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ROAD TRAFFIC INDUCED ENVIRONMENTAL AIR CONDITIONS ON STREET-ENTREPRENEURS IN AKURE-SOUTH LGA. ONDO STATE, NIGERIA

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Abstract

Roadside corridor serves as a major hub for street entrepreneurs to display their items and carry out their business in most African city. The major objective of this research is to be carried out roadside analysis of the surrounding air along street corridor in other to determine the amount of Carbon monoxide (CO), Sulphur dioxide (SO_2), Nitrogen dioxide (NO_2) and Particulate Matter (PM_{10}) which are by-product of automobile on the street entrepreneurs on the selected street in Akure, Ondo State, Nigeria. Likewise, both Survey and experiment analysis was deployed to obtain the real state of some of the common air pollutant in the corridor of study. Results shows that these informal entrepreneurs are greatly affected by road traffic air pollutant; as 12.45% of the respondents have high nasal discharge, 12.21% of the respondents reported high throat irritation, 12.21% of the respondents cough often, 4.72% reported high level of breathlessness and 4.11% reported high asthmatic condition. While it was observed that between 13.943ppm to 3.225ppm of carbon monoxide, 0.025 ppm to 0.007 ppm sulphur dioxide, 0.071 ppm to 0.016ppm of Nitrogen dioxide and 1156.000 $\mu g/m^3$ to 328.260$\mu g/m^3$ of Particulate matter 10 (PM_{10}) is generated along the corridors of study. The study recommends that entrepreneurs in the informal sectors operating along road corridors should carry out their business at least 150m away from major road traffic path to avoid over exposure to automobile generated air pollutions as this will lead to a decrease in health hazard occasioned by over-exposure.

Keywords: Informal Entrepreneurs. Air Pollution. Road Traffic. Health Hazard.

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1 Introduction

Due to the recent realities brought on by the economic crisis and the rise in unemployment, many people and families have been forced to shift their efforts to other forms of business in the informal entrepreneurial sector in order to cope with these economic realities (WILLIAMS; GURTOO, 2012). As a result, street entrepreneurship has become the norm for many urban dwellers in developing cities of the world (MATZEMBACHER; GONZALES; SALDANHA, 2019).

Many people are moving to the informal entrepreneurial sector along road traffic corridors in order to survive new government policies that prevent the majority of people from profiting effectively from their white-collar jobs. These trades are advertised on roadside corridors (IGWE, et al., 2014). The informal economy is a type of economic activity that is not sufficiently covered by formal provisions, both in law or in exercise, this is according to the International Labour Organization (ILO, 2011; WILLIAMS; GURTOO, 2012).

The surrounding environmental quality of air condition at a location is a reflection of the state of the region due to the prevailing activities throughout the spatial spectrum, according to the Federal Highway and Administration agency in the United States of America-USA (FHWA, 2019). It has been noted that fossil-fuelled vehicles pollute the air and surrounding areas, which can be distressing for those who go about their daily lives adjacent to these roadside corridors, contributing to the bad quality of the environment globally (GETACHEW, 2015; ZHANG, et al., 2018).

Over time, research on entrepreneurship has focused on the effects of various attributes, organized physical characteristics, and resource configurations on entrepreneurial output (COMPANYS; MCMULLEN, 2007).

However, the understanding of how roadside and/or street entrepreneurs in an emerging market are affected by the surrounding environment is particularly important due basically to the releases from the tile pipe gases emitting from automobile as they pass along the road corridor in which these entrepreneurs carry out their informal entrepreneurship activities (ODESANYA; OKOKO; STEPHENS, 2019). In actuality, few studies have been done on the safety of informal entrepreneurs along such route corridors despite the vibrancy of the sector (LEFEBVRE; De STEUR; GELLYNCK, 2015).

Studies in this field are few and tend to focus on cutting-edge high-tech companies (VRONTIS, et al., 2017). As the case of entrepreneurship on roadside risks is concerned, more research is also required in low-income enterprising (ALFIERO; LO GIUDICE; BONADONNA, 2017).

The main issue that many small to medium-sized businesses faces, especially those engaged in street initiatives, is how to replace active innovation with something more profitable (FARSI; TOGHRAEE, 2014). These entrepreneurs also deserve to be protected from the unpleasant externality of the transportation sector, caused by the release of harmful gaseous substances to the environment. This essay tries to fill that knowledge vacuum, focusing on street entrepreneurs and the safety concerns surrounding their workspace in relation to air pollution.

The prevailing assumption in the literature that street entrepreneurs lack innovation and that their safety concerns are not taken seriously stems from their low educational standards (REYNOLDS et al., 2002; BHOLA, et al., 2006; MATZEMBACHER; GONZALES; SALDANHA, 2019).

