

Assessment of the Perceived Impact of Flooding and Climate Change on Construction Projects in Nigeria

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Abstract

Since the Paris Agreement (PA) in 2015, there has been an increasing focus on assessing the impact of flooding and climate change. The study assessed the impact of flooding and climate change on construction projects in Nigeria. Data were collected through questionnaire and semi-structured interview to address the research objectives. Primary data were collected by applying tools for eliciting local knowledge and perceptions, such as interviews and questionnaire administration. Nigerian town planners, architects, quantity surveyors, engineers, construction managers, contractors, and project managers were sampled and administered copies of the questionnaire. The findings revealed there is a high level of impact (76.8%) of flooding on the construction industry in Nigeria. The many (55.1%) of the respondents agreed that they experienced financial implications due to inadequate implementation of risk-mitigating methods for unforeseen flood and weather events. The identified key causing some of structure/ building collapse are attributed to issue of flood events and climate change such as heavy rainfall and overflow of rivers in accordance of 64.4% of the respondents. The study concluded that flood events are not the primary cause of structural or building collapses in the industry and also identifies key causes of flooding in Nigeria, including the release of water from the Ladgo Dam in Cameroon and the overflow of the Rivers Niger, Benue, and Meme due to heavy rainfall. To navigate these challenges, a proactive and well-informed construction key stakeholders and manager should consider active integration of flood risk mitigation strategy from the tender phase to operation stage thereby; ensuring adequate information is available to justify project decisions.

Keywords: Construction project, Climate change, Flood, Management, Mitigation

1. Introduction

In recent times, academic and political discussions have increasingly focused on the issues of flooding and climate change effects, recognizing their significant impact on construction projects. As a result, the effects of flooding and climate change on construction have become an international concern. Construction professionals working for clients, contractors, and consultants agreed that flood and climate change incidents affect construction projects (Okosun *et al.*, 2021). According to Aje *et al.* (2014), a project may be delayed (cost and time overrun) in part or whole due to inclement weather. As the variations in weather patterns become too extreme, their impact becomes puffed up, and construction projects become unprofitable (Hegeman, 2019). This emphasizes that construction industry managers are responsible for mitigating these impacts by accurately applying their expertise and skills.

The 2022 flood in Pakistan affected about 72 million people. It caused about 149 billion US dollars in damages, while in Nigeria, the 2022 flood affected 34 of the 36 states, displaced over 1.4 million people, and killed 612 people. Over 200,000 homes and 110,000

hectares of farmland were entirely or partially destroyed. Buba *et al.* (2021) also reported that extreme flood events had increased the number of collapsed structures/buildings in Nigeria. Efforts must be harnessed to mitigate this extreme weather event, which occurs more frequently due to climate change. Construction managers should know how they could mitigate climate change's impact on the construction industry and continuously develop and cultivate profitable businesses while meeting client needs. Floods can be caused by anthropogenic activities, which are human intervention in the natural processes which may include an increase in settlement areas; population growth in low-lying plains prone to flooding leading to alterations in the natural drainage and river basin system; deforestation and urbanization (Nharo, 2016).

Science communicators favor the term flooding and climate change over global warming due to the growing concern in the construction industry based on its impacts, such as storm damage, power outages, and loss of biodiversity that come to play. According to Okosun *et al.* (2021) a two percent (2%) increase in the construction work stoppage due to unexpected inclement weather has a major impact on the bottom line. The impacts of climate change events on

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construction projects' atmosphere have increased exponentially in the past 28 years. Attempts by man to harness available water resources have resulted in the construction of dams and other water control structures. The failures of these structures have resulted in flood risk in Nigeria. Similarly, Oluwajana *et al.* (2022) observed that flood and climate change impact the cost and time performance of construction projects in Nigeria.

Rising temperatures, flooding, and environmental pollution have become serious concerns to men when they exceed their coping capacities, damaging lives and property (Abbas *et al.*, 2012). As reported in NIMET (2015), economic losses due to flooding and climate change in states have increased in folds and have also resulted in major loss of human lives and livelihoods, destruction of economic and social infrastructure, and environmental damages (John-Nwagwu *et al.*, 2021). This further justifies the need for a policy framework to explore the impact of flooding and climate change on construction projects in Nigeria. Thus, research gaps exist; that informed participatory approach.

