

Mizan and the green consumer: Exploring eco-friendly packaged food adoption among middle-class Muslim consumers

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ABSTRACT

This study examines the adoption of eco-friendly packaged foods among middle-class Muslim communities, emphasizing their role in promoting sustainable lifestyles. It fills a research gap by integrating Islamic ethical principles, specifically the concept of balance (*Mizan*), into sustainable product adoption models. Data collection was performed through cluster sampling of 240 respondents. The study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to handle complex models with small to medium sample sizes and its exploratory and confirmatory analysis capacity. The findings show that all proposed relationships are statistically significant. As an Islamic ethical principle of balance, *Mizan* plays a key role in shaping responsible waste management practices. Along with product design and business models, *Mizan* encourages more mindful and sustainable waste handling. Effective waste management then enhances environmental awareness, directly promoting sustainable product adoption. Product design also directly affects adoption behavior, while natural resource management and technological innovation contribute to the development of sustainable business models. These findings highlight *Mizan* as a foundational ethical value that guides individual environmental behavior and strengthens the structural pathways leading to sustainable product adoption.

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Introduction

Environmental awareness has become vital in driving sustainable consumption behaviour and increasing global concerns towards environmental damage. As discussed in previous studies, environmental concern and product innovation drive the purchasing and adoption of green products (De Canio et al., 2020; Harjadi & Gunardi, 2022). However, scholarship that combines an ethical approach and religiosity, particularly in the context of Islamic values, into the empirical model of sustainable consumption is lacking. The Islamic principle of *Mizan* (balance and justice) imposes an ethical obligation that individuals and businesses have to take about their consumption behavior and the environment; therefore, preserving the environment is required (Widiastuty & Anwar, 2025). *Mizan*, as an ethical Islamic principle, can assist in forming environmentally responsible behaviors and encourage sustainable consumption (Wulan, 2025). *Mizan* is relevant to empirical studies on sustainability and is particularly lacking within the context of Muslim middle-class populations in Southeast Asia, a demographic that warrants attention for their religiosity commitment.

Previous studies on consumer behaviour toward environmentally friendly products have employed various theoretical and methodological approaches. Harjadi and Gunardi (2022) and Athia et al. (2024) studied green purchase intention in Indonesia and emphasized the moderating of subjective norms and ecological awareness, and mediating of self-generated word of mouth. Their research underlined the importance of social psychology and sociology in the intention to purchase green products. De Canio et al. (2020) focused on Italian consumers. They showed that concern for the environment moderates the effect of the preferences of sustainable retailers and producers on the intention to buy eco-friendly packaged foods. Abrar et al. (2021) studied the green purchasing behavior of South Asian Gen Y and Gen Z consumers. They emphasized the impact of ecological knowledge, green self-identity, social status, and the role of social status on sustainable consumption behavior. However, despite the valuable insights, a critical research gap remains. Most prior scholarship has separately considered sustainability dimensions like product design, waste management, and promoting environmental awareness. In addition, the existing literature primarily concentrates on psychological, technological, and pedagogical influences. It neglects the moral and spiritual dimensions, even though they may pertain to consumption behaviors, particularly among the Muslim middle-class demographic. There is a lack of practical research that integrates these variables with Islamic ethic frameworks, such as

Mizan, centered on middle-class Muslim consumers who, with their respective religious and socio-economic profiles, make for an interesting case study.

The middle-class Muslim population has a notable socio-economic and cultural impact on adopting sustainable practices (Choirin et al., 2024; Askandar et al., 2018). Members of this group exhibit moderate to high levels of devotion to religion, growing concern for the environment, and disposable income that enables eco-friendly spending (Rofhani, 2013). Recent research suggests that this group is more actively participating in sustainability, such as adopting biodegradable and recycled packaging in the halal food sector (Khandeparkar et al., 2024; Ghalih et al., 2024). Additionally, the development of Islamic-based ecotourism in Lombok (Kismawarni et al., 2024) and the rapid growth of halal restaurants in Jakarta and Kuala Lumpur that promote the use of organic ingredients and eco-friendly packaging also contribute to this trend.

Moreover, the innovation and technology that sustain packaging have put forward the need to advance technology for sustainability. Dantas et al. (2023) observed the impact of packaging in Pakistan's fast-moving consumer goods (FMCG) industry, wherein green packaging improves sustainability, while multisensory packaging has negative implications. As revealed by Maziriri (2020), green advertising and green packaging have offered a significant competitive advantage and improved the profitability of the Manufacturing Small and Medium Enterprises (SMEs) in South Africa. Hussain et al. (2024) reviewed the recently developed methods in sustainable food packaging, including applying bio-nanocomposites, antimicrobial, and multifunctional films made from natural sources. All of these emphasize the need for safe materials and sustainable methods for eco-friendly production to minimize environmental impact while improving food safety.

