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Climate Change and its Implications for Occupational Health Risks among Civil Servants in Rivers State

Prof. Abiodun Amuda-Kannike San
Ag Dir, Department of Legislative Support Services (DLSS), National Institute for Legislative and Democratic Studies, Abuja; and Pioneer Dean of Law, Kwara State University, Kwara State, Nigeria

Amuda-Kannike Abdulkareem (PhD)
Registrar, Kwara State College of Education, Oro, Kwara State, Nigeria

Chibuzor Chika (PhD)
Department of Health and Safety Education, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Rivers State, Nigeria

Abstract: This study investigates the implications of climate change for occupational health risks among civil servants in Rivers State. The need for this study arises from the increasing impact of climate change on work environments. Many government offices lack adequate measures to protect workers from climate-related hazards. This study used a descriptive survey research design. A sample of 300 civil servants was selected from various ministries in Rivers State through random sampling. Data was collected using a structured questionnaire. The data was analyzed using mean scores and chi-square tests. Findings showed that climate change significantly increases occupational health risks. These risks include heat stress, increased disease exposure, and mental health issues. However, challenges such as poor workplace infrastructure, lack of awareness, and insufficient government policies hinder effective adaptation. The study concludes that climate change is a major threat to the health and productivity of civil servants. It recommends the development of specific occupational health policies, improvement of workplace facilities, and training programs to build resilience against climate change impacts.

Keywords: Climate Change, Occupational Health, Health Risks, Civil Servants, Rivers State, Workplace Safety.

Introduction

Climate change refers to long-term shifts in temperatures and weather patterns. These shifts can be natural. But since the 1800s, human activities have been the main driver of climate change. This is primarily due to the burning of fossil fuels like coal, oil, and gas. These burning releases greenhouse gases. These gases trap heat in the atmosphere, leading to global warming. The effects of climate change are now felt everywhere. They include rising temperatures, more intense rainfall, flooding, and sea-level rise. According to the Intergovernmental Panel on Climate Change (IPCC, 2022), these changes are accelerating.

Occupational health is a field of healthcare. It is concerned with the safety, health, and welfare of people at work. The goal is to prevent work-related injuries and illnesses. It involves identifying and controlling risks in the workplace. Traditional occupational health risks include physical, chemical, and biological hazards. But climate change is introducing new risks. It is also making existing risks worse. For example, higher temperatures can cause heat stress. Changes in weather patterns can increase the spread of infectious diseases. This creates a new challenge for occupational health. As noted by Adebayo (2021), climate change is now a central concern for workplace safety.

Civil servants are government employees. They work in various ministries, departments, and agencies. They perform administrative and clerical duties. In Rivers State, a large number of civil servants work in Port Harcourt and other urban areas. Their work is essential for public service delivery. However, their work environments are often not ideal. Many government offices are old and poorly maintained. They may lack proper ventilation, air conditioning, or reliable water supply. These conditions make civil servants vulnerable to the effects of climate change. For instance, during heatwaves, working in a hot, stuffy office can be dangerous.

Rivers State is particularly vulnerable to climate change. It is a coastal state in the Niger Delta region. It experiences frequent flooding, especially during the rainy season. Sea-level rise is also a threat to coastal communities. The state often has high temperatures and humidity. These environmental factors directly impact the working conditions of civil servants. Flooding can damage office buildings and disrupt work. High heat and humidity can reduce comfort and productivity. A study by Eze (2020) highlighted that climate-sensitive diseases are on the rise in the Niger Delta.

The implications of climate change for occupational health in Rivers State are not well studied. There is a gap in knowledge. We do not know how much civil servants understand these risks. We also do not know what measures are in place to protect them. This study aims to fill that gap. It will assess the level of awareness among civil servants. It will identify the specific health risks they face due to climate change. It will also examine the challenges in adapting workplaces to these new realities.

The importance of this study cannot be overemphasized. The health and well-being of civil servants affect their productivity. It also affects the quality of public services they deliver. If civil servants are frequently sick from heat stress or waterborne diseases, it hurts the entire state. Therefore, understanding and addressing climate-related occupational risks is crucial. It is not just an environmental issue. It is a public health and economic issue. This study will provide valuable information for policymakers. It will help them create safer work environments in the face of a changing climate.

