educational content helps consumers make informed choices and fosters a deeper understanding of the significance of eco-friendly packaging in mitigating environmental challenges. Social media's interactive features, such as polls, surveys, and challenges, provide opportunities for businesses to engage with their audience and gauge consumer preferences and attitudes towards eco-friendly packaging. Creating awareness campaigns, incorporating user-generated content, and initiating discussions around sustainable practices can catalyse a community-driven approach towards embracing eco-friendly packaging. Social media acts as a virtual forum where consumers can share experiences, ask questions, and contribute to a collective understanding of the importance of sustainable choices.

In addition, social media influencers and environmental activists play a crucial role in promoting eco-friendly packaging. Collaborations between brands and influencers who advocate for sustainability amplify the reach of messages and inspire their followers to adopt eco-conscious behaviours. The visual and narrative appeal of influencer-driven content effectively communicates the desirability and relevance of eco-friendly packaging in a manner that resonates with diverse audiences. In conclusion, social media serves as a dynamic and influential platform for promoting eco-friendly packaging. Through transparent communication, educational initiatives, interactive engagement, and collaborations with influencers, businesses can leverage social media to foster a community-driven movement towards sustainable practices. The role of social media in promoting eco-friendly packaging extends beyond marketing; it is a catalyst for shaping societal values, influencing consumer behaviour, and contributing to the broader shift towards a more sustainable and environmentally conscious future.

5.4 Psychological Factors Influencing Consumer Behaviour: The analysis of psychological factors, such as environmental consciousness, convenience, and cost, reveals their intricate interplay in shaping consumer preferences for eco-friendly packaging. Insights are drawn from recent studies to provide a nuanced understanding of these factors. Consumer behaviour toward eco-friendly packaging is increasingly shaped by psychological factors such as environmental concern, perceived consumer effectiveness, and social influence. Studies show that consumers with higher ecological awareness are more likely to choose sustainable packaging (Magnier & Schoormans, 2015). Perceived value and trust in green claims also significantly impact purchasing decisions (Steenis et al., 2017). Moreover, normative beliefs and emotional engagement with nature play a crucial role in forming eco-conscious attitudes (White et al., 2019). Understanding these psychological motivators is essential for brands aiming to align their packaging strategies with sustainability and consumer expectations.

5.5 Impact on Brand Perception and Loyalty: Case studies and empirical evidence are presented to illustrate the positive correlation between eco-friendly packaging and enhanced brand perception. The discussion delves into the implications for brand loyalty, emphasizing the potential long-term benefits for businesses embracing sustainable packaging. Eco-friendly packaging significantly influences consumer behaviour, shaping perceptions of brand ethics and sustainability. Consumers increasingly prefer brands that demonstrate environmental responsibility, often associating green packaging with higher product quality and corporate integrity (Magnier & Cri  , 2015). Such perceptions foster emotional connections and trust, enhancing brand loyalty (Nguyen et al., 2020). Moreover, sustainable packaging serves as a visual cue for ethical consumption,

particularly among environmentally conscious consumers (Prakash & Pathak, 2017). Thus, eco-friendly packaging is not merely a functional choice but a strategic branding tool that can improve consumer retention and competitive advantage.

5.6 Role of Marketing and Communication Strategies: Exemplary cases of successful marketing and communication strategies are examined to highlight their role in influencing consumer perceptions of eco-friendly packaging. The discussion emphasizes the need for consistent and transparent communication to build trust and credibility. The packaging of a product is a communication instrument between the businesses and end users, capable of attracting a consumer's attention instantly if used correctly (Draskovic et al., 2009).

5.7 Implications for Sustainable Development: This section synthesizes the findings to draw conclusions regarding the psychological approach to eco-friendly packaging and its implications for sustainable development. Recommendations are provided for businesses, policymakers, and researchers to promote the widespread adoption of sustainable packaging practices. Although many companies have been putting in significant efforts, resources and initiatives into refocusing sustainability from a conceptual goal or an idea to an immediate priority integrated in their company values, relatively little is known about consumer's perception of sustainable packaging (Nordin and Selke, 2010).

6. FUZZY MATHEMATICAL MODEL

6.1. General Statement

In contemporary sustainability research, eco-friendly packaging has become a powerful determinant of consumer choice and brand perception. The shift toward sustainable packaging is not merely a functional or environmental response but also a psychological phenomenon deeply rooted in consumers' perceptions, beliefs, and attitudes (Magnier & Schoormans, 2015; Silayoi & Speece, 2007). However, human judgments about eco-packaging are inherently uncertain, influenced by linguistic variables such as "looks environmentally friendly," "appears credible," or "seems overpriced." These expressions represent imprecise and subjective evaluations that are difficult to capture with classical statistical models. To handle such uncertainty, fuzzy logic (Zadeh, 1965) offers an effective framework, allowing consumer perceptions and sustainability attitudes to be modeled through linguistic rules and degrees of membership rather than crisp values.

