

Perceived Impact of Air Quality and its Implications for a Sustainable Environment in Rivers State

Susan I Ajiere¹, Bridget E. Diagi², David Edokpa², Ifeoma M. Onyejekwe², Uloma L. Onyeananam³

¹University of Port Harcourt, Nigeria

²Federal University of Technology Owerri, Nigeria

³Rivers State University, Nigeria

²Institute of Natural Resources, Environment and Sustainable Development (INRES), University of Port Harcourt

³Institute of Geoscience and Environmental Management (IGEM) Rivers State University Port Harcourt

Abstract:- Environmental sustainability is important to many nations worldwide, it is the ability to protect natural resources for the benefit of current and future generations while maintaining the ecological balance of our planet and If steps are not taken to lessen the sources of air pollution in our surroundings, air pollution poses a threat to the sustainability of the ecosystem. The Aim and Objective of this study is to assess the perception of residents on the rate of air quality/ air pollution in Port Harcourt and its implications for achieving a sustainable environment. A structured questionnaire was used to solicit information from residents. An online survey was used for this survey, a cross-sectional study methodology was chosen, and a questionnaire was created using the Google Documents website (doc.google.com). The link was deactivated after 400 answers during its three-month active period, during which it was closely monitored. Bivariate percentage analysis and cross-tabulation were used to analyse the study's data. The results show that 73.3% of the participants have been residents of Port Harcourt for more than 11 years. This suggests that they have a deep understanding of the environment. Over 96% are educated which signifies that the majority are literate and understand the dangers associated with air pollution, and 79.5% of the respondents have noticed a change in air quality where they live while 78.1% observed that the air quality is very low. Above 88.3% rated the air pollution to be high and 59% are not certain if the air quality will improve. This work recommends urgent intervention by the government, and regulatory bodies to work towards improving the air quality in the state by stopping or reducing any activity that leads to the increase of air pollution and ensuring the implementation of environmental policies, this will help in achieving a clean and sustainable environment.

Keywords:- Environmental Sustainability, Air Pollution, Air Quality, Ecological Balance.

I. INTRODUCTION

The perceived rate of air quality, as perceived by individuals and communities can have significant implications for creating a sustainable environment. Air pollution is a significant factor in environmental degradation (Chaabouni et al. 2016). Pollution happens when

constituents that can harm people and other living things are let out into the environment without control measures. Manisalidis et al., 2020 noted that pollutants are harmful substances either in solid, liquid, or gaseous states that occur in higher than normal concentrations which tend to impact negatively on the environment. While air quality is referred to as the quantity of contaminants and particulates in the air we breathe.

Numerous factors, such as fossil fuel combustion, industrial activity, car emissions, and natural occurrences like wildfires, can contribute to poor air quality. According to Zaidi and Saidi (2018) and Apergis and Garzón (2020), greenhouse gases like carbon dioxide (CO₂) are the major gases resulting in air pollution in the atmosphere. Government, academics, the media, and the general public are all very interested in how air pollution affects the environment and human health (Ajire et al., 2022). In this day and age, where greenhouse gas emissions are either constant or rising, it is essential to recognize the importance of breathing clean air (Ghulam and Syed, 2020). Due to several actions taken by humanity, ambient and outdoor air pollution have grown to be major issues in this era. Approximately three billion people worldwide continuously depend on burning fuels in cooking for their families as well as heating, leading to extremely elevated levels of indoor air pollution (Peter Rajaj et al., 2021). In terms of non-communicable diseases (NCD), outdoor (ambient) air pollution ranks as the world's top environmental risk factor (Murray, 2020).

Air quality is a relevant environmental justice issue because of its regional variability, where more disadvantaged populations bear an unjustifiable burden of environmental health risks (Hajat et al., 2015). Numerous studies demonstrate a direct link between air pollution and mortality rates. In other words, both wealthy and developing countries experience negative effects on human health as air pollution levels rise (Li et al. 2019; Kayani et al. 2020). According to Darçin (2017), air pollution causes over 3.3 million deaths worldwide each year. Poor health brought on by air pollution increases healthcare costs and harms labor productivity. Domestic output also declines as productivity does (Mehrra et al. 2011), which slows down the entire economic cycle. Policymakers and economists are concerned about the societal cost of air pollution. A precise

