

The Influence of Clients in Driving Implementation of Green Buildings in Tanzania: A Qualitative Approach

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Abstract Green buildings are gaining global popularity due to their promotion of sustainable development and mitigation of construction's environmental impact. This involves creating environmentally responsible and resource-efficient structures and processes throughout a building's lifecycle, from site selection to deconstruction. Implementing green building practices requires input from all stakeholders across the project lifecycle. While clients are central stakeholders, their influence on green building implementation in construction projects remains understudied. This qualitative study explores the influence of clients on green building implementation in Tanzania, using semi-structured interviews with seven clients in Dar es Salaam whose houses are Green Building Tanzania certified. Results indicate that clients play a crucial role in the green building process, from initiation to completion, by providing resources, selecting consultants and contractors, and prioritizing sustainability. However, their engagement is hampered by limited awareness of green building practices among construction professionals, a scarcity of local green technologies, cost concerns, and a lack of clear guidelines. The study recommends practical educational training on green building practices for Tanzanian construction stakeholders and the implementation of mandatory green building codes and regulations.

Keywords Clients, Influence, Sustainability, Green building, Tanzania

1. Introduction

The rapid economic and societal development has led to significant growth in the construction industry, driven by high demand for housing and infrastructure [1]. This sector plays a crucial role in a nation's economic growth and has contributed to sustainable advancement through key objectives such as job creation, increased output, and income generation [2]. In Tanzania, the construction industry is expanding swiftly, particularly in urban areas experiencing fast population growth. For instance, Dar es Salaam, Tanzania's commercial hub, is rapidly urbanizing and is one of Africa's fastest-growing cities. According to UN forecasts, Tanzania's urbanization is outpacing other East African nations, with an average annual growth rate of 5.4% [3]. By 2030, Dar es Salaam could achieve 'megacity' status with over 10 million residents, potentially reaching 21.4 million by 2052 [3]. This population surge increases the demand for housing and infrastructure. The FYDP [4] notes a rise in the construction of commercial and residential buildings, aligning with Kikwasi & Escalante's [5] findings that Tanzanian investors favor fixed assets like buildings, contributing to economic growth which rose from 25% to 34%.

Despite its economic potential, the construction sector poses significant environmental challenges. Globally, buildings account for approximately 38% of energy consumption and greenhouse gas emissions [6], and they are responsible for 20-50% of natural resource use and 50% of solid waste [7,8,6]. As the population grows, construction demand and consequently greenhouse gas emissions will rise, leading to resource depletion, loss of green spaces, global warming, acid rain, and smog.

Green building is recognized as a vital strategy to mitigate the environmental impacts of the construction sector [9,10]. This involves developing environmentally friendly structures that are resource-efficient throughout their life cycle, including design, construction, operation, maintenance, renovation, and deconstruction [11]. Literature indicates that green buildings provide benefits across the three pillars of sustainability: environmental, economic, and social [10,12]. These benefits include improved water and energy efficiency, enhanced human health, increased productivity, better indoor environmental quality, higher property values, and reduced resource use during construction and operation [10,13].

The successful implementation of green buildings relies on decisions and collaboration among key stakeholders in the construction chain, including owners, developers, managers, designers, and governments [14,15]. Client play a crucial role in making key decisions that shape the extent of sustainable practices for each project [16,15]. Zang et al. [15] discussed

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the characteristics and preferences of clients in green buildings, highlighting factors that influence client decisions such as sustainability, cost-efficiency, and health benefits associated with green building practices. They noted that clients are becoming increasingly aware of the long-term advantages of investing in environmentally friendly construction. They have the authority to initiate and implement construction projects, making them the most significant stakeholders in promoting sustainability. Research indicates that the primary obstacle to green building implementation is the responsibility of owners, followed by government, consultants, contractors, and tenants [17].

Several studies have focused on stakeholders and green buildings. For example, Ezanee et al. [18] found that clients view investing in green buildings as costly, indicating that clients will only participate if funds are available for green projects. Zhan and Tu [19] highlighted that clear guidelines influence real estate developers' adoption of green buildings in Singapore. Likewise, Okoye [20] found that guidelines and knowledge affect clients' commitment to sustainable construction practices in Nigeria. Candel & Törnå [21] identified perceived barriers faced by housing owners in implementing municipal sustainability requirements in Sweden. Owusu-Manu et al., [22] noted that financial and technological support, along with institutional settings, significantly influence the adoption of smart buildings.

