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Appraising Construction Practitioners Preparedness to Mitigate Climate Change in Nigeria: The Way Forward

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ABSTRACT

Studies have shown continuous global warming and climate change may threaten construction stakeholders, including construction practitioners especially in developing countries like Nigeria. There is a paucity of literature regarding construction practitioners' preparedness to mitigate climate change. Hence, Thus, this study explored construction practitioners' preparedness level to mitigate climate change in Nigeria. A qualitative research method was adopted through face-to-face interviews. The researchers engaged 17 participants from Abuja and Benin City, and saturation was achieved. The study analysed collated data manually and presented findings in the thematic pattern. Findings reveal that Nigerian construction practitioners' level of preparedness is weak and may have challenges coping with the impacts of climate change on the industry. This is an on-going study. Therefore, as part of the study's contribution, feasible and integrated regulatory policies should be encouraged to mitigate the impacts of climate change on practitioners. This includes climate change sensitisation, prioritising practices to achieve sustainable project transformation, and integrating climate change interventions.

Keywords: Built environment, Carbon monoxide, Climate, Construction practitioner, Nigeria, Resilience

INTRODUCTION

Climate change is a threat to humanity and the environment. It is an environmental alteration because of unregulated human activities (Agboola et al., 2023). Fossil fuel combustion that emits greenhouse gas (GHG) emissions, forest clearing, industrial procedures, and conventional agricultural methods are examples of human activities that could threaten the environment.

The study's focuses on the construction industry. Sharma et al. (2011), Francart et al. (2019), and Ahmed et al. (2021) affirmed that the GHG from operational energy use, is the major contributor to climate change. The construction sector contributes 16% of GHG emissions within the European Union (Eurostat, 2018) and 5–40% in other countries (Yokoo et al., 2015). Federici et al. (2015) and Morecroft et al. (2019) identified the changes involved. This includes wind forms, precipitation levels, long-term changes in temperature forms, and other features of climate schemes. The construction sector is top on the list of sectors that expose the environment to unfriendly consequences because of their activities if not regulated. The continuous climate change challenge may compound the issue. Agboola et al. (2023) acknowledged that climate change exacerbates present social, economic, and inequalities and unjustifiably upsets defenceless inhabitants. The low-income groups in developing countries may be the worst hit. The consequences of climate change on the environment and humanity, if not mitigated, are enormous. This includes food insecurity risks, water shortage, economic instability, public health issues, compromises the planet's ecological balance and biodiversity, and ecosystem loss. Luo et al. (2013) affirmed that developed countries' construction sectors, especially developed countries, enhance their endeavours to mitigate and acclimatise to environmental reality. Some measures adopted include embracing mechanisms to mitigate GHG emissions, adapting sustainable land management, improving energy efficiency, and using renewable energy sources for mitigation.

In developing countries, especially in African countries, climate change may be reduced if urgent actions are taken by the appropriate authorities (Isingoma, 2009; Agboola et al., 2023). The developed countries have managed the impact by engaging professional stakeholders in technological-driven and sustainable innovation to reduce its consequences (World Health Organisation, 2021). This is because climate change could cause extreme temperatures, leading to higher energy requests for cooling. This would affect the building's energy proficiency. Yuen and Kumssa (2010) asserted that climate change has caused unpredictable weather patterns, deteriorating coastlines, pest proliferation, and waterborne diseases in developing countries. They avowed that many African cities are experiencing urbanisation increase, leading to more GHG. This is because urbanisation is linked with high construction activities. The inability to regulate some of these construction activities to be environmentally friendly is a major challenge in these cities. The reasons are not within the scope of this study. However, Rajabifard et al. (2019) discovered inadequate human and economic resources as hindrances to mitigating climate change impacts. In Nigeria, Kahan et al. (2015), Tunji-Olayeni et al. (2020), Shittu (2020), and Agboola et al. (2023) worked on the influence of climate change on the construction sector.

Some studies (Camilleri et al., 2002; Ezeabasili and Okonkwo, 2013; Beyioku, 2016; Agboola, 2019; Hurlimann et al., 2019; Shittu, 2020; Tunji-Olayeni et al., 2020; Nwankpa, 2022; Agboola et al., 2023) focused on related areas. Besides the adopted review or quantitative method in the majority, none covered construction practitioners' preparedness in Nigeria or other