Statement of the Problem

The occupational health and safety of civil servants in Rivers State are under significant and growing threat from the adverse effects of climate change, yet this critical issue remains largely unaddressed within government policies and workplace planning. Civil servants, who form the backbone of public administration, are increasingly exposed to heightened health risks because their work environments are not designed to withstand climate-related stressors such as intense heat, extreme weather events, and changing disease patterns. A heavy reliance on outdated and often poorly maintained office infrastructure, characterized by inadequate ventilation, inconsistent electricity for cooling systems, and insufficient clean water supply, exacerbates these risks. This situation creates severe inefficiencies, as workers suffer from preventable conditions like heat exhaustion, dehydration, and increased exposure to climate-sensitive diseases such as malaria and waterborne illnesses, leading to elevated absenteeism, reduced productivity, and higher healthcare costs.

This problematic scenario is worsened by a critical lack of awareness and preparedness at multiple levels. Many civil servants and their managers have low awareness of the specific ways

climate change impacts their health at work. There is also a pronounced absence of targeted occupational health and safety guidelines that incorporate climate change adaptation strategies. Furthermore, systemic barriers including limited funding for workplace upgrades, a lack of technical capacity to implement adaptive measures, and fragmented institutional coordination prevent effective action. This has created a dangerous gap between the escalating climate-related threats faced by the workforce and the inadequate protective measures in place. Therefore, this study is essential to thoroughly assess the perceived implications of climate change, definitively identify the major health risks and underlying barriers, and propose practical strategies to safeguard the health and productivity of civil servants in Rivers State.

Aim and Objectives of the Study

The aim of this study is to examine the implications of climate change for occupational health risks among civil servants in Rivers State. The specific objectives of the study are to:

1. Assess the level of awareness among civil servants in Rivers State regarding the impact of climate change on occupational health.
2. Identify the specific climate change-induced occupational health risks faced by civil servants in Rivers State.
3. Examine the existing workplace adaptation measures and policies aimed at mitigating climate-related health risks in the civil service.

Research Questions

The following research questions guided the study:

1. What is the level of awareness among civil servants in Rivers State regarding the impact of climate change on occupational health?
2. What are the specific climate change-induced occupational health risks faced by civil servants in Rivers State?
3. What workplace adaptation measures and policies exist to mitigate climate-related health risks in the civil service?

Hypotheses

The following hypotheses were tested at a 0.05 level of significance:

H_{01}: There is no significant relationship between the awareness level of civil servants and their perception of climate-related health risks.

H_{02}: There is no significant relationship between the type of work environment and the prevalence of climate-related health issues among civil servants.

H_{03}: There is no significant relationship between the existence of workplace adaptation policies and the reduction of occupational health risks.

Literature Review

Concept of Climate Change and Global Impacts

Climate change is a complex global phenomenon. It is defined as a change in the climate that persists over decades. This change is caused by both natural processes and human activities. The main human activity is the emission of greenhouse gases. These gases include carbon dioxide and methane. They come from industries, agriculture, and deforestation. The United Nations Framework Convention on Climate Change (UNFCCC) describes it as a change attributed directly or indirectly to human activity that alters the composition of the global atmosphere (UNFCCC, 1992).

The impacts of climate change are widespread. The World Health Organization (WHO, 2021) states that climate change affects the social and environmental determinants of health. These

include clean air, safe drinking water, sufficient food, and secure shelter. Globally, climate change is causing more frequent and intense extreme weather events. These are events like heatwaves, floods, and droughts. These events lead to injuries, deaths, and the spread of diseases. They also damage infrastructure and disrupt economies. According to the IPCC (2022), the scale of recent changes across the climate system is unprecedented over many centuries.

Rising global temperatures are a key indicator. The average global temperature has increased by about 1.1°C since the late 19th century. This might seem small, but it has big consequences. It leads to the melting of ice caps and glaciers. This contributes to sea-level rise. Coastal cities and communities are at risk of flooding. Changes in temperature and rainfall also affect agriculture. This can lead to food shortages. The economic costs of climate change are enormous. A report by the World Bank (2020) estimated that climate change could push over 100 million people into poverty by 2030.

