



Balancing Environmental Building Requirements and the Real Estate Investment Needs: Challenges and Visions Highlights

Jana Tahboub ¹⁾, Bader Alatawneh ^{1)*}

¹⁾ Department of Architecture, Palestine Polytechnic University, Hebron, Palestine.

* Corresponding Author. E-mail: Bader_k3@ppu.edu

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ABSTRACT

An increased intention to meet environmental building requirements is globally evident, while these requirements are often overlooked at the investment level. This study explores the potential and challenges of balancing investment viability and building's environmental considerations. Using a mixed-method approach, the research identifies where economic considerations align with the environmental needs of building users, clients, and investors. In the Palestinian context, numerical data illustrates the long-term benefits of accepting higher upfront costs in exchange for extended payback periods. By incorporating Lean Six Sigma methodology, the study goes beyond financial analysis to examine cultural factors that influence investor behavior. Selecting samples of office buildings in Hebron City provides real scenarios where environmental design techniques are already in practice. This, in turn, validates the feasibility of environmentally conscious office buildings. The study findings indicate an average increase of 10.99 \$/m², equivalent to a 2% addition to initial construction costs when environmental practices are employed, which can be recouped within the first 32 months of the project cycle. Findings offer practical insights for planners, designers, and stakeholders. Ultimately, the research encourages investors to make strategic, informed decisions, positioning the environment as a competitive advantage in the real estate market in other similar contexts.

Keywords: Architectural design, Economic feasibility, Environmental investment, Preliminary design phase, Real estate, Office buildings.

INTRODUCTION

The office building construction process involves a complex trade-off between the economic objectives of investors, such as cost-effectiveness, payback periods, and profits, and the environmental needs of building occupants. Balancing these two dimensions (economic and environmental aspects) is essential to ensure the long-term viability of office building occupancy while simultaneously mitigating adverse impacts on the environment (Bakumenko et al., 2023). This equilibrium cannot be attained without precise numerical

computations incorporating Life-Cycle Cost Assessment (LCCA) while factoring in the human element (Christensen et al., 2016). Recent research has increasingly focused on integrating economic and environmental considerations in construction, particularly in office buildings. (Ghaffar et al., 2021) introduced the Sustainable Urban Economy (SUE) model in Egypt, linking urban design elements to economic sustainability through expert analysis. In addition, a Swedish study explored retrofitting heritage facades and highlighted the need for life-cycle assessments, yet the economic advantages of such

retrofits remained limited (Jerome et al., 2021). Hereu-Morales and Valderrama (2022) examined the challenges of balancing the Triple Bottom Line (TBL) under capitalist systems, emphasizing the need for comprehensive models to integrate societal, environmental, and economic dimensions effectively. Meanwhile, Bakumenko et al. (2023) highlighted gaps in automating environmental sections of business plans, calling for advanced expert systems to bridge the gap between environmental impact and economic efficiency.

Studies on energy-efficient residential construction have also gained traction, particularly in Romania, as Karda et al. (2023) emphasized the medium-term financial benefits of green homes despite initial cost concerns. In Canada, Kamali et al. (2022) proposed a robust Life-cycle Cost Assessment (LCCA) framework tailored to modular buildings, offering a practical tool for stakeholders to optimize sustainability decisions. In Russia, Karaeva et al. (2022) developed environmental indicators to evaluate the efficiency of energy projects, further reinforcing the global trend of harmonizing economic and environmental goals. In Palestine, the 2022 Palestine Green Buildings Council study highlighted barriers to green construction, including financial risks and limited awareness, urging deeper research into aligning economic viability with environmental design (Council, 2022). Despite these advancements, a research gap persists in identifying how economic and environmental investment considerations intersect in the Palestinian socio-cultural context. Two main cultural aspects affect the implementation of environmental real estate investment in Palestine. The first factor concerns investors' beliefs about environmentally friendly buildings, and the second concerns their cultural awareness of initial costs and payback periods. The socio-economic evaluation of real estate investment behavior is mainly qualitative,

encompassing factors, such as social policies, occupant well-being, safety, and community impact (Alessandrini et al., 2022). In the Palestinian context—particularly in Hebron—investment behavior is also shaped by local construction practices, material use, labor, and marketing. Investors' willingness to pay (WTP) for green features depends on six key barriers: economic, financial, political, technological, knowledge-based, and time-related, as outlined in PESTLE analysis (Abu Hanieh et al., 2022; Ha et al., 2023; Kircher, 2022; Kumah et al., 2022). These include high costs, limited market demand, lack of incentives, insufficient regulatory support, inadequate expertise, and public unawareness (Prasetyawan et al., 2023). While green materials and donor-funded projects exist in Palestine, political challenges due to Israeli occupation, such as land restrictions and limited resources, heavily influence investor decisions (Council, 2022). Despite this, a green building code aligned with international standards was developed in 2013 by the Engineering Association, although implementation often relies on costly external expertise.

The second key cultural challenge is raising awareness of long-term savings from green buildings. Understanding concepts, like payback periods and Life Cycle Costing Analysis (LCCA), remains limited. Estimating the additional cost of green buildings in Palestine—such as the 6.5%-25% seen elsewhere—could help justify their affordability through Life Cycle Costing Analysis (Prasetyawan et al., 2023).

Insufficient understanding of specific barriers hinders investors from engaging in environmental real estate projects in Palestine. Factors, such as lack of market demand, high investment risk, the absence of technology and professional personnel, inadequate public awareness, limited knowledge of green buildings, and time-related factors, remain unclear (Table 1).

