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RESEARCH ARTICLE

Attitude and Consumer Behavior Towards Ecofriendly Products in Punjab, Pakistan: A Way Forward for Sustainable Consumer Behavior

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ABSTRACT

Background: Sustainable consumption patterns are need of hour to achieve the sustainable development goals especially in developing world where the population is increasing at fast pace. In developing countries, environmental consideration while consumption is very important. Awareness is still at the beginning stages in most of the developing countries like Pakistan. Now both marketers and consumers are diverting to the ecofriendly products because of awareness about imputation of global warming, non-biodegradable solid waste, harmful import of pollutant etc. These environmental issues lead to further investigation in order to acquire more knowledge in handling this matter.
Objective: This study examined the factors that trigger consumer to buy ecofriendly products. The present study was conducted to determine the consumer purchase intention (as dependent variable) among the consumers in study area, by using product price, environmental awareness and concerns, green promotion and availability (as independent variables).
Methodology: A well-structured questionnaire was developed to collect primary data from 220 respondents. Simple random sampling technique was used to collect data.
Results: Advertisement and the significance of environmental knowledge prompt to believe consumer on green claim products. Pay an extra price for ecofriendly products also showed a positive attitude towards purchase intention. Furthermore, positive attitude does not lead to action i.e. purchase of these products.
Conclusion: With the growing awareness, many businesses have accepted their responsibility not to harm the environment and not to waste the natural resources. Consumer buying choices can make a difference to the environment just because of awareness and could be accelerate the consumption of ecofriendly products. The most powerful element that influence purchase of green products was environmental concerns that will help to reduce in production of unsustainable products.

INTRODUCTION

Sustainable development requires the development and use of sustainable and ecofriendly products (Majeed *et al*. 2022). The developing world is facing serious concerns to sustain production and consumption in the presence of rising population, externalities and market inefficiencies (Gilal *et al*. 2020; Waqas *et al*. 2020). Nature blessed humans with a beautiful and clean environment, but the humans destroy the environment with their activities. Overpopulation, polluted air, land, water, loss of public spaces, disappearance of biological diversity and all environmental problems that whole world is currently facing environmental sustainability issues due to which environmental issues have effects and changed the ornament of human life activates (Batool *et al*. 2023; Durrani *et al*.

2023). The use of worldwide electronic products has increased due to the accelerated growth in technology that creates environmental deterioration. Human resource management, economic, financial and technical advancement affected the environmental issues at large in many ways (Ionescu *et al.* 2021). The utilization of resources depends upon the decisions taken by human resources in economic cycle from farm to fork in whole value chain. Technological innovation can deteriorate and save the environment according to human requirements and choices. Marketing at large creates such an environment that can influence the human behavior, attitude and decisions towards any product and its credentials. There are different marketing terms used to represent ecofriendly products like green, nature friendly etc. to promote good and services, sometimes with extra, more specific certifications such as ECO labels. The International Organization Standardization has developed ISO 14024 to demonstrate principle and procedure that Eco labelers should follow. Worldwide big industrialization is just the result of fast economic growth and increasing consumption of natural resources. This in turn has resulted in eruption of environment due to explosion of natural resources (Nguyen 2020).