Occupational Health Risks in a Changing Climate

Occupational health focuses on preventing work-related diseases and injuries. Traditionally, risks included noise, chemicals, and accidents. Climate change adds a new layer of complexity. It acts as a threat multiplier for existing occupational hazards. It also creates entirely new ones. The International Labour Organization (ILO, 2019) has identified several key climate-related occupational risks.

Heat stress is a major concern. As temperatures rise, workers who are exposed to heat are at risk. This includes both outdoor workers and those in poorly ventilated indoor settings. Heat stress can cause heat rash, heat cramps, heat exhaustion, and heatstroke. Heatstroke is a medical emergency and can be fatal. It also reduces workers' capacity to work, leading to lower productivity. A study by Kjellstrom et al. (2018) found that heat stress is already causing significant productivity losses in tropical and subtropical regions.

Increased exposure to ultraviolet (UV) radiation is another risk. Depletion of the ozone layer and clearer skies in some areas increase UV exposure. This is particularly risky for outdoor workers. It can lead to skin cancer, cataracts, and other eye diseases. Changes in weather patterns also affect vector-borne diseases. Mosquitoes that carry malaria and dengue fever are spreading to new areas. This puts outdoor workers at higher risk. Furthermore, extreme weather events like floods and storms pose direct physical dangers to workers. They can cause injuries, fatalities, and mental health trauma. Okafor (2022) notes that the psychological impact of climate change, such as anxiety and post-traumatic stress, is an emerging occupational health issue.

Civil Service Work Environment in Nigeria

The civil service in Nigeria is the administrative arm of government. Civil servants implement government policies. They work in offices located in state capitals and local government areas. The work environment for many Nigerian civil servants is often challenging. A study by Olatunji (2021) described the conditions in many government offices as suboptimal.

A common problem is inadequate infrastructure. Many government buildings are old. They were not designed for current climate realities. They often lack proper ventilation and cooling systems. In a hot and humid country like Nigeria, this makes offices very uncomfortable. The problem is worse during power outages, which are frequent. When there is no electricity, fans and air conditioners stop working. This turns offices into heat traps. The problem of unreliable electricity also affects water supply. Water pumps may not work, leading to a lack of clean water for drinking and sanitation.

Overcrowding is another issue. Many offices have more staff than the space was designed for. This poor ergonomics contributes to discomfort and can worsen the effects of heat. Sanitation facilities are often inadequate. There may not be enough toilets or handwashing stations. This creates a risk for the spread of infectious diseases, especially during outbreaks. These challenging conditions make civil servants highly vulnerable to the effects of climate change. As

Ibrahim (2020) argued, improving the public sector work environment is essential for national development.

Climate Change Vulnerability in Rivers State

Rivers State is located in the Niger Delta region of Nigeria. It has a coastline along the Atlantic Ocean. The state has a tropical monsoon climate. It is characterized by high temperatures and heavy rainfall for most of the year. The state is highly vulnerable to the impacts of climate change. A report by the Rivers State Ministry of Environment (2021) outlined several key vulnerabilities.

Flooding is the most prominent threat. The state experiences severe annual flooding. This flooding inundates communities, destroys farms, and displaces people. It also damages public infrastructure, including government offices. Floodwaters contaminate drinking water sources, leading to outbreaks of waterborne diseases like cholera. Rising sea levels are a long-term threat to coastal areas of the state, including parts of Port Harcourt.

High temperatures and humidity are a constant feature. Heatwaves are becoming more common. The urban heat island effect makes cities like Port Harcourt even hotter. This combination of heat and humidity creates dangerous conditions for human health. It is also conducive to the spread of diseases. Mosquitoes thrive in warm, wet conditions. This makes malaria a perennial problem. Given these environmental conditions, the occupational health risks for civil servants in Rivers State are significant and require urgent attention (Eze, 2020).

Challenges of Mitigating Climate-Related Occupational Risks

Addressing occupational health risks from climate change is difficult. There are many challenges. The first is a lack of awareness and knowledge. Many employers and workers do not fully understand the links between climate change and workplace health. They may see heat stress as just normal discomfort, not a health risk. This lack of awareness means that prevention is not a priority.

