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A Theory of Planned Behaviour Approach to Understand the Purchasing Behaviour for Environmentally Sustainable Products

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Abstract

This study examines the purchasing behaviour for environmentally sustainable products using the framework of the Theory of Planned Behaviour. It investigates the determinants of the purchase intention for environmentally sustainable products leading to the purchase behaviour for the same. The data collected for the study was analyzed using Structural Equation Modelling (SEM). The result of the study indicates that environmental knowledge has a significant positive relationship with the attitude towards environmentally sustainable products. The strength of significant relationship between attitude and purchase intention is greater compared to the significant relationship between perceived behavioural control and purchase intention. Subjective norm was not found to be significantly related to purchase intention. A significant positive relationship was also found between purchase intention and purchase behaviour. The study has helped in understanding the relative strength of determinants of purchase intention with regard to environmentally sustainable products which lead to purchase behaviour for the same. The findings have important implications for marketers as well as for policy makers.

Keywords: Environmentally sustainable products, theory of planned behaviour

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Introduction

World commission on environment and development also acknowledged as “The Brundtland Commission” has linked environment protection with global development. It has also recognized sustainable development as the “impetus enabling fulfilment of the requirements of present generation without compromising the ability of future generations to meet their own needs”. In fact, environmental sustainability is the guiding principle and most important task of the 21st century as emphasized at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in the year 1992 (Harmsen Consultancy BV, 2012). There are many environmental issues such as global warming, climate change, environmental degradation due to pollution, loss of biodiversity that endanger the environmental sustainability. These issues are intrinsically related to human behaviour (Gardner & Stern, 2002). In order to reduce the degree of deterioration of environmental sustainability, it is necessary to understand and change the relevant human behaviour (Steg & Vlek, 2009). Conformity with the environmental regulations, keeping a pace with the competitors, overhauling of the organizational image, keeping the presence in the new markets and value addition to the products are some of the reasons compelling the firms to think about environmentally sustainable products (Chen, 2010).

Environmentally sustainable products have been described and defined by researchers in different fashion. Such type of products has been described as the products which are environmentally friendly, environmentally superior and ecologically safe without harm to the environment (Chan, 1996; Marron, 1997; Davis, 1994). Environmentally sustainable products have been described by D'Souza, Taghian and Khosla (2007) as the products that help in achieving the reduction in the environmental impact due to usage of such products. The overarching phenomenon of environmentally sustainable products itself incorporates concepts like recycling strategies, contents related to recycling, reduction in the materials used for packaging of materials and using products which are harmless to the environment. Adding new dimensions to the description, Hartmann and Apaolaza (2006) described environmentally sound production processes and responsible product usage also as the requirements of the environmentally sustainable products.

Consumerism which took shape in order to safeguard consumers against unethical marketing practices and harmful products has broadened with time encompassing the environment protection as one of its key issues (Keegan, Moriarty & Duncan, 1995). In wake of such developments, the strength of consumers sharing a common concern towards environment or showing pro-environment behaviour has increased over time (Jain & Kaur, 2004). Pro-environmental behaviour can be understood as a type of general attitude that mainly manifests the apprehension of consumers towards the issues related to environment (Datta, 2011). In the recent years, there has been ever increasing manufacturing and supply of environmentally sustainable products such as recyclable products, energy efficient appliances, and organic food items to name a few but the overall benefits obtained by these means have largely been outpaced by the growth in the consumption (Midden, Kaiser, & McCalley, 2007). This is also a compelling reason to understand the human behaviour so far as consumption of the environmentally sustainable products is concerned. It is obvious that the matters related to environment are of major concern for the class of consumers who are conscious towards such issues and implement the same concern in their purchase decisions (Laroche, Bergeron & Barbaro-Farleo, 2001). This requires a good understanding of consumer preference by marketers in such cases in a quest to align their business accordingly. It is evident from extant literature that eco-friendly category of consumers is a segment which is evolving at a good pace but one remarkable point emphasizing the behaviour of such class of consumers is that they also vary significantly in terms of their acceptance of environmentally sustainable products (Datta, 2011). In addition to this, environmentally sustainable products also need technical and innovative modifications in the existing basic products (Steg & Vlek, 2009); hence it is necessary for the marketers to understand the behavioral aspects of acceptance and consumption of such products so that they could incorporate necessary amendments in the products as well as in their overall marketing strategy in line with the requirement.

There are many studies in the context of Indian consumers exploring the consumer attitude and behaviour towards green practices, green buying behaviour and opportunity and challenges in green consumerism (Jauhari & Manaktola, 2007; Jain & Kaur, 2004; Mishra & Sharma, 2010; Datta, 2011). These studies have looked upon a range of issues in green consumerism and environmental aspect of marketing providing some good knowledge about Indian consumers but there is a gap in the literature when it boils down to finding a predictive relationship between different aspects during the process of adoption and purchasing of environmentally sustainable products right from the formation of attitude to purchase

intention finally leading to purchase behaviour in a complete cycle. There are a number of studies on such variables such as exhibition of attitude towards environment by Martin and Simintiras (1995), perceived consumer effectiveness by Rice, Wongtada and Leelakulthanit (1996) which have mentioned that these variables affect the purchasing of environmentally sustainable products. All such studies have been done in isolation and hence much knowledge is not available about the inter-relationship between these variables and the effect of these variables individually on intended purchasing intention and purchasing behaviour especially in Indian context. This necessitates the requirement of examining a theoretical framework which could broaden the scope of the study by incorporating relevant exogenous and endogenous variables in a coherent manner.

The present study attempts to fill the research gap by incorporating the theory of planned behaviour (Ajzen, 1991) to understand the behaviour of the consumers towards purchasing of environmentally sustainable products in the context of Indian consumers using Structural Equation Modelling (SEM). First of all, this paper examines the relationship between extent of knowledge towards environment and attitude towards environmentally sustainable products. In addition to this, the study also looks at the relationship of purchase intention with variables like attitude, subjective norm, and perceived behavioural control finally leading to purchase behaviour. Hence, the main contribution of this study is to find out the relationship between attitude towards environmentally sustainable products and purchase intention by incorporating other determinants also which affect the purchase intention and eventually purchase behaviour in a complete framework in the context of Indian consumers. The study also investigates the relative strength of subjective norm and attitude towards purchase intention for environmentally sustainable products in a collectivistic culture like India where subjective norm is expected to have greater strength compared to attitude.

The structure of the paper consists of section on literature review followed by conceptual framework and hypotheses development. The next section is on methodology and measurement which describes the methodology, sampling clubbed with the data collection and description of the instruments used for measuring the constructs. The section on empirical result discusses the findings of the measurement model which includes evaluation of reliability, convergent validity and discriminant validity of the constructs. The section also covers the result of structural model which includes path estimates and fit indices for the model. The methodology and measurement section is followed by sections on discussion, implications and finally limitations and directions for future research at the end.

Literature Review

The Theory of Reasoned Action propounded by Ajzen and Fishbein (1975, 1980) paved the path for the Theory of Planned Behaviour by Ajzen (1991). The Theory of Planned Behaviour has been used in this study for examining the purchasing behaviour towards environmentally sustainable products. The theory of planned behaviour enables us with a complete framework for exploring the factors which influence the decision to engage in behaviour related to environmental issues such as recycling (Boldero, 1995; Chan, 1998) and the same can be applied in systematically understanding different factors affecting the purchase behaviour for environmentally sustainable products. According to the Theory of Reasoned Action (TRA), intention of undertaking or not undertaking the behaviour is the direct predecessor to the behaviour. The intention under discussion is often a result of actions undertaken by individual to evaluate the favorable or unfavorable performance of the behaviour. In many cases, it enunciates disposition of the attitude and the subjective norm wherein the subjective norm is basically the perception formed by the individual about undertaking or not undertaking that behaviour due to the social pressure. One prominent assumption of TRA is that behaviour under consideration is volitional in nature i.e. person can decide whether he or she performs that behaviour or not (Ajzen, 1991). Although true in many cases, behaviour may also depend on other factors such as availability of appropriate opportunities and resources which collectively correspond to the people's actual control over the behaviour (Liska, 1984). The theory of planned behavior (TPB) is one step ahead of the theory of reasoned action in the sense that it takes care of the original model's limitation to deal with incomplete volitional control (Ajzen, 1991). TPB includes a third variable known as perceived behavioral control (PBC) which indicates the ability of a person to undertake the behaviour under consideration under the assumption that individual behaves in a rational manner considering the ramification of his or her actions (Ramayah, Lee & Lim, 2012). In fact, perceived behavioral control manifests the difficulty and controllability to execute specific behaviour (Ajzen, 1985).

