

EXPLORING THE EVOLUTION OF THE MASS-EMPTY SPACE RELATIONSHIP FOR SOCIAL SUSTAINABILITY IN SHUSHTAR NEW TOWN: INSIGHTS FROM KAMRAN DIBA'S DESIGN

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ABSTRACT

Social housing projects bear significant historical and architectural importance within modern architecture, arising as responses to the urgent need for affordable and adequate housing for the working class during rapid urbanisation. Completed in 1977 by Kamran Diba Architect, Shushtar New Town in Iran stands out as a rare example of modern development in Iran built with attention to regional vernacular architecture. Its primary purpose was to house employees of a specific company, although the city was designed to accommodate families from different income groups. Today, maintaining social sustainability is a universal factor in the generic discourse of social housing. Although the term “social sustainability” was coined after the emergence of Shushtar New Town, Diba’s design considerations reflect an attempt to maximise the social sustainability of the complex. Diba conceived Shushtar New Town based on the idea of creating social and civic engagement. This research focuses on examining the role of open and semi-open spaces, such as open areas, courtyards, terraces, and patios, in promoting social sustainability within residential areas in Shushtar New Town. By analysing the resident-led changes and their underlying dynamics, the research aims to derive valuable insights for future design projects and heritage preservation efforts in social housing. Open spaces play a vital role in the social sustainability process as they offer more. The proposed methodology ensures a comprehensive understanding of spatial transformations and resident experiences in these social housing projects. In this regard, the research employs descriptive-analytical methods, library-applied research, and case studies. This research is part of an ongoing PhD thesis, at FAUP, supervised by Prof. Helder Casal Ribeiro.

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1. INTRODUCTION

In the early 1970s, Iran experienced a sharp rise in oil revenues and the political ambitions of the government led to large-scale investments. This resulted in a boom in housing construction and new urban developments. Prefabricated housing emerged as a response to the growing housing market and to shorten construction times. This method of construction, which seemed more economical and practical, was welcomed by investors. The prevailing conditions were based on a Western materialistic and quantitative approach, which was alien to the cultural and social values of Iranian society. On the other hand, the sudden development and abundance of jobs due to the expansion of industry caused massive population migration from rural areas, leading to the need to create residential complexes to house the workforce migrating to cities, and numerous residential complexes were built. The “Shushtar New Town” was also designed and implemented during these years to accommodate employees of the Karun Agro-Industry Company.

“This project is located near the ancient city of Shushtar in the southwest of Iran and follows the traditional urban pattern of Iranian cities with an interwoven urban fabric and bricks (mud) as building materials”.¹ The design intentionally incorporated the traditional elements of Shushtar’s historical architecture to maintain cultural continuity and respect for the region’s heritage.

Upon completion of the first phase of the project in 1977, the outcome was an impressive new hybrid city that effectively reintroduced Shushtar’s traditional architectural features within a modern framework. This blending of old and new elements created a unique urban environment that celebrated the historical aesthetic of Shushtar while also accommodating contemporary needs.

2. SOCIAL HOUSING

According to Davis (1995), “Social housing projects hold considerable historical and architectural significance within the realm of modern architecture. They arose in response to the urgent need for affordable and suitable housing”.²

“The core concept of “public housing” or “social housing” in Iran was formed as a result of the advent of modernisation in the 1940s”.³

The creation of social housing was undoubtedly a tool for their social engineering programme and agenda to project a progressive global image for Iran. However, this resulted in a rise in inadequate social housing provision during the 1960s and 1970s, affecting the country’s identity and people’s attitudes towards the Iranian-Islamic way of life. Criticism from opposition groups led the government to explore alternative solutions to social housing design.⁴ Shushtar New Town was presented as an alternative for developing social housing that could address the environmental and cultural aspects while meeting the physical and psychological needs of its residents (**Fig. 1**).

3. INTRODUCING DIBA’S LINE OF THINKING IN DESIGN

Kamran Diba is one of the prominent Iranian architects, having greatly influenced the evolution of contemporary architectural discussions in Iran.

1. Mohammad ali Sedighi, Shushtar New Town, Shushtar (IR), Kamran Diba (DAZ Architects Planners & Engineers, Global housing, 2016, 246.

