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# DETERMINANTS OF GREEN PRODUCT PURCHASE DECISION: AN EMPIRICAL STUDY USING SMART PLS-SEM

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**Abstract:** *The present study is an attempt to identify factors affecting consumer's decision to purchase green products during COVID 19 pandemic in India. To test the research model and hypotheses Primary data was collected through structured questionnaire. Responses were collected from 232 respondents. This study sheds light on the determinants of consumer decision to purchase green products. In the light of findings, it suggests green product marketing strategies. It will allow businesses to acquire more market-applicable approach to sustain in the competitive market. The present study carried out smart PLS-SEM in R-studio in order to test the proposed conceptual model.*

**Key words:** *Green marketing, Green product, Social circle, Environment commitment*

## Introduction

Green marketing is a holistic concept involving environmentally friendly practices in all the stages such as the production, designing, marketing and selling of goods or services. American Marketing Association, "green marketing is the efforts by the organizations to produce, promote, package, and reclaim products in a manner that is sensitive or responsive to ecological concerns. "Green products mean those products which are not destructing in nature for environment, use less toxic ingredients, recycled packaging and material that is not damaging for the globe (Gurau and Ranchhod, 2005). These products have gained popularity because of its minimal impact on the environment followed by safety, acceptable price, long term health benefit, energy efficiency, long lasting effects, durability, recyclability and reusability (Yesmin, Shayala; Akter, Sharmin, 2018). Witnessing the demand for eco-friendly products, many companies in India such as Mama earth ,Dabur, Kama, Patanjali, ITC, Tata, LG etc have started producing these eco-friendly products. Apart from consumers and businesses, even government has also taken several initiatives by

making many regulations in support of protection of environment for example the ban of plastics in many parts of the country. As green marketing is different from the marketing in traditional way, marketers need to know the factors that persuade the consumer to buy the green products. This study aims to resolve the research question that what factors influence the consumer decision to buy the green product.

## Need of Study

It is observed that many studies (Vijayasree et al., 2022; Chen et al., 2022; Chitra and Govindasamy, 2020; Sujith, 2017; Mohd Noor et al. (2016); Chopra and Vinayek, 2013; Pandey, 2012) have been done on customers' perception towards green product. But to the best of knowledge of researcher expect very few studies no comprehensive study has so far been conducted to explore the factors affecting customers' purchase decision of green product during the ongoing uncertainty of the COVID-19 pandemic. Hence, the present study contributes to the field by investigating and exploring factors influencing customers' green product purchase during the COVID-19 crisis.

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## Research Objective

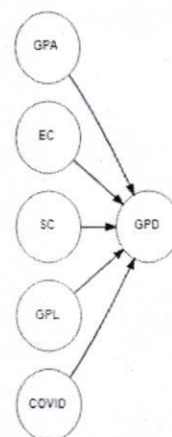
To identify factors affecting consumer's green product purchase decision during the ongoing uncertainty of COVID 19 pandemic.

## Literature Review

The concept of Theory of Planned behavior TPB (Ajzen, 1991) is used in this study to focus on the consumers decision to purchase green products. The first factor is the attitude towards behaviour such as consumer's evaluation about the benefits of purchasing green products, having an interest to protect the environment, and realization of supporting the initiative taken by the environmentally friendly companies. The second factor is subjective norm such as the existence of consumer's peer, reference groups and opinion leaders which also purchase and consume green products. And, the third factor is perceived behavioural control which is related to, for instance, the consumer's perception about the degree of easiness to acquire and utilize the green product. On the basis of the findings of past studies (Ginsberg and Bloom, 2004; Chen & Chai, 2010; Saxena & khandelwal, 2010; Burgos-Jiménez, Vázquez-Brust, Plaza-Úbeda, & Dijkshoorn, 2013; Mobley, Vagias, & DeWard, 2010; Koo and Chung, 2014; Bratu, 2019; Liobikiene and Poškus, 2019; Joshi and Rahman, 2015; Sun et al., 2021; Jian et al., 2020) the present study identifies the fear of COVID-19 pandemic, environment commitment, green product literacy, green product awareness, and social influence as an important variables that have an bearing impact on the actual behavioral action (i.e. the decision to purchase green products). The study develops following conceptual model as shown in fig 1:

Hence, proposed hypotheses of the study are as follows:

- H1: Green awareness significantly affects the consumer's decision to purchase green products.
- H2: Environment commitment significantly affects the consumer's decision to purchase green products
- H3: Social influence has a positive influence on consumers' green product purchase attitudes
- H4: Green product literacy has a positive impact on consumers' green product purchasing attitudes.
- H5. Fear of COVID significantly affects green product purchase decisions of consumers



## Research Methodology:

**Research Design:** the present study is descriptive cum analytical in nature.

**Sampling unit:** The present study captured those individual customers who have been using green product.

**Design of Questionnaire:** To measure the construct of the study, total of 21 variables adapted from past studies have been used in the present work. Five-point Likert scale (i.e., 1 = strongly disagree to 5 = strongly agree) was employed to measure the respondent's responses.