Demand for ecofriendly products across the globe has just grown by rise in buyer education. Therefore, the ideology of understanding the environmental attitude of the consumers come out from eco-friendly marketing and green marketing (Ud Din *et al.* 2023). Pattie defined Green Marketing as "the holistic management practice responsible for identifying, anticipating and satisfying the requirements of clients and society, in a profitable and sustainable way" (Peattie 2016). Due to the energy crisis many developing countries are adopting energy-efficient appliances (EFAs), this is s best way out about sustainable consumption and energy related issues for consumers. EFAs are environmentally friendly too (Ahmed *et al*. 2023; Bhutto *et al*. 2021). There are a lot of factors that affect consumer interest in adopting ecofriendly friendly products including inadequate information about products, lack of finance for firms, cost of output and the trust that individual actions alone cannot impact the tendency to free ride. In this regard marketing can do wonders, they identify the needs and wants of consumers and urge them to buy eco-friendly products (Hayyat *et al*. 2023; Sharma and Trivedi 2016). In these days, educated peoples are aware of ecofriendly products and have knowledge about environment related issues. Altruistic movies were more important for buyers. Purchase of green products could be affected by false assumptions about word "ecofriendly" (Barbarossa and De Pelsmacker 2016; Saeed *et al*. 2023). Customer awareness about the product is the constitutional right of consumer is called consumer awareness. Brand awareness is to the extent to which consumer insight into the particular products or services and familiarize the customer with unique and new designs (Prakash and Thakur 2023). Consumers are becoming more bionomical responsive and desire to purchase green products (Suganya and Kavitha 2017). Level of knowledge, attitudes, values and practice of consumers are depending by the serious quality of environment (Pillai 2016).

The aim of this study was to find out consumer buying behavior towards ecofriendly products in concerns of environmental issues and whether they would be able or not to pay an extra price for such products. This research is based on five ecofriendly products: cloth or cotton bag, recycled fabric cloth, paper packaging and disposable plates, solar energy sources and LED blubs. The main reason why cloths bags are better than plastic bags are: cloths bags are reusable, decreasing the need to buy them again and again. Therefore, it decreases the use of plastic and plastic pollution. There are some fabrics that are ecofriendly due to availability in nature, clean from any chemical or toxic substance and no harm to others like hemp, wool, organic cotton, soy silk, bamboo fabric, jute, corn fiber etc. Conventional or organic cotton require more resources as compared to recycled cotton that prevents additional textile waste. The objective of this study was to analyze the consumer behavior towards ecofriendly products, the demand of ecofriendly products and determinants of ecofriendly products adoption.

MATERIALS AND METHODS

For getting better understanding of the theoretical framework and including the factors that affect purchase of ecofriendly products, a conceptual framework is shown in Fig. 1 to extract the ideas from the theoretical framework discussed here. The main population targeted in this study was basically from Faisalabad, which is the third most populous city in Pakistan. A well-structured and pre-tested questionnaire was used to collect primary data. The data was collected through planned interviews. Simple random sampling was used to pick respondents, and 220 participants were selected from study area.

The method used to separate systematic variation from noise is being a multivariate exploratory analysis that's called principal component analysis. It allows envision of objects and variables and preserve the relevant information of the original data that allowed to define a space of reduced dimensions (Geladi and Linderholm, 2020). A statistical process that allows you to summarize the information by mean of smaller set of "summary indices" from information content in large data tables is called Principal component analysis. PCA is very helpful tool to find out the analysis of dataset that may contain multicollinearity, missing value, categorical data and vague measurements due to this property it is flexible tool. The main object is to express information as a set of précises and draw out the important information from data is called principal components.

The most common application of principal component analysis (PCA) is to reduce the dimensionality of data in order to obtain lower-dimensional data. This is

Fig. 1: Conceptual framework

accomplished by projecting each data point onto only the first few principal components, all the while attempting to preserve as much of the variation in the data as possible. In addition to that, it is utilised in the process of predictive modelling and the examination of explanatory data. A correlation matrix with ones on the diagonal is affected negatively by this. The value of variance is responsible for determining whether the number of observed values, the sum of diagonals, or the trace of the matrix are correct. In this study, the number of observed variables has been shown to be either fewer than or equal to the number of major components. The first major component has a significant proportion of the data's variation in comparison to the second component, which also has a great amount of the data's variance and is completely uncorrelated (orthogonal) with the first one, and so on. Due to the fact that they are orthogonal, which means they are symmetric, the primary components are the eigenvectors of the covariance matrix. Eigenvectors are weights that are utilised in the process of estimating elemental score.

