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ORIGINAL ARTICLE

Purchase intention for energy-efficient equipment appliances: extending TPB with eco-labels, green trust, and environmental concern

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Abstract Energy-efficient equipment appliances (EEEAs) offer great potential for domestic energy saving. This study aims to explore the direct influence of TPB constructs (i.e., attitude, subjective norm, and perceived behavioral control), eco labels, and green trust on the intention to buy EEEAs with green environmental concern as moderator. We employed quantitative methodology to test the relationship in the proposed model with an Indian sample of 321 respondents. Both Confirmatory Factor Analysis and Structural Equation Modeling were used for data analysis with AMOS 22.0. The findings reveal that eco-labels and green trust fully mediate the relationship between attitude and PBC to intention to buy EEEAs. The results also suggest that eco-labels and green trust play a positive and vital role in leading to purchase sustainable appliances. Through this study, we contribute to literature encompassing energy-efficient product consumption, achieved through heightened eco-labels perceptions and green trust. The EEEAs purchases can be stimulated among the consumers with higher green environmental concern.

Keywords Eco-labels · Green trust · Environmental concern · Energy-efficient equipment · Structural equation modelling (SEM) · TPB · Purchase intention

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Introduction

Several survey reports have suggested that the consumption of energy-efficient products could lessen 50% of greenhouse gas emissions by 2050 (Nadel & Ungar, 2019). The increasing deterioration of the environment globally does require decision-makers to recognize consumers' purchasing behavior is probably the root cause of ecological harm (Suki et al., 2021; Sun & Wang, 2019). Subsequent increase in energy utilization and GHG emissions can considerably be decreased if consumers are driven by awareness and choices in the market to buy energy-efficient appliances (Parikh & Parikh, 2016). The Indian government (GOI) has strict ecological programs and policies, along with several governing mechanisms

for protecting the environment. In fact, the government has launched various awareness programs and schemes for ecological protection and climate change, for instance, National Green Corps 'EcoClub', Swatch Nirmal Tat Abhiyan, Green Skill Development Program, and National Clean Air Program among others.

Further, under the National Action Plan on Climate Change (NAPCC), some of the other schemes/programs include National Improved Energy Efficiency Project (Under Ministry of Power), National Mission for Green India (MOEFCC), National Solar Mission (MNRE), and National Commission on strategic Awareness for Climate Change (MOS&T) (GOI Website: http://moef.gov.in). Additionally, the Indian government has also established a Bureau of Energy Efficiency (BEE), and under its aegis, began several other programs in order to increase and expand energy efficiency.

As per a survey of Global online environment and Sustainability, 86% of Indian consumers seem to have faith on EEPs and energy-efficient appliances (EEAs) (Nielsen, 2011). Speaking of which, it may be noted that GOI has taken many "particular actions", such as making LED lights eminent, which saves around 38 million tons of Carbon Dioxide Emissions per year (Gupta, 2021). Interestingly, even consumers have started showing interest in purchasing energy-efficient equipment appliances (EEEAs) that uses lesser energy, aimed at significantly reducing carbon footprint, while preserving the ecology (Chau & Quoquab, 2019; Waris & Ahmed, 2020). However, EEEAs still struggles to attract sufficient buyers (Zhang et al., 2022), and hence requires decision-makers to understand the factors that actually influence the consumers' purchasing intention (Sharma & Foropon, 2019).

In fact, the consumers' intention to purchase eco-friendly and energy-efficient equipment has been studied by different researchers, using various theoretical frameworks, and factors, and contexts (Anshu et al., 2022; Waris et al., 2021; McAndrew et al., 2021; Ahmed et al., 2019). Notably, most of the studies on EEEAs have been conducted in the context of Asian countries, for example, China (Wang et al., 2021a, 2021b; Liao et al., 2020; Zhang et al., 2019), Vietnam (Nguyen et al., 2017, 2016), Korea (Ha & Janda, 2012) Pakistan (Qalati et al., 2022; Waris et al., 2021; Waris and Hameed, 2020a), and Malaysia (Harun et al., 2022; Tan et al., 2017). Several of these studies have explored consumers' energy-efficient product purchasing behavior and have used the Theory of Planned Behavior (TPB) (Ajzen, 1991). The objective has been to study the role of consumers' attitude, subjective norms and perceived behavioral control in terms of understanding 'buying intention' (Cai et al., 2019; Wang et al., 2014; Wang et al., 2011).

Several other studies on EEEAs have chosen to use the Theory of Consumption Values (TCV) (Ali et al., 2019a), along with a combination of TPB and (TRI) Technology Readiness Index (Ali et al., 2019b). Some have adapted TPB with (NAM) Norm Activation theory (Wang et al., 2019a), while a few others have inferred from TPB, the theory of reasoned action (TRA) and (TAM) technology acceptance model (Hua & Wang, 2019). A few of the other theories being used/adapted include an extended theory of planned behavior model (Harun et al., 2022; Waris et al.,2021; Aslam et al., 2021), multi-attribute utility theory, attitude behavior and context theory (Anshu et al., 2022), etc. for studying the role of socio-economic characteristics (Ahmed et al., 2019), interest, consumers' ecological knowledge (Wang et al., 2014), perceived consumer effectiveness (Waris & Hameed, 2020c), and altruism (Waris et al., 2021; Yarimoglu & Binboga, 2019) on purchasing intention of for green sustainability.

However, very few research have been done exploring the role of eco-label, green trust, and environmental concerns vis a vis the consumers' intention to purchase EEEAs (Waris & Hameed, 2020a, 2020b, 2020c; Waris & Ahmed, 2020). Even if available, most of them studied the linear direct relationship between attitude, subjective norm, perceived behavioral control, and consumers' behavioral intention in different country contexts (Waris et al., 2021). This study thereby looks to address the research gap by focusing on India, while incorporating the TPB variables (attitude, subjective norm, and perceived behavioral control), green trusts and eco-labels, in order to understand the consumers' behavioral intention to purchase EEEAs.

This study makes numerous contributions to extant literature in EEEAs. First, it contributes to both the direct and indirect effect of eco-labels that influence consumers' behavioral intention towards purchase of EEEAs, which in turn, provides comprehensive view for buying intention towards EEEAs. Secondly, it also explores the mediating role of TPB variables between

green trust and intention to buy EEEAs. The empirical outcomes offer benefits to academicians, policymakers, independent ecological protection agencies, and non-governmental organizations (NGOs) working towards alleviating rising environmental concerns that encourages consumers to save energy through favorable intention to buy EEEAs.

The remaining paper consists of 6 sections: Section 1 encompasses the introduction; section 2 discusses the theoretical background, based on which hypotheses are developed. While section 3 covers the methods, the following section includes data analysis. Section 5 consists of discussion of findings with relevant implications; and finally in section 6, we conclude.

