

Shaping green consumer behavior through environmental awareness: Comparative insights from Saudi Arabia and Pakistan

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Abstract: Environmental awareness and consumer behavior have been increasingly shaped by societal shifts towards sustainability, manifesting in the rise of green consumerism worldwide. This research focused on green consumer behavior in Kingdom of Saudi Arabia and Pakistan while comparing their economic, cultural, and environmental elements. Based on the learning theory of consumer behaviour, the study explored the role of environmental awareness and knowledge and their impact on green purchase intentions and consumer behavior in relation to the SDGs. A stratified random sample of 500 respondents was collected from each country. Structural Equation Modelling was employed to test relationships and mediation analysis which led to the confirmation of hypotheses. Further, the mediated moderation analysis showed that perceived value for green products strengthen the relationship between purchase intentions for green products and overall green consumer behavior. The study's findings highlighted the role of environmental education and policy intervention in promoting sustainable consumption, tailored to unique socio-economic and environmental contexts of each region.

Keywords: green consumer behavior, green purchase intension, environmental knowledge, environmental awareness, green product value

Introduction

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The environmental awareness in consumer behaviour has led to societal change, where people are embracing environment friendly practices and making greener purchase. This shift is particularly evident within green consumerism which organizes consumers based on the ecological impact of products and services (Maurer and Bogner 2020; Nekmahmud and Fekete-Farkas 2020). Environmental issues remain prevalent due to several factors, including updated information, policies and social media groups (Kautish et al. 2020; Shafique et al., 2020). Thus, consumers are increasingly aware of the impact of their activities on the environment and are seeking ways to minimize it. This awareness has significantly influenced consumer behaviour, encourage them to buy green products. The growing emphasis on environmental protection in the global economy has also shifted consumer awareness toward green consumerism (Ogiemwonyi and Jan 2023). This research focuses on green consumer behaviour in Saudi Arabia and Pakistan, chosen for their diverse cultures, economies, and physical environments. The study aims to examine the impact of green consumer behaviour, with a focus on environmental awareness and knowledge, identifying factors that contribute to the increase in green consumers in those regions.

The learning theory of consumer behaviour provides a solid theoretical foundation for examining how consumers learn and modify their consumption habits over time (Yildirim 2022). The theory suggests that consumers are influenced by various stimuli, which initiate learning process that shapes their purchasing behaviour (Hojnik et al. 2020). From this perspective, environmental consciousness and literacy are two essential requirements that raise consumer awareness of environmental issues, shaping their sentiment and behaviour toward green products (Zhang et al. 2024). Applying green consumer behaviour is also aligned with a more extensive context represented by the seventeenth Sustainable Development Goal Responsible Consumption and Production. Promoting environmental awareness and knowledge enhancing consumer attention, and increasing the perceived value of environment friendly products can encourage more responsible behaviour (Chang et al. 2021). This shift can help in decomposing the ecological impact, encourage sustainable resource utilization, and thus help attain the SDGs.

That is the extent to which people are aware of a particular issue concerning the environment and the impacts of the activities they undertake within the environment. It involves the understanding of the

environment in the broadest sense and the acceptance of the need for sustainable solutions in the environmental context. Environmental knowledge on the other hand can be defined as the awareness of other miscellaneous and specific concepts regarding the environment together with details of issues and solutions to environmental issues (Gunawan et al. 2024). It has some facts and the knowledge that is used within applying it on enhancements on such decision-making in order to get better results regarding the state of the environment (Hojnik et al. 2020). Green consumer behaviour refers to the decision process that involves consciously selecting goods and services based on the effects they have on the environment (Manolis and Manoli 2021). This behaviour could thus be attributed to a higher level of concern for the environment and the need to ensure environmental order. In this study, green purchase intention is used as a motivational variable between awareness/knowledge and purchasing behaviour (Maurer and Bogner 2020). It reflects the concern of the consumer towards the purchase of green products through awareness of the environment and information (Anwar and El-Bassiouny 2020). Environmental awareness serves as one of the major determinants of consumer behaviour, especially in green consumer behaviour.

The study is underpinned by the learning theory of consumer behaviour which is a comprehensive model that enables researchers to explain how the consumers change their consumption pattern over time (Yildirim et al. 2024). The theory proposed that a learning process is impacted by several stimuli that in turn influence the consumer behaviour (Hojnik et al. 2020; Zaheer et al. 2023). Using this theory, the study focuses on the research question on environmental awareness, knowledge, and consumer behavior towards buying green products (Kalyar and Rafi 2013; Kalyar et al. 2019). This theoretical lens assists in understanding how awareness and knowledge play out their roles in the process towards the generation of green purchase intentions and actual consumer behaviour.

