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REVIEWER'S REPORT

Manuscript No.: IJAR-51685 Date: 19-05-2025

Title: Study of the thermal behaviour of an experimental building at the National Research Centre for Development in Chad

Recommendation:
Accept as it is.....YES.....
Accept after minor revision.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality			√	
Techn. Quality			√	
Clarity			√	
Significance			√	

Reviewer's Name: Shafiya Akhter

Reviewer's Decision about Paper: **Recommended for Publication.**

Comments (*Use additional pages, if required*)

Reviewer's Comment / Report

General Evaluation:

The manuscript presents an experimental investigation focused on the thermal performance of a small office-type building in N'Djamena, Chad. The study is situated within the broader context of sustainable construction and energy efficiency, particularly emphasizing the use of local building materials in warm climates. The topic is significant for regions facing similar climatic challenges and seeking context-appropriate building solutions.

Abstract:

The abstract provides a concise summary of the study's purpose, methodology, and key findings. It clearly highlights the thermal challenges experienced in the experimental cell,

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particularly the overheating of the roof and the failure to meet thermal comfort standards. The key terms used are relevant and capture the essence of the study.

Introduction and Background:

The introduction effectively situates the research within the framework of global concerns regarding energy efficiency and thermal comfort. It references established standards such as ISO 13790 and ASHRAE guidelines, thereby grounding the work in recognized regulatory frameworks. The description of local construction practices and their limitations in Chad is informative and relevant, providing a clear rationale for the study.

Literature and Theoretical Framework:

The manuscript draws on relevant literature related to building thermal behaviour and the influence of material properties and climatic conditions. Citations of previous numerical and experimental studies lend support to the research focus. The integration of concepts related to thermal comfort, such as temperature and relative humidity, aligns well with standards mentioned.

Methodology:

The use of hygrothermal sensors (SHT75 and SHT35) for real-time temperature and humidity measurement is appropriate for the study's aims. The description of the materials and their thermo-physical properties indicates a solid understanding of factors influencing thermal performance. The experimental approach, involving in situ measurements, strengthens the practical relevance of the findings.

Results and Analysis:

Preliminary results summarized in the abstract indicate significant thermal input through the roof and overheating in the attic space. The findings that the cell did not meet thermal comfort criteria are clearly stated, providing a strong basis for further analysis.

Clarity and Language:

The manuscript is generally well-written and clear. Technical terminology is used appropriately and is accessible to readers familiar with thermal engineering and building science.

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Conclusion:

This study provides valuable empirical data on the thermal behaviour of buildings constructed with local materials in a hot climate context. It is well positioned to contribute to ongoing efforts to improve building design and energy efficiency in Chad and similar environments. The integration of experimental data with regulatory standards adds robustness to the research.