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ARTICLE

Evaluation of Single-Use Plastic Bag Charges Policy: Evidence from Lagos, Nigeria

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Abstract

This study evaluated people's perception of the proposed charges on single-use shopping bags and the willingness to pay or shift to sustainable alternatives for single-use plastic shopping bags in Ikorodu and Ikeja in Lagos, Nigeria. Using Yamane's formula, a minimum sample of 400 was required; however, 1,639 respondents were selected through stratified random sampling to ensure demographic representation. Structured questionnaires were administered physically and online. Descriptive and inferential analyses were conducted using SPSS, including Pearson's Product Moment Correlation, Chi-square, and logistic regression. Results showed a significant positive relationship between environmental perception and willingness to adopt sustainable alternatives ($r = 0.321$, $p < 0.05$). The regression model was significant ($\chi^2 = 580.058$, $p < 0.05$) indicating that policy initiatives influence waste reduction behavior. Opposition to direct charges remained high though most respondents were willing to reduce plastic bag use. Increasing environmental awareness alongside regulatory measures is recommended to promote sustainable behavior.

Keywords: Single-use plastic shopping bags, plastics, ban, charges, environment

1.0 Introduction

Lagos State, the commercial capital of Nigeria, is one of the largest cities in Africa with its population projected to exceed 20 million by 2030 (World Population Review, 2023). It is one of the fastest-growing coastal cities in the world. The high and increasing population has led to increased waste generation. Lagos state generates a huge amount of waste annually, estimated at about 5.46 million tons of waste each year (Akoni, 2024). This is equivalent to approximately 14,900 tons per day (Olaoti, 2024). Plastic makes up a significant portion of these wastes. The city's vast waterways and shoreline are especially susceptible to plastic pollution, worsening already-existing environmental issues. Lagos's high population density and limited waste management facilities both contribute to the plastic pollution problem in the state.

According to the composition of the municipal waste in Lagos State as presented by LAWMA in 2016, about a quarter of the waste consists of plastics, but unfortunately, plastic does not decompose, and high-energy ultraviolet light is required to break it down (Oladiti 2024). The widespread utilization of plastics is attributed to their low cost, lightweight nature, durability, availability, and ease of use. To address the menace of plastics in Lagos, the State Government on January 2024 banned the use of Styrofoam packs for food packaging- a single-use plastic (Lagos State Ministry of Environment and Water Resources 2025). There are many other types of single-use plastics that require attention with respect to waste management and the volumes they contribute. An example is single-use plastic shopping bags. Consumers' attitude towards single-use plastic bags influences their disposal behaviors and acceptance of alternatives (Linder *et al.,* 2017). To address other single-use plastic menace Lagos State proposed a ban on single-use plastics with effect from 1 July 2025 (Agbo, 2025). While there is awareness of their negative effects, many consumers prioritize convenience over environmental considerations (Afolabi *et al.,* 2021). Economic constraints often lead residents to choose cheaper, single-use options, despite the growing discourse on sustainable alternatives (Oduyoye *et al.,* 2020). According to Bansal and Kumar (2019), people with higher degrees tend to exhibit more environmentally responsible behaviors. There is no study on the perception to the proposed charges on single-use shopping bags in Lagos. The issue of single-use plastic shopping bags in Lagos State is a pressing environmental and socio-economic challenge that requires a multi-faceted approach. Thus, the aim of this study is to evaluate people's perception of the possible introduction of charges on single-use shopping bags and the willingness to pay or adopt sustainable alternatives to single-use plastic shopping bags in the Ikorodu and Ikeja areas of Lagos. There are two hypotheses and corresponding null hypotheses for this study. They are:

Table 1: Hypotheses and null hypotheses in this study

Hypotheses	Null Hypotheses
1.There is significant relationship between people's perception of single-use plastic shopping bags and their willingness to adopt sustainable alternatives	1.There is no significant relationship between people's perception of single-use plastic shopping bags and their willingness to adopt sustainable alternatives.
2.The implementation of initiatives to encourage the re-use of shopping bags has a significant impact on reducing waste from single-use plastic shopping bags.	2.The implementation of initiatives to encourage the re-use of shopping bags do not significantly have an impact on reducing waste from single-use plastic shopping bags.

2.0 Methodology

Study Locations

Lagos state is administratively divided into twenty (20) Local Government Areas (LGAs), out of which Ikorodu and Ikeja (the city capital) LGAs were selected for this study. According to the Lagos State Government Ministry of Statistics, the estimated population of these areas is approximately 2,500,000 (Lagos State Bureau of Statistics, 2021-2022). Ikeja and Ikorodu were chosen based on the number of shopping malls, markets present in these areas and population.

