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Consumer Expenditure Pattern Study on Environmental Goods

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ABSTRACT: The society, its people and health of environment are interconnected. The consuming pattern, the way a consumer makes a particular decision while making a purchase has a definite impact on the environmental well-being. The research work on environmental issues is being carried from different perspectives and is spread world-wide. The increase in family/individual income has led to hike in family/individual expenditure also. In order to lead a comfortable life, many individuals got prompted towards market products in various manners. Health of the environment is directly affected by the buying behaviour of the individuals and therefore, may be considered a big determinant of environmental health. In this paper, the consumers' expenditure pattern on environmental goods is studied to see the influence of various demographic factors. The expenditure pattern on environmental goods has been found to change with age, education level, stream of education and also on family size and number of earning members in a family. Males and females are found equally concerned when there is a choice to incur expenditure on environmental goods. Similarly the expenditure pattern on environmental goods is found independent of place of residence.

Keywords: Consumer environmental responsibility, Environmental goods and bads, expenditure pattern, willingness to spend, Grey zone, Remedial action

I. INTRODUCTION

Any part of natural environment can be used to promote welfare of living being-including plants, animals and human being. The environmental components such as air, soil/land, water, wildlife, forests etc. in that state which promote healthy mutual co-existence and welfare of all living being define environmental goods. Consumer Environmental Responsibility is formally defined as "a state in which a person expresses an intention to take action toward remediation of environmental problems, acting not as an individual consumer with his/her own economic interests, but through a citizen consumer concept of societal-environmental well-being. Further this remedial action will be characterized by awareness of environmental problems, knowledge of remedial alternatives best suited for alleviation of the problem, skill in pursuing his or her own chosen action, and possession of a genuine desire to act after having his/her own locus of control and determining that these remedial actions can be meaningful in alleviation of the problem" [1]. The imbalance between the individual and the environment always led to promulgation of disease [2]. It occurs on a continuous range from a 'state of health' to a 'state of disease' and between these two states is the grey zone of sub-optimal health, which is a 'state of imbalance'. The grey zone is a very critical zone because a person not diagnosed for any disease still, may not be healthy [2]. One-cause-one-effect relationship is seldom manifested in case of disease; rather the emergence of disease depends on several factors, like lifestyle, local customs, physical environment, biological environment, and level of industrialization. The awareness of people is increasing day by day and now they come to know that the water, the air or the soil they consume to drink, to breathe, or to grow crops respectively and further, the rocks on which they raise buildings to live and to work for their livelihood may affect the chances of getting serious environmental health complications and diseases. It is a common perception among many people that in the state of their natural occurrence, the air, the water and the soil ought to be in good health and therefore they constitute an environmental good but the human activities might transform to make them polluted, contaminated and therefore become an environmental bad [2]. We must learn how to sustain living beings on our planet in the wake of such environmental issues.

The various aspects of the environment carry a value tag based on eight justifications: utilitarian or materialistic, ecological, aesthetic, recreational, inspirational, creative, moral, and cultural. Environmental ethics is a new discipline which teaches environmental values mainly to make us accountable to

our generations to come. It reminds us of our moral obligations to leave a healthy environment for them [3].

The consumer preference for goods, both for market goods and environmental goods is the backbone of any economic phenomenon. The demand for goods decreases/increases with the increase/decrease in price. Air quality and water quality are viewed as environmental goods while air pollution, water pollution, beautiful land and ocean vista or smoggy vista over a city are viewed as environmental commodities. Although it is difficult to bring all aspects of the environment about which a consumer may express his/her concerns and preferences comprehensively under the preview of the paradigm of an economic theory, but we could investigate about the quantity of money which a consumer would be willing to spare for particular levels of an environmental good. It is also equally pertinent to know as to how many people are there who would be there to protect environmental goods. Although, it is difficult to estimate the true value of demand for such goods and services, it does not diminish the validity of the principle of demand for environmental goods and services.