countries. Hurlimann et al. (2019) adopted a qualitative approach but covered the construction industry in Australia with less in-depth knowledge of the construction practitioners' preparedness. They focused on how the sector planned to tackle climate change challenges. Camilleri et al. (2002) engrossed on climate change impacts on building performance in New Zealand. They adopted a review and case studies methods. Ezeabasili and Okonkwo (2013) conducted a review of their research. Beyioku (2016) studied the causes and impact of climate change on the environment, using Nigeria as a case study. Agboola (2019) acknowledged that climate change may threaten achieving SDGs unless steps are taken to mitigate its impacts. Tunji-Olayeni et al. (2020) explored the drivers and policies for implementing sustainable construction in developing countries, using Nigeria as a case study. The study found five main drivers and recommended public sensitisation and tax relief via government regulations. They addressed their studies from a quantitative perspective and covered southwestern states. Nwankpa (2022) asserted that the impact of climate change is intensifying environmental fragility risks in developing countries like Nigeria. For example, extreme floods resulting from climate change compound construction activities like road construction in flood zones. This study will fill these gaps. This aligns with Agboola et al. (2023), who suggested a qualitative approach to investigate construction practitoners' preparedness level to mitigate climate change in Nigeria.

Studies have shown continuous global warming and climate change may threaten the construction stakeholders, including the construction practitioners especially in developing countries like Nigeria. This is one of the study's motivations to stir stakeholders, especially construction practitioners, to understand the urgency of preparedness to mitigate climate change in the industry. The continuous increase in climate change and its impacts on the construction industry may threaten achieving SDG 13 (Climate action). However, there is a paucity of literature regarding construction practitioners' preparedness to mitigate climate change. Thus, the study explored construction practitioners' preparedness level to mitigate climate change in Nigeria. The following objectives will be employed to accomplish the study's aim:

i. To investigate the perceived preparedness level of construction practitioners to mitigate climate change.
ii. To suggest measures to improve construction practitioners' preparedness level to mitigate climate change.

RESEARCH METHOD

The study adopted a phenomenological qualitative research design. A phenomenology approach is used when research discovers the underlying matters (Creswell and Creswell, 2018; Ebekozien and Aigbavboa, 2021). Paley (2016) asserted that it derives the meaning of a phenomenon through questioning a small set of people. For this study, it was utilised to explore experts' opinions concerning construction practitioners' preparedness level to mitigate climate change in Nigeria. The face-to-face interviews were supplemented with the reviewed literature. Regarding the adopted purposeful

sampling, the study targeted participants who are considered knowledgeable in the subject area (Morse, 2015; Aigbavboa et al., 2023a; 2023b; 2024), as presented in Table 1. For a better representation, among the two cities (Abuja and Benin City) covered, Abuja is ranked top commercial and construction hub. The study concealed the participants' identities for confidentiality reasons. This aligns with Ebekozien (2021). The interviews took 50 minutes on average per interviewee via recording with the participants' approval.

Table 1. Description of the participants' background.

ID	Type of organisation	Location	Years of experience	Rank/Post
1	Construction contracting firm	Abuja	33 years	Site Manager, medium firm
2			30 year	CEO, small firm
3	Construction consultant firm		14 years	Principal Manager, Arch. firm
4			18 years	Director, Structural Engr. firm
5	Government official		12 years	Senior staff
6	Government higher education institution		22 years	Senior Lecturer
7	Television station		14 years	Broadcaster/Meteorologist
8	NGO (environment matters)		29 years	Director/Founder
9			22 years	Director
10	Construction contracting firm	Benin City	29 years	CEO, small firm
11			11 years	Site Engineer, medium
12	Construction consultant firm		23 years	Principal Partner, QS firm
13	Government official		13 years	Senior staff
14	Government higher education institution		22 years	Academic Environmentalist
15			18 years	Senior Lecturer
16	Television station		10 years	Broadcaster/ Meteorologist
17	NGO (environment matters)		16 years	Director

Source: Authors work

The researchers engaged selected construction consultants, environmentalists, relevant government ministries/departments/agencies, meteorologists, NGOs, and developers/construction contractors. The semi-structured questions proffered answers to the study's objectives. The investigators utilised a theme technique for the data analysis. This is an on-going study. The interviews for these two cities were conducted between October 2023 and November 2023. The collected data were analysed manually via thematic analysis (Ebekozien et al., 2021a; 2021b), and saturation was achieved at the 15th participant. The study coded the collated data (Corbin and Strauss, 2015; Jaafar et al., 2021). Fifty-one codes emerged from the coding and categorised into nine sub-themes. From the nine sub-themes, two themes emerged, as presented in the next section.

FINDINGS AND DISCUSSION

The section presents results and a discussion as they emerged from the study.

Theme 1: Perceived Construction Practitioners' Preparedness Level to Mitigate Climate Change

Construction activities are a major source of GHG emissions. Studies (Tunji-Olayeni et al., 2020; Alsheyab, 2022; Ebekozien et al., 2023b) revealed that GHG emissions threaten the environment and the construction industry. Thus, construction practitioners' awareness and preparedness level are pertinent to mitigating climate change (major). This is one of the study's motivations; to explore practitioners' preparedness level to mitigate climate change impacts that may emerge from construction activities before, during, and after the project. This is germane. Participant P8 says, "….. *construction activities and environment are correlated because construction activities occur in the environment. Likewise, without the environment, construction activities can't take place*…." The study's findings agree Beyioku (2016), who avowed that without the environment, human activities, including construction, cannot exist (majority). Also, without regulated construction or sustainable construction, the environment may not be habitable and sustainable.

