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Modelling Managerial Determinants for Green Building Technology Adoption: A Decision-Making Framework from the West Bank

Ramiz Assaf[1,*], Mohammad Qalalweh[1], Abdalmuttaleb Al-Sartawi[2], Zaher Abusaq[3], Mohammad Kanan[3]

1 Industrial and Mechanical Engineering department, Faculty of Engineering, An-Najah National University, Nablus, Palestine
2 Accounting Finance & Banking Department, College of Business & Finance, Ahlia University, Manama, Bahrain
3 Industrial Engineering Department, Jeddah College of Engineering, University of Business and Technology, Jeddah, Saudi Arabia.

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ABSTRACT

This research explores the managerial and environmental conditions affecting the uptake of Green Building Technology (GBT) in the West Bank, based on data collected from 500 real estate developers. The analysis employed Partial Least Squares Structural Equation Modelling (PLS-SEM) to evaluate the proposed framework. The results demonstrate that governmental support, the perceived benefits of GBT, acceptance within the market, and societal pressures all significantly and positively influence adoption. Conversely, perceived limitations of GBT show a significant negative impact. Additionally, the presence of internal GBT-related resources within organisations mediates the effect of government support on adoption. Leadership commitment from top management and a strong sense of environmental responsibility were also found to strengthen several of the model's relationships. The findings emphasise the importance of both institutional backing and internal capacities in driving sustainable building practices, alongside the active participation of key stakeholders. This study enhances the academic discourse on green building and provides practical guidance that may assist policymakers, property developers, and sustainability advocates in promoting GBT implementation within the context of developing nations.

1. Introduction

The concept of green building (GB) is increasingly recognised as an effective solution to mitigate the environmental and climatic consequences associated with the construction sector [3]. GB seeks to enhance operational efficiency, reduce energy consumption, and safeguard both environmental quality and human well-being [18]. The construction industry remains a major contributor to global carbon emissions and accounts for approximately two-thirds of total energy consumption. GBs adopt environmentally responsible practices and sustainable materials to reduce ecological harm, optimise utility expenses, and enhance user satisfaction. Although the primary focus of GB research has traditionally centred on environmental impacts, a growing body of scholarship has started to

* *Corresponding author.*
E-mail address: ramizassaf@najah.edu

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emphasise the significance of social perceptions in influencing its promotion and practical implementation. Nevertheless, investigations into social dimensions remain limited [18]. GBT, a specialised category within ecological construction, is designed to improve the environmental, economic, and social performance of buildings across their life cycle [32]. It comprises a set of high-quality methods, tools, and technologies aimed at increasing efficiency in energy, water, land, and materials while reducing negative environmental outcomes and enhancing public health throughout construction phases.

This study addresses key technical and organisational challenges observed in the Palestinian context and compares these with regional experiences. It offers suggestions for adopting renewable energy solutions and promoting environmentally friendly construction in Palestine. Social obstacles may hinder the progress of this sustainable initiative. These barriers encompass public attitudes, behavioural norms, consumer purchase intentions, and the rebound effect following occupancy. Encouraging GBT adoption is fundamental to the broader advancement of GB. In Vietnam, for instance, GBT uptake remains low due to industry-related constraints, reinforcing the vital role of construction developers in advancing this agenda.

By drawing on theories such as the resource-based view and reviewing existing literature on GBT, this study develops a conceptual model to examine the intention of real estate developers in the West Bank to adopt GBT. Despite some familiarity with the term "green buildings," public understanding often remains superficial, with misconceptions linking GB merely to aesthetic greenery rather than environmental or functional benefits. This indicates a significant knowledge gap regarding the ecological and economic advantages of GBs. Over several decades, scholars have emphasised the triple benefit environmental, financial, and social—associated with GB, yet empirical studies on consumer perception remain scarce. Designers' ability to influence consumer attitudes plays a crucial role in encouraging mainstream adoption [18].

The research focuses on understanding societal demands, behavioural tendencies, and consumer purchasing behaviour, along with the hindrances encountered during the implementation of GBT. The investigation is guided by specific research questions aimed at addressing knowledge gaps and informing methodological choices. While societal values, attitudes, and norms exert a considerable influence on GB practices, limited empirical work has explored the behavioural intentions of developers. Through literature synthesis, survey methods, and inductive analysis, this study explores social variables, including a general lack of awareness, limited enthusiasm for environmentally responsible buildings, reluctance to acquire GB spaces, and societal scepticism toward green construction. The economic and environmental benefits of GB—such as lower energy and water usage and reduced demand for land and materials—are increasingly recognised by the public. Investigating the determinants of GBT adoption in the West Bank is particularly important due to its unique socio-political and economic context. Identifying these factors can provide practical insights for enhancing sustainable construction efforts. Moreover, this research contributes by outlining the primary obstacles and enabling conditions that shape GBT implementation. A holistic understanding of these elements can guide stakeholders in resource allocation and awareness strategies, ensuring the adoption of environmentally sound construction practices.

Studies focused on GBT in the West Bank can serve to improve climate resilience and resource preservation through sustainable construction strategies. The main objective of this research is to explore the underlying factors that shape the intentions of developers to adopt GBT in the region. This inquiry holds relevance for the formulation of sustainable development policies and construction frameworks. Adoption of GBT is necessary for curbing greenhouse gas emissions, improving energy performance, and enhancing thermal comfort and indoor environmental quality. Furthermore, GBT offers practical benefits such as increased workplace productivity and healthier indoor environments. This study also considers consumer responses to GBT adoption. Effective implementation requires consumer involvement throughout planning, design, operation, and maintenance processes, as this ensures alignment with occupant needs and expectations. Such an approach fosters the development of buildings that are both sustainable and user centred. GB initiatives aim to preserve ecological balance while ensuring comfortable and health-conscious living spaces. They also address critical challenges related to energy efficiency and long-term sustainability [15]. As a transformative approach, GB has redefined the construction industry [37].

Zhao et al. [37] and Zhussupova et al. [38] identify GBs as projects resulting from the integration of sustainable design principles into construction, often referred to as high-performance buildings. To qualify as green, structures must comply with local or international standards relating to site sustainability, water conservation, and energy efficiency [38]. Moreover, financial incentives associated with green construction serve as strong motivators. Hence, GB strategies must consider public health, comfort, profitability, and environmental responsibility. GBT, sometimes described as eco-architecture or sustainable design, emphasises reduced energy and water consumption, minimised waste production, and the use of renewable materials. Its scope has expanded to encompass all phases of building development and operation. A primary goal of GBT is to improve energy efficiency. Empirical evidence confirms the economic advantages of such measures, as energy-efficient buildings significantly lower electricity consumption and reduce CO_2 emissions. The International Energy Agency (IEA) estimates that such buildings can achieve a 50 percent reduction in annual energy use, while data from the US Department of Energy suggests possible savings of up to 30 percent [19].

Reducing water usage through GBT involves the adoption of efficient fixtures, rainwater collection systems, and greywater recycling. Research by the Water Research Foundation found that greywater reuse could lower water consumption in building systems by 27 percent. Additionally, the selection of sustainable, non-toxic, and non-hazardous materials is essential in GB projects [28]. Findings from the World Green Building Council highlight that using such materials can halve construction-related pollution. Healthy indoor environments can be achieved through non-toxic construction inputs and effective ventilation systems [30]. Studies have shown that such measures support occupant well-being. For instance, research conducted by Jimenez et al. [20] at Harvard University found that improved building environments led to a 26 percent enhancement in cognitive performance. The environmental and social contributions of GBs also extend to community development and sustainable land use. Initiatives such as promoting green transport and walkable urban designs have been recommended. The University of California has reported a correlation between pedestrian-friendly neighbourhoods and reduced ecological footprints [22].

