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Environmental Attitude of Drivers in Alimosho Local Government Area, Lagos, Nigeria

*Chinenye Lilian OKAFOR[1] and Onipede WUSU[2]
[1]Lagos State University/Centre for Environmental Studies and Sustainable Development, Ojo Lagos, Nigeria
[2] Lagos State University/Department of Sociology, Ojo Lagos, Nigeria

[Corresponding Author indicated by an asterisk *]

***Abstract*—This study examined the environmental attitude of drivers towards vehicle emission. The survey design that employed a five point Likert scale questionnaire and administered to 402 respondents (drivers) generated the data analysed. Data analysis involved descriptive and regression statistical tools. The results suggest that there was significant association between respondents' sex, occupation, education and their environmental attitudes. A greater percentage (87. 3%) of the respondents was slightly more likely to agree that emissions from cars and trucks have serious impact on air quality. Majority (57.5%) of the respondents who were civil servants appeared to possess positive (favourable) attitudes towards the influence of emissions on the environment. Logistic regression suggest that respondents' sex, occupation, education and vehicle's purpose, income, age and social group significantly predicted their environmental attitudes. The study concludes that most of the sample possessed positive (favourable) environmental attitude towards vehicle emissions. This suggests that the environmental attitude of drivers towards emissions is not responsible for poor air quality. The policy implications of the findings include the need for the adoption of the polluter-pay-principle to reduce the volume of vehicles on our road, the necessity of promoting mass public transportation (such as the BRT and LAGBUS) as a way of reducing vehicle emission. Finally, sensitization program through social groups and schools is imperative.**

***Index Terms*—Air Quality, Environmental Attitude, Drivers, Vehicle Emissions.**

1. Introduction

The road environment, vehicles and vehicle drivers make up the road transportation system. Among these three, vehicle drivers with their various individual characteristics are ever dynamic and most complicated. Historical estimations points to the fact that global concentrations of carbon dioxide (CO_2) have substantially increased from an annual average of 280ppm in late 1700s to 401ppm in 2015 and 406ppm in early 2017 with the greatest contributor being the transportation sector. Concentration of methane (CH_4) however has doubled since preindustrial era estimated at 1,800ppb in 2015 while that of nitrous oxides (N_2O) which rarely exceeded 280ppb before 1920s rose to 328ppb in 2015 according to Environmental Protection Agency, (EPA) (2018). Department for Environment, Food and Rural Affairs (DEFRA) (2013) and Todts (2018) had earlier suggested that the level of vehicle emission is rising. One of the challenges of environmental scientists has been to reduce vehicular emissions. The road transport sector produces a wide range of issues ranging from poor air quality (air pollution), road accidents, noise, traffic congestion, increased travel time to other numerous environmental and social costs, hence the need to assess the attitude of drivers towards transport related emissions (Shafie & Mahmud, 2020). According to Masurali & Surya (2018), there has been a considerable increase in research on the attitude and perception of drivers on vehicle emissions and the adoption of cleaner measures in the last few years but not much research appears to have been done in Nigeria.

This study aims to fill these gaps by focusing on the environmental effects of vehicle emissions in relation to the drivers who are responsible for the state and conditions of their vehicles. In addition to their environmental attitudes, the role of drivers according to Axsen & Sovacool (2019) and Kopnina (2017) in low carbon transport mobility cannot be overemphasized. This study evaluated the relationship between the attitude of drivers and vehicle emission and the findings of this study will lead to a better decision making process by the transportation authorities on drivers' willingness and reactions towards transport policies. It will also go a long way to inform other relevant authorities on the current level of awareness and knowledge of the drivers on transport and environmental related issues. Specifically, it has three major objectives: (a) to determine the attitudes of road transport operators towards vehicle emission; (b) to investigate the predictors of the attitudes of road transport operators towards vehicle emission and (c) to examine the contributions that road transport operators can make in order to curtail vehicle emissions. This study also tested one hypothesis: Road transport operators are likely to possess negative (unfavourable) environmental attitudes. A survey design was employed using a five point Likert scale questionnaire was administered to Drivers at selected locations within the sample area using stratified and accidental sampling methods. The remaining part of the article is organised to provide a review of related literature, explain the research method

adopted followed by an analysis of the results, discussion and the testing of the hypotheses. In the final sections, conclusions and implications are derived from the study findings, and recommendations made.