assessment of air pollution is necessary for effective air quality management, but if the amount of pollution is overstated, overregulation results (Lu et al. 2017), which ultimately harms a country's economic growth. Various health implications of air pollution exist. Even on days with little air pollution, vulnerable and sensitive people's health can be negatively impacted. Chronic obstructive pulmonary disease (COPD), coughing, shortness of breath, wheezing, asthma, respiratory illnesses, and high hospitalization rates (a measure of morbidity) are all directly associated with short-term exposure to air pollution. Chronic asthma, pulmonary insufficiency, cardiovascular illnesses, and cardiovascular mortality are the long-term impacts of air pollution (USGCRP, 2009). Diabetes appears to be brought on by prolonged exposure to air pollution, according to a Swedish cohort study (Eze et al., 2014). In addition, air pollution appears to have several detrimental consequences on human health in infancy, including respiratory, cardiovascular, mental, and prenatal issues that can result in infant mortality or chronic illness as adults (Kelishadi, 2010). The perception of air quality can have an impact on sustainability in a variety of ways, such as raising public awareness of the need for cleaner air and the demand for stronger rules and sustainable measures to do so. Additionally, it motivates decision-makers to adopt air quality laws and policies with greater vigor. As the need for sustainable solutions rises, it may also encourage the development and acceptance of cleaner technology. A variety of air pollutants, including greenhouse gases, are a factor in climate change. Reducing these pollutants can enhance efforts to mitigate climate change while also improving air quality. When people see air quality as a climate issue, they may be more willing to support initiatives to cut emissions and switch to low-carbon energy sources. In conclusion, a sustainable ecosystem is created in large part by how well the air is considered to be. It can raise

public awareness, affect legislative choices, encourage technical development, and encourage group action to enhance air quality and address more extensive environmental issues. Individuals and societies may help create a healthy reliable sustainable tomorrow by realizing the significance of air quality.

A. Study area with map

The Port Harcourt metropolis is the oil and gas center of Nigeria's Niger Delta and the capital of Rivers State (figure 1). With a population of over 1.5 million, it has an area of about 1811.6 km² (world.wng.org, 2017 and Weli & Efe 2015). In Rivers State, it is situated between Latitude 4°45'N and Latitude 4°55'N, (AAAS, 2021 and Kio-Lawson & Dekor, 2014) and between Longitude 6°55'E and Longitude 7°05'E. Abia and Imo states, Akwa-Ibom state, Bayelsa state, and the Atlantic Ocean from the city's northern, eastern, western, and southern boundaries, respectively (Fig. 1). It is located between the Dockyard Creek/Bonny River and the Amadi Creek, with an estimated mean elevation of 12 kilometers above mean sea level (Weli & Efe 2015). The Port Harcourt metropolitan is made up of the Obio/Akpor and Port Harcourt local government areas (LGAs). The atmosphere of Port-Harcourt demonstrates that there are two different seasons there: the wet season and the dry season. With a monthly mean of 348.92 mm and 364.68 mm, respectively, July and September have the highest average monthly rainfall. The month of December saw the least amount of rainfall, at 26.40 mm. The mean maximum temperature over the Port Harcourt metropolis is around 34°C in March, and the mean lowest temperature is about 21°C in January. Port Harcourt is less affected by the harmattan period, which is a climatic phenomenon that many towns in West Africa encounter. Ajiere and Weli (2018); World Meteorological Organisation, 2016.

