DETERMINANTS OF PURCHASE INTENTION IN CONTEXT OF ENERGY EFFICIENT PRODUCTS

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ABSTRACT

To acquire a less carbon intensive and cleaner environment, we can't ignore household consumption due to their indispensible role in environmental sustainability. Objective:-To check the influence of Knowledge, attitude towards environment, perceived price and attitude towards products on the purchase intention of consumers in context of energy efficient products. Method: - Data of one hundred and eight respondents was analysed through structural equation modelling in Smart PLS-3. Results:-Knowledge has significant positive influence on attitude towards environment, attitude towards products and purchase intention whereas attitude towards environment has non-significant influence on purchase intention but have significantly positive influence on attitude towards products. Perceived price does not have significant influence on attitude towards products but attitude towards product has significant positive influence on purchase intention. Conclusion:-Government and marketers should focus their policies and strategies towards increasing the knowledge level of people regarding benefits (Environmental Benefits and personal benefits) by using these products as well as should provide the fruitful reason for using these products while comparing with their perceived prices.

Keywords: Environment, Energy, Knowledge, Price, Intention

INTRODUCTION

From the outlook of developed nations, today it seems people are becoming more conscious towards green products than before (Claudy et al., 2013) but in developing nations generally it is observed that human value towards environment is not like as in developed nations. Sustainability is an important aspect which attracts the attention of various policy makers from several decades (Ali et al., 2019). Due to numerous environmental problems people are paying their attention towards the sustainable development. There is a lot of change in consumption and demand pattern of people due to change in their lifestyle (Akroush et al., 2018). Energy Security is important part in the economic growth of a nation and for accomplishing this security challenge of energy boldly, it is essential to enhance the efficiency of energy sources, development of more energy efficient supplies and use of more energy efficient sources (World Bank, 2005) all over the world. At this present time period, inculcating awareness for rational use of energy efficient products and threat for the earth's climate from irrational use of energy is also important (Rafique & Rehman, 2017; Meng et al., 2018). Government of almost every country prepare and implement policies for reducing the consumption of energy from household and reduce emissions of greenhouse gases (Steg et al., 2005). In previous studies various constructs were studied related to energy efficient products in which attitude, subjective norms, perceived benefits, environmental knowledge and purchasing intention etc. were included. Energy efficient products mainly include Air Conditioner, refrigerator and washing machine etc. This present study is focussed on five constructs mainly Knowledge, perceived price, attitude towards environment, attitude towards products and purchase intention. High demand of energy is influenced by economic development and high income of people. The consumption of household sector is found a significant contributor in the greenhouse gas emission (Pothitou et al., 2016 and Niemeyer, 2010). Therefore this study focused on these five pillars and impact of first four has checked on intention to purchase energy efficient appliances. These constructs in the present study are taken from Akroush et al.(2018), and Nguyen et al.(2016). After collection of surveyed data, Structural equation modelling was applied in Smart PLS-3.

KNOWLEDGE

Here, Knowledge means own perception level about what they know or how much they are aware about energy efficient products. It is also known as perceived knowledge and acts as a foundation for predicting the attitude of people (Levine and Strube, 2012). In this study, the following hypotheses regarding knowledge aspect related to environment are proposed:

(H1) Knowledge has significant influence on attitude towards environment.

(H2) Knowledge has significant influence on attitude towards product.

(H3) knowledge has significant influence on the purchase intention.

PERCEIVED PRICE

Perceived price refers what people think about the price of particular goods and services. In the finding of some studies the perceived price found a significant negative influence on the purchasing intention. So fourth hypothesis is:

(H4) Perceived price has significant influence on attitude towards product.

ATTITUDE TOWARDS ENVIRONMENT

The construct refers that attitude which people have about environmental protection. So, in the present study a hypothesis is formulated with regard to study the impact of this construct on purchase intention.

(H5) Attitude towards environment has significant influence on intention to Purchase.

(H6) Attitude towards environment has significant influence on the attitude towards product.

ATTITUDE TOWARDS PRODUCTS

Consumer attitude regarding energy efficient products is also checked by the following hypothesis.

(H7) Attitude towards product has significant influence on purchase intention.

RATIONALE FOR THE STUDY

This study would be helpful for environment due to its focus on energy efficient products that is a good contributor for the environmental protection. There is a need to study about the people's perception about these products and how much they have intention to purchase for such products.