In this way, what are the exposure levels to air-related pollutants that roadside businesses in the informal sector are exposed to? This question is what drives this study. An inquiry was conducted to address this subject, with a case study concentrating on roadside merchants that engage in Petty trade, street hawkers, vulcanizers, owners of roadside shops, auto mechanics who work on cars alongside the road, and food sellers (beans cake makers, snacks markers, etc.) all engaging in selling their product along the street in a developing city in Nigeria.

By gaining a deeper understanding of the nature and qualities for entrepreneurial safety on road corridor, this study will add to the body of knowledge on street vendors. In particular, it is hoped to further knowledge of how street vendors can remain safe during economic downturns that have prompted many to turn to this type of business for family sustainability.

2 Methodology

Akure-south Township is located in Ondo State, Nigeria and it is the capital city of the state. The study area lies on latitude 7° 4’ and 70 25’ north of the equator and longitude 5° 5’ 5°30’ east of the Greenwich meridian. Figure 1 shows the map of Akure-south Local government while, figure 2 shows the land use type and the network of road for the selected corridor of study.

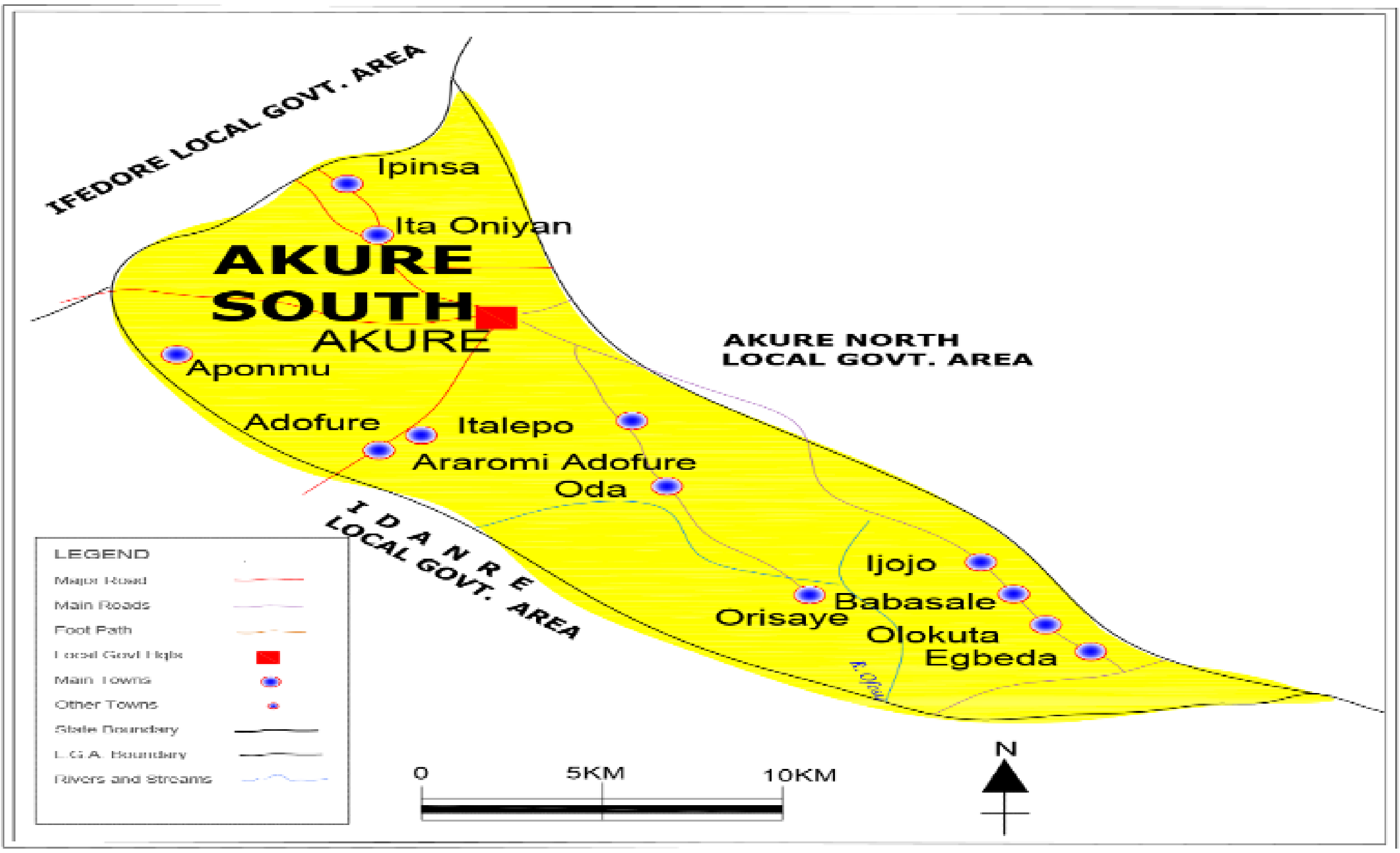

Figure 1. Map of Akure-South LGA. Ondo State, Nigeria. Source: The author (2019).

