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RESEARCH ARTICLE

Socioeconomic Perception on Ban of Polyethylene Bags in Bhubaneswar Smart City: An Empirical Analysis

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ABSTRACT

This study unquestionably is a contemporary topic in the field of environmental economics as the objective of this study is to map the perception of consumers towards the policy undertaken by Government to ban plastic bags in Bhubaneswar smart city. This will ultimately reflect the environmental concern of citizens and consumer behavior to reject plastic bags in a smart city framework. A total of 506 respondents participated in a survey which has been conducted on a face-to-face mode. The result of this study showed that the respondents are aware about the ill effects of plastic bags but still consuming it. The key findings of this study will help making the campaign for reduction of plastic bags more effective.

INTRODUCTION

The trend for sustainability has become very common for good governance in many countries and many Governments all over the globe have tried applying sustainability as an area of strategy to build a good image among the voters. An extremely relevant example in this context is the recent ban on use of plastic bags which are generally made of polyethylene in retail business that will ensure reduction in pollution and safeguarding of natural resources. These are basically products made out of polymer and generally offered by retail outlets whether in urban or rural areas for carrying products purchased by customers (CEVKO, 2015) [1]. The existence of plastic bags has made the human life more comfortable and convenient (Zen et al. 2013) [2]. But these plastic bags which are made out of polyethylene may contaminate the food system and water by getting decomposed that can lead to dangerous hazards to human life as well as the whole ecosystem (Resetar-Deac et al. 2015) [3]. This is the reason why different national; state level and local-self-governments have banned the use of plastic bags in their territory. And for a smart city like Bhubaneswar, to achieve the goal of making an eco-city it is significantly essential to adopt this policy of banning plastic bags with outmost sincerity. This policy to be effective the behaviors of consumers which is determined by their psy9chological viewpoints play an important role. The reason behind this is that these

are the consumers only who wish to have these bags at the point of purchase so that they can carry the products they purchased comfortably. This in turn induce the retail business owners to buy plastic bags so that they can offer it to consumers at the time of sale and consequently it causes the manufacturers of these plastic bags to keep on supplying it to the retailers. The present study is an attempt to map the socioeconomic perception of citizens of Bhubaneswar smart city on ban of plastic bags through empirical evidences.

1. REVIEW OF LITERATURE

The purpose of the present study has been narrated in the previous section. A similar type of study has been undertaken in Los Angeles city that assessed the economic impact of ban of plastic bags in its territory in which it has been found that the ban on plastic bags affected mostly the retail stores in general and pharmaceutical and grocery stores in specific [4]. Switching costs, new purchases cost and sales tax are the three types of costs the people of the city required to bear after this policy. In another study in the same city, it has been discovered that the paper bags are the most relevant alternative to plastic bags but since paper bags also come in such a category which needs to be banned for protection of environment, focus should be on reusable bags. These reusable bags may be made from fabric or woven synthetic fiber [5]. In another study in the same city of Los Angeles it has been discovered that it is not about the cities like it, the use of plastic bags is promoted everywhere in the country like USA [6]. And surprisingly it is not limited to well developed geographies, even in places including South Africa the plastic bags are distributed by retail outlets along with the products purchased from them [7]. But, the use of plastic bags depends on the attitude, habits and behaviors of those people who use them as identified by a study conducted in England [8]. Environmental consciousness and social pressure are two key influencers that shape the consumer attitude and behavior towards usage of plastic bags according to a study [9]. So, the key questions here is What is the perception of population in Bhubaneswar Smart City towards consumption of polythene bags? The present study is an attempt to answer this research question.

2. Research Design

The sample of the research comprised 506 individuals who are citizens of Bhubaneswar smart city and they have been selected randomly using lottery method of simple random sampling technique. The research instrument used for measurement in the present study is a behavioral questionnaire which is a structured and quantitative piece of document. The data has been collected on a face-to-face mode. Before going to undertake the interviews, the respondents were first of all introduced to the objectives of the study and with their consent only each of the respondents were asked the questions. A screening has been done before collection of data so that only those elements from the population will be selected in the sample who are using polythene bags for carrying or storing any materials. The first section of the questionnaire comprises of questions related to demographic characteristics of the respondents. The second section is dedicated to explore the usage and attitude towards polythene bags. And finally, the third section has been made to map the perception of the sample towards ban of polythene bags. Data collected from the respondents have been analyzed through descriptive statistics and inferential statistics.

3. Key Findings

Table 4.1 shows the demographic profile of the sample and according to it there are four age groups in which the sample has been split. The least number of respondents are in the age group of 46-60 years. In the rest of the age groups almost similar number of respondents are

there. Then on the basis of gender we can see that the table shows 196 female respondents and 310 male respondents. The male respondents are more than the female respondents.

Table 4.1 Demographic Profile

Sl. No.	Age	Count	Gender	Count
1	16-25 Years	146	Male	310
2	26-35 Years	129	Female	196
3	36-45 Years	141		
4	46-60 Years	90		
Source: Primary Data				

Source: Primary data

It has been found from the study that maximum amount of people are agreeing that banning of polyethene bags in the city is a wise step as 26% somewhat agree and 36% strongly agree with this decision (Table 4.2).