The purpose of this research study is to analyse and compare the factors that influence green consumer behaviour toward SDGs in Saudi Arabia and Pakistan regarding learning theory frameworks. Consequently, the primary aim of this study is to assess and compare Saudi Arabian and Pakistani consumers' overall understanding and knowledge regarding the environment and his/her green purchasing preferences and behaviour. The rationale for this research arises from the observing cultural, economic and environmental disparities

between the two countries. Therefore, the study seeks to contribute to this strand of literature to advance understanding of how differences in awareness and knowledge affect green intentions and behaviour in different contexts. In addition, the study is in synchronized with Sustainable Development Goal (SDG) 12 relative to Responsible Consumption and Production (Chang et al. 2021; Shiel et al. 2020). It is placed to improve knowledge of how increasing the awareness of the environment and knowledge leads to consumers' responsible behaviour for achieving sustainability (Anwar & El-Bassiouny 2020; Chang et al. 2021).

Literature review and development of hypotheses

Environmental awareness and green consumer behaviour

Environmental awareness means an understanding of the physical environment and accepting the consequences of human behaviour on it. It includes a keen understanding and respect for the environment and the prompt need to conserve it. Environmental awareness and the adoption of sustainable consumption patterns are vital pillars in the accomplishment of the Sustainable Development Goals (SDG), especially environmental ones. Environmental awareness on the other hand involves acknowledging the fact that protection of the environment is necessary and assessing the effects that societal activities have on nature (Bashirun and Noranee 2020). According to Severo et al. (2021), attitude refers to cognitive information in terms of environmental matters including climate change, pollution, and loss of species, which foster pro-environmental behaviour. However, there is a type of awareness that is effective, a form of emotional connection to environmental issues that can compel people to do something about it (Yamane and Kaneko, 2021). Education-Action programs that advocate thinking and action are more effective in fostering the behavioural comprehension of knowledge making it turn into practical action toward environmental conservation (Raza and Khan 2022). Green consumer behaviour is defined as those actions that involve using money to purchase goods and services in a way that would not harm the environment (Siyal et al. 2021). The favourable attitudes toward the environment mean more favourable actions toward the environment, and causational beliefs or perceived consumer effectiveness significantly affect consumer behaviour (Alagarsamy, Mehroliya and Mathew 2021). Peer pressure also remains relevant; marketers who seek to target consumers with messages regarding

green products, impact social approval standards for the same (Voola et al. 2022). However, some of the perceived barriers include; perceived higher costs, availability, and inconvenience all of which can limit green consumer behaviours, thus the need to solve such challenges when encouraging green consumption. Regarding environmental awareness and green consumer behaviour, the following are the SDGs that are highly connected: SDG 12 – Responsible Consumption and Production SDG 13 – Climate Action SDG 15 – Life on Land SDG 14 – Life below Water (Amoako et al. 2020). These ideas are incorporated into literature in frameworks such as the Theory of Planned Behaviour as well as the Value-Belief-Norm Theory to forecast and explain environmentally sensitive behaviour. There is a sense in which the endeavour to promote sustainable consumption patterns can contribute to achieving sweeping sustainability objectives and creating a healthier world for future generations.

H1: Environmental awareness is positively related to green consumer behaviour for SDGs

Environmental knowledge and green consumer behaviour

Environmental knowledge refers to the understanding of environmental issues, including the causes and consequences of environmental problems, as well as the role of individual actions in mitigating these issues. It encompasses both factual knowledge about environmental issues and the ability to apply this knowledge in everyday life (Prieto-Sandoval et al. 2022). The researchers (Yamane & Kaneko, 2021) have proved that there is a strong positive relationship between environmental awareness and its impacts on customer behaviour. For instance, in a research (Amoako et al. 2020) it is found that consumers who depicted a higher level of E-scheme knowledge will engage in environmentally friendly behaviours like energy conservation and recycling. This is the case because environmental knowledge gives consumers the relevant information that they require to come up with proper consumption patterns (Khan et al. 2023).

Educational programs and awareness campaigns, media coverage and social influence, and personal experience and feedback received from others have been cited as essential determinants in environmental knowledge (Zameer and Yasmeen 2022). Awareness creation through educational programs and corresponding consumer awareness campaigns can improve environmental knowledge (Ling et al., 2024).