There are two approaches for measurement of consumers' demand for environmental goods.: Hedonic Approach and Household Production Approach. In Hedonic Approach, an attempt is made to know the amount of changes in the price of conventional goods (e.g. house) due to change in environmental good (e.g. air quality). From this value of environmental good to the individual is inferred. In Household Production Approach, it is assumed that the consumer will combine private goods with environmental goods to produce another good, which is the real source of utility. For example, to keep the indoor noise to a tolerable limit, when or where it matters, and one can apply sound proofing, which is a private good, to avoid sound pollution. The amount spent on sound proofing i.e. a private good is just to avoid pollution and so can be used to know the value of environmental good or bad. So the subjects of the sample would be delivered questionnaire to get information about the money spent by them or their families on environmental goods.

To peep into the mindset of the population, there is always a need to study their responsibility aspect for environmental health for the constructive growth of their society. The underlying research study reported in this paper is a small step in this direction.

II. LITERATURE SURVEY

Udo Ebert (2003) in his paper "Environmental Goods and the Distribution of Income" presented a theoretical investigation of distribution impacts of environmental commodities. This paper introduces a proper framework from defining concepts related to measuring benefits to examining the determinants of benefit incidence. The core of the paper is concerned with a discussion about the income elasticity of the 'marginal willingness to pay' when there is one environmental good [4].

Himayatullah Khan (2009) in his paper "Willingness to pay and demand elasticities for two national parks: Empirical evidence from two surveys in Pakistan" estimated the income and price elasticities of demand for 'improved environmental quality' of two national parks in northern Pakistan. Environmental improvements reported more beneficial to low-income groups in comparison to high-income groups in the paper [5].

Brännlund and Ghalwash (2008) in their paper on "The income-pollution relationship and the role of income distribution: An analysis of Swedish household data" analyzed the relationship between household income and pollution. They formulated a model with which the choice of consumption of goods was determined in different types of households. They further linked their demand model with emission functions of various goods. They showed that with change in income distribution from uneven to equalization of income led to increase in emissions even though average income level was kept constant [6].

By comparative static analysis, Matthew J. Kotchen (2009) in his paper on "Voluntary Provision of Public Goods for Bads: A Theory of Environmental Offsets", demonstrated how the level of social welfare and of public good depend on the technology, individual wealth, and an initial level of the public good [7].

According to the results of Cone Consumer Environmental Survey of year 2009 published in year 2012 in the book Green Libraries, America's 34 percent consumers indicated that they were more likely to buy environment friendly products, and another 44 percent indicated their environmental shopping habits had not changed as a result of the economy and around 8 percent said they were less likely to buy such products [8].

Philippe Martin (2010) in his paper on 'Consumer attitudes and perceptions on sustainability' held that for the consumers who are willing to be environmentally responsible in their purchases suffer from lack of universal guidance and also from the benchmarks necessary for comparing environmental impact of products and services [9].

Chen and Chai (2010) in their paper entitled "Attitude towards the environment and the green products: consumers' perspective" reported that the concept of global warming has lead people to develop interest towards ecological development and reinforced interest towards the environmental issues [10].

Sachdev (2011), in his paper "Eco-friendly products and consumer perception" reported that rising social concerns for the atmosphere compelled more number of businesses to consider green matters as a chief source of strategic revolution [11].

Upadhyaya and Shukla (2011) through their work reported in "Environmental concerns and influences on green consumers: an empirical study" underlined the fact that in order to devise strategies and policies to meet the green consumers' needs, wants and demands, eco-friendly behavior must be inculcated understood clearly [12].

Joshi and Mishra (2011) aimed their study to understand their awareness on environment friendly car (EFC) in Maharashtra (India). They stressed the need to create more awareness about EFC in non metros. They stressed that both marketer and the government should create the desired knowledge to make people aware about environmental problems those arise just because of cars in use [13]. In similar research area, the buying behaviour of customers towards small car segment in

Haryana has been studied by Warne and Rani (2014) [14].

Singh, (2011) highlighted the emerging awareness of elderly consumers about green products. This study was presented in "The 2011 Barcelona European Academic Conference Barcelona". This emerging awareness of elderly consumers has been found reflected in their purchasing patterns [15].

Valaškova and Klieštik (2015) found demographic, responsibility, information and purchasing as the factors needed to understand consumer behavior. In their study they reported that even any recession could not bring any diversion in consumers' positive attitude towards green products [16].

Paco and Raposo (2009) in their study identified the characteristics of green consumers like that of environmental knowledge and concern. The factors considered are environmentally friendly products, environmental activism, environmental knowledge, environmental knowledge and activism, environment-friendly products, recycling, perception, resource saving, distrust towards environmental standards [17].