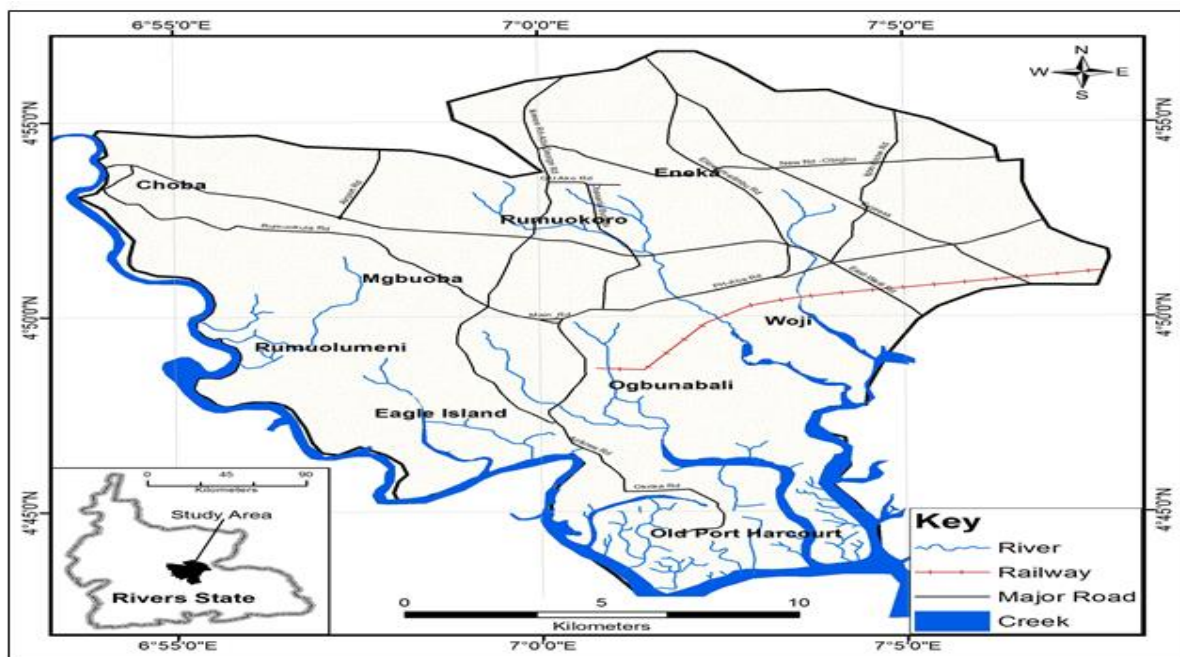


Fig. 1: Map of Port Harcourt

II. LITERATURE REVIEW

A. Air pollution and sources

Air pollution is a major issue in the environment that affects ecosystems, man's health, and the climate globally. The term "air pollution" refers to the presence of one or more contaminants, or combinations of them, in the air for an extended period in amounts that have the potential to harm property, human health, animals, or plants, or to unreasonably interfere with the comfort and well-being of people or property. A solid (big or sub-molecular), liquid, or gaseous air pollution may be present in the atmosphere for a short period or for a long time. These substances that result in air pollution harm the environment by affecting people's comfort, health, or ability to eat certain foods (Purohit, 2004). "Air pollutants" are any chemical, biological, or physical substances that alter the atmosphere's inherent properties. Present in earth space. Both natural occurrences such as (volcanic eruption, wild fires, smoke, burning of forests, etc.) and man-made (burning of fossil fuels, transport services, emissions from plants, as well as emissions from other industry activities) processes produce air pollution. There are two categories of air pollutants: primary and secondary. Pollution from primary sources are materials that are created directly by a process; examples of these include carbon monoxide gas from vehicle exhaust and volcanic ash. In the lower atmosphere, heat and solar radiation have the power to convert primary pollutants into secondary pollutants like ozone (O₃) and other photochemical pollutants. Pollutants are dangerous substances that are created in more than normal amounts and lower the quality of our environment. They can be solids, liquids, or gases. As a result of the pollution that human activity causes to the soil, water, and air that we breathe, the ecosystem is negatively impacted. The industrial breath brought about the generation of massive amounts of airborne pollutants that are damaging to human health, even if it was also a major achievement in terms of technology, society, and the supply of numerous services. However, these whole processes of industrialization have brought about much air pollution which has become a discussion on a global scale as a result of public health concerns and the well-being of humans. This significant issue is linked to social, economic, and legal issues as well as lifestyle choices. Undoubtedly, global urbanization and industrialization are escalating to previously unheard-of and unsettling levels in our day and age. Approximately 9 million fatalities globally are attributed to anthropogenic air pollution, making it one of the greatest threats to public health (WHO 2019).