It also plays an important role in increasing environmental concern and awareness since consumers are constantly exposed to such issues through the media and social networks (Maurer and Bogner 2020). Consumer knowledge is also influenced by personal observations and information received from other sources, as people transform their knowledge and that of others to create their own knowledge (Shiel et al. 2020). Consequently, environmental knowledge is a critical element that forms consumer behaviour, especially in the green consumerism realm (Lavuri 2022). Through presenting the relevant information to make informed decisions, knowledge of the environment can affect the perception of attitude, subjective norms, and perceived behavioural control (Essiz et al. 2023). This means that issues such as education, media, and first-hand experiences affect the level of understanding of the environment. This study can help in formulating interventions aimed at encouraging individuals to increase their level of knowledge on the environment to create an effective environment for encouraging sustainable consumption practices and environmental sustainability.

H2: Environmental knowledge is positively related to green consumer behaviour for SDGs

Environmental awareness and green purchase intentions

The green purchase intentions can be defined as the consumers' readiness or tendency to buy products that are green or that have some form of connection to the conservation of the environment (Nikolić et al. 2022). The products include characteristics like recyclability, biodegradability, the use of sustainable or Organic material and so on which restrict the negativity on the environment. Green purchase intentions refer to the consumer's behavioural inclination to make decisions to purchase goods and services that are labelled as environment-friendly based on their knowledge, self-attitude, the influence from other people, and perceptions or impacts on the environment with their consumer decisions. Environmental awareness is the concern of the state of the environment or the sensitivity towards the environment and the impact of human activities on the biosphere. This learning entails components of climate change, pollution and eradications of bio-diversity amongst others as it creates disposition and perception on sustainability (Dinu et al. 2020). Studies (e.g. Aldieri et al. 2022) have found that enhancing the environmental consciousness brings about the individual's preparedness for environmentally friendly consumer participation toward decisions because of

the positive perception of environmental products and the belief that consumers' actions contribute to environmental enhancement.

H3: Environmental awareness is positively related to green purchase intentions

Environmental knowledge and green purchase intentions

Green purchase intentions and environmental knowledge show a significant relationship since environmental knowledge impacts green purchase intentions (Maciejewski and Lesznik 2022). Environmental literacy means being familiar with the environmental conditions and the effects of an individual and his actions toward the environment. The researchers (Voola et al. 2022) found that there is a positive relationship between environmental knowledge and green purchase intention because when consumers are aware more of the environment they will be sensitive regarding their purchases to the environment. This knowledge ensures consumers are aware of the advantages of consuming green products in that they decrease pollution and preserve resources, thus increasing their incentive to buy such products. Secondly, environmental knowledge forms attitudes and beliefs that are reported to highly influence green purchase intentions. For instance, when people are conscious of the consequences of polluting the environment with plastics, then they will be forced to use products that are reusable or biodegradable (Kerber et al. 2023). Studies indicated that environmental knowledge enhances the perceived consumer effectiveness, which in simple terms means that it makes the consumers feel capable enough to make the right green choices. However, it is seen that environmental knowledge is not sufficient to stimulate green purchase intentions; that is, other factors such as social pressure, personal orientation, and self-perceived factors such as higher prices or unavailability also contribute significantly (Lavuri 2022). As such, to improve the levels of green purchase intentions, different strategies have to be adopted, they are the level of environmental knowledge, perceived barriers, and social influence. By raising awareness and knowledge of the existing environmental problems, consumers will be more likely to make the right decisions in their choice of products and foster the concept of individual responsibility for the environmental situation and thus stimulate the demand for green products on the market, which will positively affect the changes in business and the transition to a more sustainable economy (Siyal et al. 2021). Education and awareness intervention in

addition to the barriers to green consumption can lead to the development of sustainable habits consistent with general environmental conservation sustainable development (Dinu et al. 2020).

H4: Environmental knowledge is positively related to green purchase intentions

Green purchase intentions and green consumer behaviour

Intention to buy green products has a positive relationship with the consumer in the context of SDGs (Nekmahmud and Fekete-Farkas 2020). The research (Mohiuddin et al. 2018) indicated that green consumer behaviour relates well with the strong purchase intentions of green products and sustainably supported brands. From the perspective of the client, such a shift in the consumption pattern minimizes the negative effects on the environment while encouraging the business organizations to support sustainable development goals, particularly in the area of responsible consumption and production as espoused in SDG 12 (Yildirim 2022). the research (Zaheer et al. 2023) indicates that consumers' green products' purchase intentions determine the customers' actual purchase behaviour and in the process, support environmental and societal gains. The positive relationship established here therefore calls for further encouragement of green purchase intention as a way of enhancing sustainable consumer behaviour as espoused by the sustainable development goals (Nguyen & Le 2020).