Table 1. Barriers affecting the implication of environmental buildings (Ha et al., 2023)

Factor	Barrier	Global Analysis	Palestine
Economic	High costs of green buildings	✓	✓
	Lack of market demand	✓	NA
	High green material price	✓	✓
	Limited supply of green materials	✓	✗
Financial	Lack of financial support	✓	✗
	High risk of investment	✓	NA

	Lack of incentives	✓	NA
Political	Lack of policies and regulations	✓	✓
	Lack of building codes and regulations	✓	✘
	Lack of enforcement of the law	✓	NA
	Occupation	invalid	✓
Technology and Training	Lack of a database and information on green buildings	✓	✓
	Lack of expertise	✓	✓
	Lack of experienced labor	✓	✓
	Lack of technology	✓	NA
	Lack of professional personnel	✓	NA
Knowledge	Lack of public awareness	✓	NA
	Lack of knowledge of green buildings	✓	NA
	Lack of expert knowledge	✓	✓
Time	Time consumption is the barrier.	✓	NA

Previous research confirmed the lack of local studies on environmental design practices in investment projects, underscoring the need for context-specific research (Tareq & Al-Kindy, 2025). Thus, this study aims to establish a balance between the economic demands of real estate investors and the environmental requirements of office building users in the Palestinian context. Accordingly, this study assumes that minor environmental adjustments in the preliminary design stage of office buildings may increase the initial construction cost by up to 10%, but will reduce the total Life Cycle Costs (LCC) of these buildings, including social costs.

Based on the literature review, the analytical framework of this study is structured around four main dimensions that shape environmental real estate investment: economic, environmental, cultural, and contextual factors. Global studies emphasized the importance of cost analysis, payback periods, and Life-Cycle Cost Assessment (LCCA) in guiding investment decisions (Pasqualino et al., 2024; Psychoyios, 2023; Warren-Myers & Finance, 2012), while research on environmental performance highlighted the operational and user benefits of green buildings (Schweiker et al., 2018; Soydan et al., 2012; Tekce et al., 2020; Thongsumrit et al., 2023). In the Palestinian context, cultural factors—such as investor beliefs, misconceptions about initial costs, and limited awareness of long-term savings—play a crucial role in shaping investment behavior. Additionally, contextual

barriers identified through PESTLE literature, including weak regulations, lack of incentives, technological gaps, and political constraints, further influence decision-making (Prasetyawan et al., 2023; Rana et al., 2021; Saka et al., 2021). Integrating these dimensions into a unified framework allows this study to analytically examine how economic and environmental intentions interact with cultural perceptions and external barriers to influence investor choices in Hebron's office building sector.

The following sections include the methodology used to support or refute the study hypotheses, the results, their discussion, and recommendations, and, finally, the conclusion. The study connects its findings to the Lean Six Sigma (DMAIC) Analysis, based on previous research interpreting investment as a business model (Tengtarto et al., 2023).

METHODOLOGY

The study framework is divided into primary sections: fieldwork survey, spatial data collection, interviews and questionnaires, and the researchers' validation. Hebron city was selected, because it is the largest city in the West Bank, with a high rate of urban transformation and a higher investment ratio, according to government statistics. Case studies were surveyed by using the municipal buildings license records (GIS Department at Hebron Municipality helped identify suitable buildings). Then, they were filtered and selected

following the data accessibility and relevance of each case (availability of information, drawings, implemented cases, implantation date after 2010, investors' response, clients' response, users' response for interviews, etc., were key factors of the selection criteria). Data, such as drawings, names, surveys, and

people's networking, was collected from local governmental entities, municipalities, the Engineers Association, and engineering offices. Occupancy rates exceeding 70% and typical construction patterns were used to select offices in each building.

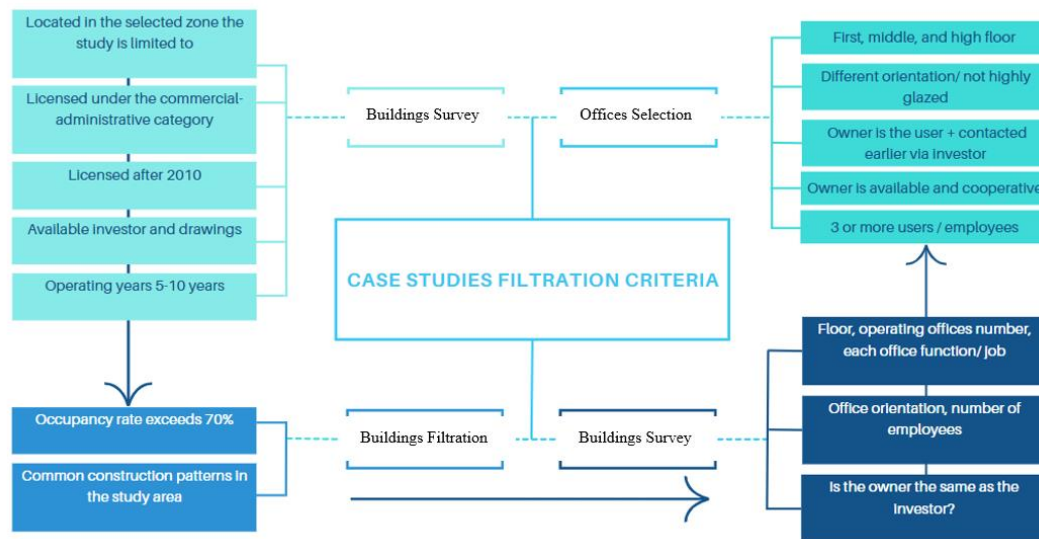


Figure 1. Case studies filtration process; case studies selection process intersected with investors' interviews and building survey visits

At the same time, specific offices were selected through personal visits based on their orientation, floor level, and user availability. Data analysis tools included Design Builder (V6.1) software for simulating environmental performances, along with supplementary data, such as electricity bills, survey sheets, and observational data, to validate simulation results.

