Sustainable Architectural Design in Palestine: A Review in the Context of Globalization and Green Imperialism

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Abstract

This article addresses sustainable design challenges in Palestinian architecture, especially in the context of globalization and green imperialism. It emphasizes the need for an approach that emphasizes local needs and cultural values, away from the effects of global capitalism. It examines the deep-rooted links between local Palestinian architecture and sustainability and discusses how contemporary sustainable design can be harmonized with this heritage.

1. Introduction

Vernacular Palestinian architecture is deeply related to the concept of sustainability as a symbol of local identity, cultural heritage, and environmental adaptation. It evolved over the centuries, adapting to local conditions and environmental constraints.

Although sustainability is often seen as a modern concept, its roots are deeper in historically and culturally rich regions such as Palestine. Local architecture is notable for adapting to the local environment, using available resources efficiently, and reflecting local culture (Thwainy, 2008). However, globalization has led to the rapid replacement of these traditional structures with modern ones. The modern buildings constructed in Palestine over the last few decades have often been designed following global standards and therefore use of materials and design principles that are not suitable for the local climate and environmental conditions (Alragabi, 2024). This has posed serious threats not only to environmental sustainability but also to cultural sustainability.

Sustainability means meeting the needs of the present without jeopardizing the ability of future

generations to meet their own needs (World Commission on Environment and Development, 1987). Behind this simple definition there are three pillars: of environmental, economic and social sustainability. Environmental sustainability is concerned with conserving natural resources, reducing pollution and preserving ecosystems (Baker, 2006). Economic sustainability aims for economic growth without depleting natural resources, ensuring social justice and equitable distribution of resources (Baker, 2006). Social sustainability, on the other hand, focuses on increasing social welfare, reducing inequalities, protecting human rights and ensuring that everyone has access to basic needs (McKenzie, 2004).



Figure 1. Dimensions of Sustainability, H. Alragabi

Where these three pillars come together, green architecture emerges. Green architecture is an approach that integrates sustainability principles into architectural design (McLennan, 2004). This approach aims to increase energy efficiency, conserve natural resources, and create a healthier and more sustainable built environment (Edwards & Turrent, 2000). The history of sustainable architecture in Palestine has been shaped by buildings built in harmony with the local conditions of this region (Eg. Battir village, (Kudumovic, 2023)). Traditional buildings were constructed with local materials, and their design was developed with environmental factors in mind. For example, the use of local stone ensures the thermal balance of the buildings and makes it possible to keep the interiors cool (Ragette, 2003). Such buildings are also equipped with water-saving systems; rainwater harvesting systems and efficient use of natural water resources are common practices in traditional Palestinian buildings (Ragette, 2003).

However, with globalization, modern and contemporary often environmentally maladaptive structures have replaced these traditional buildings. This paper examines how sustainable architecture in Palestine has evolved in this context and how the concept of sustainability has been reshaped under global influences (Alragabi, 2024).

2. Sustainable Design in Palestinian Traditional Architecture

Palestinian vernacular architecture has demonstrated sustainability principles, adapting to the soil and climate over thousands of years. This architecture emphasizes both harmony with the environment and cultural identity. This includes:

- Climate-compatible design: Traditional ventilation systems such as thick stone walls, shaded courtyards, wind towers (Malkaf), Al Mashrabiya windows, and natural cooling were utilized to provide natural cooling and minimize energy consumption. It has also been expressed using passive design strategies in traditional building design (Fathi, 1986; Al-Khawli, 1975).

- Wise Use of Local Resources: Stone, adobe, wood, and other natural materials were used in a manner consistent with sustainable building methods and low environmental impact (Amiry & Tamari, 1989; Hadid, 2002).

- Cultural Integration: Traditional Palestinian homes reflect social values such as privacy, a sense of community, and the value placed on family life (Amiry & Tamari, 1989). The use of courtyards served as social gathering spaces that brought families together and provided coolness to the interior spaces (Haddad, 2010).



Figure 2. Hirbawi Complex in the Old City of Hebron- showing local architecture, H. Alragabi



Figure 3. Plan and Eastern Facade of Al Harbawi Complex in Al Aqaba Neighborhood, The Old Book of Hebron (HRC, 2008)



Figure 4. Kufr Akab – Al-Quds/Jerusalem Region, H. Alragabi

3. Contemporary Palestinian Architecture: Challenges to Sustainability

The new understanding of sustainability is based on the idea that contemporary architecture should adapt to local conditions. However, many modern buildings constructed in Palestine ignore the local environmental conditions and appear as projects with low energy efficiency, consuming water resources, and not responding adequately to the needs of local communities.

