

PROTECTIVE ARCHITECTURAL FEATURES IN HOUSING DESIGN FOR PRIVATE CULTURES

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ABSTRACT

This paper focuses on housing design for private cultures such as Islam. The suggested design approach is monitored through the assessment of Mirbat (Dhofar Governorate, Sultanate of Oman) domestic architecture. This research builds on the authors' previous works in protective architectural features and a survey of residential satisfaction, that identified the importance of housing privacy to residential satisfaction in private cultures and suggested the need for privacy is not met in modern residences. Through a comparison of traditional and contemporary Mirbat's residences features, the authors identify that protective architectural features that were employed in traditional residences which contributed to privacy provision of the inhabitants are no longer employed in contemporary housing design (or used as decorative elements). Therefore, this study takes the next step and proposes a new approach of residence design which can accommodate the privacy required in private cultures. Furthermore, through the employment of traditional housing protective architectural features in a modern setting, the authors propose a residential layout model that considers inhabitants' social background, traditions and lifestyle that could serve desired privacy. Finally, the authors evaluate the proposed residential model according to the privacy criteria (as identified through the residential satisfaction survey) and conclude that suggested approach in layout and the proposed model satisfy residents' privacy needs and has potential applications in private cultures such as Islam, as well as in other cultures for safety provision.

Keywords: private cultures, Islamic cultures, privacy, protective architectural features, housing design.

1 INTRODUCTION

Residential design in architecture is a challenge, especially when social transformations are happening in the built environment. These transformations may be affected from material use to wider phenomenon of globalization and urbanism. As Rapoport states, built environments have various purposes where the main purposes are to shelter people and their activities from climate, from any kind of enemies by providing a safe space, to stress social identity and indicate status [1]. Most importantly, according to Rapoport the socio-cultural factors are more important than climate, technology, materials and economics in influencing built form and that even the humblest dwellings are more than material objects or structures but they are institutions, basic cultural phenomena [1].

When housing is considered in private cultures such as in Arab Gulf countries and other Islamic cultures, the concept of privacy has always been of a primary consideration and traditional houses were built to adapt to the local natural habitat to satisfy societal and cultural values, which supports the claim of the Rapoport [1] and the previous research of Cazacova and Yapicioglu [2]. Islamic architecture designates certain cultural norms [3], particularly its strong accent on the highly societally valued attribute of family privacy. As the home is considered a social unit whose structure cannot be disassociated from the family living inside it, Islamic architecture particularly prioritizes the human needs of safety and privacy. By designing from inside out and implementing a strong spatial hierarchy, traditional Islamic architecture satisfies inhabitants' desires for both privacy and social contact [4], [5]. As a matter of fact, in a world where the privacy and security of the



home has emerged as a core privacy issue [6], some lessons in housing design can be learned from Islamic civilizations. Ragette [7] uses Germany's Ruhr district as an example of how western architecture has borrowed from eastern. In this setting, closely packed Arab-style courtyard houses were adapted into a settlement known as little Jerusalem. Ragette [7] describes the settlement as uniform construction consisting of houses up to 4.5 m in height, with simple whitewashed walls and very few external openings where the interior spaces are arranged around an inner courtyard, with parking located beneath the structure.

As previous research of Cazacova and Yapicioglu identified [2], in traditional Arab cities that are distinguished by their organic pattern, lack of open spaces and densely arranged housing units, the notion of privacy and hospitality has a significant influence on home culture and housing formation. This close relationship between culture, lifestyle and housing differentiates Islamic architecture from that of other cultures. Another distinguishing feature of Islamic architecture is the traditional courtyard community that is the customary residential form. Enclosed within the house's exterior walls and safeguarding the interior spaces, the courtyard extends the interior space, provides shade and protection against wind and sand and privacy to its inhabitants.