The framework used in this study exercises control on availability and perceived consumer effectiveness as two variables denoting perceived behavioral control. Overall, TPB is a conceptual framework looking at the factors affecting the behaviour towards a particular issue. It has been extensively applied in many studies on matters related to environmental aspect of behaviour such as recycling (Chan, 1998; Shaw, 2008; Begum, Siwar, Pereira, & Jaafar, 2009; Ramayah et al., 2012), water saving technology (Lynne, Casey, Hodges, &

Rahmani, 1995), and environmental attitude (Kaiser, Wölfling & Fuhrer, 1999). TPB has also been extensively used in understanding ethical behaviour. Purchasing of environmentally sustainable products or green products is also an ethical decision (Hopfenbeck, 1993). Table 1 displays some of the ethical decisions faced by individuals when TPB was applied to understand the concerned behaviour. It is interesting to observe that majority of the studies have been undertaken in developed countries and particularly in U.S, hence it is difficult to ascertain the validity of the studies in other cultural settings (Lee & Green, 1991) especially in developing country like India.

TPB also allows taking into consideration the other variables which might explain the behaviour significantly (Ajzen, 1991). This study makes use of environmental knowledge as an extra factor affecting the formation of consumer's attitude towards environmentally sustainable products. Similar approach has been undertaken by Ramayah et al. (2012) in studying the recycling behaviour of the individuals.

Table 1
Review of Extant Literature Applying TPB for Ethical Decision Making

Citation	Focus of study	Outcome	Type of study	Sample for study
Randall and Gibson (1991)	Influence of ethical decision making in the medical profession	A moderate amount of variance was explained by the subjective norm. Also the perceived behavioral control had lesser effect on the explanation of variance	Empirical	Subjects in northwest pacific, U.S.
Lynne et al. (1995)	An examination of the water saving technology adoption and behaviour towards technology investment	Perceived behavioral control improved the prediction of actual behavior	Empirical	Farmers in Florida, U.S.
Taylor and Todd (1995)	Examination of the antecedents of recycling and composting intentions in integrated waste management behavior model	Attitude and perceived behavioural control affected the intention to recycling behaviour as well as composting. The behaviour in study was negatively influenced by subjective norms	Empirical	Household population in an U.S city
Chang (1998)	An assessment of the validity	In comparison to attitude, the	Empirical	Students of

	of theory of reasoned action and theory of planned behavior in view of their application in the area of moral behavior	perceived behavioral control was a more apt in predicting the behavioral intention		Hongkong university
Kaiser et al. (1999)	Extension of environmental attitude models into the moral realm	Close to fifty percentage of the variance of ecological behavior intention ultimately predicting the variance of general ecological behavior was found to be explained by environmental knowledge, values, and a feeling of responsibility	Empirical	Swiss adults and Californian students
Mannetti et al. (2004)	Comparison of the predictive power of the model for self expressive behaviour with that of the TPB.	The personal identity explained the intention to recycling significantly and independently	Empirical	Students and young workers in Rome, Italy
Kelly et al. (2006)	Study on the attitudes and behaviour in response to a recycling scheme	Recycling behaviour was significantly related to attitudes toward recycling and the place of work	Empirical	University students in New Zealand
Vermier and Verbeke (2008)	Investigation of the determinants of sustainable dairy consumption behaviour	The combined effect of personal attitudes, perceived consumer effectiveness, perceived social influences, and perceived availability explained close to fifty percentage variance in intention to consume sustainable dairy	Empirical	Highly educated young adults from Flanders, Belgium
Birgelen et al. (2009)	Analysis of factors affecting consumer behaviour related to packaging regarding beverage consumption	There was a linkage between the eco-friendly purchase and disposal decisions for beverages. Similar association was also found to be with the level of environmental awareness of consumers and eco-friendly attitude	Empirical	Cross-sectional research among German scholars
Sidique et al. (2010)	Understanding of recycling behavior to improve the efficacy of recycling policies	Demographic factors were instrumental in the usage of drop-off recycling sites and attitudinal factors were also instrumental in affecting the site usage	Empirical	Drop-off recycling sites in Michigan in U.S.
Ramayah et	Examination of determinants	The recycling behaviour was	Empirical	University

al. (2012)	of recycling behaviour	contributed by knowledge about the environment and the related awareness. The same behaviour was getting affected by social norms in biggest manner.		students in Malaysia
Current study	Investigation of the purchasing behaviour for environmentally sustainable products using TPB model	Environmental knowledge was found to have significant relationship with attitude and attitude was the greatest predictor of the purchase intention	Empirical	Indian students

Considering the environmental behaviour of an individual, there are many contextual factors which affect the motivation of the individuals to engage in such behaviour (Stern, 1999; Thøgersen, 2005). An individual aspiring to engage in recycling, for example, needs availability of recycling facility and similarly an individual intending to reduce pollution due to abundance of cars on road needs a good quality public transport as a replacement so that he or she could adopt and display his or her behaviour in line with the awareness towards the environment (Santos, 2008; Van Diepen & Voogd, 2001). The fact remains that the severity of the constraints in many cases may outweigh the motivation to bring about environmental changes (Corraliza & Berenguer, 2000). This highlights the importance of considering factors related to perceived behavioral control such as control on availability and perceived consumer effectiveness in addition to intra-personal variables such as attitude and subjective norm (Steg & Vlek, 2009). There are many ways in which contextual factors may affect the intention and behaviour. These may affect the behaviour directly apart from affecting it in conjunction with attitude and subjective norm.

Conceptual Framework and Hypotheses

Figure1 displays the conceptual framework based on the Theory of Planned Behaviour (Ajzen, 1991) used in this study.

