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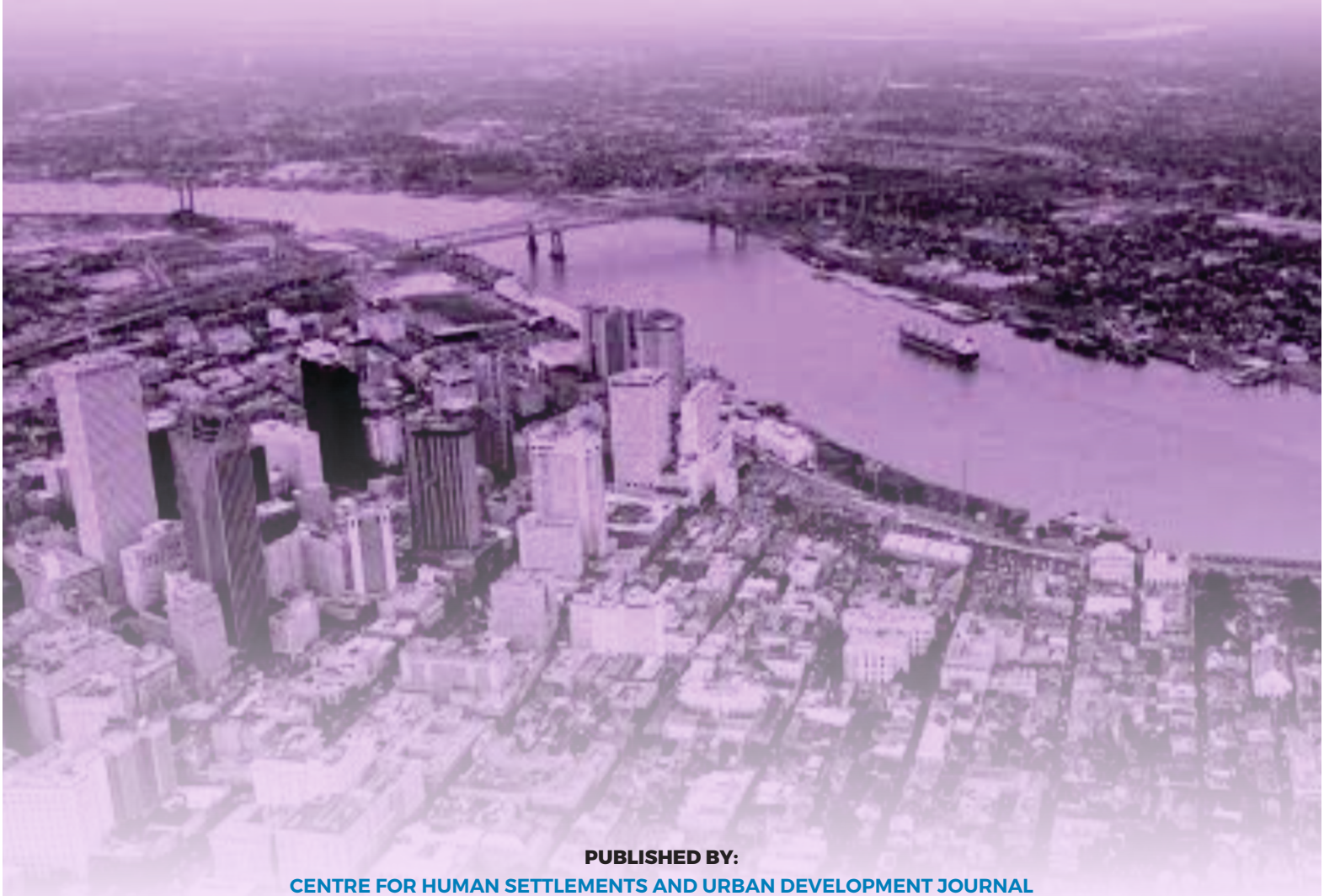

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Editorial Committee

EDITORIAL REMARKS

Dear Reader,

This year the Centre for Human Settlements & Urban Development (CHSUD) will mark her 20th anniversary. This edition of her journal is intended as a prelude to launching of the Anniversary Edition tagged "Managing Human Settlements in the Urban Century". This will highlight the requisites of having and keeping cities, towns and all forms of human settlements as humanity finally moved into the age where urbanization and urban activities, for the first time in history, dominates the planet. The special call for a focus on urbanization is further hinged on the fact that besides dominating human settlement types, urban related human activities have had the greatest impact on earth and its environment. This has resulted into a phenomenon now referred to as "The Anthropocene" – an interconnected, complex global systems in which humanity's impact has become clear.

