

The Influence of Green Marketing Mix on Purchase Intention: The Mediation Role of Environmental Knowledge

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Abstract—Green marketing is a tool used by many companies in various industries to encourage for purchase products. Quite a number of studies discussed the green market and its association with the behavior of consumer over the years; however one can find a few studies on the association in between green marketing mix and purchase intention in Sudan. The main intention of the current study is to investigating the impact of green marketing mix elements (product, pricing, distribution and promotion) in Sudan on purchase intention, also test environmental knowledge as moderator, the design of this research is descriptive and quantitative in nature. The sample was drawn from the population of MBA students of Sudanese Universities. For the empirical analysis, 417 questionnaires were distributed whereas only 341 questionnaires were returned. Multiple regressions revealed that there is significant effects of green marketing mix elements on the consumer's purchase intention. While the environmental knowledge moderate the relation between green marketing mix and purchase intention. However, the results of the present study are based on the pilot study and they are primary in their nature. Future research can investigate relationships identified in this work, as well as tease out mediating relationships.

Index Terms—Green Marketing Mix, Purchase Intention, Theory of Planned Behavior, Environmental Knowledge

1 INTRODUCTION

IN this era of advanced and knowledge based technology, consumer's awareness about the environment has considerably increased all over the world. Issues related to environment and its harmful impact such as global warming, pollutions, non-biodegradable solid waste have become global issues [1]. In resultant, both firms and consumers are becoming more and more sensitive to the need for switch to green products and services. It is extensively believed and observed that the shift to "green" may appear to be costly in the short term; it definitely proves to be an essential and advantageous, cost-wise too, in the long run [2]. Environmental issues and its bad impact on the human being attracted the policy makers, academicians and researchers. Most of the international organizations and NGOs are discussing this issue on the different platforms. However, still they are not able to reach any solid conclusion. Especially air pollution, conservatory effects and ecological unbalances, are the main environmental issues which are facing by the human being [3]. Unfortunately, on the other side, green marketing is the most neglected area and could not be able to attract the academicians. So one cannot see many significant contributions in this area. In fact this is the major issue which one can easily observe in the field of green marketing [4]. It is worthwhile to note that most of the studies conducted on the green marketing discussed with ref-

erence to the developed world, mainly focused on the US market, however most of the underdeveloped countries are barren in this respect. This is of particular concern; specific developed country - specific orientation can have significant influence on the behavioral disposition of consumers of those countries [5]. However the main objective of the current study is to estimate the influence of applying green marketing mix elements (product, pricing, distribution and promotion) on purchase intention in Sudan. And also environmental knowledge as moderator between the relationship green marketing mix and purchase intention.

2 GREEN MARKETING AND PURCHASE INTENTION: A LITERATURE SURVEY

In this section an effort will be made to review the different studies related to green marketing, purchase intention and we will also try to discuss the major theoretical development in this respective field.

2.1 Green Marketing Mix

Every company has its own favorite marketing mix. Some have 4P's and others have 7P's of marketing mix. The 4P's of green marketing are that of a conventional marketing but the challenge before marketers is to use 4 P's in an innovative manner.

2.1.1 Green Product

In the past decades, terminologies like green products, sustainable, environmentally friendly, pro-environmental, eco-friendly and ecological have often been used interchangeably by marketers to advise and tempt the consumers as piece of green marketing [6]. Environmentally friendly" refers to products or services that are not harmful to the outdoor environment. However, for more than a decade, the U.S. Federal

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Trade Commission (FTC) has issued warnings about products or services marketed as environmentally friendly, environmentally safe [7]. A green product is defined as "a product that was manufactured using toxic-free ingredients and environmentally-friendly measures, and which is certified as such by an acknowledged organization" [8].

Product is the center of green marketing mix and the most essential part whole green marketing strategy [9]. In the world of business, the terms "green product" and "environmental product" are generally used for those efforts which protect or boost the natural environment by conserving energy and/or resources and reducing or eliminating use of noxious agents, pollution, and waste [10].

