

Evaluating the Impact of Sustainable Construction Practices and Design Strategies on Thermal Comfort for Energy and Cost Efficiency in Buildings

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ABSTRACT

Thermal comfort has become an important concern in hot and tropical buildings due to rising temperatures, high humidity, urban heat effects and increasing dependence on mechanical cooling systems. This study evaluates how sustainable construction practices and passive design strategies can improve thermal comfort while supporting energy efficiency and cost efficiency in buildings located in hot climatic regions. The specific objectives were to identify the main problems affecting the construction of thermally comfortable indoor environments, analyse how sustainable construction methods and passive design features can improve thermal comfort and energy performance, evaluate their contribution to reducing energy costs, and propose practical strategies for achieving thermal comfort with efficient cost performance. A pragmatic, qualitative-dominant mixed-methods design was adopted, comprising a structured literature review, a questionnaire survey and semi-structured interviews. The questionnaire collected 31 responses from construction industry professionals and was analysed using the Relative Importance Index (RII) method, while eight semi-structured interviews were conducted with architects, quantity surveyors, engineers and estimators possessing local and international hot-climate project experience, analysed thematically.

The findings show that humidity discomfort, temperature discomfort, indoor heat accumulation and dependence on mechanical cooling are the key thermal comfort concerns reported by respondents. Building orientation, insulation materials, wall materials and natural ventilation were identified as the major factors influencing thermal performance, while roof insulation, orientation, shading and construction materials were ranked as the most effective passive strategies. The interviews further highlighted practical measures such as cross ventilation, hollow blocks, double glazing, Low-E glass, double-skin façades, light-coloured finishes, solar systems, radiant and district cooling, and rooftop greenery, together with the central role of lifecycle costing in justifying these measures. The study concludes that thermal comfort should not be treated only as a mechanical cooling issue, but should be addressed through climate-responsive design, improved envelope performance, selective passive ventilation, sustainable material selection and lifecycle-cost-based decision making, with Quantity Surveyors positioned to support this transition through structured cost-benefit advice.

Keywords: Thermal Comfort, Passive Design, Sustainable Construction, Energy Efficiency, Lifecycle Cost.

INTRODUCTION

Background

Thermal comfort refers to the way occupants experience and respond to the thermal conditions of their surrounding environment. It is influenced not only by measurable physical parameters such as air temperature and humidity, but also by social practices, cultural expectations, clothing habits and individual adaptation. From a technical perspective, thermal comfort is defined as a condition of mind in which an individual expresses satisfaction with the thermal environment, reflecting a state in which occupants feel neither excessively warm nor cold (ASHRAE, 2009), and it is widely recognised as a key component of indoor environmental quality in buildings.

Historically, thermal comfort in buildings has been achieved primarily through mechanical heating, ventilation and air-conditioning systems (GhaffarianHoseini et al., 2016). While these systems provide precise control over indoor temperatures, their widespread use has led to significant increases in operational energy consumption, greenhouse gas emissions and long-term building costs (Xu et al., 2025), and has reduced emphasis on architectural design and material performance as primary regulators of indoor thermal conditions (Argyriou, Marinelli and Melissas, 2025). In response, sustainable construction practices and climate-responsive design strategies have gained increasing attention as viable alternatives to energy-intensive comfort solutions. These approaches emphasise early-stage design decisions, including building orientation, form, envelope performance, material selection and natural ventilation, to reduce heat gain and enhance thermal regulation (Branciforti and Hafez, 2026).

Despite a growing body of literature, existing studies frequently address thermal comfort, energy efficiency and cost performance in isolation. Research on thermal comfort often prioritises indoor environmental quality without fully accounting for energy or economic implications (Nicol and Roaf, 2017), while energy-efficiency studies commonly focus on reducing consumption without adequately considering occupant comfort or affordability (Safarova et al., 2022). The combined effectiveness of passive strategies as an integrated design solution, particularly in warm and resource-constrained contexts, remains insufficiently explored (Hendriks et al., 2025). Addressing this gap is essential to establishing evidence-based design and construction approaches tailored to tropical developing environments such as Colombo, Sri Lanka.