Theoretical background and hypotheses development

Theoretical support and extended TPB

Consumers' intention to purchase energy-efficient products can be influenced by several internal and external factors. This study proposes to examine the role of attitude, subjective norms, perceived behavioral control, environmental concern, green trust, and eco-labels on consumers' intention to buy energy-efficient products in India. Influenced by the Theory of Planned Behavior (TPB) (Ajzen, 1991), we propose that consumers' attitude, subjective norm, and perceived behavioral control can influence their EEEAs' purchase intention. TPB model suggests that an adjacent or a nearby element of a person's behavior represents his/her behavioral intention, which in turn, reveals the individual's willingness to execute a given act. Additionally, TPB shields a person's societal and non-volitional behavior and presents sufficient performance in terms of expounding force (Hassan *et al*. 2016). The TPB advocates for the role of attitude, subjective norm and perceived behavioral control.

The TPB has great relevance and appropriateness, and is also considered to have a leading framework in environmental psychology and consumers' green/eco-conscious behaviors (Yadav et al., 2016). Previous researchers have widely used TPB for the pro-environmental behaviors, for instance in activities as recycling, consumption of organic products, energy-efficient appliances, green hotels, housing, and restaurants (Dwivedi et al., 2021; Yadav & Pathak, 2016; Han et al., 2010).

Notably, extension to TPB is acceptable considering the insertion of relevant variables to increase a model's explanatory power, which in turn, could expand the perspective (Ajzen, 1991). Moreover, newer constructs may be added to the prevailing model, fulfilling the set parameters, as posited by Ajzen, (1991), for instance, (1) the factors should lead to rational consumer decision-making; (2) novel constructs should be independent in the model; and (3) the variables should have a direct relationship with the constructs of TPB. Herein it may be noted that earlier added constructs have certainly enhanced predictability of human behavior in their relative domains (Hameed et al., 2019; Han and Yoon 2015). The extended TPB model has been extensively used in literature on the topics of consumption of renewable power technologies (Jabeen et al., 2019); purchase of energy-efficient appliances (Qalati et al., 2022; Hossain et al., 2022; Harun et al., 2022; Waris et al., 2021; Liao et al., 2020); energy conservation (Wang et al., 2019b); employees' energy-saving behavior at workplace (Akhound et al., 2021); household waste behavior (Wang et al., 2021a, 2021b); household energy saving option (Xu et al., 2021); purchase of green cars (Wang et al., 2022); predicting green product purchase behavior (Gupta, 2021); eco-label food consumption (Ates, 2021); and selection of green hotel (Wang et al., 2019a). Existing research has also extended the TPB model by integrating essential variables, such as environmental concern, green trust, and eco-labels, especially for understanding the users' buying intention of energy-efficient equipment in India. Trust, on the other hand, is a contextual element that acquires the degree to which, a consumer expects faith, confidence, and trustworthiness towards EEPs, which help in protecting the environment, and in the process, influence consumers to buy them (Chen & Chang, 2013).

Green trust, for instance, serves as an important variable in 'social trade-off', as it has a significant impact on consumers' beliefs or expectations about EEPs (Yadav et al., 2019). Therefore, the inclusion of green trust is found to be one of the influential drivers/potential predictors in buying energy-efficient products that may significantly increase consumers' intention to get involved in 'green movements' (Ahmad et al., 2021; Chen & Chang, 2012). Consumers who

are environment-conscious try to take care of the ecology, and are keen to contribute to a better quality of environment. This study thereby included 'environmental concern' as an important antecedent for buying intention of EEEs (Yarimoglu & Binboga, 2019; Paul et al., 2016). Notably, these novel constructs do have an intense effect on consumers' purchase intention on EEEs, and they have been proved to have played a significant role (Waris & Ahmed, 2020).

Following the signaling theory by Spence (1973), we propose eco-labels as a quality signal that may convey positive messages about the quality of EEE, which further affects consumers' purchase intention (Modliński & Gladden, 2021). The signaling theory proposes an explanatory mechanism, the way in which, eco-labels or certification seals can work to confirm the reliability and trustworthiness of the manufacturers' ecological claims, and thereby develop an affirmative attitude towards the source of the claim for purchase intention of energy-efficient equipment (Atkinson & Rosenthal, 2014; Erdem & Swait, 1998).

The inclusion of green trust, environmental concern, and eco-labels in TPB is indispensable for predicting environmental-friendly behavior of Indian consumers, especially in terms of understanding their purchase intention of energy-saving products. The hypotheses development outlines the influence of each TPB construct on the intention to buy EEEAs, followed by mediation hypotheses for green trust and eco-labels, with green environmental concern as moderating variable.

Hypothesis development

Attitude and intention to buy EEEAs

Attitude (ATT) is a psychological state of mind that influences an individual to react to a person, things, and circumstances (Ha & Janda, 2012). Furthermore, attitude in terms of energy-saving buying behavior is defined as an "individual consciousness towards executing electricity-saving behavior, which mainly rests on the assessment of liking of saving electricity and the information person possess towards such a behavior" (Jamil *et al.,* 2022; Wang *et al*., 2014). Attitude refers to the consumers' good or bad evaluation of a situation or object (Ajzen, 1991). Waris *et al.* (2021) verified this argument and recommended that positive evaluation does lead to behavioral intention. Besides, extant research also posited the importance of consumers' affirmative attitudes towards energy preservation (Waris & Hameed, 2019; Jabeen *et al.,* 2019). Shimul *et al.,* (2021) for instance, stated that consumers' affirmative attitude does have a strong and significant association with EEEA purchase.

On the same line, the research found that households with an optimistic attitude for saving energy do have an inherent intent to consume energy-saving products (Aslam *et al*., 2021; Abu-Elsamen *et al*., 2019). Extant literature has also shown both a positive and significant impact of attitude over the buying intention of EEEAs (Qalati et al., 2022; Joshi et al., 2022; Tanveer et al., 2021; Waris & Ahmed, 2020), and also for employee's energy-saving behavior in companies/workplace (Akhound et al., 2021; Gao et al., 2017). For energy-saving appliances, an inclination and preference towards the ecological product may impel consumers' intention to buy. Thus, by reviewing and integrating extant literature, we form our first hypothesis:

H1: Attitude influences consumers' intention to buy EEEAs.

Subjective norm and intention to buy EEEAs

Subjective norm refers to the professed external societal force (i.e., it may be from families, co-workers, friends, celebrities or renowned figures) that effectively pushes a person to perform (i.e., encouraging) or not to perform (i.e., discouraging) a behavior per se (Harun *et al.,* 2022; Aschwanden *et al*., 2021). Researchers in the past have verified that subjective norm (SN) is an essential determinant for an individual's energy-saving intention (Xu et al., 2021; Zhao et al., 2019; Tan et al., 2017). In fact, studies have examined and confirmed that subjective norms do affect energy conservation (Ali et al., 2019b). For example, there is a positive association between subjective norm (SN) and pro-environmental behavior (McBride et al., 2020; Lopes et al., 2019).