Semi-structured interviews were conducted with three key stakeholder groups: engineering offices to understand existing construction practices and environmental awareness; municipality officials to examine licensing processes and governmental roles in promoting environmental standards; and investors to

explore their investment behavior, awareness of environmental needs, and willingness to adopt environmental practices. The interview analysis process was aligned with the PESTLE framework, addressing political, economic, sociological, technological, legal, and environmental factors (Kircher, 2022). Surveys and questionnaires were also administered to office users to assess their awareness of environmental needs, satisfaction with environmental conditions (e.g. natural light, ventilation, and thermal comfort), and the impact of these factors on their productivity, well-being, and retention.

Table 2. Methodology structure implementation

Research Question	Fieldwork	Output	Contribution to Research
Where can investors' economic vision meet their clients' and the building's users' environmental needs?	Data collection	Stakeholders' definition	Knowing the names and entities associated with office real estate
	Networking	Stakeholders' contact lists	Having contacts for stakeholders for interviews
	Interviews	Stakeholders' point of view	Knowing the economic, technical, and social considerations of stakeholders
	Case selection	Offices	Used for simulations and questionnaires
	Users' questionnaires	Employees' perspective	Comparing what employees want to what investors want

	Simulations	Models for examined cases before and after edits	Needed preliminary designs for making the building environmentally friendly
	Calculations	Premium cost for environmental office buildings + payback period	Research question answered
Conclusion and Recommendations Extraction			
The premium cost is acceptable to investors		The premium cost is higher than what investors would accept	
Extracting from interviews: The barriers behind abandoning the application of environmental office buildings (influential factor extraction)		Economic considerations justify abandoning environmentally friendly office buildings.	

Table 3. Networking steps: The networking process was distributed over five subsequent steps

Networking Step	Outcomes
Engineering Association	Consultant engineering offices contacts
Consultant Engineering Offices Filtration	Filtering the offices to contact only the concerned offices
Interviews with Engineering Offices	Problem confirmation + investor contacts
Hebron Municipality Key Persons Interviews	Problem confirmation + investor contacts
Interviews with Investors	Clients' contacts

Interviews were held with key real estate investors in the study context, aiming at investigating their awareness of building's basic environmental needs, the current investment trends in the region, understanding which basic environmental needs investors consider the most when constructing and which they neglect, validating the outcome from the initial cost calculation process, and finally, validating the outcome from the payback period calculations. The outcomes were also derived from client interviews.

The next step in the methodology was to administer questionnaires to all users of the selected case studies to assess several benchmarks for office users. Key metrics included employees' awareness of their environmental needs and preferences, satisfaction, the impact of each environmental consideration on their performance when examined in isolation, and the current work environment within the study context to estimate the social costs associated with poor indoor environmental quality in the workplace.

The responses were analyzed using Excel sheets to evaluate employee satisfaction, financial and environmental preferences, and performance in the work environment. The researchers' confirmation phase focused on validating the proposed design interventions through simulations, parametric analysis, and economic evaluation. Base models of the selected case studies were created using real-world data. The cases' environmental and energy performance was validated

by comparing simulated results with actual utility bills. Optimized models were then developed by introducing environmental optimization suggestions in the preliminary design stage, such as enhanced insulation, natural ventilation, and daylight optimization, and comparing their environmental and economic performance with that of the base models. A parametric analysis was performed to test multiple design scenarios, focusing on optimizing heating and cooling loads and daylight distribution to improve indoor environmental quality (IEQ). Results were systematically organized into Excel sheets for detailed analysis. Economic optimization followed, involving a cost-benefit analysis to evaluate initial costs, long-term energy savings, and payback periods for the proposed designs. This process identified design scenarios with the shortest payback periods and the most significant environmental benefits.

- Base Model Creation and Preliminary Design Edits

This phase began with creating base models of the selected buildings using 2002 Jerusalem Airport weather data. Preliminary design edits were then applied to enhance thermal comfort and daylight based on office building standards collected from the literature. Locally available, widely used Palestinian solutions were integrated to meet these needs. The results were analyzed in two steps: first, by assessing each edit's

impact on IEQ, temperatures, daylight, and energy loads; second, by applying edits sequentially and conducting parametric analysis to explore all possible scenarios. Results were evaluated using Excel to measure annual effects in appropriate units and percentages. Figures 2 and 3 showcase the process steps.

The environmental and economic optimization

phase used a triangular optimization method starting with a parametric analysis of environmental factors. Simulations prioritized minimizing cooling, heating, and lighting loads, followed by economic analysis to determine costs and payback periods. The final model recommended the most cost-effective design with the shortest payback time for office buildings (Figure 4).