Research Aim and Objectives

The aim of this research is to analyse how sustainable construction practices and passive design strategies can enhance thermal comfort while minimising energy use and keeping building costs manageable. The specific objectives are:

1. To identify the problems in constructing buildings that achieve thermally comfortable indoor environments.
2. To analyse how simple sustainable construction methods and passive design features can make buildings thermally comfortable and energy efficient.
3. To evaluate how these sustainable and passive design solutions can lower energy costs of buildings and improve cost efficiency.
4. To propose strategies for designing and constructing buildings that achieve optimal thermal comfort while maximising energy efficiency.

Scope of the Study

This research focuses on residential and commercial buildings located in hot and tropical climatic regions, where high ambient temperature and solar radiation significantly influence indoor thermal conditions and cooling demand (Nicol and Roaf, 2017; IEA, 2025). The study examines sustainable construction practices

and passive design strategies applicable at the early design stage, including natural ventilation, solar shading, thermal insulation, envelope optimisation, green roofs and solar energy systems (Mohammed, Farid and Khalil, 2024; Chkeir et al., 2024), and evaluates their contribution to operational energy reduction and life-cycle cost performance rather than detailed mechanical system design. From a Quantity Surveying perspective, particular emphasis is placed on early-stage cost planning, material selection and value engineering decisions.

LITERATURE REVIEW

The building sector is among the largest consumers of energy globally and is responsible for a substantial share of greenhouse gas emissions through both operation and material use (Nicol and Roaf, 2017). A significant proportion of this consumption is associated with maintaining thermal comfort, commonly achieved through heating and cooling systems (GhaffarianHoseini et al., 2016), and this challenge is intensified by rising global temperatures and increasingly frequent extreme climatic events (Argyriou, Marinelli and Melissas, 2025).

Problems in Achieving Thermally Comfortable Buildings

Inadequate consideration of climate-responsive design at the early design stage is a primary challenge affecting thermal comfort. Decisions such as orientation, form, spatial layout, window placement and envelope configuration strongly influence indoor heat gain and airflow, yet these decisions are often undervalued once the building form is fixed (Chipade et al., 2025). Poor selection of envelope materials, weak roof and façade performance, and limited natural ventilation further increase overheating and cooling demand (Mahrous et al., 2024; Branciforti and Hafez, 2026). Occupant behaviour also plays a role: buildings that restrict occupant control over windows, shading and ventilation increase dependence on mechanical cooling (Hendriks et al., 2025). These problems are amplified in hot and humid urban contexts, where designs transferred from temperate climates without local adaptation frequently result in overheating (GhaffarianHoseini et al., 2016; Elguindi et al., 2014).

Table 1. Summary of Literature Findings on Problems Affecting Thermal Comfort

Literature Area	Key Problem Identified	Sources
Early-stage design	Poor orientation, layout and opening placement increase heat gain and are costly to correct later.	Chipade et al. (2025); Branciforti and Hafez (2026)
Building envelope	Weak roof, wall, façade and glazing performance increases heat transfer and overheating.	Mahrous et al. (2024); Reza and Suleiman (2021)
Natural ventilation	Poor airflow planning and limited openings reduce ventilation effectiveness and raise cooling reliance.	Hendriks et al. (2025); Safarova et al. (2022)
Climatic/urban context	High temperature, humidity and urban heat increase indoor thermal stress and reduce passive cooling effectiveness.	Safarova et al. (2022); Hendriks et al. (2025)
Mechanical cooling reliance	Heavy dependence on air-conditioning increases energy use, operational cost and environmental impact.	GhaffarianHoseini et al. (2016); Xu et al. (2025)

Sustainable Construction and Passive Design Strategies

Passive design strategies such as orientation, shading, natural ventilation, thermal mass and envelope optimisation can substantially reduce solar heat gain and cooling demand when applied correctly (Argyriou,

Marinelli and Melissas, 2025; GhaffarianHoseini et al., 2016). Building orientation and form determine solar exposure and airflow potential and are most effective when addressed at the concept stage (Hassani, Bahramani and Ghobadian, 2019). Shading devices and solar heat gain control measures, including overhangs, louvres and double-skin façades, reduce direct solar exposure on glazed surfaces (Hashemi, Fayaz and Sarshar, 2010; Reza and Suleiman, 2021; Beytekin, 2019). Natural ventilation and airflow planning can lower cooling loads where cross-ventilation paths are designed into the building form, although effectiveness diminishes in humid, densely built urban settings (Kamal and Sarswat, 2020).