2.1.2 Green Price

The price which consumer pays is actually the cost of a product. It is a critical element of the marketing mix. The majority of consumers will only be ready to pay a premium if there is a perception on additional product value [11]. This value may be enhanced performance, function, design, visual appeal, or taste [3]. Green marketing should get all these facts into consideration though charging a premium price [12]. The price of green product should be affordable for the customer which encourage them to purchase [13]. However, it is assumed that initially the cost and price of the green products will be higher but in the long-run it will be less due to learning by doing, incremental change in the knowledge and the advance and cheap technology [9]. Green pricing considers people, planet and profit. In that way it looking after the health of employees, communities and ensures efficient productivity. Value can be added to it by changing its emergence, functionality and through customization, etc. [2,14]. However, in some cases it is higher than the prices of the normal alternatives [15].

2.1.3 Green Place

Green place is about managing logistics to minimize the transportation emissions, thereby in effect aiming at reducing the carbon footprint and in general environmental pollution [14], is related to distribution gates use that deal with green products, which are suitable for customers, in terms of facilitating their delivery, and to secure cycling procedures conducting inside environmental conditions, standards and requirements [16]. It is worthwhile to note that place is not a cost generator factor, it has numerous features that can create revenues and certain outcomes. This element of the marketing mix is dealt "how-to-handle-distance" [17]. The choice of where and when to make a product obtainable by an organization, will have significant impact on the customers. Very few customers will go out of their way to buy green products [3] merely for the sake of it. Green distribution is a very delicate operation. Customers must be guaranteed of the 'Ecological nature' of the product [13]. Few interested customers will go out of their way to buy green products [18].

2.1.4 Green Promotion

This refers to providing genuine information about the products in a way that does not harm the materialistic and moral consumers' interests [16]. Green advertising as promotional messages is a significant promotional tool that may appeal to

the real demand of environmentally concerned consumers [19]. The objective of green advertisements is to influence consumers' purchase behavior by encouraging them to buy products that do not pollute the environment and to direct their interest to the positive consequences of their purchase behavior, for themselves as well as the environment [20]. The above is some sort of marketing communication which is defined as a cross-functional activity [21]. Engaging in green promotion, may impact the likelihood that companies' claims are precisely monitored [22].

Green advertising defined by Zinkhan and Carlson [23] cited by [24] as "*the appeals that try to fulfill consumers' needs, aspiration regarding to environmental concern and health issues from different perspectives including ecology, sustainability, and pollution-free messages*" [25]. Green promotion involves communicating information on the environmental commitments and the efforts made by companies to consumers [9,18].

2.2 Purchase Intention

Quite a number of studies have tried to find the association between the academic theories (models) and empirical trends in the customer purchasing intention field because the customers' purchase intention is performed the final consequence beyond perspective, Chen [26], indicated that there existed a significance relationship between environmental knowledge, attitudes, environmental concern and social influence and green purchase intention. Purchase intention refers to the attempt to purchase a product or service. [27]. Intention is a specificity to act in an assured way [28].

Wang [29] shows that unlike collectivism values, environmental visibility, and subjective norms, which exert a positive effect on green product purchase intentions, the external locus of control exerts a negative effect. The results of this study also show the dominant effect that collectivism values exert on green purchase intentions.

According to Arslan and Zaman [30], purchase intention can be defined as "*a possibility that a consumer will intend to purchase a product or service in future*". A positive purchase intention drives to consumer for actual purchase action or a negative purchase intention restrains to consumer not to purchase. There is a consensus among the experts that studies can also use purchase intention as an important indicator for estimating consumer behavior [31]. It is also observed that the cost of retaining a recent customer is economical than prospecting for a new customer [32]. Purchase intention for green environment products is conceptualized as "*the probability and willingness to prefer to purchase the product which has features of having eco-friendly features*" [33].

2.3 Theory of Planned Behavior and Green Marketing

The Theory of Planned Behavior (TPB) has been validated in the context of pro-environmental behavior. The TPB proposes that one's intention to perform a behavior is predicted by attitudes, subjective norms, and perceived behavioral control. According to the theory of planned behavior, perceived behavioral control, together with behavioral intention, can be used directly to predict behavioral achievement [34]. With the passage of time, a number of theories are emerged in the field of economics, psychology, sociology and business which ex-

plained the consumer's behavior [35].

