Dwelling Otherwise: Interior Architecture Strategies for Sustainable and Culturally Rooted Social Housing in the Gulf Countries

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Abstract

Rapid urban growth in the Arabian Gulf has amplified the urgent need for sustainable, inclusive, and culturally sensitive housing strategies. While global discourses on sustainable housing often emphasize technological innovation, the regional context of the Gulf requires a more nuanced approach that integrates cultural identity, social cohesion, and environmental resilience. This Perspective article explores how interior architecture strategies can inform the development of sustainable and socially rooted housing models in the Gulf countries. Building on the theoretical framework of the triple helix model of innovation—linking government, academia, and industry—the paper emphasizes the role of design thinking, interior spatial strategies, and cultural adaptation in shaping alternative approaches to social housing. Through comparative analysis and critical reflection, this article argues for a shift from standardized housing provision toward adaptive, hybrid, and community-centered models. The discussion highlights both current advances and future directions, positioning interior architecture not only as a discipline of aesthetics but also as a driver of socio-environmental innovation.

Keywords: Interior Architecture, social Housing, Gulf Region, sustainability, cultural Identity, Urban Science, Triple Helix, Critical Reflexion.

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* Introduction

Urbanization in the Arabian Gulf has been among the most rapid and intense in the world, driven by economic growth, population expansion, and ambitious national development agendas (1). This rapid transformation has created pressing challenges in terms of housing provision, sustainability, and cultural identity. In particular, the question of social housing—how to provide affordable, sustainable, and inclusive living environments—remains a critical issue across the region. Traditional approaches to social housing, often imported from Western models, have struggled to adapt to local cultural practices, climatic conditions, and community structures (2).

At the same time, new technological and architectural paradigms are emerging, offering alternative ways of conceptualizing housing in rapidly changing societies. Among these are 3D-printed housing, modular construction, and adaptive reuse of existing structures. While these innovations address material efficiency and speed, they often fail to consider the cultural and interior spatial dimensions of living environments. Interior architecture, with its focus on the human scale, everyday practices, and cultural embeddedness, has the potential to bridge this gap by proposing design strategies that root sustainability within social and cultural frameworks (3).

This article takes the form of a Perspective, proposing an integrative approach that combines sustainability, cultural responsiveness, and design innovation for social housing in the Gulf. Drawing on the triple helix model of innovation (4), it positions the collaboration between government, academia, and industry as a driver of contextually relevant housing strategies. The following sections will examine three key areas:-

1- Sustainability beyond technology: integrating environmental and cultural factors.

2- Interior spatial strategies: adapting layouts and functions to Gulf lifestyles.

3- Hybrid and community-centered models: moving from individual dwellings toward collective forms of living.

The discussion will reflect on both opportunities and limitations, ultimately arguing for a paradigm shift in how Gulf countries conceptualize housing—not as a product, but as a living process rooted

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in culture, environment, and innovation.

* Challenges of Social Housing in the Gulf

Social housing in the Gulf faces unique challenges due to rapid population growth, climatic constraints, and socio-cultural expectations (5). Imported standardized models often neglect cultural practices such as extended family living, privacy rules for gender-segregated spaces, and the importance of communal courtyards. Additionally, economic disparities and high land costs further complicate housing affordability. Current technological solutions, including prefabricated and modular housing, provide efficiency but rarely address spatial adaptability or cultural resonance (6).

* Interior Architecture as a Driver of Sustainability

Interior architecture can mediate between environmental sustainability and cultural relevance. Flexible layouts, adaptive furniture, and the use of sustainable materials (e.g., local stone, timber composites, recycled components) contribute to both ecological and social sustainability. Spatial strategies such as cross-ventilation, shading, and indoor-outdoor integration reduce energy consumption while respecting traditional spatial hierarchies (7).

* Cultural Responsiveness and Identity

Embedding cultural identity into social housing requires understanding of local customs, social interaction patterns, and symbolism. Design strategies include modular spaces that allow for gender-segregated areas, multi-generational accommodation, and flexible communal spaces that can adapt to family or community needs. Culturally responsive design enhances social cohesion and fosters a sense of belonging, which is crucial for long-term sustainability (8).

Emerging Strategies: Mobility, Modularity, and Hybrid Living

Innovative approaches such as 3D-printed housing, mobile units, and hybrid living models provide opportunities for rapid, adaptive, and cost-effective housing solutions. Integration with smart technologies enables energy monitoring and climate responsiveness, while modular interiors allow households to modify spaces over time. Hybrid living strategies encourage communal interaction while preserving private domestic areas, aligning with both Gulf social norms and global sustainable design principles (9).

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* Discussion

This Perspective underscores the potential of interior architecture as a central driver in sustainable social housing. By linking environmental sustainability with cultural identity, interior architecture enables context-sensitive solutions that align with both global innovation and local traditions. The Triple Helix model further supports this by fostering collaboration between government, industry, and academia, ensuring that housing solutions are technologically feasible, socially acceptable, and culturally grounded (4,10). While challenges remain, particularly in policy integration and funding mechanisms, these strategies offer a roadmap for Gulf countries to reconceptualize social housing as a dynamic, living system rather than a static product.

* Conclusion

Sustainable social housing in the Gulf requires a holistic approach that merges technological innovation, cultural sensitivity, and interior architectural expertise. This Perspective highlights the value of flexible spatial layouts, culturally informed interiors, and hybrid living strategies, supported by the Triple Helix innovation framework. Future research should continue to explore participatory design, material

innovation, and policy frameworks that enable scalable, contextually responsive social housing. By doing so, Gulf countries can foster housing that is sustainable, inclusive, and culturally rooted, setting a precedent for other rapidly urbanizing regions.

Figure 1: Triple Helix Model Applied to Social Housing in the Gulf

This figure illustrates the interaction between government, industry, and academia in driving culturally responsive and sustainable social housing.

Table 1: Comparative Strategies for Sustainable Social Housing

Strategy	Gulf Implementation	Global Examples
3D Printing & Modularity	SRTI Park, UAE	ICON Homes, USA
Cultural Spatial Adaptation	Flexible family layouts	Cohousing, Denmark
Sustainable Materials	Local stone & timber composites	WASP Earth Houses, Italy

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