This volume nine and particular edition (number one) feature works that explored elements and scenarios that increasingly dominates African cities today. Many of them exhibiting lack lustre state of bourgeoning cities and towns in sub-Saharan Africa. But shown here exhibiting the different efforts being made towards having sustainable living and livelihood. This is evident from widespread poverty and deprivations highlighted by "*Implications of Spatial Variation of Household Poverty Incidence in Neighbourhoods of Minna, Nigeria"*, to the explorations of the limitations of interventions shown by *"Climate Change Mitigation Paradox: Poverty and Greenhouse Gas Reduction in A Global South City"*. The different negative effects of increasing human activities on the natural and social environment enumerated by "*Spatio-Temporal Analysis of Land Use and Land Cover Change of Birnin Kebbi for Sustainable Development"*, and, "*Reduction in the Effects of Climate Change: Efforts Towards Safeguarding the Built Environment in Kaduna, Nigeria";* have drawn attention to the dimensions and consequences, at local, national and regional levels, the increasing effects of human activities dominated earth and arguably the planetary system.

Dr Aliyu M. Kawu MNITP, RTP, MeRSA
Editor-in-Chief
CHSUD Journal

Papers for Journal

The journal accepts well researched papers, including case studies, from all disciplines in Environmental Sciences and other disciplines or subject areas related to the built environment. However, papers to be considered for a specific volume of the journal should fall within the theme and sub-themes specified. The theme for each volume of the journal will be specified.

Submission of Papers

All manuscripts should be submitted to the editor, CHSUD Journal. Three hard copies of papers should be forwarded to the editor with a letter of undertaking that the work is not under consideration elsewhere and it will not be sent to another journal until final decision has been made on it.

Electronic Version: In addition to three hard copies, an electronic version of the article should be forwarded to CHSUD e-mail.

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REDUCTION IN THE EFFECTS OF CLIMATE CHANGE: EFFORTS TOWARDS SAFEGUARDING THE BUILT ENVIRONMENT IN KADUNA, NIGERIA

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Abstract
In developing nations such as Nigeria, climate change has negatively affected the built environment, which necessitates adaptation and mitigation measures. The objectives of the study are to explore the predictors of climate change indicators, appraise the adverse effects of climate change on human health; and document the awareness of climate change adaptation and mitigation strategies. The Relative Importance Index (RII) was used to analyze the collated and screened data from the respondents who are experts and professionals in the case study neighbourhood. Findings revealed the predictors of climate change indicators; biodiversity (4.21), pollution (4.13), Urbanization (4.06), and land degradation (3.96). For adverse effects of climate change on human health, findings revealed increases in; Nutritional infectious diseases (4.08); Temperature-related health effects (4.05), and Air pollution-related health effects (4.03). The study's outcome suggests that combating the menace of climate change in recent years calls for robust measures that will help in the long-term improvement and maintenance of the built environment. Hence, the need for urgent actions toward integrating climate change interventions into Nigerian government decisions, initiatives, and development.

Keywords: Climate Change, Built environment, Mitigation, Adaptations, Relative important index, Nigeria

Introduction

Climate change scenarios can be used to estimate the potential costs of global warming to mankind (Tol, 2002). Simultaneously, carbon emissions are calculated concerning economic activity as determined by representative carbon concentrations and social development routes (Gattuso et al., 2015). Multiple elements contribute to the societal implications of climate change in practice, given the intricate interplay between climate and society. Climate change remains to be the most prominent critical issue confronting countries around the globe today. As a result of this menace, the possible implications of public space as part of built environments (rural and urban) necessitate more attention in recent times. The vast variety of projected climate impacts on natural ecosystems and the current atmospheric concentrations of greenhouse gases (GHGs) constituted a significant threat in recent times (IPCC, 2010; Munang et al., 2013). Hence, As evidenced by increasing ocean temperatures, worldwide heavy snow, and rising average sea levels, the climatic change system is indicating global warming (IPCC, 2010). In view of this, numerous developing countries around the world remain vulnerable to the consequences of climate change; consequently, the global agenda continues to prioritize a sustainable future (Federici, et. al, 2015; Rossi et al., 2016).

Built environments such as ecosystems, according to Morecroft et al., (2019); form an important part of environmental conservation because they can greatly decrease the greenhouse effect and its vulnerability. Similarly, mitigation of climate change through ecological restoration or more effective land strategic planning has proven to be more widely recognized in recent times (Griscom et al., 2017). Climate change alludes toward a possible shift in the aspect of the climate as identified in the mean variations that last for a certain considerable amount of time. The issues emerged from a spike in the overall atmosphere's surface's average global temperature in the late nineteenth century (USGCRP, 2017; Friedlingstein et al., 2019). Changes in the climate are a result of an increase in globally averaged temperatures, while extenuating circumstances such as natural occurrences and human behavior cause an upsurge in global average temperatures. Evidence has shown that several countries all across the world would feel the consequences of the effects of global warming, hence, several agencies have responded to the challenges to reduce the risks posed to society (IPCC, 2010; Anthun, et al., 2019). Health problems have resulted from the conflict between environmental preservation and economic expansion, which has been exacerbated by industrialization and urbanization (Hanmin et.al., 2021). Although there is a surge of attention in comprehending

how carbon emissions affect health in the context of climate change, little is observed at the regional level and by empirical studies.

