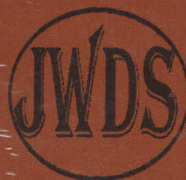


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08

Perception and Awareness of Climate Change in Osogbo Metropolis, Nigeria

Salami, A.A., Olanrewaju, R.M. and Tilakasiri, S.L.

Abstract

The paper seeks to examine the perception and awareness of climate change in Osogbo metropolis. A total of four hundred copies of questionnaire were administered to solicit information from the respondents using systematic random sampling technique while three hundred and sixty-four copies were retrieved and analysed using descriptive statistics of simple percentages, mean, standard deviation. Results obtained indicate very high perception and awareness levels (87.1%) among the respondents irrespective of their socio-economic backgrounds. Majority (64 %) linked climate change with increase in temperature. Findings also revealed that climate change is mainly caused by human activities which in turn affect socio-economic activities in the study area. The study calls for proper government policies formulation and enforcement towards mitigating the adverse impacts of climate change. As a matter of urgency, State government should mainstream climate change and environmental conservation into the developmental plans of Local Governments in the State. This is to build resilience in systems, sectors, infrastructure and programmes in the face of climate change impacts.

Keywords: Awareness, Climate Change, Information, Perception, Policy

Introduction

Climate change refers to a change which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (United Nations Framework Convention on Climate Change, (UNFCCC, 1992). Climate change is one of the most serious environmental threats facing the world today (Tilakasiri, 2008). It is a massive threat to human development and in some places it is already undermining the achievement of the Millennium Development Goals (MDGs) and the international communities' efforts to reduce extreme poverty (People's Bank, 2008).

The issue of climate change is global and Nigeria is not excluded from its threats as a sea-level rise of just 0.2m due to climate change could flood over 3,400 km² of the country's coast land. One prediction is that "Nigeria will lose close to \$9 billion as a result of such a disaster while at least 80% of the inhabitants of the Niger Delta will be displaced due to large areas being below sea level in the oil rich region" (Guardian, 2001).

A major factor responsible for this change in climate is the increasing concentrations of greenhouse gas emissions; these greenhouse gases include carbon IV oxide, nitrous oxides, chlorofluorocarbons and hydrocarbons such as methane, ozone, aldehydes and water vapour into the atmosphere. As humans emit more carbon IV oxide into the atmosphere, the greenhouse effect i.e. global warming becomes stronger. This causes the earth's climate to change unnaturally (Nura, 2009).

The primary direct effects of climate change are increase in droughts and floods, more seasonal peaks in river flow, a higher probability of stronger tropical storms (Muthukumara, Anil and Viju, 2008) and a higher frequency in late onset of rainy (Olanrewaju, 2004).

Climate change with its resultant effect, global warming is already taking its toll in the events of things on planet earth. Climate change could also cause water and land shortages because of growing desertification, and reduced agricultural activities have fueled conflict over these scarce resources among the poor.

Urban settlements also experience the consequences of accommodating migrant populations, the unique aspects of urban heat islands (which affect human health and energy demand), and some of the more severe aspects of air and water pollution (IPCC, 2001). The impacts of climate change are being felt by both developed countries and developing countries. Ayoade (2003) stressed that the possible effects of climate change are on agriculture and land use; ecosystem and biodiversity; human settlement; disease and health as well as hydrology and water resources.

A lot of information abounds on sustainable climate change adaptation mechanisms but these pieces of information are under-utilized. The lack of reliable communication channels and delays in forecast dissemination has also contributed to increased vulnerability of communities in areas to climate related disasters (www.wordpress.com). Poorly developed communication infrastructures are making complex the task of developing location specific responses that can effectively address the impacts of climate change. Technical Centre for Agriculture (CTA, 2008) is of the view that the role of information in moving forward the climate change agenda and communicating relevant information to the public is very crucial in order to minimize the effects of climate change on agricultural production systems and enhance human survival.