2. Literature Review

Over the years, various studies have been conducted on vehicle emissions, drivers, attitudes and air quality. This section presents a review of previous studies on these subjects. Given the negative externalities that comes into play with transportation such as traffic congestion and pollution from emissions, the existing information on Nigerian cities and various research outputs re-endorses the fact that the issues in the road transport sector need special attention in order to realize the much needed environmental sustainability of Nigerian cities. So many studies have also shown the relationship between traffic and driving conditions for fuel consumption and emissions. Vlieger, Keukeleere & Kretzschmar (2000) pointed out the influence of driving behaviour and traffic conditions on fuel consumption and emissions when they studied a small set of passenger cars. Their study revealed that there was a 40% rise in fuel consumption of aggressive driving when compared with normal driving. They also concluded that fuel consumption was about two times higher in city road traffic that in ring roads. The resultant effect of these increased fuel consumption scenarios is an increased rate of emission. A study by Walton, Thomas & Dravitzki (2004); Rhodesa & Pivikc (2010) and Sanitthangkul, Ratsamewongjan, Charoenwongmitr & Wongkantarakorn (2012) opined a strong relationship existing between environmental attitudes and willingness to portray a positive environmental behaviour especially when it comes to transportation. Their studies reinforces that the attitude of Drivers towards vehicle emission can influence the rate of vehicle emissions. Their studies also points out the attitude of Drivers toward green cars and the factors that influence their attitude. Furthermore, what a Driver thinks, feel and act towards their individual vehicles and driving as a whole affects the volume of their vehicular emissions which will subsequently affect ambient air quality. Averagely, Drivers are considered to play an important role towards climate change based on their choice of vehicle. Keyvanfar, Shafaghat, Muhammad & Ferwati (2018); Wardman & Whelan (2001) and Beck, Rose & Hensher (2010) pointed out in their studies that knowledge of some environmental concepts like: Vehicles emissions being a main driver of climate change; the use of environmentally friend transport; and carbon reduction policies and polluter pay principle goes a long way to form their environmental attitude. The growing global focus on environmental concerns, especially on the role of carbon emissions in climate change, has created an atmosphere where environmental attitude is a pre-eminent focus thus the growing interest in examining the link between Drivers attitude and climate change [Flamm (2006); Barnes, Chatterton & Longhurst (2019) and Muslim, Keyvanfar, Shafaghat, Abdullahi & Khorami (2018)].

Diversity in culture, religious and spiritual approaches, and philosophical approaches may bring about different views of nature and the environment, and consequently lead to different motivation and attitudes towards the environment, Hebel, Montpied & Fontanieu (2014) and Bashirun & Noranee (2020). However, an understanding of the relationship(s) that exists between the attitudes that people have towards the environment and the factors that influence these attitudes, will be a step in the right direction [Rosa & Collado (2019) and Dagher & Itani (2012)]. Although Abun & Racoma (2017), implied that taking this right step to solve environmental problems is uncertain if there is a misunderstanding of the causes, hence the concept of environmental knowledge. Having established that environmental problems are majorly caused by human behaviors (anthropogenic), these behaviors are a reflection of attitude. If the person sees the object negatively or positively, it will affect the way how she/he relates to that object. Therefore, there can be several kinds of behaviors toward a certain object depending on the attitudes or views of the person toward that object. Despite the undisputed success in analysing people's attitudes towards vehicle emissions, important fundamental problems and questions remain unanswered. Hockenbury & Hockenbury (2007) and Flamm (2006) stated that a drivers' attitude forms a critical element in road behaviour. Environmental attitude within the scope of this study is best explained as a combination of emotional, cognitive and perceptual processes with respect to vehicular emissions as an aspect of the environment. It is the Drivers' overall evaluations of vehicular emissions, its causes and its resultant consequences. Flamm (2006) and Leonidou, Leonidou & Kvasova (2010) opined that the history of environmental attitudes are not based on a singular factor, rather are multi-dimensional. The way Drivers reason affects what they feel, and as such a determinant of their attitude towards vehicle emissions along with its implications. Mensing, Bideaux, Trigui & Tattegrain (2013) and Chen et al., (2018) in their studies referred the term "eco-driving" to reflect the efficient energy use of vehicles and the set of rules, techniques and behaviour that Drivers can employ in order to reduce their fuel usage, emissions of CO_2 and other pollutants. In view of this, a Driver with a positive attitude would be one who ensures his vehicle's maintenance routine is proper and that the vehicle is in a road worthy state in addition to driving his or her vehicle in a way to maximize the consumption of fuel and reduce exhaust emissions (Eichelberger, Stulce, McGraw, Perez & Stowe, 2014). Hockenbury & Hockenbury (2007) also suggested that attitude transmits into behaviour which refers to a drivers' active responsiveness to vehicle emission in the context of the study. People are always unconsciously trying to maintain a balance among their attitude, beliefs and subsequently their behaviour. According to Department for Transport (DFT) (2013), it is assumed that humans act in line with their attitudes although some social psychologists opined that it is not in all cases that we have people's attitude and their behaviour aligning perfectly but human beings have a greater inclination to act in accordance with their attitude.