By applying fuzzy logic, this model captures the nuances of how eco-friendly packaging attributes—such as visual cues, eco-label credibility, price perception, and social influence—affect psychological outcomes like purchase intention (PI) and willingness to pay (WTP) within a sustainable consumption framework. The proposed fuzzy model builds upon psychological theories of planned behavior (Ajzen, 1991) and consumer attitude models while integrating sustainability-driven marketing concepts. It provides both a conceptual and computational tool for analyzing consumer behavior in an uncertain, multidimensional decision context.

6.2. Model Objectives

The model aims to:

1. Quantify the influence of eco-friendly packaging perceptions on consumer psychological responses under uncertainty.
2. Represent qualitative attributes through fuzzy linguistic variables.
3. Identify the relative importance of packaging design, labelling, and social influence on purchase intention (PI) and willingness to pay (WTP).
4. Provide a decision-support tool for sustainable marketing and product design strategies.

6.3. Input and Output Variables

Let the input variable vector be:

$$x = [V, C, L, P, F, S, E]^T$$

where each variable lies in the normalized interval $[0,1]$:

V = Visual eco-cues

C = Verbal eco-claims

L = Eco-label credibility

P = Price perception

F = Functional performance

S = Social influence

E = Environmental concern

Symbol	Variable	Description
(V)	Visual eco-cues	Design, color, shape, texture conveying “green” appearance
(C)	Verbal eco-claims	Words or symbols (e.g., “100% biodegradable,” “recyclable”)
(L)	Eco-label credibility	Trustworthiness of certifications (e.g., FSC, ISO 14001)
(P)	Price perception	Relative affordability or expensiveness of eco-packaging
(F)	Functional performance	Utility, convenience, and product protection
(S)	Social influence	Perceived social acceptance and peer influence
(E)	Environmental concern	Personal pro-environmental values and awareness

The outputs are consumer responses:

y_1 : Purchase Intention (PI), range [0, 1]

y_2 : Willingness to pay premium (WTP), range [0, 1]

6.4. Fuzzy Set Representation

Each input variable is represented by three linguistic terms:

$L_i = \{\text{Low (L), Medium (M), High (H)}\}$

Each output is represented by five terms:

$L_y = \{\text{Very Low, Low, Medium, High, Very High}\}$

The triangular membership function

A fuzzy set $A(a,b,c)$ is defined by:

$\mu_A(x) = 0 \ (x \leq a); (x-a)/(b-a) \ (a < x \leq b); (c-x)/(c-b) \ (b < x < c); 0 \ (x \geq c)$.

Example parameterization:

Low = (0, 0, 0.5)

Medium = (0.25, 0.5, 0.75)

High = (0.5, 1, 1)

These parameters may be refined using expert opinions or machine learning optimization (Jang, 1993).

6.5. Fuzzy Rule Base

The fuzzy rule base encodes expert psychological understanding as IF–THEN statements linking packaging perception to behavioural outcomes. The rules are constructed based on literature insights (Silayoi & Speece, 2007; Magnier & Schoormans, 2015) and qualitative interviews.

Each rule R^k has the general structure:

R^k : IF (V is ${}_1A^k$) AND (C is ${}_2A^k$) AND AND (E is ${}_7A^k$) THEN $y_j = {}_0a^k + \sum_{i=1}^7 {}_ia^k x_i$

Where ${}_iA^k$ are fuzzy sets and y_j (PI or WTP) is the crisp output consequent (Sugeno, 1985).

Example rules:

1. R_1 : IF V=High AND L=High AND E=High THEN PI=Very High.
2. R_2 :IF P=High AND F=Low THEN PI=Low.
3. R_3 :IF C=High AND L=Medium AND S=High THEN WTP=High.
4. R_4 :IF V=Low AND L=Low THEN PI=Very Low.
5. R_5 :IF E=High AND S=High THEN PI=High and WTP=High.

These rules mimic human cognitive evaluation: when the package design and label are trustworthy, purchase intention increase; however, high price or poor functionality reduces it.

6.6. Fuzzy Inference Process

For a given input vector x :

Step 1: Fuzzification - Each crisp input is transformed into fuzzy degrees of membership.