2.4 Green Marketing Mix and Purchase Intention

There are few studies discussed the green marketing mix, for example, Hashem and Al-Rifai [16], estimated the effect of green marketing mix in three Arab chemical industries companies in West Asia on consumer's mental image and Rakhsha and Majidazar [36] evaluated the effectiveness of green marketing mix on consumer satisfaction and loyalty.

Ansar [37] developed a framework to examine the impact of green marketing on consumer purchase intention (socio-demographic variables, price, environmental advertisement and ecological packaging) with green purchase intention. The study shows a positive significant association with green purchase intention. Maletic et al. [38] found a positive purchase intention on buying an environmentally friendly product in spite of a higher price. f Ali et al. [39] conclude that a person with positive intentions to buy green product attain higher actual buying rates than others who have low or no intention of buying green products. Also competitive price and quality of a green product have positive impact on customers GPB, if customers have high and positive intention to purchase them.

Wanninayake and Randiwela [40], explain that, there is a relationship among the elements of the marketing mix, i.e. product, package, price, place and promotion and also how each of those variables correlates to the purchase decision. On contrary to the above, Tias [41], suggests there is no significant relationship between green advertising and green product to purchasing decision. Schiffman and Kanuk [42] claimed consumer behavior is what displayed by consumers in searching for, purchasing, using, evaluating, and disposing products and services that they expect will satisfy their needs. The activities that people take and decisions they make to consume certain products, or services, or to have a different ways to live rather than others, all affect the environment in direct and indirect ways [43].

Bukhari [12] argued that companies need to increase their communication with the customers ongoing green, and that attributes like price and quality are more important than "environmental responsibility". In addition Solaiman et al. [44] indicated that organizations must ensure that green marketing activities are assimilated holistically, especially if they are used in positioning or promotional activities.

Furthermore, Peng and Chen [45], found diners' product knowledge can moderate the relationships between restaurant stimuli and diners' emotion. Grewal et al. [46] regard the consumer product knowledge may moderate the effects of price, brand name and store name on consumer internal reference price, product evaluations and purchase intention.

In addition a number of studies found significant relation-

ship between environmental knowledge and purchase intention such as, Chen [26], Aman et al. [47], Mei et al. [48], Mostafa [49]. On the other hand, several studies found significant relationship between green marketing and purchase intention such as Wanninayake and Randiwela [40], Tias [41], Juwaheer et al. [50], Solaiman et al. [44] On the basis of available literature we develop the following hypotheses for our empirical estimating :

H1: There is appositve significant relationship between green marketing mix and purchase intention.

H2: Green marketing mix positively affects purchase intention moderated by the effect of environmental knowledge

3 METHODOLOGY

3.1 Sample and Data Collection

It is appropriate for the current study since intentions are subjective to individual needs and attitude. The nature of the current research is quantitative and examines the impact of independent variables, i.e. Green Product, Green Price, Green Place And Green Promotion on Purchase Intention.

A total of 417 questionnaires were distributed among the respondents and 341 submitted their response. The overall response rate was 82%. So a sample of 341 questionnaires was used for the purpose of analysis. The unit of the analysis was a student of MBA at Universities in Sudan. A structured questionnaire was developed for the data collection. A questionnaire is a pre-formulated written set of questions to which respondent's record their answers. The sampling method was a random sampling. Table 1 presents a summary of the response rate.

3.2 Measurement

The current study used multiple indicators to measure each of the components of green marketing mix. Because it is impossible for a single indicator alone will capture the domain of a given green marketing mix dimension in a proper way [51]. As Campbell and Fiske [52] suggested that using of multiple indicators also allows examining discriminate validity of the various concept dimensions.