LITERATURE REVIEW

Different authors focused on different aspects for studying the buying behaviour of people in context of energy efficient products in which energy awareness & Knowledge, perceived benefits, perceived price, attitude, belief, confidence, subjective norm, eagerness, values and behavioural intentions etc. were included. The current study included five constructs where knowledge, perceived price, attitude towards environment, attitude towards products and intention to purchase are included. Some previous researches on energy efficient products mentioned below:

Niemeyer S. (2010) provided a valuable contribution on "Consumer voices: adoption of residential energy-efficient practices" with the objective of getting an insight about constraining variables which exist in the path of adopting energy efficient practice and to uncover the relationship among attitude, belief, knowledge and other resources. Random stratified sampling was used in which two strata of urban and rural were made in Nebraska (US state) and in the analysis part descriptive statistics, correlation and factor analysis were administered. Various constraining variables were identified in which knowledge of existing energy efficient practices, technology, some obstacles like assistance, lack of information, cooperation, etc. Along with this economic constraints i.e. household income, cost as a problem, financial need and existing energy costs and some demographic variables were inquired.

Ha &Janda (2012) conducted study on "Predicting consumer intentions to purchase energy-efficient products" based on Theory of Reasoned Action. Category of energy efficient products included small electronic products and electrical appliances and objective was getting insight about the behavioural intention for purchasing energy efficient products. With the help of 202 respondent's data of South Korean respondents and Variables namely knowledge, Confidence, Subjective norm, Beliefs, Eagerness, Attitude, Environmental awareness and Behavioural intention results revealed knowledge and belief had positive relation and along with this belief and attitude had positive relation too. Awareness regarding environment and subjective norm was supported but there was not statistically significant relation between subjective norm and eagerness.

Mills &Schleich (2012)provided their valuable contribution on "Residential energy efficient technology adoption, energy conservation, knowledge and attitudes: An analysis of European countries" and this study in various countries of Europe and 5000 household were studied in 10 countries. With this study it came to know that the households which have more young children are better adopters of the energy efficient technologies and more involved in energy conservation's practices and gave primary importance to energy savings for saving the environment from deterioration. Household of Elder people gave primary importance to financial savings and less likely to go for energy conservation alternatives. Higher education gave impetus towards more environmental friendly the behaviour and involves in the energy conservation behaviour and adopts energy efficient technology models.

Nguyen, Lobo & Greenland (2016) investigated "Energy efficient household appliances in emerging markets: the influence of consumer values and knowledge on their attitudes and purchase behaviour" in Vietnam. Under sampling part, 682 respondents included. Cognitive and motivational aspects were checked to have knowledge about which factors affect the purchase behaviour of consumer while buying energy-efficient products. After analysis results revealed that people who have more egoistic value have priority on their personal inconvenience and have negative attitude towards

environment protection and people who are strong in biospheric and altruistic values have more positive attitude towards the environment and use energy efficient products. Another finding was, attitude is found a significant contributor in forming purchase intention and purchase behaviour.

Nguyen, Lobo and Greenland (2017) provided their valuable contribution on "The influence of Vietnamese consumers' altruistic values on their purchase of energy efficient appliances" with the objective of getting insight about how people's altruistic values affect their environmental attitude, personal norm, subjective norm and perceived barriers for purchasing environmental friendly products(specific on energy efficient products). With the help of Exploratory factor analysis and structure equation modelling the results revealed that altruistic values positively influenced personal norms, subjective norms, and environmental attitudes and mitigate the perceived barriers while purchasing environmental friendly products.

Zainudin et al. (2017) conducted their study on "mind the gap: household's knowledge and action in energy efficiency behaviour" and study area was Malaysia with the objective of getting knowledge about the relationship between environmental knowledge and their actions. Perception on product advantages, subjective norm, attitude, perceived behaviour control negative, personal norm and responsibility were taken as independent variables and dependent variable was behavioural intention. In the Analysis part with 392 respondent's data which was collected through Cluster sampling, Structure equation modelling revealed that subjective norm, perceived advantages of products and responsibility are significantly related through the mediating effect of attitude. Findings showed most influencing factor was perceived product advantages which affects behavioural intention.

Park & Kwon (2017) conducted a study on "What motivations drive sustainable energy-saving behaviour? an examination in South Korea" with the objective of getting insight about the motivators which drive people towards energy saving behaviour. Sampling part included 1050 South Korean consumer. An integrated model was built and structural equation modelling was used for testing the hypothesis with this, general model of perceived value, in-depth interviews, four external factors, and a pen-and-paper survey was also done. Results revealed that consumer perceived benefits determine the perceived value of energy saving behaviour and this is increased by social responsibility and weakened by environmental knowledge and interesting finding was sequential relationship between social responsibility-perceived value-intention to use-actual usage and trust was not a significant contributor of perceived risk.