Figure 1: Map of Lagos showing the study areas

Study Design

The study utilized descriptive surveys using well-constructed questionnaire from March to October 2024, to assess consumers' perceptions of charges on single-use shopping bags in Lagos, Nigeria.

Population of the Study

Residents of Ikorodu and Ikeja Local Government Areas of Lagos State made up the population. According to the Lagos State Government Ministry of Statistics, population of these areas is approximately 2,500,000 (Lagos State Bureau of Statistics, 2021-2022).

Sample Size

The formular according to Yamani (1967) was used to determine the sample size (n).

$n = \frac{N}{1+N(e)^2}$ It states that the sample size is given by division of the population size, (N) by a sum of 1 and N multiplied by e which is the precision level. N= 2,500,000, e= 0.05. A sample size of a minimum of 400 respondents was found to be acceptable for this study.

Study Population and Sampling technique

The study population consisted of both female and male participants, with a population of 1639 filling the questionnaire. Using stratified random sampling technique. This approach ensured representation across different ages, genders, income levels, and educational backgrounds.

Study Instrument

Structured questionnaires designed specifically for this study were used to collect data. The questionnaires used had sections for demographics, Participants' single-use Plastics shopping bag Consumption Status and Willingness to Change, Perspective to Enacting Laws and type of laws related to Single-use Shopping Bags, awareness of environmental impacts, attitudes toward single-use plastic bags perceptions of policy effectiveness. A Likert scale was employed to gauge responses. Responses employed ranged from agree to strongly disagree.

Data Collection Method and Analysis

The questionnaire was administered in person by trained researchers to ensure consistency in data collection and Google forms were used to distribute questionnaires through email. A total of 1639 questionnaires were collected. Excel spreadsheet was used to compute the data. Descriptive and inferential statistical methods were employed using the SPSS as the statistical tool for analyses.

Ethical considerations

Strict adherence to Ethical guidelines was adhered to throughout the process. Before data collection, informed consent was obtained from all participants. We ensured they understood the purpose and voluntary nature of their involvement in the study, their rights to anonymity and confidentiality.

3. Results

Responses to Questionnaire

Demographics

A summary of the gender analyses from the data gathering shows that, Male participants made up 61.6 % of the respondents, while 38.4 % of them were females, 54.1 % of them were 18-25 years, 24.5 % of the participants earned below N 50,000. The responses of participants to the questions on demographic characteristics of participants are listed in Table 2.

Table 2: Characteristics of participants (Demographic)

Variables	Frequency	Percentage
Gender		
Male	1010	61.6
Female	629	38.4
Total	**1639**	**100.0**
Educational		
No Education	0	0.0
Primary Education	39	2.4
Junior high school	39	2.4
Senior high school	803	49.0
BSc.	631	38.5
MSc/PhD	127	7.7
Total	**1639**	**100.0**
Age		
Less than 26	886	54.1
26-35	207	12.6
36-45	166	10.1
46-55	254	15.5
Greater than 55	126	7.7
Total	**1639**	**100.0**
Monthly income		
<N 50,000	402	24.5
N 51,000-N 100,000	377	23.0
N 101,000-N 200,000	608	37.1
N 201,000-N 500,000	210	12.8
>N 500,000	42	2.6
Total	**1639**	**100.0**
Occupation		
Student	925	56.4
Government employee	400	24.4
Private employee	148	9.07
Petty trader	81	4.94
Business	85	5.19
Total	**1639**	**100.0**

Source: Field survey 2024

Participants Plastics Consumptions Status and Willingness to Change

Responses to questions that assessed the consumption status of participants to single-use plastic shopping bags and willingness to change are as shown in Table 3. Their responses were; throw them away (14.7 %), reuse some and throw some away (60.2 %), reuse all of them (17.5 %), sell them (2.6 %) and use for other things (5 %). Most of the respondents were willing to reduce their use of single-use plastic shopping bags (75.3%). The survey shows that most of the respondents sometimes go shopping with reusable shopping bags (77.7%) never use it (5%) and few always go with their bags (17.3%). Their reasons for not using reusable shopping bags were primarily as "not readily available in most shops and markets" (42.6 %) and "they forget to bring them along for shopping" (37.1%). For most of the respondents (62.0 %) charges should not be made for single-use plastic shopping bags while 38.0% agreed that charges should be made. This suggests an unwillingness to change from the use of single-use plastic bags.

