

# Consumer Perception towards Green Products: A Factor Analytic Approach

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## Abstract

This study aims to put forth the concept of Green marketing. Indian industry has been fast growing. Customers are changing their perceptions towards the products preferring environment friendly products because there is a growing awareness to protect the environment. As resources are limited, it is important for the marketers to utilize the resources efficiently. Promotion and adoption of green products & technologies is necessary for conservation of natural resources and sustainable development. As a result, companies are increasingly using strategies for the promotion of adoption of green products and services. However, the acceptability of green marketing concept is still lacking among the consumers reason being lack of awareness about eco friendly products and services, in-effective advertisements by manufacturers, lack of standardization of government rules and regulations. So, the present paper tries to identify the customer perception towards eco-friendly products with the help of factor analytic approach. Seven factors are manipulated in this research paper which is Desire, Trustworthiness, Preference, Ethical, and Awareness, and Initiative, Social welfare for result. For this purpose, a sample of 100 graduates and post graduate students from Amritsar (Punjab) were taken.

## Keywords:

Green Marketing, Green products and technologies, Consumer Perception, Factor analytic approach

## Introduction

Over the last twenty years, public support for environmental protection has waxed and waned. Despite the difference in concern, the green movement is arguably one of the most important social movements in recent history. Many national polls indicate that public concern towards the environment has remained consistently high (Roper, 1992). As compared with a decade earlier, now more people are supporting increase in governmental spending for environmental causes & are willing to sacrifice economic growth for environmental protection (Gallup & Newport, 1990). Green marketing has gained wide acceptance among several companies as being a viable

competitive strategy (Shrum, McCarty, and Lowrey, 1995). According to The American Marketing Association, green marketing presume to be eco friendly marketing which involves several activities like production process, change in packaging, product modification as well as advertising modification. Green marketing is the practice of adopting resource conservation and environment friendly strategies in all stages of the value chain (Johri, & Sahasakmontri, 1998). A large number of marketers are targeting the green segment of the population. Recycled paper and Plastic Goods, Rainforest Crunch ice-cream, and Dolphin-Safe Tuna are examples of products positioned on the basis of environmental appeal. The number of new green product introductions in national markets rose from 60 in 1986 to 810 in 1991; even more revealing is that the share of new green product introductions among all new introductions rose from 1.1% in 1986 to 13.4% in 1991 (Ottman, 1993).

### Characteristics of Eco-Friendly Products

The products manufactured through green technology causing no environmental hazards are called green products. Promotion of green technology and green products is necessary for conservation of natural resources and sustainable development. Some characteristics of green

product are given below:-

- Products those are originally grown.
- Products those are recyclable, reusable and biodegradable.
- Products containing recycled contents, non-toxic chemical.
- Products that do not harm or pollute the environment.
- Products that will not be tested on animals,
- Products that have eco-friendly packaging, refillable containers. (Gurusamy 2013)

### Review of Literature

Rapidly changing environment is now a major concern for the people throughout the world, making them more and more concerned about the environment. Various studies have been conducted in respect of green product and marketing. The studies being reviewed in the concern are as below:-

Sr No.	Title	Author	Year	Conclusion
1	Shades of green: A Multidimensional analysis of Environmental Advertising	Banerjee, S	1995	The majority of advertisers were found projecting a greener corporate image rather than focusing on the environment benefits of their products or services as a result of the increasing consumer awareness, thereby targeting the green segment of the consumer market.
2	Green Marketing: Multiplier for Appropriate Technology Transfer?	Fisk, G	1998	The risk and reward effect of green marketing tactics are traced to identify their implications in pursuing globally sustainable development.
3	Marketing Strategy, Product Safety and Ethical Factors in Consumer Choice	Curlo, E	1999	The result depicts that provision of negligence information heightens consumer concern for safety. So the brand which conforms safety standards will be chosen by consumers who care about safety standard.
4	Environmental Priorities in Strategic Product Development	Simon, M. et al	2000	A four stage framework for eco design practice resulted; first, to make an environmental assessment from life cycle viewpoint; then to communicate the analysis and collect feedback; thirdly to prioritize the environmental issues and finally the design using relevant tools and methods.
5	Empathizing with nature: The Effect of Perspective Taking on Concern for Environmental issue	Schultz, P	2000	Through the reference of an animal being harmed by pollution, participants were instructed to take their perspective which scored significantly higher in biosphere environmental concern.