However, privacy concerns can limit designers' freedom and, therefore, contemporary architects often compromise it in favor of other principles such as aesthetics, modernism and construction cost. In this transition from traditional to contemporary lifestyle, the dwelling design lost its relationship with culture and geography, and therefore the ability to satisfy the local requirements for subjective safety and visual privacy (or, conversely, the absence of fear that cultural values are threatened) [2]. Furthermore, these changes happened so rapidly that they are more of transformations rather than adaptations, however the modernist ideology was unsuccessful in making similar changes in social values of private cultures, especially visibility concerns of the female population in these cultures. This study seeks to fill the void in information about the preferences of women in private cultures and proposes a design layout which might serve the privacy concerns of the female population in these cultures without affecting its identity. As Hassan Fathy [8] quoted in Petruccioli "culture is the result of the interaction between man's intelligence and his environment in order to satisfy his physical and spiritual needs".

Furthermore, as Rapoport [1] states, in certain societies certain forms of housing were rejected because of tradition embedded in the society and this is where the culture and form relation persisted for many years where we see similar layouts of dwellings in certain cultures. Not only this allowed the traditions to continue, but also allowed the society to practice their traditions the way they are accustomed to without being concerned of their daily practices. This article, then, following the dissatisfaction of the users of the contemporary housing in private cultures [2], tries to evoke the observation of Rapoport [1] and questions the contemporary layout of housing in private cultures and suggest a new form and layout where we can connect culture and form again in private culture.

2 PREVIOUS STUDY OVERVIEW

This research builds on the authors previous study on tenants' satisfaction with residences design in private cultures that showed residents dissatisfaction with contemporary residences design [2]. Through a survey of one hundred two traditional dwellings in old area of Mirbat in Sultanate of Oman conducted in 2014 [9], various housing typologies, distinguishing features and factors influencing those features were identified. Of these, the key factor that influenced the design of the traditional residence identified was protective requirements due to the strategic location of the town. The urge of providing a safe and



private dwelling to live in influenced the design of the dwelling through features such as block type, layout and courtyard, multiple entrances, façade, parapets with crenels/merlons, a massive gate-like wooden door, small double-framed windows, thick walls, etc. Therefore, this study takes the next step further and proposes a new approach of residence design which can accommodate the privacy required in private cultures. Furthermore, through the employment of traditional housing protective architectural features in a modern setting, the authors propose a residential layout model that considers inhabitants' social background, traditions and lifestyle that could serve desired privacy.

These protective features are listed in Table 1 and coded as: PF1 (layout): houses shared walls and narrow streets, houses' massive and blank exterior walls, inner courtyard; PF2 (façade): limited windows that face the main street are located on the upper level; PF3 (roof terrace): high parapet with stepped crenels/merlons to observe the streets without being exposed; PF4 (doors): multiple doors with massive interior locks as escape routes, main gate-like door with small opening for access restriction; PF5 (windows): limited street-facing windows; fixed window-screens, inner shutters and locks; PF6 (screens): screened passageways on ground and upper floors and around the courtyard; PF7 (parapet spots): originally designed as viewing devices.

Table 1: Mirbat traditional houses design features influenced by the protective requirements.

Protective feature	Features intensification			
	Code	Code	Code	Code
Photo	Layout – PF1 	Façade – PF2 	Roof parapet – PF3 	Door – PF4 
Photo	Window – PF5 	Screen – PF6 	Spots – PF7 	

3 RESEARCH METHODOLOGY

Assessing the problematics of privacy (the women's feelings, opinions, needs and preferences regarding residential visual privacy), and typology of traditional housing which provided privacy, the authors proposed a new model combining the two main principles; privacy and protective features. The new design method of the residential model and its performance is further evaluated by its examination against the criteria (consideration in the design process) created (based on theoretical framework) and listed below:

- Criteria 1 – Cultural background and residents' lifestyle
- Criteria 2 – The universal right for privacy

- Criteria 3 – Strict interior spaces' division by function
- Criteria 4 – House design from inside–outside
- Criteria 5 – Local legislations/restrictions in housing design.

After creating the new model, the new model was tested through a survey among 100 Mirbat female residents. The purpose of the interviews was, again, to assess the women's feelings, opinions, needs and preferences regarding residential visual privacy and to evaluate whether the new model can suffice privacy issues (being observed by neighbors) that the female residents felt uncomfortable with.