Step 2: Rule Activation - Compute firing strength.

Step 3: Aggregation (Sugeno Model) - Output y .

6.7. Learning and Optimization

Parameters are learned from empirical data using hybrid ANFIS learning (Jang, 1993). Objective Function: minimize MSE between predicted and observed PI/WTP. Optimization involves least squares and gradient descent for membership adjustment.

6.8. Validation Framework

Dataset: Consumer survey responses on eco-packaging perception.

Performance Metrics: MSE, RMSE, R^2 , and rank correlation.

Sensitivity analysis identifies most influential inputs such as eco-label credibility and visual cues.

6.9. Theoretical Foundation and Interpretation

The model integrates principles from psychology and sustainability marketing. Theory of Planned Behaviour (Ajzen, 1991): Attitude, Norms, and Control are represented by fuzzy inputs. Cognitive Dissonance (Festinger, 1957): Conflicts between eco-claims and functionality reduce intention. Social Identity Theory (Tajfel, 1981): Social influence reinforces sustainable purchase behaviour.

6.10. Model Illustration

Suppose an individual perceives:

$$X_0 = [V = 0.8, C = 0.7, L = 0.9, P = 0.6, F = 0.7, S = 0.8, E = 0.9]$$

Fuzzify each variable, activate relevant rules, compute firing strengths α_k , and aggregate.

If resulting crisp outputs are:

$$PI = 0.85, WTP = 0.74$$

This indicates high purchase intention and moderate willingness to pay, showing that while the packaging appeals psychologically, and price remains a moderating factor.

6.11. Model Extensions

Type-2 Fuzzy Sets: Capture uncertainty in membership functions themselves (Mendel, 2001). For instance, consumer's interpretation of Eco-friendly varies regionally; Type-2 sets account for such ambiguity.

Fuzzy AHP (Analytic Hierarchy Process): Prioritize attributes like L and V through pairwise comparisons, producing expert – weighted fuzzy inputs (Saaty, 1980).

Hybrid Fuzzy – Neural Systems: Combine fuzzy logic with neural learning for large database (adaptive neuro-fuzzy systems).

Cross-Cultural Comparison: Extend the model to test how cultural dimensions (individualism, uncertainty avoidance) modify membership functions or rule weights (Hofstede, 2011).

6.12. Policy and Managerial Implications

For Business: The model identifies which eco-packaging attributes most influence psychology. Firms can prioritize investments in credible labeling and design aesthetics to enhance perceived sustainability.

For Policymakers: Insights can inform standards for eco-labeling transparency and regulations promoting truthful environmental claims.

For Consumers: Awareness campaigns can reduce uncertainty, aligning psychological perception with genuine environmental benefits.

7. CONCLUSION

The study concludes that understanding the psychological dynamics of eco-friendly packaging is crucial for advancing sustainable marketing and industrial practices. Through an integration of behavioural insights and fuzzy mathematical modelling, this research establishes that consumer perceptions toward sustainability are shaped by multidimensional factors such as visual appeal, eco-label credibility, and environmental concern. These elements significantly enhance sustainable purchase intentions, while price sensitivity and perceived functionality act as moderating influences. The fuzzy model effectively addresses the inherent uncertainty in consumer attitudes, offering a structured and interpretable framework for predicting behavioural outcomes. Moreover, the findings underscore the vital role of sustainable packaging in mitigating carbon emissions, reducing waste from e-commerce, and promoting circular economy principles. Businesses can utilize these insights to design packaging that not only aligns with environmental objectives but also appeals to consumers' psychological motivations. Policymakers, likewise, can employ these results to craft regulatory frameworks and incentive mechanisms that support eco-friendly innovations. Ultimately, the study bridges theoretical and practical domains, demonstrating that sustainability-oriented design, supported by data-driven modelling, can lead to long-term ecological and economic gains, reinforcing the importance of consumer-centered approaches in India's evolving green market landscape.

8. SUGGESTIONS AND RECOMMENDATIONS

1. Integrate Cross-Cultural and Demographic Perspectives

Expand the review to include cultural and demographic influences—such as age, gender, education, and income—on psychological responses to eco-friendly packaging. These factors significantly shape consumer attitudes and behaviors, offering valuable insights for targeted strategies.

2. Trace Evolution of Consumer Perceptions Over Time

Analyze how consumer views on sustainable packaging have changed over time. Identifying these trends can reveal shifting psychological drivers and highlight areas for intervention or improved engagement.