6	Design for the environment: A Quality based Model for Green product Development	Chen, C	2001	Two major findings show that green product development and strict environmental standards might not necessarily benefit the environment.
7	Social Responsibility in Environmental Marketing planning	Karna, J. et al	2003	The result also give evidence that green values, environmental marketing strategies, structures and function are logically connected to each other as hypothesized according to the model of environmental marketing used to guide this study.
8	Green Marketing or Green Wash? A Comparative study of Consumer' Behavior on Selected Eco and Fair Trade Labeling in Sweden	Zaman, A.U. et al	2010	The study showed that most of the eco-friendly brands do not comply with environmental justice and eco system service in their label policy initiatives. Moreover, a gap was observed between policy initiatives and actual practices.
9	Can Green Marketing be used as a tool for Sustainable Growth? A study performed on Consumers in India- an Emerging Economy	Saxena, R. & Khandewal, P.K	2010	The study analyzes people's concern for a healthy environment to live and preference of environment friendly products and services to consume significantly present among the respondents of the study.
10	Green Marketing and its Impact on Consumer Buying Behavior	Boztape, A	2012	Environmental awareness, green promotion activities, green product features and a green pricing effect were found to be statistically significant for consumer buying behavior.

## Research Methodology-

### Objectives of the study

1. To find out the Consumer perception towards environment friendly products.
2. To suggest suitable green marketing initiatives for government, industry and consumers in Punjab.

### Sampling Design

These respondents were interviewed through a pretested, well structured questionnaire which was administered personally.

### Methods of Data Collection

The present study is mainly based on primary data collected from 100 respondents belonging to different cities of Punjab region. Graduate and postgraduate students from Guru Nanak Dev University were selected for the survey. The survey was conducted during the period of December 2014 to January 2015. The demographic characteristics of the respondents depict that the majority of students were in the age group of 20-40 years and 52% of them were females and most of them were graduates.

## Research Tools

Five point likert scale has been used for the said purpose ranging from strongly agree to strongly disagree. To find out the perception of respondents towards Environment Friendly Products, Factor Analysis used for analyzing correlations between variables factor analysis, which reduces their number into fewer factors which explains much original data more economically (Nargundkar, 2010).

### Scope of the Study & Limitation

From the literature review, it can be summarized that not much work has been done on Consumer Perception towards Environment Friendly Products in Punjab. Indian industry has been fast growing and customers are changing their attitude towards green products. They prefer green product more in comparison to other products as they want to protect the Environment.

**Global Scenario-**Nowadays Green Marketing has become a growing concern. As all the marketing related activities of international organization authorities and government want to protect to customer and society. These organizations are designed to protect customer and environment in several ways; because of environment protection many regulatory came into picture these are; The Australian Trade Practices

Commission's (TPC) "Environment Claims in Marketing- A Guideline (TPC1992), The US Federal Trade Commission's (FTC) "Guides For The Use of Environmental The National Association (NAAG 1990) National Association of Attorneys General, World Trade Organization etc.

- It is a comprehensive study as not much work has been done on this topic in Punjab region.
- It is new and dynamic concept in marketing.

### Limitation

- The biasness of the respondents may affect the result of the study so far as primary data is concerned. Because of the biases of the respondents the result of the study may not be the same for all the cities and at all places.
- The survey has been conducted in Punjab region only. It may not reflect the public opinion at large.
- The sample size has been small (100) which may not reflect the broader picture.
- Time and cost constraints.

### Data Analysis and Major Findings

Factor analysis has been used for analyzing the collected data. Factor analysis falls into a class of statistical techniques usually SPSS software has been used for testing the data. 23 statements were used for factor analysis. After the data was fed, the Bartlett's test of sphericity was run along with KMO. Explanatory factor analysis is used to identify the underlying constructs and investigate relationships among the key survey interval-scaled questions regarding perception towards green products. To test the suitability of data, reliability test has been conducted and value of Cronbach's alpha comes out to be .814 which is significant. The following steps have been conducted to analyze the data.

- Kaiser-Meyer-Olkin Measure of Sampling Adequacy is computed which is found to be .728. It is indicated that the sample is good enough for sampling.
- The overall significance of correlation matrices is tested with Bartlett Test of Sphericity (approx chi square = 637.780 and significant at .000) provided as well as support for validity of the factor analysis of the data set.

**Table 1 – KMO & Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.728
Bartlett's Test of Sphericity	Approx. Chi-Square	637.780
	df	253
	Sig.	.000

(Source IBM SPSS statistics 19 version)

Hence, all these three standards indicate that the data is suitable for factor analysis. Principal components analysis is employed for extracting factors.