Irrespective of the advancements been made over the decades to improve efficiency in vehicles, the road transportation sector with its contributions to high levels of air pollutants that are above European Union (EU) standards is currently accountable for up to twenty- five percent of greenhouse gases in Europe. Markovich & Lucas (2011) and Cloke & Layfield (1996) argued that road transportation sector is responsible for the emissions of CO_2 which is reportedly the most dangerous of the Greenhouse gases. They stated further that it will be disastrous if global warming should cross the 2^0C, threshold of safety. In Nigeria, anthropogenic sources of CO_2 emissions have road transportation topping the list Okedere, Elehinafe, Oyelami & Ayeni (2021) and Fakinle, et al., (2020). Eugene (2000) observed that "Driver" in the road transport business refer to the physical person which owns the license for the performance of activities of transport on the road. This includes a private vehicle owner, a commercial driver both for passenger and haulage vehicles and a professional driver. A road transport operator is one directly or indirectly engages in the activity of transportation either as a necessity, luxury, convenience or gain. Road transportation can be categorized into passenger and goods transport. On the causes of pollutant emissions from road transport operations, Gorham (2012) noted the causes of pollutant emissions from road transport, though complex in details but straightforward conceptually. According to him, vehicular use is not only on the high side but "unclean" when used. He suggested that it will be in good order if the volume of cars on the road can be reduced as well as using vehicles that are "clean" enough. According to Abdul-Raheem, Ajayi, & Awoyemi, (2019), in most developing countries of the world particularly Nigeria, vehicular growth and operation has not been properly checked by environmental regulating authorities leading to increased levels of pollution. International Road Transport Union (2014) made a proposition stating that the various transportation modes offset their various costs by reinvesting revenues generated from road users into amortization, improvement and maintenance of road infrastructure. This is necessary because adapting these infrastructures is totally important to meet the ever increasing demand for movement in both passenger and goods transportation while at the same time reduces vehicular emissions as earlier pointed out by Gorham (2012); Bellis (2019) and Ansar & Monika (2019). Marko, Durđica & Goran (2015) implied that Buses and coaches like the BRT and LAGBUS which have greater carrying capacity can each be used to replace up to eleven cars subsequently reducing traffic congestion , fuel combustion and its resultant CO_2 emissions.

DFT (2013) reported that researches on public perceptions about road transportation impacts have been conducted on the general public over the years by Department for Environment, Food and Rural Affairs (DEFRA) (2012 & 2013) and Olayinka, Adedeji, & Ajibola (2015). They came out with results that enlightened us on how dangerous air pollution is to human health. In these surveys, drivers reported that air pollution emission were of the greatest concern to them. This was followed by Greenhouse gas emissions and finally traffic congestion. In a recent study on the attitude of drivers to vehicle exhaust conducted by NatCen for DFT in 2013, 40% of the respondents reported that vehicle emissions were a "very serious" problem compared to the 2011 rate of 45% and 77% in 1997 (DFT, 2013). An analysis of exhaust emissions from gasoline and diesel powered engines in two areas of high vehicular traffic in Lagos Metropolis carried out by Ndukwe & Jenmi (2008), revealed that average concentrations of 0.075ppm, 2.143ppm, 0 .875ppm, 40ppm and 15.5ppm for H_2S, SO_2, NO_2, CO and CO_2 respectively from light vehicular emissions were detected which far exceeds the available Federal Environmental Protection Agency (FEPA) limits for environmental pollution control in Nigeria. These limits includes: SO_2-0.1ppm, NO_2-0.06ppm and CO-20ppm, so the values above acts as an evidence on the continuous challenges of the impact of vehicular emissions on urban air pollution in Nigeria (Ladan, 2013). The results of many studies Njoku, Rumide, Akinola, Adesuyi & Jolaoso (2016); African Technology Policy Studies Network (ATPS), (2013); Ndoke & Jimoh (2007); Adeyanju & Manohar (2017) and Angnunavuri, Kuranchie, Attiogbe, & Nerquaye-Tetteh (2019) suggested that strict and appropriate vehicle emission management should be carried out owing to the fact that the results for the assessment of carbon monoxide (CO), Carbon dioxide (CO_2), oxygen (O_2), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), nitrogen oxide (NO), suspended particulate matter (SPM) were quite high and above regulatory limits in the various cities they sampled.

Having highlighted an obvious nexus between environmental concerns (climate change, poor air quality etc.,), vehicle emission, environmental attitude and behaviour, this study therefore is aimed at examining the possible relationship(s) between road Drivers' attitude and air quality.

3. Methodology

Survey research design was employed in the study. This design used the questionnaire as the data collection instrument. The detailed methodological steps used in this study are seen in Figure 1.