3. Evaluate Marketing Strategies and Communication Effectiveness

Examine the impact of various marketing messages—emotional appeals, social norms, and informative content—on consumer behaviour related to eco-friendly packaging. Understanding which approaches resonate can guide more effective brand communication.

4. Incorporate Empirical Evidence and Behavioural Studies

Support the review with experimental research, such as surveys or interviews, to measure actual consumer behaviours toward different types of sustainable packaging. This empirical data will validate psychological insights with real-world observations.

5. Identify Barriers and Offer Practical Recommendations

Address psychological obstacles like perceived inconvenience or cost that hinder eco-friendly packaging adoption. Explore how corporate social responsibility (CSR) initiatives influence brand loyalty, and conclude with actionable guidance for businesses and policymakers to promote sustainable consumer behaviour.

REFERENCES

1. Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
2. Ampuero, O., & Vila, N. (2006). Consumer perceptions of product packaging. *Journal of Consumer Marketing*, 23(2), 100–112. <https://doi.org/10.1108/07363760610655032>
3. Bem, D. J. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. *Psychological Review*, 74(3), 183–200. <https://doi.org/10.1037/h0024835>
4. Dhiraj, S. (2014). *Green marketing* [Postgraduate lecture notes]. GreenMarketing-131012140001-phpapp01.
5. Doyle, M. (1996). The consumer side of packaging power. In M. Doyle (Ed.), *Packaging strategy: Winning the consumer* (pp. 153–175). Lancaster, PA: Technomic Publishing Company, Inc.

6. Draskovic, N., Temperley, J., & Pavicic, J. (2009). Comparative perception of consumer goods packaging: Croatian consumers' perspective. *International Journal of Management Cases*, 11(3), 154–163.
7. Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford University Press.
8. Gonzalez, A., Van Huynh, F., & Yousef, W. (2009). *Sustainable packaging: A study of consumers' loyalty and behavior*. Jönköping International Business School, Jönköping University.
9. Grankvist, G., & Biel, A. (2007). Predictors of purchase of eco-labelled food products: A panel study. *Food Quality and Preference*, 18(4), 701–708. <https://doi.org/10.1016/j.foodqual.2006.11.002>
10. Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture*, 2(1), 1–26. <https://doi.org/10.9707/2307-0919.1014>
11. Jang, J.-S. R. (1993). ANFIS: Adaptive-network-based fuzzy inference system. *IEEE Transactions on Systems, Man, and Cybernetics*, 23(3), 665–685. <https://doi.org/10.1109/21.256541>
12. Kalkowski, J. (2007, December). State of “green packaging.” *Packaging Digest*, 44(12), 40.
13. Kassey, W. (2001). Green dilemma. *Marketing Intelligence & Planning*, 19(7), 444–455. <https://doi.org/10.1108/EUM00000000006394>
14. Kozik, N. (2020). Sustainable packaging as a tool for global sustainable development. *SHS Web of Conferences*, 74, Article 04012. <https://doi.org/10.1051/shsconf/20207404012>
15. Kuvykaite, R., Dovaliene, A., & Navickiene, L. (2009). Impact of package elements on consumer's purchase decision. *Economics and Management*, 14(4), 441–447.
16. Magnier, L., & Crié, D. (2015). Communicating packaging eco-friendliness: An exploration of consumers' perceptions of eco-designed packaging. *International Journal of Retail & Distribution Management*, 43(4/5), 350–366. <https://doi.org/10.1108/IJRDM-04-2014-0048>
17. Magnier, L., & Schoormans, J. (2015). Consumer reactions to sustainable packaging: The interplay of visual appearance, verbal claims and eco-labels. *Journal of Environmental Psychology*, 44, 53–62. <https://doi.org/10.1016/j.jenvp.2015.09.004>
18. Marsh, K., & Bugusu, B. (2007). Food packaging—Roles, materials, and environmental issues. *Journal of Food Science*, 72(9), R39–R55. <https://doi.org/10.1111/j.1750-3841.2007.00501.x>
19. Mendel, J. M. (2001). *Uncertain rule-based fuzzy logic systems: Introduction and new directions*. Prentice Hall.
20. Ng, A., & Paladino, A. (2020). Examining the influences of eco-labels and environmental impact on product evaluations. *Journal of Cleaner Production*, 265, Article 121757. <https://doi.org/10.1016/j.jclepro.2020.121757>
21. Ng, A., Butt, M. M., Khong, K. W., & Ong, F. S. (2014). Antecedents of green brand equity: An integrated approach. *Journal of Business Ethics*, 121(2), 203–215. <https://doi.org/10.1007/s10551-013-1689-z>
22. Nguyen, T. N., Lobo, A., & Greenland, S. (2020). Pro-environmental purchase behaviour: The role of consumers' biospheric values, attitudes and advertising skepticism. *Journal of Retailing and Consumer Services*, 55, Article 102082. <https://doi.org/10.1016/j.jretconser.2020.102082>
23. Nordin, N., & Selke, S. (2010). Social aspects of sustainable packaging. *Packaging Technology and Science*, 23(5), 317–326. <https://doi.org/10.1002/pts.921>
24. Pålsson, H., & Hellström, D. (2016). Packaging logistics in supply chain practice – current state, trade-offs and improvement potential. *International Journal of Logistics Research and Applications*, 19(4), 351–368. <https://doi.org/10.1080/13675567.2016.1196147>
25. Peattie, K., & Crane, A. (2005). Green marketing: Legend, myth, farce or prophecy? *Qualitative Market Research*, 8(4), 357–370. <https://doi.org/10.1108/13522750510619733>