Given the urgency of environmental sustainability, and the pivotal role of developers in shaping the built environment, it is essential to understand the managerial, institutional, and societal influences on GBT adoption. This study addresses a significant gap in literature by providing empirical insight into these dynamics within the West Bank, where GB practice remains in its early stages. Drawing on theoretical models and the views of local developers, a comprehensive framework is developed to deepen academic understanding and offer practical guidance to decision-makers, industry professionals, and environmental advocates. Ultimately, the findings of this research contribute to broader discussions on sustainable urban development by identifying enabling conditions for accelerating the transition towards green construction in Palestine and other emerging markets.

2. Literature Review

2.1 Green Building Technology GBT

Recent developments in the construction sector have increasingly incorporated environmentally responsible approaches, reflecting the necessity of sustainable growth within the industry. The application of GBT has become integral to achieving sustainable construction outcomes [27]. Although the concept of GBT has been interpreted differently across academic literature, it is consistently regarded as an eco-innovative strategy aimed at enhancing the long-term environmental, social, and economic performance of building structures. GBT promotes sustainability through a combination of techniques, products, and procedures designed to optimise the use of energy, water, land, and materials while minimising ecological harm and supporting public health throughout a building's entire lifecycle [35]. According to Yang et al. [35], the range of GBT solutions encompasses seven principal categories, including interior lighting systems, energy control mechanisms, conservation of natural resources, renewable energy integration, resource recovery processes, air quality management, and thermal comfort regulation. These interconnected benefits contribute to enhanced environmental, economic, and social outcomes for the built environment.

The planning, construction, renovation, management, or adaptive reuse of buildings with an emphasis on ecological preservation and resource efficiency is central to sustainable architecture. The increasing global recognition of this approach has attracted significant interest from stakeholders across regions. This momentum has spurred the advancement of GBT initiatives, which are designed to maintain the sustainability of building systems over extended periods. Numerous technologies now support the widespread adoption of green and sustainable construction practices, simplifying long-term implementation processes [13]. Design strategies are frequently structured around core sustainability objectives, including the efficient use of energy, water, land, and materials, along with a commitment to environmental protection. GBT encompasses the comprehensive tools, practices, and innovations necessary to realise these goals. The consistent application of sustainable construction technologies is advocated as a means of reducing power consumption and safeguarding the environment [27]. However, various studies indicate that the uptake of such technologies, particularly in developing nations, is hindered by several challenges. Despite their advantages, GBTs face multiple barriers in practice. These include high initial costs, limited expertise among subcontractors, low market readiness, and insufficient awareness of the associated environmental and economic benefits. Additional obstacles include a lack of supportive non-governmental incentives and widespread industry resistance to change [13].

Ahmad et al. [1] further identified a lack of regulatory frameworks and the absence of dependable, eco-conscious suppliers as major impediments to the successful deployment of GBT in construction. In response to growing environmental, energy-related, and societal concerns within the construction sector, there has been an increased focus on the development and adoption of GBT solutions. These include technologies such as eco-blocks and insulated blocks, which improve energy conservation by mitigating the transfer of heat and cold, thereby enhancing indoor comfort [21]. In many less developed contexts, conventional construction techniques remain dominant due to limited awareness of GBT, insufficient engagement with industry specialists, and a lack of policy-level support [21]. These issues contribute to the persistence of outdated construction norms. Public endorsement remains essential for the widespread implementation of innovations such as eco-blocks. As technical advancements within the construction sector, GBTs have become crucial to improving the environmental performance of construction enterprises and have attracted increasing global attention [7].

2.2 GBTs Adoption Intention

National variations in population demographics, economic development, cultural norms, knowledge dissemination, and public awareness significantly influence the advancement of green construction practices [8]. These disparities indicate that sustainable construction strategies must be adapted to align with each country's unique capabilities, expertise, and developmental priorities. A foundational requirement for achieving green and sustainable construction lies in the adoption of

GBT. However, the uptake of GBT within Palestine's construction sector remains limited due to numerous structural and contextual barriers. The role of construction developers is pivotal in driving both the acceptance of GBT and the broader proliferation of green buildings. In alliance-based construction firms, GBT facilitates competitive environmental performance, offering tangible market and economic benefits [7]. The pursuit of zero-carbon urban development necessitates broader application of GBT. Existing scholarship has primarily focused on aspects such as supply, demand, and the drivers of GBT adoption [14]. In response, industry partnerships such as the Green Building Alliance have emerged, collaborating with multiple construction actors to address the financial and operational obstacles related to GBT implementation [36]. One such initiative is the Green Technology Federation, established by various research organisations and construction firms at Vanke Green Buildings Park, to promote sustainable innovation.

Considering current economic and societal challenges, coordinated action is required among governments, local authorities, industry stakeholders, and financial institutions. Effective policy frameworks must combine regulatory enforcement with strategic incentives. Governments play a critical role by establishing mandatory environmental performance standards, technical codes, and recommended practices that align with broader sustainability goals. To accelerate adoption, policy instruments such as financial incentives, tax relief, direct subsidies, waived permit fees, low-interest financing, and development concessions should be deployed [2]. Developers are more inclined to adopt GBT when several key conditions are satisfied. These include: (1) the integration of green building principles within their core business strategies; (2) the increasing uptake of GBT across the industry; (3) the existence of structured plans to introduce diverse GBT-based construction projects; and (4) the emergence of a strong organisational culture centred on sustainability [27].

Tran et al. (2020) applied GBT in empirical analysis using the frameworks of Diffusion of Innovation (DOI), Resource-Based View (RBV), and Resource Dependence Theory (RDT). Their approach explored how interdependence within sustainability-focused supply chains influences the willingness of developers to engage with GBT. These theoretical models collectively address gaps in existing innovation adoption literature, offering a more robust lens through which to understand GBT uptake. The authors recommend that future investigations extend to the roles and network structures of other key stakeholders to facilitate broader GBT dissemination. The establishment and enforcement of GBTS are essential to embedding sustainability within the construction industry. Despite increasing recognition of their importance, adoption of GBTS remains slow due to persistent barriers. Developers continue to be central actors in promoting GBTS. Wang et al. [31] conducted an analysis of developer behaviour regarding GBTS adoption and diffusion, using a theoretical framework that integrates the Technology Acceptance Model (TAM), Innovation Diffusion Theory (IDT), and relevant GBTS literature. Their model includes individual, product, and interface-level factors, which provide insights into both the technological impact pathways and the social communication patterns that influence the spread of GBTS.

A multidimensional research model that considers the interplay between individuals, technologies, and user interfaces offers a comprehensive foundation for studying market adoption and dissemination of GBTS. Further refinement of this model can significantly advance related academic work [27]. In their study, Wang et al. [31] used data from China's 20 leading property developers to represent the national development trajectory, while also noting the relative lack of participation among smaller firms. Additional research is necessary to generate a more inclusive understanding of GBTS uptake across different scales of construction enterprises. Considering the evolving policy landscape within the construction sector, the expansion of GBTS warrants careful attention. Governmental bodies are advised to strengthen GBTS-related regulations and standards to promote consistent industry-wide adoption. Technical support and training programmes should be made available to developers to build their capacity for integrating GBTS into projects. Simultaneously, voluntary adoption should be encouraged through market-driven strategies, enabling developers to actively participate in the transition towards environmentally responsible construction [27].

2.3 Technological Factors and GBTs Adoption Intention

While technological innovation remains central to the adoption of GBT, a range of non-technical variables significantly shape adoption intentions. Regulatory standards, economic incentives, public awareness, educational outreach, and market conditions all exert a critical influence, interacting in context-specific ways that affect the likelihood of GBT implementation across different regions [2]. These factors contribute to a complex ecosystem in which GBT adoption is determined not solely by technological capability but also by institutional, financial, and societal considerations. Despite this broader context, technical characteristics continue to serve as fundamental drivers of GBT acceptance. GBT encompasses a broad suite of innovations designed to improve energy performance, promote environmental sustainability, and support efficient building operation. The integration of advanced technologies, such as intelligent sensors, automated meters, renewable energy systems, and energy management platforms, enhances the effectiveness and attractiveness of GBT, thereby increasing adoption likelihood [2]. One of the most influential technical precursors of adoption intention is cost-effectiveness. GBT solutions that enable substantial energy savings and efficient resource utilisation are more likely to be adopted, particularly when the expected financial returns are sufficient to offset the initial investment [5].