H5: Green purchase intentions positively related to consumer behaviour for SDGs

Mediating role of green purchase intentions

Green purchase intention is therefore a bridge between attitude and actual pro-environmental behaviour; it can hence facilitate the achievement of the SDGs (Ogiemwonyi and Jan 2023). Environmental concern therefore entails appreciating the effects of the environment and factors such as pollutants, global warming, and deforestation among others (Yildirim et al. 2024). Another hypothesis is that higher levels of environmental perception lead to higher levels of green purchase intentions among consumers; it means that consumers are more likely to buy eco-friendly products (Hung and Chang 2024). These intentions can help establish the connection between the recognition of the problems and the chances of a transformation in the consumers' behaviour.

Earlier studies were conducted in this context as it emerges from the interaction of environmental awareness and the intention to buy green products (Chang et al. 2021). This intention was considered to impact the consumers' behaviour, in common, and, therefore, their actual behaviours, regarding purchasing products that align with the objectives of the SDGs, especially those that are associated with the ideas of sustainable consumption and the protection of the environment. However, the extent of conformity and usage which is contingent on this mediation is a function of other variables such as; culture, perceived relevance of the values, and potential barriers to use like cost and ease (Malarvizhi et al. 2022).

These boundaries can be overcome through the encouragement of education, policy, and strategic marketing efforts to support the theory regarding green purchase intention to reinforce the mediating factor regarding GA preferring tangible and environmentally friendly actions for sustainable development (Mohiuddin et al. 2018). Overall, green purchase intention as a mediator between environmental awareness and actual buyer behaviours that are indicative of the desired change in consumer habits and line with the SDGs is an effective concept (Zhang et al., 2024).

H6: Green purchase intentions positively mediate environmental awareness and consumer behaviour for SDGs

The 'green purchase intention' also stands as a vital mediator between environmental knowledge and the actualized sustainable consumer behaviour benefiting the three pillars of SDGs. Environmental attitude increases the understanding of problems like pollution and global warming, thus increasing the green purchase attitude consumers' readiness to make purchases that are friendly to the environment. These intentions serve as somewhat of a middleman between awareness and behavioural change, motivating the consumer to be environmentally friendly (Voola et al. 2022). Several studies have produced evidence that demonstrates that when consumers' awareness of the environment is raised, they are more willing to purchase environmentally friendly products thus altering their behaviour in ways that are necessary for the achievement of the SDGs including responsible consumption as well as action towards climate change (Comrey and Lee 2013; Hung and Chang 2024; Kharbanda et al. 2023). However, the usefulness of this mediation can be influenced by factors such as social acceptability, user's beliefs about the issue, and perceived impediments to change such as costs and ease of the

process (Bashirun and Noranee 2020). By eradicating them through education, policy, and marketing, a firm's green purchase intentions will be enhanced.

H7: Green purchase intentions positively mediate environmental knowledge and consumer behaviour for SDGs

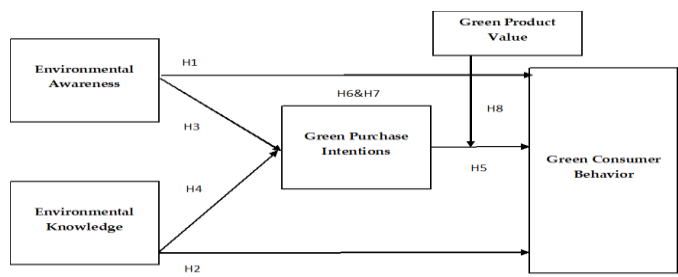
Moderating role of perceived value

Perceived value for green products involves the consumer's evaluation of the amount and quality of the benefits and utilities of the green products relative to the benefits and utilities of the total costs (Amoako et al. 2020). These aspects include; the environmental cost of green products and the costs of products themselves, their quality and effectiveness, their perceived health benefits, and the long-term costs of these products (Zameer and Yasmeen 2022).

Green purchase intention encompasses the consumers' attitude towards the purchase of green products while green consumer behaviour covers the purchase and usage of green products (Synodinos et al. 2023). Since these consumers expect high value in green products, their green purchase intentions are likely to be translated into green consumption. Such aspects of perceived value include environmental concerns, product characteristics, cost, and perceived satisfaction with green products (Siyal et al. 2021). For instance, if the consumers only learn that the buying of sustainable goods is good for the natural environment, these consumers will be willing to translate the good intentions into action and thus help achieve the SDGs like SDG 12 on Consumption and Production, SDG 13 on Climate Change, and SDG 15 on Life on Land. On the other hand, when the perceived value of green products is low, the consumers with HI-GP may not act as green consumers because they perceive green products to be expensive, low in quality, or inconvenient. Some of the ways to enhance the perceived value of green products include; arranging aware-ness programs, ensuring high green product quality and performance (Rafi et al. 2022), providing subsidies and discounts for green products, and the use of proper marketing communication to promote aspects that support the green product value. Therefore, the perceived value for green products affects the relationship between green purchase intention and green consumer behaviour for the realization of the SDG goals.