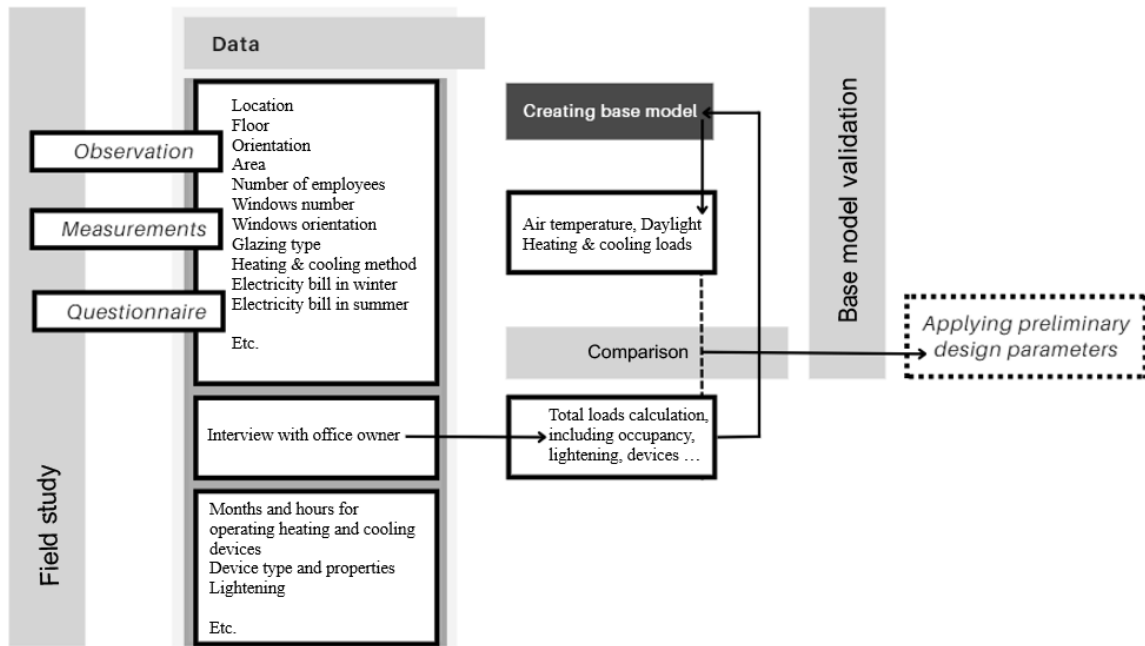


Figure 2. Base model creation and validation process

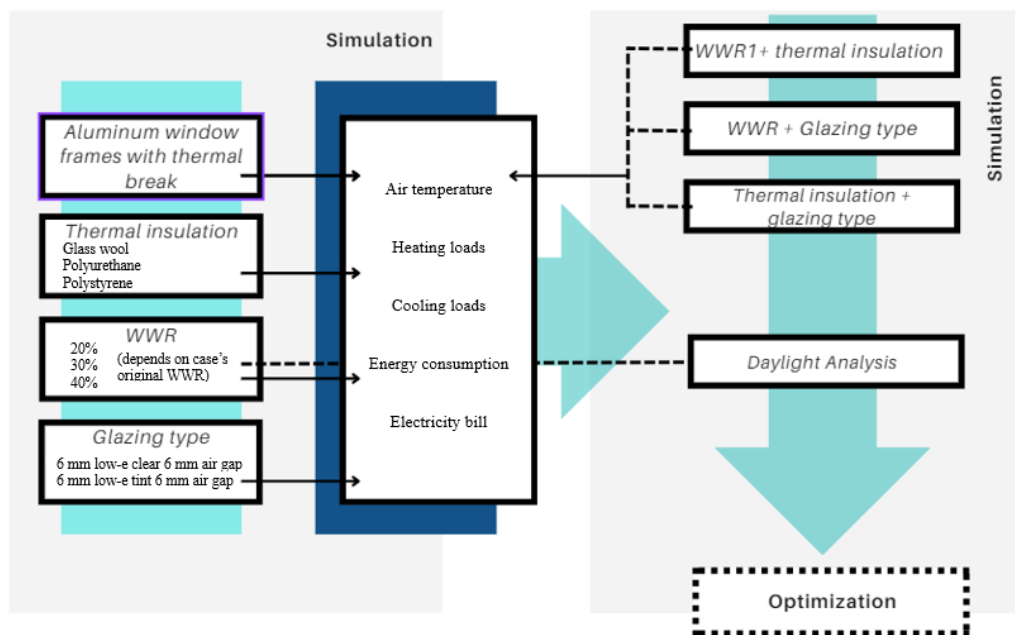


Figure 3. Preliminary design edits and simulation

The Lean Six Sigma methodology was applied to analyze the findings and to develop actionable solutions. When environmental design principles are communicated to investors in business language, where influential factors are defined, analyzed, and measured in numbers, and the process of improvement and control is straightforward, investors will better understand the

process as a business model rather than non-financially beneficial outcomes (Francescato et al., 2022). This approach ensures that the proposed designs can effectively balance the economic and environmental outcomes while aligning with the business objectives of real estate stakeholders.