2. San Davis. *The Architecture of Affordable Housing* (Berkeley: University of California Press, 1995.)

3. Rahmatollah Amirjani “Shushtar New Town: A Turning Point in Iranian Social Housing History.” (PhD diss., University of Canberra, 2020), 3.

4. Amirjani, “Shushtar New Town: A Turning Point in Iranian Social Housing History.”, 3.

“Diba designed Shushtar New Town based on his own perception and understanding of the region and its vernacular architectural elements”.⁵

Diba’s design method for residential projects prioritised regional cultures and people’s behaviour over the functionalist approach of Modern architecture. Diba regarded himself as a “human-friendly” or “culture-friendly” architect, aiming to meet people’s desires through design practices rooted in social and humanistic principles.⁶

Overall, Kamran Diba’s design for Shushtar New Town reflects his commitment to enhancing quality of life and social sustainability through a design approach that is both innovative and deeply rooted in cultural context. Diba’s architectural works bridge traditional Iranian architecture with modern architecture.⁷

Thus, Diba’s approach was characterised by a mediating strategy, balancing modern innovations with respect for local traditions. He focused on updating traditional design elements rather than imposing radical new concepts, maintaining a harmonious blend of old and new.⁸

5. Rahmatollah Amirjani, “An Analogical Quotation,” in *Quotation, Quotation: What Does History Have in Store for Architecture Today?*. *Proceedings of the 34th Annual Conference of the Society of Architectural Historians, Australia and New Zealand*, ed. Hevork Hartoonian, and John Ting (Canberra: SAHANZ, University of Canberra, 2017), 17.

6. Reza Daneshvar, “A Garden between Two Streets: 4001 Days in the Life of Kamran Diba” (Tehran: Bongah, 2016), 115.

7. Mohammadreza Shirazi, “From Utopia to Dystopia: Shushtar–E–No, Endeavour Towards Paradigmatic Shift”. in *Urban Change in Iran* (New York: Springer International Publishing, 2016), 234.

8. Shirazi, “From Utopia to Dystopia: Shushtar–E–No, Endeavour Towards Paradigmatic Shift”, 235.

9. Rahmatollah Amirjani, “Shushtar New Town: A Turning Point in Iranian Social Housing History.” (PhD diss., University of Canberra, 2020), 176.

10. Amirjani, “Shushtar New Town: A Turning Point in Iranian Social Housing History.”, 167.

4. KAMRAN DIBA’S THEORIES IN OPEN SPACE

Diba’s thinking in the design of New Shushtar reflects his loyalty to traditional and Iranian architecture. The central courtyard, which is one of the important elements of Iranian architecture, plays a prominent role in the spatial organisation of the investigated works. The combination of volumes in the plan has created a different shape of the central courtyard and has added to the spatial diversity of the semi-open space.

“Indeed, Diba replaced the concept of void, a Western phenomenon, with a central courtyard, an important vernacular housing element, to produce a more culturally friendly residential typology”.⁹

Diba has been able to enhance the visual appeal through the spatial sequence, which is created through open, closed and semi-open spaces, and to enrich the emphasis on form such as symmetry, rhythm and movement. This type of design aims to provide individuals with a heightened awareness of the created space, and strengthens presence.

“Shushtar New Town is clustered low-rise carpet housing with medium density settlements. This project is laid out on an undulating site near Shushtar, overlooking a river”.¹⁰

Shushtar New Town units are designed according to a courtyard housing model, providing privacy along with other well-known typological features. These designs include various two to three-bedroom and two-story houses, which are the most common types among the units. Additionally, Diba dedicated two sections of his planned project to low-rise units.¹¹ In addition, the dwellings are designed to incorporate the possibility of unit extension.

5. THE ROLE OF SOCIAL SUSTAINABILITY IN SHUSHTAR NEW TOWN

Today, maintaining social sustainability is a universal factor in the generic discourse of social housing.

Social sustainability interaction is one of the most valuable criteria in architecture, influenced by physical elements and serving as a common language among people. Architectural spaces vary and fulfil users' needs in different situations. Therefore, in architecture, people's relationships, social interactions, security and safety, as well as the quality of communal spaces, all play a significant role in social sustainability.¹²

In the Shushtar project, Diba designed the houses to be closely attached to each other, considering the horizontal density of the buildings because he believed that a certain interaction, coherence, and dialogue among residents would occur in the space between such buildings. These spaces allowed for activities such as children playing under parental supervision and residents socialising in green areas.¹³

Additionally, to address the extreme southern heat, Diba designed Shushtar's streets and open spaces to retain night-time coolness, prioritise pedestrian comfort, and enhance social interaction by eliminating car traffic and narrowing alleys.¹⁴

He avoided public greenery due to high maintenance costs, instead opting for using private courtyard gardens for shade and greenery. Although incomplete, planned gardens between housing phases were intended to keep the air cooler and fresher. These sustainable design choices aimed to provide shade, improve air circulation, enhance safety, and ensure privacy.