The second challenge is economic. Retrofitting buildings to be more climate-resilient costs money. Installing air conditioning, improving ventilation, and providing clean water require investment. Government budgets are often tight. Allocating funds for workplace improvements can be difficult. There is also the cost of developing and implementing new policies and training programs.

The third challenge is institutional. Occupational health and safety regulations in many countries, including Nigeria, have not been updated to include climate change. The existing laws may not specifically address risks like heat stress or climate-sensitive diseases. This creates a legal vacuum. Without clear regulations, employers are not compelled to act. There is also a lack of technical expertise. Few safety officers are trained to assess and manage climate-related risks. Adamu and Yakubu (2023) identified poor policy implementation as a major hurdle in Nigeria.

Theoretical Framework

This study is guided by the Protection Motivation Theory (PMT). PMT was developed by R.W. Rogers in 1975. It explains how people are motivated to protect themselves from threats. The theory suggests that people engage in protective behaviors based on two key processes: threat appraisal and coping appraisal.

Threat appraisal involves evaluating the severity of the threat and one's vulnerability to it. For example, a civil servant must believe that heat stress is a serious health risk (high severity) and that they are likely to suffer from it in their office (high vulnerability). Coping appraisal involves evaluating the effectiveness of the recommended protective action (response efficacy) and one's ability to perform it (self-efficacy). For instance, the civil servant must believe that drinking more water and taking breaks in a cool place will actually prevent heat stress (response efficacy) and that they are able to do these things at work (self-efficacy).

In the context of this study, PMT helps understand the behavior of civil servants and policymakers. If civil servants do not perceive climate change as a severe threat to their health, they will not demand safer working conditions. Similarly, if policymakers do not feel vulnerable to pressure or do not believe that adaptive measures are effective or feasible, they will not implement them. Therefore, for successful adaptation, both threat and coping appraisals must be high. This theory will help analyze the awareness levels and the likelihood of adopting protective measures against climate-related occupational health risks in Rivers State.

Methodology

This study used the descriptive survey research design. This design is appropriate because it helps in describing the characteristics of the population and understanding the current situation. The population of the study consisted of 5,000 civil servants working in the various ministries in Port Harcourt, Rivers State. This includes administrative staff, clerical officers, and other public servants. The sample size for the study was 300 respondents. This sample was selected from 10 different ministries. The ministries included Health, Education, Environment, Works, and others. The random sampling technique was used. This means every civil servant in the selected ministries had an equal chance of being chosen. This method helps to ensure that the sample is representative of the larger population.

The instrument for data collection was a structured questionnaire. It was titled "Questionnaire on Climate Change and Occupational Health Risks (QCCOHR)". The questionnaire had two sections. Section A collected demographic information. This included age, gender, ministry, and years of service. Section B had 15 items. These items were based on the research objectives. They measured the level of awareness, the identified health risks, and the existing adaptation measures.

The questionnaire used a four-point Likert scale. The options were Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). This scale is simple and easy for respondents to understand. It also allows for quantitative analysis of opinions. The instrument was validated by experts in environmental health and public administration. They checked the questions for clarity and relevance. A pilot study was conducted with 30 civil servants from a different state. This was to test the reliability of the questionnaire. A reliability coefficient of 0.85 was found. This is considered good for such studies.

Data collection was done over a period of four weeks. The researcher visited the selected ministries and distributed the questionnaires. Some respondents filled them on the spot. Others took them and returned them later. To ensure a good response rate, follow-up reminders were sent. The data collected was analyzed using mean scores. The mean score helped to determine the average response for each item. A mean score of 2.50 and above was considered as agreement. Below 2.50 was considered disagreement. The chi-square test was used to test hypotheses at a 0.05 level of significance.

Results

Analysis of Research Questions

Research Question One: What is the level of awareness among civil servants in Rivers State regarding the impact of climate change on occupational health?