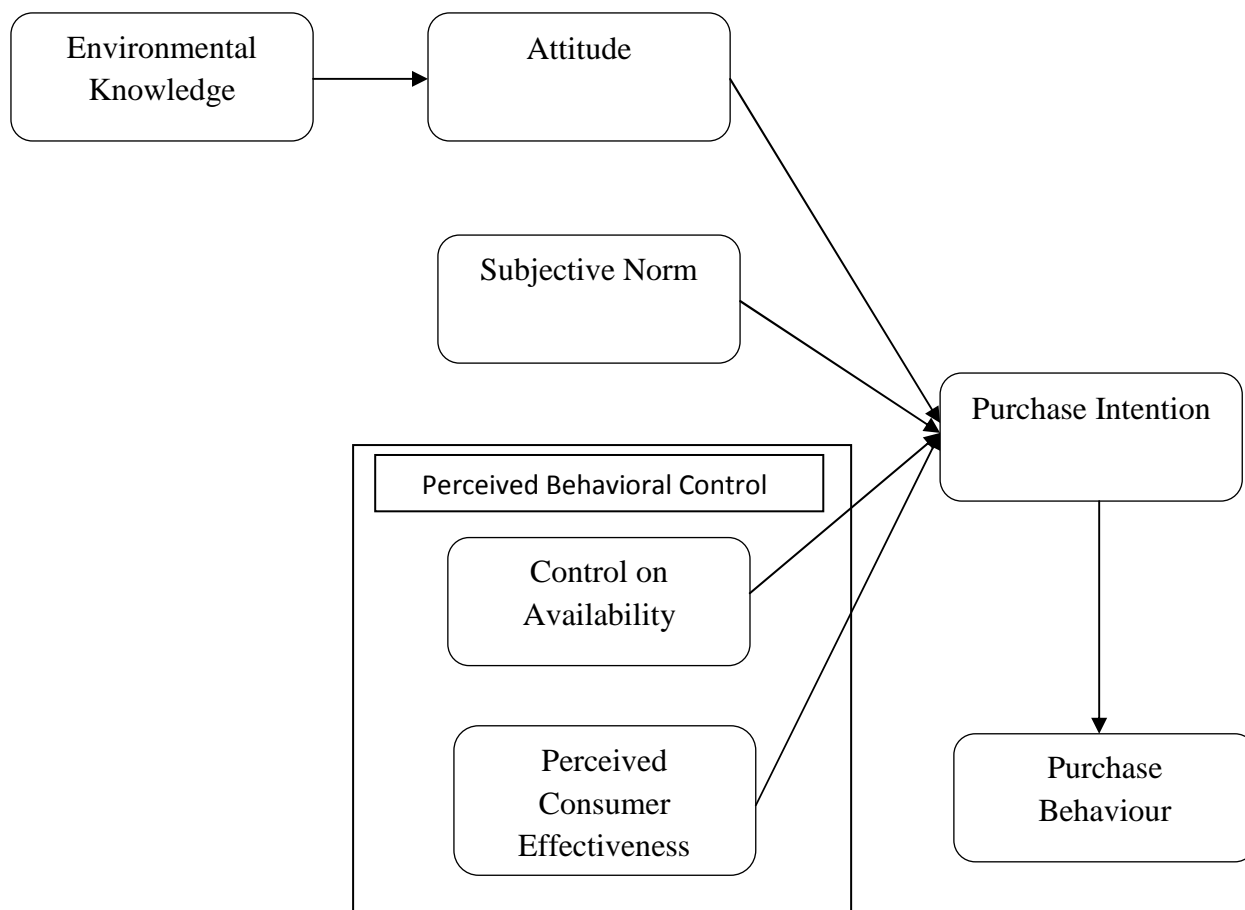


Figure1. Conceptual framework for the study (Source: Ajzen, 1991; Ramayah et al., 2012)

Environmental Knowledge and Attitude towards Environmentally Sustainable Products

The term “Environmental knowledge” encompasses the level of environmental awareness amongst the individuals, linkages between different aspects of environment and a sense of awareness to keep the environment intact for future generations. Looking it at more discrete level, Schahn and Holzer (1990) discussed about two varieties of environmental knowledge: first the abstract one related to problems, reasons and the related solution and second one the concrete part of it related to behavioral knowledge that can be used to act upon the issues. Hines, Hungerford and Tomera (1987) have also mentioned knowledge to be the most significant predictor of the environmental action. For attaining a goal, knowledge

helps in understanding the most appropriate way to move towards that goal (Pellegrini, 2007). An individual willing to use sustainable products may not have necessary knowledge about the implication of his or her action towards betterment of the environment barring him or her from undertaking that action. Fryxell & Lo (2003) have defined environmental knowledge as “a general knowledge of facts, concepts, and relationships concerning the natural environment and its major ecosystems”. Kaiser et al. (1999) indicated environmental knowledge and awareness as the precondition for the formation of attitude towards environment. This type of knowledge is basically part of the action based knowledge within the cognitive psychology since individual with this knowledge understand the impact of their action on the environment (Frick, Kaiser & Wilson, 2004).

Elaboration Likelihood Model (ELM) propounded by Petty and Cacioppo (1983, 1986) prompted to explore the linkage between environmental knowledge and attitude. This theory has been mostly used in the context of communication and persuasion and explains the formation of a certain kind of attitude. It relates the degree of involvement of the consumer to the decision making process. As per ELM, a higher involvement of the consumer would lead to a higher degree of cognitive elaboration of the stimulus Petty and Cacioppo (1983). It results into higher level of logical thinking before arriving at any decision. In case of low involvement, the peripheral route for the persuasion is used leading to formation of attitude of lesser strength. ELM argues that a concentrated and thoughtful attention to a cue would mark the central route for persuasion whereas if the individual is not putting attention to a cue then the peripheral route gets activated for persuasion. Here, attitude towards environmental consciousness plays a clear role in deciding the adoption or purchase of the environmentally sustainable products. The information rich consumers will use the logical ways to analyse and make their decision due to environmental knowledge in such cases whereas less informed consumers would mostly rely on certain cues. This will lead to difference in the adoption process of such products among different set of customers. The consumption experience in such cases may also vary depending upon the degree of environmental attitude of the consumer. In the context of present study, environmental knowledge would basically equip the customer to make a thoughtful effort while going for the purchasing of environmentally sustainable products. The environmental knowledge would primarily activate the attitude of the individuals to think and act in environmentally conscious manner. If the arguments made in favor of environment are stronger due to the influence of the knowledge concerning to it, the formation of the attitude

towards environmentally sustainable products would also be positive in line with Elaboration Likelihood Model (Petty & Cacioppo, 1983, 1986).

Many researchers have estimated the association between environmental knowledge and attitude. Environmental knowledge was found to be associated with attitude in line with conservation group membership and education (Maloney & Ward, 1973). Increased knowledge was found to moderate the attitude towards environment (Ramsey & Rickson, 1976) and liberate the political, social, and religious outlook and perception of an individual towards likely impact of his or her actions (Arbuthnot, 1977). In general, knowledge and awareness about environment has been found to be related to environmental attitude and behaviour and this relationship has been supported empirically (Diekmann & Preisendörfer, 2003). Arcury (1990) found a direct relationship between environmental knowledge and attitude. Although there are strong evidence of positive relationship between environmental awareness and attitude (Begum et al., 2009), few studies such as the one done in Malaysia stated that despite environmental awareness and knowledge, students didn't display attitude to act accordingly (Hassan, Noordin, & Sulaiman, 2010). But such results are sparse and majority of studies indicate a direct relationship between environmental knowledge and attitude towards environment. In view of the discussion and under the notion of positive effect of environmentally sustainable products on environment, it is hypothesized that:

H1: The environmental knowledge has positive relationship with attitude towards environmentally sustainable products.

Attitude and Purchase Intention for Environmentally Sustainable Products

According to Allport (1935), attitude has been defined as a mental and neural state of readiness. This state of mind basically influences the response of the audience towards all objects and situations with which the audience is confronted. One extension of this phenomenon has been aptly undertaken by Schultz and Zelezny (2000), who define it by taking into account the attitude towards environmental concerns. They describe it as the deep rooted concept in a person's self with a perception of the degree of bonding between self and the environment. Irland (1993) mentions that a consumer's purchasing intentions are dependent upon his or her environmental attitudes. A favourable attitude towards a product which is environmentally sustainable adds to sustainable consumption behaviour as pointed out in several studies (Chan, 2001; Verbeke & Viaene, 1999; Tanner & Kast, 2003; Vermeir,

& Verbeke, 2004). The attitude acts as an important antecedent to the behavioural intention which is described as the degree of favourable or unfavourable evaluation of the behaviour under study (Ajzen, 1991). Cheng, Lam, & Hsu (2006) concluded that a person willing to display a specific behaviour may undertake the cost benefit analysis as a consequence of the action undertaken and favorable attitude is linked with positive evaluation of the action (Ajzen, 1991; Cheng et al., 2006). Ajzen (1991) emphasized that positive attitude towards a particular behaviour strengthens the intention to perform that behaviour. Under this discussion, it is hypothesized that:

H2: An attitude towards environmentally sustainable products has positive relationship with the purchase intention for the products.

Subjective Norm and Purchase Intention for Environmentally Sustainable Products

Subjective norm can be comprehended as the perceived social force to carry out a particular behaviour (Ajzen, 1991). According to Ajzen and Fishbein (1977), subjective norm can be stated as a form of belief that individuals approve or disapprove certain behaviour when undertaking and performing the same. Individuals not only perform behaviour under social pressure but the subjective norm also provides them information about the appropriateness of behaviour under consideration (Jager, 2000). Subjective norm is perceived to affect purchase intention independently (Robinson & Smith, 2002).