While the studies mentioned having broader demographic and cultural coverage, there is a lack of focus on sustainable consumption and the general environmental attitude within the middle-class Muslim society. The existing literature predominantly concentrates on three key areas: consumer behavior toward eco-friendly products (Harjadi & Gunardi, 2022; De Canio et al., 2020; Abrar et al., 2021), innovations in sustainable packaging (Dantas et al., 2023; Maziriri, 2020; Hussain et al., 2024), and environmental awareness and behaviors across diverse population groups (George et al., 2023; Mollaei et al., 2023; Ahmad et al., 2024; Ahmad et al., 2023). For example, Harjadi and Gunardi (2022) reported that altruistic values, subjective norms, and ecological awareness drive purchase intention of products. Also, Dantas et al. (2023) reported on the positive benefits of green packaging, and Ahmad et al. (2024) discussed the role of education in sustainable environmental behavior and adopting

green packaging. However, there is currently no empirical study on using the ethical balance (*Mizan*) principle in fostering sustainable consumption and environmental awareness through waste management, especially concerning food with eco-friendly packaging.

In response to the gap in existing research, this study looks at *Mizan*, an Islamic concept rooted in balance, as a meaningful lens to better understand how environmental awareness can be shaped through responsible waste management. The goal is to see how this process ultimately influences people's willingness to adopt eco-friendly packaged food. To explore this relationship, we bring together insights from four well-established theories: Trust Theory, the Technology Acceptance Model (TAM), Agency Theory, and the Theory of Planned Behavior (TPB). Each of these frameworks offers a different angle. For example, Trust Theory helps us understand how *Mizan* can build collective confidence in environmental values by emphasizing ethical responsibility and mindful waste practices (Morgan & Hunt, 1994; Razak, 2023). On the other hand, TAM focuses on how technology can make waste management more effective, raising environmental awareness and making sustainable options more approachable (Silva, 2015). Agency Theory shifts the focus to how firms manage natural resources, suggesting that effective governance can lay the groundwork for business models aligned with sustainability goals (Zogning, 2022). Finally, TPB explains how product design and waste reduction efforts shape people's attitudes and intentions—especially when influenced by social norms like environmental concern (Ajzen, 1991).

This is the first integrated attempt to construct and empirically test a model that links *Mizan*, product design, waste management, and environmental consciousness to explain how they influence the adoption of food packaging sustainability. We go beyond considering *Mizan* as a mere theoretical construct and give it tangible appreciation in the context of consumer and business behavior. This perspective, the intersection of Islamic ethical frameworks and contemporary sustainability practices, makes the research unique. The findings are theoretical and actionable for policymakers and businesses to drive responsible consumption, especially among the emerging middle-class Muslim demographic that is challenging the traditional spending-economically and socially-oriented paradigm.

Literature Review

Environmental Awareness and Adoption of Eco-Friendly Packaged Food Products

The relationship between waste management and adopting eco-friendly packaged food products is crucial. Consumers realize the effects of using packaged food products. In the

food industry, the solution to this problem, sustainable packaging, was often driven by environmental awareness, with a biodegradable and compostable material (Khandeparkar et al., 2024). A digital platform as a marketing strategy that utilises eco-friendly packaging for food products strengthens this phenomenon (Antony et al., 2024). Furthermore, the rational and emotional variables drive the consumer to choose the green product, which is strengthened by feelings to decide to buy (Lombardi et al., 2024).

H₁: Environmental awareness has a positive and significant effect on the adoption of eco-friendly packaged food products.

Waste Management and Environmental Awareness

The role of waste management in driving environmental awareness is vital in increasing sustainability practices and avoiding environmental degradation. When consumers are aware of waste, responsible management habits will increase (Zhou et al., 2022). It shows the string relation against waste management and environmental awareness. On the other hand, some difficulties happen in Bandung, Indonesia, regarding waste management, which are strengthened by socio-cultural dynamics (Soesilo & Alfarizi, 2024). When reviewed in a socio-cultural perspective, the waste bank and campaign by social media have developed to increase public participation. Furthermore, basic environmental education will determine behavior about waste management; for example, understanding the recycling concept helps increase responsible behavior against environmental degradation (Akintunde & Akintunde, 2023). Regardless, a lack of knowledge about waste management in the green economy needs to be resolved to achieve sustainable progress (Nandy et al., 2022). For this reason, addressing the lack of knowledge and improving environmental awareness is crucial in relation to efficient waste management practices.

H₂: Waste management has a positive and significant effect on environmental awareness.

Business Model and Waste Management

Sustainable business models have long influenced waste management and play a pivotal role in achieving sustainability progress. For example, the circular economy model recommends using efficient resources and recycling, which increase sustainable development (SDGs) in responsible consumption and production and sustainable development of the city (Puntillo, 2023). Furthermore, some innovative waste management methods, such as bioremediation, are crucial to decreasing the environmental pollutants from industry (Singh & Raj, 2020). Besides that, the collaborative framework is inter-organizational. Also, it helps

recycle and reuse industrial by-products that change waste into valuable resources for industry, which have economic value and increase green industry ecosystems (Valkokari et al., 2016). This model and strategy are consciously stronger in using the waste management process for sustainable ecology (Farooq et al., 2022).