Adoption decisions are also influenced by confidence in GBT performance and reliability. For GBT to gain traction among property developers, owners, and users, there must be assurance that these technologies not only meet regulatory standards but also deliver tangible environmental and operational outcomes under real-world conditions. Demonstrated performance contributes to trust and reinforces willingness to adopt [2; 5]. Compatibility is another technological dimension influencing uptake. When GBT can be integrated with existing infrastructure and design frameworks without extensive redesign or disruption, the perceived ease of adoption improves, which in turn strengthens adoption intention [5]. Incorporating sophisticated control and monitoring systems further promotes GBT implementation. Features that support real-time data acquisition, analysis, and remote system management allow users and facility managers to optimise energy use and improve operational decision-making. User-friendly interfaces and intuitive functionalities also enhance user engagement and positively influence usage intent [4; 5]. The development of GBT should therefore be closely aligned with information and communication technologies (ICTs) to support seamless data exchange, automation, and interoperability.

ICT integration facilitates strategic oversight of building operations, enabling remote diagnostics, adaptive control, and enhanced performance monitoring. GBT that leverages ICT to improve system efficiency and responsiveness, has a higher probability of acceptance. Furthermore, the environmental benefits offered by technologically advanced GBT—such as reduced carbon emissions, better indoor air quality, and more efficient water usage—serve as compelling justifications for adoption. Documented evidence and case studies illustrating GBT contributions to environmental sustainability goals can significantly strengthen the rationale for widespread implementation [5].

2.4 Organizational GBT Resources and GBT Adoption Intention

The effective implementation of GBTS by construction developers relies heavily on internal organisational GBT resources. These resources encompass several critical components, including project management units, team competencies, staff expertise, centralised databases, technical standards and procedures, and financial capacity. Unlike conventional construction projects, green building initiatives require specialised knowledge of technical parameters, environmentally conscious procurement, market awareness, sociocultural dynamics, and health and safety regulations to ensure the successful integration and functioning of GBT throughout the construction process. Darko [8] reported that certain limitations, such as insufficient GBT knowledge, reluctance to transition from traditional practices, and the absence of specialised databases, had limited influence on GBT adoption. However, for effective GBT implementation, construction firms must strategically utilise their internal capabilities. This includes enhancing project management practices, ensuring well-structured teams, allocating sufficient budgets, and establishing comprehensive technical guidelines.

Organisational GBT resources encompass all tangible and intangible assets required to incorporate GBT into building projects. According to Häkkinen and Belloni [16], these include funding mechanisms, data repositories, standardised procedures, designated project management divisions, skilled personnel, and experienced professionals in the field of green construction. Several studies have found that strengthening these resources significantly improves the prospects for GBT adoption. For example, Darko [8] identified a strong correlation between the presence of a dedicated green building project management unit, competent team members, and employee knowledge with increased intentions to adopt GBT. Similarly, Wang et al. [33] highlighted the contribution of robust databases and technical frameworks in supporting this outcome. These findings suggest that organisations aiming to adopt GBT should prioritise the development and optimisation of internal resources. Firms equipped with dedicated green building project managers are more capable of overseeing the adoption process effectively. Such project managers serve as key points of contact for team members, offering guidance and resolving queries related to GBT implementation. Their involvement may also foster a culture in which teams are more inclined to embrace GBT practices due to confidence in the unit's leadership and expertise.

Organisational capacity is often linked to the technical proficiency of project teams. Teams operating in environments where GBT resources are readily available are more likely to integrate these technologies effectively. Training initiatives aimed at enhancing staff expertise further support this process [35]. In this context, GBT staff expertise refers to the depth of knowledge and skill possessed by employees. Individuals with a strong grasp of GBT are better positioned to support implementation efforts and mentor others within project teams. Access to and familiarity with a comprehensive GBT database can also enhance staff capabilities by providing reliable information on the functions, costs, and benefits of various technologies. The GBT database serves as a centralised knowledge repository, offering structured insights into technological options, associated costs, and expected outcomes. Such databases can facilitate informed decision-making, ultimately encouraging greater adoption. Additionally, the existence of clear technical standards and procedural guidelines helps streamline planning, construction, and maintenance processes in green building projects. These tools not only improve operational efficiency but also reduce the likelihood of implementation errors or oversights.

Budgetary support is another decisive factor influencing the uptake of GBT. As GBTs can entail substantial upfront costs, the availability of dedicated funding is essential. Budget allocations can support both the acquisition of technologies and the training of personnel, ensuring that staff are adequately prepared to manage and utilise GBTs. External drivers such as regulatory directives, consumer demand, and access to sustainable materials also shape GBT adoption. Nonetheless, the role of organisational GBT resources remains fundamental. The relationship between resource availability, strategic management, and corporate values determines how effectively GBT can be integrated within a firm's operations. As the scope and complexity of GBT continues to evolve, firms must assess and adapt their internal resources accordingly. Darko [8] concluded that the existence of well-organised project management structures could enable smoother GBT adoption, as these units offer essential guidance for project teams. A detailed GBT database outlining the range of available technologies, alongside their benefits and cost implications, supports rational decision-making. Moreover, the implementation of technical standards and procedures helps to guarantee efficiency and reduce the incidence of errors. Financial resources also play a crucial role, particularly when directed towards professional training and project team development, thereby reinforcing an organisation's capacity to successfully implement GBT.

2.5 Top Management Leadership and GBT Adoption Intention

The involvement of senior management is a decisive factor in determining whether a firm proceeds with the adoption of GBT. Empirical evidence from Darko [8] confirms a positive association between top-level leadership and the intention to utilise sustainable construction technologies. The study concluded that effective leadership from senior executives plays a critical role in facilitating GBT implementation through resource allocation, goal setting, and the cultivation of a corporate culture supportive of sustainability. Similarly, research by Wang et al. [33] in the Chinese construction sector also demonstrated a statistically significant correlation between top management engagement and successful GBT adoption. Their findings underscored the importance of executive leadership in supporting education and training efforts, fostering awareness of green construction practices, and promoting the uptake of GBT.

These studies collectively highlight that the active participation of high-ranking executives is essential for realising the adoption of GBT. Senior leadership contributes to implementation success by directing organisational resources, establishing strategic objectives, promoting a sustainability-oriented culture, and endorsing employee capacity-building initiatives. Awareness-raising and the provision of incentives are also among the crucial mechanisms through which top management can influence GBT acceptance. Darko [8] and Wang et al. [33] emphasised that senior executives are uniquely positioned to provide the financial and temporal resources necessary for integrating GBT into construction projects. They may allocate funding for technology acquisition, dedicate time for staff development, and ensure that teams are well-prepared for implementation. Additionally, leadership at the top levels can articulate clear organisational objectives regarding sustainability. By establishing measurable targets and issuing structured directives, management provides teams with a roadmap for achieving successful GBT outcomes.

Beyond setting direction, a supportive organisational climate is often shaped by the behaviours and values promoted by senior leadership. This includes fostering a work environment where employees feel encouraged to engage with sustainability issues, share ideas, and seek clarification on GBT-related topics. Executive leadership can also drive employee development through structured training and continuous learning programmes. These educational efforts are aimed at equipping staff with both theoretical understanding and practical skills necessary for effective GBT implementation. Raising internal and external awareness regarding the benefits of sustainable buildings is another critical function of executive leadership. Through direct communication and advocacy, senior leaders can increase interest and acceptance of green construction practices among employees, clients, and the broader community. To reinforce these efforts, management may introduce both financial and non-financial incentives to reward engagement with GBT. Monetary incentives might include bonuses or funding for pilot projects, while non-monetary rewards could involve public recognition or professional advancement opportunities.