Material selection also influences indoor temperature stability: sustainable and recycled insulation materials can reduce thermal conductivity and improve envelope performance (Branciforti and Hafez, 2026; Mahrous et al., 2024), while green roofs and façade systems provide additional cooling and stormwater benefits where properly maintained (Shafique, Kim and Rafiq, 2018; Ma'bdeh, Ali and Rabab'ah, 2022). Collectively, the literature indicates that no single passive measure is sufficient in isolation; thermal comfort improvements are most reliably achieved when orientation, envelope performance, shading, ventilation and landscaping are combined as an integrated design strategy (Indrawanto, 2021; Zanjirei et al., 2025).

Energy Efficiency, Cost Performance and Research Gaps

Thermal comfort and building energy efficiency are closely linked, as heat gain through the envelope directly drives cooling energy demand (Yang, Lam and Tsang, 2008; Xu, Lu and Peng, 2025). From a life-cycle perspective, sustainable design measures may increase capital expenditure but reduce operational expenditure and environmental impact over the building's life (Eichhammer and Broc, 2025; Chipade et al., 2025). Certification frameworks such as LEED have been shown to encourage the adoption of passive strategies, although uptake in resource-constrained and tropical developing contexts remains limited (Xu, Cheng and Sun, 2025; AIA, 2012).

Notwithstanding this evidence, existing research tends to evaluate thermal comfort, energy performance and cost separately, and the professional decision-making processes, particularly those of Quantity Surveyors, that determine whether sustainable and passive measures survive early design and value engineering stages remain insufficiently examined (Hauashdh et al., 2022). This research addresses that gap by evaluating thermal comfort, energy efficiency and cost efficiency together, from the combined perspective of building occupants and construction professionals in a tropical developing context.

RESEARCH METHODOLOGY

The methodological framework adopted for this research is guided by the Research Onion (Saunders, Lewis and Thornhill, 2019), which provides a structured approach to selecting an appropriate research philosophy, approach, strategy and methods in relation to the research objectives. This framework is well suited to applied built-environment research, where methodological choices must reflect real-world constraints, professional practice and the involvement of multiple stakeholders rather than controlled experimental conditions.

Research Philosophy and Approach

A pragmatic research philosophy was adopted because the study is driven by a practical research problem rather than a commitment to a single epistemological position, allowing the researcher to focus on the usefulness of findings for practice (Saunders, Lewis and Thornhill, 2019). An abductive research approach was used, allowing established concepts from thermal comfort and hot-climate design literature to be examined and refined through primary data, rather than testing predefined hypotheses or generating theory from data alone.

Methodological Choice and Data Collection

A qualitative-dominant mixed-methods design was adopted, integrating a questionnaire survey of building

occupants with semi-structured interviews of construction professionals, thereby enabling triangulation between occupant experience and professional judgement (Saraswati and Devi, 2023). The questionnaire, administered online via Google Forms and Microsoft Forms, targeted building occupants aged 18 and above living or working in buildings located in hot climatic regions, and used predominantly five-point Likert-scale questions to capture thermal comfort experience, perceived effectiveness of passive design strategies, occupant adaptive behaviour and perceived barriers to sustainable implementation. A total of 31 valid responses were obtained, drawn mainly from Quantity Surveying (45.2%), Architecture (29.0%), MEP-related fields (12.9%) and Structural/Civil Engineering disciplines.

Eight semi-structured interviews were conducted with construction professionals, coded R1 to R8, comprising architects, quantity surveyors, civil engineers and an estimator with project experience in Sri Lanka, the United Arab Emirates, Qatar, Oman and Australia. Interviews explored professional judgement regarding capital-versus-operational cost trade-offs, value engineering, and practical strategies for delivering thermally comfortable, energy-efficient buildings. Convenience sampling was used for the questionnaire survey and purposive sampling for the interviews, prioritising quantity surveyors owing to their central role in early design-stage cost planning.