According to Diagi et al., 2022, one of the main causes of air pollution in cities is vehicle emissions. Furthermore, vehicle transportation is a source of a wide range of air pollutants with differing degrees of toxicity (Roychowdhury et al., 2016). (Aliyu&Amadu, 2017) state that between 80% and 90% of ambient carbon monoxide (CO), hydrocarbons (HCs), particulate matter (PM), and nitrogen oxides (NO₂) are attributed to road traffic pollution. The most frequent air pollutants released in cities include SPM (Sustained Particulate Matter), NO_x (nitrogen oxides), SO_x (sulfur dioxides), CO, and others. These pollutants might be gasses, liquid droplets, or solid particles (Njoku et al., 2016). On a

road, vehicle traffic is regarded as a non-point or line source. Huge ships' turbine engines also release tons of harmful airborne particles and greenhouse gases into the atmosphere. Industry: Because fossil fuels produce CO and CO₂, sulfur hexafluoride, and particle matter, the majority of industries rely on them either directly or indirectly. Large volumes of particulate matter are released into the environment, namely by the cement industry. Paints, electronics, dry cleaning supplies, and reducing agents release a variety of dangerous volatile chemicals. Pollution is also produced by the use of HFC, PFC, SF₆, and nitrogen oxides. Households: Here, carbon and soot emissions from cooking using fossil fuels can be taken into account. Intoxication may arise from exposure to volatile toxicants, such as insecticides' permethrin compounds, which can contaminate food or the air. Farming methods: Greenhouse gases are released by agricultural practices such as the application of natural fertilizers as well as the rearing of livestock. Persistent organic pollutants (POP) are released by pesticides. Methane and other greenhouse gases are produced by enteric fermentation in cow ranching. In addition to lowering air quality, insecticides, and weed killers include hazardous compounds. Quarrying, earthmoving, and land mining: Large-scale mineral mining frequently results in the release of chemicals and dust into the atmosphere. Additionally, dust particles are produced during the limestone quarrying, blasting, and cement-making operations. Building and maintenance tasks: Dust is frequently generated during drilling, blasting, transportation, loading, and unloading operations. Furthermore, there exist other non-point human sources of dust creation, including welding, painting, auto repair, and other similar activities. Air pollution is a complex problem with many contributing factors and significant negative effects on both the environment and human health. Comprehending its origins and consequences is essential for formulating efficacious approaches to alleviate its consequences and safeguard the welfare of the general public and the earth.

B. Environmental Impact of Air Pollution in Rivers State

When dangerous materials are released into the sky, it results in air pollution. It is a critical environmental issue affecting not just the health of people but also the environments in which we live. In the Niger Delta region of Nigeria, specifically in Rivers State, air pollution has become a significant concern due to fast industrialization, urbanization, and transportation growth. Their pollution sources in the state are diverse and can include industrial activities, vehicular emissions, burning of fossil fuels, waste incineration, and more.

Potential impacts of air pollution on Rivers State's environment include:

- **Human Health:** Air pollution can lead to various health issues, particularly respiratory and cardiovascular problems. Numerous studies have highlighted the direct connection between air pollution and adverse health effects (WHO, 2016, Ugbabore et al., 2016, Yakubu, 2018, Ogele and Egbueze, 2020). Cardiovascular and respiratory diseases, lung cancer, and early mortality have been linked to exposure to pollutants such as

particulate matter (PM_{2.5} and PM₁₀), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and ozone (O₃). The study carried out by Lelieveld, *et al.* (2019) reveals that every year, air pollution causes about 8.8 million preventable deaths, making it a critical global public health concern. Fine particulate matter (PM_{2.5}) and other pollutants can enter the respiratory system, causing or exacerbating conditions like asthma, bronchitis, and even more severe respiratory diseases. These health complaints related to air pollution triggered the Rivers State Government to form a technical team to produce initial data on air quality for the state. The study identified the daily activities of the residents as the with the most source of impact. These included burning tires, burning mixed garbage carelessly, burning tires, emissions from asphalt manufacturers, and artisanal refining. (Rivers State Government, 2019). Exposure to air pollution has been shown to have detrimental health impacts, making it a serious environmental danger to human health.