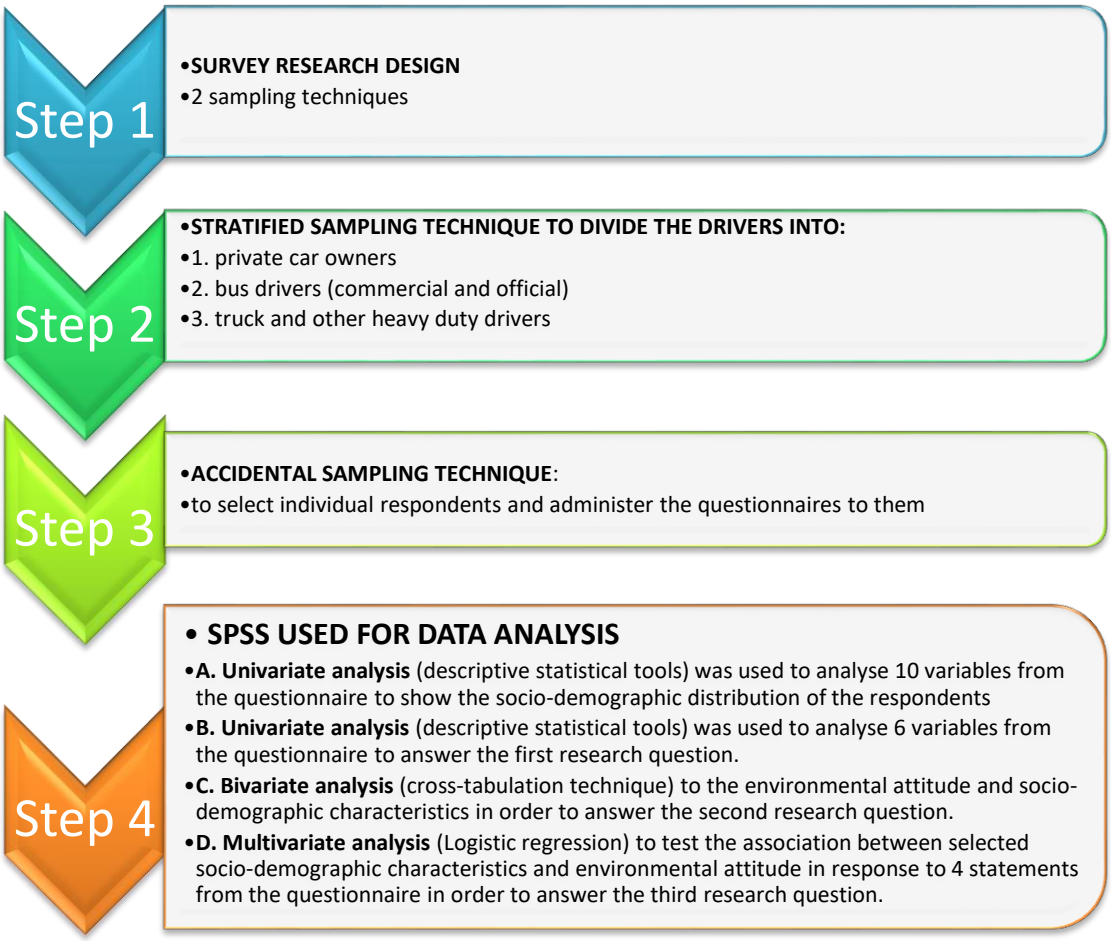

Fig 1: Methodological steps for the study

STUDY AREA, POPULATION, SAMPLE SIZE AND SAMPLING TECHNIQUES

The study area includes Igando, Isheri-olofin, Isheri -osun, Egbeda, Ayono, Ipaja, ikotun, ijegun, Egan, Ishitu, Abarange, Aborun, Shasha, Akowonjo and Iyana-ipaja areas of Alimisho local government, Lagos State. This study population comprised of drivers in the road transport industry in Alimosho local government area of Lagos state. These drivers include both public and private vehicle owners and drivers, males and females which include vehicle owners, commercial bus drivers, individual drivers, staff bus drivers, and truck drivers who are either employed or self-employed. A finite number of individuals were taken from the population of study. They include 402 road transport drivers. Two sampling techniques were combined; the stratified and the accidental sampling technique. The stratified technique entailed stratifying vehicle owners into three. These groups include private car owners, bus drivers (commercial and official), truck and other heavy duty drivers. We used the accidental sampling technique to select respondents out of these three groups. The accidental sampling technique was used because the study population is typically transitional and highly mobile.

RESEARCH INSTRUMENT

Quantitative data was collected through a 5-point Likert scale questionnaire. The questionnaire was split into two sections. The first section consists of social, economic and demographic information and some largely close ended questions. The second section consists of structured questions providing the response options to cover the negative-to-positive dimension. It consists of the 'stem' statement and the 'response scale' (that is the options offered to respondents). The response scales were classified into Strongly Agree, Agree, Not Sure, Disagree, and finally Strongly Disagree on a scale of 1-5 respectively.

DATA COLLECTION METHOD

Vehicle owners were targeted as groups (offices and churches). They did not require much explanation as majority of them were literate enough. Among the groups targeted were: FCMB banks at Idimu and Akowonjo, Meadow hall

school Egbeda staff bus, IHS Igando staff bus, GTB Ikotun, and carwash, Winners chapel Akesan and powerline, Redeem Igando, isheri, and Ikotun etc. The commercial vehicle drivers were targeted at bus stops while the drivers waited for their turn to load for a trip. The major bus stops were Egbeda, Iyana-Ipaja, Igando, Ikotun and Ijegun bus stops. These steps enabled the streamlining of the expected respondents since the study sample cannot be questioned while they are in motion.