Additionally, previous studies have revealed that there is a significant link between SN and green purchase intention (Dangi et al., 2020; Hua & Wang, 2019). Notably, recent literature also depicts a positive influence of SNs over consumers' buying intention of EEEA (Liu et al., 2021), and for energy-saving behavior at the workplace (Akhound et al., 2021; Tan et al., 2017). In view of energy-saving appliances,

the familiar (from families) or unfamiliar forces (co-workers or friends) may effectually encourage consumers' intention to buy. On the same line, we propose the following hypothesis:

H2: Subjective norm influences consumers' intentions to buy EEEAs.

Perceived behavioral control and intention to buy EEEAs

Perceived Behavior Control (PBC) reveals the ease or trouble to execute behavior that may be reflected through the availability of resources and/or opportunities that include money, time, and external conditions, like the accessibility of facilities, and the individual's apparent capability/talent/self-confidence (Liu *et al*., 2018). To buy EEE, consumers must have the monetary capacity and ability to buy and use it, and such EEPs are more valuable than other conventional products (Harun *et al.,* 2022; Hua & Wang, 2019). In the area of ecological marketing, PBC as a construct has been verified as an effective analyst of consumers' eco-friendly behavior (Waris & Ahmed, 2020; Hameed *et al.,* 2019).

Literature also confirms that perceived behavioral control and behavioral intention relate positively, especially in areas that include waste sorting (Wang et al., 2021a, 2021b), household energy saving (Qalati et al., 2022) workers' energy saving (Lopes et al., 2019; Gao et al., 2017), electricity conservation (Ansu-Mensah & Bein, 2019), and purchase of green furniture (Xu et al., 2021). Furthermore, studies related to PBC have been found to act as a significant stimulus for the intention to buy EEEs (Harun et al., 2022; Waris et al., 2021; Liao et al., 2019; Ru et al., 2018). In an energy-efficient equipment perspective, the easy availability of the products or timely availability at a reasonable price may influence consumers' intention to buy. Thus, we hypothesize:

H3: Perceived behavioral control influences consumers' intention to buy EEEAs.

Eco-labels, TPB variables, and intention to buy EEEAs

Eco-labels (ECLs) are considered to be a promotional tool for giving information to consumers about products to lessen information deficit, now-a-days which is prevailing at business and communication levels (Ahmad *et al.,* 2021) that are not hazardous to the ecology. Eco-labels build up consumers' competence to evaluate the probable effects of products on the environment at the time of purchase (Hameed & Waris, 2018). The adoption of products based on consumers' valuation of several traits of eco-labels is an essential marketing tactic that assists in minimizing information irregularities on ecological products (Waris & Hameed, 2020a). Previous studies reveal that both awareness and trust in eco-label do have both a significant and positive impact on green buying intention (Irfan *et al.,* 2021; Hasnain *et al.,* 2020) and energy-efficient appliances (Hossain *et al.,* 2022). Neto, (2019) studied the impact of eco-label communication (e.g., color, claim, and green color) on purchase intention, and found that awareness of eco-labels is a significant predictor of consumers' purchase intention.

In the credibility context, past research showed that consumer-perceived credibility of eco-labels does have a positive impact on green product buying intention (Jamil *et al.,* 2022; Riskos *et al.,* 2021). Several other studies earlier, vis a vis their outcomes on eco-label and purchase behavior confirmed positive association (Waris & Hameed, 2020a; Taufique et al., 2017). Thus, it can be concluded that eco-label does assist in molding consumers' favorable attitude, and builds both trust and reliance in energy-saving home appliances for the purchase of certified wood (Al-Gasawneh & Al-Adamat, 2020). Several earlier studies have confirmed the positive relationship between eco-label and consumer buying intention towards energy-efficient home appliances (Jamil et al., 2022; Waris & Ahmed, 2020), and also for eco-labeled electricity (Hansla, 2011).

More recently, Waris et al. (2021) developed a model, and found both positive and significant relationship with TPB. However, the authors ignored/overlooked the direct association between eco-labels and the intention to buy for EEEAs. Considering energy-saving products, eco-label is the means through which consumers know how products are effectively made, which may go on to influence consumers' intention to buy.

Therefore, we propose:

H4: Eco-labels influence the consumer's intention to buy EEEAs.

H5: Attitude mediates between eco-labels and intention to buy EEEAs.

H6: Subjective norm mediates between eco-labels and intention to buy EEEAs.

H7: Perceived behavioral control mediates between eco-labels and intention to buy EEEAs.

Green trust, TPB variables, and intention to buy EEEAs

Trust is a belief, and a major determinant of the consumer's long-term behavior (Waris & Hameed, 2020a). 'Green trust' alludes to 'trust' in the environment, as well as the 'trust' in the firm that develops environment-friendly products (Hameed & Waris, 2018). Green trust is defined as "a willingness to depend on a product or service based on the belief or expectation resulting from its reliability, benevolence, and ability about ecological performance" (Chen, 2010). For energy-efficient appliances, green trust is consumers' faith, confidence, and trustworthiness towards the products which protect the environment and influence consumers to buy. Thus, 'green trust' improves the buyers' trust for ecological products, which in turn, triggers the 'intent' to ultimately buy those eco-friendly products. Waris & Hameed, (2020a) found that 'green trust' can significantly affect the decision to purchase eco-friendly products. Specific green product and service-related studies and their relationship with the intention to buy are also reported in the past such as inverter air conditioners (Rahardjo, 2015), energy-efficient appliances (Waris & Ahmed, 2020), electric and hybrid cars (Schmalfuß *et al.,* 2017) etc. Further, many researchers have approved the significant impact of trust on attitude (Ciftci & Cizel, 2020; Alonso Dos Santos et al., 2016), while several scholars studied the significant relationship between green trust and the intention to buy ecological products (Jiang & Chiu, 2014; van der Heijden *et al.,* 2003; Chen & Chang, 2012).

Atkinson and Rosenthal (2014) discussed misleading advertisement statements by firms about eco-friendly products, whereby they witnessed fewer inclinations towards products that they considered had a paucity of trustworthiness. Testa et al., (2015) stated that consumers often tend to be suspicious regarding ecological claims by firms, as they do tend to be overstated or fake at times, which effectively results in confusion, while reducing the consumers' trust and propelling them to not buy the products (Kalafatis et al., 1999). Through their study dealing with green trust, Chen and Chai (2010) claimed that it has a positive effect on the consumers' willingness to buy eco-friendly products. Organizations should thereby avoid greenwashing activities (Hameed et al., 2021a), and have a pre-requisite to build the consumers' trust instead, by separating dangerous materials and manufacturers' eco-friendly products (Hall & Vredenburg, 2005). Several other studies too have given ample evidence that showed that consumers do tend to disbelieve the claims of green products, which in turn, manifest as significant hurdles to buying green products (Hameed *et al.,* 2021a; Gupta & Ogden, 2009). Therefore, green trust is an essential and significant predictor of consumers' buying intention of green products (Jamil *et al.,* 2022; Waris & Hameed, 2020c).