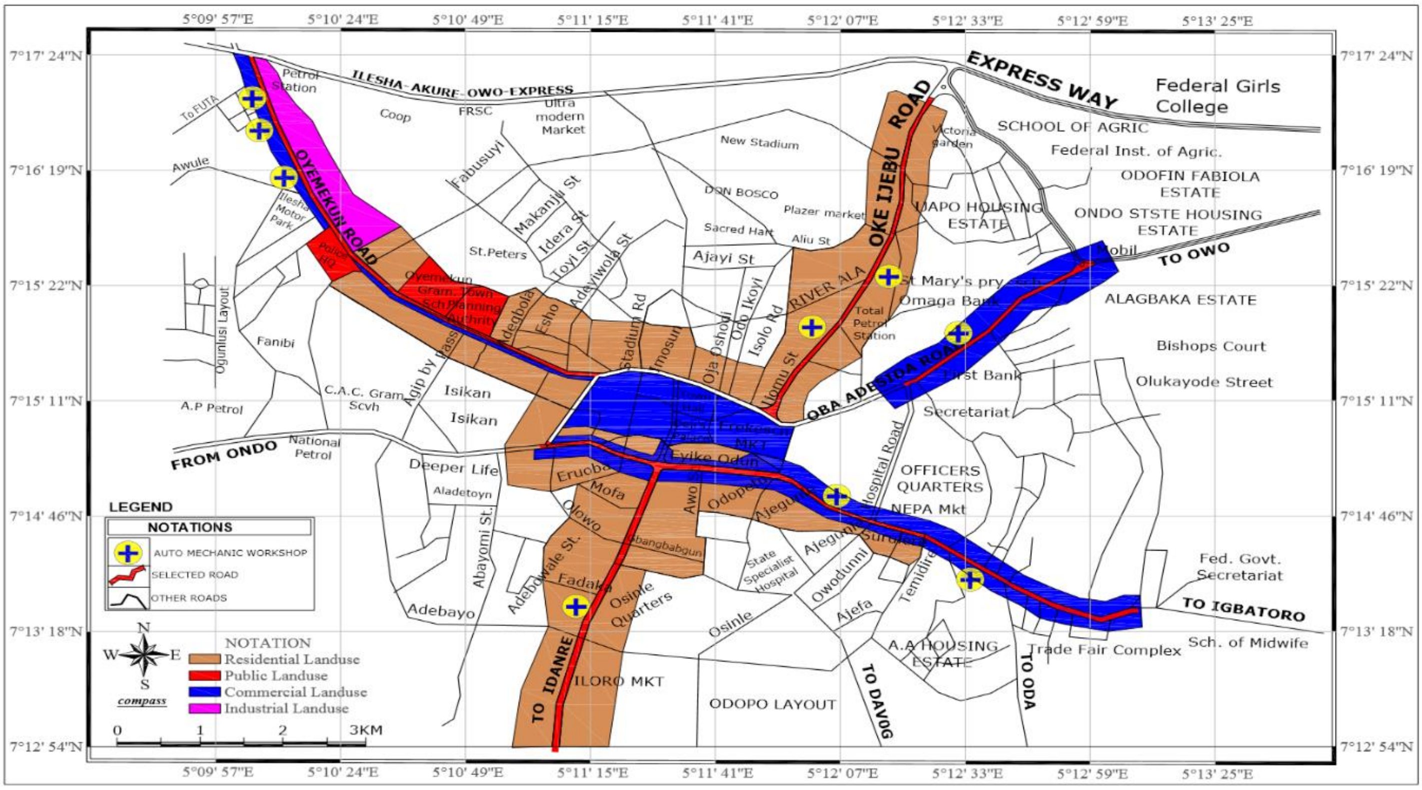

Figure 2. Akure-South Network of Road Showing Network of Selected Road Corridor, and Land use. Source: The author (2019).

Research Population

A reconnaissance survey "Unpublished record" was carried out to count the population of people along the corridors of study (petty traders, street hawkers, vulcanizers, roadside shop operators etc.) who work every day to meet up with family demand. These populations cover both sides of the roads. The width of coverage was 25 metres from the road median. Investigators were deployed to move along this corridor from 9am to 12 noon (Monday, Wednesday and Friday) and count people who subsist along the corridor.

A pre-sampling of data was conducted to show the population in other to make the work scientific, five per cent (5%) of the total population were sampled hence, 827 people (Table 1).