The following research objectives are set out to be achieved by this study: i) to determine the most rational approach to mitigate the risks experienced by flooding and climate change, ii) to determine the financial (cost) implications on construction projects experienced due to flooding and climate change, iii) to determine the major concerns raised by flood events and climate change in Nigeria, iv) to determine the extent to which contractors have implemented methods to adapt to the effects of flooding and climate change, v) to determine how does flooding and climate change impact the construction project lifecycle and vi) to determine the different methods to safeguard a contractor against the impacts of flooding and climate change.

2. Literature review

Construction projects in Nigeria are significantly challenged by flooding and climate change, which have an impact on schedules, expenses, and structural integrity. Nigeria's geographical susceptibility, along with bad urban design and insufficient drainage systems, aggravates the effect of floods on building operations (Unegbu *et al.*, 2024). Particularly in coastal and low-lying areas like Lagos, Port Harcourt, and Kano, climate change has changed rainfall patterns, causing more regular and severe floods (Chang and Ross, 2024). Increasingly, construction companies and stakeholders see these environmental hazards as significant barriers to the completion of projects, thereby requiring adaptive plans to minimise disturbances. Research shows that floods caused by climate change postpone projects, raise maintenance expenses, and shorten the life of infrastructure (Olanrewaju *et al.*, 2020). Drawing on empirical research and industry sources, this literature review investigates the perceived effects of floods and climate

change on Nigeria's building business. Flood causes work stoppages, material damage, and restricted access to project locations, hence upsetting construction timelines. Nkwunonwo *et al.* (2020) estimate that more than 60% of Lagos construction companies experienced project delays caused by seasonal floods, with some projects suffering delays of up to three months. Flood-induced erosion and waterlogging can compromise foundations, hence requiring expensive corrective actions.

2.1. *To determine the most rational approach to mitigate the risks experienced by flooding and climate change*

Flooding and climate change pose significant challenges to the construction industry, particularly in regions like Nigeria where inadequate infrastructure, such as drainage systems, exacerbates the situation (Unegbu *et al.*, 2024). Among the many ideas put out to reduce these hazards are contracts, technology, insurance, and research-based planning. Ajayi *et al.* (2024) claim that only a tiny percentage of Nigerian building firms integrate flood risk evaluations in their project design, suggesting that the construction sector's method of reducing climate change risks is reactive rather than proactive. Though their use in the Nigerian setting is yet underexplored, contracts are becoming more acknowledged as a way to control these risks (Alabi, 2016). A more integrated strategy that incorporates modern technologies like Geographic Information System (GIS) would thus be the most logical way to reduce the hazards connected to climate change and floods.

2.2. *To determine the financial (cost) implications on construction projects experienced due to flooding and climate change*

Flooding and climate change have a major financial effect on building projects as these natural phenomena often cause delays, higher project costs, and material damage (Olanrewaju *et al.*, 2020). Construction expenses in flood-prone locations may surpass first estimates by as much as 20-30% (Nicholas *et al.*, 2022), with projects experiencing longer timeframes caused by work halts, material damage, and site access concerns (Adelekan & Asiyambi, 2016). In Nigerian construction, where the effects of floods go beyond direct damage to buildings and include loss of production, higher maintenance expenses, and the need for expensive redesigns, this has been a major problem (Ibem *et al.*, 2021). Rising temperatures, floods and other climate-related events also may greatly shorten the life of infrastructure, which would increase long-term maintenance and operating expenses (Okoye *et al.*, 2021). Given these financial consequences, building firms have to include thorough financial planning to include climate-related hazards and get suitable insurance to offset such losses.

2.3. To determine the major concerns raised by flood events and climate change in Nigeria

Heavy rain and river overflow are the main causes of structure damage, so flood occurrences and climate change have generated many worries in the Nigerian building sector (Oluwajana *et al.*, 2022). Particularly in low-lying places like Lagos and Port Harcourt, where flood-induced erosion and soil instability endanger the integrity of buildings, the rising frequency of severe weather events has put great pressure on construction methods (Ezeokoli *et al.*, 2019). Many city areas' poor drainage systems aggravate these hazards and increase the susceptibility of building sites to weather-related disturbances (Nkwunonwo *et al.*, 2020; Adeleke *et al.*, 2018). Moreover, the absence of strong rules and policies to control flood risk in the building sector has aggravated these worries (Agbola *et al.*, 2012). Many projects are left vulnerable to financial and structural damage as construction managers are usually unready for the abrupt beginning of these dangers. This emphasises the need of a more strategic approach to flood and climate risk management, including environmental impact assessments (EIA) into the project lifecycle and supporting more robust public-private partnerships (Adedeji *et al.*, 2023).