H₃: Business model has a positive and significant effect on waste management.

Mizan and Waste Management

Mizan is closely related to waste management, especially in the need for equitable, efficient allocation and utilization of resources. As a fundamental principle, *Mizan* emphasizes balancing dangerous waste management to minimize environmental degradation (Kanoun et al., 2013). Similarly, a waste management strategy that adopts the 3R principle (Reduce, Reuse, Recycle) can align waste generation volume with existing management capacity, particularly in urban areas facing increasing waste pressure (Kinantan et al., 2018).. Furthermore, Albert et al. (2023) highlight using a balanced scorecard approach in community-based waste management programs such as waste banks, demonstrating that strategic planning is crucial in creating sustainable operations while simultaneously generating positive social impacts. Thus, integrating the value of balance into waste management practices results in a more holistic approach, promoting ecological sustainability and strengthening the overall well-being of society.

H₄: *Mizan* has a positive and significant effect on waste management.

Product Design and Waste Management

Another important relation in this study is product design and waste management. Green product design shows support for environmental care. Green product design, as known in this study, is ecodesign, drawing on recycling resources that decrease the waste innovatively (Wulansari, 2023). Another treatment, such as Do It Yourself, also emphasizes how creativity decreases the waste (Shahhoseini et al., 2023). Furthermore, effective internal product design combines the manufacturing process and assembly, which helps environmental recovery through reclamation and decreases the cost of comprehensive waste disposal. The importance of selecting recyclable or biodegradable materials when designing sustainable Computer-Aided Design (CAD)-based plastic products, particularly in the context of hazardous waste, is emphasized (Camañes et al., 2024). This aims to prevent the accumulation of hazardous waste in the environment and support more ecologically responsible design principles.

H₅: Product design has a positive and significant effect on waste management.

Product Design and Adoption of Eco-Friendly Packaged Food Products

Now, the consumer begins to consider the green packaging for their food consumption. Green packaged food products focus on minimizing the negative impact by using materials and innovative processes, like utilizing agricultural waste to create packaging that can be naturally decomposed (biodegradable) (Oboturova et al., 2024). This approach not only solves the issues about plastic waste and food preservation, but also accords with consumer concerns regarding waste management, and this is proof that environmentally friendly products can influence consumer purchasing intentions (Nugraha & Ramadhan, 20254). Another study noted that sustainable green packaging determines important integration among environmental conservation, food safety, and social value, simultaneously strengthening the overall appeal of environmentally friendly packaging (Santi et al., 2022). This implementation can increase company profitability, which drives the sustainability of the circular economy (Yuan, 2023).

H₆: Product design has a positive and significant effect on the adoption of eco-friendly packaged food products

Natural Resource Management and Business Models

The intersection of natural resource management (NRM) and sustainable business models aimed at environmental stewardship represents an emerging domain of critical importance to ecological and economic sustainability. Olajide et al. (2023) describe effective NRM as clean technology, conservation, and pollution prevention as eco-efficient practices that enhance business competitiveness and reduce negative ecological impacts. This is most relevant to the oil and gas industry, which is heavily regulated and needs to adopt green practices for compliance and economic viability. Additionally, the application of advanced digital technologies within extracting and resource-based industries optimizes the consumption of these resources, improving sustainable and efficient use (Ruan et al., 2022). These actions, alongside other resource-saving strategies, work towards the goal of achieving a circular economy, where resource consumption is minimized and waste is eliminated. This guides the need for sustainable business models, which create a balance between resource management and corporate responsibility (Junita, 2019). In other words, these approaches reduce critical environmental impacts and, at the same time, enhance economic strength, supporting the long-term environmental and operational sustainability of a business.

H₇: Natural resource management positively and significantly affects business models.

Technological Innovation and Business Models

The importance of the relationship between technological innovation and sustainable business models has drawn attention as a vital factor of corporate sustainability performance. Wang & Zhong (2024) single out digital transformation as a driver of green innovation by increasing productivity and reducing financial bottlenecks, which has scaled and improved the effectiveness of green initiatives within industries. Additionally, Zhou et al. (2023) emphasize the interplay between innovation of sustainable business models and technologies within the green industry, noting that their convergence is synergistic and that the joint adoption improves environmental performance and sustainability of the corporation in the long run. Tehseen et al. (2023) Financial technologies further strengthen these relations by promoting green innovation and green financing, thus enhancing corporate environmental responsibility. This research emphasizes that the relationship between technology and business innovation is not only a one-way street, as the adoption of innovative technologies accelerates green innovation, but there is also a need to transform the business model to one that is sustainable to foster a responsible corporate ecosystem.

H₈: Technological innovation has a positive and significant effect on business models.