Climate change across Africa has resulted in the most unpredictable weather patterns, deteriorating coastlines, and indeed the proliferation of pests and waterborne diseases. Whenever the atmospheric temperature rises by one degree, African farmers are predicted to lose $28 per hectare annually (IPCC, 2021). Cities are important producers of greenhouse gases. To complicate things further, African nations are among the greatest urbanization rates in the world, ranges of up from 2.4% in North Africa to 4.02 % in West and Central Africa to 4.05 % in East Africa between the Year 2005 and the Year 2010 (UN-Habitat 2008). Environmental problems in African countries have recently been raised due to the production of unusually large amounts of pollutants. Among the factors include rapid industrial pollution and sizable recurrent wildfires intended on removing pasture and woodlands to create space for more conservation agriculture practices. Exacerbating impacts have harmed national economies, people's way of life, numerous communities, and countries. African countries lack both the economic and human resources to ameliorate the climate change consequences (Yuen & Kumssa, 2011; Jagtap 2007). Simultaneously, the knowledge skills in Africa are low areas of the technological capabilities needed to combat air pollution generated by high population and increased use of motor vehicles. In Nigeria, studies have shown that the country is already contending with a slew of environmental issues that have been connected to public space, and climate change (Holm, 2003; Akinola & Adewale 2012). According to research projections, between the years 2030 and 2050, there will be a climate change scenario that will culminate in roughly 250,000 deaths per year as a result of heat distress (UNEP 2013; WHO, 2021). However, Climate change is currently ravaging African cities, and it will deteriorate in the upcoming decades because cities will eventually house the bulk of nation's inhabitants. Meanwhile, the interaction between people and built environment has an impact on the well-being. A focus on preventing diseases and illnesses connected with overpopulation, inadequate sanitation, and exposure to environmental pollution are to be given adequate attentions (Agboola 2011b; Taff et al., 2019). Facilities such as green spaces, constructed or allocated for specific and crucial tasks with a bearing on environmental sustainability, public health, and wellbeing enable, support, and promote comfortable, productive, and healthy living in the planned environment (DeWeerdt 2007; Agboola 2019; Rashed & Shah, 2021).

However, fewer studies have focused on adaptation techniques aiming at mitigating the impacts to reduce greenhouse gas emissions as collective actions in South-west, Nigeria (Jones et al.; Naumann et al., 2011). Addressing the climate change for future environmental planning will ameliorate the future negative consequences as mitigation and adaptation are associated with arrays of benefits for biodiversity conservations and peoples' wellbeing (Morecroft, et al., 2019; Hanmin et. al., 2021). The gap in this study's context is attributable to the quantitative techniques that have been used to come up with reliable findings, conclusions, and recommendations for measures against climate change in Nigeria. Justification for the research work is vested in the changes in the climate, its mitigation, and adaptation intervention needed inclusiveness by the participation of the major players directly. Their involvement in this study includes feedback through survey questionnaires on the study's main themes. This method document the preventive measures in Nigeria climate change's study for future prospects; enhancement of health, and environmental conservation of Nigeria's built environment.

Therefore, this study identifies experts assessment of how climate change has influenced built environment in the Nigeria's Northern region. The objectives are to: explore the reasons for climate change in Kaduna, Nigeria; determine the consequences of environmental issues on inhabitant health in Kaduna, and critically determine the key measures of climate change mitigation and adaptation to enhance the environmental sustainability of Northern region of Nigeria. The need to conserve, safeguard, and enhance the environment is a critical challenge for numerous countries, and it dominates deliberations and initiatives of government agencies and humanitarian organizations all over the world, including Nigeria. This study is therefore significant through the assessment of recent rapid urbanization and industrialization patterns in the study area; by highlighting the ways to integrate the preventive measures and management steps taken in reaction to

anthropogenic climate effects. Because of the present deteriorated form of the majority of the planet's habitats, restoration is a key to realizing the concerted efforts for adaptations and mitigations.

Research Methodology

The Nigerian city of Kaduna is situated in the country's northern Guinea savannah region (Figure 1). It is located 645 meters above sea level, between Longitudes 7 and 8 degrees east and Latitudes 10 and 11 degrees north. With a population of 1,561,000 and an annual growth rate of 2.55%, according to UN figures from 2010, Kaduna is now the fifth-largest city in Nigeria, after Lagos, Kano, Ibadan, and Abuja. Due to the significant impact of human activity in the industrial, building, and other sectors on climate change, Kaduna State was chosen for this study.