**Data Collection:** The present study mainly collected primary data from customers in India. For collecting primary data the researcher conducted online survey through questionnaire method. Before initiating the survey, questionnaire's face and content validity was established on the basis of expert opinion. Then, the final version of questionnaire was distributed on social media in form of google link.

**Period of Study:** The online survey was conducted in the period of November 2022 to January 2023.

**Size of sample and sampling technique:** Determination of the number of samples with what was said by (Hair 2010). According to Hair(2010) sample size should be equal to or greater than 10 times the number of variables. In the present study researcher used 21 statements, and hence covered 232 respondents. The sampling technique in this study is non-probability sampling, which is convenience sampling.

**Secondary Data:** To some extent, the present study made use of secondary data and it was collected from books, journals, newspapers, magazines and internet.



**Data Analysis:** To establish cause and effect relationship among independent and dependent variables the present study conducted smart PLS-SEM using r-studio version 4.3.1 (Neeraj Kaushik, 2021). The reason behind the use of Smart PLS-SEM is that it works well with comparatively less size of sample and requires no distributional assumption (Hair et al., 2018).

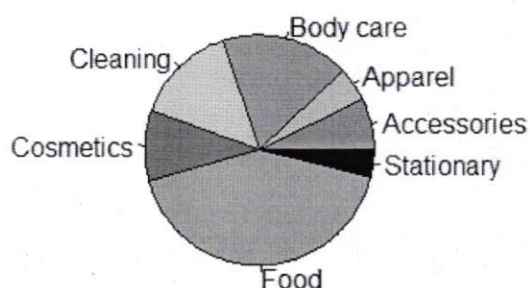
**Results and Discussion**

**Descriptive statistics:** Table 1 depicts the variety of green products purchased by respondents. It is evident from the table and pie chart that those who did purchase green products, majority of respondents gave preferences to the food products made from organic ingredients, herbs or ayurveda followed by body care products. Cosmetic, cleaning, and accessories products were a given second preferences while buying green products by the customers. But Apparel and stationary products were the least preferable green products to the respondents.

**Table 1: Most conventionally consumed green products**

Green product purchased	No. of Respondents
Accessories	17
Apparel	11
Body care	42
Cleaning	33
Cosmetics	23
Food	97
Stationary	9

Source: Primary Data



**Structural Equation Modeling**

The present study carried out smart PLS-SEM in R-studio in order to test the proposed conceptual model. Smart PLS-SEM incorporates two-level of

examination, such as assessment of measurement model and structural model.

**Measurement Model:** MM is known as outer model it is used to check the validity and reliability of constructs. It links statements to their identifiable latent construct.

**Reliability:** Table 2 represents reliability (Cronbach's alpha) of all latent constructs followed by internal consistency (Henseler's rho A and composite reliability) and convergent validity (average variance extracted). Since the value of Alpha, rho C, and rho A are greater than 0.7 for all the constructs and the average variance extracted (AVE) exceed cut-off point of 0.5 (Byrne, 2013; Hair et al., 2017), reliability is achieved in the study.

**Table 2: Reliability**

Construct	alpha	Rho C	AVE	Rho A
GPA	0.765	0.817	0.607	1.560
EC	0.923	0.933	0.778	1.090
SC	0.831	0.898	0.746	0.841
GPL	0.808	0.881	0.712	0.859
COVID	0.749	0.834	0.557	0.803
GPD	0.741	0.838	0.566	0.752

Source: Primary Data

**Discriminant validity:** After assessing the construct reliability, the discriminant validity test was carried out by cross-loading, HTMT ratio of correlations and fornellarcker criterion.

**Cross loading:** Table 3 depicts the result of cross-loading. To achieve discriminant validity the statements should be loaded strongly on their own construct than others and must have the threshold value of 0.50. The findings of measurement model indicate that all the items have loading above 0.50.

**Table 3: Cross Loading**

Constructs	GPA	EC	SC	GPL	COVID	GPD
GPA1	0.682	0.225	0.342	0.028	0.175	0.150
GPA2	0.640	0.155	0.160	-0.340	0.058	0.022
GPA3	0.973	0.178	0.352	0.038	0.457	0.486
EC1	0.077	0.901	0.328	-0.084	-0.223	0.030
EC2	0.133	0.821	0.335	-0.117	-0.120	0.001
EC3	0.262	0.952	0.294	-0.188	-0.205	0.043
EC4	0.294	0.849	0.293	-0.205	-0.087	0.006
SC1	0.475	0.249	0.848	-0.044	0.277	0.518
SC2	0.179	0.313	0.870	0.177	-0.003	0.470
SC3	0.321	0.307	0.873	0.161	0.090	0.384
GPL1	0.055	-0.117	-0.003	0.810	0.292	0.139