Environmental Awareness as a Mediator

The increase in environmental awareness explains the link between waste management and the adoption of environmentally friendly food packaging. By mitigating plastic waste and using plastic substitutes, communities are more aware of the ecological realities surrounding plastic pollution and its aftermath. Increased awareness makes people more likely to demonstrate responsible buying behavior, including purchasing items with environmentally preferable packaging. As Surya et al. (2023) pointed out, the creation and use of ecomarketing eco-friendly packaging sustainability is achieved while simultaneously mitigating the impacts of environmental harm.

In addition, initiatives aimed at eco-friendly food and beverage containers have been shown to improve awareness and sustain community plastic mitigation efforts (Riyadi & Yusup, 2024). Further research states that proactive, environmentally-friendly attitudes and acts derive from a strong concern for the ecosystem, indicating that humanity acts decisively toward reducing the ecological footprint (Sugiarto & Gabriella, 2020). In addition, applying the Zero Waste philosophy, which emphasizes the sustainable disposal of waste and

improved ecological conditions, can greatly enhance overall environmental quality (Widiatmoko et al., 2024). Thus, adequate waste management, combined with educational efforts and innovative strategies for eco-friendly food packaging, enhances ecological literacy and consequently cultivates adopting eco-friendly packaged food products.

H₉: Waste management positively and significantly affects adopting eco-friendly packaged food products mediated by environmental awareness.

Waste Management as a Mediator

The relationship of *Mizan* (balance), product design, business models, and environmental awareness through effective waste management fundamentally drives the sustainability objectives. Dominguez & Bhatti (2022) state that the *Mizan* concept balances product development with business models focused on ecological concerns. This has been demonstrated in circular economy business models, which foster social and environmental value by transforming waste, such as retired fire hoses, into fire safety apparel. Moreover, eco-design goes further by advocating for using recycled materials and recycling waste, such as fashion waste, into sustainable clothing (Wulansari, 2023). Wedari & Alfian (2024) indicate that business practitioners continue to operate with a limited understanding of the principles of the green economy, waste management, and ways to adopt sustainable practices. In the larger context, these considerations are essential in creating innovation to reduce waste and enhance sustainable business practices with responsible environmental management. Thus, the following hypotheses are proposed:

H₁₀: *Mizan* positively and significantly affects environmental awareness mediated by waste management.

H₁₁: Product design positively and significantly affects environmental awareness mediated by waste management.

H₁₂: Business model positively and significantly affects environmental awareness mediated by waste management.

Business Model as a Mediator

The relationship between the management of natural resources and the technological development of waste management is essential to formulating sustainable environmental business models. Sustainable goals and addressing modern waste management issues require intelligent waste management solutions and advanced recycling technologies (Mashudi et al., 2023). There is an emerging focus on converting waste to energy and other reusable products,

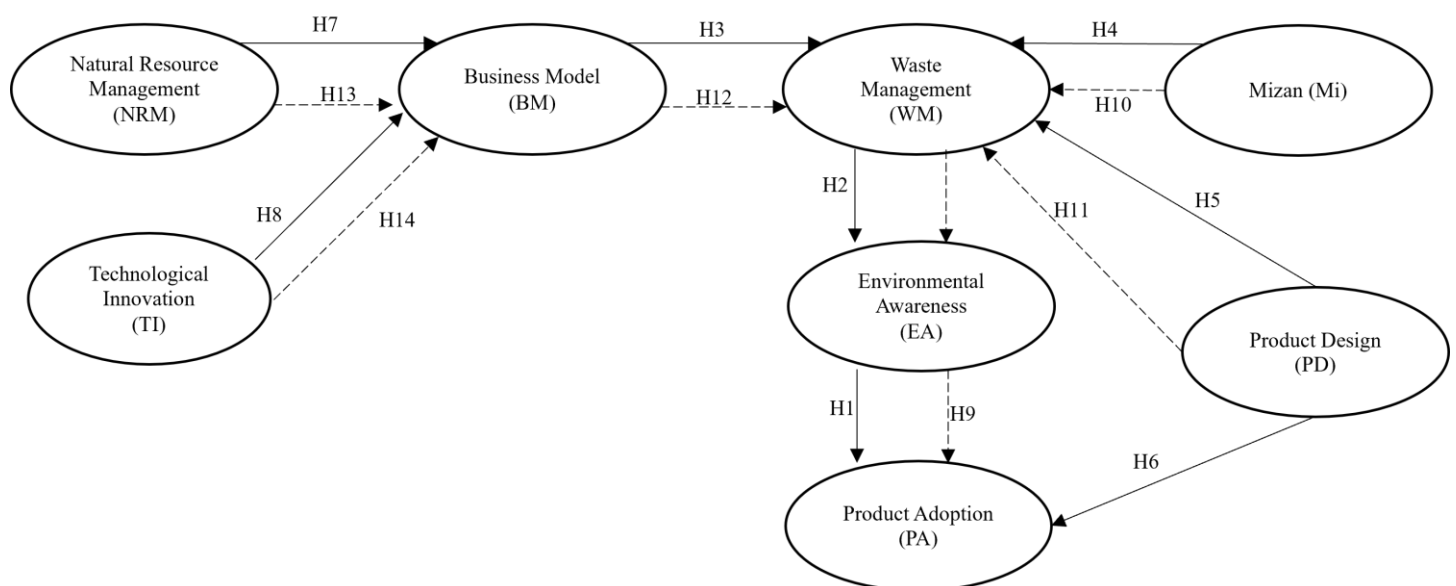
which marks the need for sustainable approaches and proper education and awareness (Farooq et al., 2022). Siahaan et al. (2023) discussed the innovative and collaborative approaches towards the regenerative Zero Waste Business Model, which answers the wasteful reproductive business models motivated by profit and poses a great environmental risk. Moreover, using advanced waste treatment pyrolysis and gasification technologies further strengthens the application of circular economy principles as they treat waste as a resource instead of a burden (Tanveer et al., 2022). Therefore, the efficient integration of the sustainable management of natural resources with technologies and eco-friendly business models will foster significant improvements in waste management, reduce the negative impact on the environment, and help achieve sustainable economic prosperity. Following such a structure, the subsequent hypotheses are put forth:

H₁₃: Natural resources management positively and significantly affects waste management mediated by the business model.

H₁₄: Technological innovation management positively and significantly affects waste management mediated by the business model.

The research framework illustrates how natural resource management, technological innovation, *Mizan* (ethical balance), and product design influence sustainable product adoption. These variables operate directly or indirectly through mediators such as business models, waste management, and environmental awareness.

Figure 1. Research Framework



Methods

The data was collected over two months, from November to December 2024, focusing on middle-class Muslim communities in Bone Regency, South Sulawesi, Indonesia, who had already adopted eco-friendly packaged food. Given that the population was spread across several subdistricts with similar socio-demographic traits, levels of religiosity, and environmental concern, cluster sampling was chosen for its practicality and efficiency, as Myers and Hansen (2011) recommended. This method made reaching respondents easier while maintaining a representative sample. The main instrument used was a structured questionnaire, developed from the indicators of each research variable. It was distributed in both printed and digital formats. Printed versions were handed out to those without internet access, while the online version was shared via Google Forms, WhatsApp, and Instagram. This mixed approach helped ensure broad participation. In total, 240 valid responses were collected. This sample size meets the minimum standard for multivariate analysis, as suggested by Hair et al. (2011), and is further supported by Elser and Urabe (1999) and Schermelleh-Engel et al. (2003). In addition, Table 1 shows several questions that are used to measure each variable: Product Adoption (PA), Environmental Awareness (EA), Waste Management (WM), Business Model (BM), *Mizan* (Mi), Product Design (PD), Natural Resource Management (NRM), and Technological Innovation (TI).

Table 2 shows that all indicators have greater values when compared to other variables; it can be concluded that this test meets the validity discriminant criteria. Then, the indicators used are sufficiently distinct from one another and effectively measure different constructs. Finally, in evaluating the measurement model using PLS-SEM, we looked at several indicators that reflect reliability and validity; these included factor loadings, Cronbach's alpha, composite reliability (CR), average variance extracted (AVE), and measures of discriminant validity. As presented in Table 3, most of the factor loadings were above the 0.7 standard, and both Cronbach's alpha and CR values adhered to the guideline by Hair et al. (2011), demonstrating good internal consistency. The AVE for each construct also exceeded 0.5, thereby satisfying the criteria set by Kim et al. (2015), affirming the existence of convergent validity. Discriminant validity was assessed by the cross-loading method and the Fornell-Larcker criterion. All items validated their associated construct by loading significantly higher on their construct compared to other constructs (Hamid et al., 2017), and the square root of AVE was compared to the correlations with other variables as posited by Chawla and Joshi (2019), confirming the criteria were met.

Table 1. Constructs and Measurement Items

Constructs	Code	Items
Product Adoption (PA)	PA1	I prefer food with eco-friendly packaging.
	PA2	I am willing to pay more for green packaging.
	PA3	I often buy eco-packaged food.
Environmental Awareness (EA)	EA1	I value environmental protection in life.
	EA2	I believe everyone should protect nature.
	EA3	I try to avoid single-use plastics.
Waste Management (WM)	WM1	I reduce waste daily following the principle of <i>Mizan</i> (balance) for sustainability.
	WM2	I recycle waste to minimize environmental harm.
	WM3	I prioritize hazardous waste control to prevent environmental degradation.
Business Model (BM)	BM1	I support business models using eco-packaging to lower pollution.
	BM2	I choose business models focused on efficient energy usage.
	BM3	I support business models showing social responsibility toward nature.
<i>Mizan</i> (Mi)	Mi1	I balance consumption by choosing environmentally responsible daily products.
	Mi2	I buy products that reflect strong ethical purchasing values.
	Mi3	I apply sustainability principles through eco-conscious choices and actions.
Product Design (PD)	PD1	I prefer to buy products with recyclable materials.
	PD2	I am more interested in products with designs that reduce raw materials and energy use.
	PD3	I prefer products that have sustainable features, such as reusable packaging.
Natural Resource Management (NRM)	NRM1	I use natural resources efficiently to reduce waste.
	NRM2	I help preserve nature through reforestation-focused environmental efforts.
	NRM3	I choose eco-materials that lower harmful environmental impact.
Technological Innovation (TI)	TI1	I support food technology that is aligned with <i>Mizan</i> ethical values.
	TI2	I support production innovation to reduce energy waste.
	TI3	I encourage packaging innovation that reduces plastic-related pollution.