2.4. To determine the different methods to safeguard a contractor against the impacts of flooding and climate change

Various strategies, including the use of weather derivatives, insurance, better contracts, and the adoption of resilient building techniques, help contractors protect themselves against the effects of floods and climate change. Though being a relatively recent idea in the Nigerian building sector, weather derivatives have shown to be successful means of controlling financial risks connected to weather (Isang, 2023). Though only some of contractors are aware of its function in reducing climate change risks, insurance coverage is still lacking in Nigeria. Though studies show this is underused in Nigerian construction projects, using contracts to distribute weather-related risks among stakeholders is another efficient approach (Ajayi *et al.*, 2020). Reducing the long-term effect of climate change on construction projects also depends on using climate-resilient building methods such as

raised foundations, flood-resistant materials, and sustainable design principles (Ibem *et al.*, 2021; Hegeman 2019). A mix of these techniques, guided by thorough study and planning, may enable contractors to create resilience to climate-related hazards and guarantee the long-term viability of their initiatives.

3. Research Methodology

Exploratory research design and survey research methods were adopted for this study. Data were derived from both primary and secondary sources. A mixed-methods approach was used to collect data from participants, combining surveys and interviews. A total of 130 WhatsApp/emails with questionnaires were sent out to a convenient purposive sample, of which 74 well-completed questionnaires were retrieved and analyzed. Additionally, 15 professionals were interviewed to gather further insights. The questionnaire included both closed-ended and open-ended questions to generate both statistical and textual data. The survey was administered via the Survey Monkey platform, with links distributed through WhatsApp or email due to COVID-19 restrictions. "This circumstance requires a few events, individuals, or objects to be identified, chosen, and examined to determine the population from which it was chosen (Salaria, 2012). This helps select a subset of a population to represent the entire population of interest. Stratified and cluster sampling techniques guided the distribution of the sets of the questionnaire. Data for the research population (Nigerian construction industry) were derived from the records of real estate construction, professional bodies in Nigeria, and the Cooperate Affairs Commission.

A total of 130 WhatsApp/emails with questionnaires were sent out to a convenient purposive sample, of which 74 well-completed questionnaires were retrieved and analyzed, with a response rate of 57.0%. According to Survey Town (online), a standard response rate would be 10–15%. Hence, it is recommended that a reliable analysis be run. The questionnaires were presented logically, while the semi-structured interviews (qualitative approach) were carried out on several Nigerian construction industry professionals. To achieve the needed social survey, a convenient and purposive sample included construction managers and

Table 1: Questionnaire administration schedule

Respondents	Number Administered	Number retrieved
Architects	15	7
Quantity surveyors	12	6
Town planners	10	4
Construction Managers	20	11
Contractors	39	30
Engineers	13	5
Project Manager	21	11
Total	130	74

Source: Author's field survey, 2020

contractors to gain reliable insight and an in-depth view of their opinions, beliefs, and thoughts regarding flooding and climate change and its impact on the Nigerian construction industry. Data collected from the semi-structured interviews (Key Informant Interviews) were recorded and stored in a password-protected system to ensure confidentiality and access to the researchers only; SPSS version 21 was used in analyzing the data.

4. Findings and discussion

The questionnaire data were analyzed to determine the impacts of flooding and climate change on construction projects in Nigeria. The sub-sections below present details of these impacts.

4.1. Discussion of results

4.1.1. *Are you aware of floods and climate change in Nigeria?*

Regarding awareness, nearly all respondents (98.7%) acknowledged the occurrence of flood events. A significant majority (89.4%) were aware of climate change, while the remaining 10.6% had only a basic awareness. This aligns with findings by Chang and Ross, (2024), who reported heightened awareness of flooding due to recent extreme weather events. However, the remaining 10.6% with only basic awareness underscores the persistent knowledge gap, similar to Oluwajana *et al.* (2022), who observed limited climate literacy among professionals.