**Rotation Method:** Orthogonal rotation with Varimax was applied for the purpose of the present study. Orthogonal rotation is preferred when the researcher wishes to have factors or dimensions which are not correlated with each other. The latent root criterion is used for extraction of factors. As per the criteria, factors having latent roots or Eigen values greater than one are only considered significant. There are only seven factors having Eigen values exceeding one in our study which are 5.166, 1.840, 1.738, 1.406, 1.288, 1.254 and 1.157 respectively. The percentage of total variance is used as an index to determine how well the total factor solution accounts for. The present solution of index accounts for 60.219 % of the total variation of the data. It is pretty good figured which we got from the

analysis and we only lost 39 % of the information content in our study.

### Criteria for the Significance of Factor Loadings-

A decision must be made regarding which factor loadings are worth considering when researcher interprets the factors. A factor loading represents the correlation between an original variable and its factor. The criterion given by (Hair,1995), where factor loading based on sample size is taken as the basis for decision about significant factor loading, was adopted. For our sample 100 respondents, a factor loading of .5 and above has been considered significant. All the 7 factors have been given appropriate names on the basis of variables represented in each case. From the rotated factor matrix that variables 5(I purchase a product with environmental safety prospective), 9(I always prefer energy saving products when I purchase electronic items), 10(I specifically check recycle label on the back of

product), 11(I always prefer product with reusable container), and 12(Eco-friendly product feature motivates me to buy a product) have high loadings of .796, .781, .723, .671 and .641 on factor 1. This suggests that factor 1 is a combination of these five original variables. Similarly for factor 2, we find the variables 2(I do not like to buy product with excess packaging), 3(I am ready to pay a higher price for the eco-friendly products), 19(I never buy Products which contain toxic chemical), 22(I usually prefer net banking to avoid paper wastage) and 23(Solar light system is a good green product initiative) have high loadings of .750, .576, .500, .473 and .419 respectively. This indicates that factor 2 is a combination of five variables. Factor 3 can be interpreted as a combination of variables 4(I prefer eating organic products available in the market), 6(I prefer to use CFL lights), and 21(An environmentally responsible product become comparatively less expensive when whole life costs are taken into consideration) have loading .845, .447 and .543 respectively. This indicates that factor 3 is a

combination of three variables. Factor 4 is a combination of three variable 14(Government must frame stringent rules and regulations in support of green marketing and should assure proper implementation of the same), 17(Ecological friendly technologies must be followed by companies in over all working criteria), and 20(I prefer getting bills on my mails) with factor loading of .344, .790, and .623. Factor 5 is combination of two variables 8(I do not like plastic bags), 18(Specifically ecological products are of good quality) with factor loading of .779 and .556. Factor 6 is combination of three variables 1(I like to use eco-friendly products), 7(I prefer to use fuel efficient vehicles) and 13(When I am confused about product, I prefer green products) with loading value .637, .667 and .488. At last factor 7 having combination of two variables 15(Green advertisement doesn't affect my purchase decision) and of 16(I want to buy product which are not tested on animals) with loading of .510, .645.