Subjective norm has been extensively analyzed in the studies on environmentally responsible behaviour (Biel & Thøgersen, 2007). Various studies such as the study on sustainable food by Vermeir and Verbeke (2006), study on organic food by Chen (2007) and Gotschi et al. (2007) indicate a relationship between subjective norm and a consumer's intention to engage in that behaviour which is both significant and positive. Some other studies undertaken by scholars such as Sidique et al. (2010) and Shaw (2008) conclude that exhibition of behaviour resulting in betterment of environment such as recycling was directly affected by the extent of the social pressure or social norm and the directionality of such relationship was positive in nature. Based on these discussions, it is hypothesized that:

H3a: Subjective norm has positive relationship with the purchase intention for environmentally sustainable products.

Many scholars such as Hofstede (1980), Sinha and Verma (1987), Triandis (1995), and Triandis and Bhawuk (1997) in their studies have concluded that Indian culture is collectivistic in nature. People in a collectivistic culture display values and orientation that is collectivist in nature i.e. oriented to belongingness to a group (Triandis, 1995). There is emphasis on in-group membership in such type of culture and the same is characterized by relational norms and interdependence. Social norm is an important mean of viewing the life for people under collectivistic society and they keep more emphasis on the emotional aspect of the decision making rather than on the rational cost-benefit analysis in a relationship (Sinha et al., 2001). Indians choose to conform to a group such as society and derive their identity from the group membership in addition to seeking guidance for appropriate behaviour from the group itself (Sinha, 1990). According to McCarty and Shrum (1994), people belonging to collectivistic culture are more concerned towards environmental issues as compared to people from individualistic culture. People from collectivistic culture also listen to the salient referent sources within their society (Lee & Green, 1991). Based on the discussion, it is hypothesized that:

H3b: Given the collectivistic nature of Indian people, subjective norm would have stronger impact on their outlook towards environmentally sustainable product purchase intention in comparison to their attitude.

Perceived Behavioral Control and Purchase Intention for Environmentally Sustainable Products

Consumer purchasing decision is a complex process and at time many situational factors such as perceived behavioural control in addition to attitude help in taking the decision (Jager, 2000). According to Ajzen (1991), an individual's likelihood of disposition of behaviour depends on the extent of availability of linking resources and existence of prospects to behave in that manner. He also stated that it is the discernment of the behavioral control which is more important than the actual control. Perceived behavioral control has its roots in Atkinson's (1964) theory of achievement motivation which emphasizes on the expectancy of success i.e. on perceived probability of succeeding in a given scenario. Ajzen (1991) also mentioned that the perceived behavioral control and the behavioral intention in conjunction may help in directly ascertaining a particular behaviour.

In the present study, control on availability of environmentally sustainable products and perceived consumer effectiveness have been considered as two variables to explain the perceived behavioural control. Availability of a product is the degree of difficulty or ease in locating and obtaining a product for consumption. Unavailability of an environmentally sustainable product may pose as a constraint for a highly motivated consumer. Several researchers have concluded that an individual's confidence in his or her ability to control and thereby display the behaviour has positive relationship with the purchase intention or the purchase behaviour (e.g., Baker et al., 2006; Taylor & Todd, 1995). Actual or perceived unavailability of such products might have greater role on conversion of intention into actual behaviour. This could be a reason behind low degree of translation of intention of using such products into the actual usage behaviour (Vermeir & Verbeke, 2006). In view of this discussion, it is hypothesized that:

H4a: There is a positive relationship between the control on availability of the environmentally sustainable products and the purchase intention towards the products.

According to Straughan and Roberts (1999), an important element of perceived behavioural control, namely perceived consumer effectiveness, is the conviction that the individuals have the ability to manipulate the outcome in a positive manner as a result of their action in this regard. Perceived consumer effectiveness has significant relationship with perceived behavioral control (Vermeir & Verbeke, 2008). Many researchers have studied the response of consumers towards environmental issues and have analyzed perceived consumer effectiveness in order to explain the belief of the consumers for positive outcome of their actions (Kinneer et al., 1974; Webster, 1975; Roberts, 1995). According to Roberts (1996), consumers must be guided and believed to understand that the actions undertaken by them have impact on the outcome in order to motivate any sort of change in their behaviour. Many scholars such as Straughan and Roberts (1999) in this area of study found empirical validity for the positive relationship between the behaviour showing anxiety for environment and perceived consumer effectiveness. Perceived consumer effectiveness affects the intention and behaviour if the consumers sense that their behaviour will not result into the intended outcome (Ellen, Wiener, & Cobb-Walgren, 1991). Thus, it is hypothesized that:

H4b: Perceived consumer effectiveness has positive relationship with purchase intention for environmentally sustainable products.

Purchase Intention and Purchase Behaviour for Environmentally Sustainable Products

Behaviour can be determined from the intention with considerable accuracy (Ajzen, 1991). Many studies have confirmed the relationship between intention and actual behaviour (Ajzen & Fishbein, 1980; Sheppard, Hartwick, & Warshaw, 1988). Historically, intention has been assumed to be strong predictor of behaviour but in some cases it may not act in consistent manner. In a study on the behaviour pertaining to the use of information technology, Venkatesh et al. (2003) reported a small to medium effect size of intention to use information technology on the actual behaviour. This may be attributed to as intention - behaviour gap and the same has been confirmed in the study by Grunert and Juhl (1995) also who concluded that intention may not necessarily lead to the desired behaviour. However, several researchers such as Sheppard et al. (1988) mentioned a high degree of correlation between intention and behaviour. Researchers studying the buying behaviour for organic food have found significantly positive relationship between purchase intention and purchase behaviour (Saba & Messina, 2003; Thøgersen, 2007). In view of the discussion, it is hypothesized that:

H5: Purchase intention is positively related to the purchase behaviour for environmentally sustainable products.

Methodology and Measurement

Data Collection and the Sample

The consumer is the unit of analysis in this study. Questionnaire survey was used to collect data and verify the research framework leading to hypotheses. The objective was to ascertain the determinants of purchasing behaviour for environmentally sustainable products in Indian context. The questionnaire was administered through online survey to a convenience sample consisting of 235 students pursuing postgraduate and doctoral studies in the city of Ahmedabad, India. There are two reasons for focussing on the student sample. The first reason is that the young students are the future consumers and they have the ability to bring about a difference in the consumption pattern in the years to come. They may carry forward their product consumption habit when they grow older. The second reason behind

targeting student population was that they are educated and have some knowledge on the subject matter of sustainability. It might be difficult for an unaware respondent to understand the concept of sustainability leading to difficulty in answering questions related to control on availability, perceived consumer effectiveness etc for environmentally sustainable products (Vermeir & Verbeke, 2004). Using students as subject in social psychology research are mainly motivated by convenience related factors but ascertaining their representativeness has always been questioned (Bearden et al., 1993; Burnett & Dunne, 1986; Permut et al., 1978). It was believed that students tend to behave less emotionally and impulsively than normal consumer (Sears, 1986) but the researchers such as Gordon et al. (1984) have argued that one need to make direct comparison between students and the general consumer in a specific area of concern for establishing external validity. In a study on environmental consciousness, Synodinos (1990) found the responses obtained from students to be similar to that obtained from general consumers. Inspired by the findings of the previous studies, the current study has also utilized student sample.

The survey questionnaire was segregated in different sections in order to assess all variables used in this study. The questionnaire also captured the demographic profile of the respondents. Prior to mailing the questionnaire to the respondents, the items of the questionnaire were discussed with five students who had previously purchased any environmentally sustainable product in order to find ambiguity in terms, meaning of items etc. They were also asked to fill up the answers pertaining to questionnaire. Thus, the content validity of study was established.

The number of responses obtained was 162 making the response rate equal to 68.9%. Out of these responses, 10 respondents had not completed different sections of the questionnaire; hence their responses were not taken into account. Thus, the final completed responses used in the study were 152 with a response rate of 64.7%. Table 2 displays the demographic profile and sample descriptive statistics.