Data Gathering from Respondents

The method deployed in obtaining the research data was by gathering information with the use of a questionnaire as seen in appendix 1. These measures were in agreement with the ethical standards of the committee responsible for human at the Federal University of Technology, Akure, Ondo State (OSG, 2012), Nigeria with code FUTA/ETH/23/100 as seen in appendix 2. This was done so as to make assertion of possible air pollutant's influence on the health of the entrepreneurs since most of them earn their living on the street. These air pollutants have been linked to asthma, coughing, breathlessness, nasal discharge, throat discomfort, and other symptoms (OGUNTOKE; YUSSUF, 2008). Field enumerators were deployed to administer questionnaires to collect data for the study.

Method of collecting the Air Pollutant

Msa Altair 5X air analyser/detector device (msa xcell sensor technology brand) was used to collect data (gas content) of Nitrogen dioxide (NO_2), Sulphur dioxide (SO_2), Carbon monoxide (CO) while CLJ-D Particulate counters detector (100-1million (PCS) Brand) was used to analyse the Particulate matter of PM_{10}.

Operation Procedure for Collecting Pollutant Gases using Altair5x gas monitor

Apparatus: Global Positioning System (GPS), Altair5x gases monitor in ambient air and Stopwatch.

Altair5x gas analyser works with the aid of sensors to detects gases. The device was turned on by pressing standby button and waiting for (10 – 15) seconds for the next page to display on screen. 2 red alarm indicators make sound, just to notify that the device is on and ready for collect air for analysis.

The inlet pump was blocked for 10 seconds with left finger in order for the pump test to pass. The device (MSA Altair 5x) was then pointed to the location/spot where measurement is to be taken. After a while the READ button is pressed on to simultaneously display data for the gaseous value of each of the gases collected through the inlet pump. Gases measured are Nitrogen dioxide (NO_2), Sulphur dioxide (SO_2), Carbon monoxide (CO). Figure 3 shows the Msa Altair 5X in use during the field data Collection for air pollutant in one of the study location.

Figure 3. Msa Altair 5X in use during the field data Collection.

Operation Procedure for Collecting Particulate Matters (PM_{10})

Apparatus: GPS, CLJ-D Particulate counter (100-1million (PCS) Brand) and Stopwatch

To measure PM10, a CLJ-D Particulate counter was employed. An internal volume-controlled pump drew the ambient air into the monitor at a rate of 1.2 litres per minute. The sample was collected onto a filter after passing through the measuring cell, laser diode detector, and measuring cell. The pump also produces the necessary clean sheath air, which is filtered and returned to the optical chamber via the sheath air regulator so as not to prevent contamination of the laser-optic assembly.

The sample air is flown at 1.2 L/min through a thin, fine dust filter, eliminating all dust particles. Clean air is drawn in by a membrane pump through a valve as a safety measure. A flow controller that tracks the pressure drop across the orifice was in charge of controlling the sample's flight. To keep the optic and the measurement chambers clean, some of the cleaned air was utilized to irrigate the measuring chamber. The system was calibrated for zero particles using this clean air during the functional self-test. Figure 4 shows the CLJ-D Particulate counter used during the field data collection process.

Table 1. Population of People in the selected corridor to be sampled for Akure-south LGA. Source: The author.

S/No	Corridor of Study	Population	5% Population sampled
1.	Cathedral to Road Block	3626	182
2.	Idanre Road (from Arakale/Idanre Road Junction to Oba Afunbiowo Estate, Oke-Aro);	3567	178
3.	Adekunle Ajasin Road/Parliament Road/Igbatoro Road (NEPA Junction to SCAAB Filling Station at Igbatoro Road)	2146	107
4.	Arakale Road (from NEPA Roundabout to Isinkan Roundabout)	2218	111
5.	Oba Adesida Road (from Nigeria Police Force "A" Division, Akure to Mobil Filing Station, Fiwasaye Junction).	2109	105
6.	Oke-Ijebu Road (from Ijomu junction to Oke-Ijebu-Ijapo Roundabout)	2875	144
	Total Population	16541	827

Source: Researchers pilot survey (2019).