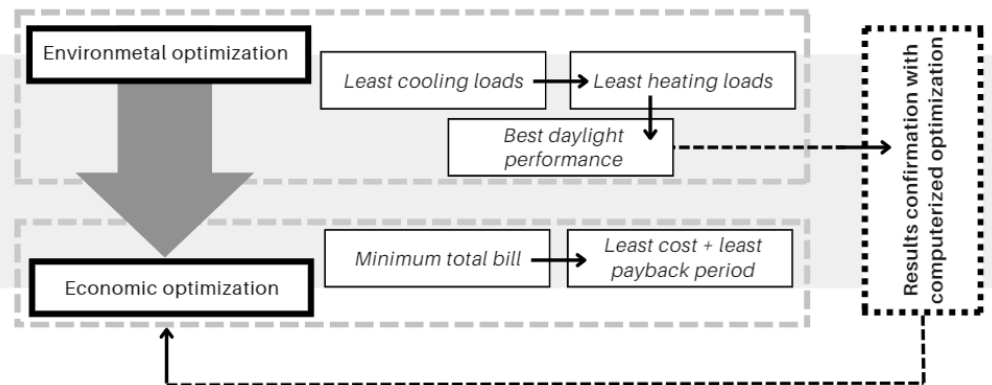


Figure 4. Optimization process

RESULTS

The study focuses on Hebron, but it may apply to other regions with similar conditions and climates. The research scope is confined to office buildings located in Mediterranean climates and constructed with local building techniques, materials, and labor, with consideration of their associated costs. The scope of this study is confined to office buildings constructed by investors for resale purposes, excluding those intended for personal use by individual firms. It is also confined to office buildings constructed and licensed during the early years of the last decade, using the period's standard construction practices. The solutions proposed for the selected cases must consider various factors, including location, environmental considerations, initial and ongoing costs associated with office buildings, as well as cultural and societal constraints.

The networking phase identified key stakeholders involved in environmentally conscious building construction in the study context. Out of 86 consultant engineering offices, 44 had obtained licenses for office buildings in the past decade, and 27 of these offices had licensed two or more office buildings. Phone interviews were conducted with 14 engineering offices, 8 of which provided valuable data and recommended 12 investors.

Cross-referencing with the municipality confirmed that seven investors owned office buildings licensed after 2013. These investors participated in semi-structured interviews and nominated 22 clients, from whom eight agreed to further interviews. This networking approach effectively established connections across engineering offices, investors, and clients, ensuring diverse perspectives for the study. The interview results were then classified using the PESTLE framework to identify the primary influential factors affecting the environmental construction process in the region. These influential factors are displayed after examining the feasibility of the environmental preliminary design suggestions for the selected cases.

Interview Results

Engineering offices' interviews summary: Hebron's construction market is technologically capable of adopting environmental practices, making technology no longer a barrier. Investors still resist the cost of thermal insulation, though studies showed that it adds only 2.44% to the total investment (Abu Hanieh et al., 2022). Natural lighting and sun exposure are increasingly prioritized, while ventilation is often managed mechanically due to concerns about main street noise.

Hebron Municipality key persons' interview summary: Palestine lacks enforced regulations and incentives for environmental design. While the 2019 Civil Defense law enforced international standards, it boosted some environmental practices in Hebron. While investment behavior in Hebron often involves altering licensed building functions after approval, such as turning parking spaces into shops. Key investor barriers include assumptions about client unwillingness to pay extra, low public awareness, and limited land. At the same time, experts stress the need for enforced regulations, incentives, and targeted awareness workshops for engineers, investors, and clients.

Investors' interview summary: Most investors showed strong awareness of environmental building needs, shaped by engineering guidance, personal experience, and international exposure. Economic benefits rather than environmental concerns drove their decisions. Most investors reported improved alignment with basic environmental needs in recent projects. Therefore, they are willing to accept a 10%-30% increase in initial costs for environmentally designed buildings, which results in higher property value, faster occupancy, and greater marketing potential, despite client price sensitivity and the lack of municipal incentives. All investors agreed that a maximum payback period of three years is acceptable to recover their capital quickly and re-invest.

Clients' interview summary: 90% of clients are aware of basic environmental needs. Most clients prioritize natural daylight, ventilation, and sunlight exposure, while a few apply thermal insulation due to limited office hours. This aligns with the investors. Clients are generally willing to pay 10%-40% more for environmental features, but are more motivated to pay

extra for services, like parking, while views on payback periods vary, accepting periods up to 10 years.

Case Studies Selection and Simulation Results

The study was conducted in Hebron city, focusing on Ain Sarah Street (the trade zone). The study involved a multi-step process that integrated insights from investor interviews, existing building surveys, collaboration with the Geographic Information System (GIS) Department, and engagement with the Licensing Department at Hebron Municipality.

Out of 14 investor-provided office buildings, only 5 met the selection criteria, and 2 had valid as-built drawings. These two buildings were chosen for further investigation in the study. Two selected office buildings were surveyed, showing occupancy rates of 76% and 70%. However, highly-glazed buildings were excluded to focus on cost-driven investor decisions rather than on aesthetic preferences. The selected buildings went through a filtration process to find the office case studies as follows:

- Building 1 – Haras St. Building: consists of nine floors, the ground floor has shops, and the offices are located on the higher floors. Two offices were selected: the first, located to the west on the second floor, is referred to as case 1. The second is located to the southwest on the fifth floor, and is referred to as case 2.
- Building 2 – Ein Sarah St. Building: the ground level has shops on the main street, and the offices are located on the upper floors. The selected office is located on three facades of the second floor. It is a large accounting company, and one of its offices was selected for further investigation. The office is located to the west and referred to as case 3.