Table 2

Demographic Profile and Sample Descriptive Statistics

	N	Percentage
<u>Gender</u>		
Male	129	84.87%
Female	23	15.13%
<u>Age (Years)</u>		
20-25	48	31.58%
26-30	46	30.26%
31-35	36	23.68%
> 36	22	14.47%
<u>Education</u>		
Bachelors Degree	72	47.37%
Masters Degree	80	52.63%
Total	152	100%

Instruments

The established validated scales used for measuring environmental knowledge, attitude, subjective norm, control on availability, perceived consumer effectiveness, purchase intention and purchase behaviour were taken from the extant literature. The scales were mostly adapted from the studies conducted on topics related to environmentally conscious consumer behaviour. The scales used for measuring the responses were measured on a 5-point Likert scale where 1 denoted strongly disagree and 5 denoted strongly agree. A three items scale for environmental knowledge was developed by Sidique et al. (2010) which they have used in the study on recycling behaviour. Looking at the context of the study, the same scale was adapted in this study. The attitude towards environmentally sustainable products was measured using the scale with four items developed and used by do Valle et al. (2005) for predicting and understanding the recycling behaviour. Subjective norm was measured

using a scale used by Vermier and Verbeke (2008) in a study on sustainable dairy consumption behaviour and had four items. Similar questionnaire items have also been suggested by Ajzen and Fishbein (1980). Control on availability was measured using three items scale developed and used by Sparks and Shepherd (1992) which they have used in a study on green consumerism. Perceived consumer effectiveness was measured using a scale developed by Roberts (1996) having four items. This scale has extensively been used in several studies measuring perceived consumer effectiveness (e.g. Straughan & Roberts, 1999). Purchase intention was measured using a four items scale developed by Baker and Churchill (1977). Finally, the purchase behaviour for environmentally sustainable products was assessed using six items scale used by Schlegelmilch et al. (1996). The scale has been used by the authors in a study to find the relationship between green purchasing decisions and environmental consciousness. The scale items are listed in Appendix 1.

Empirical Results

The study utilized structural equation modeling (SEM) to verify the research framework and the hypotheses using AMOS version 4.0 (Byrne, 2001) with maximum likelihood estimation (Joreskog & Sorbom, 1996). The two stage model building process as suggested by Anderson and Gerbing (1988) for using SEM was followed. The measurement model and structural model were analyzed using AMOS version 4.0.

The Measurement Model

The CFA model included all the constructs: Environmental Knowledge (three items scale), Attitude (three items scale), Control on Availability (three items scale), Subjective Norm (three items scale), Perceived Consumer Effectiveness (three items scale), Purchase Intention for environmentally sustainable products (four items scale), and Purchase Behaviour for environmentally sustainable products (four items scale). The resulting model produced good fit indices: $\chi^2 = 358.749$, degrees of freedom (df) = 209, goodness-of-fit index (GFI) = 0.838, adjusted goodness-of-fit index (AGFI) = 0.786, comparative fit index (CFI) = 0.929, root mean square error of approximation (RMSEA) = 0.069, Hoelter .05 index = 103. The t values corresponding to all the items were significant ($p < 0.001$).

Convergent and Discriminant Validity, Average Variance Extracted (AVE), and Composite Reliability

The mean, standard deviation, correlation and square root of average variance extracted (AVE) have been reported in table 3. There is positive correlation between environmental knowledge, attitude, subjective norm, control on availability, perceived consumer effectiveness, purchase intention and purchase behaviour.

Table 3

Correlations, Mean, Standard Deviation and Square Root of AVE

<u>Construct</u>	Environmental Knowledge	Attitude	Subjective Norm	Control on Availability	Perceived Consumer Effectiveness	Purchase Intention	Purchase Behaviour
Environmental Knowledge	0.886						
Attitude	0.613**	0.905					
Subjective Norm	0.383**	0.423**	0.854				
Control on Availability	0.152**	0.263**	0.252**	0.797			
Perceived Consumer Effectiveness	0.188**	0.341**	0.261**	0.037**	0.885		
Purchase Intention	0.495**	0.746**	0.436**	0.391**	0.405**	0.873	
Purchase Behaviour	0.267**	0.495**	0.458**	0.429**	0.317**	0.644**	0.848
Mean	4.048	3.965	3.110	2.757	4.311	3.850	3.762
Standard Deviation	0.832	0.786	0.935	0.938	0.675	0.801	0.876

** p < 0.01.

The diagonal elements shown in bold represent square root of AVE and other elements are the correlation.

There are two measures to look at the reliability of the constructs. The first measure is ascertained by examining the loading of items of each construct. The item loadings of all the constructs reported in table 4 are significant as the t-values corresponding to all the items were greater than 2 (Anderson & Gerbing, 1988) and above a minimum cut off value of 0.7 (Hair et al., 2011). One item each from attitude, subjective norm, perceived consumer effectiveness and two items from purchase behaviour were deleted due to value of the item loading being less than 0.7. The second measure, Cronbach's α is also the measure of reliability. The minimum cut off value for Cronbach's α is 0.7 (Hair et al., 2011). As shown in table 4, value of Cronbach's α for the constructs in this study i.e. for environmental knowledge, attitude, subjective norm, control on availability, perceived consumer effectiveness, purchase intention and purchase behaviour vary from 0.816 to 0.892. The

measurements for all the constructs are acceptable for reliability as the numerical values of these are more than 0.7 (Hair et al., 2011).

Table 4
Factor Loading (λ), Cronbach's α , AVE and Composite Reliability

Constructs	Items	λ	Cronbach's α	AVE	Square Root of AVE	Composite Reliability
Environmental Knowledge	EK-1	0.786	0.879	0.785	0.886	0.916
	EK-2	0.883				
	EK-3	0.851				
Attitude towards Environmentally Sustainable Products	ATT-1	0.825	0.890	0.818	0.905	0.931
	ATT-2	0.902				
	ATT-3	0.838				
Subjective Norm	SN-1	0.828	0.868	0.729	0.854	0.890
	SN-2	0.901				
	SN-3	0.765				
Control on Availability	CAV-1	0.734	0.816	0.635	0.797	0.839
	CAV-2	0.866				
	CAV-3	0.725				
Perceived Consumer Effectiveness	PCE-1	0.899	0.817	0.783	0.885	0.914
	PCE -3	0.731				
	PCE -4	0.704				
Purchase Intention for Environmentally Sustainable Products	PI -1	0.854	0.892	0.762	0.873	0.927
	PI -2	0.797				
	PI -3	0.791				
	PI -4	0.792				
Purchase Behaviour for Environmentally Sustainable Products	PB -1	0.842	0.874	0.719	0.848	0.911
	PB -4	0.750				
	PB -5	0.811				
	PB -6	0.762				

The degree to which the construct's items indicate the latent construct is given by measure of composite reliability. The value of composite reliability of the constructs in this study ranges from 0.839 to 0.931 which is more than the recommended level of 0.7 suggested by Gefen et al. (2000). In order to verify the validity of the constructs in this study, convergent and discriminant validity was assessed. Average variance extracted (AVE), which

is the measure of amount of variance captured by construct through its items in comparison to the amount of variance captured due to the measurement error was calculated based on the procedure described by Fornell and Larcker (1981).

In order to assess the discriminant validity, the square root of AVE shall be greater than the correlation between the construct and the other construct in the model (Fornell & Larcker, 1981). On examining table 3 and table 4, it can be found that the square root of AVE is greater than the correlation between the constructs in all the cases. Therefore, the discriminant validity of all the scales was supported. Another method for demonstrating the discriminant validity for two estimated constructs describes the procedure in which the estimated correlation parameter between the constructs is constrained to 1. In the next step, a chi-square difference is carried out on the results obtained for the constrained and unconstrained models (Joreskog, 1971). According to Bagozzi and Phillips (1982), in a model with no restriction on the correlation to 1 and simultaneously a significant and lower value of χ^2 for the same would specify that the constructs under the study are not perfectly correlated. This would establish the discriminant validity. This is one necessary condition for assessing discriminant validity and the same shall be performed by taking one match-up of constructs under investigation at one point in time (Anderson & Gerbing, 1988). The pair-wise χ^2 differential test was conducted for all the constructs in this study with and without correlating the constructs to unity. The result of the test is shown in Appendix 2. Based on the result obtained, the discriminant validity of all the constructs is supported.