Even though the importance of green trust has been established in literature, there has been limited empirical evidence on the role of green trust in shaping consumers' energy-efficient saving behaviors. In fact, limited research that exists has mainly focused on the role of green trust in building green brand equity (Yadav et al., 2016; Butt et al., 2021; Chen, 2010). In the current study, we propose that green trust influences TPB variables in shaping consumers' intention towards buying energy-efficient equipment appliances.

Previous literature showed trust to be both an important and a significant antecedent for shaping attitudes towards behavior, subjective norms, and perceived behavioral control for filling online tax returns (Wu & Chen, 2005). Sung et al. (2021) found that trust is an essential element in forming attitudes towards behavior, subjective norms, and perceived behavioral control to promote low-carbon tours in the future. Yadav et al. (2016) and Dwivedi et al. (2021) posited that travelers' green trust positively relates to attitude, subjective norm, and perceived behavioral control, which in turn, are further linked with their behavioral intention towards green hotels. In fact, it has been found that consumers' green trust in the context of e-commerce, e-vendor for online shopping and web survey participation significantly affect their intention directly/indirectly via attitude and PBC and their buying intention (Kim, 2012; Fang et al., 2009; Pavlou & Fygenson, 2006). Prevailing empirical research studies have concluded that TPB has an acceptable, reasonable, and analytical power in green

decision-making intentions. Based on the above arguments, we propose the following hypotheses:

H 8: Green trust influences the consumer's intention to buy EEEAs.

H 9: Attitude as TPB mediates between green trust and intention to buy EEEAs.

H10: Subjective norm as TPB mediates between green trust and intention to buy EEEAs.

H11: Perceived behavioral control as TPB mediates between green trust and intention to buy EEEAs.

Environmental concern as moderating variable

Environmental concern is the extent to which, people are aware of environmental issues and care to solve ecological problems (Alibeli & Johnson, 2009); they also have a favorable attitude towards protecting the environment (Kumar et al., 2022). Literature revealed that environmental concern favorably influences consumers' behavior towards green products (Roberts & Bacon, 1997; Harun et al., 2022). Additionally, it may be noted that environmental concern brings about psychological responsibility, along with an inclination to sustain environmental issues (Yiming & Xigen, 2021). So far, environmental concern has been studied as a mediator in affecting environment-friendly products (Amatulli et al. 2019).

Considering the nature of the concern, it can result in forms such as more significant concern or less concern for the environment, which could be helpful as a moderator for testing its effect on making environment-friendly choices. Kushwah et al. (2019) revealed that environmental concern does moderate the relationship between the intention to buy green products and consumers' value. Tandon et al. (2021) found a significant moderating role of environmental concern in attitude and behavior towards green products. Building upon such findings, we argue that consumers varying levels of environmental concern may strengthen or weaken the impact of behavioral factors, such as attitude, subjective norms, perceived behavioral control, and its impact on intention. We thereby posit:

H12a, b, c: Green environmental concern moderates the relationship between ATT, SN, PBC, and INT, such that consumers with higher green EC would be more intended to buy EEPAs.

On the basis of the aforesaid review of literature, below mentioned model is proposed as a research framework (Fig. 1).

Method

Sample and data collection

For this research study, the sample size was computed as per Kline's (2015), that is, 10 responses per parameter of the variable. There was a total of 7 variables with 32 items, resulting in a minimum sample size of 320 (~32*10). For data collection, we opted to choose respondents who were above the age of 18, owing to their knowledge of green products (Chan, 2001). They were chosen, because as adults, they would be better equipped to compare and assess some of the existing varieties, and thereby make a choice (Paul et al., 2016). Quota based on age and convenience sampling technique was used to recruit respondents for the survey screened through question about their awareness of energy ratings

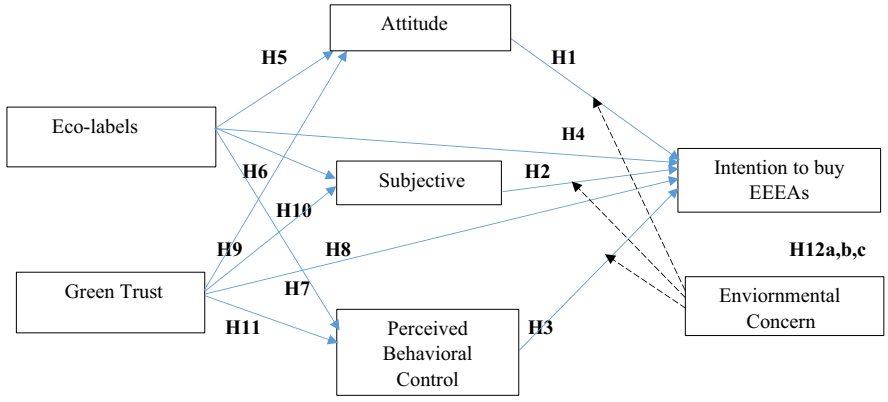

Fig. 1 Proposed research model

(Waris & Hameed, 2020c). Three hundred fifty-six respondents were contacted from India through an online survey attaching a GoogleDocs® link. Upon verification, we found 35 responses were incomplete and therefore dropped for further analysis, which yields a usable sample of 321 respondents. The sample was majorly contained male respondents (78.8%, n=253), married people (73.5%; n=236), and balanced on age (42.1% were of 30–39 years). Preliminary analysis showed that a clear majority of respondents with formal education (52.6% postgraduates and 29.6% graduates). The questionnaire consists of two sections where the first portion includes demographic characteristics such as gender, age, marital status, employment status, and area of the user of EEEAs (Table 1). The second section has 32 items representing seven constructs (refer Appendix for detailed scale items).

Table 1 Demographic characteristics

Variable	*Number*	*Percentage*
Gender		
Male	253	78.8%
Female	68	21.2%
Age		
19-29	74	23.1%
30-39	135	42.1%
40-49	62	19.3%
50 and above	50	15.6%
Marital status		
Single	81	25.2%
Married	236	73.5%
Divorced	4	1.2%
Employment status		
Full-time	212	66.0%
Part-time	7	2.2%
Unemployed	9	2.8%
Business	63	19.6%
Student	23	7.2%
Housewife	7	2.2%
Education		
Primary	1	0.3%
High school	10	3.1%
Diploma	14	4.4%
Graduate	95	29.6%
Post graduate	169	52.6%
Doctorate	32	10.0%
Personal income		
Less than 10,000	36	11.2%
10,001-30,000	44	13.7%
30,001-50000	72	22.4%
More than 50,000	169	52.6%
Are		
Rural	17	5.3%
Semi-urban	38	11.8%
Urban (city)	266	82.9%
The user of Star Rating Energy Efficient Equipment Appliances		
Yes	263	81.9%
No	58	18.1%

Measures

The structured questionnaire contains demographics and constructs which were adapted from published studies. Eco-labels (6 items) have been measured following Nittala (2014) and Taufique *et al.,* (2017). Attitude (6 items) has been measured based on Hua & Wang (2019) and Taylor & Todd (1995). Subjective norms (5 items) were determined using a 5-point Likert type scale adopted from Hua and Wang (2019). Perceived behavioral control has been measured through a 4-item, 5-point Likert type scale which is adapted from Francis et al. (2004) and Smith & MacSweeney (2007). For 3 items of environmental concerns, study of Kilbourne and Pickett (2008) has been followed.