Table 2. Discriminant Validity

Constructs	PA	PD	TI	EA	MB	Mi	WM	NRM
PA	0.859							
PD	0.631	0.882						
TI	0.562	0.767	0.927					
EA	0.662	0.776	0.799	0.838				
BM	0.544	0.714	0.830	0.748	0.915			
Mi	0.643	0.768	0.726	0.722	0.725	0.920		
WM	0.602	0.760	0.820	0.783	0.771	0.758	0.882	
NRM	0.648	0.798	0.773	0.773	0.743	0.825	0.842	0.912

Table 3. Validity and Reliability

Constructs	Code	Loading Factors	AVE	Composite Reliability	Cronbach's α
PA	PA1	0.828	0.737	0.894	0.822
	PA2	0.883			
	PA3	0.864			
EA	EA1	0.862	0.702	0.876	0.787
	EA2	0.862			
	EA3	0.789			
WM	WM1	0.918	0.778	0.913	0.857
	WM2	0.846			
	WM3	0.881			
BM	BM1	0.912	0.837	0.939	0.902
	BM2	0.892			
	BM3	0.940			
Mi	Mi1	0.927	0.846	0.943	0.909
	Mi2	0.899			
	Mi3	0.932			
PD	PD1	0.887	0.779	0.913	0.858
	PD2	0.899			
	PD3	0.861			
NRM	NRM1	0.905	0.832	0.937	0.899
	NRM2	0.934			
	NRM3	0.897			
TI	TI1	0.911	0.860	0.949	0.919
	TI2	0.942			
	TI3	0.929			

Table 4. Demographic Profiles

Profiles		Frequencies	Percentage (%)
Gender	Male	91	37.917
	Female	149	62.083
Age	Under 20 years old	3	1.250
	21-30 years old	206	85.833
	31-40 years old	21	8.750
	41-50 years old	8	3.333
	Above 50 years old	2	0.833
Occupation	Gov. Employee	17	7.083
	Non-Gov. Employee	42	17.500
	Employee	13	5.417
	Lecturer/Teacher	25	10.417
	Police/Military	1	0.417
	Entrepreneur	31	12.917
	Farmer	1	0.417
	Other	110	45.833
Education Level	Primary School	0	0.000
	Secondary School	0	0.000
	Senior High School	24	10.000
	Diploma	10	4.167
	Bachelor's	166	69.167
	Master's	38	15.833
	Doctoral	2	0.833
Monthly Income	< IDR 5 million	182	75.833
	> IDR 5 million to IDR 10 million	51	21.250
	> IDR 10 million to IDR 15 million	4	1.667
	> IDR 15 million	3	1.250

Finally, respondents' demographic characteristics and background information are summarized in Table 4. Respondents' gender distribution shows that women comprise 62.1% (149 out of 240) of the sample and men 37.8% (91). Concerning age, the majority of the sample is represented by the 21 to 30 age category (85.8%), with a smaller cohort of 31 to 40 years old (8.8%). Concerning occupations, respondents working in the 'Other' category represent the highest percentage (45.8%), followed by people in the private sector (17.5%). As for educational qualifications, a bachelor's degree is the most common (69.2%). Income is reported to be below 5 million IDR monthly for the upper majority (75.8%). As a summary,

this demographic highlights that the respondents are primarily young females who are well educated and whose incomes primarily fall within the lower to middle-income class.

Result and Discussion

Table 5, the direct effect result shows that all the hypotheses were accepted. It can be seen that all of the structural direct effects ($H_1 - H_8$) result in $t\text{-values} > 1.96$ and $P\text{-values} < 0.05$. The study findings indicate significant direct effects of several factors on adopting eco-friendly products among the middle-class Muslim community. Environmental awareness and product design directly influence the adoption of eco-friendly products. This means that the higher the individual's awareness of the importance of sustainability and the more the product design aligns with eco-friendly principles, the greater the likelihood that individuals will adopt these products within their patterns of sustainable consumption (Khandeparkar et al., 2024). Additionally, effective waste management is a crucial element in shaping positive-

Table 5. Results of the Structural Model (Direct Effect)