Since the late 20th century, Palestinian architecture has undergone significant changes due to the impact of globalization, new building materials and technologies. These changes have created major challenges for sustainable design in Palestine:

-Impact of Globalization: The proliferation of architectural styles and building materials worldwide threatens Palestine's unique cultural identity and sustainable construction practices (Salman, 2018; Asquith & Vellinga, 2006).

- Green Imperialism: The tendency of developed countries to impose sustainability solutions on developing countries, often ignoring local needs and values (Shaqir, 2023; Hamouchene, 2023).

- Limited Resources: Palestine faces ongoing occupation, resource constraints and economic barriers (Tuffaha, 2009; PCBS, 2010; Isaac, 2010). These factors make it difficult to implement sustainable building projects.

- Culture Loss: The use of new building materials and techniques leads to the loss of traditional Palestinian architecture and building practices (Senan, 1993).

- Loss of Cultural Identity: The proliferation of modernist buildings that do not reflect the values of Palestinian society creates a gap in cultural identity (Bshara, 2022).

4. Globalization and Green Imperialism

Globalization has greatly influenced architectural trends around the world. In Palestine, these effects are particularly evident through the concepts of sustainability and green building. This process, called green imperialism, means that the concept of sustainability is exploited by global capitalism and local values are ignored in this process (Hamoushan, 2023). In this context, many green building projects have been shaped to comply with global standards rather than local needs and cultural values (Ling et al., 2018), as seen in the case of Palestine. For example, some green building projects implemented in Palestine were built in accordance with Global sustainability standards. Although these projects were successful in terms of environmental sustainability, they did not adequately meet the social and cultural needs of local communities (Shaqir, 2023). This has left the concept of sustainability disconnected from local realities. Such projects are often financed by Global-based corporations, and the economic benefits of these projects often go to global capital, not local communities (Harvey, 2015).

Green imperialism manifests itself not only in the architectural field, but also in the economic and political spheres. In this process, global capital seeks to maximize its own interests by exploiting local resources and cultural values. In developing countries such as Palestine, this creates serious obstacles to the realization of sustainable development goals. Green imperialism, as an approach that ignores the needs and cultural values of local communities, weakens the concept of sustainability and causes the erosion of local architectural identity (Hamoushan, 2020).

5. Analysis

Evaluating the principles of sustainable architectural design concepts applied in Palestine is imperative, especially because contemporary trends have moved away from the traditional vernacular architecture. This deviation has led to the creation of architectural forms that are incompatible with the local environment and inadequate in meeting their users' functional needs. The study proposes two directions of analysis and synthesis for sustainable design in Palestine (Figure 5) needed for defining criteria.

1. First Analysis: A Comparison Between Traditional and Contemporary Palestinian Architecture

In this type of analysis, a comprehensive comparison is made between traditional architectural elements and contemporary architectural practices in Palestine. Traditional Palestinian architecture has many notable features in terms of sustainability, focusing on the use of local materials, energy efficiency, and climatic adaptation. In contrast, contemporary architecture is often based on design norms imported from globally and fails to adequately adapt to local environmental conditions and cultural values (Alragabi, 2024).



Figure 6. Analysis diagram framework, H. Alragabi, 2024.

This analysis examines how traditional architecture can be combined with contemporary sustainability practices and how both approaches can be optimized in terms of sustainability criteria. Traditional buildings utilize local resources to minimize environmental impacts, while contemporary buildings are often equipped with imported materials and energy-consuming systems. In this context, suggested criteria and strategies for sustainable design have been developed.



Figure 5. Analysis and Synthesis of Two Aspects of Sustainable Design in Palestine, H. Alragabi, 2024.



Figure 7. Analysis diagram framework, H. Alragabi, 2024.

For both contemporary and traditional different levels, such as urban level, architectural design, and structural level, analysis are needed while inspecting coordination with environment, economic, and sociocultural aspects as the pillars of sustainability.

2. Second Analysis: Evaluation of Green Building Projects

When it is about green building projects, the sustainability criteria encompass environmental, economic, and social sustainability dimensions. In particular, this analysis includes the evaluation of green building projects implemented in Palestine based on the proposed 25 sustainability criteria. The projects were evaluated according to environmental criteria, such as energy efficiency, water management, and material selection, as well as social criteria, such as community integration and cultural harmony (Alragabi, 2024). Evaluating sustainability initiatives requires a nuanced approach that considers not just environmental

impact but also economic, social cultural aspects. The elements we'll explore offer a comprehensive framework for analyzing sustainability initiatives, particularly in the context of avoiding pitfalls like green imperialism and ensuring genuine community development.