Table 1: Mean Score Showing the Level of Awareness on Climate Change and Occupational Health

S/N	Items	SA	A	D	SD	Total Score	$\bar{x}$
1	I understand what climate change means.	210	70	12	8	1082	**3.61**
2	I am aware that climate change can affect my health at work.	95	110	65	30	870	**2.90**
3	My workplace has discussed the health risks	40	60	120	80	660	**2.20**

	of rising temperatures.						
4	I know the symptoms of heat-related illnesses like heatstroke.	55	80	100	65	725	**2.42**
5	I am aware that climate change can increase diseases like malaria.	180	85	25	10	1035	**3.45**

Table 1 shows that respondents have a high general awareness of climate change ($\bar{x}$=3.61) and its link to diseases like malaria ($\bar{x}$=3.45). Awareness of the direct occupational health impact is moderate ($\bar{x}$=2.90). However, there is a low level of specific knowledge about heat-related illnesses ($\bar{x}$=2.42) and a clear lack of discussion in the workplace ($\bar{x}$=2.20), which falls below the acceptance level of 2.50.

Research Question Two: What are the specific climate change-induced occupational health risks faced by civil servants in Rivers State?

Table 2: Mean Score Showing the Prevalence of Climate-Induced Occupational Health Risks

S/N	Items	SA	A	D	SD	Total Score	$\bar{x}$
6	I often feel excessively hot and uncomfortable in my office.	250	40	8	2	1138	**3.79**
7	I have experienced dizziness or fatigue due to heat at work.	190	75	25	10	1045	**3.48**
8	Flooding around my workplace has affected my commute and health.	165	90	30	15	1005	**3.35**
9	I have had more frequent cases of malaria or other fevers recently.	200	70	20	10	1060	**3.53**
10	Workplace stress has increased due to climate-related disruptions.	175	85	30	10	1025	**3.42**

Table 2 reveals that all listed health risks have very high mean scores, all well above 2.50. The highest mean is 3.79 for feeling excessively hot in the office. This is followed by experiences of malaria/fever ($\bar{x}$=3.53) and heat-related dizziness ($\bar{x}$=3.48). This means respondents strongly agree that they are facing significant climate-related health risks at work. Flooding ($\bar{x}$=3.35) and increased stress ($\bar{x}$=3.42) are also confirmed as major issues.

Research Question Three: What workplace adaptation measures and policies exist to mitigate climate-related health risks in the civil service?

Table 3: Mean Score Showing the Existence of Workplace Adaptation Measures

S/N	Items	SA	A	D	SD	Total Score	$\bar{x}$
11	My office has reliable air conditioning or ventilation.	45	55	110	90	655	**2.18**
12	There is a policy for flexible working hours during extreme heat.	20	30	100	150	520	**1.73**
13	Clean drinking water is always available at my workplace.	80	90	80	50	800	**2.67**
14	My office has a first-aid kit and protocol for heat stress.	25	40	105	130	560	**1.87**
15	Management encourages practices to reduce heat stress.	35	50	95	120	600	**2.00**

Table 3 shows very low mean scores for most items. Items 11, 12, 14, and 15 have mean scores far below the 2.50 acceptance level. This indicates strong disagreement that effective adaptation measures are in place. The only item with a score above 2.50 is the availability of clean drinking water ($\bar{x}$=2.67). This suggests a severe lack of policies, infrastructure, and management initiatives to protect civil servants from climate-related health risks.

Testing of Hypotheses

Hypothesis One (H_{01}): There is no significant relationship between the awareness level of civil servants and their perception of climate-related health risks.

Table 4: Chi-Square Test for Hypothesis One

Cells	f_o	f_e	Df	x^2 cal	x^2 crit	Decision
5	11	38.2	12	52.45	16.92	H_{01} Rejected

The calculated chi-square value is 52.45. The critical value from the table is 16.92. Since 52.45 is greater than 16.92, the null hypothesis is rejected. This means there is a significant relationship between the awareness level of civil servants and their perception of health risks. In other words, civil servants who are more aware of climate change are more likely to perceive it as a threat to their health at work.

Hypothesis Two (H_{02}): There is no significant relationship between the type of work environment and the prevalence of climate-related health issues among civil servants.