Figure 1: The Study Area **(**Kaduna state, Nigeria)

Source: Adapted from Onwumere (2017).

The questionnaires used to collect the data for this research were created based on the findings of the review of related literature. The questionnaire was split into various sections in accordance with the specific objectives of the study. Sections 2 and 3 ask questions about the sources of climate change and its adverse effects, respectively, while Section 1 is on the demographic features of the respondents. The scale of measurement used for section 2 was a five point Likert type scale with '1' denoting '*strongly disagree'*, '2' denoting '*disagree*', '3' denoting '*undecided'*, '4' denoting '*agree*', and '5' denoting '*strongly agree'*. Section 3 used a Likert type scale with '1' denoting '*no effect*', '2' denoting '*minor effect'*, '3' denoting '*neutral*', '4' denoting '*moderate effect*', and '5' denoting '*major effect'*. In Section 4 of the questionnaire, experts who work in the built environment were questioned about their familiarity with climate change adaptation and mitigation strategies and had been rated on a scale of '1' to '5', with '5' representing the highest level of '*awareness*' (from '*not at all aware'* to '*very aware')*. The adoption of mitigation and adaptation strategies for climate change was then assessed using Section 5. We used a 5-point Likert scale, where '1' meant '*never'*, 2 meant '*rarely'*, 3 meant '*occasionally'*, '4' meant '*often'*, and '5' meant '*always'*.

Using a convenience sampling technique, the sample size was chosen from the population of both registered and non-registered built

environment experts (Creswell, 2012). Due to the absence of an exhaustive list of built environment experts in the study area, this strategy proved sufficient. Professionals from the domains of architecture, urban and regional planning, building technology, quantity surveying, and estate management engaged in the study in the number of one hundred and three (103). But the online survey was conducted between May and June 2022, and the collected results were compiled, vetted, coded, and examined. Relative Importance Index (RII) was employed to examine the compiled data because it is appropriate for prioritizing indicators rated on Likert type scales and it allows the identification of the most relevant criteria based on responses from respondents (Rooshdi et al., 2018).

For each of the variables, the sum of the weighted values (SWV) over the total value was obtained. The index was then used as the basis for ranking. According to the Likert scale coding, the variables are arranged from most weighted to least weighted in descending order. The most important factors are those at the top of the list, while the least important factors are those at the bottom. Tables and charts are used to present the findings.

$$Q = EFx / N \quad \text{.....Eqn.1}$$

Where, Q=Mean, Σ =Summation,

Fx=Frequency of x and N=Number of occurrences.

The scores on the 5-point Likert scale were given a weight value of 5, 4, 3, 2, and 1 in order to calculate the perception aggregate index (I) of each service. The product of the weight value of each rating and the quantity of replies for each rating was added to yield the sum of weight value (SWV) for each variable. The summation of value (SWV) for each variable was divided by the total number of respondents, denoted by the letter "N," to generate the perceptual aggregate index (I) for each variable.

$$\text{Index (I)} = SWV / N \quad \text{.....eqn.2}$$

Results and Discussion

Demographics of the respondents

The demographics data for a total number of 105 professionals indicated the sample of the professionals consisted of 65.71% men and 34.28 women as depicted in Figure 2. Regarding the respondents' ages, at the time of the survey, 45.71% of the respondents were between the ages of (25-40), 29.52% were between the ages of (41-50), and 24.76% were between the ages of (51-60) as presented in Figure 3. This inferred that a higher proportion of the professionals in the research area are under 40 years of age.

