



# **Public Perception of Climate Change Impact on Human Health in Trans Amadi Area of Port Harcourt, Rivers State, Nigeria**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. Author HOS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors HOS and PTB managed the analyses of the study. Author CJU managed the literature searches. All authors read and approved the final manuscript.*

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## **ABSTRACT**

This study examined the public perception of climate change impact on human health risks in Trans Amadi area of Port Harcourt, Rivers State, Nigeria. An in-depth questionnaire on public perception of climate change and possible implications on human health was administered to participants within Trans Amadi area of Port Harcourt and their corresponding responses were analyzed and discussed. Demography of respondents showed 44% are male while 56% are females. On the educational level of respondents, the survey showed that 3% had just primary school education, 41% had up to secondary school education, 52% had acquired tertiary education and just 2% had non-formal education or are uneducated. Survey on respondents understanding and perception on climate change showed 85% - 93% response on awareness; 77% completely agreed that climate change poses a threat for the people around the world and that climate change is caused by human activities and the global temperature has changed compared to previous

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decades; 59% of the respondents somewhat agreed that the temperature within Trans Amadi region has changed drastically while 44% believes that climate change is only because of the pollution from industries within the area. A preponderance of the respondents (78%) strongly believed that climate change impacts most on vector borne diseases / infectious disease; 75% strongly believed that it causes shortage in food supply, 57% strongly believed it causes air pollutants while 45% strongly believed it impacts heavily on storm and flooding. There was a generally high awareness of the causes and effects of climate change among the respondents. Therefore compliance to reduce emission of gases that lead to global warming should be enforced in all areas and sectors of the economy and green approaches should be adopted in all that we do as humans.

*Keywords: Climate change; public perception; human health risks.*

## 1. INTRODUCTION

Climatic factors vary naturally around the world without obvious notice, and at the same time comfortably maintaining the various natural and ecological systems. In the last 2-4 decades, however, this variation has gone beyond natural levels that climatologists are now in general agreement that the world has begun to experience the process of global "climate change". The causes could be natural or human, though questions have been raised on whether the problem is caused by human activities or it's just a part of nature's cycle [1]. The effects of these causes can be seen on rising sea levels, melting of ice caps, heat waves, violent downpours, and animal metabolism. The assessment report of the Intergovernmental Panel on Climate Change (IPCC) affirmed that the world is headed for painful problems sooner than expected, as green house gases emissions continue to rise, resulting in a warming of the earth's surface [2].

Global warming, otherwise known as climate change, has been increasingly recognized as the greatest threat of the century [3-5]. Climate change has brought about possibly permanent alterations to earth geological and ecological systems and decision-makers across the world face the challenge of adapting to a changing climate [6,7]. One negative impacts of climate change is rising seas level which threatens coastal cities across the world. Report has indicated that about 9.7 million people shall be displaced in Nigerians due to rising seas by 2050, of which a significant proportion would be among the coastal population in Lagos and Port Harcourt [8]. Amosu et al. [9] reported that Nigeria's renewable coastal resources and biodiversity are threatened by climate change.

Climate change-related impacts on the ecosystems are likely to affect population by

creating favourable conditions for disease vectors or disease pathogens as well as placing the communities at high risk of malnutrition, diarrheal diseases and other environmental health effects attributable to climate change [4,10,11]. Researchers have attributed rise in diseases such as West Nile Virus, lyme disease, rift valley fever and mosquito-borne diseases like dengue fever and malaria to warmer temperature [4,10,12]. The World Health Organization (WHO) posited that changes in infectious disease transmission patterns are attributable to climate change [12]. Although the impacts of climate change are global, the most vulnerable are the poor and marginalized people from developing countries who depend most directly on their ecosystems for survival. These are the same people who have the least capacity to adapt to the rapid changes that are affecting their environment, who do not have access to adequate safe water, adequate sanitation and lack access to land, credit or knowledge [3,13].

Although climate change has been recognized, studied and debated for decades but the recognition of the present high concentrations of green house gases in the atmosphere growing at an unprecedented rate with its obvious devastating consequences is relatively recent and public perceptions of the risk posed by climate change and support for adaptation vary for different countries. The severity of the health impacts of climate change is partly dependent public awareness and systems put in place to address or prepare for these changing threats. Impacts will also vary based on where a person lives, how sensitive they are to health threats, how much exposure to climatic change impacts and how well they are able to adapt to change. There is paucity of information on public perception of climate change impact on human health among residents of Port Harcourt. The aim of the study is to ascertain the perception of the residents and workers within Trans Amadi

area of Port Harcourt, Rivers State, Nigeria towards climate change with respect to its health risks.