GPL2	0.009	-0.108	0.128	0.888	0.253	0.321
GPL3	0.019	-0.183	0.087	0.833	0.145	0.287
COVID1	0.177	-0.264	-0.045	0.063	0.728	0.395
COVID2	0.402	-0.008	0.375	0.194	0.815	0.631
COVID3	0.544	-0.048	0.066	0.293	0.743	0.386
COVID4	0.035	-0.539	-0.188	0.248	0.693	0.281
GPD1	0.461	0.022	0.314	0.197	0.652	0.790
GPD2	0.265	-0.145	0.259	0.329	0.617	0.844
GPD3	0.372	0.280	0.601	0.217	0.226	0.670
GPD4	0.198	-0.029	0.492	0.224	0.269	0.690

Source: Primary Data

**Note(s):** GPA-Green Product Awareness, EC-Environment Commitment, SC-Social Circle, GPL-Green Product literacy, COVID-Fear of Covid-19, GPD-Green Purchase Decision

**FornellLarcker(FI) Criterion:** Table 4 depicts the score of fornellarcker criterion. The findings show that the square root of AVE for the each construct was higher than its correlation with another corresponding construct in the study which, in turn, indicates that constructs possess discriminant validity.

Table 4: FornellLarcker Criterion

Const ructs	GPA	EC	SC	GPL	COVID	GPD
GPA	0.779	.	.	.	.	.
EC	0.210	0.882	.	.	.	.
SC	0.383	0.333	0.864	.	.	.
GPL	0.026	-0.162	0.103	0.844	.	.
COVID	0.424	-0.218	0.149	0.257	0.746	.
GPD	0.440	0.037	0.538	0.321	0.609	0.752

Source: Primary Data

**Heterotrait-Monotrait ratio (HTMT):** Table 5 depicts HTMT ratios which are found to be below the threshold value of 0.85 (Henseler et al., 2015) to represent appropriate discriminant validities of all latent variables in the study.

Table 5: Heterotrait-Monotrait ratio (HTMT)

Const ructs	GPA	EC	SC	GPL	COVID	GPD
GPA	.	.	.	.	.	.
EC	0.278	.	.	.	.	.
SC	0.452	0.397	.	.	.	.
GPL	0.218	0.187	0.198	.	.	.
COVID	0.434	0.341	0.298	0.372	.	.
GPD	0.403	0.197	0.696	0.380	0.775	.

Source: Primary Data

**Multi-collinearity Check:** According to Hair et al.

(1995), low VIF values are preferred to ensure a low degree of multicollinearity among variables. Table 6 indicates that VIF values of all constructs are below the threshold limit of 3 (Hair et al., 2019), thus indicating that multicollinearity does not exist in the present study.

Table -6: VIF (Variance Inflation Factor)

Construct	VIF
GPA	1.496
EC	1.320
SC	1.308
GPL	1.110
COVID	1.467

Source: Primary Data

**Structural Model:** The second aspect of smart PLS-SEM is to build and assess structural model. The purpose of structural model is to evaluate the hypotheses relationships among the constructs. The structural model indicates the causal relationship between independent and dependent constructs. According to Hair et al. (2017), the bootstrapping approach is used for evaluating the significance of the path coefficient.

A positive value on the path coefficient indicates that the related variable has a positive effect; on the other hand, if the path coefficient value is negative, the related variable has a negative effect. The value of the t-statistic will be compared with the table value. If the t-statistic value is greater than the table value, the related variable is declared to have a significant effect. For the confidence level of 95% ( $\alpha = 5\%$ ), the table value is used as a reference of 1.96.

Judging from the evaluation results using the Path Coefficient output in table 7, it can be concluded that the variable Green Product Awareness, Environment Commitment, Social Circle, Green Product Literacy, Fear of COVID have a positive effect on consumers' green product purchase decisions. And in the evaluation value of T-statistics, it is concluded that the variables Fear of COVID, Social circle and Green product literacy have significant effect on purchasing decisions because it is > 1.96, therefore hypothesis H5, H4, H3 are accepted. While the Green product awareness and Environment commitment have no significant effect in creating the desire of customer to purchase a green product because the T-statistical value is 1.813 < 1.96, therefore hypothesis H1, H2 are rejected.