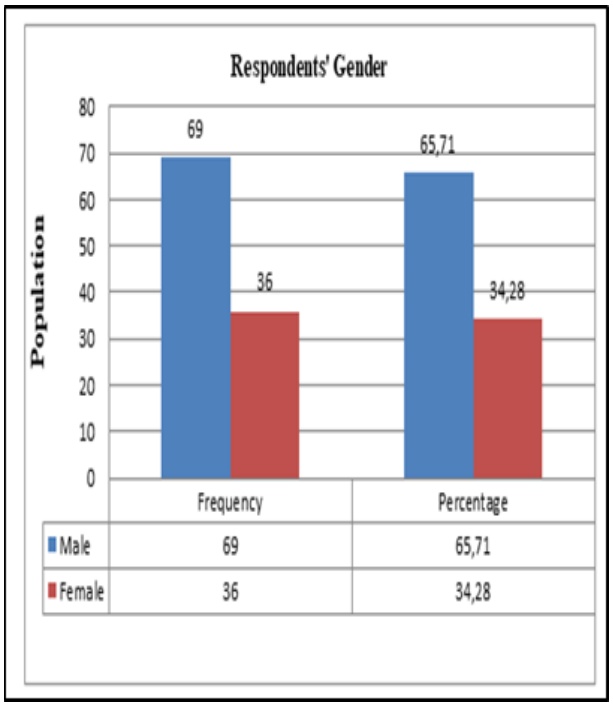

Figure 2: Respondents' Gender

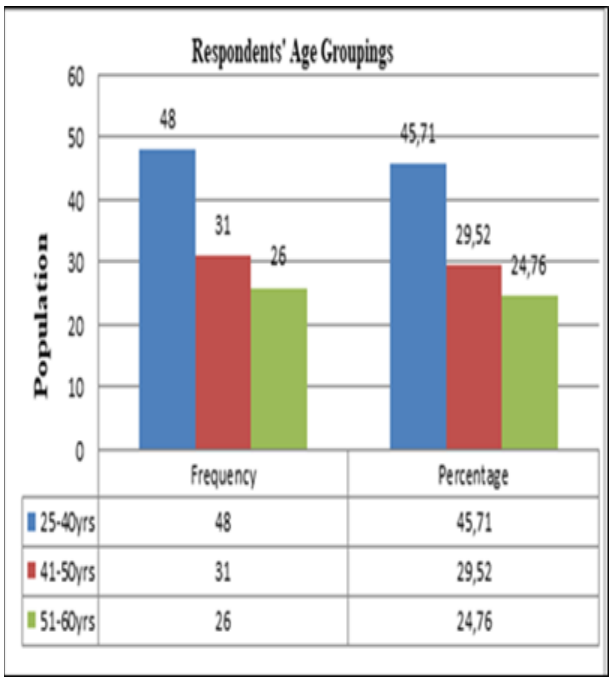

Figure 3: Respondents' Age Classification

Figure 4 revealed that approximately 71.42% of the respondents were married, according to the statistics, while the remaining 23.80% were single. In terms of the professionals' working experience,

the findings showed that 21 (20%) had 11–15 years of experience, 28 (26.66%) had 6–10 years, and 26 (24.76%) had 1–5 years of relevant experience as depicted in Figure 5. Similar to this, 12 (11.42%) had more than 20 years of relevant experience, and 18 (17.14) had between 16 and 20 years. Additionally, the results showed that about 26.66% of respondents had professional training in architecture, 20.00% in urban and regional planning, and the remaining 20.95%, 17.14%, and 15.23%, respectively, had professional backgrounds in building, estate management, quantity surveying, and estate management as shown in Figure 6. Respondents' who are Masters' degree holders made up of 37.14%; Bachelors' degree holders had 35.23%; holders of Higher National Diploma certificate constitute 14.28%; while 8.57% are Doctorate degree holders as indicated in Figure 7.