In the light of these, sufficient effort is desirable to examine the perception and awareness levels of climate change in the study

area with the aim of promoting better understanding and information on climate change issues as well as developing adaptive and mitigation mechanisms. This is paramount in order to avoid or at least lessen the negative impacts of climate change.

The Study Area

Osogbo is situated between Latitude $7^{\circ}43'$ and $7^{\circ}58'$ north of the Equator and Longitude $4^{\circ}31'$ and $4^{\circ}37'$ east of the Greenwich Meridian (Figure 1). The study area which constitutes Osogbo and Olorunda Local Government Areas occupies an area of about 144km^2 (55.6 sq. mi) with the total population of 288,455 (NPC, 2006). The spatial extent of Osogbo that was 3.95km^2 in 1962 had increased to 241.79km^2 in 2011, indicating that the city had been sprawling at an average rate of 4.9km^2 per annum between 1962 and 2011 (Aguda and Adegboyega, 2013).

Based on Koppen-Geiger climatic classification, Osogbo lies within a region described as tropical climate (Aw). It has a tropical dry and wet climate. The wet season starts in April and ends in early October, while dry season spans between November and March. The months of December through January are characterized by a dry-cold-dust laden harmattan wind from the Sahara Desert. The rainfall pattern has double peaks in June/July and September. The two peaks are separated by a period of short dry spell of August break. The highest rainfall usually occurs between June and July while the mean annual rainfall is about 1,241mm. The mean annual temperature is 26.1°C . The driest month is January with 9mm of rainfall. It is characterized by savanna vegetation. The topography is mainly gently dissected plains.

Osogbo is a major trading and distribution center for people within and outside its immediate environment. The emergence of Osogbo as a state capital coupled with other factors has led to the influx of people from other towns and villages, thus giving it the status of a

twin city, that is, a traditional as well as a modern city (Adenaike, 1991; Egunjobi, 1995). Most of the socio-economic activities as well as engineering constructions taking place in the city influence climate change through deforestation and emission of greenhouse gases.

Figure 1: Osun State Map Showing Osogbo with Nigeria as inset



Materials and Methods

Data used in this study were collected from both primary and secondary sources. While primary source of data were questionnaire the secondary data were gathered from already existing and published works such as textbook, government reports, journals, news, magazines, internet and website. The 2006 total population of the two Local Government Areas that constitute Osogbo is 288,455. These are Olorunda and Osogbo LGAs with the growth rate of 3.2% as obtained from the 2006 National Population Commission, Osogbo. This estimated 2006 total population was projected to 2015 (9 years) using the formula below

Where

P_n represents future population;

$$P_n = P_0 \left\{ 1 + \frac{r}{100} \right\}^n$$

P_0 represents current population = 288,455;

r represents population growth rate = 3.2 (NPC, 2006); and

n represents time interval (number of years) = (2015 – 2006) 9 years.

After applying the above formula, the obtained projected population for 2015 (382,997) was used to determine the sample size. Aguda and Adegboyega (2013) used this formula in calculating the population growth and expansion in Osogbo.

Taro-Yamane (1967) formula was used to determine the required sample size. This is given as:

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

Where:

n = sample size

N = finite population

e = level of precision or level significance = 0.05

I = unity

Using the above formula, the total population from the projected census figure of 2006 is 382,997 by 2015, at 0.05 significance level, the formula boils down to:

$$n = \frac{382,997}{1 + 382,997(0.05)^2} = 399.58 = 400$$

Therefore, detailed and well-structured questionnaire was designed and a total of 400 copies were administered using systematic random sampling on the following selected political wards, Obale, Ayetoro, Owode I, Agowande, Atelewo, Ataoja 'A' to 'C', Jagun 'A' to 'B' and Eketa. Three hundred and sixty four (364) copies of questionnaire were returned and analysed using simple percentage, mean, standard deviation, bar graph, and pie chart.