The responses of participants to the questions on perspective to enacting laws to charge people for single-use shopping bags are as shown in Table 4. Their responses varied with 32.5 % of the respondents strongly against, 19.6 % of respondents moderately against, while 15.1 % (strongly for) and 22.5% (moderately for) of the respondents were in support of the laws, 10.3 % were neutral when asked about payment for the single-use plastic shopping bags. However, more participants were in support of a statewide ban, increased tax on the item and were willing to pay for environmentally friendly alternatives.

Participants' Awareness on Environmental Impacts of Single-use Plastic Shopping Bags

The responses of participants to the questions on responses on environmental impacts awareness of single-use plastic bags are as shown in Table 5. The response to the question on harm caused to the environment by single-use plastic shopping bags showed that more respondents were aware of their potential harm (60 %) and considered themselves environmentally friendly/cautious (67.4 %).

Testing hypothesis

Hypothesis One

To test the hypothesis that there is significant relationship between people's perception of single-use plastic shopping bags and their willingness to adopt sustainable alternatives in relation with its null hypothesis, the responses to

What do you do with the plastics/Nylon shopping bags once you have used them for carrying your shopping home?

Do you use reusable shopping bags whenever you go to market/shopping?

I do not use reusable shopping bags because…..,

Should there be laws to charge you for your single-use shopping bags?

What kind of reusable shopping bags would you prefer?

were compared with the responses to

Are you willing to reduce your consumption of single-use plastic nylon shopping bags?

Do you support payment for use of disposable plastics bags which are currently given free?

Would you recommend a state-wide ban on single-use plastics shopping bags?

Do you approve of increasing tax on single-use plastic bags as a way of controlling use?

Results of Product Moment Correlation coefficient (PPMCC)presented in Table 6 was used study the relationship between people's perception of single-use plastic shopping bags and their willingness to adopt sustainable alternatives. The PPMCC showed that there is a significant positive relationship between people's perception of single-use plastic shopping bags and their willingness to adopt sustainable alternatives, because the calculated value (0.321) was greater than the critical value (0.195) with 1637 degrees of freedom at 0.05 level of significance. As the perception of

harm caused by the bags increased the willingness to support sustainable alternatives and support policies increased.

Table 3: Responses of participants' single-use plastic shopping bag consumption status and willingness to change

Questions	Responses	Frequency	Percentage (%)
1.What do you do with the plastics/nylon Shopping Bags once you have used them for carrying your shopping home?	I throw them away.	241	14.7%
	I reuse some and throw some away.	987	60.2%
	I reuse all of them.	287	17.5%
	I sell them.	42	2.6%
	Others	82	5.0%
	TOTAL	**1639**	**100%**
2. Are you willing to reduce your consumption of single-use plastic shopping bags?	No	405	24.7%
	Yes	1234	75.3%
	Total	**1639**	**100.0%**
3. Do you use reusable shopping bags when going to market/ for shopping?	Always	283	17.3%
	Sometimes	1274	77.7%
	Never	82	5.0%
	Total	**1639**	**100.0%**
4. I do not use reusable shopping bags because…?	Ignorance of their exisitence	42	2.6
	Unavailable at my most visited supermarket	699	42.6
	I often forget to bring mine	608	37.1
	Preference for single-use plastic bags	248	15.1
	Others	42	2.6
	Total	1639	100.0%
5. Should there be laws to charge you for your single-use shopping bags?	No	1016	62.0
	Yes	623	38.0
	Total	**1639**	**100.0**

Table 4: Responses on perspective to enacting laws and type of laws related to single-use shopping bags

Question	Responses	Frequency	Percentage (%)
Do you support payment for use of disposable plastics bags which are currently given free?	Strongly for	247	15.1%
	Moderately for	369	22.5%
	Neutral	169	10.3%
	Moderately against	321	19.6%
	Strongly against	533	32.5%
	Total	**1639**	**100.0%**
Would you recommend a state-wide ban on single-use plastic shopping bags?	Strongly for	415	25.3%
	Moderately for	661	40.3%
	Neutral	121	7.4%
	Moderately against	81	4.9%
	Strongly against	361	22.0%
	Total	**1639**	**100.0%**
3. Do you approve of increase tax on single-use plastic bags for controlling use?	Strongly for	208	12.7%
	Moderately for	695	42.4%
	Neutral	123	7.5%
	Moderately against	82	5.0%
	Strongly against	531	32.4%
	Total	**1639**	**100.0%**
4. Are you willing to pay for alternative environmentally friendly shopping bags?	No	644	39.3%
	Yes	995	60.7%
	Total	**1639**	**100.0%**
5. What kind of reusable shopping bags would you prefer?	Plastics	125	7.6%
	Cloth	459	28.0%
	Paper	285	17.4%
	Fiber	571	34.8%
	Other	199	12.1%
	Total	**1639**	**100.0%**