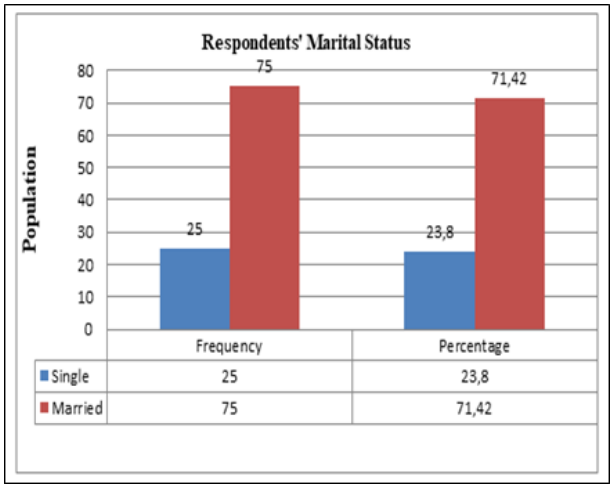

Figure 4: Respondents' Marital Status

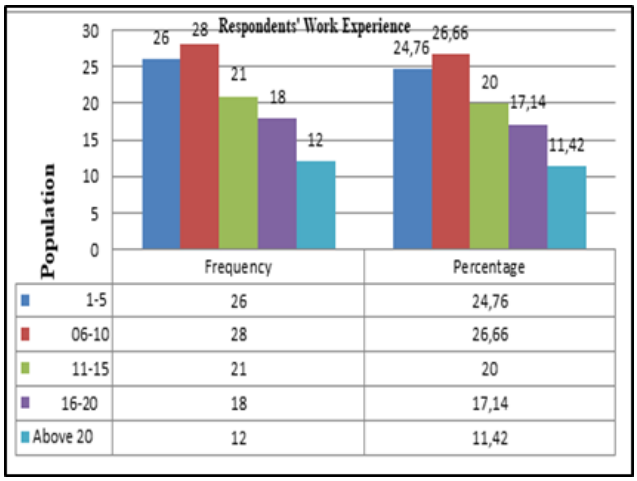

Figure 5: Respondents' Work Experience

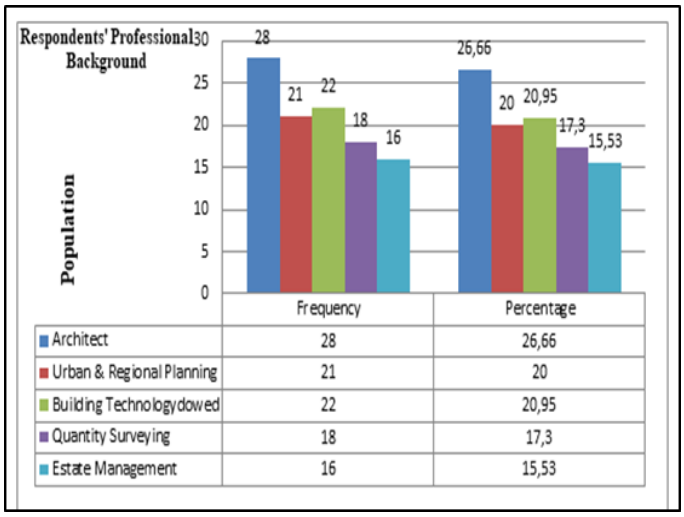

Figure 6: Respondents' Professional Status

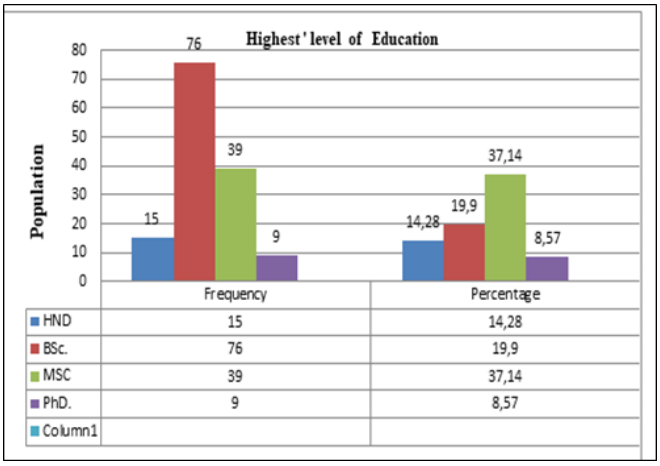

Figure 7: Respondents' Level of Educatio

Table 1: Predictors of Climate Change Indicators

Variables	1" (strongly disagree)	2 (Disagree)	3 (Undecided)	4 (Agree)	5 (Strongly agree)	∑f	SWV	RII Index	Rank
Land degradation (LD)	9 (8.57%)	7 (6.67%)	4 (3.80%)	44 (41.90%)	41 (39.04%)	105	416	3.96	**4th**
Biodiversity loss (BDL)	5 (4.76)	7 (6.66%)	2 (1.90%)	43 (40.95%)	48 (45.71%)	105	437	4.21	**1st**
Pollution (P)	3 (12.7%)	8 (9.90%)	5 (22.5%)	45 (21.1%)	44 (41.90%)	105	434	4.13	**2nd**
Drought (D)	13 (12.38%)	8 (7.61%)	3 (2.85%)	42 (31.0%)	39 (37.14%)	105	401	3.81	**5th**
Land use change such as deforestation and desertification	17 (16.19%)	10 (9.52%)	4 (3.80%)	36 (34.28%)	38 (36.19%)	105	383	3.64	**8th**
Urbanization (URB)	8 (9.90%)	8 (9.90%)	4 (3.80%)	44 (41.90%)	43 (40.95%)	105	427	4.06	**3rd**
Stratospheric ozone depletion (SOD)	3 (2.85%)	4 (3.80%)	5 (22.5%)	46 (14.1%)	47 (12.7%)	105	353	3.36	**7th**
Population growth (PG)	9 (8.57%)	14 (13.33%)	5 (22.5%)	38 (36.19%)	39 (37.14)	105	399	3.80	**6th**

Table- 2: Adversarial Effects of Climate Change Human Health

Variables	1 (No effect)	2 (Minor effect)	3 (Neutral)	4 (Moderate effect)	5 (Major effect)	∑f	SWV	RII Index	Rank
1) Increase in Air pollution related health effects	4 (3.80%)	6 (5.71%)	16 (15.23%)	35 (33.33%)	44 (41.90%)	105	424	4.03	**3rd**
2) Increase in Temperature-related health effects	5 (22.5%)	3 (2.85%)	18 (17.14%)	34 (32.38%)	45 (42.85%)	105	426	4.05	**2nd**
3) Increase in Mental-related infected infectious diseases	4 (3.80%)	6 (5.71%)	19 (18.09%)	35 (33.33%)	41 (39.04%)	105	418	3.98	**6th**
4) Increase in Nutritional infectious diseases	4 (3.80%)	3 (2.85%)	16 (15.23%)	39 (37.14%)	43 (40.95%)	105	429	4.08	**1st**
5) Increase in Water and foot Borne related diseases	6 (5.71%)	8 (9.90%)	10 (9.52%)	37 (35.23%)	44 (41.90%)	105	420	4.00	**5th**
6) Increase in shortage of food production	17 (16.19%)	7 (6.67%)	12 (11.42%)	30 (28.57%)	39 (37.14)	105	382	3.63	**7th**
7) Increase in Poverty / low level of economic activities	4 (3.80%)	6 (5.71%)	16 (15.23%)	36 (34.28%)	43 (40.95%)	105	423	4.02	4th