Further, to measure green trust, a validated 5-item, 5-point Likert type scale, extracted from studies of Chen & Chang (2012) has been used. The research study has applied anchors as "1=strongly disagree and 5=strongly agree" for all measurement parameters, refer Appendix. Finally, a 5-item scale was applied to explain 'green product purchase intention' developed by Hua & Wang (2019) and Francis et al. (2004).

Scale reliability

Internal consistency of the items was computed through Cronbach's alpha (α) using SPSS 26.0. Table 2 explains that α values were greater than 0.80 than standard yardstick value of 0.7, which confirms internal consistency (Nunnally & Bernstein, 1994) and hence have a very good reliability.

Table 2 Construct reliability and measurement items

	Latent variable	Cronbach's α	λ	AVE	Composite reliability
Attitude	Att1	0.969	0.904	0.832	0.967
	Att2		0.931		
	Att3		0.945		
	Att4		0.940		
	Att5		0.868		
	Att6		0.884		
Subjective norm	SN1	0.911	0.723	0.693	0.917
	SN2		0.842		
	SN3		0.948		
	SN4		0.938		
	SN5		0.674		
Perceived behavioral control	PBC1	0.905	0.795	0.692	0.900
	PBC2		0.901		
	PBC3		0.803		
	PBC4		0.826		
Environmental concern	EC1	0.904	0.800	0.624	0.767
	EC2		0.779		
	EC3		Deleted		
Eco-labels	ECL1	0.923	0.879	0.668	0.923
	ECL2		0.897		
	ECL3		0.746		
	ECL4		0.837		
	ECL5		0.792		
	ECL6		0.738		
Green trust	GT1	0.945	0.829	0.750	0.937
	GT2		0.749		
	GT3		0.901		
	GT4		0.938		
	GT5		0.900		
Intention to buy EEEAs	INT1	0.880	0.919	0.740	0.894
	INT2		0.728		
	INT3		0.920		

Common method bias

Common method bias (CMB) is generally considered as a main concern in survey-oriented studies (Hulland et al., 2018). It causes serious concern to the validation of generalizability of the findings (Podsakoff *et al.,* 2003). As per Babin & Zikmund (2016), Harman's single factor approach was used to detect whether data does have CMB. Exploratory factor analysis with unrotated solution was applied, which revealed that the first factor explains 21.158 percent of variance, which is lesser than the threshold of 50 percent (Harman, 1976). Further, full collinearity of constructs was computed to comment on common method bias (Zafar et al., 2019). The inner VIF of all constructs taking each construct as dependent one-by-one was calculated, which were found to be less than 3.3 (Butt et al., 2021). This clearly indicates that the data were free from common method bias.

Data analysis

Measurement model testing

The data has been analyzed using IBM Amos-22.0, to run model fit. Structural equation modeling (SEM) was used for examining the data, given its capacity to evaluate the measurement error, compute latent constructs, estimated through observed variables, and evaluate complex models (Stein et al., 2012), or multifaceted–level models (Mackenzie, 2001). Notably, it was to compare complex theoretical models (Steenkamp & Baumgartner, 1998) over traditional multi-variate techniques. Importantly, SEM was used in two stages: (Ahmed et al., 2019) validating the measurement model and (Ahmad et al., 2021) testing the structural model. In the initial step, we confirm the quality and adequacy of measurement all through CFA by confirming reliability, and convergent and divergent validity, followed by making use of SEM to test causal relationships among latent variables in the next step (Arbuckle, 2006).

After Cronbach's α reliability test, the composite reliability (CR) value is an additional technique for checking internal reliability. Also, CR is an effective measure to check internal consistency, and to measure the constructs, values should be ≥ 0.90, thus verifying internal consistency. To prove convergent validity, the values of AVE should be ≥ 0.50 (Hair *et al.*, 2014) are presented in Table 2. CFA was performed on the data. Following Byrne (2001), the maximum likelihood estimation (MLE) method has been applied in every phase to check construct validity. Thus, as a first step, the measurement model was used to perform CFA. CFA results indicate that the indices were close to the acceptable model fit, $\chi 2 = 248.554$, $\chi 2/df(443) = 2.818$, $GFI = 0.797$, $TLI = 0.919$, $IFI = 0.928$, $CFI = 0.927$, $RMSEA = 0.075$, except GFI. Therefore, modification indices above 4 were used to connect the error terms. As a result, the model fit indices were as follow: $\chi 2 = 695.28$, $\chi 2/df$ $(394) = 1.765$, $GFI = 0.896$, $TLI = 0.963$, $IFI = 0.969$, $CFI = 0.968$, $RMSEA = 0.049$.

The values of Cronbach α and composite reliabilities of each construct need to be above 0.70 in psycho-social research (Hair et al., 1998), while Cronbach's α range from 0.880 to 0.969 proves a reliable internal consistency among the items. Our composite reliability ranged from 0.767 to 0.967, more than the suggested threshold level of 0.60 (Bagozzi & Yi, 1988) (see Table 2). Convergent validity proved that all AVE values were above 0.5 (Bagozzi & Yi, 1988); specifically, they ranged from 0.624 to 0.832, signifying convergent validity for all the constructs. The squares of inter-construct correlation are shown in Table 3, and they were lesser than their respective square roots, guiding to establishing discriminant validity (Fornell & Larcker, 1981).

Structural model testing

By ensuring both reliability and validity tests, we performed a structural analysis to test the causal relationship among latent variables. The results of the structure model are the following: $\chi 2$ = 779.311, $\chi 2$ /df (351)=2.220, GFI = 0.894, TLI = 0.947, IFI = 0.955, CFI = 0.954, RMSEA = 0.062 (Hair et al., 1998). The findings of our proposed model suggest magnificent explanatory power for the intention to buy EEEAs (R2 = 70%). Here, we are testing the direct link of ECL to PI and GT to PI, and the indirect relationship through TPB variables as mediators.