Data Analysis

Quantitative data were analysed using descriptive statistics and the Relative Importance Index (RII) method, which converts ordinal Likert-scale responses into a comparable ranking of relative significance, calculated as:

$$RII = \Sigma W / (A \times N)$$

where W is the weighting assigned by each respondent, A is the highest possible weighting value, and N is the total number of respondents. Calculated RII values range between 0 and 1, with higher values indicating greater significance, influence or effectiveness. Qualitative interview data were analysed using thematic coding, in which transcripts were reviewed to identify recurring ideas relating to climate-responsive design (CD), passive ventilation (PV), building envelope strategies (BE), sustainable methods (SM), industry barriers (IB), lifecycle cost comparison (LC) and the Quantity Surveyor's decision-support role (QS).

Table 2. Research Objectives with Corresponding Data Collection Methods

Objective	Method	Purpose
Objective 1	Literature review	To identify common design and construction challenges affecting thermal comfort in buildings.
Objective 2	Questionnaire survey; literature review	To examine the effectiveness of sustainable and passive design strategies in improving thermal comfort and energy efficiency.
Objective 3	Semi-structured interviews	To evaluate the impact of sustainable and passive design strategies on energy consumption and cost efficiency.
Objective 4	Semi-structured interviews	To develop practical strategies for designing energy-efficient, thermally comfortable buildings.

Ethical Considerations and Limitations

Participation in both the questionnaire and interviews was voluntary, and informed consent was obtained from all participants prior to data collection; anonymity and confidentiality were maintained throughout by withholding personally identifiable information from reported findings. As an undergraduate research project, the study is limited by a relatively modest sample size and reliance on self-reported, cross-sectional

data, which may constrain the generalisability of findings; the use of methodological triangulation across three data sources was adopted to mitigate this limitation.

RESULTS AND DISCUSSION

This section presents the findings of the questionnaire survey and semi-structured interviews, structured around the research objectives, and discusses them with reference to the literature reviewed in Section II.

Respondent Profile

The questionnaire survey generated 31 valid responses from construction industry professionals. As shown in Figure 1, the majority of respondents were from the Quantity Surveying discipline (45.2%), followed by Architecture (29.0%), MEP-related fields (12.9%) and Structural/Civil Engineering and other disciplines. Several respondents possessed exposure to both local and international construction environments, particularly Sri Lanka and Middle Eastern countries, providing a broad range of professional perspectives on thermal comfort, sustainable construction and cost efficiency.

2. Professional background
31 responses

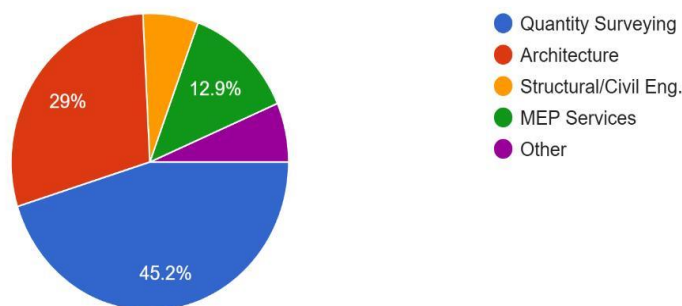


Figure 1. Professional Background Distribution of Questionnaire Respondents (n = 31)

Thermal Comfort Challenges and Influencing Factors (Objective 1 and 2)

Table 3 presents the RII ranking of thermal comfort and cooling-dependency factors. Discomfort due to humidity recorded the highest significance (RII = 0.761), followed closely by temperature-related discomfort (0.755) and indoor heat accumulation during hot weather (0.742). Difficulty in maintaining acceptable comfort without mechanical cooling also recorded a high RII value (0.723), confirming the literature's observation that hot, humid climates substantially increase reliance on air-conditioning (Safarova et al., 2022; GhaffarianHoseini et al., 2016).