In addition to these targeted strategies, senior management can further influence GBT adoption by embedding environmental sustainability into the organisation’s strategic vision. Leading by example, executives may signal their commitment to green construction by prioritising it within corporate plans and resource allocations. Furthermore, they can set long-term sustainability goals that align with the organisation's future growth trajectory, thereby institutionalising environmentally responsible practices within the firm's operational framework.

2.6 Government Support and GBT Adoption Intention

Governments play a pivotal role in facilitating the widespread adoption of environmentally sustainable construction practices by offering various forms of support. One of the primary mechanisms is the provision of financial incentives, including tax exemptions, reimbursement schemes, and direct subsidies, which serve to reduce the initial cost burden associated with GBT. Additionally, governments may offer technical support to firms and institutions aiming to integrate GBT into their operations, thereby improving their capacity for sustainable development. In many jurisdictions, regulatory frameworks mandate compliance with green building standards, thereby embedding sustainability criteria into the planning and construction processes. There is a growing consensus that state intervention constitutes an effective strategy to encourage green construction. According to findings by Darko [8], financial assistance provided by government agencies significantly influences GBT uptake in the United States. The study observed that, in the absence of such support, small-scale enterprises were far less inclined to pursue green construction technologies.

This need for government involvement is especially critical in developing nations, where public authorities often exert substantial control over land allocation and building permit issuance. These levers allow governments in emerging economies to play an active role in shaping construction practices towards sustainability. By leveraging their regulatory authority, these governments can accelerate the adoption of GBT more effectively than in more decentralised settings. Across the broader body of research, government intervention is consistently identified as a central enabler of sustainable construction. Through a combination of fiscal and non-fiscal measures, including targeted legislation and advisory services, state actors can help to lower the cost barriers, increase accessibility, and enhance the attractiveness of GBT for the private sector. This integrated support structure not only facilitates initial adoption but also contributes to the long-term viability of green construction practices.

2.7 GBTs' Market Acceptance and GBTs Adoption Intention

The adoption of green building is significantly influenced by both the perceived market acceptance of GBT and the willingness of firms and individuals to adopt such technologies. Market acceptance reflects the general perception held by consumers and businesses regarding the value and feasibility of GBT, while adoption intention refers to the likelihood that these actors will select GBT over conventional construction methods. A growing body of research suggests a positive link between favourable market perception and the intention to adopt, indicating that higher optimism regarding GBT corresponds with increased adoption rates. Multiple variables shape the market reception of GBT. These include the accessibility of reliable information and an understanding of the potential benefits and drawbacks associated with its use. GBT is promoted based on its capacity to reduce energy and water consumption, improve indoor air quality, and enhance occupant productivity. However, concerns persist around the relatively high implementation costs, the limited availability of specialised expertise, and questions about long-term performance outcomes.

Access to accurate and comprehensive information plays a key role in shaping stakeholder attitudes. Informed consumers and organisations are more likely to recognise how GBT can be applied efficiently and realise its associated benefits [24]. Consequently, knowledge dissemination is essential to strengthening positive perceptions and ultimately encouraging adoption. In addition to informational availability, regulatory pressures may also influence market receptiveness. The existence of legal mandates requiring the adoption of sustainable construction methods often strengthens public and corporate inclination towards GBT. Firms and customers are more inclined to support GBT when it aligns with existing regulations or future compliance obligations.

Other critical elements affecting adoption intention include perceived advantages and disadvantages, organisational culture, and the mindset of key decision-makers. The likelihood of adopting GBT often hinges on whether stakeholders believe the technologies can reduce costs or environmental impact. Conversely, if businesses associate GBT with high financial risk or uncertain returns, they may be reluctant to proceed. The orientation of decision-makers significantly influences the outcome. Leaders with strong environmental values are more inclined to champion GBT, while those primarily focused on financial performance may still support adoption if the economic benefits are clear. Organisational culture is another determinant; enterprises with a culture that prioritises sustainability are typically more receptive to integrating GBT into their practices. Ultimately, both market acceptance and adoption intention serve as interconnected drivers of green building development. Confidence and enthusiasm among firms and consumers towards GBT have been shown to enhance the probability of adoption, reinforcing the importance of positive perceptions in achieving broader sustainability objectives.

2.8 Social Demand and GBTs Adoption Intention

The demand for green buildings reflects a broader societal inclination towards environmentally responsible infrastructure. This demand manifests in various forms, including preferences for residential and commercial spaces that align with ecological standards. Environmentally conscious individuals often express a preference for certified green spaces, such as those meeting LEED or BREEAM standards, seeking both environmental stewardship and healthier living or working conditions. There is an increasing interest in sustainable industrial developments as businesses aim to reduce their ecological footprint. These facilities typically incorporate energy-efficient technologies, eco-friendly construction materials, and waste minimisation strategies. Similarly, in the service-oriented real estate sector, properties such as resorts, condotels, official premises, and retail units are also experiencing growing demand for environmentally friendly design. These structures can enhance indoor air quality and reduce utility costs for occupants, thus offering both ecological and economic benefits.

From the perspective of RDT, customers are viewed as critical external resources that influence organisational decisions. A firm's success is closely tied to its responsiveness to consumer demand, particularly as it pertains to sustainable development. Therefore, organisations are more inclined to adopt practices that align with growing societal expectations regarding green construction. Koebel et al. [23] demonstrated that specific market dynamics, such as population size, income levels, and educational attainment, significantly influence the adoption and diffusion of green innovation. Regions with more affluent and better-educated populations tend to exhibit stronger preferences for sustainable residential solutions. Conversely, Djokoto et al. [10] identified limited public awareness and insufficient social demand as key obstacles impeding the progress of green building practices. A further study by Wang et al. [33] highlighted how the absence of robust customer demand has undermined efforts within China's construction sector to advance green building initiatives.

Taken collectively, these findings illustrate the essential role of social demand in shaping the trajectory of green construction practices. A thorough understanding of the factors driving public interest can enable firms to design and deliver more responsive and sustainable building solutions, thereby fostering broader adoption and supporting environmental objectives. In the context of the West Bank, a model was developed by researchers and GBT specialists to investigate how construction practices influence societal attitudes towards sustainable buildings. This model designates GBT adoption intention as its sole dependent variable, defined within the literature as the commitment of developers to integrate GBT into both current and future construction endeavours. The summary of the hypotheses is presented in Table 1.

Table 1
Summary of Hypotheses

Hypothesis	Statement	References
H1	GBT market acceptance has a positive effect on GBA adoption.	Darko [9]; Quangdung et al. [25]
H2	Government support has a positive effect on GBA adoption.	Wang et al. [33]
H3	Social demand for green buildings has a positive effect on GBA adoption.	Djokoto et al. [11]; Koebel et al. [23]; Wang et al. [33]
H4	GBT advantages have a positive effect on GBA adoption.	Darko [9]; Wang et al. [32]
H5	GBT disadvantages have a negative effect on GBA adoption.	Ahmad et al. [1]; Ganiyu et al. [13]
H6	Organizational GBT resources mediate the relationship between government support and GBA adoption.	Darko [9]; Häkkinen and Belloni [16]; Wang et al. [33]
H7	Top management leadership positively moderates the relationship between GBT market acceptance and GBA adoption.	Darko [9]; Wang et al. [33]
H8	Environmental awareness positively moderates the relationship between social demand for GB and GBA adoption.	Twumasi-Ampofo et al. [29]; Zhao et al. [37]

3. Methodology

This study employed a quantitative, deductive research approach to examine a theory-driven model of GBT adoption within the West Bank context. The research utilised a descriptive and causal research framework, focusing on empirically testing the influence of various managerial, institutional, and perceptual factors on the adoption of Green Building Advantages (GBA). To collect the necessary data, a structured questionnaire was administered, enabling the evaluation of hypothesised relationships among the study constructs. The methodological approach aligns with that adopted in previous investigations employing structural equation modelling techniques [8; 33].