To evaluate the consumer's response towards ecofriendly products was being used a contingent valuation (CV) approach. A direct estimation of WTP just allowed by the CV approach by means of different (direct) extract technique. A type of regression where dependent variable just has two values is called Probit model. The dependent variable Y is a distinct variable that represent a choice, or category, from a set of mutually exclusive choices or categories. In this study probit model is used to estimate the willingness to pay for ecofriendly products and recognized the factors affecting the willingness to pay (Gujarati and Porter 2009). There are some factors that explain positively affect while other factors negatively affect willingness to pay for ecofriendly products. Probit model is basically applied for those variables that are qualitative in nature and have answers in two types like "yes or no" and "purchase or no purchase"

In probit regression, when dependent variable is binary is being used to model the regression function that's called increasing standard normal distribution Φ, that is we assume:

$$E(Y|X)=P(Y=1|X) = \Phi(\beta 0+\beta 1X).$$

Assume that Y is a binary model. The model

$$Y = \beta 0 + \beta 1 * X1 + \beta 2 * X2 + \beta 3 * X3 + \cdots \cdots \beta n * Xn$$

With

$P(Y=1 \mid X_1, X_2,\ldots\ldots..X_K) = \Phi (\beta_0+\beta_1X_1+ \beta_2X_2+\ldots\ldots B_kX_k)$ is the population probit model Φ is the cumulative standard normal distribution function with multiple repressor model $X_1, X_2 \ldots..X_k$ (Kantar 2021).

RESULTS AND DISCUSSION

Ranking of constraints

The collected data of 220 respondents were interviewed from different colonies of Faisalabad and mostly people are employed. The mean ranking of constraints that play a great role to purchase ecofriendly products (Table 1).

Principal component analysis

In this particular research, a Bartlett test of sphericity (BTS) and a Kaiser-Meyer Olkin (KMO) were utilised in order to establish that principal component analysis is an effective method to use. The value of BTS in Table 2 is displayed as 3183.391, and its degree of significance is shown to be significant, which suggests that the data were suitable for PCA analysis (Table 3). Because KMO has a value of 0.926, it may be deduced that there are adequate items for each factor. Throughout the course of our inquiry, we settled on a total of seventeen important aspects to look at.

Finding common elements, or principal components, in the form of linear combinations of the studied constraints is the goal of PCA, and these factors are then ranked according to their significance. Three components have eigenvalues greater than one, and these three components are responsible for 71.58% of the variance. It is important to note that only the factors with eigenvalues greater than one are kept. Only three elements are above the one eigenvalue, according to the eigenvalue plot (benchmark). The variance of 50.44% is accounted for by the first component's eigenvalue of 8.575. The first part is made up of eight components. Quality, performance, flavor, the environment, being healthy, being promoted, being available, and a reasonable price are the limitations that apply to this component. Performance (0.900), environment (0.894), flavor (0.866), health (0.875), promoted (0.803), availability (0.792), and fair costs are also factors, with quality having the greatest factor loading at 0.912. (0.784).

Rotated component matrix

The factor loading of component 1 as a whole is 6.846 (Table 4; Fig. 2). The variance for the second component is 14.88% with an Eigen value of 2.530. This component consists of eight items, as follow: packaging design (0.808), advertisement (0.780), satisfaction (0.762), environmental concern (0.745), environmental knowledge (0.742),

Table 1: The mean ranking of constraints playing a great role to purchase ecofriendly products