26. Prakash, G., & Pathak, P. (2017). Intention to buy eco-friendly packaged products among young consumers of India: A study on developing nation. *Journal of Cleaner Production*, 141, 385–393. <https://doi.org/10.1016/j.jclepro.2016.09.116>
27. Rokka, J., & Uusitalo, L. (2008). Preference for green packaging in consumer product choices – Do consumers care? *International Journal of Consumer Studies*, 32(5), 516–525. <https://doi.org/10.1111/j.1470-6431.2008.00713.x>
28. Saaty, T. L. (1980). *The analytic hierarchy process*. McGraw-Hill.
29. Schwartz, S. H. (1977). Normative influences on altruism. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 10, pp. 221–279). New York, NY: Academic Press.
30. Silayoi, P., & Speece, M. (2007). The importance of packaging attributes: A conjoint analysis approach. *European Journal of Marketing*, 41(11/12), 1495–1517. <https://doi.org/10.1108/03090560710821279>
31. Singh, S., & Pandey, N. (2018). Green marketing: Policies and practices for sustainable development. *International Journal of Management Studies*, 5(3), 48–56.
32. Smith, N. C., & Brower, T. R. (2012). Longitudinal study of green marketing strategies that influence consumer behavior. *Journal of Business Ethics*, 110(3), 355–369. <https://doi.org/10.1007/s10551-012-1474-z>
33. Steenis, N. D., van Herpen, E., van der Lans, I. A., Ligthart, T. N., & van Trijp, H. C. M. (2017). Consumer response to packaging design: The role of packaging materials and graphics in sustainability perceptions and product evaluations. *Journal of Cleaner Production*, 162, 286–298. <https://doi.org/10.1016/j.jclepro.2017.06.036>
34. Sugeno, M. (1985). *Industrial applications of fuzzy control*. Elsevier Science Publishers.
35. Svanes, E., Vold, M., Møller, H., Pettersen, M. K., Larsen, H., & Hanssen, O. J. (2010). Sustainable packaging design: A holistic methodology for packaging design. *Packaging Technology and Science*, 23(3), 161–175. <https://doi.org/10.1002/pts.861>
36. Tajfel, H. (1981). *Human groups and social categories: Studies in social psychology*. Cambridge University Press.
37. Testa, F., Iovino, R., & Iraldo, F. (2021). The circular economy and consumer behaviour: The mediating role of information seeking in buying circular packaging. *Business Strategy and the Environment*, 30(2), 746–760. <https://doi.org/10.1002/bse.2656>
38. Thøgersen, J. (1999). The ethical consumer: Moral choice and packaging choice. *Journal of Consumer Policy*, 22(4), 439–460. <https://doi.org/10.1023/A:1006219805218>
39. Van Birgelen, M., Semeijn, J., & Keicher, M. (2009). Packaging and pro-environmental consumption behavior: Investigating purchase and disposal decisions for beverages. *Environment and Behavior*, 41(1), 125–146. <https://doi.org/10.1177/0013916507302209>
40. White, K., Habib, R., & Hardisty, D. J. (2019). How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. *Journal of Marketing*, 83(3), 22–49. <https://doi.org/10.1177/0022242919825649>
41. Zadeh, L. A. (1965). Fuzzy sets. *Information and Control*, 8(3), 338–353. [https://doi.org/10.1016/S0019-9958\(65\)90241-X](https://doi.org/10.1016/S0019-9958(65)90241-X)