- **Biodiversity:** Air pollution doesn't only affect human health; it also has profound consequences for ecosystems. Acid rain, a result of sulphur and nitrogen emissions, can damage soil quality, freshwater bodies, and vegetation. Forests and aquatic ecosystems, which play crucial roles in carbon sequestration and biodiversity conservation, are particularly vulnerable. The National Acid Precipitation Assessment Program (NAPAP) in the United States (Douglas, *et al.*, 2011) provides insights into the detrimental acid rain's effects on delicate ecosystems, reinforcing the urgent need for emission control measures. Air pollution can impact ecosystems by altering habitats and food sources for various species, leading to shifts in biodiversity and potential species extinctions (Singh and Agrawal, 2020). In 2019, a study by Bakpo and Emejuruin Rivers State revealed that the vegetation's species richness, dominance, and density were all impacted by gas flare. This can disrupt ecosystems and biodiversity.
- **Water Quality:** Water bodies can become contaminated by airborne contaminants (pollutants) that settle there. For example, when pollutants like heavy metals settle into waterways, they can contaminate aquatic environments and disrupt aquatic life. Acid rain is created when certain air pollutants, such as nitrogen oxides and sulfur dioxide, combine with water vapor. When rain falls, the quantity of acid in the rain not only deteriorates home rainwater sources but also the region's well and river water sources' quality, which has made it harder to find clean drinking water sources and made the few clean water sources already available in the area more scarce. Ighalo, *et al.* (2020).
- **Climate Change:** Certain air pollutants contribute to climate change and global warming because they are also greenhouse gases. For example, the burning of fossil fuels releases carbon dioxide (CO₂) emissions that have an impact on air quality as well as global warming. (UNEP, 2021). Remarkably, the Niger Delta is more vulnerable to climate-related risks like floods, which are expected to increase as a result of climate change. (Echendu, *et al.*, 2022) In addition to having an impact on

air quality, emissions from burning fossil fuels raise global temperatures.

- **Economic Impact:** Air pollution can have economic repercussions, including healthcare costs, reduced labor productivity due to health issues, and damage to crops and other agricultural products. (Ogele and Egbueze, 2020).

There are several efforts to mitigate the environmental impact of air pollution encompassing various approaches. Transitioning to clean and renewable energy sources, implementing stricter emissions standards, improving transportation systems, and promoting sustainable agriculture are all integral steps toward reducing air pollution. International cooperation is also essential to address cross-border air pollution challenges

C. Air Quality and Environmental Sustainability

Air quality is a crucial aspect of environmental sustainability, as it directly impacts human health, ecosystems, and climate change. The degradation of air quality due to pollutants from various sources poses significant challenges for achieving long-term environmental sustainability. The current understanding of air quality and its relationship to environmental sustainability, highlighting key research findings and identifying potential strategies to improve air quality and promote sustainable development.

➤ Air Quality and Human Health

Several investigations have demonstrated a robust connection between air pollution and detrimental impacts on human health. Increased mortality rates, lung function impairments, and respiratory and cardiovascular disorders have all been linked to high concentrations of air pollutants such as particulate matter (PM), nitrogen dioxide (NO₂), and ozone (O₃) (Dockery *et al.*, 1993; Brook *et al.*, 2010). This data emphasizes how critical it is to regulate air quality effectively to safeguard public health and maintain environmental sustainability.

➤ Air Quality and Climate Change

In addition to endangering human health, air pollution fuels climate change. Global warming is primarily caused by greenhouse gases (GHGs), such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Furthermore, there is a considerable chance of warming associated with short-lived climatic pollutants (SLCPs), such as black carbon and tropospheric ozone. It is possible to lessen the effects of climate change and improve environmental sustainability by reducing emissions of these air pollutants through sustainable practices, such as switching to clean energy sources and increasing energy can improve the sustainability of the ecosystem (Shindell *et al.*, 2012).

➤ Sources and Control Measures

Identifying and controlling the sources of air pollution is essential for maintaining air quality and environmental sustainability. Industrial activities, transportation, and residential emissions are significant contributors to air pollution. This necessitates the implementation of effective

control measures, including emission standards, technological advancements, and behavioral changes. For instance, the use of advanced emission control technologies in vehicles, such as catalytic converters and electric vehicles, has shown promising results in reducing air pollutant emissions (Cheung et al., 2010). Analogously, enterprises and homes can reduce air pollution by using energy-efficient practices and renewable energy sources (Hanna et al., 2019).