4 MODELLING A NEW RESIDENCE FOR PRIVATE CULTURES

The challenge of the modeling a new residence for private cultures is to resist the influence of Western ideology in architecture which suit a completely different culture and environment which is alien to an Islamic community. As it was shown in previous studies by Nafeesi [4], where imported Western technology, planning and construction expertise resulted in direct imitation of Western models that is not designed to accommodate privacy required. Refusing western technology and changing environment conditions is not the intention here but the essence of the culture and adapting Islamic values in the forms of architecture with regional identity and to principle of Islam is of importance.

4.1 Design method formation

Motivated by the results of previous research that shows the contribution of architectural housing features to the residents' privacy, this section proposes a new method of residence design for private cultures and employing protective features identified earlier (Table 1). Miller and Buys [10] consider planners and developers as key actors in the housing system that are responsible for the forms of human habitation, we experience. Therefore, the primary step on this design process is suggesting a layout for the neighbourhood considering the local culture and residents' lifestyle as well as local government regulations (The land plot provided by the local government for a family dwelling is usually 600 m², except the plots located at the edge of the quarter that can be up to 700 m²) [11].

In the proposed residential quarters, each dwelling occupies the whole area of the reserved land plot and is set 1.5 m back from the perimeter. Dwellings are located along the main and secondary streets, wherein the secondary roads are provided after each two rows of houses as per the municipally planned grid pattern (Fig. 1). The street elevation is uniform with one-and-a-half-, two- or three-storey that setback from the perimeter (Fig. 2). There are two types of dwellings proposed – large and medium (considering the average family members' number in Dhofari families). Each dwelling accommodates a single family, wherein its size depends on owner's wealth and its height on the number of wives the head of the family has. Each floor of the dwelling houses one wife and their children.

4.2 Modelled residence interior layout description

The second step of the design process suggests the interior layout of the dwelling. For offering a high degree of privacy as culturally required, protective features are integrated in the layout. Interior spaces are allocated according to the hierarchy that defines them as private, semi-private, and public. Wherein, Majlees (reception hall for male visitors) is classified as public, entry hall, sallah (living room), dining area, kitchen and courtyard are



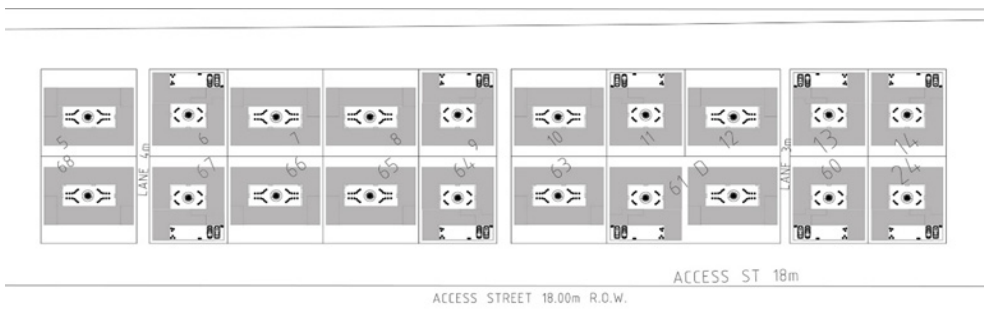


Figure 1: New modelled quarter for Mirbat.

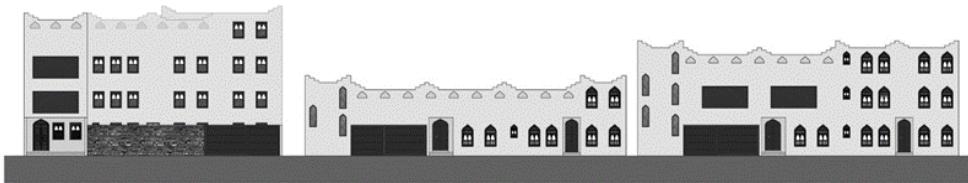


Figure 2: Street elevation composed of new-modelled residences.