Results and Discussion

Socio-Economic Characteristics of Respondents

Table 1 shows that men constituted 61.3% and women 38.7% of the respondents sampled in the two local government areas of Osogbo metropolis. The greater proportions (34.9%) of the respondents were between age bracket of 30-39 years, while 0.5% stood within 60 years and above. Majority (75.5%) of the respondents were married, 23.4% were single while 0.5% were widowed and separated. The study revealed that a greater proportion (43.7%) of the respondents had degree certificates or its equivalent, 24.5% possessed OND/NCE certificates and 15.1% had O'level certificates. The result further showed that 3.0% of the respondent possessed FSLC, and 11.8% M.Sc. The remaining 1.9% had no formal education. Signifying that larger percentage of the respondents was literate. Majority (44%) of the respondents were primarily civil servants, 22% of them were traders while others engaged in activities such as farming and artisans.

Table 1: Socio-Economic Characteristics of Respondents

Demographic Characteristics	Frequency	Percent
Gender		
Male	223	61.3
Female	141	38.7
Age		
20-29	114	31.3
30-39	127	34.9
40-49	74	20.3
50-59	47	12.9
60 and above	2	0.5
Marital Status		
Single	85	23.4
Married	275	75.5
Widowed	2	0.5
Separated	2	0.5
Education Qualification		
None	7	1.9
FSLC	11	3.0
O'Level Certificate	55	15.1
OND/NCE	89	24.5
Bachelor's Degree	159	43.7
Master's Degree	43	11.8
Occupation		
Student	34	9.3
Self-employed	41	11.3
Farming	43	11.8
Trading	80	22.0
Civil/Public Service	160	44.0
Artisans	6	1.6

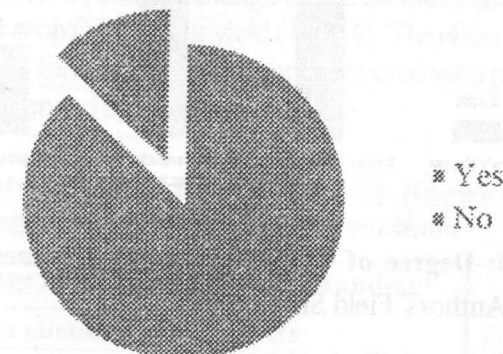
Source: Authors' Fieldwork, 2015

Source: Authors' Fieldwork, 2015

Respondents' Level of Climate Change Awareness

Figure 2 revealed that majority (87.1%) representing 317 of the respondents were aware of climate change phenomenon. This shows that the awareness level of the changing climate phenomenon

is high among the people in the study area. This implies people are sensitive to the changes going on in their environment and the level of awareness of such changes is high.

**Figure 2: Awareness of Climate Change**

Source: Authors' Field Survey, 2015

Figure 3 shows the depth of awareness of climate change in the study area as expressed by respondents. For instance 49.2% has the knowledge of climate change to a reasonable extent and 18.1% knows to a great extent that the climate of the study area has changed. About 28.3% of them have little awareness of climate change and 18.1% has deep knowledge of climate change. Only few of the respondents are unaware of climate change. This signifies that the level of climate change awareness in Osogbo is on the average. This is in line with a study carried out by the British Council in Nigeria in collaboration with BBC world service on climate change and perception which reported that awareness of climate change or global warming as defined by the environmental community is low.