Table 5: Chi-Square Test for Hypothesis Two

Cells	f_o	f_e	Df	x^2 cal	x^2 crit	Decision
5	11	29.8	12	41.22	16.92	H_{02} Rejected

The calculated value is 41.22. The critical value is 16.92. Again, the calculated value is higher. Therefore, the null hypothesis is rejected. This confirms that the work environment (e.g., poor ventilation, lack of cooling) is significantly related to the prevalence of health issues like heat stress among civil servants.

Hypothesis Three (H_{03}): There is no significant relationship between the existence of workplace adaptation policies and the reduction of occupational health risks.

Table 6: Chi-Square Test for Hypothesis Three

Cells	f_o	f_e	Df	x^2 cal	x^2 crit	Decision
5	6	14.5	12	335.78	16.92	H_{03} Rejected

The calculated chi-square value is 335.78. This is much larger than the critical value of 16.92. Thus, the null hypothesis is rejected. This shows a strong significant relationship. It means that the absence of workplace adaptation policies is strongly associated with a higher prevalence of occupational health risks among civil servants.

Discussion of Findings

The findings of this study reveal several important things. First, civil servants in Rivers State have a basic understanding of climate change. However, their awareness of its direct impact on their occupational health is low. They know climate change can cause malaria, but they do not strongly connect it to risks like heat stress in their offices. This finding is consistent with a study by Omotayo and Udochi (2021) on environmental awareness in Nigeria. They found that while

people know about global warming, they often fail to see its local and immediate implications for their daily lives.

The second major finding is the high prevalence of climate-related health risks. Civil servants reported experiencing extreme heat, dizziness, fatigue, and increased incidence of malaria. This confirms that the work environment is already negatively affecting their health. The problem of flooding impacting commutes and causing stress was also significant. This finding supports the work of the ILO (2019), which warned that workers in tropical regions are on the front lines of climate change impacts. The situation in Rivers State is a clear example of this global trend.

The third finding is the alarming lack of workplace adaptation measures. Apart from the availability of drinking water, most essential measures are absent. There are no reliable cooling systems, no flexible work policies for extreme heat, and no first-aid protocols for heat-related illnesses. This shows a major gap in occupational health and safety preparedness. This finding aligns with a study by Adamu and Yakubu (2023), which found that public institutions in Nigeria are generally ill-prepared to integrate climate adaptation into their operations.

The hypotheses tested in the study all showed significant results. This adds strength to the findings. The rejection of the first hypothesis shows that increasing awareness is a crucial first step toward risk perception. The rejection of the second hypothesis confirms that improving the physical work environment is essential for protecting health. The rejection of the third hypothesis underscores the critical need for formal policies to guide and enforce protective measures. Together, these results paint a clear picture: civil servants in Rivers State are vulnerable to climate-related health risks due to a combination of low specific awareness, poor working conditions, and a complete lack of targeted policies.

Conclusion

In conclusion, this study examined the implications of climate change for occupational health risks among civil servants in Rivers State. It found that while there is general awareness of climate change, its specific occupational health impacts are not well understood. Civil servants are already experiencing significant health issues like heat stress and increased disease exposure directly linked to their work environment. The absence of adaptation measures and policies leaves them unprotected. Therefore, there is an urgent need to address this gap. This will require a concerted effort from government, ministry heads, and occupational health experts to create safer, more resilient workplaces.

Recommendations

Based on the findings, the following recommendations are made:

1. The Rivers State Government should develop and implement a specific Occupational Health and Safety Policy that includes climate change adaptation measures. This policy should mandate standards for workplace temperature, ventilation, and water availability.
2. Awareness campaigns and training programs should be organized for civil servants and management. These programs should educate them on the specific health risks of climate change and practical steps for prevention, such as recognizing heat stress symptoms.
3. The government should allocate funds for retrofitting government buildings. This should include installing energy-efficient cooling systems, improving ventilation, and ensuring reliable water and electricity supply.
4. The government should introduce flexible working arrangements, such as adjusted working hours during periods of extreme heat or severe weather, to protect employees.
5. Partnerships should be formed with health and environmental agencies to regularly monitor and assess climate-related health risks in the workplace and provide expert guidance on mitigation strategies.

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