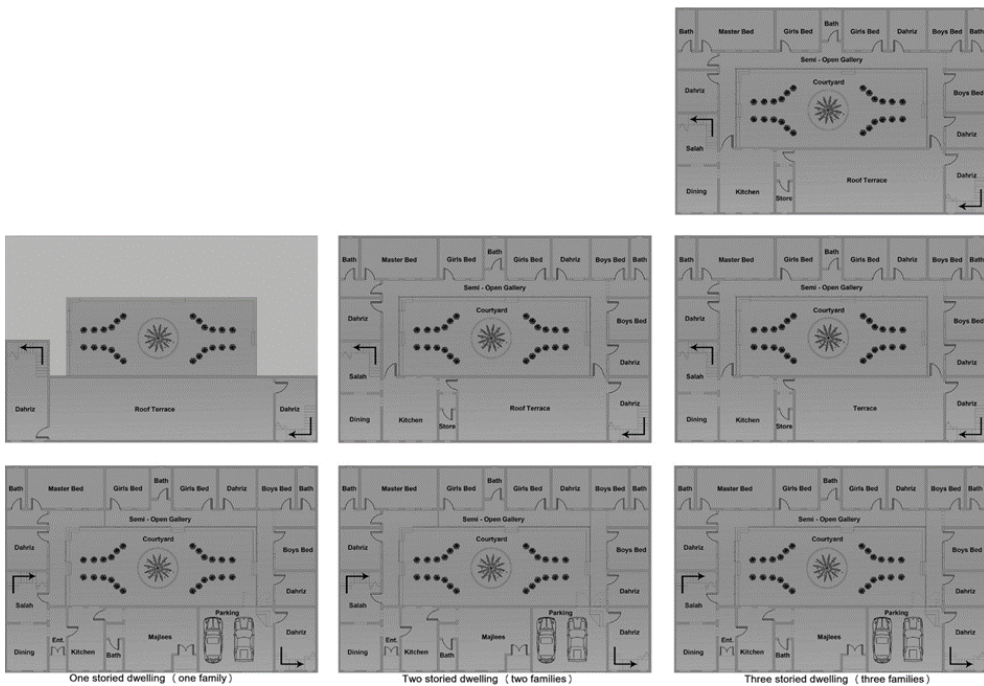


Figure 3: The layout of the new-modelled residence of large size.

classified as semi-private and family bedrooms and bathrooms as private. The respected hierarchy ensures family's privacy from outsiders as well as within the residence. The interior spaces are located along the four boundaries of the land plot, forming an inner courtyard into which the windows of the private spaces open. Public spaces windows face the street and semi-private either the street or courtyard. The Majlees (as is a public space) has a segregated entrance and an adjacent bathroom restricting the visitors access to semi-private and private spaces. The kitchen's location between the Majlees and the sallah is adjusted to the dining room and allows food to be served to both spaces without compromising visual privacy of the residents (Fig. 3).

There are two entrances for family members – one via a T-shaped corridor (for the inhabitants of the ground floor – usually first wife and her children) that is bounded on either side by the kitchen and dining area/sallah and the second one via parking for the inhabitants of the upper floors. A segregated entrance is provided for accessing the Majlees by the male visitors of the dwelling. Dahrizes (multi-purpose room for family use) are located on the right and left of the courtyard, while bedrooms and private bathrooms are located at the very rear of the house and are accessed via gallery. The windows of all private spaces (bedrooms and dahrizes) are equipped with shutters and/or screens. The gallery connecting the private spaces to the semi-private is screened too and can be either glazed or unglazed. The gallery facilitates privacy within the family disallowing the private spaces to be overlooked from the inner courtyard, which is used by all family members. The windows of the private bathrooms face the street, but are screened, located next to the ceiling and equipped with exhaust fans to ventilation enhancement.

The stairway that allows vertical transit is situated in a dahriz that is accessed from the parking area, which is itself protected from being viewed from the street by a sliding gate and from the courtyard by a gated door with a small opening. Terraces of the residence are laid out in a similar fashion, with one-storey residences featuring an open roof terrace above the public and semi-private spaces, and two- and three-storey residences featuring a semi-open terrace (Fig. 3).

The medium residence differs from the large not only by size, but also by the number of courtyards and parking location only. While the large residence has only one courtyard (inner) and a parking lot which can be accessed from both the courtyard and the dahriz, the medium residence has two courtyards: inner and adjacent. The adjacent courtyard, which is surrounded by a high, gated wall, accommodates the parking area. The layouts and spatial categories of the two residence sizes are otherwise similar (Fig. 4).