Table 3: Awareness of climate change adaptation and mitigation strategies

Variables	1 (not at all aware)	2 (slightly aware)	3 (somewhat aware)	4 (moderately aware)	5 (extremely aware)	∑f	SWA	RII Index	Rank
Greenery/Planting trees	3 (2.85%)	6 (5.71%)	4 (3.80%)	42 (40.00%)	50 (47.61%)	105	445	4.23	**2nd**
Pedestrianized environment (Reduction in global carbon Co2 emission via less usage of motorized transport)	4 (3.80%)	3 (2.85%)	11 (10.47%)	39 (37.14%)	48 (45.71%)	105	439	4.18	**3rd**
Enforcement of building guidelines	4 (3.80%)	4 (3.80%)	17 (16.19%)	41 (39.04%)	39 (37.14%)	105	422	4.01	**4th**
Use of energy-efficient technologies	3 (2.85%)	4 (3.80%)	23 (21.90%)	34 (32.38%)	41 (39.04%)	105	421	4.00	**5th**
Reliance on weather forecast	4 (3.80%)	4 (3.80%)	23 (21.90%)	35 (33.33%)	39 (37.14%)	105	416	3.96	**7th**
Advancement of renewable energy	3 (2.85%)	7 (6.67%)	5 (22.5%)	36 (34.28%)	54 (51.42%)	105	446	4.24	**1st**
Promulgation of law that discourages human activities impacts	4 (3.80%)	5 (22.5%)	20 (19.04%)	35 (33.33%)	41 (39.04%)	105	419	3.99	**6th**
Provision of stronger urban-rural connections	4 (3.80%)	3 (2.85%)	29 (27.61%)	38 (36.19%)	31 (29.52%)	105	404	3.84	**8th**
Use of resilient building materials	6 (5.71%)	7 (6.67%)	30 (28.57%)	33 (31.42%)	29 (27.61%)	105	387	3.68	9th

Table 4: Extent of using climate change adaptation and mitigation strategies

Variables	1 (Never)	2 (Rarely)	3 (Sometimes)	4 (Often)	5 (Always)	∑f	SWV	RII Index	Rank
Use of resilient building materials	3 (2.8%)	5 (22.5%)	22 (20.95%)	32 (30.47%)	43 (40.95%)	105	422	3.89	**6th**
Pedestrianized environment (Reduction in global carbon Co2 emission via less usage of motorized transport)	7 (6.67%)	8 (9.90%)	27 (25.71%)	29 (27.61%)	34 (32.38%)	105	390	3.71	**8th**
Use of energy-efficient technologies	6 (5.71%)	7 (6.67%)	12 (11.42%)	31 (29.52%)	49 (46.66%)	105	425	4.04	**2nd**
Provision of stronger urban-rural connections	5 (22.5%)	6 (5.71%)	13 (19.7%)	28 (26.66%)	45 (42.85%)	105	393	3.74	**7th**
Greenery/Planting trees	4 (3.80 %)	5 (22.5)	13 (19.7%)	32 (30.47%)	51 (48.57%)	105	436	4.15	**1st**
Advancement of renewable energy	6 (5.71%)	9 (8.57%)	13 (19.7%)	36 (34.28%)	41 (39.04%)	105	412	3.92	**4th**
Enforcement of building guidelines	8 (9.90%)	8 (9.90%)	10 (9.52%)	33 (31.42%)	46 (43.80%)	105	416	3.96	**3rd**

Promulgation of law that discourages human activities impacts	7 (6.67%)	6 (5.71%)	15 (14.28%)	39 (37.14%)	38 (36.19%)	105	410	3.90	**5th**
Reliance on weather forecast	3 (2.85%)	9 (8.57%)	21 (23.9%)	26 (24.76%)	46 (43.80%)	105	418	3.98	**3rd**

Predictors of Climate change Indicators

The first objective of the study is to explore the predictors of climate change indicators. Table 1 lists the findings about the likely causes of climate change in the research area as judged by the professionals who took part in the survey. Findings revealed the predictors of climate change indicators in the descending order of rating namely (i) Biodiversity loss; (ii) Pollution;(iii) urbanization, and (iv) Land degradation. These were ranked accordingly with the RII values of 4.21, 4.13, 4.06 and 3.96 respectively. It is clear that experts believe that urbanization, pollution, and biodiversity loss are key indicators of climate change. This illustrates the persistent issues with climate change in emerging nations like Nigeria. This study is in agreement with the results of earlier research by Ayodele (2010), Komolafe et al. (2014) and Akinro et al. (2008). It is clear from this that the main human activities that have influenced climate change include fast industrialization, a variety of pollution mechanisms, and biodiversity loss.