It must move beyond measuring environmental impact to evaluate sustainability initiatives effectively. It has developed a framework for a holistic analysis, selecting 25 elements that consider the social, economic, and cultural dimensions alongside environmental concerns. These elements were chosen based on their contribution to ensuring initiatives are truly sustainable, avoiding pitfalls like green imperialism and promoting genuine community development. By examining factors like local knowledge participation, social equity, cultural preservation, and economic integration, we can assess how well an initiative respects local context and fosters long-term positive change for the community.

Green imperialism refers to the imposition of Western environmental solutions onto developing countries, often disregarding local knowledge and needs. Lobbying efforts by powerful actors can further distort sustainability initiatives to prioritize profit over genuine progress. To avoid these pitfalls, we need a framework that prioritizes local participation, cultural sensitivity, and long-term environmental health.

This research proposes a novel framework for analyzing the effectiveness of sustainability initiatives. Moving beyond a purely environmental focus, the framework identifies 25 key aspects informed by established principles and best practices. These elements encompass the social, economic, and cultural dimensions of sustainability, ensuring well-being and social justice and ensuring a more holistic evaluation. This approach is crucial for mitigating pitfalls like green imperialism and fostering genuine community development within sustainability efforts.

Each element serves a specific purpose in assessing an initiative's effectiveness. Here's a breakdown of the elements and the rationale behind their development:

- 1. Incorporation of Local Knowledge and Expertise: This criterion emphasizes the sensitivity of handling first: Local and Traditional Knowledge Participation: This element acknowledges the importance of respecting and integrating local knowledge systems into sustainability initiatives. By doing so, solutions are more likely to be culturally appropriate and effective in the long term. Assess how effectively the initiative incorporates traditional ecological knowledge, indigenous practices, and local resource management strategies. Secondly, dealing with the: Local Expertise Utilization: Assess the initiative's use of local experts' knowledge and skills, including scientists, engineers, farmers, community leaders, and traditional knowledge holders.
- 2. Social Equity: Analyze the initiative's efforts to improve well-being for all, not just a privileged few. Examine decision-making processes, access to resources, and distribution of benefits to ensure social equity.
- **3. Meaningful Community Engagement:** Assess the initiative's level of community involvement throughout the process,

from planning and decision-making to implementation and evaluation. This fosters a sense of ownership, builds trust, and ensures culturally relevant solutions.

- 4. Local Decision-Making Empowerment: Assess whether the initiative empowers local communities to make decisions about their own sustainability efforts, fostering a sense of agency, building local capacity, and increasing the likelihood of long-term success.
- 5. Cultural Heritage Preservation: Identify how the initiative respects and integrates cultural traditions wherever possible. Look for incorporation of traditional building materials, respecting sacred sites, and supporting local artisans and craftspeople.
- 6. Cultural Identity Respect: Evaluate how the initiative respects and avoids disruptions to cultural practices, spiritual beliefs, and traditional aesthetics in design plans.
- 7. Contextualized Local Models: Evaluate how the initiative considers existing successful local models and adapts them to the unique circumstances of the community. This could involve studying traditional resource management practices, learning from existing community-based initiatives, and replicating successful models with appropriate adjustments.
- 8. Supportive Legislation: Analyze the initiative's efforts to advocate for policies that incentivize sustainable practices, regulate environmental impact, and protect the rights of local communities, creating a supportive legal framework.
- 9. Preservation and Integration of Local Architecture in Green Design: Sustainable design principles should complement and integrate with existing local architectural styles. This element encourages initiatives that respect and preserve cultural heritage while incorporating environmentally friendly design elements.
- **10. Local Industry Support:** Evaluate how the initiative supports and revitalizes local industries by promoting local businesses that use sustainable practices, creating supply chains for locally sourced materials, and providing skills development for green jobs.