The questionnaire has four sections. First section collected the demographic information. The second section measured the green marketing mix by using the 19-item scale following the methodology developed by Hashem and Al-Rifai [16], which measured the dimensions of the green marketing. The third section have five statements which represent the realization of the consumer's purchase intention following the method of Rezai et al. [53] and Chiu et al. [54]. Whereas

TABLE 1
FACTOR ANALYSIS

Items No	F1	F2	F3	F4
Green promotion:				
The company(x) devotes a special day for the environment.	.795	.241	.112	.175
The company(x) support holding. Seminars and conferences related to the environment.	.780	.206	.113	.180
Employees of the company(x) direct the customers to hour they can use the products in a way does not harm the environment.	.651	.175	.252	.215
Company (x) Contribute in supporting the environmental centers.	.609	.315	.324	.098
Green place				
Products that are friendly to the environment are sold at distinguished agents.	.096	.753	.093	.282
The company(x) make delivery is easy.	.237	.740	.229	.105
The company(x) is keen to deal with agents friendly to the environment.	.352	.716	.183	.131
The store in company(x) is clean.	.282	.696	.285	.159
Green product:				
The Company(x) concentrates on Producing the food products carry the Least percentage of the adverse reflections on the human beings.	.096	.163	.852	.119
The company(x) contributes, in producing food products with less pollution.	.061	.283	.719	.125
There effective control on the food Product that are Produced by the company(x).	.335	.185	.638	.092
Company (x) makes products free of strong toxicity materials.	.394	.060	.619	.179
Green price:				
It is noted that the company(x) raises the prices of its food products which have harmful negative usage that happens as a result of misuse.	.245	.098	.092	.753
High price of green foods sometimes stop me from purchasing them.	.065	.306	-.051	.737
Price gap between the green foods and conventional foods is huge	.102	.060	.252	.725
Price of the food Products Proportionate with their quality.	.298	.208	.289	.567
Purchase intention:				
For future purchases, I plan to seek out environmental products.				.560
For future purchases, I will take more time to search environmentally friendly alternatives to products that I typically buy.				.569
I plan to spend time searching company websites to learn more about environmentally friendly options.				.703
For future purchases, I will take more time to search environmentally friendly alternatives to products that I typically buy.				.639
I plan to continue to purchase friendly products in the future.				.585
Environmental knowledge:				
I know that I buy products that are environmentally safe.				.838
I am very knowledgeable about environmental issues.				.784
I know a lot of information about friendly products.				.773

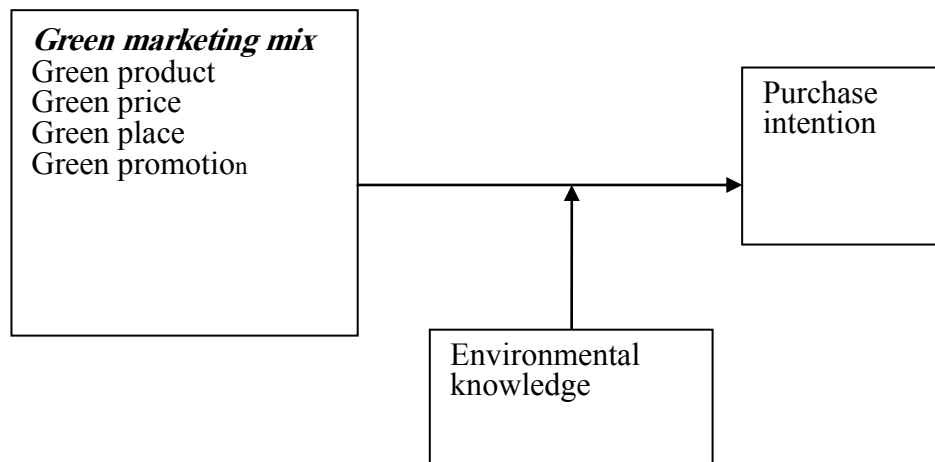


Fig. 1. Proposed conceptual framework of the study.

fourth section have four statements measured the environmental knowledge which are taken from the questionnaire developed by Mostafa [49]. A five-point Likert scale was used.

3.3 Respondents Demographic Characteristics

The respondents those are less than 30 years were 46.6%, between 30 -40 years were 34.0%, . between 40 -50 years were 9.4% and between 50- 60 years were 1.2%. ' According to the classification of the respondents' monthly income by Sudanese Pound, between 500-1000 were 19.1%, between 1001-2000 were 46.0%, between 2001-4000 were 11.1%, between 4001-6000 were 6.7%, and respondents without any income were 16.1%. The percentage of respondents from the public university was 54% whereas from the private university was 46%.