Table 4. Case studies base case conditions and optimization process results

Area (m ²)	Case 1		Case 2		Case 3	
	26		64.5		28.5	
Aspect	Base case	Optimum	Base case	Optimum	Base case	Optimum
Thermal Insulation	none	Glass wool	none	Glass wool	none	Polystyrene
Cooling Loads (kWh)	1285.22	912.5	2649.93	1854.95	3605.56	2920.5
Heating Loads (kWh)	47.56	11.41	96.29	14.44	190.9	53.45
WWR%	41%	30%	19%	40%	9%	30%
Glazing Type	Double 4-6-4 mm	Double low-e grey-tinted	Double 4-6-4 mm	Double low-e grey-tinted	Double 4-6-4 mm	Double low-e grey-tinted

Daylight Distribution	53.5%		57%		68.14%		99%		28.75%		68.25%	
PPD%	Jan.	Jul.	Jan.	Jul.	Jan.	Jul.	Jan.	Jul.	Jan.	Jul.	Jan.	Jul.
	54.71	68.09	11.97	8.05	53.14	45.88	9.47	8.53	46.41	85.24	6.95	89.42
PMV	-1.57	1.85	-0.58	0.38	-1.54	1.41	-0.46	0.30	-1.42	2.21	-0.31	2.34
Initial Cost Increment (NIS)	0		472		0		4925		0		775	
Annual Average Electricity Bill (NIS)	3410.58		3125.08		7608.83		5741.83		5541.39		3536.39	
ROI (3 years)	0		81.5%		0		13.7%		0		676%	
Payback Period	-		20 months		-		32 months		-		5 months	

The results indicate that increasing investment costs in Case 1 by 18.15 NIS/m² ensures that investors recover their investment within 6 months, yielding a profit of up to 381.5 NIS within the first 3 years. In Case 2, the higher investment costs, up to 76.36 NIS/m², can be recouped within the initial 32 months. In Case 3, the

additional investment costs of 27.68 NIS/m² are recovered within 5 months. Nonetheless, all payback periods align with the clients' stated acceptable payback period between 2 and 3 years or higher. Table 5 displays these calculations in dollars per square meter.

Table 5: Increase on initial costs (\$/m²) summary for the three selected cases

	Case 1	Case 2	Case 3	Average
Increase in initial costs (\$/m ²)	4.9	20.6	7.47	10.99

DISCUSSION AND RECOMMENDATIONS

Discussion of Financial Results

There is no one-size-fits-all solution for environmental considerations in preliminary design phases. The final financial calculations associated with incorporating environmental design preferences reveal a modest increase of not more than 2% in initial costs, notwithstanding the reduction in floor area. Despite investors generally endorsing a premium increase of 10%-20%, the resulting percentage proves significantly lower. Investors can capitalize on this addition by incorporating the increase into the office's selling price. Given that clients are amenable to a 10%-20% increase in the initial price, investors can reap double or triple profits without compromising environmental considerations, and it would still be considered acceptable by clients. This increase in the initial costs is still significantly lower than the previously indicated increase by research in other countries – 6.5% in Europe, 20%-25% in Jordan, and 7.85% in Indonesia (Prasetyawan et al., 2023).

Moreover, this represents the additional initial expenditure incurred to establish a workplace that aligns

with employees' environmental preferences. According to the questionnaires, daylight and thermal comfort emerged as the two most crucial factors among the various preferences expressed. According to the hypothesis, the additional cost associated with implementing environmental preliminary design techniques is lower than the initially presumed 10%. Moreover, the viability of adopting this cost-effective environmental approach appears to be significantly more favorable.

An alternative method to assess the viability of implementing environmental features involves comparing its payback period with the widely accepted 7-year payback period for solar energy systems in the Palestinian community. Surprisingly, the payback period from integrating preliminary design environmental features into office buildings is less than half the duration already embraced by the community. Opting for environmentally preferred options ensures quicker property sales, leading to a higher time value of money, higher occupancy rates, enhanced cash flow, and overall success for the entire building. These preferences also secure elevated selling and rental values for property investment clients while

concurrently reducing energy consumption and electricity bills.

This research is limited to Hebron city office buildings, but it may apply to similar contexts. It is worth noting that one of the important limitations the study faced was the changing market, material price changes due to the war, low response rates from investors, clients, and users, contextual social and political constraints, unavailable measurement tools, and climatic and periodic limitations. Despite these limitations, conducting a thorough study of the economic-environmental balance of office buildings in Palestine can yield valuable insights and recommendations to foster sustainable, economically viable real estate practices.

Connecting Influential Factors Using DMAIC

Following the Lean Six Sigma (DMAIC) method, the influencing factors (Table 6) are those that previously formed the labels and patterns in the Delve software thematic analysis. The data analysis described in the methodology section was used alongside the thematic analysis.

First, the definition phase was used to outline the stakeholders and decision-making problems in the environmental office buildings application in Palestine. Then, the measurement phase quantified baseline performance through interview frequencies, occurrence patterns in Delve software, and measurable constraints reported by stakeholders. This step was crucial for assigning weight to each influential factor derived from the definition phase. The analysis phase helped expand the set of measured variables to understand how

stakeholder behaviors, market barriers, and governance gaps collectively shape real estate investment decisions.