H8: Perceived Value for green products moderates the relationship between green purchase intentions and consumer behaviour for SDGs

Figure 1. Illustrating hypothesized model



Methodology

This research employed a quantitative research strategy to analyse the correlation between environmental knowledge, awareness of the environment, green purchasing behaviours intentions, consumer involvement, perceived value of green products, and green consumer behaviour. Environmental knowledge and environmental awareness were the two independent variables, green purchase intention was the mediator, while the perceived value for green products served as the moderator and the green consumer behaviour for achieving SDGs was the dependent variable.

The population of Saudi Arabian and Pakistan consumers was used and data were gathered systematically by using a stratified random sampling technique to capture equal representation from each country. The target population included men and women aged 18 years and above from both countries. Data were collected from the participants using an online survey.

The questionnaire was divided into two sections: sample demographics and the constructs that captured the study variables. In the demographics section, respondents were asked questions regarding their country, gender, age, level of education, and occupation. The constructs section measured the following variables: Environmental knowledge (IV), determined using the Scale developed by Mohiuddin et al. (2018) with slight amendments. This variable consisted of five items. Environmental awareness, also an independent variable was measured by adopting a scale, initially devised by Mohiuddin et al. (2018) but with slight alterations made to some of the questions. Green purchase intentions as the mediating variable was measured with the scale developed by (Nguyen and Le 2020) with slight tailoring to fit with research objectives. Perceived value for green products

(Moderator), was measured by the adapting the scale developed by (Nguyen and Le 2020). This variable involved the following five items. Green consumer behaviour for SDG (dependent variable) was constructed upon a scale proposed by (Kamalanon et al. 2022) with slight modifications. This variable comprised four items. All statements used a 5-point Likert scale including ‘strongly disagree’ (1) and ‘strongly agree’ (5).

To perform data analysis, structural equation modelling (SEM) was used to examine the hypothesized relationships between the variables. The analysis included the following steps: Frequency Analysis provided details of the demographic profile of the participants. Internal consistency was measured using Cronbach’s Alpha coefficient, and the validity of the measurement scales was checked using confirmatory factor analysis (CFA).

Case-1: Data analysis (for Saudi Arabian respondents)

The first case study sample consisted of 500 participants from Saudi Arabia with a gender distribution of 67.8% male, 22% female, and 10% preferring not to disclose their gender. Age distribution, 51.6% were aged 26-39 years, 29% were 18-25 years, 4.6% were 40-49 years, 1.8% were 50-59 years, and 13% were over 60 years. Regarding education, 17% had a higher secondary level education, 53.8% had a Bachelor’s degree, 7.6% had a post-graduate degree, 1.8% possessed a professional degree, and 19.8% had other educational qualifications. Occupationally, 29.2% were private sector employees, 26.2% were business owners, 13.4% were public sector employees, 12.8% were students, and 18.4% fell into other categories. The relationships between environmental awareness (EAW), environmental knowledge (EK), green purchase intentions (GPI), and green consumer behaviour for Sustainable Development Goals (GCB), while also considering the moderating role of perceived value for green products (GPV). The hypotheses tested in this study included both direct and indirect relationships, as well as moderating effects.

Table 1. Correlations coefficients for study constructs

Constructs	1	2	3	4
1 Environmental Awareness				
2 Environmental Knowledge	0.381***			
3 Green Purchase Intentions	0.539 ***	0.621***		

4	Green Consumer Behavior	0.701***	0.482***	0.591***	
5	Green Product Value	0.174***	0.104***	0.308***	0.305***
*** Significant at p<0.001					

The correlation matrix highlighted strong positive relationships among the variables studied. Environmental awareness (EAW) correlated significantly with green consumer behaviour (GCB) at 0.701 and green purchase intentions (GPI) at 0.539, indicating that higher awareness led to more sustainable consumer actions. Environmental knowledge (EK) also showed positive correlations with GCB (0.482) and GPI (0.621), emphasizing its role in influencing green behaviours.