4.1.2. *Does flood and climate change in Nigeria currently impact the Nigerian construction industry?*

A majority (76.8%) confirmed that flooding has significantly impacted construction activities. This finding supports Hegeman (2019) and Alabi (2016), who emphasized that extreme weather causes substantial cost and time overruns in construction projects. Conversely, the 23.2% who were uncertain reflect the regional and project-specific variability discussed by Unegbu *et al.* (2024), where differing exposure levels to flooding create varied perceptions of risk. Similarly, 60.0% believed climate change impacts the industry, while 22.2% remained uncertain indicating an ongoing need for awareness.

4.1.3. *Have you witnessed any impact on weather-related delays, the safety of workers on-site, a change in construction materials design, structure/building collapse, project construction delay, cost and time overruns, manufacturing, or increased insurance costs due to the impact of flood and climate change?*

Forty six percent of the respondents identified worker safety, material deterioration (14%), delays (12%), increased insurance costs (11%), structural collapses

(10%), and cost overruns (7%). These concerns echo research by Olanrewaju *et al.* (2020), who found that flooding causes substantial maintenance burdens and infrastructure decay, and by Okoye *et al.* (2021), who documented structural weakening due to prolonged waterlogging. The discrepancies in perceptions around climate change's effects suggest influences such as geographical disparities and inconsistent professional experience, consistent with the observations of Nicholas *et al.* (2022).

4.1.4. *Do you experience project construction delays due to flood and climate change?*

Only 50.2% of respondents confirmed experiencing project delays due to extreme weather. While this is a lower percentage than the literature might suggest, it validates Nkwunonwo *et al.* (2020), who reported seasonal flooding leading to 3-month delays in Lagos-based projects. It also indicates a gap in proactive delay mitigation strategies, reinforcing the point made by Ibem *et al.* (2021) about limited adoption of climate-resilient construction practices due to cost and weak enforcement.

4.1.5. *Is it true that most financial implications experienced on-site are due to weather-related delays?*

Most construction contractors are held responsible for project delays. About 28.6% of the respondents in the research environment agreed that most financial implications experienced on-site were due to weather-related delays. Only 55.4% disagreed with this submission, while 16.0% refuted the assertion. Respondents largely agreed that weather-induced delays contribute significantly to financial losses, affirming literature by Nicholas *et al.* (2022), which reported construction cost overruns by 20–30% in flood-prone areas. Construction firms often face the burden of these losses, which discourages further investment in vulnerable zones, stalling urbanization efforts a theme echoed in the work of Chang and Ross (2024).

4.1.6. *Does the contractor's Out-of-Pocket Costs Rise Proportionally to Flooding and Climate change's Impact On-Site?*

Findings reveal that 57.4% of respondents agreed that out-of-pocket costs rise proportionally with climate-related disruptions, while 42.6% disagreed. The majority response supports the assertion made by Okoye *et al.* (2021) that environmental uncertainties such as flooding often lead to unbudgeted expenses, including emergency material replacement, equipment repairs, and temporary work stoppages all of which are borne by the contractor.

4.1.7. *Have your previous executed projects experienced financial implications due to inadequate implementation of risk-mitigating methods for unforeseen flood and weather events?*

The results indicate that a significant portion of respondents (55.1%) acknowledged experiencing financial implications on previously executed projects due to inadequate implementation of risk-mitigating methods for unforeseen flood and weather events. This finding aligns with literature of by Adeleke *et al.* (2018), which emphasize that poor risk assessment and weak adaptation strategies often leave construction projects financially exposed to climate-related disruptions. In contrast, 26.7% of respondents reported no such experiences, while 18.2% were uncertain suggesting variability in awareness or effectiveness of risk mitigation frameworks across projects. The data reinforces the critical role of proactive climate risk management in safeguarding project budgets, especially in flood-prone regions like Nigeria.

4.1.8. *Have your experience of flood and climate change amounted to time and cost overruns in construction projects?*

The majority of respondents (65.2%) confirmed that time and cost overruns are frequent occurrences in the construction industry due to Nigeria's unpredictable weather conditions and climate change. These natural events have a direct impact on both the initial project cost and the timely delivery of construction projects. This finding is consistent with previous studies by Adeleke *et al.* (2018), which highlighted that extreme weather events, including floods, disrupt construction schedules and increase costs. On the other hand, 27.0% of respondents were unaware that climate change contributes to such overruns, and 7.8% were unsure, pointing to a gap in awareness and knowledge of climate-related risks within the industry. Overall, the data suggests that floods and climate change are significant factors leading to time and cost overruns in construction projects.