➤ *Policy and Governance*

Strong governance frameworks and policy frameworks are necessary to achieve environmental sustainability. Governments are essential in establishing rules, enforcing them, and keeping an eye on compliance with air quality standards. International agreements like the Paris Agreement and regional initiatives like the European Green Deal provide frameworks for promoting sustainable development and improving air quality. Strengthening policies and enhancing international cooperation are crucial for addressing transboundary air pollution and ensuring long-term environmental sustainability (Molet al., 2017).

Air quality is intricately linked to environmental sustainability, affecting human health, climate change, and ecosystems. This literature review highlights the importance of addressing air pollution through sustainable practices and effective policy measures. Promoting clean energy sources, adopting emission control technologies, and enhancing governance structures are essential steps towards improving air quality and achieving environmental sustainability. By integrating air quality concerns into broader sustainability strategies, societies can protect human health, mitigate climate change impacts, and ensure a sustainable future.

III. MATERIAL AND METHOD

The study relied on primary data gathered from Port Harcourt citizens who had access to internet-enabled devices such as smartphones, Laptop, or desktop. A brief statement was included with the link to the survey questions and selectively put on individual chat and several groups in WhatsApp, Telegram, and pages on Facebook, Facebook Messenger, and emails where you can locate residents living in Port Harcourt. The link was operational for four months and was closely watched and deactivated immediately after the response reached 400. A question survey was created on the Google Docs website (doc.google.com). The questions ranged from single to multiple choice, with some open-ended. This survey was carried out between November 2021 and February 2022. Cross-tabulation and bivariate percentage analysis were used to analyze the data. To select the required total respondents, the study used Yamane's simplified sampling formula from 1967 [19,20]. Which gave us 400, so we used 400 copies of a structured questionnaire.

the formula is presented as:

$$n = \frac{N}{1+N} (e)^2$$

Where,

e = Deviation of sampling (0.05)

N = Population Size of Port Harcourt (1.5 million)

n = Sample size

This formula is reliable at 95% and less than 5% variation factor [19,20]

A. *Method of Data Analysis*

Descriptive statistics were used to summarise socioeconomic characteristics and data gathered from the administered questionnaire was used to create tables, charts, frequency charts, and graphs and percentages

IV. DISCUSSION OF RESULTS

A. *Socio-economic characteristics of respondents*

The Socioeconomic characteristics of the population are shown in Table 1 and are very informative, the age information shows that they are all adults who participated in the survey who have lived in the city for a long time, and the majority range from 40 – to 49 years, and over 73.3% of the population have lived in Port Harcourt for over 20 years. The respondents are educated, 84% of the population have acquired tertiary education and postgraduate level of education which is good for this study and the respondents have adequate knowledge of Port Harcourt's air pollution status and changes that have occurred in the environment. The employment status shows that 29.5% are business owners /self-employed, 23% are public servants, 13.5 are students, 11.2 % are unemployed and 8.3% are civil servants. finally, 64.3% of the respondents are married which connotes a form of responsibility the society.

Table 1: Socio-Economic Characteristics Of Respondents (n=400)

Age(years)($X^2=7.815$;p-value 0.00367)	Frequency	Percentage %	Rank
20-29	88	22	3
30-39	106	26.5	2
40-49	127	31.8	1
>50	79	19.7	4
Duration of stay in Port Harcourt($X^2=7.8155$;p-value 0.00367)			
1-5	40	10	4
6-10	67	16.7	3
11-20	110	27.5	2
>20	183	45.8	1
Marital Status($X^2=7.8155$; p-value 0.00367)			
Single	129	32.3	2
Married	257	64.3	1
Divorced	5	1.2	4
Widow/Widower	9	2.2	3
Educational qualification($X^2=388.36$;p-value 4.6837)			
Non – formal	11	2.7	4
Primary	5	1.3	3
Secondary	41	10.3	2
Tertiary	184	46	1
Postgraduate	152	38	
Other	7	1.7	
Current occupation($X^2=117.82$;p-value 4.17)			
Student	54	13.5	4
Unemployed	45	11.2	5
Business Owner/Self Employed	118	29.5	1
Civil Servant	33	8.3	6
Public Servant	92	23	2
Other	58	14.5	3

Source: Fieldwork, 2022

B. Perception of Air quality and air pollution

The perception of air quality and air pollution was quite intriguing and as a result, there is the need for an

urgent response. The responses in Table 2 show that 79.4% said yes to the perception of air pollution in the environment 10.3% said no and 10.3% percent were not certain.