Findings reveal that the preparedness level is poor. However, many developed countries' stakeholders are paying attention to environmental issues. The increased awareness and the enabling environment to ensure the world is a better place for habitation may have contributed (majority). In developing countries, construction practitioners cannot be left behind. Participants P6, P8, P14 & P17 encourage practitioners to scan through the Paris Climate Change agreement concerning cutting carbon emissions by 50% in less than a decade and understand the role expected. Findings show that more task is required. This includes integrating sustainable materials into the building life cycle across the supply chain. Participants P1 & P4 agree that practitioners should know how to use sustainable tools throughout the building life cycle. The findings agree with Ness et al. (2007) and Alsheyab (2022). They avowed that sustainable tools are a good option to achieve sustainability in the construction industry. Findings show that practitioners know the possible impact of climate change if not mitigated (majority), yet responses regarding preparedness and training are poor due to reasons not within the scope of this paper.

Theme 2: Measures to Improve Construction Practitioners' Preparedness Level to Mitigate Climate Change

In less than one decade to achieving SDG 13 (Climate action), measures to ensure construction stakeholders play a significant role cannot be overstated. This is because activities from the sector are a major source of climate change and global warming. This threatens the environment and humanity (majority). Thus, this theme offers measures to improve construction practitioners' preparedness levels to mitigate the impacts of climate change on construction activities in Nigeria. Results align with Francart et al. (2019). They

discovered that stakeholders, including construction practitioners, are willing to promote sustainable construction materials if policies and strategies are implemented. Hence, nine variables emerged as measures to improve construction practitioners' preparedness level to mitigate climate change impacts on construction activities in Nigeria. This includes:

- Stakeholder's sensitisation through education (majority).
- Embrace sustainable consumption, green practices, and waste recycling (majority).
- Promote adaptation strategies (majority).
- Long-term institutional framework (mainstreaming climate change in various professional institutions activities) (P5 & P8).
- Appropriate technologies for adaption and mitigation (P11 & P15).
- Strengthen the human capacity of construction practitioners (majority).
- Sustainable land management (P10).
- Water resource management (P9 & P12).
- Research and investment (P4 & P14).

Among the nine emerging measures, promoting mitigation strategies, stakeholder sensitisation through education, embracing sustainable consumption, green practices, and waste recycling, and strengthening the human capacity of construction practitioners were frequently cited by interviewees as germane measures to improve construction practitioners' preparedness level to mitigate climate change impacts on construction activities in Nigeria. Regarding stakeholder's sensitisation, climate-resilient practices advocacy, and sustainable construction with government support (majority), findings agree with Yilmaz (2021) and Agboola et al. (2023). Yilmaz (2021) suggested a comprehensive technique and long-term commitment at all levels (international, regional, national, and local). Agboola et al. (2023) underscored that stakeholder sensitisation, including construction practitioners through education and advocacy to mitigate GHG emissions, is key to fostering sustainable lifestyles.

CONCLUSION AND RECOMMENDATIONS

This research investigated construction practitioners' preparedness level to mitigate climate change in Nigeria. The study collated data from 17 experts in Abuja and Benin City via face-to-face techniques and analysed it manually. The in-depth reviewed extant relevant literature were used to mitigate these limitations. If the awareness level is not activated to improve construction practitioners' preparedness regarding continuous global warming and climate change, the impact on the industry may be disastrous. Presently, the climate change awareness level of a critical stakeholder (construction practitioners) preparedness level is not encouraging. The study suggested possible measures to improve construction practitioners' preparedness levels to mitigate climate changes threats to the industry. The study's recommendations as a way forward may be utilised by other developing countries with similar encumbrances. This includes:

i. An all-inclusive and comprehensive awareness is a critical factor in mitigating climate change. This is lacking and requires integrated improvement through collaboration between the government (policymakers), industry, and higher education institutions regulatory agencies. Upgrading the curricula to reflect reality and the future is necessary for economic growth. The Nigerian Government should be responsible to lead this awareness campaign and take measures to mitigate them such as embracing sustainable construction.
ii. Mitigating climate change and global warming requires new innovative technologies. Thus, the study recommends upskilling and reskilling in implementing regenerative principles, understanding the long-term sustainability of the construction industry, mitigating construction and demolition waste, embracing construction recycling, and integrating climate change considerations for the benefit of the construction industry and humanity. The outcome would mitigate GHG emissions and hazardous risks.

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