Shushtar's mass-empty space pattern also heightens these notions through a clear hierarchy of courtyard implementation from urban to individual unit level. The spinal open space stretching through the complex serves as an urban courtyard, and the central open space the community courtyard, and each residential unit enjoys its individual interior courtyard. Community courtyards are more effective in this project, since every residential cluster has been organised around a central open space, reflecting Diba's focus on social sustainability.

At the same time, Diba incorporated the possibility of growing and extending the Shushtar New Town houses through a few simple modifications to the walls between the units.¹⁵ This design approach enhances families' eco-dynamic and social sustainability and diversity.¹⁶

6. RESIDENT - LED SPATIAL TRANSFORMATION:

6.1. REASONS AND ADJUSTMENTS/ APPROPRIATIONS/ UNDERTAKINGS

The design and construction of the new city of Shushtar began in 1974, and coupled with Diba's departure from Iran and the changes of the revolution, the construction of the complex was slow at first and then completely halted in 1979. After that, with the start of the Iran-Iraq war in 1980 and the arrival of war refugees to the unfinished New Shushtar, the social and physical structure of the city faced challenges in providing a well-organised and hospitable environment for its residents.

With the onset of the Iran-Iraq war, residents of war-torn cities were forced to abandon their homes and seek refuge in both nearby and distant cities. Some of them settled in Shushtar New Town; not only in the newly

11. Kamran Diba, "The Recent Housing Boom in Iran- Lessons to Remember," in Linda Safran (eds.), *Housing. Process and Physical Form* (Philadelphia: Smith Edwards Dunlap Co., 1980), 41-44.

12. Esmail Zarghami, Dorsa Fatourehchi, and Mohammad Karamloo, "Impact of Daylighting Design Strategies on Social Sustainability through the Built Environment ." *Sustainable Development* 25, no. 6 , 2017, 27.

13. Fatemeh Farnaz Arefian, and Seyed Hossein Moeini, *Urban Change in Iran: Stories of Rooted Histories and Ever-Accelerating Developments*. (New York: Springer International Publishing, 2016.)

14. Mohammad Shirazi, "New Towns-Promises Towards Sustainable Urban Form from "Shushtar-No" to Shahre Javan Community." In *Young Cities Research Paper Series*. (Berlin: TU, 2013), 42-45.

15. Shahryar Khanizad, Farzane Ehsani Moayed, "Kamran Diba and the Human-Friendly Architecture , 2014." (Tehran: Honar-e Memari-e Qarn Publications, 2014), 208.

16. Rahmatollah Amirjani, "An Analogical Quotation," no. July." *SAHANZ 2017 Annual Conference Proceedings* 14, 2017, 16.

constructed houses of Phase I but also in unfinished houses and buildings, some of which lacked doors, windows, balcony railings, and had incomplete sanitary facilities. As a result, the town was occupied before it was truly ready, and under unauthorised conditions.

The residents of Shushtar New Town social housing project actively sought to personalise their houses and adjust them according to their evolving needs and preferences. Open spaces, including open areas, courtyard, terrace, and patio, played a vital role in this process. These spaces offered residents opportunities to create buffer zones, enhance privacy, foster social interactions, and more.

However, the many changes that have taken place in New Shushtar are disappointing: in one-story residential houses, some users filled up the windcatcher holes located in the courtyard walls. Second, almost all of the early tenants blocked the openings facing the pedestrian walkways. It is evident that both of these interventions were aimed at creating more privacy for families.¹⁷

For privacy, a number of residents modified their courtyards and blocked their windows to prevent visual access from other units. Some even extended the walls up to the second floor and roofed the void from above.

In three-story residential homes, due to overcrowding from war and an influx of refugees, terraces have been either walled off to expand interior space, fenced in for security, or covered for increased privacy.