Table 5: Responses on Awareness of Environmental Impacts of Single-use Plastic Shopping Bags

Question	Responses	Frequency	Percentage (%)
1.Do you think that single-use plastic bags can harm the Environment?	No	452	27.6%
	Yes	984	60.0%
	Unsure	203	12.4%
	Total	**1639**	**100.0%**
2. What would be the most effective approach to reduce the use of single-use plastic bags?	A ban that prohibits supermarkets, stores and markets giving plastic bags, so customers would bring reusable bags to shop.	663	40.5%
	Stores and Supermarkets should sell each plastic bag for a fee	287	17.5%
	Voluntary actions	325	19.8%
	Tax on plastics bag	243	14.8%
	Others	121	7.4%
	Total	**1639**	**100.0%**
3. Do you consider yourself environmentally friendly/cautious on issues caused by single-use plastic shopping bags?	Yes	1105	67.4%
	Sometimes	534	32.6%
	No	0	0.0%
	Total	**1639**	**100.0%**

Table 6: Relationship between people's perception of single-use plastic shopping bags and their willingness to adopt sustainable alternatives

Variable	N	Df	Mean	SD	r-calc	Sig.
Perception	1639	1637	11.37	1.579	0.321	0.000
Willingness	1639		12.28	2.926		

P < 0.05; r-critical = 0.195

Table 7: Result of Omnibus Tests of Model Coefficients and Odds Ratio of Logistics Regression

Omnibus Tests of Model Coefficients P<0.05, X^2-critical = 9.48773			
	Chi-square	Df	Sig.
Step	580.058	4	.000
Block	580.058	4	.000
Model	580.058	4	.000
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1252.766[a]	.298	.443

Odds Ratio of Logistics Regression Analyses								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	Df	Sig.	Exp(B)	Lower	Upper
Laws	-.160	.178	.808	1	.369	.852	.601	1.208
Payment	.020	.055	.137	1	.712	1.020	.916	1.136
Ban	-.468	.054	75.592	1	.000	.626	.564	.696
Tax	-.886	.055	259.247	1	.000	.412	.370	.459
Constant	5.741	.436	173.092	1	.000	311.465		

Thus, the hypothesis was accepted and the null hypothesis was rejected. This result is consistent with the study by Nguyen *et al.,* (2020), Heidbreder *et al.,* (2019), Martinho, *et al*., (2017), Bolderdijk, *et al.,* (2013). They all observed that public perception of the environmental impact of plastic significantly influences their willingness to adopt more sustainable options and that when individuals perceive single-use plastic as harmful to the environment they are more likely to support or switch to eco-friendly alternatives. Martinho, *et al.,* (2015**)**, demonstrated that consumer awareness of the negative environmental consequences of plastic use plays a crucial role in shaping their purchasing behavior toward sustainable products while Koenig-Lewis *et al.,* (2014) observed that positive attitudes toward sustainability and environmental consciousness increase the likelihood of consumers choosing reusable or biodegradable bags. Bolderdijk *et al.,* (2013) highlighted that people who perceive single-use plastic as a threat to the environment are more willing to embrace alternatives, especially when there are clear benefits, such as reducing waste. Heidbreder, *et al.,* (2019) found that public perception of the environmental impact of plastics waste is a key determinant in individuals' willingness to reduce their reliance on single-use plastic and opt for reusable options and Nguyen *et al.,* (2020) demonstrated that individuals with higher environmental awareness and a negative perception of plastics pollution are more likely to take proactive steps to adopt sustainable behaviors, such as switching to eco-friendly shopping bags. These findings collectively reinforce the significant role of public perception in driving the shift towards sustainable alternatives to single-use plastic shopping bags.