Cheah and Phau (2011) studied consumers' attitude towards environment friendly products influenced by eco-literacy, orientation programs for consumers about environment friendly products. A strong correlation of these factors with attitudes of consumers has been reported in their study [18].

Manaktola and Jauhari (2007) reported that consumers mostly desire for green practices to be followed in hotels, but without their will to pay more for the introduction of these green practices [19].

Rahbar and Wahid (2011) studied the effect of green marketing tools on the purchase behavior of consumers. They reported that consumer behaviour towards eco-friendly products depends upon their level of their trust in eco-label and eco-brand of products and also on environmental advertisements [20].

It is reported that the psychographic variables in comparison with demographic variables are more effective in explaining the ecological consciousness of consumer behaviour because green purchase behaviour may not be the cause of green purchase intention of the consumer. (Akehurst *et al.,* 2012) [21].

Raksha and Shaw (2012) studied the influence of consumers' brand commitment with their perspective towards the organization taking pro-environmental initiatives. They advised that to catch more attention of consumers, companies should arrange more such activities [22].

After perceiving functional risk as an important determinant, the consumers were found with more willingness to pay more for green products (Essoussi and Linton, 2010) [23].

According to Straughan and Roberts (1999) worked on the demographical and psychological variables that can be used to understand the environment conscious consumer behavior. They reported that psychographic variables are much comfortable to explain the green consumer behavior than demographic variables [24].

Kishore Kumar and Anand (2013) in their research in a "Study on Consumer Behavior towards Eco-Friendly Paper" reported that the purchase intentions are positively influenced towards eco-friendly paper by attitude and personal norms of consumers [25]. Ali and Adil (2014) undertook study on Green Consumer Behavior in India to determine its predictors [26].

III. PROBLEM FORMULATION

From the literature survey, it can be seen that research work is being carried out on the subject of environmental issues world-wide. In addition to the geographical location, the consumerism is the main determinant to the environmental health of an area or the region. The degradation of environment components has been a topic of research for the last decade in our country and abroad [27-31]. It may also be seen that not much research work in the related field of environmental health is done in our region (Punjab) by putting the 'value system' of the consumer at a test. For the last 10-15 years, the state of physical health of people of Punjab is reported to have been crippled by fatal diseases like cancer and hepatitis. The plausible reason behind this aspect is the pollution manifested as air, water, soil and noise pollution which is not uncommon in other countries too [31]. The environmental degradation can be handled by exploring the environmental sensitivity. One mode of testing the environmental sensitivity of the population is by studying the consumer behavior with respect to their priority for environmental goods whenever they owe to acquire any market good and how they prioritize to think to make expenditure on environmental goods. So in this context, the knowledge supplement from the research undertaken in the present study would be of much importance to the society, environmental policy makers and potential new business.

IV. OBJECTIVES AND RESEARCH METHODOLOGY

Specifically the objective of the present study is to study the expenditure patterns of consumers in Punjab on environmental goods. As a matter of convenient sampling the proposed research under the said area, the sample was taken from college going students, faculty and staff in the state of Punjab. At the first stage, multistage sampling design method has been used for selection of the sample representing target population of the state.

The target population selected from adult residents of Punjab. With 5% Margin of Error and sticking to 95% Confidence Interval, a sample size of around 400 is taken. Assuming the response rate of 50%, the questionnaire entrusted to 800 respondents from different districts (Amritsar, Barnala, Bathinda, Faridkot, Fatehgarh Sahib, Fazilka, Ferozpur, Gurdaspur, Hoshiarpur, Jalandhar, Kapurthala, Ludhiana, Mansa, Moga, Mohali, Mukatsar, Patiala, Pathankot, Ropar, Sangrur, Nawan Shahr and Tarntaran) in the state. The elements of the sample are the young college going students, faculty and staff members chosen by multistage sampling design followed by convenient and random sampling. The choice of respondents only from colleges is guided by convenient sampling. 'The proportion of the respondents in the sample' represents their respective districts' proportional population in total population of Punjab. The census data of the year 2011 is taken as reference for sample size calculation [32].