In the Tanzanian context, Kongela [23] examined the awareness of sustainability potential among built environment stakeholders, revealing challenges in understanding green building concepts. Nkin et al., [24] assessed occupant satisfaction in green and non-green office buildings in Dar es Salaam, finding no significant relationship due to a lack of awareness of green concepts. Similarly, Mushi et al., [25] reviewed African green building research, concluding that while there is a body of research, data on the performance of green buildings at a regional level are scarce. Mushi, et al., [26] also found that organization decision was prominent, factors influencing adoption of green buildings in Tanzania. Phoya [27] found that some contractors engage in sustainable practices, though challenges such as limited knowledge, relaxed regulations, and negative perceptions remain prevalent. Also, Nkini et al., [28] focused on Knowledge of Stakeholders on Green Building Design Features, Triggers and Pathways for Uptake in Tanzania. Despite the extensive research, there is still limited knowledge on holistic understanding the influence of clients as implementation of green buildings. This study therefore aims to develop holistic understanding of clients' influence on green building implementation specific focus on their role and relationship in implantation of green buildings in Tanzania.

2. Literature Review

2.1. Concept of Green Building

Green building is part of the larger concept of “sustainable

development [29]. Thus, it ensures that it meets the needs of the present without compromising the ability of future generations to meet their own needs. It sometimes known as sustainable buildings or smart building and therefore, compounded on three pillars of sustainability ie environment, economic and social aspects [11]. The “Green Building” concept has been defined by the EPA [6] as “the practice of creating structures and using processes that are environmentally responsible and resource efficient throughout a building’s life-cycle from siting to design, construction, operation, maintenance, renovation and deconstruction. Karolides [29] discusses the various aspects of green buildings, emphasizing their environmental benefits, energy efficiency, and sustainable materials. Green buildings aim to minimize ecological impact while enhancing the quality of life for occupants.

The concept of a green building is driven by incentives to reduce the cost of energy and waste management considering global warming and environmental degradation [10]. Green Building Index (GBI) defines green building as a building which focuses on increasing the efficiency of resource while reducing building impact on human health and the environment during the building’s lifecycle. In similar view Building Research Establishment Environmental Assessment Methodology [30] presents aspects in which building have to adhere to maintain sustainable environment. They identified key elements for green building such as energy efficiency, materials, water, indoor air quality and less Co² emission.

Similarly, UN resolution in 2015 developed 17 Sustainable Development Goals (SDGs) which need to be realized on 2030. In lieu of these development goals, the green building are in line with SDG 6 which focus on application of water saving techniques and dry construction methods, SDG 7 which focuses on access to affordable, reliable, sustainable and modern energy, SDG 11 focuses on making cities inclusive, safe, resilient and sustainable while improving resource use and reducing pollution and poverty and SDG 12 based on Sustainable consumption and production aims at “doing more and better with less. The main focus is increasing net welfare gains from economic activities by reducing resource use, degradation and pollution along the whole lifecycle, while increasing quality of life. In sum-up green Building is characterized by water efficiency, energy efficiency, less resources used, less Co² emission and indoor air quality.

2.2. Green Building Certification and Policies

Developed nations like the U.S., U.K., Japan, and Australia have embraced green building technologies (GBTs) through policy support, certification systems, and economic incentives. Globally, countries are increasingly adopting building codes and green building certification systems like LEED (U.S.), BREEAM (U.K.), Green Mark (Singapore), Green Star (Australia), CASBEE (Japan), Green Star New Zealand, and BEAM Plus, to address environmental concerns and evaluate building sustainability across energy efficiency, water use, materials, and indoor environmental quality [26]. Green Star SA, LEED, and Green Mark Singapore are prevalent in

developing countries, including Africa. South Africa and Egypt pioneered green rating systems with Green Star South Africa and the Green Pyramid.

In Tanzania, The Tanzania Green Building Council (TZGBC) is a non-governmental organization established in 2014, leads green building initiatives by raising awareness and influencing policy, building codes, and regulatory bodies [26]. Through this initiative, several buildings have been certified. These projects include the National Housing Building (BCA Green Mark), Citibank Tanzania Serengeti Building (LEED Gold) [26]. Another notable certified projects are the Evoke Luminary, a privately-owned commercial building, the first LEED gold rated in East Africa (USGBC, 2016) and the private Hotel Verde Zanzibar which received a 5 Star Rating South African Excellence, accredited in March 2019, is the first Green Hotel as Built certified by Green Star South Africa; the hotel uses numerous green technologies to encourage sustainable tourism [28].