Influential factors were categorized by stakeholder groups for environmental office buildings in Palestine. All the defined influential factors align under five main categories that are: 1) Economic factors, 2) Knowledge and awareness, 3) Preferences, assumptions, and social practices, 4) Laws, incentives, and governmental factors, and 5) Engineering staff-related factors. These five categories have been identified and defined as the primary factors shaping real estate investment behavior in the Palestinian market. Notably, the economic factors were debunked through a comprehensive process involving interviews, simulations, and calculations.

The outcomes e showed a premium increase of not more than 2% when adopting optimal practices to achieve daylight and thermal performance. Now, the improvement phase, through simulations and financial calculations, directly challenged and refined stakeholders' assumptions by communicating the added cost while knowing that it is acceptable to them.

Furthermore, there remains a need to control the application of environmental features in real estate investment. Considerations of both economic and financial aspects, whether from investors or their clients, are significantly influenced by the fourth factor and directly shape the control phase. This factor pertains to the enforcement of laws, the provision of incentives, and other governmental measures aimed at offsetting higher investment costs and motivating all stakeholders to implement environmental practices (Tables 6 and 7). The five factors are interlinked, with each influencing the others.

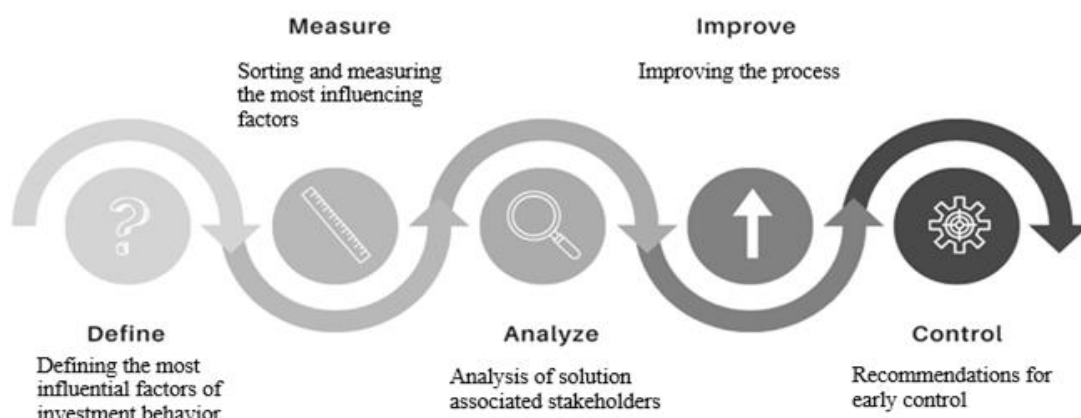


Figure 5. DMAIC process for analysis of results

Table 6. Influential factors of investment behavior in Palestine: defined theme

Engineering offices	Hebron Municipality	Investors	Clients	
Engineering staff's knowledge of environmental practices	Lack of law implication	Knowledge of environmental buildings	Accurate definition of environmental buildings	
enforced laws for implementing environmental strategies	Lack of incentives	Accurate definition of environmental practices	Environmental preferences and needs	
Up-to-date engineering staff	Building ownership (private, public, governmental, etc.)	The engineering staff	Clients' willingness to pay	
The capability of environmental technologies application	Funding availability	Previous exposure to environmental buildings	Services vs environmental?	
Recent real estate vs older real estate	Investment behavior - real execution vs licensing	Previous expertise and owned buildings	Payback period variation	
Personal assumptions on the feasibility of environmental features	Client's willingness to pay – market demand	Intersected influence with engineers and their preferred investment		
Investors' personal preferences based on their expertise in the market	Occupation and lack of available land	Clients want environmental designs and services		
Noise for natural ventilation application	Advantage to the municipality through energy reduction	Economic preferences rather than environmental		
Investors prefer design over environmental.	Multiple stakeholders' framework	Investors' time in the market and their reputation		
	Workshops and awareness raising	Buildings are becoming environmentally friendly.		
	Economic influence on investors rather than social or environmental	Real execution difference from licensed drawings		Environmental practices priorities
		Losing the office area		Lack of incentives
		Environmental buildings sell faster.		

Previous research often emphasized assigning weights to influential factors; this research's approach reveals the significant impact each factor has within a circular process, highlighting the crucial role of each factor in the overall dynamics. However, to gauge the

significance of each primary factor category, the frequency with which sub-influential factors were cited across various interviewee categories was used as a metric of importance (Table 7).

Table 7. Sorting the most influential factors into common categories

Economic Factors		◆◆◆
<ul style="list-style-type: none"> - Client's willingness to pay and market demand - Payback period and time to sell - Losing office area - Talking economic, not environmental - Funding availability - Services vs environmental? - Occupation and lack of land 		
Knowledge and Awareness		◆◆◆
<ul style="list-style-type: none"> - Recent real estate vs older real estate - Workshops and awareness raising - Accurate definition of environmental buildings - Previous exposure to environmental buildings - Previous expertise and owned buildings - Investor time in the market and their reputation 		
Preferences, Assumptions, and Social Practices		◆◆◆◆
<ul style="list-style-type: none"> - Investors' personal preferences - Personal assumptions on the feasibility of environmental features - Client's environmental preferences and needs - Clients want environmental designs and services - Real execution differs from licensed buildings - Building ownership - Building use behavior 		
Laws, Incentives, and Governmental Factors		◆◆◆
<ul style="list-style-type: none"> - Enforced laws for implementing environmental strategies - Lack of incentives - Benefit to municipality 		
Engineering Staff Related Factors		◆◆◆
<ul style="list-style-type: none"> - Engineering staff expertise - Up-to-date engineers - Capability of environmental practices application - Multiple stakeholders' framework 		
*: frequently mentioned		