3.1 Sampling Techniques and Data Collection

The current research concentrated on real estate developers operating within key urban centres of the West Bank, namely Ramallah, Nablus, Bethlehem, Hebron, and Jerusalem. These locations were purposefully selected due to their pivotal role in the Palestinian construction sector and their concentration of both commercial and residential development projects. Developers were chosen as the target respondents given their central role as primary decision-makers involved in planning, design, and the implementation of GBT. A probability sampling technique was adopted to ensure representation across firms of varying sizes and operational scopes. Data collection was conducted using structured questionnaires, which were administered both electronically and through direct engagement. A substantial sample of 500 valid responses was obtained, exceeding the minimum threshold of 300 required for conducting PLS-SEM in complex models, as recommended by [34]. Each item on the survey instrument utilised a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to capture respondent perceptions. The measurement items and constructs were drawn from well-established prior studies to ensure content validity.

The dependent variable, GBA adoption, was evaluated using six indicators adapted from [8; 26]. Items related to GBT Market Acceptance were grounded in the frameworks proposed by [8; 24], while Government Support was assessed through items based on [33]. Social Demand for Green Buildings was measured using the items developed by [10; 23; 32]. The construct assessing GBT Advantages was informed by the work of [8; 32], whereas the items evaluating GBT Disadvantages were adapted from [1; 13]. To capture the organisational dimension, the construct of Organisational GBT Resources was measured using items from [8; 16; 33]. The moderating effect of Top Management Leadership was assessed using four indicators developed by [8; 33], and the construct of Environmental Awareness was operationalised based on the measures proposed by [28; 37]. Prior to full deployment, the questionnaire underwent pilot testing involving a small group of developers and academic experts to ensure clarity and contextual suitability. The refined instrument enabled a robust empirical investigation into the determinants of GBT adoption in a developing country context. In partnership with the Palestinian Contractors Union and the Association of Real Estate Investors and Developers, a comprehensive database of firms was compiled, identifying 106 real estate development companies as detailed in Table 2.

Table 2
The Number of Real Estate Developers in the West Bank

Jericho	3
Khalil	21
Jerusalem	3
Bethlehem	10
Jenin	8
Ramallah	41
Tulkarm	2
Qalqilya	5
Nablus	14
Total	106

3.2 Data Analysis

Following data cleansing and initial diagnostic assessments, PLS-SEM was conducted using SmartPLS version 4.0. This analytical method was deemed appropriate due to the intricate nature of the model, which included both mediating and moderating variables [34]. To ensure construct validity, the study evaluated convergent validity by examining factor loadings, Cronbach's alpha, composite reliability, and average variance extracted (AVE). Discriminant validity was also verified using the Fornell-Larcker criterion, heterotrait-monotrait (HTMT) ratio, and cross-loadings. Subsequently, path analysis was applied to estimate the structural relationships among variables, which involved the testing of hypotheses, mediation, and moderation effects. This was accomplished using a bootstrapping technique comprising 5,000 resamples to ensure the robustness of the results. The chosen methodological framework provides a comprehensive basis for exploring the determinants influencing GBT adoption. Beyond contributing to theoretical discourse, the findings offer practical insights that are particularly relevant to promoting sustainable construction practices within developing economies.

4. Results

Table 3 presents the outcomes of the convergent validity assessment, demonstrating that all measurement constructs fulfil the necessary criteria for internal consistency and construct validity. Each item recorded factor loadings above 0.70, indicating strong associations between observed indicators and their respective latent variables. Both Cronbach's Alpha and Composite Reliability (CR) values surpassed the commonly accepted threshold of 0.70, thereby affirming the reliability of the measurement scales employed. In addition, the AVE values ranged from 0.606 to 0.963, each exceeding the 0.50 benchmark, which signifies that the constructs exhibit satisfactory convergent validity. These statistical results confirm the robustness of the measurement model and justify its use in evaluating the managerial factors influencing GBT adoption within the West Bank context. The demonstrated validity and reliability of constructions zsuch as Social Demand for Green Buildings (SDGB), Government Support (GS), and Organisational GBT Resources (OGBAR) further strengthen the analytical framework of the study. This ensures that the findings accurately reflect the perceptions of real estate developers regarding the adoption of GBT initiatives.

Table 3
Convergent Validity Test

Constructs	Items	Loading	Alpha	CR	AVE
EA	EA1	0.816	0.814	0.815	0.642
	EA2	0.798			
	EA3	0.797			
	EA4	0.793			
GBAA	GBAA1	0.806	0.809	0.811	0.636
	GBAA2	0.78			
	GBAA3	0.808			
	GBAA4	0.795			
GBAAD	GBAAD1	0.841	0.925	0.925	0.727
	GBAAD2	0.847			
	GBAAD3	0.851			
	GBAAD4	0.85			
	GBAAD5	0.881			
	GBAAD6	0.845			
GBAD	GBAD1	0.793	0.808	0.808	0.635
	GBAD2	0.8			
	GBAD3	0.786			
	GBAD4	0.807			
GBAMA	GBAMA1	0.793	0.87	0.873	0.607
	GBAMA2	0.806			
	GBAMA3	0.769			
	GBAMA4	0.784			
	GBAMA5	0.733			
	GBAMA6	0.788			
GS	GS1	0.981	0.962	0.962	0.963
	GS2	0.982			
OGBAR	OGBAR1	0.756	0.837	0.838	0.606
	OGBAR2	0.785			
	OGBAR3	0.771			
	OGBAR4	0.776			
	OGBAR5	0.804			
SDGB	SDGB1	0.793	0.801	0.83	0.712
	SDGB2	0.869			
	SDGB3	0.867			
TML	TML1	0.852	0.855	0.869	0.696
	TML2	0.829			
	TML3	0.844			
	TML4	0.81			

Table 4 presents the HTMT ratios used to evaluate the discriminant validity of the constructs included in the study. According to the criteria proposed by Henseler et al. (2015), HTMT values should ideally remain below 0.85 and must not exceed 0.90 to confirm that constructs are conceptually distinct. The results reveal that all HTMT ratios fall within a range of 0.034 to 0.408, significantly beneath the recommended threshold of 0.80. This demonstrates strong discriminant validity among the variables, including Environmental Awareness (EA), GS, and OGBAR. As an illustration, the highest observed HTMT ratio is 0.408 between EA and OGBAR, which, despite being the largest, still falls within acceptable limits. This indicates that these constructs, while related in the context of GBT adoption, are empirically separable. The findings reinforce the reliability of the structural model and support the assertion that each construct independently contributes to explaining the intention to adopt GBT in the West Bank. These results substantiate the robustness of the PLS-SEM approach applied in this study [17; 34].

Table 4
HTMT Ratio

	EA	GBAA	GBAAD	GBAD	GBAMA	GS	OGBAR	SDGB	TML
EA									
GBAA	0.054								
GBAAD	0.349	0.279							
GBAD	0.063	0.078	0.311						
GBAMA	0.061	0.101	0.294	0.053					
GS	0.076	0.037	0.325	0.043	0.068				
OGBAR	0.408	0.049	0.285	0.061	0.057	0.043			
SDGB	0.051	0.068	0.054	0.048	0.097	0.11	0.378		
TML	0.072	0.047	0.262	0.073	0.066	0.034	0.08	0.065	

Table 5 outlines the application of the Fornell-Larcker criterion, a widely accepted approach to evaluating discriminant validity within structural equation modelling. According to the guideline established by Fornell and Larcker [12], a construct can be considered empirically distinct if the square root of its AVE, indicated on the diagonal, exceeds its correlations with all other constructs, which are shown off-diagonal. In the current analysis, all constructs, including Environmental Awareness (EA = 0.801), GBT Advantages and Disadvantages (GBAAD = 0.853), Government Support (GS = 0.981), and Social Demand for Green Buildings (SDGB = 0.844), meet this criterion. The diagonal values consistently surpass the inter-construct correlations, affirming that each latent variable captures a unique aspect of the overall conceptual model [34]. For instance, the square root of AVE for GBAAD (0.853) is demonstrably greater than its correlations with Organisational GBT Resources (OGBAR = 0.252) and SDGB (0.042), thereby confirming the discriminant validity of the construct. These findings validate that the measurement model successfully differentiates between the constructs under study and appropriately identifies the various dimensions influencing GBT adoption in West Bank.