Table 3. Relative Importance Index of Thermal Comfort Experience and Cooling Dependency

Thermal Comfort Factor	RII	Rank
Discomfort due to humidity	0.761	1
Discomfort due to temperature	0.755	2
Indoor heat during hot weather	0.742	3
Difficulty without mechanical cooling	0.723	4

Table 4 shows that building orientation exerted the highest influence on thermal comfort performance (RII = 0.806), followed by insulation materials (0.800) and wall materials and natural ventilation availability, both recording 0.781, consistent with literature identifying orientation and envelope performance as primary determinants of solar heat gain and airflow (Hassani, Bahramani and Ghobadian, 2019; Mahrous et al., 2024).

Table 4. Relative Importance Index of Building Envelope and Environmental Factors

Factor	RII	Rank
Building orientation influence	0.806	1
Insulation materials	0.800	2
Wall materials influence	0.781	3
Natural ventilation availability	0.781	3
Window size / glazing influence	0.729	5
Roof design influence	0.703	6

Regarding the effectiveness of specific passive design strategies (Table 5), roof insulation was ranked highest (RII = 0.845), followed by building orientation (0.832), shading (0.819) and construction materials (0.800); natural ventilation and landscaping/green-roof applications were tied (0.794). These rankings corroborate the literature's emphasis on envelope-focused passive measures as the most cost-effective route to reducing cooling demand in hot climates (Shafique, Kim and Rafiq, 2018; Argyriou, Marinelli and Melissas, 2025).

Table 5. Relative Importance Index of Passive Design Strategy Effectiveness

Passive Design Strategy	RII	Rank
Roof insulation effectiveness	0.845	1
Building orientation effectiveness	0.832	2
Shading effectiveness	0.819	3
Construction materials effectiveness	0.800	4
Natural ventilation effectiveness	0.794	5
Landscaping / green roof effectiveness	0.794	5
Wall construction performance	0.768	7

With respect to occupant adaptive behaviour (Figure 2 and Table 6), keeping windows and doors closed during air-conditioning use was the most consistently adopted practice (RII = 0.832), followed by switching off cooling when spaces are unoccupied (0.703). Ventilation-based adaptive strategies, such as opening windows during cooler hours, ranked comparatively low (0.574), indicating that natural ventilation alone is often insufficient in dense, humid urban environments, in line with Kamal and Sarswat (2020).

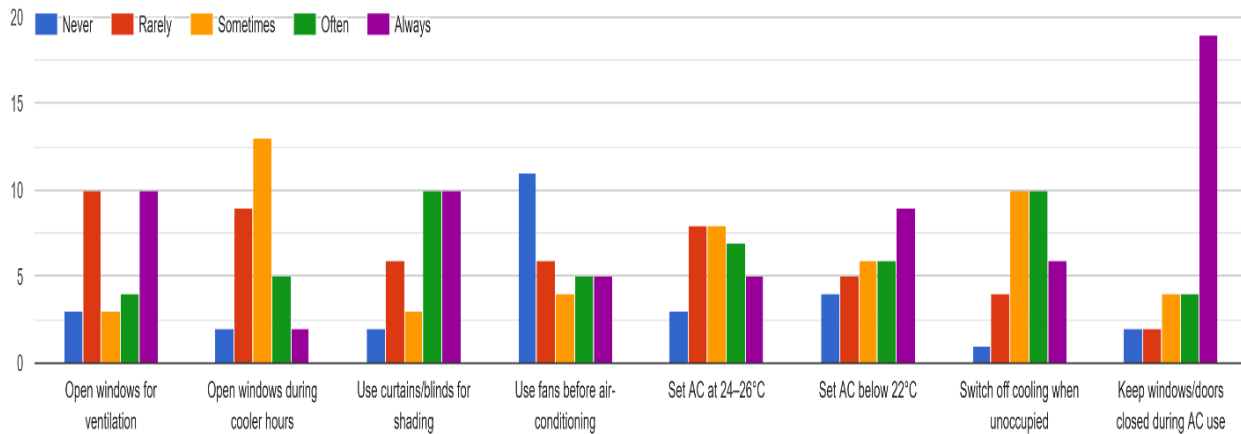


Figure 2. Occupant Adaptive Behaviour and Frequency of Use

Table 6. Relative Importance Index of Occupant Adaptive Strategies

Adaptive Strategy / Behaviour	RII	Rank
Keep windows/doors closed during AC use	0.832	1
Switch off cooling when unoccupied	0.703	2
Set AC below 22°C	0.671	3
Open windows/doors for ventilation	0.652	4
Set AC at 24–26°C	0.619	5
Open windows during cooler hours	0.574	6
Adjust clothing to cope with heat	0.523	7
Use fans before air-conditioning	0.516	8