Several policies such as Tanzania National Construction Industry Policy (2003) and Environmental Management Act (EMA) No. 20 of 2004 promote environmentally friendly construction practices but lack a clear "green building" definition and consistent enforcement regarding environmental, social, and economic sustainability [28]. Similarly, professional registration boards (Architect and Quantity Surveyors Act 2010, Engineer's Registration Board, and Contractors Registration Board Act 2010) acknowledge sustainable practices but offer insufficient guidance for green building practices (GBP). Consequently, existing acts and policies fail to provide clear mandates for tangible green building instruments. Despite these shortcomings, there is increasing recognition of the importance of implementing green buildings in Tanzania, highlighting the need to understand client involvement.

2.3. Clients and Implementation of Green Buildings

Clients have been defined as those who carry out, or assign others to carry out, design, construction, demolition or groundworks for their own account [21]. It has long been recognized that clients play an important role in the process of both initiating and implementing innovation in development projects [31,32]. A client is considered as the initiator of a project, responsible for setting requirements of the project. This could be an individual, partnership or company and includes property developers or management companies for domestic properties [33]. They finance and develop residential buildings that they either intend to sell or rent out, which can also be termed residential property developers [31]. Due to their position, clients have the responsibility of setting specifications and formulating requirements during procurement [34,31]. They also have the responsibility of employing consultants who will do the design and cost estimates or contractors who will execute the project. They provide a brief for the design team, contributes ideas to the design and construction processes, and, finally, makes authoritative decisions quickly, and the stability of these decisions. Clients are also the sources of project financing;

therefore, they facilitate payment for all construction activities. Regarding to green buildings will depend much on the specification provided by clients. In addition, the position of client as the organizer of the project appeared to influence the project environment by encouraging more integration among project participants [34]. In the same line of thinking [35] identified seven client qualities for implementing green buildings including client communication with design team, client involvement during process, client ability to coordinate of design process, client organization commitment to green, commitment in financing green design, knowledge on green design, and experience on green design.

3. Methodology

This study employed a qualitative research methodology utilizing an exploratory approach, deemed suitable due to the nature of the topic. The objective was to investigate how clients implement green buildings in Tanzania. A total of seven clients were selected for this study based on their experience in constructing green buildings, with several of their projects certified as green by various organizations. In Tanzania, seven buildings have received green certification, leading to the purposive selection of these clients, as they are the only ones associated with recognized green building certification organizations, and their information can be traced in the organizations' repositories [36,37].

Data collection was conducted through qualitative methods, specifically using semi-structured interviews. Semi-structured interviews were chosen for their flexibility in eliciting information and their adaptability to the unique contexts of individual interviewees [38,39]. Accordingly, this format allows for exploration of original areas while uncovering new dimensions of the topic that may not have been anticipated. The format also enables the interviewer to ask follow-up questions not covered in the interview guide, facilitating a deeper discussion on specific subject areas. This approach enhances the accuracy and immediacy of the interview questions. Interviews was conducted face to face and by telephone and were scheduled at the respondents' convenience, lasted between 20 to 30 minutes, and were digitally recorded for transcription to minimize information loss. Ethical considerations were prioritized; respondents were contacted in advance to confirm their willingness to participate and provided with an explanation of the study's purpose.

Thematic analysis was employed to identify themes from the interviews, following [40] recommendations for deriving themes for in-depth interpretation. Thematic analysis is a research method used to discern patterns or themes within a data set, often leading to new insights and understanding [41,42]. The analysis of the semi-structured interviews followed a deductive approach. Accordingly, thematic data analysis involves identifying themes in qualitative data. This study undertook six levels of analysis: familiarization, coding, generating themes, reviewing themes, defining and naming themes, and writing up the results.

4. Findings and Discussion

The researchers began by analyzing the respondents' demographics then followed by analyzing the data taking into consideration the key themes that emerged from the interview questions.