**Table 2. Rotated Component Matrix<sup>a</sup>**

	Component							Communalities <sup>b</sup>
	1	2	3	4	5	6	7	
<b>S1</b>	-.092	.205	.272	.008	-.045	<b>.637</b>	.143	.552
<b>S2</b>	.384	<b>.500</b>	.073	.228	.224	.067	.176	.540
<b>S3</b>	.174	<b>.750</b>	-.019	-.144	-.281	.225	.156	.768
<b>S4</b>	.092	.033	<b>.845</b>	-.066	-.013	.070	-.003	.733
<b>S5</b>	<b>.781</b>	.299	-.102	.233	.054	.030	.036	.769
<b>S6</b>	.373	-.102	<b>.447</b>	.244	-.027	.428	-.095	.601
<b>S7</b>	.012	-.034	-.096	.011	.002	<b>.667</b>	-.096	.464
<b>S8</b>	.039	-.024	.007	-.109	<b>.779</b>	.026	-.164	.648
<b>S9</b>	<b>.641</b>	.047	.420	.061	.032	.120	-.030	.609
<b>S10</b>	<b>.723</b>	.138	.049	.090	-.143	.069	-.164	.604
<b>S11</b>	<b>.796</b>	-.058	.089	-.075	.134	-.043	.051	.673
<b>S12</b>	<b>.671</b>	.322	.180	.303	.200	-.051	.141	.740
<b>S13</b>	.151	.076	-.036	.141	.484	<b>.488</b>	.216	.568
<b>S14</b>	.224	.077	.229	<b>.344</b>	.256	.308	.000	.388
<b>S15</b>	-.013	-.017	.276	.296	-.114	-.376	<b>.510</b>	.579
<b>S16</b>	.031	.103	-.121	-.052	.072	.061	<b>.645</b>	.453
<b>S17</b>	.039	.060	.191	<b>.790</b>	.052	.114	-.153	.705
<b>S18</b>	.090	-.013	-.178	.366	<b>.556</b>	-.038	.221	.534
<b>S19</b>	-.033	<b>.473</b>	.274	-.051	.469	-.030	.125	.539
<b>S20</b>	.345	.044	-.243	<b>.623</b>	-.071	-.045	.120	.589
<b>S21</b>	.268	.251	<b>.543</b>	.247	-.023	-.204	-.340	.648
<b>S22</b>	.194	<b>.576</b>	.070	.228	.085	-.029	-.478	.663
<b>S23</b>	.396	<b>.419</b>	-.024	.261	.208	-.060	-.188	.483
<b>Eigenvalues</b>	<b>5.166</b>	<b>1.840</b>	<b>1.738</b>	<b>1.406</b>	<b>1.288</b>	<b>1.254</b>	<b>1.157</b>	
<b>Cumulative Percentage Of Variance</b>	<b>14.917</b>	<b>23.210</b>	<b>31.379</b>	<b>39.512</b>	<b>47.021</b>	<b>54.236</b>	<b>60.219</b>	

(Source IBM SPSS statistics 19 version)

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 11 iterations.



**Table- 3: Factor Naming**

Statement	Factor loadings	Factor names & Variance explained
1. I always prefer product with reusable container.	.796	Desire
2. I purchase a product with environmental safety prospective.	.781	
3. I specifically check recycle label on the back of product.	.723	
4. Eco-friendly product feature motivates me to buy a product.	.671	
5. I always prefer energy saving products when I purchase electronic items.	.641	
1. I am ready to pay a higher price for the eco-friendly products.	.750	Trustworthiness
2. I usually prefer net banking to avoid paper wastage.	.576	
3. I do not like to buy product with excess packaging.	.500	
4. I never buy Products which contain toxic chemical.	.473	
5. Solar light system is a good green product initiative.	.419	
1. I prefer eating organic products available in the market.	.845	Preference
2. An environmentally responsible product become comparatively less expensive when whole life costs are taken into consideration.	.543	
3. I prefer to use CFL lights.	.447	
1. Ecological friendly technologies must be followed by companies in over all working criteria.	.790	Ethical
2. I prefer getting bills on my mails.	.623	
3. Government must frame stringent rules and regulations in support of green marketing and should assure proper implementation of the same.	.344	
1. I do not like plastic bags.	.779	Awareness
2. Specifically ecological products are of good quality.	.556	
1. I prefer to use fuel efficient vehicles.	.667	Initiative
2. I like to use eco-friendly products.	.637	
3. When I am confused about product, I prefer green products.	.488	
1. I want to buy product which are not tested on animals.	.645	Social Welfare
2. Green advertisement doesn't affect my purchase decision.	.510	

### Conclusion and Recommendations

To analyze the Consumer perception towards Environment Friendly product the present study has taken some factors namely desire, trustworthiness, preference, ethical, awareness, initiative, social welfare. The study provides us with the conclusion that there is lack standardization to certify a product as organic unless some regulatory bodies get involved in providing the certification. A standard quality control board needs to be in place for such labeling and licensing. As being a new concept, there is lack of general awareness. People need to be educated and made aware of the environmental threats related to it. The new green movement needs to reach the masses and that will take a lot of time and efforts. The investors and corporate world need to view the environment as major long-term investment opportunities, the marketers need to look at the long term benefits from this new green movement. Since it is a new concept, it will have its own acceptance period. The first rule of green marketing is to focus on customer benefits, the primary reason why customers would prefer to buy

specific products at first place. Therefore companies should motivate consumers to switch brands or even pay premium for the greener alternatives. It is not going to help if a product is developed which is absolutely green in various aspects but does not fulfill the customer satisfaction criteria. This will also lead to green myopia concept in which other companies get benefit by selling less costly products compare to environmental safe products which are costly. Also if the green products have high prices then again it will lose its market acceptability. Therefore companies should make long run policies for Environment sustainability.

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