Hypothesis	Coefficient	t-Values	p-Values	Decision
H ₁ EA -> PA	0.433	5.084	0.000	Accepted
H ₂ WM -> EA	0.783	15.606	0.000	Accepted
H ₃ BM -> WM	0.371	5.913	0.000	Accepted
H ₄ Mi -> WM	0.266	3.980	0.000	Accepted
H ₅ PD -> WM	0.290	4.816	0.000	Accepted
H ₆ PD -> PA	0.296	3.019	0.003	Accepted
H ₇ NRM -> BM	0.253	3.699	0.000	Accepted
H ₈ TI -> BM	0.635	8.721	0.000	Accepted

Table 6. Results of the Structural Model (Indirect Effect)

Hypothesis	Path-Coefficient	t-Values	p-Values	Decision
H ₉ WM -> EA -> PA	0.339	4.820	0.000	Full-Mediation
H ₁₀ Mi -> WM -> EA	0.208	3.938	0.000	Full-Mediation
H ₁₁ PD -> WM -> EA	0.227	4.391	0.000	Full-Mediation
H ₁₂ BM -> WM -> EA	0.291	5.334	0.000	Full-Mediation
H ₁₃ NRM -> BM -> WM	0.094	3.194	0.002	Full-Mediation
H ₁₄ TI -> BM -> WM	0.236	4.462	0.000	Full-Mediation

environmental attitudes. Efficient and sustainable waste management motivates people to become more aware of the environmental effects of their daily consumption and production activities, thus promoting sustainable consumption (Soesilo & Alfarizi, 2024; Zhou et al., 2022).

The Islamic principle of *Mizan*, which means balance and justice, along with product architecture and business models, directly influences waste management. These three elements help achieve effective and responsible waste management systems (Kanoun et al., 2013). At the same time, management of natural resources and technological advancements also directly reinforce sustainable business models. Firms that efficiently manage natural resources and implement eco-friendly technological innovations normally develop competitive business models that also support long-term sustainability (Olajide et al., 2023; Wang & Zhong, 2024). These outcomes emphasize that the adoption of eco-friendly products is amplified by the direct interplay of multiple factors that work in tandem to influence the target systems and structures that enable sustainable consumption.

In the context of this study, the findings can be explained with the help of four integrated theories. The Theory of Planned Behavior by Ajzen (1991) supports the findings concerning the impact of environmental awareness and product consideration by underscoring that attitudes, subjective norms, and perceived control influence behaviour intention. Trust Theory by Morgan & Hunt (1994) reinforces *Mizan*'s stance as an ethical model that nurtures public trust regarding the significance of ethical and sustainable waste and consumption practices. The Technology Acceptance Model (TAM) relates to the public's acceptance and participation in activities such as the design of eco-friendly products and waste management technologies (Silva, 2015). And Agency Theory by Eisenhardt (1989) also describes how the natural resources management and sustainable practices by business models work together, explaining that agents, in this case, the business actors, owe to the society, the principals, to be accountable and transparent in their operations in order to achieve the common sustainable development objectives. The interrelation of these four theories provides a richer rationale for this research and demonstrates how modern notions and Islamic teachings are linked in the context of sustainable consumption.

Earlier work has explored the importance of these aspects, and the findings elaborated above corroborate them further. In the case of Sentia et al. (2024), the authors demonstrated that positive social attitudes and knowledge regarding the environment strongly influence individuals' adoption of favorable environmental practices, including the adoption of

sustainable products. In the same year, Kristiana & Aqmala (2023) also highlight the issue of environmental awareness and knowledge of products as determining factors for the intention to purchase eco-friendly products. It has also been noted by Delia et al. (2023) that the design of the environmentally friendly products adds value to the product while diminishing the adverse impacts on the environment. Furthermore, Al Jaghoub et al. (2024) have also reasoned on the need for innovation in the model of sustainable businesses to advance their efficiency in the management of waste and in the utilization of resources. Sustainable management of natural resources, according to Al Jaghoub et al. (2024), can provide greater consumer appeal by supporting equitable and eco-friendly business models. Hidayat et al. (2024) further add that these business models need to be just in nature to provide for the needs of the coming generations. As discussed by Harja et al. (2024) and Fadillah et al. (2023), technological innovations in business models reinforce the competitiveness of firms and foster sustainability by adopting greener and more inclusive models.

As shown in Table 6, all hypothesized indirect effects are confirmed ($H_9 - H_{14}$), with *t*-Values surpassing 1.96 and *P*-Values under 0.05. These findings show that the variables investigated in this study are significantly affected by the mediating influence of the three constructs: environmental awareness, waste management, and business models. In a cascading manner, waste management enhances environmental awareness, which in turn triggers the adoption of eco-friendly products. This indicates that waste management goes beyond a mere technical function—it profoundly shapes psychological and behavioral dimensions that motivate individuals toward eco-friendly actions and decisions. Such awareness is vital in fostering sustainable consumption that intentionally reduces environmental harm over time (Zhou et al., 2022). Furthermore, the concept of *Mizan* from Islamic teachings, which refers to ethical balance and justice, together with eco-design and sustainable business models, sequentially affects both waste management and environmental awareness. This means that socially responsible product design and sustainable-focused business models can lead to improved waste management and heightened environmental awareness, thereby bolstering sustainable consumption (Kanoun et al., 2013). In addition, the natural resources management and technological innovation indirectly influence waste management by strengthening environmentally responsible business models. Previous research indicates that business models incorporating greater resource efficiency and adopting green technologies have more innovative structures that support sustainable systems, like in waste management (Wang & Zhong, 2024). This research reinforces the need for a more holistic approach in shifting the consumer mindset towards adopting more eco-