4.1. Demographic of the Respondents

The demographic of the respondents is indicated in Table 1. A total of seven expertise participated in the interview survey. All respondents had master's level and above indicating that they are top management and therefore they are decision making in the organization. The average year of experience is above 5 years indicating that they have good exposure in various real estate development. In terms of experience in green building concept it was revealed that all developers have good skills and knowledge on green buildings. Onuoha et al., [43] and Okoye [20] revealed that skills and knowledge of green building have an influence towards the implementation of sustainable buildings. This experience and knowledge have been acquired from different sources including workshops, collaboration with other developers, hiring an expert and working with international organizations.

4.2. Involvement of Clients in Implementing Green Building

Based on interviews with key informants, various themes have been uncovered with regard to the involvement of housing developers in implementation of green buildings in Tanzania. The results reveal that Clients are involved in different stages of housing development which include briefing stages, design stages, procurement stages and construction stages as indicated in Figure 1.

4.2.1. Involvement in Briefing Stage

The findings indicate that during the briefing stage, developers play a key role in defining and setting up project requirements, selecting the design team, and communicating project requirements to the design team. It was revealed that developers prioritize green features when establishing project requirements from the outset, as noted by one respondent.

"During project initiation, we established the requirement for energy efficiency (D). Another added, "We determine the direction of each project" (A).

The aforementioned statements support Candel and Törnå [21] in highlighting that clients significantly influence project requirements.

The finding further reveal that the design team's knowledge and experience are essential for creating effective designs with green elements. Therefore, developers were employing designers based on knowledge and experience in green building. One respondent remarked that

"We assess the knowledge and experience of designers before involving them in our project(G). We ensure that our design team, as well as ourselves, possess the necessary expertise. For instance, we engaged experts from Malaysia familiar with green building and the BCA Green Mark assessment system to train our staff and share their skills and experience." (A).

These assortment supported by Elforgani and Rahmat [35] that clients, responsible for choosing design teams capable of delivering eco-friendly designs, have opportunities to enhance the performance of green buildings. Furthermore, effective collaboration between clients and designers is essential in fostering an environment conducive to innovative solutions in green building practices. Onuoha et al. [43] and Olabi et al., [44] that green building skills influencing green commercial property investment.

Table 1. Demographic information of the respondents

| Interviewee | Gender | Position in the Project | Years of Experience in the firm | Experience in green building | Education Qualifications |
|-------------|--------|--|---------------------------------|--|--------------------------|
| A | Male | Director | 6- 10 years | Working with expert from Australia. Had information on green building before | Postgraduate level |
| B | Male | Principle project manager | 6-10 years | Attended two workshops of green building | Postgraduate level |
| C | Male | Director project Innovation and implementation | 11- 15 years | From my masters degree and I am working with international organization | Postgraduate level |
| D | Male | Managing director | More than 15 years | From my fellow developers inside and outside the country | Postgraduate level |
| E | Male | Project manager | More than 15 years | From school during my master's study | Postgraduate level |
| F | Female | Project manager | More than 15 years | Attended four workshops of green building | Postgraduate level |
| G | Male | Managing director | More than 15 years | Attended two workshops of green building | Postgraduate level |