Due to the increase of immigrants, multiple families occupied each unit, with each family in a single room, and occupants sharing service areas. Most of the families transformed the rooms to suit their individual needs. Some occupants even installed new doors to separate their entrances.¹⁸

“Cars, originally and intelligently planned to be parked at specific, external points in favor of social interaction and walking priority, are now either parked in front of the houses or within the garage converted. Many demolished the external courtyard walls and replaced the entry doors with gate-like doors to house cars”.¹⁹

It is not expected that the needs of the city will be halted over a period of time. Dynamism and change are factors that ensure the sustainability and vitality of an environment. However, what is lacking is a custodian with the responsibilities of a mayor who can control and guide the construction and changes under proper management.

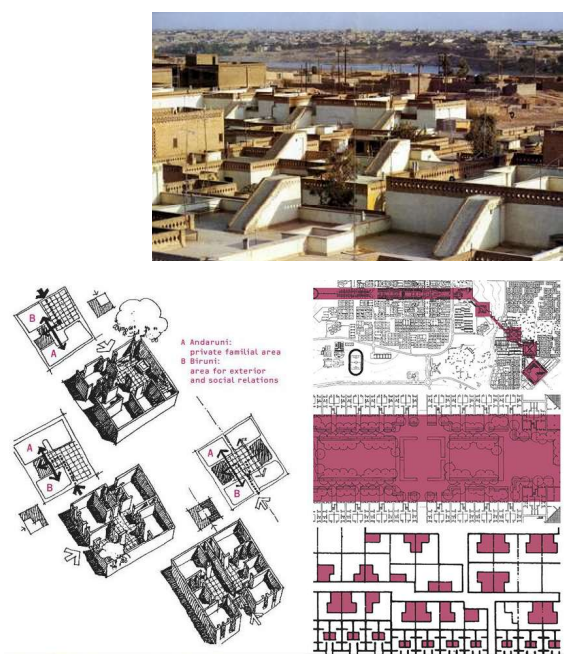
7. CONCLUSION

Based on what has been discussed in this research, it could be stated that the main objective of Shushtar New Town has been to strive for improving the quality of life for its residents. Although unforeseen social events may have hindered the project from achieving its intended outcomes, Shushtar New Town remains an important and illustrative example among new towns. Kamran Diba considers the use of all valuable environmental potentials and resources essential in creating an environment that aligns with culture, tradition, and humanity in the process of producing an architectural work. He is among contemporary architects who carefully consider various dimensions of the design context in their projects. In most of his projects, Diba, besides

17. Mohammad Shirazi, “New Towns- Promises Towards Sustainable Urban Form from “Shushtar-No” to Shahre Javan Community.” In *Young Cities Research Paper Series*. (Berlin: TU, 2013), 42-45.

18. Amirjani, Rahmatollah. “Shushtar New Town: A Turning Point in Iranian Social Housing History.” (PhD diss., University of Canberra, 2020), 214.

19. Kamran Diba, and Faryar Javaherian. “Shushtar New Town.” In *New Towns*, ed. Iraj Eetesam (Tehran: New Towns Development Cooperation, 2005), 17-30.



addressing the compatibility of functional needs, emphasises the physical situation created by the confrontation of social patterns and group behaviour, and does not separate his architecture from social meanings and dimensions. In fact, what distinguishes this project from other similar projects, both nationally and internationally, is the underlying social approach embedded within it.

Taking into account the two-way relationship between the user community and the physical structure of this town, regulated based on social-cultural interactions and ties, further emphasises its significance. This new town aims to establish a physical continuity with the historical city of Shushtar and, in addition, can be considered one of the few towns loyal to cultural-indigenous and local indices.

In the design of some units, a method has been employed that allows for the expansion of adjacent units by removing the courtyard walls. This possibility of expanding dimensions leads to internal social transformation in the neighbourhood and provides an inherent dynamic for socio-economic movement. In Shushtar New Town, Diba introduced a valuable pattern according to the needs and lifestyle of a new identity, which has a regional identity and is derived from the same social context. Although Diba's theory offered an exciting living environment and he hoped to enhance the social sustainability of the complex by increasing interaction between users and between the old and new towns, the project's incompleteness ultimately prevented it from achieving these goals. Considering that in residential complexes designed and built using mass construction methods, residents attempt to align the architecture with their lifestyle and needs by making changes. In the absence of a plan, established laws, or a management scheme for these modifications, this can lead to chaos and disorder. This results in the deterioration of the design quality, as well as wasted time and resources.