## 2. MATERIALS AND METHODS

### 2.1 Study Area

Port Harcourt, the capital of Rivers State in Nigeria, geographically located along Latitude 4°48'53"N and Longitude 7°2'14 E, is a major industrial zone, the hub of the oil and gas companies, financial institutions, manufacturing industries, and large depots in South-South Nigeria. Trans Amadi area is a thousand hectare industrial area as well as a diverse residential neighborhood in the city of Port Harcourt.

### 2.2 Research Methodology

An in-depth questionnaire on public perception of climate change and possible implications on human health was administered to participants within Trans Amadi area of Port Harcourt and their corresponding responses were analyzed and discussed. The objective of the study was explained and understood by the respondents. A vernacular interpretation was used for the uneducated respondents for ease of communication and understanding.

One hundred and fifty (150) questionnaires were distributed and 111 were retrieved from the respondents. The questionnaires were coded and data was extracted manually. The questionnaire sought socio demographic characteristics of the respondents and their knowledge, perceptions, and attitudes about the causes and effects of climate change and its impact on human health. Consecutive sampling was used to select the individuals while quota sampling was used for the corporate respondents within the study areas.

### 2.3 Data Analysis

The obtained data were analyzed using excel package and interpreted using histograms and frequency tables.

## 3. RESULTS AND DISCUSSION

### 3.1 Results

The demographic characteristics of the respondents are presented in Table 1. Female respondents were the majority 62(56%) while male were 49(44%). Majority of the respondent

were aged 18-25(45%) and the least 45-55 (7%). On the educational level of respondents, majority 58 (52%) had acquired tertiary education and just 3% had non-formal education.

Result of respondents understanding and perception of climate change showed 85% - 93% response on survey questions (Fig. 1).

On awareness of climate change and its effects, a preponderance of respondents (85%) completely agreed that climate change poses a threat for the people around the world and equally high number (77%) completely agreed that climate change poses a threat for the people around the world and that it is caused by human activities and the global temperature has changed compared to previous decades (Table 2). Several studies have shown that higher temperatures enhance production of various secondary air pollutants (ozone, particulates, nitrogen dioxide) and consequently increasing the frequency of allergic and cardio-respiratory disorders and deaths caused by these air pollutants [14-16]. On actions to be taken concerning climate change a preponderance of respondent completely agreed that each of us can reduce the effects of climate change; the government should increase the incentives for the people who try to reduce the cause of climate change and it should be mandatory to reduce energy usage if it reduces climate change (83-95%).

Survey on the respondents' perception on groups' initiative to reduce climate change revealed that corporation and industries, citizens themselves, regional government national government, international organization and environmental group are seen by respondent to contribute to reducing climate change with international organization having positive perception from respondents (81%) and national government getting the least (62%) (Fig. 2).

On respondents' perception on impact of climate change on humans, a higher percentage (78%) strongly believed that climate change impacts most on vector borne diseases/infectious disease, closely followed by shortage in food supply (75%) and the lowest impact was storm and flooding (45%) (Fig. 3). This is in congruence with the findings of Ari et al. [17], which suggest that climate variables influence the dynamics of flea vectors and rodent hosts. The abundance of rodent fleas is affected by ambient temperature, rainfall, and relative humidity, with warm-moist weather providing a

likely explanation for higher flea indices [10]. It has been established that ambient temperature, rainfall, and relative humidity have direct effects on development and survival, as well as the behavior and reproduction of fleas and their populations. Moreover, a direct effect occurs when high intensity rainfall causes flooding of rodent burrows. Indeed, rainfall controls primary production which limits rodent abundances.

There is now a consensus that the earth is warming which is leading to drastic climate change due to emissions of greenhouse gases caused by human activities. The impacts of climate change are on the rise and might be worse than expected. There have been many debates and discussions on how to combat these impacts with a general agreement that we need to reduce activities that give rise to green house gases emissions and adopt green technologies. The sheer scale