Cohen (1988) reported that it is important to examine



Table -7: Structural Model Assessment

Hypothesis Relationship	Path coefficient	SD	T-Stat.	Confidence Intervals	f-square	decision
GPA -> GPD (H1)	0.068	0.050	1.301	-0.025 0.183	0.009	Rejected
EC -> GPD (H2)	0.012	0.073	0.169	-0.161 0.149	0.001	Rejected
SC -> GPD (H3)	0.419	0.043	9.660	0.343 0.503	0.258	Accepted
GPL -> GPD (H4)	0.155	0.049	2.552	0.074 0.265	0.052	Accepted
COVID -> GPD (H5)	0.480	0.066	7.035	0.305 0.575	0.315	Accepted

Source: Primary Data

the effect sizes (f-square) of the indicators. F-square is the change in R-square when an exogenous (independent) variable is removed from the model. With effect sizes, the values of F-square 0.00 – 0.15 mean small size, 0.15 – 0.35 mean medium and over 0.35 mean large effect. This study’s F-square show that construct fear of COVID and social circle have medium effect and green product literacy has small effect size.

Table 8: R-Square Value

R Square	0.5988122
Adj Rsq	0.5899364

Source: Primary Data

R2 is the principal criterion used to evaluate the structural model. The R2 value (table 7) revealed that the 58.9 % variance in the endogenous construct (green purchase Decision – GPD) is explained by the five exogenous constructs (Fear of COVID, Social circle, Green product literacy, Green Product Awareness, Environment Commitment). This shows that descriptive power of Green product purchase decision is satisfactory because R-square should be greater than 0.26 for variance explained (Hair et al., 2013).

**Conclusion**

**Fear of COVID 19 has positive and significant effect on the purchasing of green products**

The finding of study revealed that fear of COVID has positive and significant impact in influencing customer to purchase green products. The findings of study is related with Chen et al. (2022) who identified fear of COVID 19 pandemic has an influence on customer purchase intention towards green product in Malaysia. Sun et al. (2021), also examined the green consumption behavioral intention and consumers’ positive and negative impact of COVID-19 pandemic in the context of China. Panjaitan and Sutapa (2010) found out that green product has a great impact on human health.

**Social Circle has positive and significant effect on the purchasing of green products**

The findings of present study revealed that social circle has a significant influence in inducing the customers to purchase green product. This findings of this study is in the line with the results of Chen et al. (2022) Xie et al. (2019) and Dhir et al. (2021). This means that influence of friends and relatives is important factor in promoting consumption of green product in India.

**Green product literacy has positive and significant effect on the purchasing of green products**

The findings of the present study identified green product literacy as important and significant factor in reflecting customer’s decision to purchase green product. These results reiterate the points put forward by Sun et al. (2021) and Chen et al. (2022). So the manufacturer should emphasis on making labels more informative, providing reliable information in simple and user-friendly way through product labels and creating awareness among customers about availability of the variety of green products. This practice will result in generating more sales.

**Green product awareness has positive but insignificant effect on the purchase decision of green product:** Table 6 indicates that awareness about green product affects green product purchase decision but it is insignificant. It implies that general awareness regarding the benefits of green product is not found to be crucial influencing factor when it comes to green product purchase decision during COVID 19 pandemic. It is different from previous studies conducted by Sujith (2017), Saxena; Khandelwal(2010),Mohd Noor (2016),Ginsberg and Bloom, (2004) which resulted in the conclusion that the customer awareness has a positive and significant effect on purchasing decisions.

**Environment Commitment has positive but insignificant effect on purchase decision of green product:** The findings of the study shows that environment commitment affects green product



purchase decision but it is insignificant. This means that personal commitment to protect and improve the quality of environment is not found to be significant factor in motivating the customers to purchase the green product during COVID 19 pandemic. These findings are not consistent with the results of Sharma et al. (2012), Mohd Noor (2016), Chen & Chai (2010).

### Recommendations

The study contributes to green marketing literature by exploring factors determining customers' green product purchase decision. The result revealed that fear of COVID 19, social circle, green product literacy are the crucial factors that reflect customer decision to purchase green product. Health consciousness is promoting green product consumption in India during an ongoing uncertainty of COVID 19. So, the advertising message needs to be convincing enough to boost immunity power for the users during COVID 19 pandemic which will help in motivating customers to shift from buying conventional products to Green products. Since the influence of family and friends is significant to motivate the customers to use green products, the marketers should pay attention towards providing the standard quality product which in turn will lead to positive word of mouth resulting in increased acceptance of green product. The present study concludes that marketers should not only focus on creating awareness about ecological benefits of green product but also an emphasis on educating customer about the eco-labeling, packaging and making the green products available in full range of variety. Green product literacy and knowledge is necessary to identify green product.

### Limitations and Direction for future research

The present study is cross-sectional; the future work can use a longitudinal tactic to afford findings that are more precise. The sample population was limited to Indian citizens, which may restrict the generalizability of the outcomes.

The future research studies can undertake NCA (Necessary Condition Analysis) and IPMC (Importance performance Map Analysis) in order to identify which independent variable is most important.

In addition to this, the future research studies can use control variables to tackle the issue of endogeneity.

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