Table 3 Correlations (squared correlations) of the constructs for discriminant validity

Constructs	1	2	3	4	5	6	7
Attitude (Ahmed et al., 2019)	**0.912**						
Subjective norm (Ahmad et al., 2021)	0.646	**0.832**					
Perceived behavioral control (Abu-Elsamen et al., 2019)	0.683	0.607	**0.832**				
Environmental concern (Ajzen, 1991)	0.710	0.547	0.630	**0.790**			
Eco-labels (Akhound et al., 2021)	0.719	0.520	0.637	0.628	**0.817**		
Green trust (Al-Gasawneh & Al-Adamat, 2020)	0.590	0.568	0.705	0.546	0.462	**0.866**	
Purchase intention (Alibeli & Johnson, 2009)	0.761	0.581	0.768	0.677	0.595	0.665	**0.860**

Diagonal values show √AVE

Bold values indicates sq rt of AVEs and result of hypothesis

Table 4 Results of structural model

Paths	Coefficients (β)	t values	Hypothesis supported
ATT→ INT	0.438	6.708*	**Yes**
SN→ INT	0.018	0.331	No
PBC→ INT	0.416	5.727*	**Yes**
ECL→ ATT	0.666	10.684*	**Yes**
ECL→ SN	0.343	5.667*	**Yes**
ECL→ PBC	0.453	7.76*	**Yes**
ECL→ INT	0.118	1.999*	**Yes**
GT→ ATT	0.304	7.197*	**Yes**
GT→ SN	0.362	7.240*	**Yes**
GT→ PBC	0.482	10.040*	**Yes**
GT→ INT	0.114	1.859*	**Yes**

*$p<0.05$

Table 4 elaborates on the outcomes of the proposed hypothesis, whereby 'attitude' (β=0.438, t=6.708, $p<0.05$) and 'perceived behavioral control' (β=0.416, t=5.727, $p<0.05$) seems to have significantly related to purchase intention. Hence, hypotheses H1 and H3 were supported.

The subjective norms failed to influence consumers' intentions to buy EEEAs ($p>0.05$). Further, the result proved that eco-labels significantly influence attitude (β=0.666; t=10.684, p <0.01), subjective norm (β=0.343, t=5.667, p <0.05), and PBC (β=0.453, t=7.760, $p<0.05$). In fact, GT was found significant predictor of attitude (β=0.304, t=7.197, $p<0.05$), subjective norm (β=0.362, t=7.240, $p<0.05$), and PBC (β=0.482, t=10.040, $p<0.05$). Further, the direct influence of ECL (β=0.118, t=1.999, $p<0.05$) and GT (β=0.114, t=1.859, $p<0.05$) was found to be significant for intention to buy EEEAs. With this, hypotheses H4 and H8 were supported (Table 5).

Testing the mediation effects using bootstrapping

Again, to test the indirect effects, SEM (Kenny, 2012) bootstrapping procedures were used with the help of estimands. Further, the number of bootstrap samples extracted was 2,000 and the bias-corrected confidence intervals were set at 95% (Ng et al., 2014). Using Preachers and Hayes (2008) approach of zero not falling in the interval for significance mediation, the indirect influence of ECL on INT via attitude was significant (β=0.292, 90%CI=[0.206, 0.405]), via perceived behavioral control (β=0.188, 90%CI=[0.122, 0.293]), was significant and via subjective norm was insignificant (H6). As the direct effect of ECL to PI was insignificant (H4), the relationships ECL➔ATT➔INT and ECL➔PBC➔INT were partially mediated. Hence, hypotheses H5 and H7 were supported. Also, the indirect effect of GT to INT via attitude was significant (β =0.133, 90%CI=[0.082, 0.200]), via PBC was significant (β =0.200, 90%CI=[0.137, 0.288]), and via subjective norm was insignificant (interval contain zero) (H10). As the direct effect of GT to PI was insignificant (H8), the relationships GT➔ATT➔INT and GT➔PBC➔INT were partially mediated. Hence, hypothesis H9 and H11 were supported.

Table 5 Indirect effects for mediation

Indirect paths	Beta	p-value	[*Boot*LLCI, *Boot*ULCI]
ECL→ ATT → INT	0.292	0.001*	[0.206, 0.405]
ECL→ SN → INT	0.006	0.757	[-0.029, 0.047]
ECL→ PBC → INT	0.188	0.000*	[0.122, 0.293]
GT→ ATT → INT	0.133	0.000*	[0.082, 0.200]
GT→ SN → INT	0.007	0.787	[-0.034, 0.047]
GT→ PBC → INT	0.200	0.000*	[0.137, 0.288]

*$p<0.05$

Testing the moderation effects using process macro

Hayes' Process Macro model 1 was used to test the moderating influence of green environmental concern on TPB constructs with intention to buy EEEAs. SPSS was used to perform the analysis. Bootstrapping with 5000 samples was run; the results of which are shown in Table 6. Results reveal that green environmental concern acts as a moderator for ATT➔INT (β=0.3297, t=14.57; 90%CI=[4.1564, 5.4538]), and PBC➔INT (β=0.1065, t=3.684; 90%CI=[0.0496, 0.1633]) (Table 6, Fig. 2), supporting thereby both H12a and H12c. Upon investing conditional effect further, green environmental concern positively moderates the relationships, signaling in the process that consumers with higher green environmental concerns display stronger relationship between ATT and INT, as compared to consumers with low green environmental concern. Similarly, consumers with higher green environmental concern coupled with

Table 6 Moderation effect of green environmental concern

Path	Beta	t	p	LLCI	ULCI	Moderation
ATT→ INT	0.3297	14.57	0.000*	4.1564	5.4538	Yes
SN→ INT	0.0290	1.845	0.066	-0.0036	0.1107	No
PBC→ INT	0.1065	3.684	0.0003*	0.0496	0.1633	Yes

ATT, attitude; *INT*, intention; *SN*, subjective norm; *PBC*, perceived behavioral control; *$p<0.05$

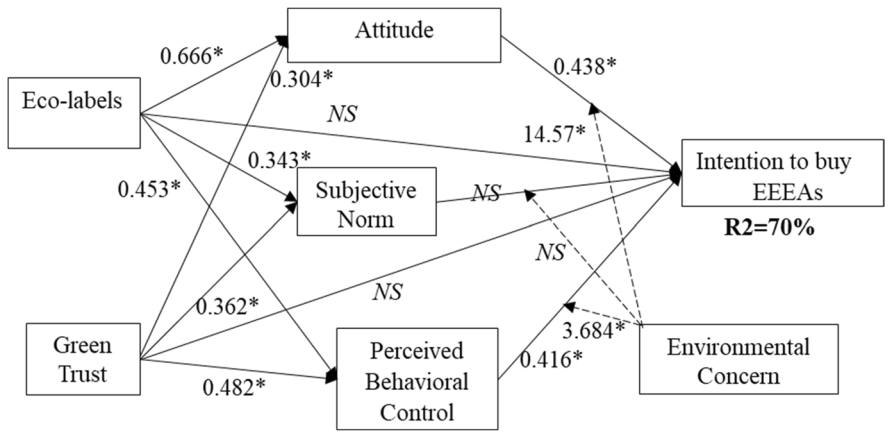

Fig. 2 Results of the structural extended model

Table 7 Conditional process analysis at moderator levels

	Effect	t	p	LLCI	ULCI
ATT→ INT (green environmental concern as moderator)					
Low	0.1345	2.39	0.017	0.0238	0.2451
Medium	0.2376	5.04	0.000	0.1449	0.3302
High	0.3407	6.59	0.000	0.2390	0.4423
PBC→ INT (green environmental concern as moderator)					
Low	0.3457	5.84	0.000	0.2292	0.4621
Medium	0.4405	8.76	0.000	0.3417	0.5394
High	0.5354	9.99	0.000	0.4300	0.6408

ATT, attitude, *INT*, intention; *PBC*, perceived behavioral control

higher PBC result in stronger intention to buy EEFAs (Table 7).