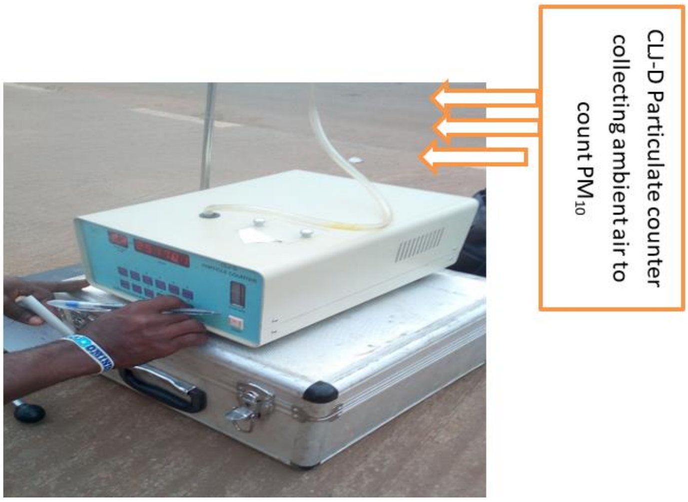

Figure 4. CLJ-D Particulate counter in use during the field data Collection.

3 Results and Discussion

Social and Economic Characteristics of respondent in Akure South LGA for the selected road corridors

The gender analysis in this study is accessible in Table 2 It shows that there are more male in the respondents than female with men having 55% of the total population sampled.

This could be because most men are bread winners hence the need to work and support the family in the absences of white-collar jobs (BUDIG; 2006). About 40.3% of those sampled are married, while 49.8% are single, showing that most of those carrying out their daily businesses in these corridors of studies are mostly singles although a high percentage are also married.

For education, 14.6% are without any formal education while 51% have primary/secondary education. Showing that more than halve of those on the street doing business are educated and with right policies and plan can be encourage in carrying out more profitable businesses that could spare than the danger attached to working along road corridors.

The highest age group sampled within the corridor of study is between 30- to 44-year-old; they are 43.3% of the total sampled respondents while self-employed individuals have the highest per cent of 51.9 for occupational status. Around 85.7% of respondents spend around 8 hours on these corridors and 63.8% of them have no children/ward that assists.

About 82.6% of the respondents do not smoke suggesting that most of those sampled for the study do not have social life of smoking. Smoking habit can influence the result negatively since the Federal ministry of health warns that smokers are liable to die young. Smoking affects the health in a negative manner (MONYE, et al., 2020).

About 10.3% of them uses firewood to cook and 55.9% of them use electrical stove/cooking gas which is a cleaner form of energy to cook either at home or at the site where they carry out their daily business.

Table 2. Social and Economic Characteristic of Respondents in Akure South LGA, Nigeria.

S/N	Type	Situation / Status	Frequency	Population %
1	Sex	Male	455	55.0
		Female	372	45.0
2	Marital status	Single	333	40.3
		married	412	49.8
		divorced	52	6.3
		widowed	30	3.6
3	Educational status	No formal education	121	14.6
		Primary/Secondary education	422	51.0
		Post-Secondary (NCE,OND,HND ETC)	178	21.5
		University Education	106	12.8
4	Age	15-29	249	30.1
		30-44	358	43.3
		44-49	179	21.6
		60 and above	41	5.0
5	Occupational status	Self employed	429	51.9
		Private/public sector employer	211	25.5
		Artisan	149	18.0
		others	38	4.6
6	Time spend around corridor of study	2 hours	146	17.7
		6 hours	236	28.5
		8 hours	295	35.7
		0thers	150	18.1
7	Children / ward assisting	Yes	299	36.2
		No	524	63.8
8	Years' along corridor	Less than 2 years	207	25.0
		2 to 4 years	300	36.3
		4 to 6 years	215	26.0
		Others	105	12.7
9	Do you smoke?	Yes	144	17.4
		No	683	82.6
10	Source of energy to cook	Firewood	85	10.3
		Kerosene stove	243	29.4
		Electric stove / gas cooker	462	55.9
		others	37	4.5

Source: Author's Data Analysis (2019).

The Air Pollutant along each corridor of study as acquired for a period of Three (3) months starting from March, 2019 to May, 2019 is available in table 3, table 4, table 5, table 6, table 7 and table 8 for the different road corridor used for this study.

Investigations carried out in Akure-South LGA along the first corridor of study (Cathedral junction to Road Block junction) demonstrate that Ilesha garage junction has the uppermost Carbon monoxide (CO) of 8.07 ppm, Sulphur dioxide (SO_2) of 0.01 ppm, Nitrogen dioxide (NO_2) of 0.04ppm respectively and the highest level of Particulate Matter (PM10) 467.86µg/m^3 was recorded in the afternoon. The results for CO, SO_2 and NO_2 is in support of those detected by OJO; AWOKOLA, (2012) and OKUNOLA et al. (2012) nevertheless result obtained by UDE; ANJORIN; EGILA, (2016); ABAM; UNACHUKWU, (2009); OGUNTOKE; YUSSUF, (2008) illustrates higher values for CO but almost similar results for SO_2. Table 3 shows the average air pollutant for Cathedral to Road Block from March, 2019 to May, 2019.