DATA ANALYSIS

SPSS (statistical package for social science) was used in the analysis of the data. Univariate analysis conducted included the use of descriptive statistical tools to elaborate the characteristics of the population or background of the respondents. Bivariate analysis used the cross-tabulation technique to relate respondents' attitude towards vehicle emissions and selected background characteristics. Chi-square statistical technique was used to test for association between the two categories of variables. Logistic regression assessed the impact of the independent variables on the respondents' attitude towards vehicle emission (the primary dependent variable). The model consisted of the dependent variable and seven independent variables (sex, age, income, occupation, educational background, vehicle type/purpose, and social group). Each of the dependent variables was reclassified 0= Positive Attitude and 1= Negative Attitude. Because the first aim of this research was to evaluate the attitude of the respondents (drivers) towards vehicle emission, six (6) statements were analysed. To achieve the second objective, which is to evaluate the predictors of their attitudes, a cross tabulation and a logistic regression was done.

4. RESULTS

This Section presents the findings derived from the analysis. Table 1 presents the socio-demographic characteristics of respondents. The table reveals that 74.1% of the respondents were males while 25.9% were females. This implies that there were more males in the study sample than females. Most of the respondents were married (74.6%). The analysis also showed that out of the 402 respondents, 43.0% reported having tertiary education, it was also deduced that more of the respondents were self-employed (53.7%).

Table 1: Distribution of respondents' environmental attitudes by the percentages of their characteristics

	CLASSIFICATION (N=402)	(%)	N		CLASSIFICATION (N=402)	(%)	N
1	**Sex**			**6**	**Vehicle Type**		
	Male	74.1	298		Private	37.1	149
	Female	25.9	104		Commercial	62.9	253
2	**Marital status**			**7**	**Income**		
	Ever married	74.6	300		N30,000-N80,000	75.4	303
	Single	25.4	102		N81,000-N150,000	13.4	54
					N151,000 & above (Median N78,000)	11.2	45
3	**Religion**			**8**	**Age**		
	Islam	25.9	104		20-29	13.5	54
	Christian	73.9	297		30-39	34.0	136
	Others	0.2	1		40 & above (Median Age is 40)	52.5	210
4	**Educational background**			**9**	**Family Size**		
	Primary and below	20.7	83		1-4 (Mean size is 4, S.D is 2.307)	60.2	242
	Secondary	36.3	146		5-8	36.6	147
	Tertiary	43.0	173		9-12	3.2	13
5	**Occupation**			**10**	**Age of car**		
	Self employed	53.7	216		10 years and below (Mean age is 5)	79.3	319
	Civil servant	46.3	186		11 years and above	20.7	83

Table 2 indicates that majority of the respondents' possessed positive (favourable) attitude. About 87.3% of them agreed with the statement that emissions from cars and trucks have serious impact on air quality. Also, 83.8% agreed with the statement that purchasing low emission vehicles will greatly improve air quality in Lagos. Similarly, about 73.4% of the respondents disagreed with the statement that poor maintenance of vehicle is not linked to poor air quality. This analysis revealed that the respondents had a positive (favourable) attitude towards vehicle emission and the environment.

Table 2: Percentage distribution of respondents by environmental attitude

SOCIO-DEMOGRAPHIC CHARACTERISTIC	POSITIVE ENVIRONMENTAL ATTITUDE	NEGATIVE ENVIRONMENTAL ATTITUDE
Polluter Pay Principle	64.9% (N= 261)	35.1% (N= 141)
Older Vehicles emit more	71.6% (N= 288)	28.4% (N=114)
Emissions from cars & trucks	87.3% (N=351)	12.7% (N=51)
Mass public transportation	50.9% (N=204)	49.1%(N=197)
Poor maintenance of vehicle	73.4% (N=295)	26.6%(N=107)
Purchasing low emission vehicle	83.8% (N=337)	16.2%(N=65)

Bivariate Test of Association between Socio-demographic Characteristics and Respondents Environmental Attitudes.

Table 3 shows the bivariate association between the environmental attitude and socio-demographic characteristics. The percentage distributions across each socio demographic characteristic suggest that majority of the respondents possessed positive environmental attitude in response to the six statements posed to them. The Chi-square significant values suggest that the respondents' occupation, education, vehicle type and social group were significantly associated with the environmental attitude.

Table 3a: Respondents' environmental attitudes by the percentages of their socio-demographic characteristics

Socio-demographic characteristics	POSITIVE ENVIRONMENTAL ATTITUDE	NEGATIVE ENVIRONMENTAL ATTITUDE	Chi- square value	P- Value
1. Purchasing low emission vehicle				
Education				
Primary & below	77.1	22.9		
Secondary	76.7	23.3		
Tertiary	93.1	6.9	19.105	0.000
Occupation				
Self employed	83.8	16.2		
Civil servant	83.9	16.1	0.000	0.984
Social group				
Yes	87.7	12.3		
No	77.8	22.2	6.874	0.009
Vehicle Type				
Private	86.6	13.4		
Commercial	82.2	17.8	1.317	0.251
2. Poor maintenance of vehicle				
Education				
Primary & below	78.3	21.7		
Secondary	82.9	17.1		
Tertiary	63.0	37.0	17.308	0.000
Occupation				
Self employed	74.5	25.5		
Civil servant	72.0	28.0	0.318	0.573
Social group				
Yes	79.5	20.5		
No	63.9	36.1	11.924	0.001
Vehicle Type				
Private	79.9	20.1		
Commercial	69.6	30.4	5.094	0.024

Table 3b: Respondents' environmental attitudes by the percentages of their socio-demographic characteristics (contd.)