Adversarial effects of climate change on human health

In relation to the appraisal of the adverse effects of climate change on the human health, findings revealed (i) Increase in Nutritional infectious diseases; (ii) Increase in Temperature-related health effects, and (iii) Increase in Air pollution related health effects were all ranked accordingly with RII values of 4.08; 4.05 and 4.03. Table 2 shows the conclusion of the detrimental effects of climate change on human health. The negative effects on residents' health include an increase in nutritional infectious diseases, an increase in temperature-related health effects, and an increase in air pollution-related health effects. This is a sign that environmental preservation and economic growth are at odds, and that this conflict has been made worse by industrialization and urbanization, which is in line with previous studies by Hanmin et al (2021). Urbanization and the rise in carbon emissions may be responsible factors as pointed out by NEST (2003), Yuen & Kumssa (2011), Zhang et al. (2015), Mauree et al. (2016), hence, stakeholders and policymakers should work toward attaining ecological sustainability and reaching the Sustainable Development Goals (SDG) (Vanham et. al., 2019). As a result, the need for environmental sustainability is influenced by issues with climate change, one of the biggest problems facing humanity.

Awareness of climate change mitigation and adaptation measures

Table 3 displays the findings about the degree of knowledge of climate change adaptation and mitigation techniques. Results for the awareness on the climate change adaptations and mitigations indicates that advancement of renewable energy; greenery/planting trees, and pedestrianized environment (Reduction in global carbon CO^2 emission via less usage of motorized transport) ranked as the highest factors with RII values of 4.24,4.23, and 4.18 respectively. This result suggests that the respondents were very aware of the advancement of renewable energy, the planting of trees, and a pedestrianized environment (reduction in global carbon CO^2 emission through less use of motorized transport), while they were least aware of the use of resilient building materials and the provision of stronger urban-rural connections. The placement of green infrastructure facilities like green areas, recreational parks, urban forestry, enforcement of building regulations, and the use of energy efficient technologies are some of the key climate change adaptation and mitigation strategies in developing countries, which is consistent with the findings of previous authors like Cheshmehzangi, et al., (2021) and Agboola (2011b). According to Abass et al. (2019), planting trees will help the environment become greener and lessen the effects of climate change, and incorporating energy-efficient technologies into the built environment will assure the sector's sustainable growth.

Adoption strategies for selected climate change mitigation and adaptation measures

The study looked into what elements of climate change adaptation and mitigation techniques had been used by built environment experts in the study area. The outcome as shown in Table 4 indicates that the extent of using climate change adaptation and mitigation strategies had the use of resilient building materials and the enforcement of building guidelines as the highest factors with 4.15 and 4.04 respectively. The result shows that the respondents' top goals in the past have been to increase green space or plant trees, deploy energy-efficient technologies, enforce building codes, and expand renewable energy sources. The least desirable include a pedestrian-friendly environment (which lowers global carbon dioxide emissions by reducing the use of motorized transportation), better urban-rural connectivity, and the use of durable building materials. Additionally, this study has demonstrated that there appears to be consistency between the strategies for climate adaptation and mitigation that professionals are aware of and those that they have put into practice because the top three strategies put into practice are also the ones that they are aware of, supporting earlier studies by Ezeabasili (2013) and Gana & Toba (2015). Therefore, there is a correlation between built environment experts in the study area's awareness of climate adaptation and mitigation methods and their adoption of those strategies.

4.0 Conclusion and Recommendation

This study examined experts understanding of the workings and consequences of climate change in an effort to enhance Kaduna and by implication Nigeria's built environment. If desired outcomes are to be achieved, the viewpoints of specialists in the built environment on the most significant predictor of climate change in the study area has being biodiversity loss must awaking governments and stakeholders. Given the city of Kaduna's growing urbanization, this is not implausible. In other words, the ecosystem of the earth has suffered greatly. Additionally, both industrial and auto emissions of greenhouse gases (GHGs) have made a contribution. From this study, it may be inferred that there are significant negative effects of climate change on people's health, which requires quick action. Educational efforts are necessary but insufficient to move the world into an ecologically sustainable mode to mitigate the adverse effects of climate change. It is therefore recommended that Governments should engage Political action enhanced by scientific information to safeguard the environment.

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