Table 2: Perception of Air quality and air pollution

Responses	Frequency	Percentage %	Rank
Yes	318	79.4	1
No	41	10.3	2
Maybe	41	10.3	2
Total	400	100	

C. Perceived sources of air pollution and its severity

According to the study, respondents in Port Harcourt perceived the following sources of air pollution, which are shown in Table 3: illegal refining activities (320 persons), industrial emissions (228 persons), vehicular emissions (151 persons), dust (138 persons), smelly sewage (109 persons), burning trash (108 persons), cigarette smoking (51 persons), cooking fuel (50 persons) and 23 persons said it's from other sources while 8 persons have no idea. This is a multi-choice question and in response to a survey questions, about ways to reduce air pollution, more than half of respondents thought that the source of the problem was illegal refining activities. Table 4 reveals that 51% of the population, which is over half of the population perceived that the severity is high,37.2% very high, 8% said is moderate, 3.5 none and 0.3 have no idea. The respondents were asked if there is hope

for the improvement of air quality, Table 5 shows the result of their responses,22.5% said there is no hope, 18.5 said yes there is hope while 59% were not certain.

Table 3: Perceived sources of air pollution within Port Harcourt

Perceived sources of air pollution	No. of respondents
Illegal refining activities	320
Industrial Emission	228
Vehicular Emission	151
Dust	138
Smelling Sewage	109
Burning Trash	108
Cooking fuels	50
Cigarette smoking	51
Other sources	23
No idea	8

Table 4: Severity of air pollution in Port Harcourt

Responses	frequency	Percentage %	Rank
Low	14	3.5	3
Moderate	32	8	4
High	149	37.2	2
Very high	204	51	1
None	1	0.3	5
Total	400	100	

Table 5: Improvement of air quality in Port Harcourt

Responses	frequency	Percentage %	Rank
Yes	74	18.5	3
No	90	22.5	2
Maybe	236	59	1
Total	400	100	

D. Observed damage to their environment as a result of air pollution

The impact of Air pollution on the environment affects an individual’s actual food and water availability (Aisha *et al.*, 2020). In this study, Table 6 shows the respondents who have observed some damage to their household items in their home and environment, 63% of the respondents noticed some changes to household items while (26%) had not witnessed any changes in household items and 11% were uncertain. Some of the items identified by the respondents include; boreholes, window and blinds curtains,

plants, and flowers in the environment, floor tiles and wall tiles, wall paint, clothing, household items such as air conditioning, unit Furniture, and kitchen utensils, fridge, chairs, vehicle color, water treatment plant, roofing sheets and it changes the color of rainwater. Studies have shown that acid rain contains dangerous levels of nitric and sulphuric acids, they can acidify the water and soil environments, damage trees and plantations, and even damage people’s structures and outdoor sculptures, constructions, and monuments. (Ashfaqet *al.*,2012)

Table 6: Observed damage to their household and the environment as a result of air pollution

Responses	frequency	Percentage %	rank
Yes	252	63	1
No	104	26	2
Maybe	44	11	3
Total	400	100	

E. The adopted protective measures

Figure 2 shows a pie chart response to available proactive measures 52.8% of the population has no proactive measures, while 47.2 said yes they improvised some methods. In Table 7 some personal methods adopted by residents in protecting themselves and their families from air pollution include, the use of a nose mask, 60.5%, a

handkerchief to cover their nostrils 8.5%, doing nothing 27% and 4% use other methods and the other methods include relocating out of Port Harcourt, restriction of movement, personal hygiene and regular cleaning and others said they do nothing, they hope in the government to act by stopping the source of this air pollution.