Search conducted along the second corridor of study in Akure South LGA i.e. (A-Division junction to Fiwasaye) shows that Fiwasaye junction has the peak Carbon monoxide (CO) of 11.304 ppm, Sulphur dioxide (SO_2) of 0.015 ppm, Nitrogen dioxide (NO_2) of 0.057ppm respectively and the highest average level of Particulate Matter (PM10) 552.67µg/m^3 was chronicled in the afternoon at A-division junction.

The result for CO, SO_2 and NO_2 is in supports of those observed by Ojo and Awokola (2012), and Okunola et al. (2012). However, results obtained by Oguntoke and Yussuf (2008), Abam and Unachukwu (2009), and Ude, Anjorin and Egila (2016) display upper values for CO but almost similar results for SO_2. Table 4 highlights the average air pollutant levels recorded.

The third corridor of study is conducted along Ijomu junction to Oke-Ijebu roundabout, its shows a value for Carbon monoxide (CO) 13.686 ppm, Sulphur dioxide (SO_2) 0.020 ppm, Nitrogen dioxide (NO_2) 0.068ppm and the average level of Particulate Matter (PM10) 1099.69µg/m^3 was recorded in the afternoon at Ijomu junction.

The result for CO, SO_2 and NO_2 is in supports of those observed by Ojo and Awokola (2012), and Okunola et al. (2012). Similarly, result obtained by Oguntoke and Yussuf (2008), Abam and Unachukwu (2009), and Ude, Anjorin and Egila (2016) show higher values for CO but almost similar results for SO2. Table 5 reveals the average air pollutant values obtained from March, 2019 to May, 2019.

Investigations carried out along the fourth corridor of study in Akure South (Arakale /NEPA 1st Bus stop Roundabout to Isinkan Roundabout) for the Three (3) months indicate that the highest Carbon monoxide (CO) value of 12.409 ppm, Sulphur dioxide (SO_2) value of 0.017 ppm, Nitrogen dioxide (NO_2) value of 0.062ppm and the peak average level of Particulate Matter (PM_{10}) value of 622.55 µg/m^3 recorded in the afternoon was chronicled at Arakale/NEPA 1st Bus stop point.

It is noteworthy to equally observe that Heath centre point also recorded 0.017ppm for SO_2 in the evening peak. The result for CO, SO_2 and NO_2 is in supports of those observed by Ojo and Awokola (2012), and Okunola et al. (2012). But results obtained by Oguntoke and Yussuf (2008), Abam and Unachukwu (2009), and Ude, Anjorin and Egila (2016) show higher values for CO but almost similar results for SO_2. Table 6 displays the average air pollutant for Arakale road (from Arakale/NEPA 1st Bus stop Roundabout to Isinkan Roundabout.

Table 3. Average air Pollutant (in ppm while PM_{10} in μg/m^3) for Cathedral to Road Block from March 2019 to May 2019. Source: The author.

Pollutant	Cathedral point			Ilesha garage			Road Block		
	Morning	Afternoon	Evening	Morning	Afternoon	Evening	Morning	Afternoon	Evening
CO	6.670	5.820	6.880	8.070	5.640	7.380	6.950	5.850	6.820
SO_2	0.008	0.008	0.008	0.010	0.008	0.009	0.009	0.008	0.008
NO_2	0.033	0.029	0.035	0.040	0.028	0.037	0.035	0.029	0.035
PM_{10}	358.240	451.220	363.720	390.780	467.860	396.760	290.890	349.350	295.340

Source: Author's Data Analysis (2019).

Table 4. Average air Pollutant (in ppm while PM_{10} in μg/m^3) for A-Division to Fiwasaye junction from March 2019 to May 2019.

Pollutant	1st bank			A-division			Fiwasaye		
	Morning	Afternoon	Evening	Morning	Afternoon	Evening	Morning	Afternoon	Evening
CO	7.195	6.942	7.383	7.356	6.361	6.665	11.304	7.077	9.614
SO_2	0.009	0.009	0.009	0.009	0.008	0.008	0.015	0.009	0.011
NO_2	0.036	0.035	0.037	0.037	0.032	0.034	0.057	0.035	0.049
PM_{10}	337.100	542.970	464.110	461.250	552.670	468.310	368.710	442.270	357.630

Source: Author's Data Analysis (2019).

Table 5. Average air Pollutant (in ppm while PM_{10} in μg/m^3) for Oke-Ijebu Road (from Ijomu junction to Oke-Ijebu from March 2019 to May 2019.