Respondents also identified the major systemic problems affecting delivery of thermally comfortable buildings (Table 7). Limited climate-responsive design practice and prioritisation of initial construction cost over long-term performance were jointly ranked highest (RII = 0.774), followed by inadequate consideration of passive design at the early design stage (0.768). These findings echo the literature's observation that early design decisions are frequently undervalued relative to their long-term performance implications (Chipade et al., 2025).

Table 7. Relative Importance Index of Major Problems Affecting Thermally Comfortable Buildings

Major Problem	RII	Rank
Limited climate-responsive building design practices	0.774	1

Priority given to reducing initial construction cost over long-term performance	0.774	1
Inadequate consideration of passive design at early design stages	0.768	3
Use of thermal comfort standards not suited to hot climates	0.742	4
Heavy reliance on mechanical cooling systems	0.735	5

Cost Efficiency and Lifecycle Considerations (Objective 3)

The interview findings indicate that cost efficiency should not be assessed through initial construction cost alone. Several respondents explained that sustainable and passive design solutions may increase capital cost at project outset but reduce operational energy, maintenance and replacement costs across the building life cycle. One respondent (R4), drawing on UAE project experience, explained that the conflict between capital expenditure (CAPEX) and operational expenditure (OPEX) reduces developer motivation to invest in better insulation or efficient façade systems, because operational costs are typically transferred to owners or tenants. Another respondent (R6) emphasised that removing insulation or façade improvements to reduce initial cost can make a building cheaper to construct but considerably more expensive to operate, underscoring lifecycle cost as the appropriate basis for evaluating sustainable design decisions (Eichhammer and Broc, 2025).

The building envelope emerged as the primary area where sustainable design reduces energy cost. Interviewees described the continued use of single glazing in Sri Lankan buildings as a source of excessive heat gain, contrasted with Qatar-based examples of double glazing, Low-E glass, tinted glazing and insulated wall systems, and Oman-based use of hollow blocks, insulation layers and light-coloured external finishes as cost-practical alternatives. Value engineering was repeatedly identified as the principal mechanism by which such sustainable features are removed from projects when budgets tighten, despite the resulting increase in long-term operational energy cost. Respondents consistently argued that Quantity Surveyors should present initial cost, lifecycle cost, payback period and long-term savings for key sustainable options before design decisions are finalised, so that value engineering evaluates lifecycle impact rather than capital cost reduction alone.

Proposed Strategies for Thermal Comfort and Energy Efficiency (Objective 4)

Synthesising the interview findings, an integrated strategy framework was developed (Table 8), comprising: prioritising climate-responsive design (site analysis, sun path, orientation and shading) at the concept stage; applying passive ventilation selectively to circulation and transitional spaces such as corridors, staircases and car parks rather than universally; improving envelope, glazing and material performance through roof insulation, hollow blocks, double glazing and light-coloured finishes; selecting sustainable technologies (solar systems, radiant or district cooling, rooftop greenery) based on climate suitability and maintenance capacity rather than appearance; and improving client awareness and early professional coordination between architects, engineers, MEP consultants, Quantity Surveyors and contractors.

Table 8. Strategy Framework Developed from Interview Findings

Strategy Area	Strategy Developed from Interview Findings
Climate-responsive design	Conduct site analysis, sun path study, wind direction review, orientation planning and shading assessment from the concept stage.
Selective passive ventilation	Use natural ventilation in suitable spaces such as corridors, staircases, car parks and common areas rather than throughout the building.
Envelope and glazing	Use roof insulation, hollow blocks, double glazing, Low-E glass, façade screens

improvement	and light-coloured finishes where suitable.
Sustainable technologies	Select solar systems, radiant or district cooling, rooftop greenery and landscaping based on climate suitability and maintenance capacity.
Client awareness and coordination	Present lifecycle cost, payback period and long-term savings evidence to clients, and coordinate design decisions across disciplines from the concept stage.