Socio-demographic characteristics	POSITIVE ENVIRONMENTAL ATTITUDE	NEGATIVE ENVIRONMENTAL ATTITUDE	Chi- square value	P- Value
3. Polluter Pay Principle				
Education				
Primary & below	66.3	33.7		
Secondary	56.8	43.2		
Tertiary	71.1	28.9	7.142	0.028

Occupation				
Self employed	63.9	36.1		
Civil servant	66.1	33.9	0.220	0.639
Social group				
Yes	62.3	37.7		
No	69.0	31.0	1.886	0.170
Vehicle Type				
Private	57.0	43.0		
Commercial	69.6	30.4	6.453	0.011
4. Older Vehicles emit more				
Education				
Primary & below	77.1	22.9		
Secondary	54.8	45.2		
Tertiary	83.2	16.8	33.067	0.000
Occupation				
Self employed	64.4	35.6		
Civil servant	80.1	19.9	12.212	0.000
Social group				
Yes	70.5	29.5		
No	73.4	26.6	0.404	0.525
Vehicle Type				
Private	63.8	36.2		
Commercial	76.3	23.7	7.242	0.007
5. Emissions from cars and trucks				
Education				
Primary & below	97.6	2.4		
Secondary	76.7	23.3		
Tertiary	91.3	8.7	25.245	0.000
Occupation				
Self employed	85.6	14.4		
Civil servant	89.2	10.8	0.280	1.169
Social group				
Yes	87.7	12.3		
No	86.7	13.3	0.086	0.769
Vehicle Type				
Private	91.3	8.7		
Commercial	85.0	15.0	3.355	0.067
6. Mass public transport				
Education				
Primary & below	63.9	36.1		
Secondary	48.3	51.7		
Tertiary	46.8	53.2	7.125	0.028
Occupation				
Self employed	49.8	50.2		
Civil servant	52.2	47.8	0.227	0.634
Social group				
Yes	51.0	49.0		
No	50.6	49.4	0.006	0.938
Vehicle Type				
Private	61.5	38.5		
Commercial	44.7	55.3	10.573	0.001

From the analysis in Table 3b, it can be deduced that respondents with tertiary education and belonged to social groups were more conscious of the fact that purchasing low emission vehicles will greatly improve air quality. They also disagreed that poor maintenance of vehicles is not linked to poor air quality. Respondents that operate commercial vehicles were more informed about the above fact in addition to the fact that they agree that polluter pay principle can be applied to reduce the number of vehicles on the road.

As indicated in Table 3b, the Chi square P value for occupation, vehicle type, education and social group ranged between 0.000 and 0.05. Therefore, H0 was rejected and we accepted the H1 which say that Drivers are likely to possess positive (favorable) environmental attitudes. This suggests that the respondents possess positive (favourable) environmental attitude towards vehicle emission.

Multivariate Test of Association between Socio-demographic Characteristics and Respondents Environmental Attitudes.

Table 4: Logistic regression on the association between selected socio-demographic characteristics and environmental attitude in response to "MASS PUBLIC TRANSPORTATION (e.g. BRT & LAGBUS) IS A WAY OF REDUCING VEHICLE EMISSION".

Characteristics	Odds Ratio	P-Value	95% confidence interval
Age			
20-29 (r)			
30-39	0.51	0.65	(0.25 - 1.04)
40+	0.35	0.00	(0.17 - 0.71)
Vehicle Type			
Private (r)			
Commercial	3.72	0.00	(2.07 - 6.70)
Income			
30,000-80,000(r)			
81,000-150,000	0.88	0.72	(0.45 - 1.73)
151,000+	0.70	0.34	(0.34 - 1.44)
Educational background			
Primary & below (r)			
Secondary	2.15	0.02	(1.13 - 3.92)
Tertiary	1.48	0.19	(0.82 - 2.67)
Occupation			
Self-employed (r)			
Civil servant	0.70	0.14	(0.44 - 1.13)
Social group			
Yes (r)			
No	0.69	0.15	(0.43 - 1.11)
Sex			
Male (r)			
Female	0.47	0.01	(0.26 - 0.82)
r = Reference Category			

Table 4 present the odds ratios on the association between selected characteristics and environmental attitudes. Respondents that were 40years and above were less likely to possess positive environmental attitude relative to those in 20-29 age bracket. Surprisingly, commercial operators were three times more likely to possess positive environmental attitude than the private operators in response to the statement that mass public transportation (e.g. BRT, LAGBUS buses) is a way of reducing vehicle emission. Furthermore, respondents with secondary education were two times more likely to possess positive environmental attitude in response to the same statements above while female respondents were less likely to possess positive environmental attitude than the male respondents.