Pollutant	1st bank			A-division			Fiwasaye		
	Morning	Afternoon	Evening	Morning	Afternoon	Evening	Morning	Afternoon	Evening
CO	7.195	6.942	7.383	7.356	6.361	6.665	11.304	7.077	9.614
SO_2	0.009	0.009	0.009	0.009	0.008	0.008	0.015	0.009	0.011
NO_2	0.036	0.035	0.037	0.037	0.032	0.034	0.057	0.035	0.049
PM_{10}	337.100	542.970	464.110	461.250	552.670	468.310	368.710	442.270	357.630

Source: Author's Data Analysis (2019).

Search conducted along the fifth corridor (NEPA junction to SCAB Filling station junction) indicates that the maximum Carbon monoxide (CO) value of 7.433 ppm, Sulphur dioxide (SO_2) value of 0.011 ppm, Nitrogen dioxide (NO_2) value of 0.051ppm were recorded and the highest average level of Particulate Matter (PM10) of 523.1 μg/m3 was detected in the afternoon at NEPA point. The result for CO, SO_2 and NO_2 is in supports of those surveys (i.e. OJO; AWOKOLA, 2012; OKUNOLA, et al., 2012). The result obtained by Oguntoke and Yussuf (2008), Abam and Unachukwu (2009), and Ude, Anjorin and Egila (2016) shows higher values for CO but almost similar results for SO2. Table 7 elucidates the average air pollutant for NEPA junction to SCAB filling Station from March, 2019 to May, 2019.

Analysis conducted along the sixth corridor of study (from Arakale/Idanre road junction to Oba Afunbiowo estate, Oke-Aro) shows that the highest Carbon monoxide (CO) value of 13.568 ppm, Sulphur dioxide (SO_2) of 0.019 ppm, Nitrogen dioxide (NO_2) of 0.068ppm was recorded and the highest average level of Particulate Matter (PM_{10}) value of 885.74 μg/m^3 was observed in the afternoon at Commercial junction. The results for CO, SO_2 and NO_2 are in supports of those observed by (OKUNOLA et al., 2012; OJO; AWOKOLA, 2012). However, results obtained by Oguntoke and Yussuf (2008), Abam and Unachukwu (2009), and Ude, Anjorin and Egila (2016) highjlight higher values for CO but almost similar results for SO_2. Table 8 explains the average air pollutant values from March, 2019 to May, 2019.

Table 6. Average air Pollutant (in ppm while PM_{10} in μg/m^3) for Arakale Road (from 1st Bus stop/NEPA Roundabout to Isinkan Roundabout from March 2019 to May 2019. Source: The author.

Pollutant	Health Centre			Isinkan Roundabout			Arakale/NEPA 1st Bus stop		
	Morning	Afternoon	Evening	Morning	Afternoon	Evening	Morning	Afternoon	Evening
CO	11.710	11.506	13.590	7.702	6.361	9.211	12.409	10.490	12.343
SO_2	0.015	0.015	0.017	0.009	0.008	0.010	0.017	0.013	0.015
NO_2	0.059	0.058	0.069	0.039	0.032	0.047	0.062	0.052	0.063
PM_{10}	356.730	426.730	362.190	369.480	441.790	375.140	520.150	622.550	528.120

Source: Author's Data Analysis (2019).

Table 7. Average air Pollutant (in ppm while PM_{10} in μg/m^3) for Adekunle Ajasin Road/Parliament Road/Igbatoro Road (NEPA Junction to SCAAB Filling Station at Igbatoro Road) from March 2019 to May 2019.

Pollutant	NEPA			SCAB Filling Station			Shoprite		
	Morning	Afternoon	Evening	Morning	Afternoon	Evening	Morning	Afternoon	Evening
CO	7.433	7.752	10.058	4.575	4.198	3.161	6.015	4.610	5.338
SO_2	0.009	0.009	0.011	0.007	0.007	0.007	0.008	0.007	0.007
NO_2	0.037	0.039	0.051	0.023	0.021	0.016	0.030	0.023	0.027
PM_{10}	436.300	523.100	443.000	249.572	299.100	253.400	334.970	401.530	340.100

Source: Author's Data Analysis (2019).

Table 8. Average air Pollutant (in ppm while PM_{10} in μg/m^3) for Idanre Road (from Arakale/Idanre Road Junction to Oba Afunbiowo Estate, Idanre Road) Afunbiowo Estate, Oke-Aro) from March 2019 to May 2019.

Pollutant	Cashold			Commercial			Afunbiowo Estate		
	Morning	Afternoon	Evening	Morning	Afternoon	Evening	Morning	Afternoon	Evening
CO	11.667	8.247	11.200	13.568	7.215	9.236	5.307	4.419	4.606
SO_2	0.014	0.009	0.013	0.019	0.009	0.010	0.008	0.007	0.007
NO_2	0.058	0.041	0.057	0.068	0.036	0.047	0.027	0.022	0.023
PM_{10}	452.750	541.850	459.680	780.090	885.740	792.030	370.660	444.460	376.330

Source: Author's Data Analysis (2019).

