

SPATIAL ANALYSIS OF POPULATION DENSITIES, HOUSEHOLD EMISSIONS AND CLIMATE CHANGE EFFECTS ON NIGERIA CITIZENS

By

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Abstract

The challenges associated with climate change are not the same across Nigeria. This is due to different geographical settings. These settings in the country are spatially related to the human population, socio-economic, environment and resources factors, and associated activities which influence climatic change. Consequently, human activities have contributed significantly to climate change through greenhouse gas emissions and reflectivity or absorption of the sun's energy. However, the negative effects of the change can be felt in almost human endeavours, especially the low-income group of the population that has low coping and less adaptive capacities. Mapping of the climate change effects on the population in Nigeria is a huge challenge with constraints of accessibilities to the household, and non-existing or unreliable data. However, this present study was carried out to address the household emissions that contribute to climate change, and the effects on Nigerian citizens. The study investigated the spatial relationship between population densities and household emissions to identify locations and distribution of potential negative public health indices (poor air quality and diseases) among the children in Nigeria and sought the residents' knowledge, attitude, and perceptions of climate change effects on people; where a Household Survey was carried out to gather data on

population densities, the locations and sources of emissions of gases contributing to climate changes, air qualities, children exposure and health conditions in Abeokuta City Nigeria. The results of a survey of two thousand (2000) households showed that the effects of climate change are associated majorly with gas emissions from cooking fuel (kerosene, charcoal) and generators with high population densities. The women and children are exposed more, facing high potential health risks from air pollution. The study concluded that due to the residents' low knowledge, poor attitude, and negative perception, there is a need for further studies and effort to create a database through mapping in Nigeria.

Keywords: Climate Change, Urban, Health, Household Emission, Nigeria

Introduction

The majority of Nigerian households are the contributors of greenhouses gas that are associated with climate change. These are the gases releases by the populace into atmosphere, resulting in global warming and climate change (Trevor, 2020).

The household emission consumption (largely fossil fuel) is often accompanied by a significant increase in CO₂ emissions which contributes to climate change. There is need to address the household emission especially from energy consumption to prevent climate change and associated health and environmental risks (Paul, *et al.*, 2009), (Matthew, Osabohien, Fasina, F, and Fasina, 2018), (Khaiwal, 2019) and (Pratiti, Vadal, Kalynyc, and Sud, 2020), and the results of study carried out by Giwa, Nwaokocha, and Sharifpur, (2022) showed that kerosene-fueled stove kitchens contributing to possible health risk due to exposure to high level of carbon monoxide.

Despite available statistics on global warming, climate change and the impacts, Peters, Andrew, Canadell, J.G. et al (2020) study, believed that Carbon dioxide emissions, the major greenhouse gas continue to grow amidst slowly emerging climate policies. For instance, according World Health Organization (WHO), climate change the biggest health threat facing humanity, it is projected that between 2030 and 2050, the change is expected to cause approximately 250,000 additional deaths per year from malnutrition, malaria, diarrhoea and heat stress alone, through unclean air, unsafe drinking water and insufficient food, and insecure housing (WHO, 2021).

Unfortunately, human influences are the primary cause of global warming, especially the carbon pollution through burning fossil fuels, where the carbon dioxide, methane, soot, and other pollutants released into the atmosphere, trapping the sun's heat and causing the earth to warm. Thereby, the earth's climate system is been altered, including its components- atmosphere, hydrosphere, lithosphere and biosphere. Furthermore, climate change is undermining many of the social determinants for good health, such as livelihoods, equality and access to sustainable healthcare delivery system which is lacking in Nigeria (WHO, 2021).

Moreover, people social-economic status, knowledge, attitude and perception, and government policies do not support positive contribution in addressing the issues of climate changes. For instance, the findings of (Dioha, 2018) showed that the household energy policies are not effective from the perspective of climate change mitigation, when the author model the Impact of Nigeria Household Energy Policies on Energy Consumption and CO₂ Emissions. While, Borisade, *et al.*,(2020) recommended advocacies to discourage the use of firewood as cooking fuel that the people of Zaria Metropolis, Nigeria used being the cheapest source of energy (Borisade, *et al.*,2020). Adeniran, Otokiti, and Durojaye, (2020) study on Climate Change Impacts in a Rapidly Growing Urban Region – A Case Study of Ikeja, Lagos, Nigeria, submitted that there is need for government to initiate vulnerability assessment of the city and engaged in public awareness on the importance of land use planning in mitigating effect of climate change (Adeniran, Otokiti, and Durojaye, 2020).

The present study focused on the climate-sensitive health risks, associated with air pollution which are disproportionately felt by the most vulnerable and disadvantaged population, especially women, children, poor communities, older populations, and those with underlying health conditions. Therefore, the study aimed to map the population densities, household emissions and climate change effects on Nigeria citizens and to create awareness through household survey to determine the people knowledge, attitude and perception on risks associated with household emission and climate change effects.

Methodology

The household survey combined the administration of questionnaire, with a developed observational checklist and Global Positioning System (GPS) to collect data from 2000 households in Abeokuta Urban and Peri-Urban South West Nigeria. The primary data collected were the demographic characteristics of each household, health situations of the members of the

household, sources of greenhouse gases (cooking-charcoal, kerosene stove, electricity supply-generators), and the locations within the household (distances and Latitude and Longitude) and secondary data of physical setting and population densities of the study area, Abeokuta South and North with over thirty (30) wards for administrative and political divisions having average population density of 350/km², on latitude 7.1475° N, longitude 3.3619 E, were analyzed with descriptive statistics.

Results and Discussion

The descriptive analysis of the data showed that at the effects of climate change are associated majorly with greenhouse gas emissions from cooking fuel (kerosene, charcoal) and generators with high population densities. Furthermore, over 95% of household surveyed are crowded where different members of the households contributing to greenhouse gas emissions from household cooking fuels and generators for the supply of electricity. The overcrowding of households with average of ten (10) members in the household especially in the core and low income residential areas of the city, lack proper urban planning, poor housing qualities, resulting to climate change activities and creating effects of high potential health risks from air pollution. Then, the residents' low knowledge, poor attitude, and negative perception are another factors contributing to engagement in household emissions and climate change effects among the urban residents in Nigeria.

Conclusion

The study concluded that there are various potential respiratory ailments affecting the population. The medical examination of these health conditions are next stage of the projects that will be part of the data to be used for the mapping of health indicators of climate change effects on vulnerable groups children, women, physically challenged individuals due to household emissions, and database are created in the study areas.

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