4.1.9. *Are you aware of using contracts to mitigate the impacts of weather conditions due to climate change on construction projects?*

The study reveals that only 47.3% of respondents were aware of using contracts to mitigate the impacts of floods and weather-related conditions, while 52.7% were unaware, indicating a significant knowledge gap in the Nigerian construction industry. This aligns with Ajayi *et al.* (2020), who found limited integration of flood risk assessments in project design despite high awareness of climate risks. As highlighted in the literature, floods delay projects, increase costs, and compromise structural integrity (Nkwunonwo *et al.*, 2020), yet the absence of climate-adaptive clauses in most contracts shows that responses remain reactive rather than preventive. Lack of proactive contract use

such as force majeure and indemnification clauses points to institutional and policy shortcomings.

4.1.10. *Are you aware of using insurance to mitigate the impacts of weather conditions due to climate change on construction projects?*

The findings show that 49.7% of respondents are aware that insurance can be used to mitigate the impacts of weather conditions caused by climate change on construction projects, while 34.3% are unaware and 16.0% remain unsure. This indicates a moderate level of awareness, suggesting that although insurance is recognized as a risk mitigation tool, its practical application in construction projects may still be limited or poorly understood. This gap aligns with existing literature that highlights the underutilization of structured climate risk management tools, such as insurance, in Nigeria's construction sector (Isang, 2023). Given the growing frequency and severity of climate-induced disruptions, there is a pressing need to enhance industry knowledge on tailored insurance policies and integrate them more formally into project planning and risk management strategies to ensure financial resilience against environmental uncertainties.

4.1.11. *What is your opinion on the major cause(s) of structure/building collapse due to flood events and climate change?*

The discussion of results aligns closely with the literature review, highlighting the considerable impact of flooding and climate change on construction projects in Nigeria. The majority of respondents (64.4%) identified heavy rainfall and river overflow as major causes of structural collapse, which supports findings by Unegbu *et al.* (2024) and Nkwunonwo *et al.* (2020) that point to extreme weather and poor drainage as critical risks. However, a significant percentage (35.6%) were unaware of such incidents, indicating a gap in awareness and documentation. Moreover, only 47.3% of respondents acknowledged the use of contracts for mitigating climate-related risks, and just 49.7% recognized the role of insurance, underscoring Ajayi *et al.* (2020) and Isang's (2023) observations that contractual and insurance-based adaptations are underutilized in practice.

4.1.12. *Are you aware of using technology to deal with the impacts of weather conditions due to climate change on construction projects?*

The analysis reveals that a significant majority (60.5%) of respondents are aware of the application of technology to mitigate the impacts of weather conditions on construction projects, with 27.6% unaware and 11.9% uncertain. This finding supports the literature's emphasis on the increasing importance of technology in enhancing resilience to climate-related disruptions in construction (Okoye *et al.*, 2021; Ibem *et al.*, 2021). It aligns with ongoing industry efforts to

adopt innovative tools such as flood modeling, real-time weather monitoring, and water-resistant construction techniques. The high level of awareness among respondents suggests growing recognition of technology's role in controlling aspects of the construction process traditionally deemed uncontrollable. However, the gap in full adoption, underscores the need for broader sensitization, training, and investment in climate-resilient technologies across the sector.

4.1.13. Are you aware of using weather derivatives as a risk assessment tool for weather conditions due to flood and climate change on construction projects?

The rationale behind this question was to assess respondents' awareness of weather derivatives as a tool for mitigating the impacts of weather conditions caused by climate change on construction projects. Unlike traditional insurance, weather derivatives do not require proof of loss only evidence of adverse weather making them a flexible financial risk management tool. The findings reveal that 45.3% of respondents were aware of weather derivatives, while 33.4% were unaware and 21.3% were unsure, indicating limited familiarity within the Nigerian construction sector. This aligns with the literature, which notes that weather derivatives are a relatively recent introduction to the industry and are still underutilized (Isang, 2023). Given their potential to support construction firms in minimizing weather-related financial risks and exploration of this instrument could significantly enhance climate resilience in construction project planning and execution.

4.1.14. In your opinion, what is the most logical approach method available to mitigate the risks imposed by flood and climate change?