S. No.	Variables	Mean	SD	Minimum	Maximum
1	Higher willingness to pay for ecofriendly products.	1.21	1.017	1	5
2	Eco-friendly products have reasonable price.	3.18	1.339	1	5
3	Price of eco-friendly products is assuming to be higher as compare of ecological-non friendly products	3.25	1.237	1	5
4	Green products have a better quality/performance.	3.35	1.374	1	5
5	Eco-friendly products have superior quality/performance than non-ecofriendly products.	3.31	1.329	1	5
6	Eco-friendly products have a good taste and/or pleasant smell.	3.21	1.386	1	5
7	Before making a purchase, you take into account whether your goods and its packaging are made to be recycled.	3.61	1.167	1	5
8	Eco-friendly products are well promoted.	3.16	1.372	1	5
9	When you read a product's eco-friendly label, your decision to buy alters.	3.37	1.203	1	5
10	Advertisement for ecofriendly products are effective in creating awareness of problem facing the environment.	3.67	1.179	1	5
11	Eco-friendly items are beneficial.	3.54	1.494	1	5
12	Eco-friendly products are healthy.	3.44	1.453	1	5
13	As a customer, you think about a product's impact on the environment before buying it.	3.51	1.157	1	5
14	You consider your purchase eco-friendly product is correct from the environmental point of view.	3.69	1.104	1	5
15	You willing to go out your way to obtain ecofriendly products.	3.60	1.079	1	5
16	In purchasing the products, you believe there is enough information available about their eco-friendly aspects.	3.37	1.233	1	5
17	Eco-friendly products are accessible /available in the supermarket.	3.20	1.404	1	5

Source: Author's own calculations

Table 2: Bartlett test of Sphericity (BTS) and Kaiser–Meyer–Olkin (KMO) tests

Bartlett Test of Sphericity Approx. (Chi-Square)	0.926
Kaiser–Meyer–Olkin test for sampling adequacy	3183.391
Degree of Freedom	136.000
Significance	0.000

Source: Author's own calculations

Table 3: Total variance explained by PCA for ecofriendly products

Component	Eigenvalue	Difference	Proportion	Cumulative
1	8.575	6.045	0.50443	0.50443
2	2.530	1.467	0.14885	0.65328
3	1.063	0.308	0.06256	0.71584
4	.755	0.061	0.04442	0.76026
5	.694	0.071	0.04083	0.80109
6	.623	0.123	0.03664	0.83773
7	.500	0.075	0.02942	0.86715
8	.425	0.056	0.02499	0.89214
9	.369	0.037	0.02173	0.91387
10	.332	0.039	0.01952	0.93339
11	.293	0.072	0.01725	0.95064
12	.221	0.051	0.01299	0.96363
13	.170	0.032	0.00998	0.97361
14	.138	0.008	0.00812	0.98173
15	.130	0.03	0.00763	0.98936
16	.100	0.02	0.00591	0.99527
17	.080	0.08	0.00473	0.10000

Source: Author's own calculations

information (0.729), labelling (0.701) and high premium price (0.589). The sum of factor loading of this component is 5.856. The third component's Eigen value is 1.063, which explains a variance of 6.216%. There is only one thing in this component. This component's constraint is more willing to spend for environmentally friendly goods. The factor loading with the highest value is the greater willingness to pay (0.935).

The combined variance of the three components is 71.58, which indicates that these three components'

Table 4: Rotated component matrix

Construct	Items	Constraints	Component		
			1	2	3
Personal capabilities	PC-1	Eco-friendly products have a better quality/performance than conventional products.	0.912	-	-
	PC-2	Eco-friendly products have a good quality/performance.	0.900	-	-
	PC-3	Eco-friendly products are good for the environment.	0.894	-	-
	PC-4	Eco-friendly products have a good taste and/or good smell.	0.886	-	-
	PC-5	Eco-friendly products are healthy.	0.875	-	-
	PC-6	Eco-friendly products are well promoted.	0.803	-	-
	PC-7	Eco-friendly products are accessible/available in the supermarket.	0.792	-	-
	PC-8	Eco-friendly products have reasonable price.	0.784	-	-
Social norms	SN-1	You consider your product, and its package are designed to be recycled before making a purchase.	-	0.808	-
	SN-2	You consider advertisement for ecofriendly products are effective in creating awareness of problem facing the environment.	-	0.780	-
	SN-3	You willing to go out your way to obtain ecofriendly products.	-	0.762	-
	SN-4	You consider your purchase eco-friendly product is correct from the environmental point of view.	-	0.745	-
	SN-5	As a consumer while purchasing a product you consider its effect on the environment.	-	0.742	-
	SN-6	You feel there is enough information about eco-friendly product features while buying the products.	-	0.729	-
	SN-7	Your purchase decision changes when you see the label of a product eco-friendly.	-	0.701	-
	SN-8	You 4 that the price of eco-friendly products is supposed to be higher.	-	0.589	-
Intention	INT-1	You are willing to pay more for ecofriendly products.	-	-	0.935