4.3 Application of protective features to a new model

The new modelled residence distinguishes between three levels of privacy: first, second and third (Fig. 5) each of which is achieved through the application of protective feature in design.

First-level privacy spaces (private rooms) require separation from outside the house (the street and neighbours) as well as from semi-public and public spaces within the house. This first-level privacy is achieved by employing the following protective features: PF1 (entrances segregated from inner courtyard via a gallery; area division for parents, girls and boys), PF6 (semi-open screened adjacent gallery) and PF5 (courtyard-facing windows with outer screens and inner shutters).

Second-level privacy spaces (semi-private rooms) are shared by family members and require visual separation from both the outside and the house's public spaces. This level of

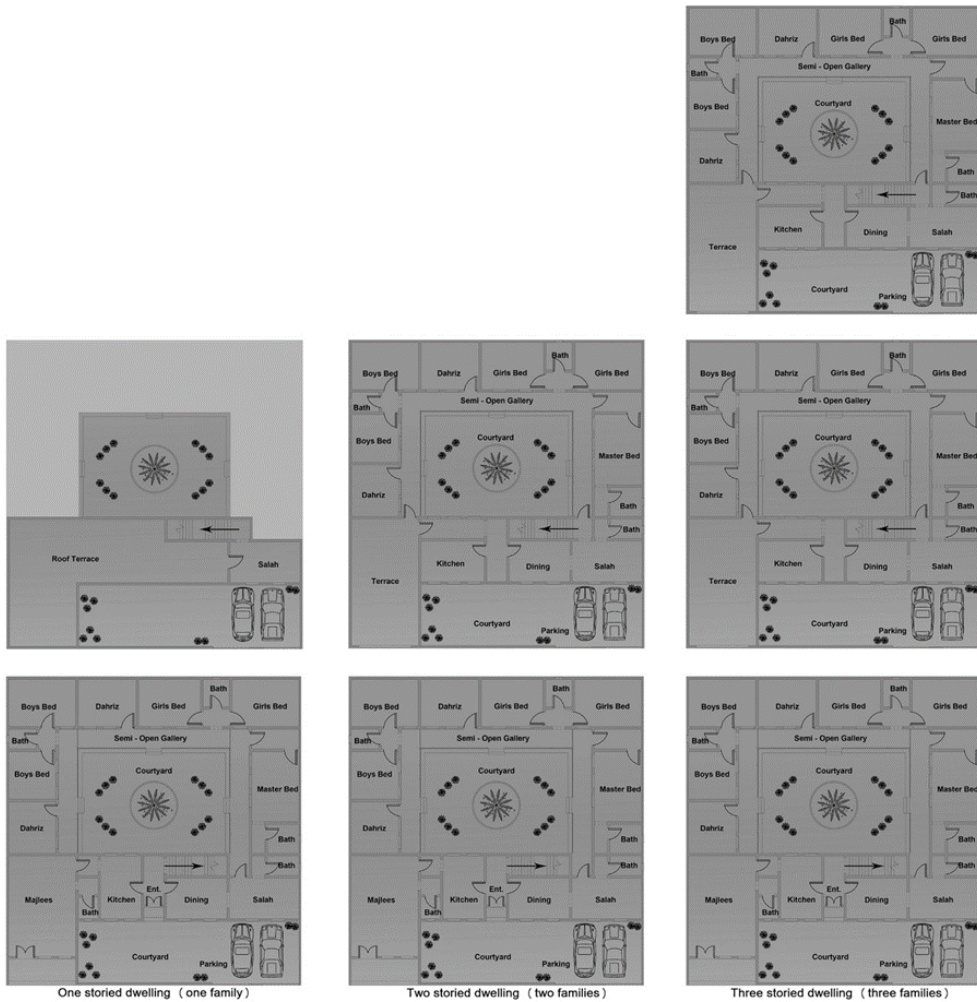


Figure 4: The layout of the new-modelled residence of medium size.