Table 5
Fornell Larcker

	EA	GBAA	GBAAD	GBAD	GBAMA	GS	OGBAR	SDGB	TML
EA	0.801								
GBAA	0.032	0.797							
GBAAD	0.303	0.242	0.853						
GBAD	-0.002	-0.041	0.269	0.797					
GBAMA	-0.019	0.076	0.265	0.032	0.779				
GS	0.068	-0.034	0.306	0.038	-0.063	0.981			
OGBAR	0.338	0.03	0.252	-0.022	-0.028	0.012	0.779		
SDGB	-0.026	0.006	0.042	0.006	-0.081	0.096	0.32	0.844	
TML	-0.053	-0.033	0.237	0.025	0.021	-0.004	-0.063	-0.052	0.834

Table 6 presents the cross-loading results, which assess whether each item most accurately reflects its corresponding latent construct, ensuring robust indicator validity. According to Hair et al. (2011), an item should load highest on its associated construct relative to all others. The current data supports this standard. For instance, EA1 to EA4 shows their strongest loadings on EA (e.g., EA1 = 0.816), with substantially lower loadings on unrelated constructs, confirming the distinctiveness of each measure. Similarly, items within constructs such as GBAAD, GS, SDGB, and TML consistently exhibit the highest loadings within their respective domains. No item demonstrates problematic cross-loading behaviour, affirming their specificity. Consequently, this result confirms strong indicator-level validity and reinforces the appropriateness of using these latent constructs to evaluate GBT adoption intention in the West Bank, thereby supporting the reliability of the measurement model [17].

Table 6
Cross Loadings

	EA	GBAA	GBAAD	GBAD	GBAMA	GS	OGBAR	SDGB	TML
EA1	0.816	0.029	0.206	-0.034	0.009	0.020	0.271	-0.014	-0.03
EA2	0.798	0.030	0.274	0.053	0.010	0.045	0.262	-0.035	-0.059
EA3	0.797	0.055	0.251	-0.013	-0.052	0.089	0.292	0.016	-0.044
EA4	0.793	-0.016	0.238	-0.009	-0.025	0.061	0.256	-0.055	-0.039
GBAA1	0.010	0.806	0.207	0.032	0.056	-0.057	0.031	-0.011	-0.025
GBAA2	0.019	0.780	0.174	-0.057	0.054	-0.006	0.045	0.039	-0.02
GBAA3	0.036	0.808	0.195	-0.077	0.064	-0.026	0.02	-0.029	-0.031
GBAA4	0.038	0.795	0.195	-0.037	0.070	-0.016	0.002	0.025	-0.031
GBAAD1	0.272	0.191	0.841	0.258	0.225	0.262	0.2	0.062	0.211
GBAAD2	0.252	0.200	0.847	0.206	0.225	0.243	0.203	0.029	0.202
GBAAD3	0.231	0.228	0.851	0.231	0.269	0.238	0.192	0.043	0.176
GBAAD4	0.263	0.177	0.850	0.217	0.214	0.291	0.205	0.025	0.227
GBAAD5	0.281	0.204	0.881	0.233	0.249	0.275	0.233	0.019	0.193
GBAAD6	0.249	0.240	0.845	0.231	0.174	0.256	0.252	0.037	0.203
GBAD1	0.005	-0.033	0.215	0.793	0.064	0.046	-0.01	0.042	-0.035
GBAD2	-0.037	-0.049	0.217	0.800	0.027	0.036	-0.021	0.01	0.054
GBAD3	0.029	-0.036	0.215	0.786	0.002	0.010	-0.015	-0.04	0.08
GBAD4	-0.002	-0.013	0.211	0.807	0.009	0.031	-0.025	0.007	-0.02
GBAMA1	0.022	0.051	0.213	0.022	0.793	-0.080	-0.01	-0.055	0.045
GBAMA2	-0.041	0.079	0.218	0.021	0.806	-0.026	-0.015	-0.06	0.015
GBAMA3	-0.069	0.075	0.172	0.056	0.769	-0.043	-0.049	-0.054	-0.004
GBAMA4	0.001	0.076	0.223	0.030	0.784	-0.109	0.021	-0.066	0.034
GBAMA5	0.014	-0.001	0.204	-0.006	0.733	-0.003	-0.026	-0.068	-0.01
GBAMA6	-0.027	0.078	0.200	0.034	0.788	-0.026	-0.061	-0.074	0.013
GS1	0.058	-0.028	0.298	0.032	-0.067	0.981	0.01	0.081	-0.012
GS2	0.075	-0.038	0.303	0.043	-0.056	0.982	0.014	0.108	0.004
OGBAR1	0.257	0.056	0.182	0.028	-0.016	-0.037	0.756	0.247	-0.111
OGBAR2	0.273	0.041	0.196	-0.065	-0.027	0.016	0.785	0.262	-0.004
OGBAR3	0.261	0.007	0.189	0.002	0.022	0.057	0.771	0.226	-0.055
OGBAR4	0.286	0.004	0.18	-0.068	-0.046	0.025	0.776	0.248	-0.045
OGBAR5	0.238	0.01	0.231	0.021	-0.037	-0.014	0.804	0.26	-0.033
SDGB1	-0.042	0.041	0.003	-0.024	-0.07	0.079	0.194	0.793	-0.05
SDGB2	0.001	-0.053	0.08	0.013	-0.052	0.098	0.298	0.869	-0.023
SDGB3	-0.032	0.041	0.012	0.015	-0.084	0.067	0.296	0.867	-0.061
TML1	-0.02	-0.012	0.235	0.023	0.085	0.035	-0.066	-0.053	0.852
TML2	-0.069	-0.001	0.188	0.045	-0.032	-0.019	-0.028	-0.034	0.829
TML3	-0.045	-0.052	0.191	0.02	0.028	-0.002	-0.063	-0.074	0.844
TML4	-0.05	-0.053	0.164	-0.01	-0.032	-0.041	-0.047	-0.003	0.81

Figure 1 depicts the study's conceptual framework, illustrating the relationship between latent constructs and their corresponding observable indicators concerning GBT adoption in the West Bank. Each latent variable—EA, GS, OGBAR, and SDGB—demonstrates a strong association with its respective indicators, all of which exhibit factor loadings exceeding 0.70. This confirms the reliability and internal consistency of the measurement items [34]. Figure 2 further presents the structural relationships among the constructs leading to the central outcome variable, GBAAD.