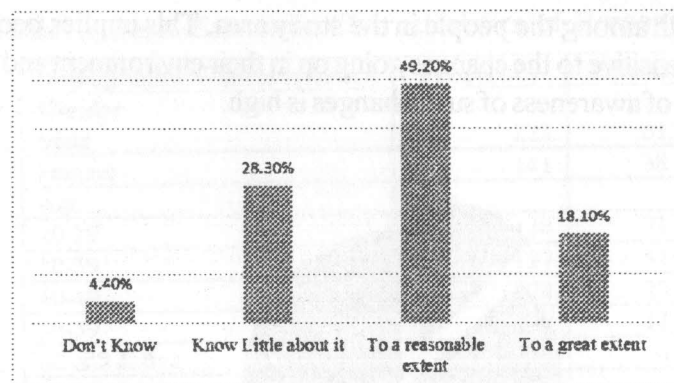


Figure 3: Degree of Climate Change Awareness

Source: Authors' Field Survey, 2015

Table 2 shows that climate change has been linked with certain climatic events and factors by the respondents. For instance, 64.0% of the respondents perceived climate change as synonymous to increase in temperature, 27.7% of them understood climate change as an increase in the incidence of drought events and about 30.2% of them linked it with high wind velocity and heat waves. Excessive sunshine contributed to increase in temperature which probably brought about the incidence of drought in the study area. Odjugo (2010) put trend in the temperature in Nigeria between 1901 and 2005 at 26.6°C, while the temperature increase for the 105 years was 1.1°C. According to Spore (2008) and IPCC (2007), this is obviously higher than the global mean temperature increase of 0.74°C recorded since 1860 when actual scientific temperature measurement started. If this trend continues unabated, Nigeria may experience between the middle (2.5°C) and high risk (4.5°C) temperature increase by the year 2100 (Odjugo, 2010).

Respondents (56.9%) also attributed climate change to an irregular pattern of rainfall. Excessive sunshine which leads to increase in

temperature and change pattern of rainfall are factors that enhance pests and disease infestation which represents the indirect impact of climate. This may be the reason why 43.3% of the respondents attributed climate change to increase in pest and disease outbreaks. Another indicator of climate change based on the opinion of the respondents is crop failure/poor yield (44.2%). The effect of global warming on soil fertility may not be unconnected with poor crop yields as experienced by the farmers.

Table 2: Distribution of Respondents by Knowledge and Understanding of Climate Change Phenomenon

Climate change knowledge and understanding*	%
Knowledge on climate change effects	
Yes	99.5
No	0.5
Understanding of climate change	
High Temperature	64.0
Irregular Rainfall	56.9
Flooding	25.8
Increased incidence of drought	27.7
Crop failure	44.2
Pests and disease infestations	43.1
High winds and heat waves	30.2

Source: Authors' Field Survey, 2015

Sources of Information on Climate Change

The major sources through which the respondents received information on climate change are displayed in Figure 4. These sources include radio/television (73.1%), newspaper (54.4%), internet (43.1%) and conferences/seminars/workshop (35.4%). Other sources include friends (24.2%), researchers (23.6%),

politicians (12.1%) and entrepreneurship centers (7.7%). This is not surprising since the demographic characteristics of the respondents displayed earlier shows majority having formal education. The implication of this finding is that the mass media (radio and television), newspapers, and internet were the major sources of information on climate change of the people. The reason for this could possibly be due to the advantages the mass media has in reaching large audience at a faster rate.

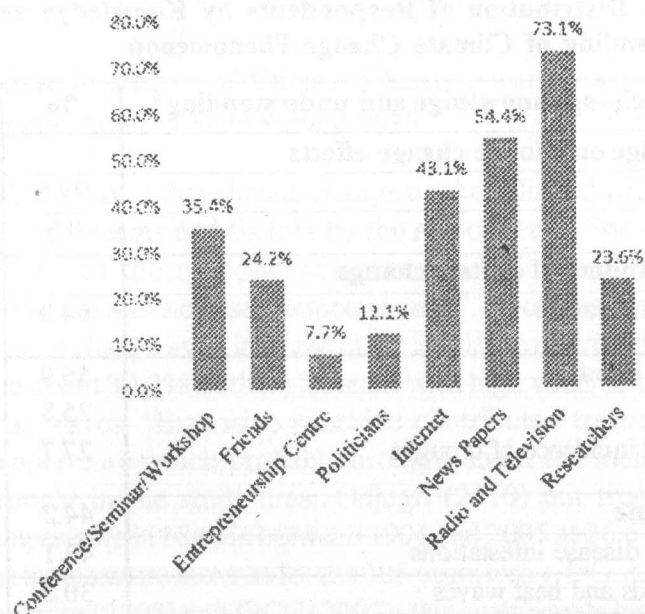


Figure 4: Sources of Information on Climate Change

Source: Authors' Field Survey, 2015

Various Opinions of the Respondents on the Causes of Climate Change

The mean scores of respondents displayed in Table 3 shows bush burning (M=3.75), burning of fossil fuel from vehicles (M=3.68),

use of generator (M=3.62), gases released from industries (M=3.53) and high temperature due to ozone layer depletion (M=3.51) as main causes of climate change. Findings revealed that climate change is closely associated with the burning of oil, coal or gas. Other perceived causes of climate change include deforestation (M=3.45), emission of greenhouse gases (M=3.39), and overgrazing of farmland by livestock (M=3.29).