privacy is primarily achieved by PF1 features (location along street-facing façade; family entrance via T-shaped corridor; indirect connection of kitchen with majlees; family-only access to inner courtyard). Additional elements such as double-gated parking (a sliding outer gate facing the street) and PF4 (gated door with a small opening leading to the courtyard), PF5 (triple-framed windows with outer fixed screens and inner shutters facing both the street and the courtyard), PF6 (screened terrace), PF3 and PF7 features are applied to safeguard inhabitants' privacy from the outside. As third-level privacy spaces (public) are used by male visitors only and do not require any visual separation from the outside but requires direct access from the street; this is achieved by PF1 features. Additionally, street-facing windows in these spaces are screened.

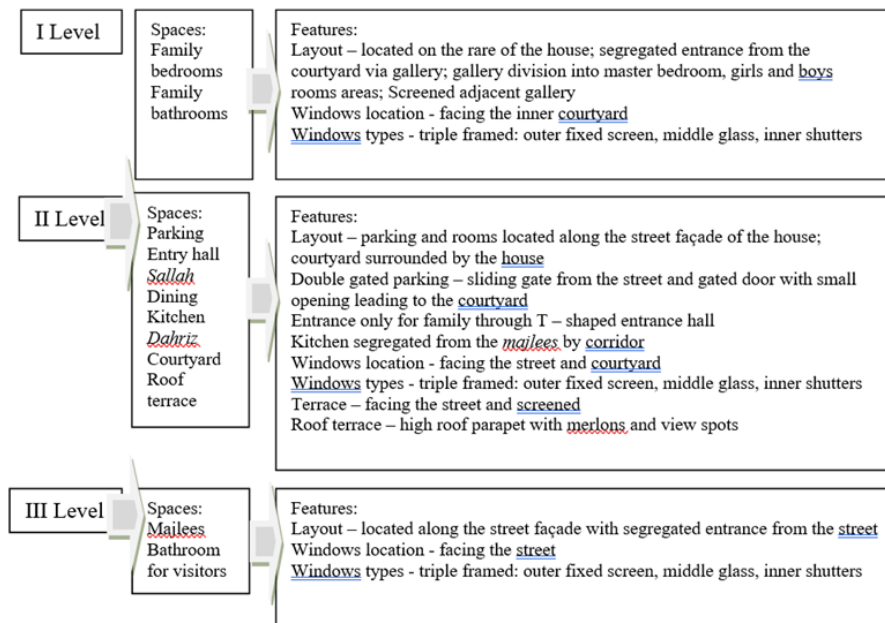


Figure 5: The methods applied in residence design for privacy.

5 RESULTS, DISCUSSIONS AND CONCLUSIONS

The proposed model of the dwelling for private cultures is assessed according to the five criteria set previously that are: Criteria 1 – Cultural background and residents' lifestyle; Criteria 2 – The universal right for privacy; Criteria 3 – Strict interior spaces' division by function; Criteria 4 – House design from inside–outside; Criteria 5 – Local legislations/restrictions in housing design.

The evaluation of the new dwelling model with the application of protective features according to the criteria 1 shows that the new design method considers the local social values and traditions. This is expressed by interior spaces' layout and residence elevations' features. Criteria 2 is considered by providing the female inhabitants indoor and outdoor secure spaces, which are not overlooked by visitors and by neighbours. Basically, the design aims to satisfy female residents' desires for privacy as dictated by local culture. Strict spaces division into first, second and third privacy levels and their location within the house fulfils the third evaluation criteria. The residence is designed from inside–outside (criteria 4) and starts with allocation of the first level privacy spaces on the very rare of the house. To satisfy criteria 5 the design considers the local restrictions for setback, privacy, layout and exterior features.

Furthermore, post design evaluation of the residence via survey shows that 76% of the young and 91% of elder respondents will be able the courtyard, only 15% (33%) of them will still curtain the windows, and 72% (85%) will use the terraces and balconies without compromising their desires for privacy. Furthermore, 82% (53%) of the survey's participants would not be afraid of being observed by their family's members and 95% (92%) of being exposed to the visitors, neighbours and by-passers. Most of the respondents (92% and 87%) evaluated the residence as satisfying the desires for privacy requested by their culture (Figs 6 and 7).