Source: Author's own calculations

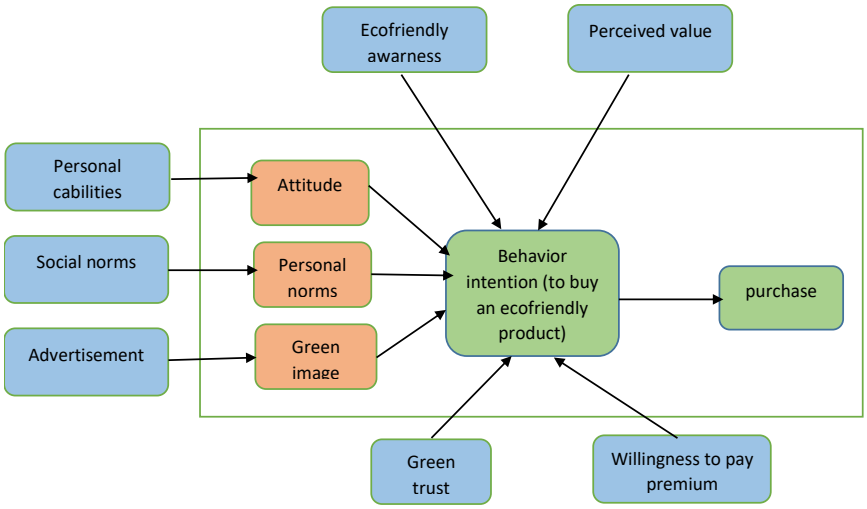

Fig. 2: Probit Model regression results for ecofriendly products

underlying restrictions account for 72% of the available data. Based on the aforementioned empirical data, the main restraint is consumers' increased willingness to pay for environmentally friendly goods.

Probit model

Probit model regression was done for ecofriendly products and willingness to pay as a dependent variable. And also evaluate those factors that affects consumer's willingness to pay.

The age coefficient was positive, indicating a favorable correlation between age and consumer purchasing intentions. Value of this coefficient indicate that when one-year increase in age of consumer than purchase of ecofriendly product is increased by 0.15% keeping all other factors constant. Furthermore, positive sign of education shows the as the number of schooling years increase of the people, they were showed more willing to pay for ecofriendly product that may be due to higher awareness level for ecofriendly products. Value of this coefficient indicate that when one-year increase in education of consumer than purchase of ecofriendly product is increased by 0.75 percent, keeping all other factors constant (Table 5).

Table 5: Probit Model regression results for ecofriendly products

Variable	B	S.E.	Sig	Exp (B)
Intercept	-2.015	.8494	.018**.	.133
Age	.015	.0144	.297.	1.015
Education	.075	.0332	.023**.	1.078
Family size	.002	.0401	.958	1.002
Household income	.228	.1316	.091***.	1.000
Green promotion	.285	.1296	.028**.	1.329
Environmental knowledge	.238	.1133	.035**.	.788
Environmental concern	.259	.1476	.050**.	1.296
Availability of ecofriendly product	.370	.1242	.001*.	1.447
Product Price	-.550	.1130	.000*.	.577
Likelihood ratio Chi square	(df=9) significance test result 83.77 (p-value=0.000)			