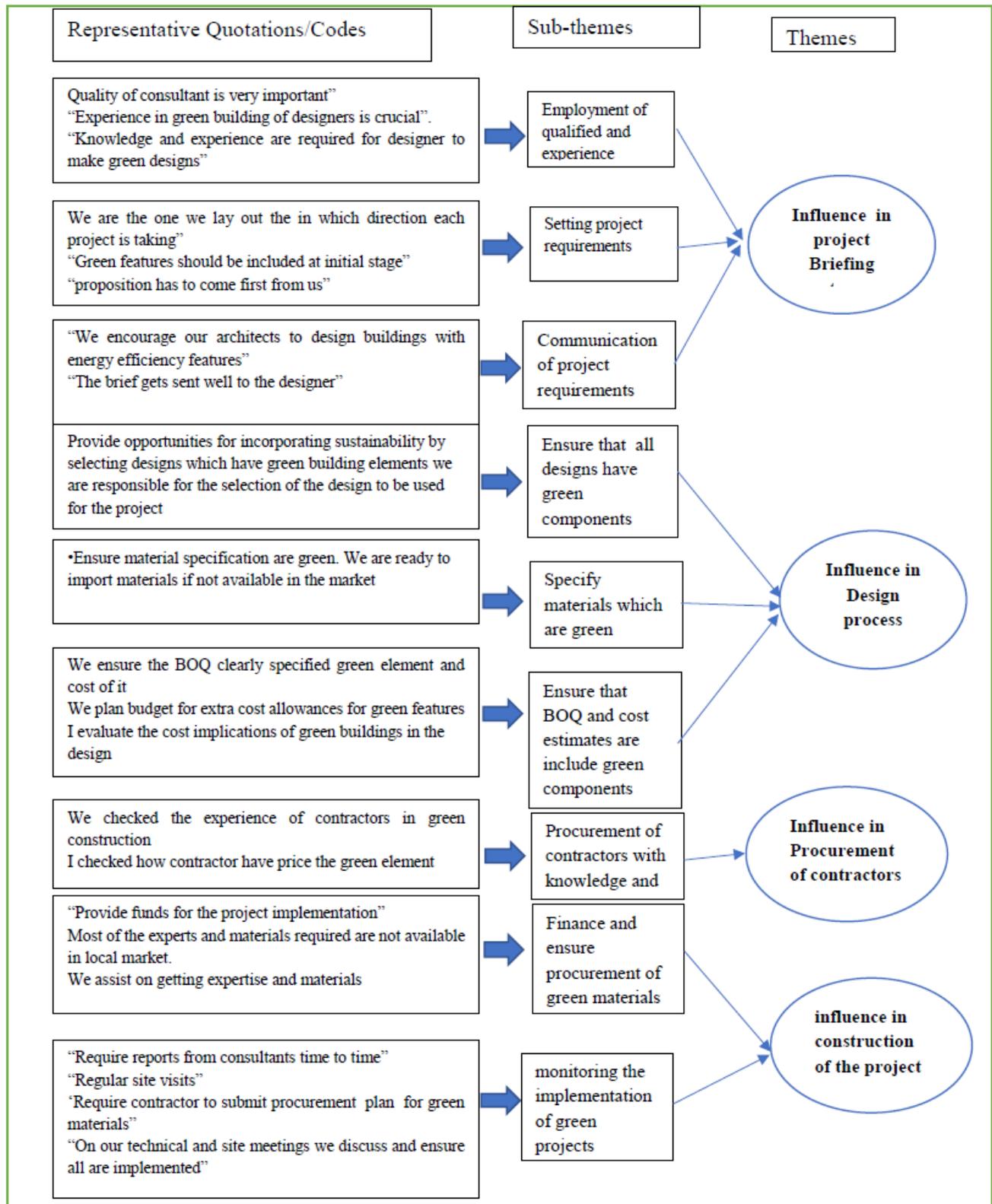


Figure 1. Themes for client influence implementation of green buildings

On the other hand, effective communication between developers and designers regarding project requirements is crucial to the design outcome, making the way developers issue project briefs essential for quality design. One of the respondents said;

"We utilize various methods, including face-to-face meetings and online communication, to effectively transmit briefs to designers." Another perspective from respondents: "We encourage our architects to incorporate green elements into their building designs."

These observations highlight the need for developers to make informed decisions when setting project requirements and selecting quality design teams, as well as effectively communicating project briefs for successful green building implementation. As noted by Huang et al., [45] integrating diverse perspectives during the early phases of project development can significantly improve sustainability outcomes. Moreover, Charef and Emmitt, [46] and Huang et al. [45] highlighted that early engagement in sustainability projects is advantageous for cultivating a greater willingness among clients to embrace sustainability because doing so can enhance their understanding of project progress through effective communication with professionals.

4.2.2. Involvement Design Process

The design process involves several activities: creating the general layout and proposal outline, producing detailed designs, establishing specifications, and preparing the BOQ and cost estimates. The study shows that clients incorporate green practices by integrating eco-friendly elements into the design outline, detailed designs, and material specifications, which are also reflected in the BOQ and cost estimates. One respondent noted that

The project may state, "we aim to be an energy-efficient building," leading the designer to focus on efficiency over usable space. (B), We collaborated closely with the design team, supplying all necessary information to ensure the project meets the required standards in their design. (D).

The statements indicate that designing green buildings is a crucial task that developers must execute effectively. It was noted that considerations for green elements in design outlines, detailed drawings, and material specifications were suggested during the briefing stage, emphasizing the client's role in ensuring project requirements are met.

One respondent stated, "I create opportunities for sustainability by selecting designs with green building elements; we are responsible for choosing the project design" (A). Another respondent remarked, "We evaluate the design's environmental impact and identify alternatives or strategies to minimize or mitigate these impacts" (C).