Tan, Ooi&Goh(2017) provided their valuable contribution on "A moral extension of the theory of planned behaviour to predict consumers' purchase intention for energy-efficient household appliances in Malaysia" with variables of environmental concern, environmental knowledge, perceived behavioural control, subjective norm, moral norm and attitude. Sampling included 210 respondents of Penang, Malaysia and after applying PLS-SEM results revealed attitude and perceived behavioural control of consumers significantly affect the purchase intention when they buy energy efficient products. Extension of theory of planned behaviour with moral norm has proved a good predictor for predicting consumer purchase intention while buying energy efficient appliances and Environmental concern, environmental knowledge and subjective norm did not influence to purchase intention significantly.

Akroush et al. (2018) conducted a study on "Determinants of purchasing intentions of energy-efficient products" in Jordan with various factors for checking purchase intention of consumers and independent variables were perceived benefits, energy awareness, consumers' attitudes and perceived price. 474 respondents were taken and two stage non probability sampling was used in which convenience and quota sampling was included. Exploratory Factor Analysis and structural equation model was applied where the results revealed that awareness about using energy efficient products positively and significantly affect the intention to purchase, perceived benefits and consumer attitude. The awareness negatively but non-significantly affects the perceived price but consumer attitude and purchasing intention is significantly affected by the perceived benefits. Consumer attitude and perceived benefits significantly but negatively affected by the perceived price. Purchase intention is significantly influenced by consumer attitude.

Jaiswal& Singh (2018) provided their valuable insight on "Towards sustainable consumption: Investigating the determinants of green buying behaviour of Indian Consumers" in Uttar Pradesh, India. Number of respondents was 410 and Purposive convenient sampling was used after that with the help of Structural equation modelling findings showed attitude towards green products is a predictor of green purchase intention; green purchase intention is a predictor of green purchase behaviour. Environmental concern and perceived consumer effectiveness is a good and significant predictor of attitude towards green products. Results also revealed knowledge had not any significant influence on perceived consumer effectiveness and attitude towards green products but had significant influence on the environmental concern.

Ali et al. (2019) conducted their study on "Determinants of Consumer Intentions to Purchase Energy-Saving Household Products in Pakistan" with the purpose of knowing the determinants which form the intention to purchase of consumers while buying energy efficient products. With the help of theory of planned behaviour and technology readiness Index the researchers had done this valuable research work. Under sampling part, number of respondents was 396 and in this study four indicators of technology readiness index were studied with theory of planned behaviour in which innovativeness,

optimism, insecurity and discomfort were included. By applying PLS-SEM results revealed that optimism and innovativeness positively influence the attitude of household consumers for buying energy efficient products but insecurity and discomfort were negatively influenced this relationship. Along with this, attitude and perceived behavioural control were also found to be significant contributor in the formation of purchasing intention for energy efficient products. The interesting finding of this study was that the subjective norms did not affect the purchase intention of Pakistani household consumers although it was contrary to earlier findings in which it has shown that this norm was an important predictor of purchase intention.

RESEARCH OBJECTIVE

After studying the available literature, Researchers have framed objectives through which they want to validate the constructs which affect purchase intention of respondents.

1. To examine the effect of knowledge on purchase intention.

2. To investigate the influence of perceived price on attitude towards product.

3. To examine the effect of attitude towards product on purchase intention.

4. To investigate the effect of attitude towards environment on purchase intention.

RESEARCH METHODOLOGY

Asurvey questionnaire method was adapted to study these constructs; Knowledge, perceived price, attitude towards environment, attitude towards product and intention to purchase. Convenience sampling technique was used and instrument of data collection consist questions of demographic profile of respondents and below mentioned five constructs. Statements of all five constructs were adapted from the previous literature in which statements of Perceived Price, attitude towards product and intention to purchase has taken from Akroush et al., (2018) and statements of knowledge and attitude towards environment has taken from the study of Nguyen et al.(2016). All Questions were asked on a 5-point Likert scale ranged from strongly agree=1 to strongly Disagree=5. Respondents belonged to Haryana (India). Most of the respondents were between 18-30 years of age and this is young age consumer group who are strongest future consumers and some are in existing present consumer group. This age group has better understanding of environmental conditions. Total 150 Questionnaire were distributed from which only 121 were received and after checking some were not taken in final study due to their improper filling. Final analysis work is done on 108 sample size.