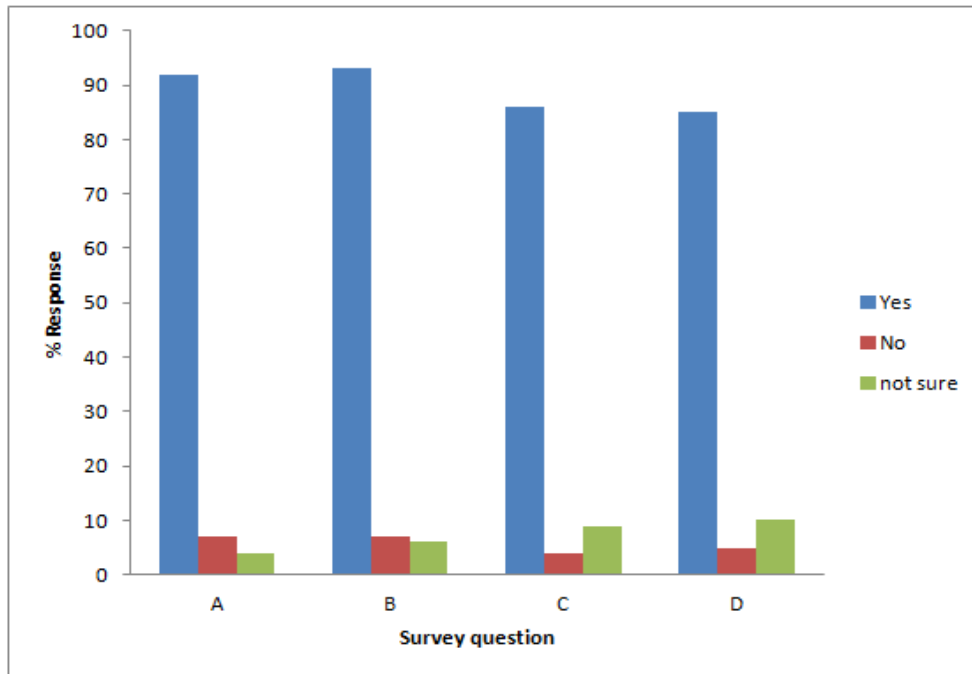
of climate change impacts demands that all we all need to do what we have to do to prevent climate change from progressing.

**Table 1. Demography of respondents**

Variable	Frequency	Percentage
<b>Sex</b>		
Male	49	44
Female	62	56
<b>Age</b>		
18-25	50	45
26-35	32	29
36-45	20	18
46-55	8	7
<b>Level of Education</b>		
Primary	4	4
Secondary	46	41
Tertiary	58	52
Non-formal	3	3

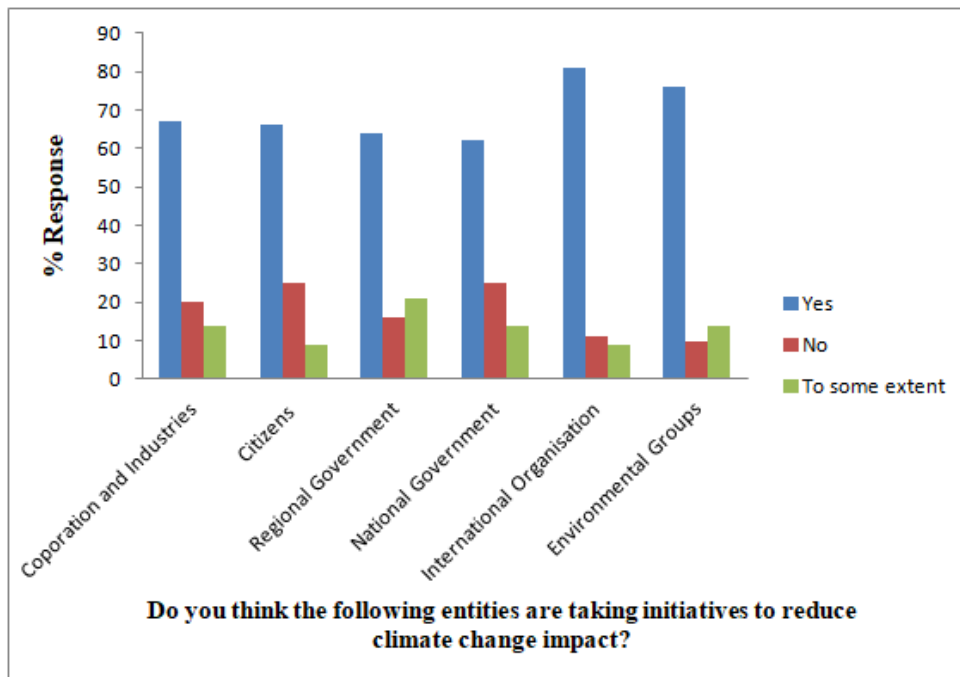
**Table 2. Respondents' perception on climate change**