3.4 Goodness of Measures

Validity and reliability tests as means to assess the goodness of measure of study construct [55]. The current study used exploratory factor analysis for testing the validity and unidimensionality of measures of all under study variables. Factor analysis was applied on the 19 items, which was used to measure green marketing mix, and 5 items, which was used to measure purchase intention and 4 items, which was used to measure environmental knowledge. Table 1 depicted the summary of results of factor analysis on green marketing, purchase intention, and environmental knowledge. In the first run of factor analysis, dropped items (mix6 = .396) were found to have communalities less than 0.50. In the second run of factor analysis, item (mix2 = .480) still had communalities value less than 0.50, and was dropped in the next run. In the third run Item (mix13) was dropped in the subsequent run, all assump-

tions were satisfactory fulfilled. All the remaining items had more than recommended value of at least 0.50 in IM with KMO value of 0.903. Results of factor analysis on purchase intention in the first run of factor analysis, all the remaining items had more than recommended value of at least 0.50 in OC with KMO value of 0.805. Results of factor analysis on environmental knowledge in the first run of factor analysis, item (en3= 390) still had communalities value less than 0.50, and was dropped in the next run. In the second run of factor analysis all the remaining items had more than recommended value of at least 0.50 in OC with KMO value of 0.890.

3.5 Reliability Analysis, Correlation Analysis, Descriptive Analysis of Green Marketing Mix Variables and Purchase Intention Variable

Reliability is an assessment of the degree of consistency between multiple measurements of variables [56]. To test reliability we used Cronbach's alpha as a diagnostic measure, which assesses the consistency of entire scale, since being the most widely used measure [3]. According to Hair et al. [56], the lower limit for Cronbach's alpha is 0.70, although it may decrease to 0.60 in exploratory research. The results of the reliability analysis summarized in Table 2 confirmed that all the scales displayed satisfactory level of reliability (Cronbach's alpha exceed the minimum value of 0.6). Therefore, it can be concluded that the measures have acceptable level of reliability.

Table 2 shows the Correlation, reliability, and descriptive Analysis for all variables. The table reveals that the MBA students of universities in Sudan have shown their concern in green marketing mix. For the product (mean=4.227, standard

TABLE 2
CORRELATION, RELIABILITY, AND DESCRIPTIVE ANALYSIS FOR ALL VARIABLES

N		1	2	3	4	5	6	Mean	Standard Deviation	Number of items	Cronbach's alpha
1	green product	1						4.227	0.768	5	.840
2	green price	.434**	1					4.019	0.768	4	.786
3	green place	.532**	.503**	1				4.148	0.781	4	.750
4	green promotion	.564**	.507**	.612**	1			4.222	0.758	4	.830
5	purchase intention	.451**	.419**	.476**	.533**	1		4.051	0.763	4	.815
6	environmental knowledge	.298**	.235**	.256**	.395**	.468**	1	3.571	0.9395	4	.796

Note: All variables used a 5-point likert scale (1=strongly disagree, 5=strongly agree).

deviation=0.768), for green promotion (mean= 4.222, standard deviation=0.758), for green place (mean=4.14, standard deviation=0.781), for green marketing mix is green price (mean=4.01, standard deviation=0.768). Given that the scale used a 5-point scale (1=strongly disagree, 5=strongly agree) it can be concluded that the MBA students of universities in Sudan are highly shown their concern to green marketing mix. The means and standard deviations of one component of purchase intention (mean=4.051, standard deviation=0.763).

Table 2 reveals also that all the correlations are in the hypothesized positive relationship. For example the relationship between all of the four components of green marketing mix and purchase intention are positive and significantly different from zero.

3.6 Data Analysis Procedures

Multiple regression analysis was used for empirically testing the research hypotheses. This technique is appropriate when the researchers' objective is to predict the changes in dependent variables in response to changes in independent variables [56]. Table 3 shows the results of the multiple regression equation testing the influence of the green marketing mix on purchase intention. In addition the results show that the green marketing mix has a positive and significant influence on purchase intention. The results showed that the hypothesis is accepted, i.e. there is a positive relationship between green product and purchase intention ($\beta=0.196$, $p<0.01$), there is a positive relationship between green price and purchase intention ($\beta=0.119$, $p<0.05$), there is a positive relationship between green place and purchase intention ($\beta=0.183$, $p<0.01$) and there is a positive relationship between green place and purchase intention ($\beta=0.314$, $p<0.01$). These results accept the H1 and H2 (green marketing mix and repurchase intention).