As Table 2 describes the path coefficient for the relationship between EAW and GCB is 0.038 ($p<0.000$), indicating a significant positive relationship. This confirms H1, suggesting environmental awareness was positively related to green consumer behaviour for SDGs. The path coefficient for EK and GCB is 0.473 ($p<0.000$), indicating a significant positive relationship. This supported H2, demonstrating that environmental knowledge contributed to green consumer behaviour. With a path coefficient of 0.761 ($p<0.000$), EAW significantly influenced GPI, strongly supporting H3. This finding highlighted that individuals with higher environmental awareness were more likely to have intentions to purchase green products. The path coefficient for EK and GPI was 0.146 ($P<0.000$), indicating a significant positive relationship. This confirmed H4, suggesting that environmental knowledge enhanced green purchase intentions. The relationship between GPI and GCB was confirmed with a path coefficient of 0.367 ($P<0.000$), supporting H5. This demonstrated that stronger green purchase intentions led to increased green consumer behaviour.

Table 2. Path Coefficients for hypothesized relationships

Constructs Relationships	Coefficient	P-values
EAW→ GCB	0.038	0.000
EAW → GPI	0.761	0.000
EK → GCB	0.473	0.000
EK → GPI	0.146	0.000
GPI → GCB	0.367	0.000
GPV x GPI → GCB	0.119	0.000

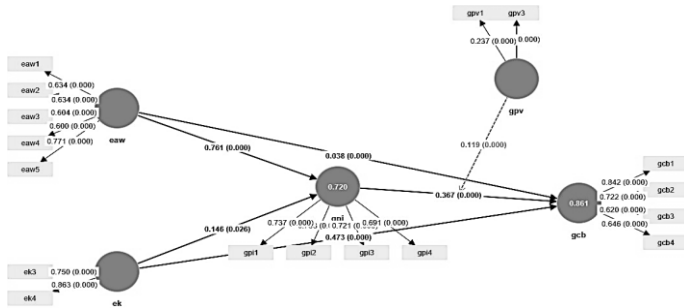
Table 3 explains the total indirect effect of EAW on the GCB via GPI is 0.280 ($p < 0.000$). These findings confirmed H6, indicating that GPI significantly mediated the relationship between EAW and GCB. While the EK on GCB via GPI had significant path coefficient 0.054 the results supported H7, showing that GPI significantly mediated the relationship between EK and GCB.

Table 3. Total indirect effects

Constructs Relationships	Coefficient	P-values
EAW → GPI → GCB	0.280	0.000
EK → GPI → GCB	0.054	0.000

The interaction term (GPV x GPI) had a path coefficient of 0.119 ($p < 0.000$), indicating a significant moderating effect as described in Table 1. This supported H8, suggesting that the perceived value of green products enhanced the positive impact of green purchase intentions on green consumer behavior.

Figure 2. Illustrating the graphical representation of path coefficients for Saudi Arabia



Case-II: Data analysis (for Pakistani respondents)

The second case study sample involved 500 participants from Pakistan with a gender distribution of 75% male, 16.6% female, and 8.4% preferring not to disclose their gender. Age-wise, 16.2% were aged 18-25 years, 32.7% were 26-39 years, 12.2% were 40-49 years, 32% were 50-59 years, and 6.8% were over 60 years. In terms of education, 13.2% had a higher secondary level education, 36.6% had a Bachelor's degree, 14.2% have a post-graduate degree, 29.8% possessed a professional degree, and 6.2% had other educational qualifications.

Occupationally, 19.4% were students, 27.5% were private sector employees, 7.8% were public sector employees, 36.9% were business owners, and 6.2% fell into other categories.

Table 4 explains the correlation matrix revealing significant and positive relationships among the variables examined. Environmental awareness (EAW) exhibited strong correlations with both green consumer behaviour (GCB) at 0.311 and green purchase intentions (GPI) at 0.567, indicating its substantial impact on promoting sustainable consumer actions. Environmental knowledge (EK) also demonstrated positive correlations with GCB (0.433) and GPI (0.342), underscoring its role in influencing environmentally conscious behaviours.