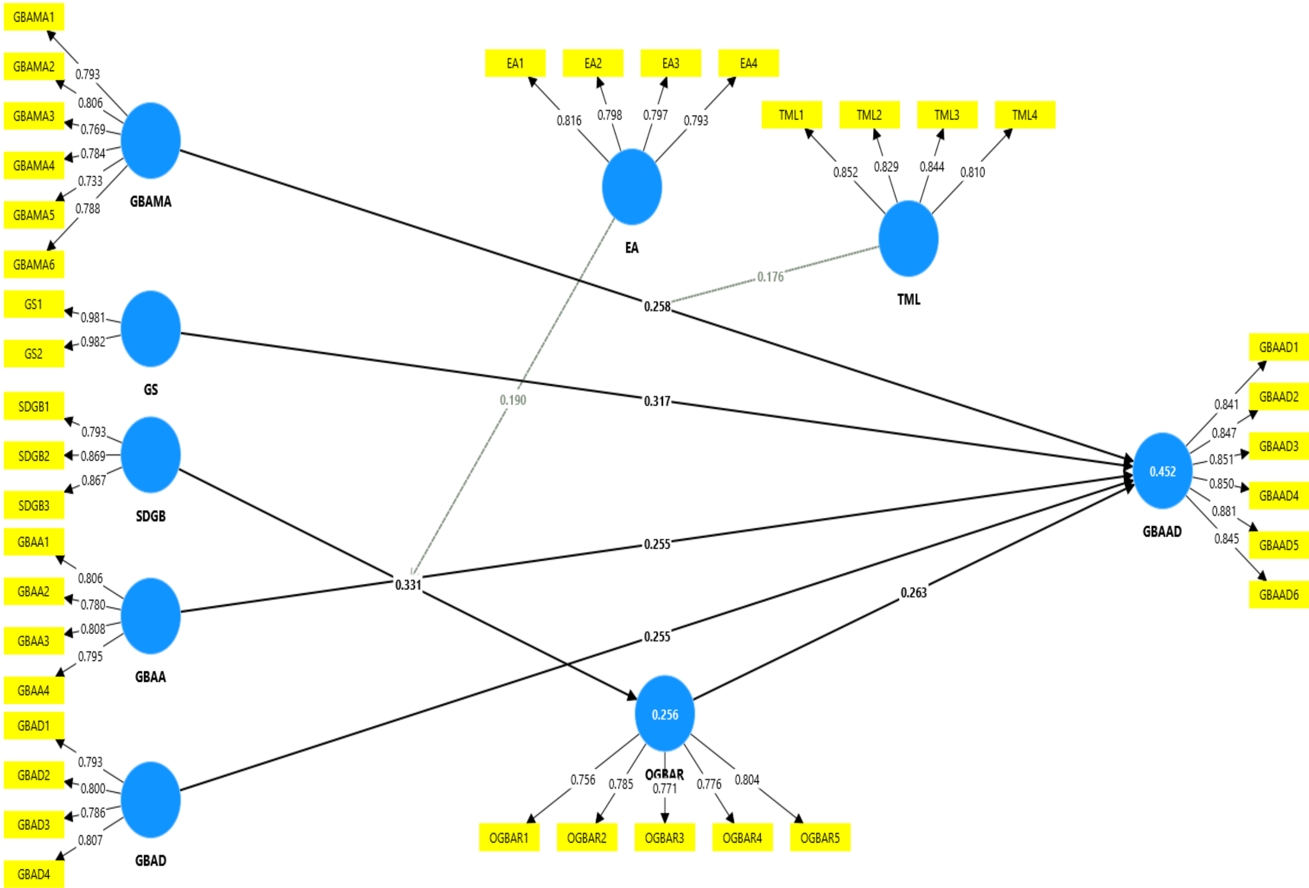

Fig.1: Measurement Model

The model yields an R^2 value of 0.452 for GBAAD, suggesting a modest level of explained variance. Among the predictors, SDGB (0.331), GS (0.317), and EA (0.258) exhibit comparatively higher path coefficients, indicating a significant influence on the perception of GBT benefits and drawbacks. These results align with prior studies Tran et al. [27], highlighting the critical role of social and institutional drivers in shaping developers' attitudes towards the adoption of GBT. Overall, the model presents a robust and well-specified participatory framework for assessing the underlying determinants of GBT adoption.

Table 7 presents the path analysis results, revealing statistically significant relationships among the constructs influencing GBT adoption within the West Bank context. All path coefficients are significant at the $p < 0.001$ level, suggesting a robust model estimation through PLS-SEM, in accordance with methodological guidance [34]. The strongest direct effect is observed from GS to GBAAD ($\beta = 0.317$, $t = 10.019$), emphasising the pivotal role of institutional support mechanisms in promoting the uptake of sustainable construction practices, as established in prior research [8]. Additional significant predictors include GBAMA, GBAA, GBAD, and TML, signifying the relevance of managerial endorsement, perceived technological benefits, and top-level appreciation in influencing GBT adoption decisions [27]. Notably, EA demonstrates a substantial effect on OGBAR ($\beta = 0.353$), which subsequently influences GBAAD ($\beta = 0.263$), highlighting the mediating function of organisational capacity in translating environmental awareness into tangible adoption behaviour.

The analysis also confirms significant moderating interactions, such as EA × SDGB affecting OGBAR and TML × GBAMA influencing GBAAD, implying that contextual factors enhance the dynamics of GBT adoption. Furthermore, the mediating pathways—SDGB → OGBAR → GBAAD ($z = 0.087$) and EA → OGBAR → GBAAD ($z = 0.093$)—affirm the presence of multi-layered effects, where both societal and managerial inputs are channelled through organisational resources to shape adoption intentions.

These insights offer substantial contributions to the understanding of the structural and contextual determinants underpinning sustainable construction practices.

Table 7
Path Analysis

	Original (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
EA -> OGBAR	0.353	0.357	0.037	9.589	0.000
GBAA -> GBAAD	0.255	0.256	0.035	7.359	0.000
GBAD -> GBAAD	0.255	0.255	0.032	8.061	0.000
GBAMA -> GBAAD	0.258	0.260	0.034	7.681	0.000
GS -> GBAAD	0.317	0.316	0.032	10.019	0.000
OGBAR -> GBAAD	0.263	0.263	0.034	7.681	0.000
SDGB -> OGBAR	0.331	0.332	0.036	9.113	0.000
TML -> GBAAD	0.239	0.241	0.033	7.234	0.000
EA x SDGB -> OGBAR	0.190	0.188	0.037	5.183	0.000
TML x GBAMA -> GBAAD	0.176	0.174	0.034	5.230	0.000
SDGB -> OGBAR -> GBAAD	0.087	0.087	0.014	6.103	0.000
EA x SDGB -> OGBAR -> GBAAD	0.050	0.050	0.011	4.434	0.000
EA -> OGBAR -> GBAAD	0.093	0.094	0.018	5.246	0.000

Figure 2 illustrates the structural model of the study, highlighting statistically significant paths influencing GBAAD adoption in the West Bank. All path coefficients surpass the critical t-value threshold ($t > 1.96$), confirming the model's strong empirical validity [34]. Among the identified predictors, GS emerges as the most influential determinant of GBAAD ($t = 10.019$), reaffirming the essential role of policy interventions in supporting sustainable construction practices [8]. OGBAR is shown to serve as a mediating function between EA and SDGB and the outcome variable GBAAD. This underscores how internal organisational capacities can bridge external drivers, such as societal awareness and demand, with actual adoption behaviours [16]. The model yields an R^2 value of 0.452, reflecting a moderate explanatory capability for predicting GBT adoption. Furthermore, notable interaction effects reinforce the interdependence between managerial and societal influences. For instance, higher levels of EA are associated with increased SDGB, indicating that the combination of awareness and public demand can effectively promote the uptake of sustainable technologies. Similarly, the interaction between TML and GBAMA highlights the synergistic effect of managerial leadership and societal appreciation in enhancing GBT adoption outcomes. Taken together, the model supports the existence of a multifaceted adoption framework, wherein institutional, organisational, and contextual elements jointly contribute to the progression of sustainable construction initiatives in the Palestinian context.