- **11. Equitable Financial Participation:** Evaluate whether the initiative ensures everyone in the community has access to and benefits from financial opportunities, considering microloans, grants, skills development programs, and fair pricing models.
- **12. Social and Economic Priorities:** Determine whether the initiative addresses the specific social and economic needs of the community. Analyze needs assessments and community consultations to ensure the initiative has a positive and lasting impact.
- **13. Economic Integration:** Sustainable development should promote inclusive economic growth that benefits the local community. This element encourages initiatives that create economic opportunities for all residents, not just a select few.
- 14. Sustainable Upliftment and Equitable Investment: Evaluate whether the initiative strives for long-term positive change through investments in social, economic development, and environmental improvements, promoting social equity and environmental sustainability.
- **15. Empowering and Revitalizing local Agriculture:** This element acknowledges the specific challenges faced by Palestinian agriculture and emphasizes the importance of initiatives that support sustainable agricultural practices, promote food security, and revitalize this vital sector of the Palestinian economy.
- 16. Climate-Specific Solutions: (Building climate resilience) Evaluate whether the initiative designs solutions tailored to the specific environmental conditions of the region. This coud involve drought-resistant crops, flood mitigation strategies, or utilizing renewable energy sources based on local availability.
- **17. Prioritization of Local Solutions:** Assess the initiative's commitment to prioritizing locally sourced materials, technologies, and expertise, fostering self-reliance and reducing environmental impact. Consider life cycle assessments to compare the environmental footprints of local and imported options.
- **18. Compatibility with Local Climate and Resources:** Assess whether the initiative considers the specific environmental conditions of the region for long-term viability

and environmental effectiveness. Analyze solutions for compatibility with local climate, resources, and ecosystems. This may involve using drought-resistant plants in arid regions, promoting water conservation techniques, and protecting sensitive ecosystems from development activities.

- **19. Dependency of Local Resources:** Assess the initiative's use of locally available resources to reduce reliance on external inputs and minimize environmental impact associated with transportation and production. This could involve using recycled materials in construction projects, sourcing timber from sustainably managed forests, and promoting local food production.
- 20. Community-Empowered Environmental Stewardship: Assess the initiative's efforts to encourage community participation in environmental protection through citizen science initiatives, community gardens, educational programs, and volunteer opportunities, fostering a sense of responsibility and ownership for the local environment.
- 21. Sustainable Local Infrastructure: Evaluate the initiative's investments in upgrading infrastructure, including waste management and public facilities, to improve living standards and environmental health. Analyze investments in renewable energy powered promoting waste treatment facilities, composting programs, and developing sustainable transportation systems (e.g., bike lanes, public transportation).
- 22. Promoting Sustainable Development with Local Integration: Sustainability efforts should consider the interconnectedness of environmental, social, and economic aspects. This element highlights the importance of integrating sustainability principles across all facets of the initiative to ensure long-term success.
- **23.** Adaptive Sustainability Solutions: Analyze whether the initiative designs solutions that can adapt to changing circumstances like climate variations or economic fluctuations. This includes incorporating modular designs, flexibility for future upgrades, and regular monitoring and evaluation.

- 24. Culturally Appropriate Adaptation of International Standards: Analyze how the initiative considers and adapts existing international best practices to ensure they are culturally sensitive and ecologically sound in the local context.
- 25. Empowering Local Communities for Sustainable Energy Independence: Analyze how the initiative supports local communities in developing renewable energy sources and improving energy efficiency, reducing reliance on external energy sources for longterm environmental benefits.

By analyzing these 25 elements, you can gain a comprehensive understanding of a sustainability initiative's strengths and weaknesses in addressing the specific needs and challenges of the community it serves. This framework can be used to evaluate existing initiatives, design new ones, and ensure that sustainability efforts contribute to a more just and sustainable future for all.

The categorization of 25 standards across socialcultural, economic, and environmental dimensions, coupled with the identification of potential overlaps, highlights the interconnected nature of sustainability. It emphasizes that analyzing these standards through a filter of well-being and social justice provides a more holistic approach. Examining overlaps imposed to achieve the agendas of green imperialism and the interests of the lobbies, such as how economic practices might impact cultural preservation or how environmental solutions might influence social equity, allows for a more comprehensive analysis. This approach prevents isolated interventions that might unintentionally or intentionally create negative consequences for other dimensions.

6. Findings and Discussion

This research examines several green buildings selected in Palestine as examples of integrating traditional and contemporary architecture and sustainable design criteria (Table 1). Through the proposed strategy for analyzing the problem of thought in sustainable design in Palestinian architecture, the most prominent factors that influenced architectural thought on environmentally friendly architecture through pressure lobbies and green imperialism were identified. Accordingly, the criteria, which reached 25 elements, were analyzed, and all elements were evaluated for each project influenced by environmentally friendly architecture ideas.

This comprehensive assessment revealed that the projects were generally successful in terms of environmental sustainability, but lacked social and economic sustainability. In particular, these projects, designed according to globally sourced standards, failed to adequately address the social and cultural needs of local communities.