Hypothesis Two

To test the hypothesis that implementation of initiatives to encourage the re-use of shopping bags has significant impact on reducing waste from single-use plastic shopping bags with its null hypothesis the questions

Should there be laws to charge you for your single-use shopping bags?
Do you support payment for use of disposable plastics bags which are currently given free?
Would you recommend a state-wide ban on single-use plastic shopping bags?
Do you approve of increasing tax on single-use plastic bags as a way of controlling use?

on perception of the respondents on enacting laws, payment, ban, and increase tax on single-use shopping bags were used as independent variables, in comparison with the question

Are you willing to reduce your consumption of single-use plastics nylon shopping bags?

a dependent variable with a yes/no response. Omnibus Test was used to assess the overall fit of the model and the results are as shown in Table 7. The Chi-square value (580.058) > critical value (9.48773), and p-value < 0.05 suggests that the model significantly improves over a model without predictions, indicating that the predictors used in the model are collectively significant and the implementation of initiatives to encourage the re-use of shopping bags, reducing wastes from single-use plastic bags has significant impact on reducing waste from single-use plastic shopping bags. -2 Log likelihood = 1252.766 represents the unexplained variance in the model. Lower values indicate a better fit. Similarly, Cox & Snell R Square = .298 and Nagelkerke R Square = .443 are pseudo-R^2 values that describe the proportion of variance explained by the model. The Nagelkerke R Square of 0.443 suggests that about 44.3% of the variance in the outcome variable is explained by the model, which is fairly strong for logistic regression.

Odds ratio logistic regression analysis is a method used to analyse relationship between a binary outcome (where the responses are yes or no)) and one or more predictor variable (in this case reducing waste from single-use plastic shopping bags). To know the impact of the implementation of initiatives to encourage the re-use of shopping bags on reducing waste from single-use plastic shopping bags and results are shown in Table 7. The odds ratio showed that the use of laws and the use of payments/ or charges to encourage the reuse of shopping bags as a way of reducing waste from single-use plastic shopping bags are not significant. However, a state-wide ban of single-use plastic shopping bags as a way of reducing plastic waste from single-use plastic shopping bags is significant. Furthermore, for every one-unit increase in laws to charge people for their single-use shopping bags, the odds of reducing waste from single-use plastic shopping bags decrease by a factor of 0.852. Also, for every one-unit increase in supporting payment for use of disposable plastics bags, the odds of reducing waste from single-use plastic shopping bags increase by a factor of 1.020. For every one-unit increase in recommending a state-wide ban on single-use plastic shopping bags, the odds of reducing waste from single-use plastic shopping bags decrease by a factor of 0.626. Lastly, for every one-unit increase in approving an increased tax on single-use plastic bags, the odds of reducing waste from single-use plastic shopping bags decrease by a factor of 0.412.

The result of analyses of Hypothesis two revealed it was accepted. Implying that if initiatives to encourage the re-use of shopping bags were implemented, they will have significant impacts on reducing waste from single-use plastic shopping bags. This result is in line with the study by Nielsen *et al.,* (2020), Rogoff and Clark (2019)*, Poortinga et al., (2013), Dikgang et al., (2012)* and Convery, *et al.,* (2007). They observed that policy-driven initiatives, such as incentives for reusable bags or bans on single-use plastic, effectively reduce plastics waste and encourage sustainable behaviors. Dikgang *et al.,* (2012) discovered that plastic bag levies and educational programs lead to a notable decrease in single-use plastic consumption, increase in the use of reusable bags. (Convery *et al.,* 2007) also highlighted the effectiveness of introducing charges on plastic bags and showed that it was associated with significant reduction in plastic waste while (Poortinga *et al.,* 2013)*,* found that implementing reusable bag initiatives not only reduced plastic bag waste but fostered long-term behavioral changes toward more sustainable shopping habits. These findings collectively emphasize the significant impact of reuse initiatives in addressing the environmental challenge posed by single-use plastic shopping bags.

4. Conclusion

The study to evaluate people's perception of single-use plastic shopping bags in Lagos, Nigeria. revealed that:

There is a significant relationship between people's perception of single-use plastic shopping bags and their willingness to shift to sustainable alternatives. The implementation of initiatives to encourage the re-use of shopping bags has a significant impact on reducing waste from single-use plastic shopping bags.

Though single-use plastic shopping bags contribute significantly to environmental degradation, targeted initiatives and shifts in consumer behavior can effectively mitigate these negative impacts. Initiatives such as increasing people's perception of the harm caused by single-use plastic shopping bags leads to increased willingness to adopt sustainable alternatives, eco-friendly packaging, greater awareness and education on environmental issues, and support for policies banning or reducing single-use plastics.

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