Road side street entrepreneurs response to Illness due to Air borne pollutants in Okitipupa LGA

Air borne diseases are largely indices of lung malfunctioning as a consequence of exposure to pollutants which enters into the respiratory tracts (WEILAND et al., 1994, Al-HURAIMEL et al., 2022). Coughing according to Oguntoke and Yussuf (2008) could be signs of some health problems emanating from emission of pollutants, however, result from the population shows that only 5.3% have high coughing problem. Figure 3 shows the frequency/rate of incidents coughing of respondents along the corridor of study.

About 48.85% of sampled respondents do not cough often while 12.21% of sampled respondents cough often; this is a sign of danger as the prevalence of chronic cough has been estimated at between 3% and 40% of the population (FORD et al., 2006) and 38.94% cough moderately. These findings indicate that pollutant from automobile in the selected corridor of study is not really a serious problem. However, result obtained are different from previous study carried out by Oguntoke and Yussuf (2008) which observed that 56.4% have high level of cough in those selected corridor of studies in Abeokuta metropolis in Ogun state, Nigeria.

Breathlessness is another sign that could cause asthma, 59.01% of the respondents do not have breathless problem, 36.28% have moderate levels of breathlessness while 4.75% have high level of breathlessness. Figure 3 displays the distribution of level of breathless. The result is also in close association to those obtained by Oguntoke and Yussuf (2008) in which they obtain 23.4% for respondents in their study.

For Nasal discharge, figure 5 elucidates the Nasal discharge pattern of respondent in Akure south LGA in the selected corridor of study. About 12.45% of the respondents have high Nasal discharge; this observed value is quite low to assume that the corridor could be the main contributor to it. About 53.6% of the respondents have low nasal discharge this result is higher than 3.6% reported by (OGUNTOKE; YUSSUF, 2008).

For Throat irritation, figure 5 expresses the throat irritation pattern of respondence in Akure south LGA in the selected corridor of study. About 12.21% of the respondents have high throat irritation and 53.69% have low throat irritation. This suggests that the effect of the discharge emission from automobile in these corridors is quite low to pose any serious health effect as it relates to throat irritations.

Asthma is a disease caused by fine particle in the air that could affect effective breathing; figure 5 shows the Asthma distribution pattern of respondence in Akure south LGA for the selected corridor of study. A closely study shows that about 4.11% of the respondents have high asthmatic conditions and 76.90% have low asthmatic condition. This suggests that the effect of the discharge emission from automobile in these corridors is quite low to pose any serious.

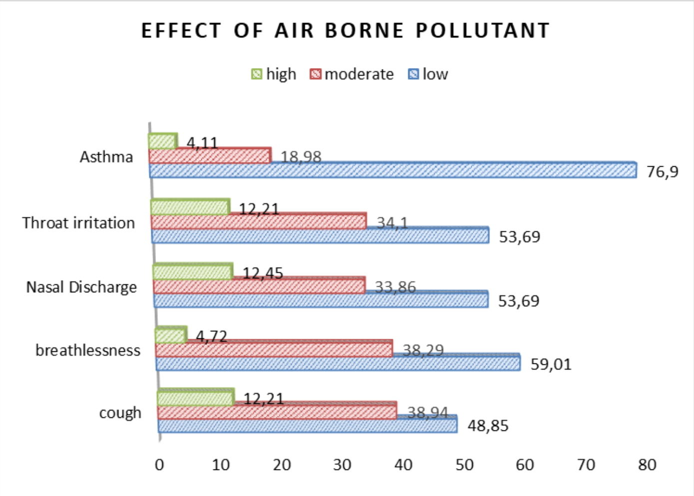

Figure 5. Illness due to Air borne pollution in Akure-south LGA. Source: Author's Data Analysis (2019).

4 Conclusions

Due to high levels of potential health hazards associated with automobile-generated pollutants on humans subsisting along traffic corridors as observed from the study, use of open spaces beside roads for shops should be discouraged in order to minimise human exposure to atmospheric pollution. The use of noise masks, regular and compulsory medical check-ups should be introduced by the state and local government through legislative policies.

This will also enable data to be gathered on the health effect of near-road pollution on roadside entrepreneurs. Based on the findings from the study, it is recommended that entrepreneurs in the informal sectors should carry out their business at least 150m away from major traffic corridors since it has been observed that at such distance, the effect of such pollutants wears out greatly so as to avoid overexposure to automobile generated pollutions as this can possibly lead to a decrease in the risk of business health hazard and increase their safety.

CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

JFO researched and wrote the article.

DECLARATION OF INTEREST

The author declares that there are no conflicts of interest in the course of this study either directly or indirectly.

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