To meet the set objectives, the Ecoscale: A Scale for the measurement of Environmentally Responsible Consumers has been put into use. All the items are in

this scale are scored on 5-point scales ranging from strongly disagree to strongly agree or ranging from never to always. This scale was originally developed by Stone *et al.,* [1].

The members of the sample were motivated to respond in an impartial and unbiased manner to all the items of the questionnaire as per the 5-point scale arrangement. To study the consumer's expenditure patterns on environmental goods, the sample was examined for measurement of demand for environmental goods.

The entire data was analyzed based on the demographic profile of the consumers using T-test and ANOVA and calculation of means and standard deviations. Then interpretations are made accordingly.

V. SCOPE

The scope of the present study is limited to the State of Punjab (India). Various demographic factors of the target population are taken into consideration to study the consumer expenditure patterns on environmental goods

VI. RESEARCH HYPOTHESES

The following hypothesis is set in the underlying study.

H1: There exist significant differences on consumers' expenditure patterns on environment and environmental goods

VII. RESULTS AND ANALYSIS

The respondents' demographic profile (Table 1) shows that participation of males in this survey based study is more than females; two-third (66.13%) of the respondents are males. Age group profile shows that most of them belong to 36-45yr age (38.71%) group while place of residence profile shows that more than half of them (56.45%) are from urban background. From the education level profile, it can be seen that most of the respondent (69.35%) possess PG/Ph.D. level of academic education and out of them maximum (35.48%) are from the engineering background. The occupation profile tells that a majority (59.69%) of the respondents are working in the government sector. It is to be further noted that most (32.23%) of the respondents have their family sizes of four members. The families with three earning members have maximum (53.23%) representation in this research survey, and most (37.10%) of the respondents have their average monthly income more than one lakh. The mean of scores and standard deviation values with reference to respondents' expenditure patterns as consumers to be incurred on the environment and environmental goods are also incorporated in Table 1. The low SD values throughout the entire demographic profile line suggests that the respondents might have converging ideas vis-à-vis their expenditure pattern on the environment and environmental goods are concerned.

The data analysis is carried by employing T-test on Gender and by analysis of variance (ANOVA) on the rest of demographic factors. The t-value and F-values are given in Table 2.

Table 1 (Source SPSS output).**

Respondents' Demographic Profile and Mean of scores and SD of Expenditure Pattern.

Demographic		No. of Respondents		Mean of scores and SD of Consumer Expenditure Pattern	
		Frequency	Percentage	Mean (**)	SD (**)
Gender	Male	328	66.13	51.29	9.28
	Female	168	33.87	51.76	10.76
	Total	496	100	-	-
Age Group (in years)	18-25	104	20.96	48.31	11.30
	26-35	112	22.59	54.71	8.94
	36-45	192	38.71	53.92	7.39
	46-55	80	16.13	46.60	10.00
	56 yrs and above	8	1.61	36.00	.000
	Total	496	100	51.45	9.80
Place of Residence	Rural	112	22.58	51.71	10.64
	Urban	280	56.45	50.88	10.11
	Rural as well as Urban	104	20.97	52.69	7.78
	Total	496	100	51.45	9.80
Education Level	Matriculation	8	1.61	36.00	.000
	12th Standard	40	8.07	45.40	8.37
	Graduation	104	20.97	53.23	9.26
	PG/PhD	344	69.35	51.97	9.68
	Total	496	100	51.45	9.80
Education Stream	Arts	72	14.52	47.44	9.08
	Science	160	32.26	48.75	10.17
	Engineering	176	35.48	54.50	9.40
	Management/Commerce	56	11.29	56.00	6.78
	Law	32	6.45	49.25	7.98
	Total	496	100	51.45	9.80
Occupation	Agriculturalist	16	3.22	53.00	4.13
	Own Business	8	1.61	65.00	.00000
	Government Sector	296	59.69	52.24	9.17
	Public/ Private Sector	96	19.35	50.42	11.99
	Unemployed/ Student	64	12.90	47.87	7.35