RESULTS

Data Analysis

PLS-SEM is used for analysing the model. PLS-SEM is a variance based SEM. In this results are reported in two parts; one is measurement model in which results of confirmatory factor analysis is reported and other one is structural model in which values of inner model means hypothesis testing is reported. In the measurement model part, reported figures are of convergent validity, factor loadings, discriminant validity and reliability measures.
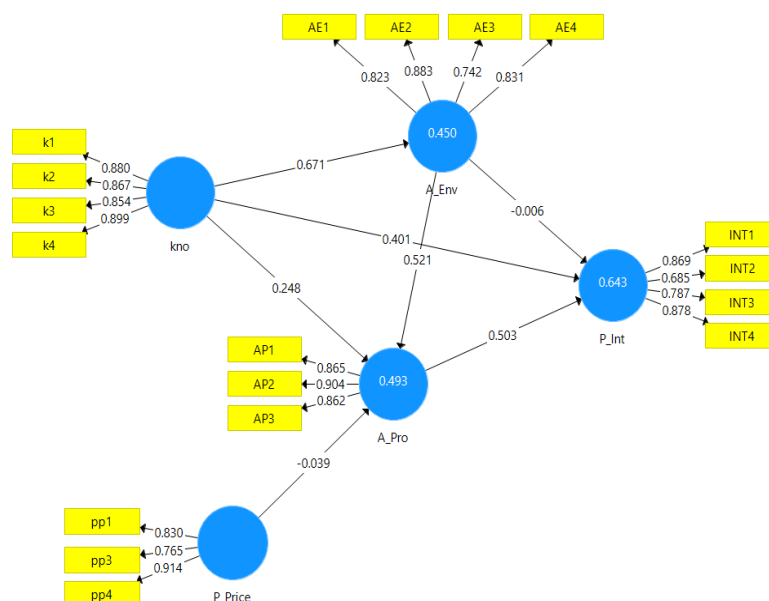
Measurement Model/Outer Model

In this part loadings, Composite reliability, Average variance extracted, Cronbach alpha and HTMT (Heterotrait Monotrait) ratio is reported. With AVE and CR convergent validity investigated. Constructs have proved convergent validity with value of CR above 0.70 and value of AVE is above 0.50. Factor loadings are above 0.50 except one statement of perceived price which had loading 0.48 which was below 0.50. Therefore, removed this statement due to low factor loading (Perceived Price is a Likert scale construct therefore deleting one statement has not given any problem) and after deletion of this statement AVE of Perceived Price is also increased. Reliability is also proved with Cronbach Alpha.

Discriminant Validity

After checking above mentioned values, Discriminant validity is reported. In this part researchers used HTMT ratio for reporting discriminant validity. Standard value under HTMT ratio is below 0.85 and in this study, all values found below 0.85. Hence, Discriminant validity of all constructs is proved.

Structural Model

After satisfying with the results of measurement model now the results of structural model or outer model is reported in which significance value, r^2, f^2(effect size) and Q^2(predictive relevance) is reported. Bootstrapping on 5000 resample size was also done. All hypothesis are supported except two in which one is Attitude towards environment does not have significant influence purchase intention with P-Value 0.956 that is above 0.05, and t-statistic is 0.055 and other hypothesis is not supported in which perceived price leads to attitude towards products which have P-Value 0.643 which is high from 0.05 so it is also not supported. f^2 shows the effect size and Q^2 shows predictive relevance, f^2 and Q^2 both have value range which are between 0.02 to 0.15 means weak effect size, value range between 0.15 to 0.35 shows medium effect size and value above 0.35 shows large effect size.

Model is fit with SRMR value of 0.08. After checking important values of f^2, r^2 and Q^2, this model provide r^2value is 0.643. With this r^2, purchase intention is predicted 64% by four constructs in this model. Q^2 value shows predictive relevance of this model and Q2 value for purchase intention is 0.346, this value proved model has strong predictive relevance because it is equal to 0.35. All VIF values are less than 3 which show there is no multi- Collinearity among all constructs.