Discussion

Studies in the past have posited that green behavior has indeed attracted a lot of attention in management research (Zhao et al., 2018). The current study has analyzed the buyers' purchase intention for EEEAs in India. Research on green behavior is mostly influenced by the TPB and examined the role of PBC, SN, and attitudes on sustainable product purchasing intention. The current research extended the TPB by including eco-label, green trust and environmental concern along with the TPB factors such as PBC, SN, and attitudes for examining the consumer's intention to buy EEPs. This study makes a significant contribution to consumers' purchase intention for energy-efficient appliances literature. We analyzed consumers' buying intention in India, using CB-SEM (co-variance based structural equation modeling) technique. We focused on consumers' propensity to lessen energy consumption through the purchase intention of EEEAs. Established on the purpose to save and conserve energy usage through the purchase of EEEAs, this study empirically evidenced the significance of environmental concern, eco-labels, and green trust along with TPB variables as mediation in the purchase of EEEAs.

Purchase intention for EEEAs is fostered by increasing green trust, through awareness and creating awareness on eco-labels and its traits, along with a concern for ecology, while avoiding the negative ones like greenwashing activities and green

confusion. Given the earlier theoretical dimensions as the root of hypotheses for this study, we considered eco-labels, green trust and environmental concern as a primary source of energy-efficient appliances with TPB as a mediator to anticipate intention to purchase them.

As per the study, results proved, among the TPB variables, perceived behavioral control and attitude are significantly related to consumers' intention to purchase energy-efficient products, which is uniform with the preceding studies (Waris & Ahmed, 2020). Agreeing with the past studies (Ru *et al.,* 2018), the result proves that energy-saving product consumers also feel that the availability of resources and easiness of purchasing the products influence their intention to purchase. For example, in the context of electric bikes and vehicles, the perceived limited supply and lack of sufficient service centers have been discouraging Indian buyers to purchase energy-efficient products. Similarly, in the context of rooftop solar products, domestic consumers' perception of the post-installation maintenance-related complications affects the intention to buy negatively (Satapathy *et al.,* 2021).

The subjective norms have shown its inconsistency impacts in several areas of pro-environmental research and the insignificant effect of SN on intention has not been really surprised. On the same line, the result does not agree that subjective norms can impact consumers' purchase intention for energy-efficient equipment. This means customers' intention to purchase is not influenced by social pressure from family, friends, colleagues, and others to comply with their views. Agreeing with Paul et al. (2016), the insignificant relation may be attributed to consumers' belief that simply because the social groups purchase the product may not influence consumers to purchase energy saving products. The low influence of the social group in a collectivist Indian culture is strange. This may be because of the influence of the market economy, the societies are shifting towards more individualistic values (Shah, 2009), therefore, not necessarily be the norm in society.

Specifically, this study is intended at understanding diverse factors, which impact intentions to buy energy-saving appliances from the perspective of consumers and has incorporated and considered TPB as a mediator for ecolabels to predict the intentions to buy EEEAs. Agreeing with the past studies (Waris et al., 2021), the study result proved that eco-label is significant to attitude, subjective norm, and perceived behavioral control.

The extensive use of the TPB model has successfully been applied to get to know the intention to buy EEAs for developing markets like India. The findings show that attitude, subjective norms, and perceived behavioral control significantly impact to buy of energy-saving products which is similar to earlier studies (Waris & Ahmed, 2020; Hua & Wang, 2019). The result suggests that consumers are adaptable to eco-labels and inclined by the advantages connected with the products that steer the utilization of ecological products. The prerequisite and effective designing of eco-labeled products is to catch consumers' appeal that is directed towards green/ecological products and ultimately results in pro-environmental behavior (Hameed &Waris, 2018). Therefore, the government must make eco-labeling compulsory (Taufique *et al.,* 2017) as it is stated that the eco-labels are a significant basis of information to buyers regarding green products and with EEEAs, consumers are inclined towards it and pay due concentration to its labeling. Also, eco-labels are the means and certified labels for organizations to stimulate products' ecological traits.

The result of the study found that green trust significantly influences the intention to purchase an EEEAs and TPB partially mediates green trust and intention to buy. The result proved the positive impact of green trust on purchase intention. We concur with Chen and Chang (2012), whereby they stated that enhancing green trust is essential for building sustainable consumers, and therefore, companies should follow stringent ecological procedures by implementing these principles that include enhancing environmental excellence, sustainable and sound environmental policies, the necessity of being transparent to the details of their product, and corporate practices. Thus, companies/firms must lessen the perceptions of greenwashing, green consumer confusion, and green perceived risk to increase their consumers' green trust instead, which effectively helps in easing consumer skepticism and increasing ecological trust for environmental products (Chen & Chang, 2013).

Theoretical implications

Current study has come to several theoretical inferences which enhance the extended TPB and its

contribution to the current literature on green purchase behavior. This study presented a holistic framework for the relationships among green trust, eco-labels with intention to buy energy-efficient equipment appliances, and green environmental concern as moderator. Past researchers have highly researched on psychographic factors such as values, interests, attitude, and opinions (IAO), altruism, environmental concern, and eco-labels for molding the behaviors of consumers (Waris et al., 2021; Waris & Hameed, 2020c; Hameed *et al.,* 2019), and have ignored direct and indirect link through TPB constructs for intention to purchase energy saving products.

Based on our results, we affirm the impact of eco-labels on consumers' attitude and intention to buy energy-efficient products and offer a new perspective of its direct and indirect effect on the consumers' intent to buy. In the process, this study verifies and extends the positive influence of eco-labels on subjective norms and perceived behavioral control to buy energy-efficient appliances, which were amiss thus far (Waris et al., 2021; Waris & Hameed, 2020a). Notably, eco-labels are strategic marketing tools to distinguish green products from conventional one. They create a positive image, which generates consumers' trust in product performance, and also plays an influential role in improving consumers' approval for EEEAs and buying EEPs (Hua & Wang, 2019; Taufique et al., 2017).

Besides the results also confirm the positive impact of green trust on ATT, SN, PBC, and intention to buy EEEAs. Importantly, green trust created through green claims cause favorable attitude and control perceptions; therefore, the insertion of green trust as a determinant of TPB constructs does contribute to the enlarged the scope of TPB in energy-efficient product consumption, enhancing in the process, extant literature from a developing country's perspective, particularly India.