Reasons	Spatial transformation	photograph ¹
Privacy	- Filling the windcatcher holes located in the walls of the courtyard. - Blocking openings facing pedestrian crossings. - Creating a roof for the courtyard and blocking the windows to prevent the visual access of other units.	
Security	- Converting a private yard into a parking lot. - Replacing the entry doors with gate-like doors for cars. - Extending the wall up to the second floor and roofing the void from the top.	
War	- Transforming the rooms according to their own condition and needs. - Building walls inside the rooms, creating new spaces for sleeping or as kitchens. - Converting a large number of balconies into small rooms.	

Figure 1. Kamran Diba, Shushtar New Town, Shushtar, Iran, 1974-1977.

Figure 2. Urban courtyard, community courtyard, and individual courtyard, Shirazi, after Diba, 1981.

Figure 3. Author, Table 1, Resident-led spatial transformation²⁰

20. Source of all table photos: Amirjani, Rahmatollah. "Shushtar New Town: A Turning Point in Iranian Social Housing History." Doctor of Philosophy in Architecture, University of Canberra, 2020. (photographs reproduced with the permission of Rahmatullah Amirjani)

Therefore, the work does not end with the completion of the construction; rather, consistent and ongoing management of the habitation and modifications is necessary. Consequently, effective management throughout the design, construction and post-occupancy phases is crucial. In this complex, it appears that a lack of management and disorganisation has enhanced related issues. ■

REFERENCES

- Amirjani, Rahmatollah. 2017. "An Analogical Quotation," no. July." SAHANZ 2017 Annual Conference Proceedings 1-13.
- Amirjani, Rahmatollah. 2020. "Shushtar New Town: A Turning Point in Iranian Social Housing History." Doctor of Philosophy in Architecture, University of Canberra.
- Arefian, Fatemeh Farnaz, and Seyed Hossein Moeini. 2016. "Urban Change in Iran: Stories of Rooted Histories and Ever-Accelerating Developments." ham: Springer International Publishing.
- Daneshvar, A. 2016. "Garden Between Two Streets, See also the phase one plan." The Agha Khan Award for Architecture, "Shushtar New Town 161.
- Davis, Sam. 1995. "The Architecture of Affordable Housing." Berkeley: University of California Press.
- Diba, K. and Javaherian, F. 2005. "Shushtar New Town. In: Eetesam, I. (Eds.): New Towns." New Towns 15–36.
- Diba, Kamran. 1980. "The Recent Housing Boom in Iran-Lessons to Remember." In Housing: Process and Physical Form, edited by Linda Safran. Philadelphia: Aga Khan Award for Architecture.
- Hamzenazhad, Mehdi. 2014. "Ethical Sustainability in Iranian New Towns: Case Study of Shushtar New Town." Asian Social Science; Vol. 10, No 13.
- Sedighi, Mohammad Ali, Shushtar New Town, Shushtar (IR), Kamran Diba (DAZ Architects Planners & Engineers, Global housing, 2016, 246.
- Shirazi, Mohammadreza. 2013. "New Towns- Promises Towards Sustainable Urban Form from "Shushtar-No" to Shahre Javan Community." In Young Cities Research Paper Series. Berlin: TU.
- Shirazi, Mohammadreza, 2016, "From Utopia to Dystopia: Shushtar-E-No, Endeavour Towards Paradigmatic Shift". In Urban Change in Iran (New York: Springer International Publishing).
- Zarghami, Esmail, Dorsa Fatourehchi, and Mohammad Karamloo. 2017. "Impact of Daylighting Design Strategies on Social Sustainability through the Built Environment." Sustainable Development 25, no. 6 (2017): 504-27."

BIOGRAPHIES

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Helder Casal Ribeiro, Architect (FAUP, 1992), holds a PhD in Architecture with the thesis "The Experimentation of the Modern in the work of Mário Bonito: a design process from the 40s to the 60s" (FAUP, 2013). He has been a professor at FAUP since 1999 and is currently an Assistant Professor at the same institution, teaching UC Project 3 of the Integrated Master's Course (MIARQ) and the Curricular Units of the Doctorate Programme in Architecture (PDA).

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