Table 4.2 Agreement on the ban

Please give me your level of agreement on 'Banning of Polythene bags in your city'?	
Strongly Disagree	14%
Somewhat Disagree	16%
Do not know/Can't say	8%
Somewhat Agree	26%
Strongly Agree	36%
Source: Primary Data	

Source: Primary data

It has been discovered that a large number of respondents i.e. 72% say that the ban of polythene bags is not cost effective for them. It is shown in table 4.3.

Table 4.3 Cost-effectiveness of the ban

Is the ban of uses of polythene bag cost effective to you?	
Yes	28%
No	72%
Source: Primary Data	

Source: Primary data

Further, it has been identified even after the ban a large proportion of the sample i.e. 67% are using polythene bags even now (Table 4.4). So, even if people understand and respect the policy of banning plastic bags in the city, still in order to comfortably undertake their daily life they are not hesitant to use plastic bags.

Table 4.4 Usage of plastic bags after the ban

Are you using polythene bags after the ban?	
Yes	67%
No	33%
Source: Primary Data	

Source: Primary data

Apart from it, around 59% of the sample think that it was a right decision to ban plastic bags in Bhubaneswar smart city and only 25% of them think that it was not a right decision (Table 4.5).

Table 4.5 Right decision

Did you think it was a rightdecision?	
Yes	59%
No	25%
Undecided	16%
Source: Primary Data	

Source: Primary data

Socioeconomic Perception

Variables identified to study the socioeconomic perception of people of Bhubaneswar on Ban of Polyethylene Bags are presented in table-4.6. Independent variables identified are from V1 to V18 and the dependent variable is V19.

Table-4.6 Variables for Socioeconomic Perception

Variable Code	Socioeconomic Variable
V19 (DV)	I am aware of the negative impact of polythene bags on environment and society; hence banning the usage of polythene bags is a need.
V1	Plastic bags contribute to the landfill's growing volume of waste since they are placed into landfills where they can survive for up to 1000 years without being broken down by sunlight or microbes. (Plastic bags take much longer time to be broken down)
V2	Plastic bag waste buildup does not harm the ecosystem as it does not degrade the beauty of nature. (Does not distort ecosystem and beauty of nature)
V3	The plastic bag persists in the soil for an abnormally long time and is neither biodegradable nor nearly compostable, which causes incalculable harm to the agriculture. (Harms to agriculture)
V4	Because the plastic bags are present, the agricultural crops cannot flourish there because their roots cannot spread out. (Roots of the crops cannot spread out with the presence of plastic bags)
V5	Plastic bags have cumulative effects over time that have a negative influence on society and the environment since they decompose much more slowly in water than they do on land. (Decomposition of plastic bags is much slower in

	water than on land)
V6	Since plastic bags are non-biodegradable environmental waste, white pollution has been brought on by the country's widespread use of plastic bags. (White pollution is caused by massive use of plastic bags)
V7	Petroleum and natural gas are the main components of plastic bags, and 4% of the world's total oil is utilised in their manufacture. (Huge oil is used to produce plastic bags)
V8	These bags, which are widely used to transport food, have an adverse effect on human health since they can lead to cancer, endocrine disruption, and reproductive system harm. (Causes human health hazards)
V9	Reusing plastic bags might result in microbial cross-contamination of food. (Reuse of plastic bags is more dangerous)
V10	Since plastic bags are also used to dispose of domestic and human waste, they put human health at more danger than "open" disposal of these wastes. (Use of plastic bags to dispose domestic and human waste is more dangerous than open disposal of these wastes)
V11	When plastic bags clog sewer systems, it produces unpleasant odours and provides a welcoming environment for mosquitoes and other disease-carrying vectors. These diseases include encephalitis, dengue fever, and malaria. (Blocking the sewerage by plastic bags cause air pollution and diseases)
V12	Marine life, cattle, and animals are put at risk by plastic waste. (Puts life of animals at risk)
V13	Plastic bags are known to be consumed by animals, which results in disease and mortality. (Causes for animal mortality)
V14	When plastic bag garbage degrades, it can influence animal hormone levels as it moves up the food chain, which can eventually harm people as well. (Causes animal hormone disorder and harm to people)
V16	Ban of plastic bag will impose extra money burden as the outlets will charge for carry bag and create inconvenience; thus; it is not an encouraging step (Causes monetary burden and inconvenience; so not acceptable)
V17	The environmental impact of this product, which contributes to acid rain and smog, is largely attributable to the air pollution brought on by the release of hazardous chemicals and CO2 during the production of plastic bags. (Causes acid rain and smog)
V18	Plastic bag manufacturing and distribution use energy, deplete resources, and produce greenhouse gas emissions. (Causes depletion of resources and greenhouse emissions)

Source: Literature Review

A 5-point Likert scale has been used to collect data pertaining to the perception of 250 respondents on ban of polythene bags (Table 4.7). Five points used in the scale are; 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for strongly agree.

		N	%
Cases	Valid	250	100.0
	Excluded[a]	0	.0
	Total	250	100.0
a. Listwise deletion based on all variables in the procedure.			