For assessing the convergent validity of the scales, it is necessary that the value of AVE shall be greater than 0.5 (Bagozzi & Yi, 1988). In the present study, as per the data displayed in table 4, the values of AVE vary from 0.635 to 0.818 for the constructs which confirms the convergent validity of the constructs.

The composite reliability and the value of Cronbach's α in all the scales were acceptable. Thus, all the scales demonstrated the reliability, convergent validity and discriminant validity.

Common Method Bias

Response bias could be a reason for measurement error leading to suspicion about validity of the relationship being estimated (Bagozzi & Yi, 1991). The response bias is a kind of systematic measurement error which may have grave consequences on the result of the

study as it may provide some alternative explanation for the relationship between the constructs being studied (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The systematic error variance may lead to confounding empirical result and may also provide misleading conclusion (Campbell & Fiske, 1959). The effect of common method variance on the result of the study can be minimized using statistical methods recommended by Podsakoff et al (2003). Following are some of the statistical remedies which have been applied to take care of the common method bias:

- **Harman's single-factor test:** Harman's single-factor test is considered by researchers as one of the most authentic statistical procedures to identify the common method bias. The basic idea behind this method is to load all the variables under study into a single factor and undertake the factor analysis of it (Aulakh & Gencturk, 2000; Organ & Greene, 1981). The unrotated factor solution is then arrived at in order to find out the number of factors which finally show the amount of variance in the variables. As mentioned by Podsakoff et al. (2003), if considerable amount of common method variance is present then there would either be an emergence of a single factor as a result of the factors analysis or there would be emergence of one general factor. This factor would describe the substantial amount of covariance amongst the variables under discussion.

In order to take care of the response bias, the data was analyzed taking all items for factor extraction keeping the number of factors equal to one in SPSS. The percentage of variance extracted for one factor was 32.487% which is less than 50% hence the issue of response bias doesn't seem to be a problem in this study. The result is attached as Appendix-3.

Although adequately used in research, this method may do nothing to statistically control for method effects. Podsakoff et al (2003) describe it as a diagnostic technique for addressing the extent to which common method variance may be a considered as a problem. It is therefore necessary to look at other methods to address the issue of common method bias.

- **Controlling for the effects of a single unmeasured latent method factor:** This is also called a latent variable approach in which a first-order factor is included in the model. All the measures are considered as the indicator to the theoretical model under the study. The benefit of applying this method is that it doesn't identify and measure

the particular factor which may be a reason behind the method effects. Another benefit of using this procedure is that it looks at modeling the method factor on the measures instead of the latent constructs. Due to this reason, “this procedure doesn’t require the effects of the method factor on each measure to be equal” (Podsakoff et al., 2003). In lines with the above mentioned procedure, common factor was created in AMOS and was linked to all items used in this study. The model was analyzed using AMOS to see the effect of common method variance. The finding of this analysis also ruled out the possibility of common method bias as a source of problem in this study. Thus the response bias is not a challenging issue creating any problem in this study.

The Structural Model

The estimation of the structural model was done by means of AMOS version 4.0 using maximum likelihood estimate (MLE). The test of overall fit of the model produced a chi-square (χ^2) value of 389.479 with 218 degrees of freedom and the model had a p-value less than 0.001. All the fit indices were within acceptable range. The value of Goodness-of-fit index (GFI) was 0.827 which was slightly below the recommended acceptable value of 0.90 (Hair et al., 2011). This value however was acceptable as it was greater than 0.8 (Byrne, 2001; Kline, 1998). It can be considered as moderate value and the model can be classified as reasonable (do Valle et al., 2005). The sample size may be an issue for the low value of GFI although a cutoff of 0.9 for GFI itself is not appropriate for low sample size (Miles & Shevelin, 1998). The value of the Adjusted goodness-of-fit index (AGFI) was 0.780 which was close to recommended cut-off level of 0.80 (Chau & Hu, 2001). The value of Comparative Fit Index (CFI) was 0.919 and the Tucker-Lewis Index (TLI) was 0.906. Both of these indices were within the acceptable limit of 0.9 (Hair et al., 2011) and can be considered satisfactory. The value of the Root Mean Square Error of Approximation (RMSEA), which is an absolute measure of the parameter of fit, was equal to 0.072. Thus, it was within the acceptable cut off level of 0.08 (Hair et al., 2011). The ratio of chi-square (χ^2) and degree of freedom was obtained to be 1.79 which was well below the recommended upper cut-off value of 3 (Kline, 1998). The value of standardized root mean residual (SRMR) was 0.085, which was also less than the cut-off value of 0.10 (Hair et al., 2011).

CFI has been considered by Anderson and Gerbing (1992) as a type of stable fit indices which exhibits a fair degree of robustness also. Looking at the value of different fit

indices and comparing the values with recommended acceptable limits described in extant literature, it can be concluded that there is a good degree of fit between the research framework and the data.

As displayed in table 5, the environmental knowledge was positively and significantly related to the attitude towards environmentally sustainable products ($\beta = 0.618$, $p < 0.01$), attitude was positively and significantly related to purchase intention ($\beta = 0.579$, $p < 0.01$), subjective norm was positively related to purchase intention but was not statistically significant as $p > 0.05$, control on availability was positively and significantly related to purchase intention ($\beta = 0.231$, $p < 0.01$), perceived consumer effectiveness was positively and significantly related to purchase intention ($\beta = 0.189$, $p < 0.01$) and purchase intention was positively and significantly related to purchase behaviour ($\beta = 0.785$, $p < 0.01$) for environmentally sustainable products. The structural model also provided the opportunity to analyse the direct relationship between environmental knowledge and purchase intention. The relationship between environmental knowledge and purchase intention was very low in strength and was also not significant ($\beta = 0.025$ and $p = 0.782$).

Table 5
Summary of the Structural Model

Path Description	Hypothesis	Unstandardized Path Estimates	Result
Environmental Knowledge → Attitude	H1	0.618 **	Supported
Attitude → Purchase Intention	H2	0.579**	Supported
Subjective Norm → Purchase Intention	H3a	0.092	Not Supported
Control on Availability → Purchase Intention	H4a	0.231**	Supported
Perceived Consumer Effectiveness → Purchase Intention	H4b	0.189**	Supported
Purchase Intention → Purchase Behaviour	H5	0.785**	Supported

$\chi^2 = 389.479$, $df = 218$, $GFI = 0.827$, $AGFI = 0.780$, $CFI = 0.919$, $IFI = 0.920$, $TLI = 0.906$, $RMSEA = 0.072$

** $p < 0.01$

Thus, hypotheses H1, H2, H4a, H4b, and H5 were supported. The hypothesis H3a which examined the relationship between subjective norm and purchase intention for environmentally sustainable products was not supported. Hypothesis H3b, which hypothesized that subjective norm would exert stronger influence on individual's disposition

towards environmentally sustainable product purchase intention in comparison to attitude was also not supported.

Discussion

The rationale behind this study was to scan and observe the determinants of purchase intention for environmentally sustainable products and also to ascertain the relative strength of these determinants like attitude, subjective norm and perceived behavioural control. The study also explored the relationship between environmental knowledge and attitude towards environmentally sustainable products. The entire study was done using the framework of the theory of planned behaviour (Ajzen, 1991) in order to understand the effect of different determinants of purchase intention for environmentally sustainable products in a single framework which finally culminated to purchase behaviour for environmentally sustainable products. The results obtained from the structural model indicate a good fit. It indicated that the attitude was the most important determinant of the purchase intention for environmentally sustainable products in this study.