These two analysis types can be used to emphasize the importance of integrating both traditional and contemporary architectural elements for the development of sustainable architecture in Palestine. The successful implementation of this integration can contribute to the creation of sustainable architectural structures not only for Palestine but also for other regions with similar climatic and cultural conditions.

The recommendations presented in this study stem from a comprehensive evaluation system that aims to improve sustainable architectural practices in Palestine and enhance the effectiveness of existing projects in terms of sustainability. This evaluation system assesses project performance based on environmental, social, and economic criteria, offering specific guidance for improvement. It emphasizes the importance of projects meeting higher standards in areas like energy efficiency, water management, and material selection. In particular, integrating the strengths of traditional Palestinian architecture, such as the use of local materials and climate adaptability, into contemporary designs is strongly recommended, to reduce the environmental footprint and harmonize with the local ecosystem.

The integration of traditional and contemporary architecture in terms of sustainability plays a critical role in the success of sustainable architectural practices in Palestine. The traditional architectural elements revealed in the first analysis offer significant sustainability advantages, especially in terms of the use of local materials, energy efficiency, and climatic adaptation. In contrast, the green building projects evaluated in the second analysis of the second analysis have achieved some successes in terms of environmental sustainability but have shown shortcomings in terms of social and economic sustainability.

Project Name	Supervising institution	Photos
1. Palestine Museum - Ramallah	Heneghan Peng - based in Dublin	
2. Shtayya Green Build- ing - Nablus	Shtayya - Architecture Firm	
3. Mohsen Qattan Foun- dation New Building – Ramallah	Mohsen Qattan Foundation	
4. Aqaba Green School – Tubas	Palestinian Ministry of Education	مدرسة عقابا الخضراء حصلت على المستوى الذهبي و 146 / 200 نقطة

Table 1. Green buildings in Palestine, H. Alragabi, 2024

5. AL Kamar - House of the Moon – Ramallah	ShamsArd	
6. Earth House in Gaza	ShamsArd	
7. Kaykab Ecological Museum – Ramallah	ShamsArd	
8. Wadi Almogir School - Hebron	Belgium Architecture Office	
9. BMIP Bethlehem	French investor A.F.G Architecture and En- gineering Group	

10. Mashrabiya House Senan Abdelqader- Al- Quds/Jerusalem	Senan Abdelqader – Architect	
11. Desert House, Eco- friendly House in Jericho – Jericho	Hani Al Hassan - Architect	
12. Ramallah Beit Iksa Historical Center	Beit Iksa local community, RIWAQ	

The integration of traditional vernacular and modern architecture is critical to the success of sustainable architectural practices in Palestine. Integration of traditional architectural elements into green building projects can more effectively meet environmental, social, and economic sustainability criteria. Figure 7: Proposed Strategies for the Integration of Traditional and contemporary Architecture diagram illustrates how this integration process can be realized and provides strategic recommendations on how to combine the advantages of both architectural approaches.

This research highlights that while green building projects in Palestine often excel in environmental sustainability, they may fall short in addressing the social and cultural needs of local communities. These projects tend to be designed according to global standards and can reflect a form of green imperialism, where local architectural identity is weakened and the interests of global capital are prioritized (Shaqir, 2023). Therefore, the preservation of traditional architectural heritage and its harmonious combination with modern technologies are crucial for achieving sustainable architecture in Palestine (Alragabi, 2024). Traditional vernacular Palestinian buildings offer an excellent example of local materials and climatic adaptation (Ragette, 2003; Thwainy, 2008), providing a strong basis for modern design in terms of environmental adaptability, affordability, and socio-cultural relevance.

7. Conclusion

This paper shows that sustainable architecture in Palestine can be made more effective through the preservation of traditional architectural heritage and the harmonious integration of modern technologies. The analysis (first analysis and second analysis) shows that the integration of traditional architecture with modern technology offers a great potential for sustainable architecture and that green building projects are successful in terms of environmental sustainability but insufficient in terms of social sustainability.

These analyses emphasize that sustainable architecture should not only be considered as an environmental concept but should also include social and economic dimensions. These findings, supported by the graphs, charts, and figures detailed in the Alragabi thesis (2024), provide important clues for the future of sustainable architectural design in Palestine. These findings serve as a roadmap for enhancing existing projects and guiding the design of future, more sustainable structures, and may also be applicable to other regions sharing similar climatic and cultural contexts.

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