Table 8. Improving the influential factors

Influential factor	Responsible Stakeholder	Recommendations
Economic Factors		
Client's willingness to pay and market demand	Investors, the awareness factor associated with stakeholders	Effective marketing campaigns that highlight the environmental features + awareness campaigns
Payback period and time to sell	Investors, clients	Highlighting that the payback period does not exceed 32 months
Losing the office area	Municipality, clients	Office price covers lost meters, and the municipality represents investors with the Ministry of Local Government.
Talking about economic, not environmental issues	Engineering offices	Adopt a feasibility study for environmental features as a case

Funding availability	External funds	External funds should also be directed to environmental buildings in the private sector.
Services vs environmental?	Investors + Engineering Association + municipality	Services are not to be compromised
Occupation and lack of land	-	-
Knowledge and Awareness		
Recent real estate vs older real estate	Municipality, Engineering Association, engineers, universities ...	Clear definition of environmental buildings
Accurate definition of environmental buildings		
Previous exposure to environmental buildings	Investors, municipality	Knowledge exchange
Previous expertise and owned buildings		
Investor' time in the market and their reputation		
Workshops and awareness raising	Municipality, Engineering Association, engineers...	Awareness campaigns
Preferences, Assumptions, and Social Practices		
Personal assumptions on the feasibility of environmental features	Engineers, universities	Awareness, feasibility planning, and studies proposing
Investors personal preferences	Engineers	Environmental and aesthetic should not contradict
Clients want environmental designs and services.	Engineering Association, municipality...	Services are not compromised in favor of environmental designs.
Client's environmental preferences and needs	Investors, engineers	Investors and engineers should conduct market research to understand their clients' needs and preferences without making assumptions.
Building ownership	Municipality	A particular stake is kept for the investor
Real execution differs from licensed buildings.	Municipality	Better control and enforcement of the law
Building use behavior	Clients and municipality	Awareness campaigns
Laws, Incentives, and Governmental Factors		
Enforced laws for implementing environmental strategies	Government, municipality, Engineering Association, external funds	Environmental Buildings Department
Lack of incentives		Creation of an incentive system
Benefit to the municipality.	Municipality	Benefits system with points
Engineering Staff Related Factors		
Engineering staff expertise	Engineering Association, university	Regular workshops, awareness campaigns, and technical support
Up-to-date engineers		
The capability of environmental practices application		
Multiple stakeholders' framework	Engineering Association	Regular meetings to bridge the gap between investors and engineers

Many interconnected factors influence how investors and clients engage with green buildings, and

improving these areas can significantly support the shift toward sustainable development. Investors need clearer marketing that highlights both the financial and environmental values of green features, supported by awareness campaigns from universities and municipalities. At the same time, clients should feel confident in the realistic 32-month payback period and the quicker sales cycle that environmentally designed projects can attain.

Governments can help by offering density bonuses and practical financial incentives to offset any perceived loss of rentable space, similar to the financial and non-financial incentives used in other countries (Rana et al., 2021). Government incentives are crucial in promoting environmentally conscious construction practices among investors and their clients. These incentives build investor confidence in environmental investments and facilitate effective client marketing. Governments can implement various incentives for entire green buildings or specific components to encourage and guide investments toward environmentally friendly construction. This approach encourages clients to invest in eco-friendly properties, contributing to the community's overall well-being (Saka et al., 2021).

Precise definitions of environmental buildings, along with regular workshops and knowledge sharing between practitioners and new investors, are essential for raising awareness. Misunderstandings about the costs of green features should be addressed through feasibility studies and straightforward communication, while engineers must balance environmental techniques, aesthetics, and costs to meet investor expectations. Continuous market research is also needed to follow changing client preferences, and municipal regulations should ensure compliance with approved environmentally friendly plans. Finally, stronger legislation, a well-designed incentive program, and better cooperation between engineers and investors—supported by training and professional networking—can create a more supportive environment for green investment and environmental building practices.

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CONCLUSIONS

Environmentally conscious office buildings are both feasible and beneficial in the Palestinian context. This research combined interviews, feasibility assessments, and case studies to confirm that environmental buildings can align with investor goals when their long-term financial value is clearly communicated. Although awareness is increasing, many investors still hesitate because of assumptions about higher costs, limited knowledge, and unclear regulations.

The findings make it clear that environmentally friendly buildings can advance through coordinated efforts among investors, engineers, municipalities, and government entities. Better communication, practical incentives, stronger regulations, and continuous awareness campaigns are essential to support environmentally friendly building practices. With proper guidance and clearer market information, environmental buildings can become a competitive option in the real estate sector. The results and recommendations provide a practical roadmap for improving environmental building practices in Palestine and in other regions with similar circumstances.

Subsequent investigations could examine the findings from this research and expand the identified results. A future study could consider the Voice of Customer (VOC) of all employees in the region to specifically identify their preferences, and employ multi-decision selection criteria to assign weights to those preferences, along with their associated costs, to choose which environmental feature receives higher incentives. Future extensions could investigate the most sellable area resulting from the application of environmental design strategies and value the financial considerations to obtain a more accurate estimate of the increase in environmental building investment. Furthermore, the design of the incentive system, in collaboration with the municipality and the local community (another Triple Bottom Line TBL study) could be undertaken to strengthen the DMAIC process's control phase.

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