friendly habits and a lifestyle that embraces sustainable consumption (Olajide et al., 2023). Further research has shown that waste management systems improve eco-consciousness, which indirectly promotes the use of green products within sustainable consumption models. Additionally, the concepts of *Mizan*, product design, and business models have a cascading indirect impact on both waste management and environmental awareness. Natural resource management, as well as innovations in technologies, indirectly influence waste management through sustainable business models.

As noted in the research by Riyadi and Yusup (2024), the adoption of green products is one way to eliminate the negative impacts on the environment, as it helps to reduce plastic waste. Widiatmoko et al. (2024) explain the application of the Zero Waste concept and efficient waste management as it relates to sustainability. Furthermore, Sumarno et al. (2015) explain the advantages of eco-friendly product design, which include the efficient use of raw materials and the handling of the waste created, as well as improving waste management and environmental stewardship. Further underscoring green business practices are waste management and energy use, which impact waste management (Pratomo et al., 2023; Al Jaghoub et al., 2024; Kurniawati & Ali, 2024). These studies reinforce the research findings that waste management and sustainability are important in influencing the consumer decision-making of eco-friendly products through indirect and intricate pathways, especially in fostering sustainable consumption.

While focusing on ethical balance (*Mizan*) as a framework to cultivate environmental consciousness via waste management and the adoption of eco-friendly packaged food, this study combines Trust Theory, the Technology Acceptance Model (TAM), Agency Theory, and the Theory of Planned Behavior (TPB) into one framework. These theories are used synergistically to formulate hypotheses and construct a conceptual model that explains the relationships among environmental awareness, technological innovation, moral responsibility, and the intention to engage in sustainable consumption. Trust Theory (Morgan & Hunt, 1994; Razak, 2023) situates *Mizan* as a core ethical principle that nurtures public trust towards sustainable endeavors. *Mizan* strengthens legitimacy, which reinforces collective participation towards collective waste management and ethical consumption within the context of balance, justice, and responsibility. On the other hand, TAM focuses on the perceived ease of use and usefulness of waste management technologies, as their activated attention to adoption of eco-friendly packaged food products (Silva, 2015) recognizes *Mizan* as a moral guide towards the responsible application of such technologies.

Besides, Agency Theory elucidates why great governance and management of natural resources are necessary to foster innovation and patterns of sustainable consumption (Zogning, 2022). Under this consideration, *Mizan* provides an ethical aspect to the agency relationship by stressing the need for sustainable social cooperation and collective responsibility to mitigate ecological harms. TPB (Ajzen, 1991) reinforces the model as it accounts for attitudes, subjective norms, and perceived behavioral control, and how they shape an individual's intention towards adopting sustainable consumption. Here, *Mizan* reinforces subjective norms by stressing moral and religious consciousness to promote consumption that is environmentally and morally sustainable. The addition of the four concepts and the principle of *Mizan* deepens the theoretical framework of the study and illustrates the application of Islamic teachings in designing and formulating hypotheses on the expectation of the behavioral change among the Muslim middle-class population.

Conclusion and Suggestion

In this study, we found that different factors play a meaningful role in shaping how middle-class Muslim communities adopt eco-friendly products. This adoption is closely tied to how aware people are of environmental issues and how products are designed. These two elements, awareness and design, have a clear and direct influence on people's decisions. On another level, managing waste well helps build that awareness, acting as a bridge between daily habits and sustainable thinking. The idea of *Mizan*, or ethical balance in Islam, along with thoughtful product design and business strategies, also helps encourage better waste practices and a stronger environmental mindset. Even elements like how we manage natural resources or use new technology come into play—though more indirectly—by influencing how sustainable business models are built, which then support broader efforts to live and consume more responsibly.

This study offers valuable insights, but it also has a few limitations that should be acknowledged. The study's scope, focused on middle-class Muslim communities, does not consider other societal or cultural groups. Additionally, it overlooks some important external elements like governmental, market, or regulatory structures that could influence the consumption of sustainable goods. Another limitation is the exclusive use of quantitative techniques. Such approaches, while effective in pattern discovery, often miss important insights in comparison to people's motives, the industry, or other relevant perspectives. In the approach, studies could widen the scope of participants to include more diverse groups or more prominent overarching elements or system-level factors. The integration of quantitative

techniques with pre-existing qualitative approaches would also allow for the formulation of a more holistic understanding of the subject matter. Furthermore, the understanding of the role of *Mizan* in the sustainability of day-to-day choices must be deepened in the formulation of structures that more precisely reflect its sustainability in local to global contexts.

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