The quotations highlight that the design stage is crucial for detailing project information. The findings also indicate that clients ensure all building materials are explicitly listed in the Bill of Quantities (BOQ). "We understand that some green building elements are expensive, so we ensure the BOQ clearly specifies these elements and their costs" (B).

According to Candel & Törnå [21], Okoye [20] and Owusu-Manu et al. [22] clients' commitment to financing green buildings is a key factor influencing the decision to adopt smart buildings. This attention to detail in the design stage not only aligns with cost management but also serves as a foundation for achieving sustainability goals. The quotations further emphasize that early integration of green features in building design can mitigate future costs and enhance the overall value of the project. "By incorporating

energy-efficient systems from the outset, we can optimize their performance and reduce the overall operational expenses," states a project manager (C).

Moreover, a thorough examination of the Bill of Quantities reveals that clients are increasingly recognizing the long-term benefits of investing in green technologies. "The initial investment might be higher, but we see a significant return on investment through energy savings and increased property value over time" (D).

Research by Candel & Törnå [21] supports this perspective, illustrating that green building need funding for green initiatives. As Owusu-Manu et al. [22] note, many financial institutions are still hesitant to invest in unproven green technologies." This highlights the need for ongoing dialogue between clients, financial entities, and policy makers to create more favorable funding landscapes.

4.2.3. Involvement in Procurement of Contractors

Procurement of contractors is crucial as it affects the quality of work. This study shows that clients actively involved in green building projects by select contractors knowledgeable about sustainable practices. One respondent mentioned, "We checked the experience of contractors and how they priced the green elements." This finding aligns with research by Candel & Törnå [21], Owusu-Manu et al., [22] Zhan and Tu [19], and Okoye [20] highlighting that stakeholder experience and knowledge significantly influence green building implementation. Furthermore, the selection process emphasizes the importance of collaboration between clients and contractors, fostering an environment conducive to innovation and sustainable practices. This is echoed in findings by Oluwoye et al. [47], who argue that an integrated approach among all stakeholders leads to more effective project outcomes. One client articulated the importance of partnership, stating, "We seek contractors who are not only technically proficient but also share our commitment to sustainability."

This collaboration often extends beyond the construction phase, as many clients prioritize contractors who demonstrate a willingness to engage in ongoing education about green technologies and practices. Research conducted by Zhang et al. [48] supports this viewpoint, suggesting that contractors who stay abreast of advancements in sustainable materials and methods are better positioned to execute green building projects successfully.

4.2.4. Involvement in Construction Stage

The construction stage serves as the critical test for project goals such as timely delivery, high quality, cost-effectiveness, and safety. This stage encompasses all activities from when contractors assume control of the site until project completion. The findings reveal that clients are involved in green building by making actual payments for the projects. One of the respondents highlighting that green building projects require more funding than conventional ones. For instance, during the construction of the Luminary Evoke building, more funds were allocated to this project than to others.