The relationship between environmental knowledge and attitude was found to be positive and significant. It was on the expected line as per the theoretical assumptions and was similar to the findings obtained by Ramayah et al. (2012) who explored the environmentally concerned recycling behaviour using the theory of planned behaviour. Communication and educational efforts for enhancing the knowledge towards issue related to environmental concern have been effective in encouraging disposition of behaviour that are considered good for the natural environment (Sidique et al., 2010, Bratt, 1999). The attitude towards environmentally sustainable products was found to be positively and significantly related to the purchase intention for the same. This finding is also consistent with the results obtained on similar relationship in the study by Chan and Lau (2002) and Ramayah et al. (2012). The subjective norm which is referred to as perceived social demand to execute a particular behaviour was found to be insignificant and very low in terms of its estimated value in this study. Many researchers such as Trafimow and Finlay (1996) and Cialdini and Trost (1998) have also discussed the relatively weaker impact of subjective norm in TPB. These scholars mentioned that the subjective norm was more relevant to the individuals who could access the collective self in a prominent manner. The collective self is dependent upon interpersonal bonds to others which are obtained from common and also from some sort of symbolic identification with a group (Sedikides, 1993). In the context of pro-environmental behaviour, probably people showing affiliation to in-group membership such as groups

advocating pro-environmental concern may be more concerned to the environmental issues and the impact of subjective norm may be more pronounced on purchase intention for environmentally sustainable products in such cases. It was also hypothesized that subjective norm would have greater impact compared to attitude on the purchase intention in a collectivistic culture like India. This hypothesis was also not supported, however similar study in the context of Chinese culture which is also collectivistic in nature has shown subjective norm to have greater impact than attitude (Chan & Lau, 2002). It may again be attributed to less accessibility of the subjects in this study to the collective self and also to the blurring line between collectivism and individualism in Indian society. The low and insignificant estimate of subjective norm may also be due to underestimation of this construct measured by questionnaire completed in a private setting (Stiff, 1994) wherein participant didn't exhibit the exact self-nature. An important construct to replace subjective norm could be the moral norm or personal norm. As per Schwartz (1973), personal norm is normally the manifestation of an individual's statement about the correctness of behaving in a desired manner. These personal norms are also experienced as the feeling of moral obligation or norms. The moral norms have been described as the internalised form of the social norms and there is overwhelming evidence of relationship between this and environmentally concerned behaviour in the literature (Thøgersen, 2007). Inclusion of moral norm in place of subjective norm may improve the explanation of behaviour in TPB framework in situations that are morally oriented in nature (Armitage & Conner, 2001; Kaiser, 2006).

The elements of perceived behaviour control i.e. control on availability of environmentally sustainable products and perceived consumer effectiveness were found to have a positive and significant relation with the purchase intention for the environmentally sustainable products. The findings are in sync with the results obtained from earlier studies on pro-environmental behaviour by researchers like Straughan and Roberts (1999) and Webster (1975).

Overall the model utilizing the theory of planned behaviour framework explained the purchase intention and purchase behaviour for environmentally sustainable products with good insight in parsimonious and adequate manner in a developing country like India. The adequacy of TPB model was consistent with finding by researchers like Vermier and Verbeke (2008), Birgelen et al. (2009) etc. There is scarcity of study on the impact of environmental knowledge on the attitude towards environmental issues in Indian context although the same has been studied in other geographies (e.g. Ramayah et al., 2012 in Malaysia). The current study also fills this gap.

Implications

There are several important implications of the result obtained from this study. First of all, the study can serve as a reference to investigate the validity of TPB model for study on subject related to environmental issues in other geographies including other cultural settings and behavioural determinants. The findings of this study have provided valued knowledge on the prerequisite of the purchase intention which finally leads to purchase behaviour for environmentally sustainable products in Indian context. These findings can help the policy makers as well as the marketers to formulate their policy with regard to actions which would enhance the purchase and usage behaviour of the consumers towards environmentally sustainable products. It is important for the policy makers working towards improvement of environment to understand the behavioural aspects of the consumption so that they could make people change and believe in certain aspect of their action leading to betterment of the environment and ecology. The landscape of the marketing is changing rapidly due to ever increasing attention being paid to issues like pro-environmental behaviour. The pertinent issues like climate change, green house gas emission etc are threatening the sustainable development issues with pervasive impact on global socio-economic scenario. Hence, more and more consumers are expected to shift towards products which are environmentally sustainable in nature. At this juncture, it is of immense importance for marketers to include the element of environmental sustainability in their marketing strategy. The current study would help them in understanding an important element of the marketing strategy which is the behaviour of consumers. The findings such as insignificant impact of subjective norm on purchase intention could be a new thing for a collectivistic culture like India; hence marketers may have to move away from the traditional way of managing marketing activities targeted exclusively on collectivistic nature of Indian culture.

Policy makers and marketers need to keep in mind that environmental knowledge has significant and positive impact on the attitude towards environmentally sustainable products. It provides them with the opportunity to design their communication content in line with requirements to enhance the knowledge level of target audience. There is always a concern towards authenticity of the claims made by marketers for the environmentally sustainable products. The apprehension is more enhanced in the absence of appropriate communication that tells about the genuineness of the claim. A right set of knowledge is expected to have positive impact on the attitude of the consumers as per the findings of this study.

It is also important to note that the perception of reward or punishment affects the factors like perceived consumer effectiveness (Poortinga, Steg, Vlek, & Wiersma, 2003) and actions from agencies aimed at increasing the pro-environment behaviour is seen more favorably compared to actions intended at reducing the attractiveness of environmentally harmful behaviour (Steg, Dreijerink, & Abrahamse, 2006). Hence the notion of perceived consumer effectiveness shall be aligned accordingly by the marketers or policy makers while designing their strategies for environmentally sustainable products.

Limitations and Directions for Future Research

The empirical results obtained in this study are consistent with the theoretical background and also with the general belief on the subject matter. Despite this, the present study has few limitations. The study was undertaken in a single Indian city i.e. in a particular geography hence the study may not have included all the relevant ecological diversities at a more aggregate level. In spite of this limitation, the findings are immensely important in advancing the knowledge on the buying behaviour of consumers for environmentally sustainable products in Indian context considering the diversity and representativeness of sample used for the study. Another real concern was the positive response bias which was taken care of by ensuring the anonymity of the respondents and by encouraging them to express their correct position on the issue. The same has been checked statistically also. There may be an issue with the self-reported behavioral measures which are expected to be guided by the belief and intention of the respondents. However, the translation of the expressed behaviour into actual behaviour is a matter of further investigation. This has been the concern for many researchers such as Grunert and Juhl (1995) who in a study on sustainable food products found inconsistency between the attitude initially shown by the consumers and translation of the same into purchase decision. This inconsistency may depend on many factors such as price, availability, level of involvement etc (Vermeir & Verbeke, 2004). These factor need to be investigated in future studies.

The present study has been conducted by considering mainly those constructs which were the part of the theory of planned behaviour in addition to constructs like environmental knowledge and perceived consumer effectiveness. Future studies need to investigate the role of many other important constructs like involvement, trust, values which might act as moderator or mediator to the various constructs of the model. Since environmental concern is an important policy issue on global level, it is prudent to study the role of environmental legislation as a moderator to the purchase behaviour in the model.

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Appendix 1: Questionnaire Items

Construct	Items	Source
Environmental Knowledge	EK-1: Using environmentally sustainable products is a primary means to reduce pollution. EK-2: Using environmentally sustainable products is a substantial approach to reduce wasteful use of natural resources. EK-3: Using environmentally sustainable products is one great approach to conserve natural resources.	Sidique et al. (2010)
Attitude	ATT-1: I believe that use of environmentally sustainable products by me will help in reducing pollution and also help in improving the environment. ATT-2: I believe that use of environmentally sustainable products by me will help in reducing wasteful use of natural resources. ATT-3: I believe that use of environmentally sustainable products by me will help in conserving natural resources. ATT-4: I feel good about myself when I use environmentally sustainable products.	do Valle et al. (2005)
Subjective Norm	SN-1: My friends expect me to engage in environmentally sustainable product usage behaviour. SN-2: My family expects me to engage in environmentally sustainable product usage behaviour. SN-3: My society expects me to engage in environmentally sustainable product usage behaviour. SN-4: People can rely on me to make a positive contribution to the society due to my environmentally sustainable product usage behaviour.	Vermier and Verbeke (2008)
Control on Availability	CAV-1: I am familiar with the availability of environmentally sustainable products in my locality. CAV-2: I can easily get environmentally sustainable products whenever I need them. CAV-3: I have complete control over the number of environmentally sustainable products that I need to buy for personal use.	Sparks and Shepherd (1992)
Perceived Consumer Effectiveness	PCE-1: It is worthless for the individual consumer to do anything about pollution. PCE-2: When I buy environmentally sustainable products, I try to understand how its use will affect the environment and other consumers. PCE-3: Since one person cannot have any effect upon pollution and natural resource problems, it doesn't make any difference what I do. PCE-4: Each consumer's behavior can have a positive effect on society by purchasing products sold by socially and environmentally responsible companies.	Roberts (1996)