This result is also in agreement with the finding fact that burning of coal, oil and natural gas, as well as deforestation and various agricultural and industrial practices, are altering the composition of the atmosphere and contributing to climate change (www.gcric.org). The implication of this finding is that human activities are to a large extent the major causes of climate change as most of their industrial or agricultural activities lead to increase concentrations of greenhouse gases in the atmosphere.

Table 3: Various Opinions of the Respondents on the Causes of Climate Change

<i>Perceived causes of climate change</i>	Mean	SD
Use of generator	3.62*	0.80
Bush burning	3.75*	0.47
Burning of fossil fuels from vehicles	3.68*	0.58
Deforestation	3.45*	0.78
Overgrazing	3.29	0.93
Gases released from industries	3.53*	0.69
High temperature due to ozone layer depletion	3.51*	0.67
Emission of GHGs	3.39*	0.82

* Perceived major causes

Source: Authors' Field Survey, 2015

Perceived Effects of Climate Change on Human Activities

Perceived effects of climate change as indicated by the respondents on Table 4 include heat from high temperature (M=4.54), socio-economic impact (M=4.46), low rainfall intensity (M=4.43), high temperature due to the depletion of ozone layers (M=4.34), distortion and destruction of wildlife ecosystem (M=4.34), incidence of vector-borne diseases (M=4.33) and erosion problems (M=4.32). Other effects of climate change as perceived by respondents include human health (M=4.32), low agricultural productivity (M=4.28), frequent flooding (M=4.26), water pollution due to climate variability (M=4.25) and drying of rivers, lakes and surface waters (M=4.25).

Table 4: Perceived Effects of Climate Change by Respondents

<i>Perceived effects*</i>	Mean	SD
Socio-Economic Impacts	4.46*	0.88
Low rain fall intensity	4.43*	0.79
Heat from high temperature	4.54*	0.68
Erosion problems	4.32*	0.83
Water pollution due to climate variability	4.25*	0.80
Low agricultural productivity	4.28*	0.92
Incidence of vector-borne diseases	4.33*	0.78
High temperature due to the depletion of ozone layers	4.34*	0.71
Distortion and destruction of wildlife ecosystem	4.34*	0.79
Drying of rivers, lakes and surface waters	4.25	0.87
Frequent flooding	4.26*	0.82
Human Health	4.32*	0.73

Source: Author's Field Survey, 2015

4.28*4.33*4.34*4.34*4.254.26*4.32*

0.920.780.710.790.870.820.73

Conclusion

Climate Change is about the biggest challenge confronting human race. There are several security challenges driven by climate change including, but not limited to, food shortages, water crises, catastrophic flooding, greater frequency and intensity of hydro-meteorological disasters, population displacement, and increased public health issues. To avert the attendant consequences of climate change demands multifaceted and interlocking principles of public policy, multilateral negotiation and technological advancement. It is therefore imperative for the government and stakeholders to come together to address the issue with a coordinated, effective, efficient and sustainable approach. There is the need to continuously enlighten the populace about the environment, its quality and the impact of mans' habits and attitudes on its sustained quality. In this study, respondents' perceptions and awareness on climate change is high irrespective of their socio-economic backgrounds. This study also shows that the awareness level of the changing climate phenomenon is high among the people while a greater percentage of them are aware of climate change to a reasonable extent. Notwithstanding, there is still need for continuous canvassing the awareness on climate change so as to promote a better understanding of people on climate change issues as well as to develop appropriate adaptive and mitigation strategies. This is paramount in order to avoid the possible causes of climate change.

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