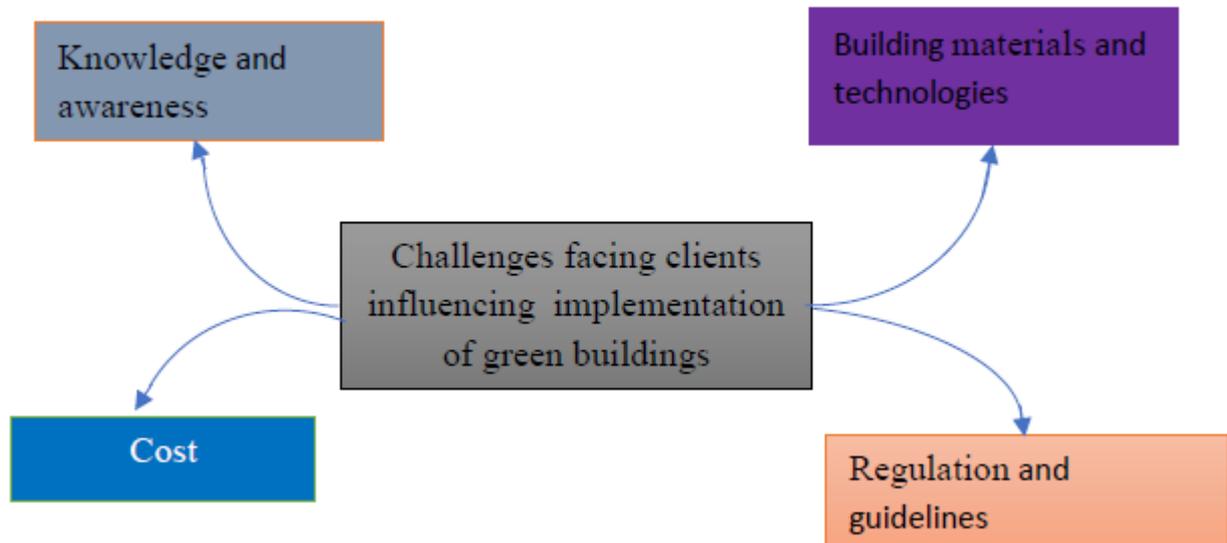


Figure 2. A thematic review using an ATLAS.ti 8 network view on challenges facing clients in influencing green buildings

Another respondent said *at that time, we had numerous ongoing projects, but we allocated most resources to this one due to its promising future benefits.* Financial resources are essential for green buildings, as highlighted by Okoye [20], who noted that financial stability influences clients' commitment to sustainable construction in Nigeria. Specifically, clients must allocate robust budgets for sustainability projects to avoid abandonment or suboptimal performance [22]. However, despite these positive shifts, a persistent challenge remains: the disparity in funding for green initiatives.

Further findings reveal that clients aided contractors in ordering green building materials and ensured they had the required skills. One of the respondents said, *“Due to a scarcity of experts and materials in the country, we assist contractors in their procurement”* (F). Another respondent states *“While our in-house architects lack extensive experience in green building, we are sharing knowledge with companies with relevant expertise”* (C). This highlights the necessity for developers to invest funds, as successful green building implementation involves substantial initial costs.

Clients are also involved in monitoring the implementation of green projects. Results show that during the construction phase, clients make regular site visits, attend meetings, and request performance reports from contractors. This active involvement allows clients to ensure that sustainability practices are adhered to and that project milestones are met. Additionally, they evaluate compliance with environmental regulations and assess the effectiveness of eco-friendly materials and technologies employed on-site. By fostering open communication channels with contractors and stakeholders, clients can promptly address any issues that arise, facilitate adjustments, and share best practices.

4.3. Challenges Facing Developers in Implementation of Green Buildings

Based on interviews with key informants, various challenges have been uncovered with regard to the implementation of

green buildings in Tanzania. Respondents were asked to mention the challenges they are facing in the implementation of green building. The results were grouped in three themes namely Lack green building materials, technologies, service providers in the local market., An increase in construction costs in green building projects compared to conventional buildings and lack of clear regulation and guidelines.

4.3.1. Lack of Green Building Materials, Technologies, Service Providers in the Local Market

The findings reveal that the absence of green building materials, technologies, and service providers poses a significant challenge to implementing green building in Tanzania, a sentiment echoed by all interviewees. For instance, Interviewee B noted, *“Sometimes we have to import these green materials and expertise from outside the country, which makes projects very expensive.”* Interview D added, *“Most of our staff lack experience and the necessary skills and technology for designing and constructing green buildings.”* Interviewee A supported this by stating, *“We have in-house architects, but they are not very experienced in green building. We are trying to share knowledge with companies that have experience in green building projects.”*

The foresaid reveal that lack of green building materials, technologies and service providers in the local market affect the decision of developers to implement green buildings. This finding is consistent with study by Fathalizadeh et al., [49] stated that the selection of building materials is influenced by their availability and the skills required for installation. A study by Eze et al., [18], reported that the availability of technical skills and experts was among the top 10 determinants of sustainable building materials selection in projects. Also Nkin et al., [28] reveal that green building materials, technologies, service providers in the local market is among the factors adoption of green buildings in Tanzania. Therefore, to ensure more clients are implementing green buildings, the research and development of key technologies

should be strengthened. The government should increase support for technological research and communication in order to improve the commercialization level and market penetration capacity of new technologies. Meanwhile, innovative technologies need to be commercialized through an effective platform to demonstrate and promote them.

4.3.2. Knowledge and Awareness

The findings indicate limited awareness and knowledge of green building practices among the public.

Interviewee F stated that *obtaining skilled workers to install green materials in buildings is challenging*, which Interviewee D supported by noting the low knowledge among people about green buildings. Interviewees A, C, and F pointed out that *tenants are unable to differentiate between green and conventional buildings*. Additionally, one interviewee (A) mentioned the *difficulty in finding designers and contractors experienced in green building*.