This question sought to identify the most logical method for safeguarding contractors against the impacts of floods and climate change on construction projects. The findings reveal that 44.5% of respondents considered the use of contracts as the most logical approach, while 18.7% emphasized the importance of research and accurate planning, and 15.1% pointed to the use of technology. Only 11.3% believed that a combination of all available methods would yield the best outcome. These results suggest a fragmented understanding among professionals in the Nigerian construction industry regarding comprehensive climate risk mitigation strategies. The dominance of contract-based responses indicates some awareness of formal risk allocation, yet the relatively low recognition of integrated approaches highlights the need for further education, policy development, and knowledge dissemination in this evolving field.

4.1.15. Do you think the construction manager is in a position to safeguard the contractor against the impact of climate change on construction projects?

The majority of respondents (51.6%) believe that a construction management practitioner is in a position to safeguard the contractor against the impacts of climate change on construction projects, while 33.2% disagree, and 15.2% are unsure. This aligns with the literature, which stresses the critical role of construction managers in mitigating climate-related risks (Muller & Eli, 2021). The results suggest that construction managers are seen as key players in managing climate change risks, but further training and awareness are needed to ensure they are equipped with the necessary tools and strategies to effectively safeguard contractors and projects.

4.1.16. What are the future methods of dealing with risks imposed by flood and climate change?

In response to the question, the following suggestions were received to address a serious issue that will explore and identify possible future methods of dealing with the risks imposed by flood and climate change based on the beliefs, experience, and knowledge of the respondents.

The responses are;

- I. Historical flood and climate data for the specific location (sites) in construction projects in Nigeria must be considered and incorporated into the contract. This will avoid the possible loss of person-hours due to flood events or climatic conditions. This alarming situation is becoming more challenging as flood events and climate change are changing different geological locations.
- II. To mitigate climate change's impact on projects, a contingency sum should be included in the estimated contract value, reflecting the likelihood of remedial actions necessary to fix the damages caused by such adverse climate conditions.
- III. Thinking for contingency planning for future flood events. In developed countries, information on the severity of flooding measured by its impact is key to insurance claims. Affected contractors should be involved in a participatory and bottom-up manner in drawing up measures to mitigate the impacts of flooding and, indeed, in flood management strategies.
- IV. The contract should document all current and future flood and inclement weather data. The planners must also ensure the programme allows adequate float to cover adverse weather delays.
- V. Historical flood and climate data for the specific location (sites) in construction projects in Nigeria must be considered and

incorporated into the contract. This will avoid the possible loss of person-hours due to flood events or climatic conditions. This alarming situation is becoming more challenging as flood events and climate change are changing different geological locations.

- VI. Amending current and future contract documents to cover flood and climate change based on unpredicted events.
- VII. All flood and inclement weather data is documented in the contract; the planners must ensure adequate float is allowed in the programme to cover any adverse flood events and weather delays.
- VIII. Technology plays an interesting key role on sites. It allows the construction manager to better predict flood events and inclement weather at the tender phase so that the program can allow sufficient downtime.
- IX. Neither a single solution nor a combination is the perfect answer to flooding and weather. Preparing during the tender phase and having ample information to justify his position requires a proactive and well-versed construction manager.

5. Conclusion and Further Research

This research examined the Nigerian construction industry's challenges due to flooding and climate change. The findings are crucial for contingency planning, management response, and strategic decision-making by construction managers, disaster managers, and other relevant authorities. These insights

help implement effective measures to mitigate the impact of flood events and climate change on construction projects in Nigeria. The study revealed discrepancies between its findings and some of the literature reviewed. Most respondents disagreed with the assertion that financial implications on-site were primarily due to weather-related delays and time and cost overruns in Nigerian construction projects. In addition, the study shows that flood events are not the primary cause of structural or building collapses in the industry.

Climate change increasingly affects construction projects; it is not yet systematically reflected in contract practices underscoring the need for regulatory reforms, professional training, and the development of standard contract provisions that address environmental risks. A well-informed construction manager should integrate flood risk considerations from the tender phase; ensuring adequate information is available to justify project decisions. Therefore, while climate change increasingly affects construction projects, it is not yet systematically reflected in contract practices underscoring the need for regulatory reforms, professional training, and the development of standard contract provisions that address environmental risks. Future research should be explored on scientific investigation by professional practitioners in the built environments on the cost and implications of flooding and climate change impacts on construction projects in Nigeria.

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