Practical implications

The result can have important managerial implications. To develop the consumer's interest in energy saving products, policymakers should implement pertinent environmental protection programs and policies and stimulating educational programmes which collectively grow the strength of the media to stimulate environmental awareness (i.e., increase the information among consumers). Advertising and promotion are the media through which marketers and policy-makers (including government bodies), NGOs, and green companies or groups communicate and build the consumer's trust for EEEAs by inviting celebrities, and sports stars through their collective influence on consumers will be encouraged energy-saving intentions and alter their attitudes and such activities considered to be socially responsible activities (Parsa *et al.,* 2011). Governments/NGOs could create more awareness through campaigns regarding the advantages of using energy saving products, energy shortfalls, and its consequences of excess energy utilization for receiving promising results by improving and building behavior norms. Besides, social media communication today serves as an important tool in encouraging ecological protection awareness and knowledge related to EEPs (Junsheng et al., 2019).

Additionally, marketers must publicize and broadcast the ecological aspects of their products such as using energy-saving products will help to reduce emissions of greenhouse gases and other environmental pollution (Taufique *et al.* 2017). Firms/companies need to put extra efforts to increase awareness among consumers for, eco-labels and also for EEEAs. (Testa et al., 2015; Taufique et al. 2017). Moreover, companies should work towards increasing consumer awareness in terms of eco-labels traits rather than simply applying an eco-label on their EEEs (Testa et al., 2015). Advertising campaigns (started by the government, NGOs, and green groups) add a lot in the context for increasing credibility of eco-label information (Taufique et al., 2017). From the advertisers' outlook, it appears that adding an eco-label to energy-efficient products do create positive signals for consumers, as well as for the product and source. If firms/companies or corporate bodies emphasize consumers to opt for green varieties or choices, then

such policies could be a win-win position, as consumers do tend to have a positive attitude towards such products or brands; thus such investments would indeed be rewarding (Atkinson & Rosenthal, 2014). EEEA makers should aggressively adopt third-party eco-labeling schemes, which do serve as an effective tool to acquire a competitive advantage in a market (Thøgersen et al., 2010).

Eco-labels help to develop consumers' attitudes and perceived control of resources that play crucial part in molding consumer's behavior for protection of environment. The government should implement the energy efficiency labeling policy to be mandatory, make them popularize, and promote across manufactures through subsidies (in the form of corporate tax relief) and across consumers through selling the energy products at lesser prices (in form of personal tax relief) (Waris et al., 2021; Wang et al., 2019b), targeting price sensitive consumers for energy-efficient appliances.

To intensify green trust in complex green marketing, companies should reduce the information asymmetry and claim "greenness" in the companies which enhances the role of green sustainable environment (Peattie, 1992). To bridge the communication gap, develop a trustworthy channel between consumers and vendors to augment ecological excellence and reduce the adverse effect of consumer purchases on ecology (Sweeney et al., 1999). Some studies have shown that consumers are incapable of understanding what eco-labels convey, which in turn, leads to mistrust (Thøgersen, 2010). Thus, to enhance green trust among consumers, third party eco-labeling system and third-party certification must be applied to achieve competitive and economic advantage (Atkinson & Rosenthal, 2014), specifically to conquer the problem of 'greenwashing' (Chen & Chang, 2013).

Concern for the environment and its awareness is becoming extremely significant today. Extant research affirms that people are more anxious towards their health than ecology. Thus, campaigns held by the government or NGOs shall relate good health to environmental products, which does have an intense and lifelong impact.

Limitations and directions for future research

The current study has limitations and hence may suggest scope for future research. Firstly, although the research provided a distinctive model that links the variables such as eco-label, green trust, and environment concern with TPB constructs to determine the purchase intention for EEEAs consumers in India, future research may consider government policy and regulations, perceived product risks, perceived personal inconvenience, and price sensitivity to predict green equipment purchase intention. For example, government policy and regulations influencing the pricing of green energy products may influence purchasing intention of energy products (Bekti *et al.,* 2022). Joshi *et al.,* (2022) did a literature review and found that perceived product risks, perceived personal inconvenience, and price sensitivity can influence individuals' intention to buy energy intention products. Secondly, the current research has been conducted in the Indian context only. Hence, the result may not be generalized and applied to another country's context. This is largely because the sociocultural background of Indian consumers is different from other countries. Future research may study the role of cultural factors on green product buying intention. Researchers may use an improved version of Fishbein's behavioral intention model by Lee (1990) as a theoretical framework to study the impact of culture on purchasing intention (Junghwa *et al.,* 2013). Fourthly, consuming energy-efficient products can be termed ethical consumption. Current research has not considered the moral reasoning that ultimately shapes ethical consumption. Future research may extend the TPB to include moral reasoning specifically influenced by the socio-intuitionist model (Zollo *et al.,* 2018).

Data Availability Data will be provided based upon request.

Declarations

Conflict of interest The authors declare no competing interests.

Appendix. Measurement items

Attitude towards buying energy-efficient equipment appliances

"I like the idea of energy efficient appliances".
"I look forward to using energy-efficient appliances".
"I like to use energy-efficient appliances".
"I have a positive attitude toward using energy-efficient appliances".
"I think using energy-efficient appliances is good for my life".
"I would like to recommend energy-efficient appliances to people around me".

Subjective norm

"It is pleasing to have energy-efficient appliances".
"If respectable or important people use energy-efficient appliances; I would like to use them more."
"If my family and friends use energy-efficient appliances, I would like to use them more".
"If people around me use energy-efficient appliances, I would like to use them more".
"Using energy-efficient appliances is a social trend".

Perceived behavioral control

"For me, it's easy to buy energy-saving appliances".
"I think I have the ability to purchase energy-saving appliances".
"It is entirely up to me whether I select and purchase energy-saving appliances in daily life".
"I have relevant resources, time, and opportunities to purchase energy-saving appliances".

Environmental concern

"Anti-pollution laws should be enforced more strongly".
"Major political changes are necessary to protect the natural environment".
"Major social changes are necessary to protect the natural environment".

Eco-labels

"I know the meaning of the term "eco-friendly".
"I know the meaning of the term "energy-efficient".
"I know the meaning of the term "biodegradable".
"If possible, I would like to buy products with recycling label".
"Marketers must advertise the environmental aspects of their products".
"Government must make eco-labelling mandatory".

Green trust

"Energy-efficient Equipment appliances' environmental reputation is generally reliable".
"Energy-efficient Equipment appliances' environmental performance is generally dependable".
"Energy-efficient Equipment appliances' environmental claims are generally trustworthy".
"Energy-efficient Equipment appliances' environmental concern meets your expectations".
"Energy-efficient Equipment appliances' promises and commitments for environmental protection".

Intention to buy energy efficient equipment appliances

"In the future, I will buy energy-efficient appliances if I need to have home appliances".
"In the future, I am willing to pay higher prices for energy-efficient appliances".
"In the future, I plan to buy appliances with better energy efficiency".

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