Table 5: Logistic regression on the association between selected socio-demographic characteristics and environmental attitude in response to "EMISSIONS FROM CARS AND TRUCKS HAVE SERIOUS IMPACT ON AIR QUALITY".

Characteristics	Odds Ratio	P-Value	95% confidence interval
Age			
20-29 (r)			
30-39	0.24	0.01	(0.08 - 0.69)
40+	0.17	0.00	(0.06 - 0.48)
Vehicle Type			
Private (r)			
Commercial	8.99	0.00	(3.18 - 25.36)
Income			
30,000-80,000(r)			
81,000-150,000	0.97	0.95	(0.31 - 2.98)
151,000+	0.00	0.10	(0.00 -)
Educational background			
Primary & below (r)			
Secondary	15.25	0.00	(3.24 - 71.88)
Tertiary	2.33	0.28	(0.50 - 10.97)
Occupation			
Self-employed (r)			
Civil servant	0.70	0.37	(0.33 - 1.51)

Social group			
Yes (r)			
No	0.61	0.23	(0.27 - 1.37)
Sex			
Male (r)			
Female	0.33	0.02	(0.13 - 0.87)
r = Reference Category			

From Table 5, it is clear that respondents within the age brackets of 30 and 39, 40 and above were less likely to possess positive environmental attitudes compared to respondents below this age bracket in response to the statement that emissions from cars and trucks have serious impact on air quality. Surprisingly also, commercial operators were almost nine times more likely to possess positive environmental attitude than the private operators in response to the statement that emission from cars and trucks have serious impact on air quality. This may be attributed to the fact that these commercial drivers drive as a profession and not just as a necessity or luxury, therefore wouldn't want to respond in ways that they think may be detrimental to their profession. Respondents with secondary education were fifteen times more likely to possess positive environmental attitude in response to the same statements above while female respondents were less likely to possess positive environmental attitude than the male respondents in response to the statement that emission from cars and trucks have serious impact on air quality.

Table 6: Logistic regression on the association between selected socio-demographic characteristics and environmental attitude in response to "OLDER VEHICLE EMIT MORE THAN NEWER VEHICLES THEREBY PROMOTING POOR AIR QUALITY".

Characteristics	Odds Ratio	P-Value	95% confidence interval
Age			
20-29 (r)			
30-39	3.48	0.01	(1.37 - 8.81)
40+	1.71	0.24	(0.69 - 4.21)
Vehicle Type			
Private (r)			
Commercial	0.84	0.60	(0.47 - 1.59)
Income			
30,000-80,000(r)			
81,000-150,000	0.44	0.09	(0.17 - 1.15)
151,000+	1.09	0.86	(0.44 - 2.67)
Educational background			
Primary & below (r)			
Secondary	2.18	0.02	(1.14 - 4.18)
Tertiary	0.64	0.21	(0.31 - 1.30)
Occupation			
Self-employed (r)			
Civil servant	0.47	0.01	(0.27 - 0.82)
Social group			
Yes (r)			
No	1.31	0.34	(0.76 - 2.27)
Sex			
Male (r)			
Female	1.85	0.06	(0.98 - 3.45)
r = Reference Category			

From table 6 above, respondents within the age brackets of 30 and 39 were three times more likely to possess positive environmental attitudes compared to respondents below and above this age bracket in response to the statement that older vehicles emit more than newer vehicles thereby promoting poor air quality while respondents with secondary education were two times more likely to possess positive environmental attitude in response to the same statements above. Civil servants were found to less likely possess positive environmental attitude than those who were self-employed in response to the statement that older vehicles emit more than newer vehicles thereby promoting poor air quality.

Table 7: Logistic regression on the association between selected socio-demographic characteristics and environmental attitude in response to "THE POLLUTER PAY PRINCIPLE CAN BE APPLIED TO REDUCE THE NUMBER OF VEHICLES ON THE ROAD".

Characteristics	Odds Ratio	P-Value	95% confidence interval
Age			
20-29 (r)			
30-39	1.25	0.57	(0.58 - 2.68)
40+	0.51	0.09	(0.24 - 1.11)
Vehicle Type			
Private (r)			
Commercial	0.84	0.56	(0.48 - 1.49)
Income			
30,000-80,000(r)			
81,000-150,000	0.09	0.79	(0.02 - 0.39)
151,000+	1.68	0.16	(0.82 - 3.48)
Educational background			
Primary & below (r)			
Secondary	1.09	0.79	(0.59 - 2.03)
Tertiary	0.63	0.16	(0.33 - 1.21)
Occupation			
Self-employed (r)			
Civil servant	1.03	0.91	(0.61 - 1.73)
Social group			
Yes (r)			
No	0.75	0.27	(0.45 - 1.24)
Sex			
Male (r)			
Female	0.61	0.12	(0.32 - 1.14)
r = Reference Category			

In Table 7 above, respondents that earn between N81,000-N150,000 monthly were less likely to possess positive environmental attitude than respondents that earn above N150,000 in response to the statement that the "polluter pay principle" can be applied to reduce the number of vehicles on the road. This may be attributed to the fact that their monthly income may not be meeting up their needs at the moment therefore they will not be ready to take up further expenses.