The findings indicate that a lack of knowledge and awareness of green building practices among key stakeholders hinders the implementation of green buildings. This supports Phoya [50], who identified limited public awareness and knowledge-sharing as primary obstacles to using energy-efficient construction materials in Tanzania. Aghimien et al., [51] also noted that insufficient awareness and clear definitions of sustainable building materials among stakeholders impede the adoption of green materials and technologies. Additionally, Osuzugbo et al. [52] and Fathalizadeh et al. [49] emphasize that public awareness of sustainable construction significantly affects its adoption. In the same thinking Nkini et al., [28] found that there exist misconceptions among the constructions industry stakeholders regarding what green building practices entail and the essential requirements for their implementation. Educating stakeholders can enhance awareness of green building practices potentially improving their adoption rates. This aligns with Oke et al., [53] who stated that the adoption of sustainable construction starts with awareness followed by interest.

4.3.3. An increase in Construction Costs in Green Building Projects Compared to Conventional Buildings

Majority of interviewees acknowledge that there was additional cost in implementing green building compared to conventional approach and this has affected their decision on implementation of green buildings in other projects. One of the interviewees said, *"This makes it difficult to opt for green building due to price constraints"* (G).

"We are facing challenge of limited funds and high construction costs of green building" specific construction materials" (D) *"We import some of these materials it makes project very expensive"* (B) *"We higher expertise from outside the Country which is very expensive"*(F).

The literature supports these findings [19,54,55,56,57,58] across various countries. Eze et al. [54] noted that additional costs and financial issues are major challenges for achieving sustainable construction materials in Nigeria. Conversely,

Dadzie et al. [60] pointed out that the perceived higher costs of sustainable construction have led to increased consultant fees, partly due to the design team and contractors' unfamiliarity with sustainable methods.

4.3.4. No Clear Regulation and Guidelines

Lack of clear regulation and guideline was acknowledged as the main challenge which affect clients in implementation of green building in Tanzania. Some of the interviewees said that *We don't have regulations which guiding us"* (B), (A) (D) (C), *this is based on my own experience and exposure from outside* (A).

"Our building codes does not say anything about green buildings" (F), (G).

The findings indicate that national building regulations have limited clear policies and legal requirements for implementing green buildings, a challenge noted in various studies [62,54,50,28]. The lack of mandatory codes and regulations impedes the adoption of green buildings, relying heavily on individual developer efforts. Research by Candel & Törnå [21] and Zhang and Tu, [22]. suggests that government enactment of legislation and mandatory green building codes positively affects implementation. This finding is consistent with Kongela's [23] findings that environmental protection policies are scarce in developing regions and slight pressure is exerted by the government, as the results of a construction professional's voluntary implementation of sustainable design and techniques strengthen the concept. Therefore, a review of building codes and regulations is essential to guide green building implementation which will trigger establishing market boundaries and promoting the green building agenda at the national level to stimulate market growth.

5. Conclusions

The study aims to evaluate the influence of clients in the implementation of green buildings in Tanzania. The findings indicate that clients have wide range of involvement in implementation of green buildings from the inception of the projects through to the construction stage. Their involvement included setting project requirements with green features, employing designers and contractors with experience in green buildings, communicating briefings, selecting and approving designs which have green features, specifying green materials, providing enough funding for the projects, educating and training staff on green building principles, creating opportunities to incorporate sustainability, and monitoring the projects. However, several challenges hindered their efforts, including low awareness of green building practices among professionals in the construction sector, a lack of green technologies in the local market, cost issues, insufficient information and awareness regarding the benefits of green buildings, and the absence of clear guidelines and regulations governing their implementation. The study recommends reviewing building regulations and policies, providing more training and skills promotion, and conducting further research to gather actual

evidence on the benefits of green buildings.

Implications

Based on the findings, the study highlights important practical and policy implications for implementation of green buildings. Clients as the main stakeholders in built environment and construction have the driving power to ensure implementation of green building through other stakeholders (designers and contractors). However, the challenges which affect implementation of green buildings are addressed through policy makers, training institution, practitioners (designers and contractors), awareness, policy and regulations and research. The limitation of the study is results are interpreted based on small sample size. In future, the findings over a wider sample size may lead to a better understanding of the mode of clients' involvement and challenges affecting the wider implementation of green buildings in Tanzania.

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