4 FINDINGS

The finding of this study demonstrates that the four categories of green marketing mix namely: Green Product, Green Price, Green Place And Green Promotion have a positive and significant relationship with Purchase Intention. Which is expressed

by the MBA Students at the Sudanese Universities. Also environmental knowledge moderating the relationship between Green Marketing Mix and Purchase Intention.

5 DISCUSSION

The findings of this study demonstrate that four forms of green marketing mix namely green product, green price, green place and green promotion have a positive and significant relationship with purchase intention. The findings point out that the green marketing in business students of universities has a positive relationship with purchase intention, and this finding confirm the findings of Tias [41] which show that significant relationship between green products and green advertising with purchasing decision, and it also lined with Tang et al. [57], who shows consumer attitude positively affects purchase intention to green product. In the same context, Weinstein et al. [58] demonstrate that green price has a statistically significant positive relationship with purchase intention. Wanninayake and Randiwela [40], stated that environment friendly products and packages made the significant impact of customer buying decisions and friendly distribution, and promotion with the environment friendly product information will also significantly impact on the buying decisions in selecting products of foods. Ansar [37], argued that environmental advertisements, price and ecological packaging positively related with the Green purchase intention. The results confirm the significant positive impact of green marketing mix on purchase intention. In addition the findings of this study found environmental knowledge moderating the relationship between green marketing mix and purchase intention. This result consisted with Peng and Chen [45], found diners' product knowledge may moderate the relationships between restaurant stimuli and diners' emotion.

6 IMPLICATION TO RESEARCH AND PRACTICE

The current paper investigated the relationship between green marketing mix and the purchase intention. This can contribute to a better understanding of the antecedents of the purchase

TABLE 3

MULTIPLE REGRESSION RESULT: GREEN MARKETING MIX VARIABLES, AND PURCHASE INTENTION (BETA COEFFICIENT)

Variables	Purchase intention
Green product	.196***
Green price	.119**
Green place	.183***
Green promotion	.314***
R²	.445
Adjusted R²	.439
Δ R²	.445
F change	65.627***

Note: Level of significant: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 4

MODERATING EFFECT OF ENVIRONMENTAL KNOWLEDGE ON THE RELATIONSHIPS BETWEEN GREEN MARKETING MIX AND PURCHASE INTENTION

	Step 1 Std. Beta	Step 2 Std. Beta	Step 3 Std. Beta
<u>Predictor variables:</u>			
Green product	.215***	.185***	-.016
Green price	.119**	.102**	.637***
Green place	.163***	.171***	.704***
Green promotion	.326***	.224***	-.142
<u>Moderating variable:</u> Environmental knowledge	-	.299***	1.156***
<u>Interaction terms:</u>			
Know*product	.302		
Know*price	-1.057***		
Know*place	.302***		
Know*promotion	-1.057		
F value	68.826***	68.826***	68.826***
R2	.459	.459	.459
Adjusted R2	.452	.452	.452
R2 change	.459	.459	.459
F change	68.826***	68.826***	68.826***

Note: Level of significant: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

intention. This study further will add to the theory of planned behavior view by specifying which of attitudes are more influential in creating the customer purchase intention. Moreover, the research is among pioneer studies that validates the measurement of green marketing mix (4P's) with purchase intention. In addition, this paper will provide better understanding about considering the role of green marketing mix and identify the main constructs it that will effect on consumer purchase intention and to encourage the marketing managers

to use the more effective construct in enhancing the relationship with customers.

7 CONCLUSION AND LIMITATION

There are many limitations that must be taken into account in this study. First, the study focuses only on green marketing and purchase intention. Second this also focuses only on four dimensions of green marketing mix (green product, green

price, green place and green promotion), future research can adopt more and different dimension such as, 7P's.

In green marketing, consumers are willing to pay more to maintain a cleaner and greener environment. Green marketing assumes even more importance and relevance in developing countries like Sudan. In future only those companies will reap the greatest reward that innovates with new products, materials, technologies which are eco-centric and address the challenge by walking their talk.

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