	Labourer	16	3.23	49.00	13.43
	Total	496	100	51.45	9.80
Family Size	02	8	1.61	52.6923	5.30813
	03	88	17.75	51.7576	10.20856
	04	160	32.26	52.1667	11.86329
	05	96	19.35	50.2500	12.47566
	06	104	20.97	48.8462	10.85005
	07	40	8.06	60.2000	11.04583
	Total	496	100	51.4516	9.80237
Earning Members	02	104	20.97	52.6923	5.30813
	03	264	53.23	51.7576	10.20856
	04	48	9.68	52.1667	11.86329
	05	64	12.90	46.1250	10.63612
	06	8	1.61	65.0000	.00000
	07	8	1.61	50.0000	.00000
	Total	496	100	51.4516	9.80237
Average Monthly Income	<10,000	8	1.612	49.0000	.00000
	10,000-25, 000	48	9.68	51.1667	11.36500
	25,100-50,000	80	16.12	51.8000	9.75445
	50,100-75,000	88	17.75	50.7273	7.77962
	75,100-100,000	80	16.13	51.8000	13.01061
	>100,000	184	37.10	52.0870	8.88008
	Total	496	100	51.4516	9.80237

Table 2 (Source SPSS output)**
T-Test/ANOVA Test.
For differentiation of Consumer Expenditure Pattern within Each Demographic Group.

Demographic	**t-value (**)**	**F-value (**)**
Gender	0.504	-
Age Group	-	21.83*
Place of Residence	-	1.34
Education Level	-	14.24*
Education Stream	-	15.31*
Occupation	-	5.921*
Family Size	-	10.009*
Earning Members	-	7.810*
Average Monthly Income	-	1.584

(*p<0.01)

The following observation can be easily made from t-value and F-values to see within each demographic group as to whether there exist (or not) any significant differences on consumers' expenditure patterns on environment and environmental goods:

The Table 2 shows that there are no significant differences on consumers' expenditure patterns on environment and environmental goods among male and female consumers, with t-value 0.504, which is not significant even at 0.05 level.

The F-value 21.83 for the main effect of age on consumers' expenditure patterns is significant at 0.01 level which indicates that there are significant age wise differences in consumers expenditure patterns on environment and environmental goods.

The F-value 1.34 for the main effect of place of residence in not significant even at 0.05 level which indicates that there are no significant Place-of-Residence wise differences in said expenditure Patterns of consumers.

Table 2 shows that the F-value for the main effect of educational level on consumers' expenditure patterns came out to be 14.24, which is significant at 0.01 level. It indicates that there are significant differences in consumers' expenditure pattern and level of their education.

F-value 15.31 for the main effect of the education stream on consumers' expenditure pattern is significant at 0.01 level which indicates that there are significant education stream-wise differences in consumers' expenditure patterns.

The F-values for the main effect of Occupation, Family Size and Total Earning Members are 5.921, 10.009 and 7.810 which are significant at 0.01 levels. This indicates that there are significant differences within the respective demographic groups of Occupation, Family Size and Total Earning Members with regard to their expenditure patterns. In the questionnaire, there was space kept for single member earning families but incidentally, no respondent belong to this category. So, there was no need to keep space for single member earning families in the analysis part of this study. It is of course, the limitation of this study.

The table 2 indicates that the F-value for the main effect of family income on consumers' expenditure pattern came out to be 1.58, which is not significant even at 0.05 level. It indicates that there are no significant differences within the Average Monthly Income

demographic group with regard to their expenditure patterns.

Out of the total nine demographics chosen, the differences within the respective groups (Age, Education Level, Education Stream, Occupation, Family Size and Earning Members) with regard to consumers' expenditure patterns on environment and environmental goods are significant at 0.01 level. It is found that gender, place of residence and average monthly income do not influence significantly even at 0.05 level.

VIII. CONCLUSIONS

Thus, the expenditure pattern on environmental goods change with age, with education level, significantly depends upon stream of education, on family size and also significantly depend the number of earning members in a family. Both males and females are equally concerned when there is a choice to incur expenditure on environmental goods. Similarly the expenditure pattern on environmental goods is not a function of place of residence. The research study reveals that the set hypothesis that: there exist significant differences on consumers' expenditure patterns on the environment and environmental goods, is strongly accepted.

IX. FUTURE SCOPE

The Policy makers may take into consideration the results of this study while formulating strategies to conserve the environment to make it a livable place for the society. Further, research can be made to study the willingness of the consumers to protect the environment surrounding them.

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