Table 4. Correlations coefficients for study constructs

Contracts	1	2	3	4
1 Environmental Awareness	--			
2 Environmental Knowledge	0.4321***			
3 Green Purchase Intentions	0.567 ***	0.342***		
4 Green Consumer Behavior	0.311***	0.433***	0.322***	
5 Green Product Value	0.174***	0.234***	0.323***	0.323***

*** Significant at $p < 0.001$

Table 5 shows that the path coefficient for the relationship between EAW and GCB was 0.092 ($P = 0.000$), indicating a significant positive relationship and supporting H1. The path coefficient for EK and GCB was 0.307 ($P < 0.000$), indicating a significant positive relationship. This supported H2, demonstrating that environmental knowledge contributed to green consumer behaviour. With a path coefficient of 0.159 ($P < 0.000$), EAW significantly influenced GPI, strongly supporting H3. The path coefficient for EK and GPI was 0.759 ($P < 0.000$), indicating a significant positive relationship. This confirmed H4, suggesting that environmental knowledge enhanced green purchase intentions. Similarly, the relationship between GPI and GCB was confirmed with a path coefficient of 0.355 ($P < 0.000$),

supporting H5. This demonstrated that stronger green purchase intentions led to increased green consumer behaviour.

Table 5. Path coefficients for hypothesized relationships

Constructs Relationships	Path Coefficient	P-values
EAW → GCB	0.092	0.000
EAW → GPI	0.159	0.000
EK → GCB	0.307	0.000
EK → GPI	0.759	0.000
GPI → GCB	0.355	0.000
GPV x GPI → GCB	0.057	0.000

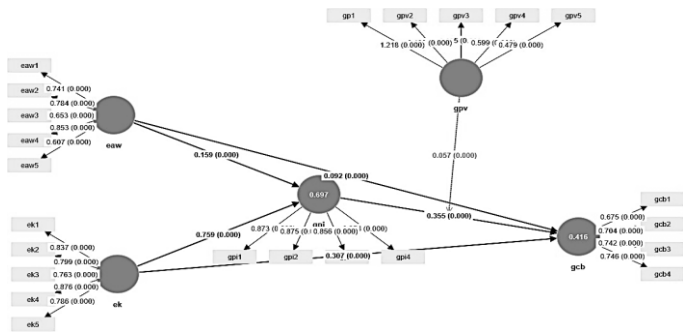
The total indirect effect of EAW on GCB via GPI is 0.455 ($P < 0.000$). This finding confirms H6, indicating that GPI significantly mediated the relationship between EAW and GCB, enhanced the overall effect of environmental awareness on green consumer behaviour. Similarly, the total indirect effect of EK on GCB via GPI was 0.169 ($P < 0.000$). This result supported H7, showing that GPI significantly mediated the relationship between EK and GCB.

Table 6. Total indirect effects

Constructs Relationships	Coefficient	P-values
EAW → GPI → GCB	0.238	0.000
EK → GPI → GCB	0.036	0.000

The interaction term (GPV x GPI) had a path coefficient of 0.057 ($P < 0.000$), indicating a significant moderating effect. This supported H10, suggesting that the perceived value of green products enhanced the positive impact of green purchase intentions on green consumer behaviour.

Figure 3. Illustrating the graphical representation of path coefficients for Pakistan case



Discussions, implications, and limitations

This comparative analysis examines the relationships between environmental awareness (EAW), environmental knowledge (EK), green purchase intentions (GPI), and green consumer behaviour for Sustainable Development Goals (GCB) in two distinct economic and environmental contexts: The two countries are Saudi Arabia and Pakistan. The research also examines the moderating effect of the perceived value of Green products (GPV).

Saudi Arabia is a member of the country with high income and it has a sufficient amount of capital that could be used to finance environmental projects (Amoako et al. 2022). Their Vision 2030 presents ideals of economic transformation and sustainable development (Sen et al., 2021). Environmentally, the challenges that the country has included factors such as scarcity of water as well as high energy factors hence making consumer green behaviour important in development (Malarvizhi et al. 2022). While Saudi Arabia has tremendous resources and funds for the environment, Pakistan is a developing country with less resources for such projects. There are several challenges that the government faces in achieving economic growth while at the same time ensuring that there is proper care for the environment. On the environmental aspect, the main concerns in Pakistan include air, water, and forest pollutants; green consumerism must be encouraged as part of sustainable development (Shamsi et al. 2022). Comparing Saudi Arabia and Pakistan enables the understanding of environmental awareness (EAW), environmental knowledge (EK), green purchase intentions (GPI), and green consumer behaviour for Sustainable Development Goals (GCB) in different economic and environmental settings prompted by differences in

economic development, industrialization, and environmental policies and awareness.

The following table outlines the specific implications of these factors in Saudi Arabia and Pakistan, highlighting how differing conditions and policies affect the progression toward sustainable development goals and consumer behaviour in each country.