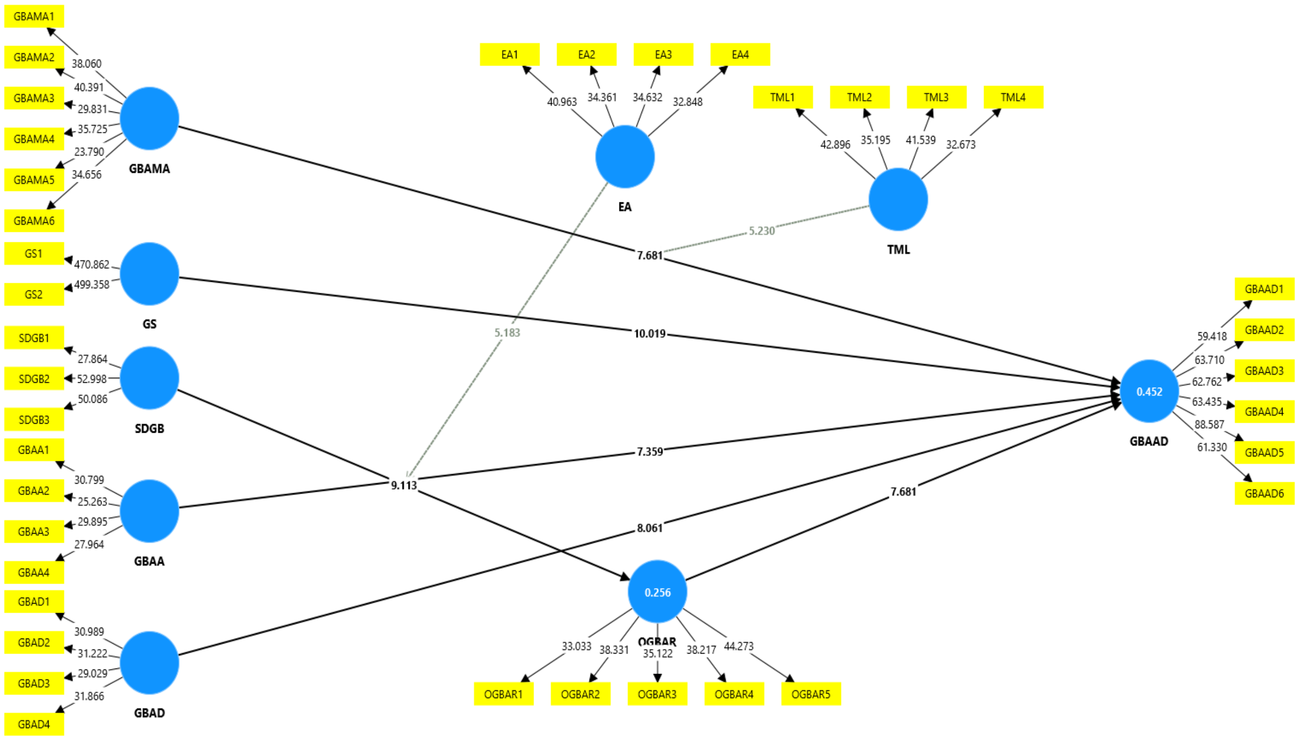

Fig.2: Structural Model

5. Discussion

The present study examined the factors influencing the acceptance of GBA in the West Bank using PLS-SEM. The results provide empirical support for most of the proposed hypotheses, offering nuanced and context-specific insights that extend or reinforce existing literature on GBT adoption. In relation to H1, the findings demonstrate that GBAMA significantly influences GBA adoption, consistent with earlier studies [8; 24]. Adoption occurs when the long-term benefits and functionality of GBT are trusted by businesses and consumers. In the West Bank context, although GBT utilisation remains limited, growing awareness and market readiness may lay the foundation for future investments.

H2 was also supported, revealing that GS has a strong positive effect on GBA adoption, aligning with prior findings [6; 31; 33]. In environments such as the West Bank, where economic and political uncertainties are prevalent, government-led initiatives (e.g., subsidies, incentives, regulations) become essential to fostering an ecosystem supportive of sustainable development. H3 confirmed the significant role of SDGB in influencing GBA adoption. This result is consistent with earlier studies [10; 23; 33], which argue that increased societal awareness and demand for sustainable living spaces drive innovation in the built environment. In the Palestinian context, environmental issues are gaining prominence, encouraging developers to respond to public interest in sustainable practices.

H5, concerning the impact of GBAD, was also validated. Barriers such as high costs, limited familiarity, and perceived risk negatively affect GBA adoption, as echoed in prior research [1; 13]. These challenges are especially pronounced in resource-constrained contexts such as the West Bank, suggesting a need for interventions such as risk-sharing mechanisms or PPP arrangements. H6 was supported, confirming that OGBAR mediates the relationship between GS and GBA adoption. This aligns with earlier studies [8; 16; 33], which emphasise the importance of internal capabilities, such as green procurement processes and technical expertise, in converting external support into actionable outcomes.

H7 found that TML positively moderates the link between GBAMA and GBA adoption. This reinforces previous research [8; 33], which stresses the pivotal role of leadership in shaping strategic responses to market signals. In the West Bank, top executives can capitalise on market enthusiasm to implement sustainability-driven strategies. Finally, H8 demonstrated that EA moderates the relationship between SDGB and GBA adoption. This confirms earlier findings [28; 37] indicating that greater environmental consciousness among stakeholders enhances responsiveness to societal expectations. Awareness campaigns and public engagement, therefore, become crucial tools for fostering a green construction culture. In summary, GBT adoption emerges as a multidimensional phenomenon shaped by the interplay of institutional, organisational, and societal factors. The findings contribute valuable, contextually grounded insights to the broader discourse on sustainable construction, supporting the advancement of innovation diffusion and environmental governance theories in developing country settings.

6. Conclusion

This study investigated the key determinants influencing the implementation of GBAAD in the West Bank, employing a PLS-SEM approach. The empirical evidence confirms that GS, SDGB, perceived advantages, and OGBAR are critical drivers in facilitating the adoption of GBT. Additionally, EA and TML emerged as important contextual and managerial enablers that strengthen the adoption process. The findings reinforce the notion that GBT adoption is not solely an economic or technological decision but is embedded within a broader institutional and social framework. The results underscore the necessity of policy interventions, increased market awareness, and organisational readiness in promoting sustainable construction. These dynamics are particularly pronounced in the Palestinian context, where ongoing political and economic challenges necessitate integrated and context-sensitive adoption strategies. The study contributes meaningful insights to the broader discourse on sustainable development, offering practical relevance for policymakers, practitioners, and researchers seeking to advance GBT adoption in emerging economies.

The findings hold several implications for decision-makers and development institutions in Palestine and comparable developing regions. Firstly, the robust positive effect of GS on GBT adoption highlights the urgent need for comprehensive public policy support, including financial incentives, regulatory frameworks, and capacity-building programmes. Secondly, expanding SDGB is essential and can be achieved through educational campaigns that raise consumer awareness of environmental sustainability and its long-term benefits, thereby creating a more informed and proactive user base. Thirdly, internal organisational development is imperative; firms must invest in technical training, secure funding for GBT integration, and pursue certifications to enhance their implementation capability. Moreover, cultivating TML through awareness workshops and strategic dialogues can facilitate the internal translation of favourable market trends into tangible organisational practices. Finally, fostering collaborative frameworks among government bodies, private sector entities, academia, and civil society is vital to build an integrated and functional ecosystem for GBT implementation. Such collective action will pave the way for a systemic transition towards sustainable building practices across the West Bank.

Despite the significance of its contributions, this study presents several limitations that offer directions for future research. The geographical focus on the West Bank and the limited sample size restrict the generalisability of the findings. Future investigations could broaden the scope to include additional regions within Palestine or other developing countries to validate the results across diverse contexts. Furthermore, while the study addressed several core variables, other influential factors such as environmental legislation, digital infrastructure, or stakeholder pressure could be incorporated in subsequent models to enhance explanatory power. Longitudinal research could also be undertaken to examine how GBT adoption attitudes evolve over time in response to shifting policy environments or technological developments. Additionally, qualitative methodologies, including in-depth interviews or case studies involving developers and policymakers, could offer richer insights into the cultural, institutional, and regulatory barriers to GBT adoption. Such research extensions will deepen the academic understanding of sustainable construction and provide more targeted, evidence-based recommendations for policy and practice.

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