Purchase Intention	<p>PI-1: I would like to use environmentally sustainable products.</p> <p>PI-2: I would buy environmentally sustainable products if I happen to see them in a store.</p> <p>PI-3: I would actively seek out environmentally sustainable products in a store in order to purchase it.</p> <p>PI-4: I would patronize and recommend the use of environmentally sustainable products.</p>	Baker and Churchill (1977)
Purchase Behaviour	<p>PB-1: I choose the environmentally sustainable alternative for products if one with a similar price is available.</p> <p>PB-2: I choose the environmentally sustainable alternative for products regardless of their price.</p> <p>PB-3: I try to discover the environmental effects of environmentally sustainable products prior to purchase.</p> <p>PB-4: I bring my own shopping bag at store in order to reduce the use of plastic bags.</p> <p>PB-5: If I understand the potential damage to the environment that some products can cause, I do not purchase those products.</p> <p>PB-6: I don't buy a product if the company which sells it is environmentally irresponsible.</p>	Schlegelmilch et al. (1996)

Appendix 2: χ^2 Differential Test for Assessing Discriminant Validity

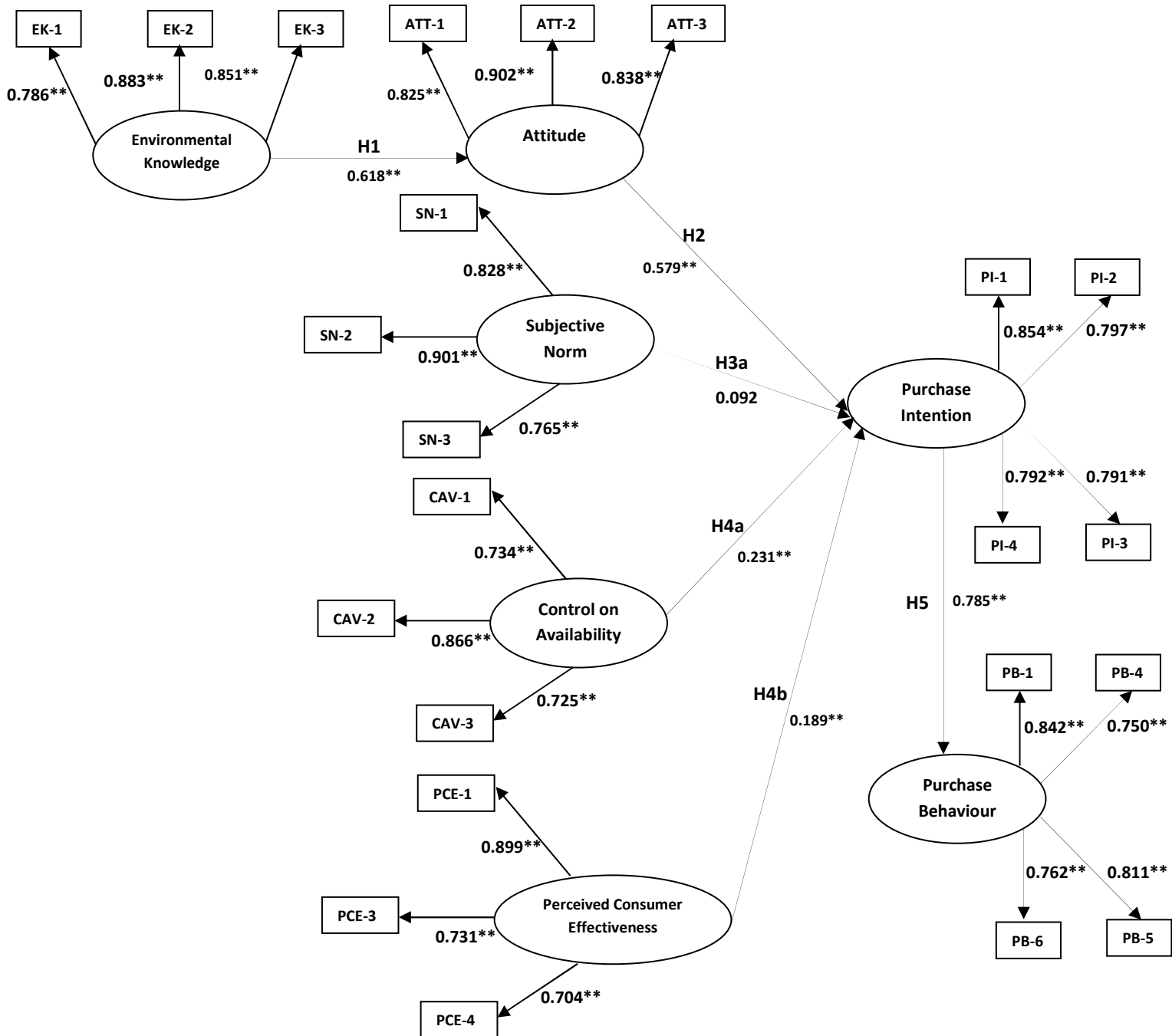
Pair of Constructs	Value of χ^2 Test without Constraining the Correlation to 1	Value of χ^2 Test after Constraining the Correlation to 1
Environmental Knowledge - Attitude	46.879	105.834
Environmental Knowledge - Subjective Norm	9.013	63.167
Environmental Knowledge - Control on Availability	10.468	97.750
Environmental Knowledge - Perceived Consumer Effectiveness	4.657	96.381
Environmental Knowledge - Purchase Intention	38.059	105.325
Environmental Knowledge - Purchase Behaviour	25.130	97.412
Attitude - Subjective Norm	13.273	65.423
Attitude - Control on Availability	12.221	89.343
Attitude - Perceived Consumer Effectiveness	8.228	89.268
Attitude - Purchase Intention	47.080	97.778
Attitude - Purchase Behaviour	10.404	65.910
Subjective Norm - Control on Availability	10.944	90.040
Subjective Norm - Perceived Consumer Effectiveness	8.238	95.640
Subjective Norm - Purchase Intention	28.447	103.769
Subjective Norm - Purchase Behaviour	8.243	66.980
Control on Availability - Perceived Consumer Effectiveness	28.076	125.503
Control on Availability - Purchase Intention	49.903	116.556
Control on Availability - Purchase Behaviour	18.281	65.071
Perceived Consumer Effectiveness - Purchase Intention	25.066	116.861
Perceived Consumer Effectiveness - Purchase Behaviour	17.215	96.571
Purchase Intention - Purchase Behaviour	56.117	111.635

Appendix 3: Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.811	35.038	35.038	9.197	32.847	32.847
2	2.608	9.313	44.350			
3	2.212	7.899	52.249			
4	1.882	6.723	58.972			
5	1.514	5.407	64.378			
6	1.252	4.470	68.848			
7	.942	3.364	72.212			
8	.855	3.055	75.267			
9	.694	2.477	77.744			
10	.593	2.116	79.860			
11	.591	2.109	81.969			
12	.562	2.006	83.975			
13	.509	1.818	85.793			
14	.465	1.661	87.453			
15	.430	1.537	88.990			
16	.408	1.458	90.448			
17	.345	1.233	91.682			
18	.323	1.153	92.835			
19	.307	1.096	93.931			
20	.297	1.060	94.991			
21	.251	.895	95.886			
22	.231	.826	96.713			
23	.199	.711	97.424			
24	.182	.649	98.073			
25	.169	.602	98.675			
26	.149	.530	99.206			
27	.119	.423	99.629			
28	.104	.371	100.000			

Extraction Method: Principal Axis Factoring.

Appendix 4: Result of the Full Model



$\chi^2 = 389.479$, $df = 218$, $GFI = 0.827$, $CFI = 0.919$, $IFI = 0.920$, $TLI = 0.906$, $RMSEA = 0.072$

** $p < 0.01$