Question	Completely disagree	Somewhat disagree	Neutral	Somewhat agree	Completely agree
1 Climate change poses a threat for the people around the world?	2(2%)	2(2%)	7(6%)	14(13%)	86(77%)
2 Climate change is caused by human activities	2(2%)	7(6%)	5(5%)	12(11%)	85(77%)
3 The global temperature has changed compared to previous decades?	2(2%)	6(5%)	5(4%)	13(12%)	85(77%)
4 The temperature within this region has changed drastically?	2(2%)	7(7%)	5(5%)	66(59%)	31(28%)
5 Each of us can reduce the effects of climate change?	1(0.5%)	6(5%)	10(9%)	11(10%)	83(75%)
6 It should be mandatory to reduce energy usage if it reduces climate change	1(0.5%)	9(8%)	2(2%)	4(4%)	95(86%)
7 Climate change is only because of the pollution from industries?	3(3%)	22(20%)	6(5%)	49(44%)	31(28%)
8 Climate change is a natural phenomenon we can't do anything about it?	73(66%)	12(11%)	6(5%)	15(14%)	5(5%)
9 Climate change is bound to happen because of the current modern society?	4(4%)	2(2%)	10(9%)	14(13%)	81(73%)
10 The government should increase the incentives for the people who try to reduce the cause of climate change?	2(2%)	2(2%)	7(6%)	14(13%)	86(77%)



**Fig. 1. Respondents' understanding/perception on climate change**

Do you feel there has been a rise in temperature over time here? A  
 Do you understand the term climate change? B  
 Do you feel climate change is caused by human activities? C  
 Do you feel climate change is taking place within the environment? D



**Fig. 2. Respondents' perception on groups' initiative to reduce climate change**

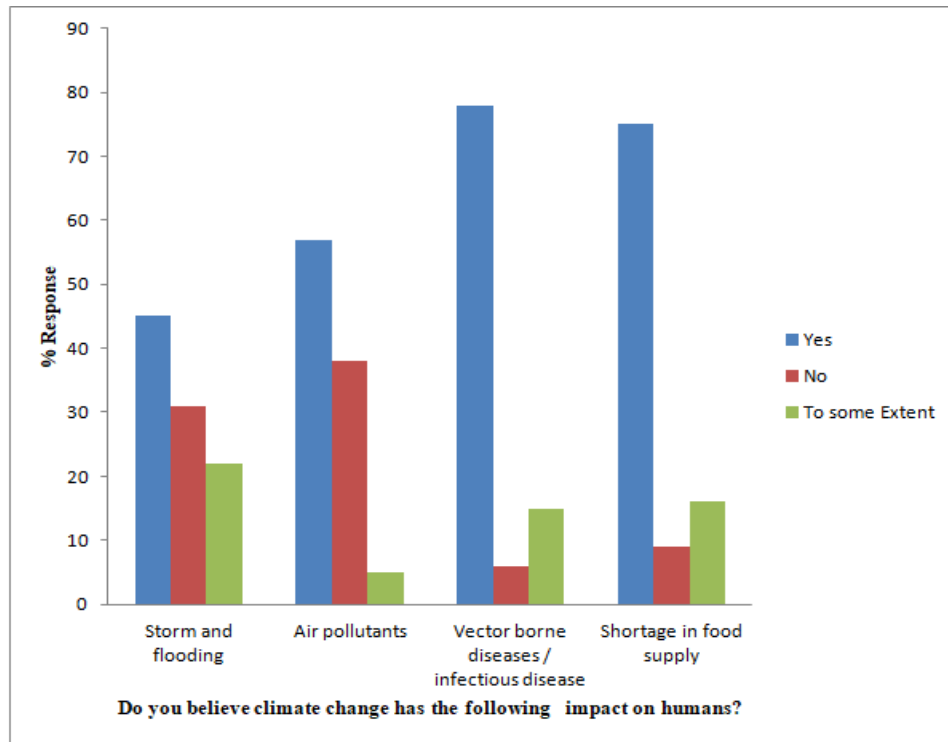


Fig. 3. Respondents' perception on impact of climate change to humans

#### 4. CONCLUSION

This study has ascertained the perception of the public living within Trans Amadi area of Port Harcourt about climate change with respect to its health risks. There was a generally high awareness of the causes and effects of climate change among the respondents. The current trends in energy use, industrialization, development and population growth in the city of Port Harcourt will continue to adversely affect the climate with attendant increase in diseases that can be spread through climate change if appropriate mitigation efforts are not put in place. To reduce the effect of climate change, there is the need to reduce activities that give rise to global warming. Compliance to reduce emission of gases that lead to global warming should be enforced in all areas and sectors of the economy and green approaches should be adopted in all that we do in order to save our environment.

#### CONSENT

As per international standard or university standard guideline participant consent has been collected and preserved by the authors.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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