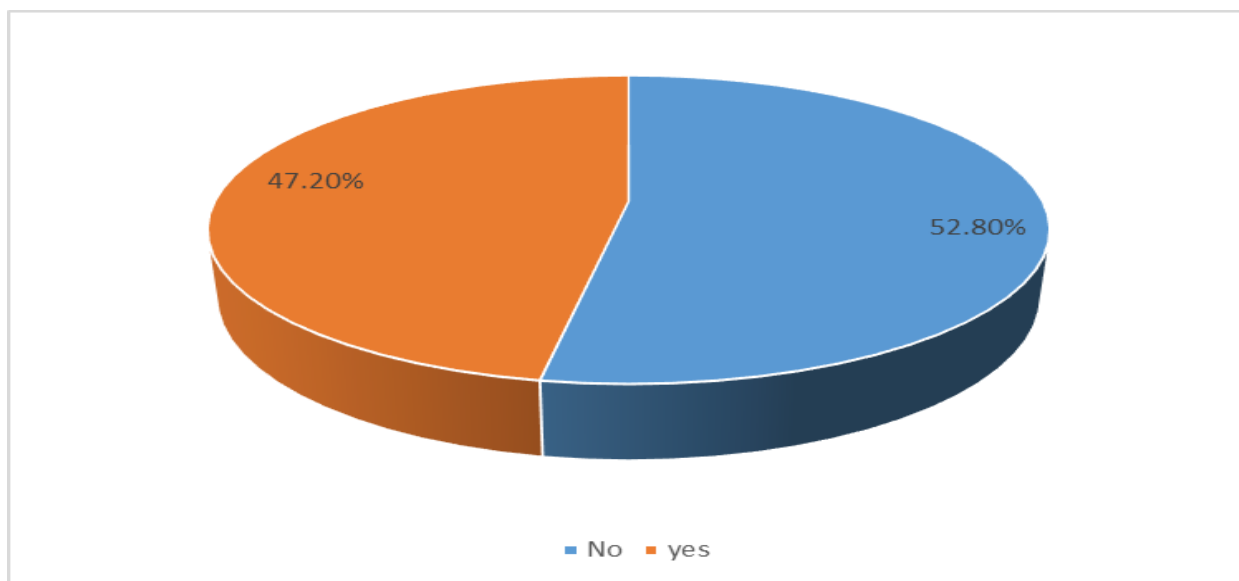


Fig. 2: Proactive measures taken to protect yourself and your family

Table 7: Method of protection from air pollution

Responses	Frequency	Percentage %	Rank
I wear a face mask	242	60.5	1
Cover my nostrils with a handkerchief	34	8.5	3
Do nothing	108	27	2
other	16	4	4
Total	400	100	

F. The consciousness of people and sensitization approach

The impact of air pollution on the environment is a great concern to the inhabitants of Port Harcourt as a majority of the respondents have perceived the impact of air pollution on their environment and are experiencing the damages it is causing in their households and environment. They depend on the government to stop the source of this air pollution because individuals alone cannot proffer a solution to this menace considering the rate of inflation, and insecurity in Nigeria. Some of the respondents have adopted some approaches to protecting lives and properties such as increasing personal hygiene and keeping their surroundings clean, water treatment, restricting movement outside by staying indoors more often, relocating their families out of the state, some relocating their businesses and this can affect the economy of Port Harcourt while some collaborate with individuals, associations that are speaking against environmental pollution

G. Implication of this study

This study can help the government and environmental experts develop useful information about people's perceptions and views on air pollution and the environment, and how it affects people. this will help the government to take action to reduce pollution by raising awareness of the issue and deter people from engaging in illegal crude oil refining by highlighting the risk that their actions pose to the Environment

V. CONCLUSION

The environmental impact of air pollution is a multidimensional crisis that demands immediate and concerted action as this study has highlighted the people's perception of the impact of air pollution on the environment, this can undermine the quality of life of current and future generations. This study looked into the effects of air pollution on the environment of Port Harcourt residents, according to the study, the majority of the respondents attributed the source of the air pollution to illegal refining plants. The residents' way of life has been significantly impacted by this, as many turn to personal adaptation strategies to deal with the effects of their environment, and some individuals, families, and companies have relocated out of the state, if this migration continues, there is a tendency that it may affect the economy of the state. We, therefore, recommend that the government should immediately stop all the sources of illegal refining in Port Harcourt and reduce any activity that leads to the increase in air pollution, ensure the implementation of environmental policies, employ a sensitization team that will make use of the media to educate the people on how best to protect their lives in their environment. If we embrace sustainable practices and technological advancements and advocate for policy changes, air pollution can be reduced and this will help in achieving a clean and sustainable environment.

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