Overall, the results demonstrate consistency between the ranked quantitative evidence and the qualitative interview accounts: strategies with the highest RII rankings (roof insulation, orientation, shading) were also those most frequently cited by interviewees as practical and cost-effective, while the highest-ranked barrier (short-term cost focus) was independently identified in the interviews as the principal driver of value-engineering removal of sustainable features. This convergence strengthens the credibility of the study's conclusions regarding the central role of early design integration and lifecycle costing in achieving thermally comfortable, energy- and cost-efficient buildings.

CONCLUSION AND RECOMMENDATIONS

Sustainable construction practices and passive design strategies can improve thermal comfort, energy efficiency and cost efficiency in hot and tropical buildings; however, their success depends on early integration, climatic suitability, practical construction capacity and lifecycle cost evaluation. The research confirms that thermal comfort should not be treated only as an air-conditioning issue: it is shaped by orientation, roof design, wall materials, glazing, shading, ventilation, façade treatment, landscaping, occupant behaviour and, critically, cost decisions made during early design and value engineering. Where these factors are neglected, buildings become more dependent on mechanical cooling, increasing energy use and operational cost.

Many effective strategies, including roof insulation, hollow blocks, double glazing, Low-E glass, double-skin façades, light-coloured finishes, green roofs, solar systems, radiant cooling and selective natural ventilation, are already used in practice. Implementation, however, remains constrained by short-term cost focus, limited client awareness, value engineering, material availability, maintenance concerns and insufficient lifecycle cost understanding. From a Quantity Surveying perspective, the key conclusion is that cost advice should not be limited to initial construction cost: Quantity Surveyors should support early design decisions by comparing capital cost, operational energy cost, maintenance cost and payback period, thereby preventing sustainable features from being removed during value engineering without regard to their long-term value.

Recommendations

1. Prioritise climate-responsive design at the concept stage, treating orientation, massing, façade exposure, window placement, airflow path and shading as core early design decisions rather than later-stage improvements.
2. Improve roof insulation and building envelope performance through insulation, hollow blocks, suitable glazing, façade shading and light-coloured finishes, selected according to local climate, material availability and budget.
3. Apply passive ventilation selectively rather than universally, reserving natural ventilation for corridors, staircases, car parks and common areas while using efficient mechanical cooling in occupied, sealed spaces.
4. Protect sustainable thermal comfort features during value engineering by evaluating each proposed removal against its effect on thermal comfort, cooling demand, maintenance and lifecycle cost, rather than initial cost alone.

5. Strengthen lifecycle cost advice by Quantity Surveyors, including structured comparisons of initial cost, operational energy cost, maintenance cost, replacement cost and payback period for key sustainable design options.
6. Select sustainable technologies based on climate suitability and maintenance capacity rather than appearance, and improve client awareness and early cross-disciplinary coordination between architects, engineers, MEP consultants, Quantity Surveyors and contractors.

These recommendations, grounded in convergent quantitative and qualitative evidence, provide a practical basis for delivering thermally comfortable, energy-efficient and cost-efficient buildings in hot and tropical climatic regions, and for strengthening the role of Quantity Surveyors as advocates for lifecycle-informed, climate-responsive design decisions.

Ethical Considerations

This research involved human participants through a questionnaire survey and semi-structured interviews. Ethical approval and clearance were obtained through the author's academic institution prior to the commencement of data collection, in line with established research ethics guidance. Participation was entirely voluntary, and informed consent was obtained from all participants prior to their involvement. Participants were informed of the purpose of the study, the nature of their involvement, and their right to withdraw at any stage without consequence. Anonymity and confidentiality were maintained throughout by withholding personally identifiable information from all reported findings; interview respondents are referred to only by anonymised codes (R1–R8).

Conflict Of Interest

The author declares no conflict of interest in relation to the research, authorship and/or publication of this article.

Data Availability Statement

The datasets generated and analysed during the current study (anonymised questionnaire responses and interview transcripts) are not publicly available due to participant confidentiality agreements but are available from the corresponding author on reasonable request. Summary tabulations of the questionnaire responses and the Relative Importance Index calculations are presented within this article.

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