Source: SPSS Output

To ascertain the reliability of data, Cronbach's Alpha is calculated (Table 4.8). As it is 0.705, the variables identified and data collected on them are reliable. Table 4.9 presents the variables entered in regression analysis.

Table-4.8. Reliability Statistics

Cronbach's Alpha	N of Items
.705	19

Source: SPSS Output

Table-4.9. Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	VAR00018, VAR00016, VAR00005, VAR00015, VAR00004, VAR00001, VAR00009, VAR00017, VAR00011, VAR00014, VAR00008, VAR00006, VAR00007, VAR00012, VAR00003, VAR00010, VAR00013, VAR00002[b]	.	Enter

a. Dependent Variable: VAR00019
b. All requested variables entered.

ANOVA is computed (Table 4.10) to know whether there is association between a set of independent variables and dependent variable.

Null Hypothesis: People are not aware of the negative impact of using polythene bags and hence don't perceive the need of banning the usage of it.

Alternative Hypothesis: People are aware of the negative impact of using polythene bags and hence perceive the need of banning the usage of it.

Table-4.10. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.577	18	1.532	2.866	.000[b]
	Residual	123.479	231	.535		
	Total	151.056	249			
a. Dependent Variable: VAR00019						
b. Predictors: (Constant), VAR00018, VAR00016, VAR00005, VAR00015, VAR00004, VAR00001, VAR00009, VAR00017, VAR00011, VAR00014, VAR00008, VAR00006, VAR00007, VAR00012, VAR00003, VAR00010, VAR00013, VAR00002						

Since the level of significance computed is 0.000 (last column of table 4.10), which is less than the 5% level of significance, the null hypothesis is not accepted and hence the alternative hypothesis is accepted. Thus, people are aware of the negative impact of using polythene bags and hence perceive the need of banning the usage of it. In order to know the variables that influence the perception of the people most, standardized regression coefficient (Beta) has been computed (Table 4.11). It is found that three independent variables V2 ((Does not distort ecosystem and beauty of nature), V10 (Use of plastic bags to dispose domestic and human waste is more dangerous than open disposal of these wastes) and V16 (Causes monetary burden and inconvenience; so not acceptable) are significantly influencing the dependent variable as the level of significance computed for each of them is less than 5%. Regression coefficients of V2 and V16 are negative. It means they are significantly influencing the dependent variable, but inversely. Regression coefficient of V10 is positive and hence it influences the dependent variable positively in a significant way. Standardized regression coefficient (Beta) is the highest for V2 (i.e., -2.071). It means V2 has the highest influence on the dependent variable. Thus, plastic bag waste buildup harms the ecosystem by degrading the beauty of nature and hence ban on its usage is a need.

Table-4.11. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.787	1.104		4.334	.000

	VAR00001	-.065	.048	-.084	-1.362	.174
	VAR00002	-1.361	.477	-2.071	-2.856	.005
	VAR00003	.840	.515	.955	1.632	.104
	VAR00004	.066	.039	.127	1.704	.090
	VAR00005	.088	.114	.052	.772	.441
	VAR00006	.032	.089	.027	.366	.715
	VAR00007	-.031	.064	-.038	-.482	.631
	VAR00008	.107	.058	.124	1.852	.065
	VAR00009	-.006	.053	-.008	-.118	.906
	VAR00010	.854	.224	1.341	3.807	.000
	VAR00011	-.254	.401	-.268	-.635	.526
	VAR00012	.084	.124	.098	.681	.497
	VAR00013	.374	.405	.387	.924	.356
	VAR00014	-.080	.104	-.051	-.770	.442
	VAR00015	-.173	.097	-.108	-1.773	.078
	VAR00016	-.435	.132	-.351	-3.297	.001
	VAR00017	.071	.057	.079	1.248	.213
	VAR00018	-.026	.060	-.027	-.438	.662
a. Dependent Variable: VAR00019						

4. SUMMARY/CONCLUSION

Plastic bags made out of polythene are used all over the world because of its advantages. These are lighter in weight and also easy to carry but the problem is with its disposal. It takes more than hundred years to get completely decomposed and that is why in a smart city like Bhubaneswar the local-self-government has decided to ban it completely. The present study attempted to know the perception of consumers of plastic bags in the city regarding this ban. A total of 506 respondents participated in a survey which has been conducted on a face-to-face mode. The result of this study showed that the respondents are aware about the ill effects of plastic bags but still consuming it. As per the perception of the respondents, use of plastic bags distorts the ecosystem by degrading the beauty of nature and hence ban of its usage is essential. It is also found from the perception study that use of plastic bags to dispose domestic and human waste is more dangerous than open disposal of these wastes. Thus, it is high time to ban the use of plastic bags. Moreover, as per the responses of the sample units, it is found that although the use of plastic bags causes monetary burden and inconvenience, people are ready to tolerate such inconvenience and burden for the sake of saving the environment and lives. It is inferred that people of smart city Bhubaneswar has the support for banning the plastic bag usage. The key findings of this study will help making the campaign for reduction of plastic bags more effective.

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