Theoretical implications

The findings of the current study hold theoretical contributions to the green consumer behaviour literature in the context of Saudi Arabia and Pakistan. Comparing Saudi Arabia and Pakistan highlights that socio-political and economic conditions shape how environmental knowledge and awareness translate into green consumer behaviours. The use of learning theory supports the claim that knowledge and awareness of the environment play a critical role in influencing people's attitudes and behaviours toward sustainable consumption. The positive significant correlations of environmental awareness, knowledge, purchasing intentions, and actual green consumer behaviour show that information and education are essential for the change in consumers. The results affirm the crucial role of environmental knowledge in shaping green consumer behaviour, reinforcing the importance of educational interventions for fostering sustainable habits. The study demonstrates that information and education significantly impact green consumer behaviour, highlighting the importance of educational programs and informative campaigns in fostering environmentally friendly habits. This theoretical perspective explains that the practice of educational programs and informative campaigns can be significant in creating consumers with environmentally friendly habits.

Practical implications

From a practical perspective, the findings presented in the study offer valuable recommendations for policymakers who seek to incite changes in consumption patterns in Saudi Arabia and Pakistan. Concretely, raising the level of environmental education in schools and Universities, using the media and community approaches to stimulate awareness among the population, and providing appropriate incentives to purchase eco-logical products in stores can increase the knowledge of the population about environmental issues. Given the strong correlation between environmental awareness and green purchase

intentions (0.761 in Saudi Arabia), policy interventions should prioritize educational programs to promote environmental consciousness among consumers. The findings indicate that policies aimed at increasing environmental education and awareness should focus on enhancing consumer green purchase intentions, as higher intentions directly lead to stronger green consumer behaviour. These pragmatic strategies are particularly crucial in turning good ideas into actual actions that help in advancing and fostering environmental stewardship initiatives, like lowering carbon impact and encouraging more sustainable and green conduct and behaviours.

Managerial implications

At the managerial level, the study provides valuable information to businesses and marketers looking forward to reaping from the increasing trend in consumption and use of sustainable products in Saudi Arabia and Pakistan. Bearing these theories in mind, awareness of factors affecting green consumer behaviour like the perceived value of green products can assist businesses in framing their strategies and products. In a nutshell, the sustainable marketing strategies that can contribute to the growth of sustainable business are: increasing the focus on the environmental impact on the product, providing accurate information about the sustainability initiatives, and appealing to the consumer's self-identity as a sustainably minded individual. The study's results highlight the importance of businesses emphasizing the perceived value of green products in their marketing strategies, particularly in Pakistan where perceived value is a stronger moderator. Furthermore, establishing relationships with ecological organizations and engaging in sustainability management increase CSR images and consumer loyalty to an environmentally sustainable business.

Limitations and future directions

There are some limitations in this study. In the cross-sectional study design, the longer-term choice transition of green consumers cannot be examined due to the lack of temporal context. Moreover, gender distribution of the sample could affect the results as gen-der influences the level of green consumption. The present research also limited to consider the influence of new media technologies on people's environmental consciousness and their buying behaviour, as well as to evaluate the efficacy of certain policies and measures designed to foster sustainable development.

The following are potential areas for future research that would build upon the outcomes from this study to deepen our understanding of green consumer behaviour within diverse socio-economic environments: First of all, future studies regarding green consumer behaviour could comprise other nations with different economic structures and culturally different consumers. Research conducted in different areas could aid in the determination of common trends regarding sustainable consumption and area-specific factors. Secondly, it has been stated that further longitudinal research could be informative regarding the dynamics of green consumer attitudes and behaviours arising from transitional economic conditions, technological innovations, and ecological legislation. Such research could provide more information about the sustainable outcomes of different interventions and awareness programs.

Additionally, future studies could explore how gender-specific factors influence sustainable consumption patterns, providing insights into targeted interventions for different demographic groups. Furthermore, more theoretical development is needed in the potential utility of digital and social media in influencing green consumers' behaviours. Studying how online platforms, social media campaigns, and influencer marketing affect environmental awareness and purchasing decisions could offer possibilities that can be useful for marketers and policymakers who are looking to use digital media for the promotion of sustainability.

Conclusion

The increased concerns towards environmental issues and the implementation of sound economic policies in KSA offer a solid platform to change the consumers' environmental consciousness and buying behaviours for environmentally friendly products. On the other hand, Pakistan needs to address the environmental concerns along with its economic constraints which require concentrated efforts on environmental awareness, as well as value-based marketing communications that can encourage green consumerism. The in-sights gathered can thus be used by policymakers and marketers in both countries to observe certain measures given the prevailing economic and environmental realities to support sustainable development goals and cultivate a culture of environmentalism.

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