RESEARCH DISCUSSION

After finding results, five hypotheses are supported and two hypotheses are not supported due to their non-significant p-values. *H1* First hypothesis is fully supported in which knowledge has significant positive influence on attitude towards environment with beta value and p value(b=0.671 and p value=0.00). This finding is same as earlier finding of Nguyen et al. (2016).*H2* knowledge has significant positive influence on attitude towards product with beta and p value (b=0.248, p value=0.019). This second hypothesis is also supported. This research finding is contrary to earlier finding of Jaiswal and Singh (2018). *H3* Knowledge has significant positive influence on purchase intention with beta and p value(b=0.401, p value=0.00). *H4* Perceived Price has negative influence on attitude towards product but it has not significant influence with beta and p value (b=-0.039 and p value=0.643). In Akroush et al. (2018) study found perceived pricehad a negative influence on purchasing intention same this study found negative influence but it is not significant in this case. O'Driscoll et al. (2013) study also found that perceived price had a significant negative influence on the purchase intention.*H5* Attitude towards environment has not significant influence with p value=0.956 on purchase intention therefore this hypothesis is not supported. It is contrary to earlier findings of Nguyen et al. (2016) in which results found a significant positive influence of attitude towards environment on purchase intention.*H6* Attitude towards product is significantly positive influenced by attitude towards environment with beta and p values (b=0.521 and p value=0.00).*H7* attitude towards product has significant positive influence on purchase intention with beta and p value (b=0.503 and p value=0.00). This finding is same like earlier finding of Akroush et al. (2018) in which consumer attitude significant positive influence on purchase intention. 64% of purchase intention is predicted through this model.

CONCLUSION

The result of the present study concluded that knowledge has a significant positive influence on attitude towards environment, purchase intention and attitude towards product. Therefore suggestions for marketers are that they should work on enhancing knowledge of people about the usefulness of these energy efficient products. Along with this attitude towards product should be strong so that people can buy energy efficient products. In this carbon intensive world, household people have strong contribution towards reducing carbon footprints on environment. Government and policy makers should frame policies for creating awareness about current sustainability issues and how these issues can be resolved by their contribution through purchasing energy efficient products. Perceived price was found having a negative influence on attitude towards environment so companies should also focus on price reducing strategies by using appropriate technologies or they can persuade customers through emphasise more on benefits more as compared to prices.

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Table-1

Characteristics	Percentage of Respondents
Gender	
Male	29.6%
Female	70.4%
Age	
18-30	88.9%
31-45	11.1%
More than 45	0%
Marital status	
Married	13.9%
unmarried	86.1%
Occupation	
Service	27.8%
Business	3.7%
Student	63.9%
Homemaker	4.6%

Table-2

Construct	Loading	CR	AVE	CronbacAlpha
Attitude_Environment		0.892	0.675	0.838
AE1	0.823			
AE2	0.883			
AE3	0.742			
AE4	0.831			
Attitude_Product	0.909	0.770	0.850	
AP1	0.865			
AP2	0.904			
AP3	0.862			
Purchase_Intention	0.882	0.654	0.825	
INT1	0.869			
INT2	0.685			
INT3	0.787			
INT4	0.878			
Perceived_Price	0.876	0.703	0.808	
PP1	0.830			
PP3	0.765			
PP4	0.914			

Knowledge		0.929	0.766	0.898
k1	0.880			
k2	0.867			
k3	0.854			
k4	0.899			

Table-3

HTMT ratio

Kno	A_Env	A_Pro	P_Int	P_Price
A_Env				
A_Pro	0.803			
P_Int	0.691	0.84		
P_Price	0.281	0.200	0.191	
Knowledge	0.769	0.670	0.777	0.328

Table-4

Structural Model Results

	Original Sample (O)	Sample Mean (M	Standard Deviation (STDEV)	T Statistics (O/STDEV|)	P Values	f2	Significant
A_Env ->A_Pro	0.521	0.523	0.1	5.209	0	0.293	Supported
A_Env ->P_Int	-0.006	-0.003	0.103	0.055	0.956	0.00	Not supported
A_Pro ->P_Int	0.503	0.504	0.117	4.311	0	0.361	Supported
P_Price ->A_Pro	-0.039	-0.013	0.085	0.463	0.643	0.003	Not Supported
kno ->A_Env	0.671	0.666	0.077	8.718	0	0.818	Supported
kno ->A_Pro	0.248	0.242	0.106	2.339	0.019	0.064	Supported
kno ->P_Int	0.401	0.401	0.087	4.626	0	0.233	Supported

Table-5		
R2 and Q2 value		
R2	Q2	
A_Env	0.45	0.27
A_Pro	0.493	0.325
P_Int	0.643	0.346

Table-6InnerVIF value

Inner Value	A_Env	A_Pro	P_Int	P_Price	Kno
A_Env		1.827	2.346		
A_Pro			1.966		
P_Int					
P_Price		1.109			
Kno		1.886	1.93		