5. Discussion

The bivariate test of association between the environmental attitude and socio-demographic characteristics showed that respondents with tertiary education and belonged to social groups were more conscious of the fact that purchasing low emission vehicles will greatly improve air quality. They also disagreed that poor maintenance of vehicles is not linked to poor air quality. This implies that education and social groups are great avenues to any approach relevant authorities may want to take in order to curtail vehicle emission. It can also be said from the analysis that civil servants were more aware of the fact that older vehicles emit more.

A Multivariate test examined the perceptions of the environmental attitudes of drivers in part of Lagos Metropolis. First, respondents that were 40 years and above (which were about half of the respondents) were less likely to possess positive environmental attitude than respondents that were below 40years to the statement that mass public transportation (e.g. BRT, LAGBUS buses) is a way of reducing vehicle emission. This may be attributed to the fact that at 40, an average Lagosian owns a car as a necessity as pointed out by Kopnina (2017) and so will likely not be in support, trying as much as possible to align his or her behaviour with the attitude as implied by DFT (2013) and argued by Hockenbury & Hockenbury (2007).

Secondly, it was deduced that respondents with tertiary education and belonged to social groups were more conscious of the fact that purchasing low emission vehicles will greatly improve air quality and disagreed that poor maintenance of vehicles is not linked to poor air quality. In the same manner, respondents with secondary education were fifteen times more likely to possess positive environmental attitude in response to the statements that emissions from cars and trucks have serious impact on air quality. This stresses the fact that education and social groups are great avenues to any approach relevant authorities may want to take in order to curtail vehicle emission. This is totally in accordance to the earlier statement by Hockenbury & Hockenbury (2007) that since people's attitudes rub off on their behaviour, we can change behaviour by altering attitude. Although a change in attitude is not always an instant reaction to any form of training or information, it can take place especially through these avenues.

Thirdly, as surprising as it may seem, commercial drivers were almost nine times more likely to possess positive environmental attitude than the private drivers in response to the statement that emission from cars and trucks have

serious impact on air quality. This may be attributed to the fact that these commercial operators drive as a profession and not just as a necessity or luxury, therefore wouldn't want to respond in ways that they think may be detrimental to their profession.

Finally, respondents attitudes towards the contribution they can make to curtail vehicle emission was measured and about 65% of the respondents possessed positive (favourable) attitude towards the polluter- pay- principle which can be applied to reduce the number of vehicles on the road. Similarly, about 72% reported that older vehicles emit more than newer vehicles thereby promoting poor air quality. This showed that a greater percentage of the respondents will be willing to do away with older vehicles.

Furthermore, the study showed that socio-demographic attributes like religion, marital status, vehicle model, fuel type and how many trips a driver takes a day are not related to his/her attitude towards vehicle emissions and its corresponding implications on air quality. It is also worthy to note that a sample population was used because it was not be possible to survey the entire population in Lagos state due to time and resources restraint and also because of the difficulty in organizing such a scheme.

6. Conclusion and Recommendations

With the increasing population in Lagos state and Alimosho local government area in particular, transportation needs and activities are increasing daily. The rate of car ownership increases as the day goes by. The need for more recent information on the environmental attitude of these road transport operators was greatly met by this study. Public knowledge on the attitude of road transport operators towards vehicle emissions and the role it may play on the quality of air around us, climate change, ozone layer depletion and greenhouse gases can be created based on the outcome of this study. The findings of this study outlined the measures to be implemented as well as investments required particularly for the promotion of a positive (favourable) environmental attitude which will most likely improve urban air quality and reduce vehicle emissions.

The study therefore concludes that most of the respondents possessed positive (favourable) environmental attitude towards vehicle emissions. This implies that the attitude of drivers towards emissions is not responsible for poor air quality. However on the basis of the analysis carried out in the study, there is need for the enforcement of policies for adequate implementation. The policy implications of the findings include the need for the adoption of the polluter-pay-principle which majority of the respondents were willing to pay if need be. In view of the fact that the majority of the respondents are willing to bear the cost of their pollution, a "pay as you pollute" system can be crafted out and added to the annual motor vehicle licensing and road worthiness dues already in operation. Also, in order to reduce the number of vehicles on the road, mass public transportation (e.g BRT and LAGBUS) can be made more efficient and available; finally, sensitization program through social groups and schools can be carried since majority of the respondents belong to one social group or the other. Vehicle emissions, its causes and its implications can be inculcated in the school curriculums at all levels of Education since majority of respondents acquire at least a basic education.

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AUTHORS

Chinenye Lilian Okafor, Ph.D., is an Adjunct Research Fellow at the Centre for Environmental Studies and Sustainable Development, Lagos State University, Ojo Lagos, Nigeria (e-mail: chinenyeokafor2017@yahoo.com).

Onipede Wusu, Ph.D., is a Professor of Demography at the Department of Sociology, Lagos State University, Ojo Lagos, Nigeria (e-mail: Onipede.wusu@lasu.edu.ng).

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