Significant at: * 1%, ** 5% and *** 10% levels of probability

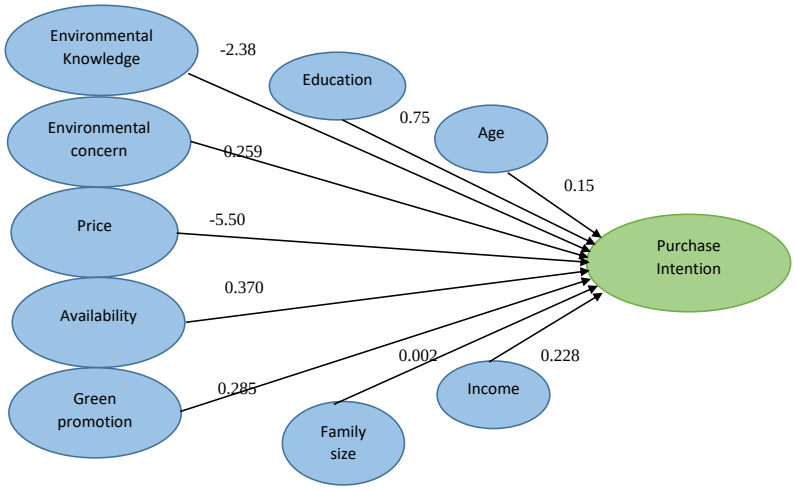

Fig. 3: Probit Model regression results for ecofriendly products

Family size and purchasing intention are positively correlated, as seen by the sign of the coefficient for the independent variable household. Despite the fact that this variable's magnitude is 0.002, which suggests that chances of household purchase intention rise by 0.002 percent for every additional household member, the results are inconsequential. The total monthly income of a household includes all sources of revenue for all family members. When income increases by one rupee, the purchase of environmentally friendly products increases by 0.228 percent, all other variables remaining constant. This is indicated by the positive sign of the variable's coefficient. Green promotion affects consumer purchase intention. Better the green promotion better will be the consumer buying behavior (Kotler and Keller 2009).

The environmental knowledge coefficient, which had a negative sign and was significant, was -0.238 (Fig. 3). According to the coefficient of variation, consumer purchase intention will fall by 0.238 percent for every unit increase in environmental knowledge, assuming all other variables remain constant. Consumer buying intent may also diminish when environmental understanding declines (Iftikhar *et al.* 2022). The coefficient of environmental concern, which was substantial at 0.259, displayed a positive sign. When all other factors are held constant, the coefficient of variable showed that for every unit rise in environmental concern, there may be an increase in consumer purchase intention of 0.259%. Consumer buying intent can increase as environmental worries do (Peattie 2010). As prices increase, consumer purchase intention will be decrease due to higher prices (Yoshida and Gordon 2012). The coefficient of this price is -0.550 showed a negative sign and was significant.

The Availability of ecofriendly product shows the positive sign and significant. Positive sign shows that 1 unit increase in the availability of the ecofriendly products 0.370 percent increase willing to pay for ecofriendly products keeping all other variables constant. All these variables play a significant role to determine the factors that affect ecofriendly purchase intention (Zhang *et al.* 2022; Chen *et al.* 2018; Hur *et al.* 2013; Suki 2016).

CONCLUSIONS AND POLICY RECOMMENDATIONS

The ecosystem is dynamic by nature; thus, we have a duty to

preserve it. Environmentally friendly items are in demand as consumers have increased their environmental awareness. On one hand, the environment and economy might benefit from a measure like the Green Tax System levied on textile manufacturers for their carbon footprint. If manufacturers must utilize ecologically friendly practices, then consumers must also do their part to protect the environment.

The study findings recommend that identifying these consumer groups will help green marketers build and promote products at reasonable pricing points. It's crucial for businesses looking to create innovative eco-friendly items to make sure their goods operate well. Environmental education is a crucial component that doesn't seem to be included in popular books. Consumers can be made aware of the environmental damage caused by hazardous items through appropriate counselling and environmental education. The majority of consumers are unaware that the products are sold in markets. The products will eventually enter the consideration stage once they are accessible to a significant percentage of consumers.

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AUTHOR CONTRIBUTIONS

JN, RK and SS contributed to the development of research concept, design of the study and data collection; BN, ZU and TU supported the formatting and proofreading and execution of the research.

CONFLICTS OF INTEREST

Authors affirm that they possess no conflicts of interest.

DATA AVAILABILITY

The data will be made available on a fair request to the corresponding author.

ETHICS APPROVAL

Not applicable.

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