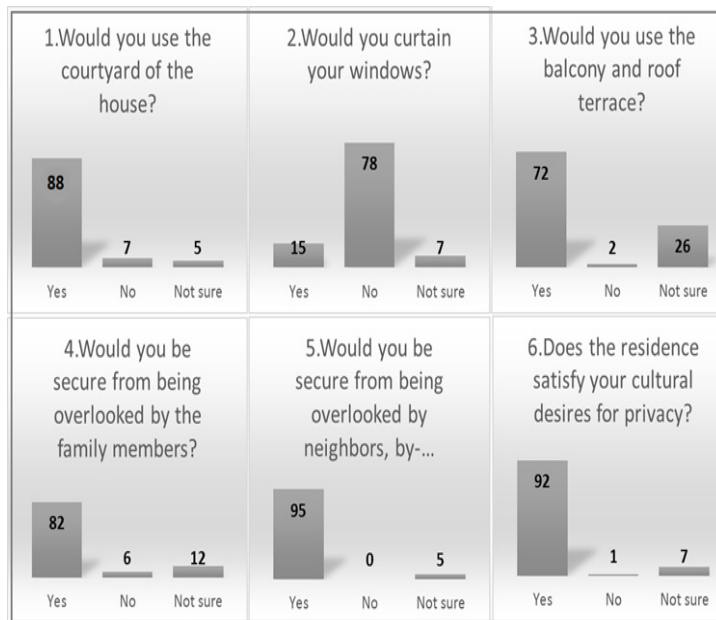


Figure 6: Post design evaluation of the modelled residence by the future users (young generation).

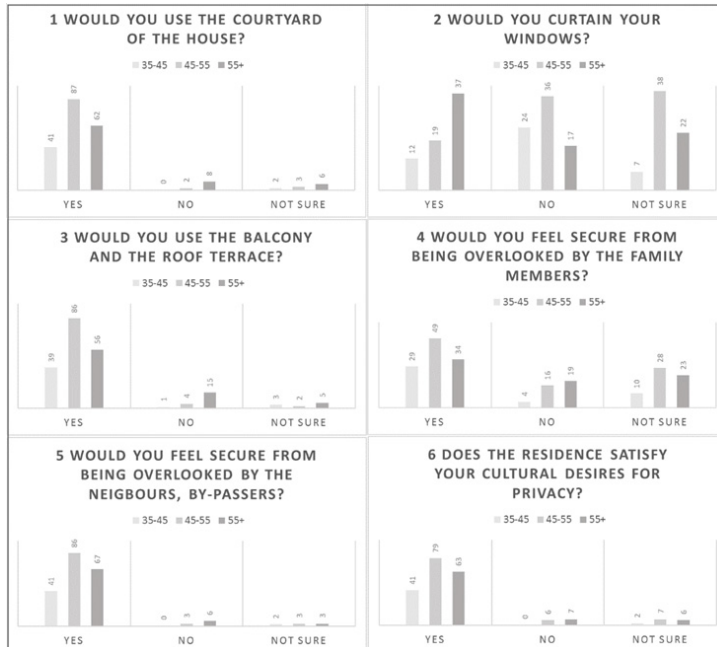


Figure 7: Post design evaluation of the modelled residence by the future users (elder generation).

As demonstrated in Mirbat's case, and as was mentioned in the introduction sections, the traditional courtyard house has been displaced by more modern structures that are less able to offer subjective safety, which refers to the feeling of security. According to Al-Kodmany [12], there are, two conflicting perspectives interpret the importance of residential visual privacy to women in private cultures. One perspective is that modernization in these cultures have decreased the women's desire for visual privacy to the "outsiders" since the shift from the private to public and women interact with the public in a direct and open way. The other perspective, however, claims that traditional attitudes to residential privacy still prevails and women in these cultures prefer inwardly designed traditional homes and neighbourhoods. Hence, local planners and architects should adopt the traditional Islamic model, similar to that seen in the existing traditional sections of the cities. Our research in this paper also show that the new proposed model satisfies the privacy which is valued by the female population in this culture and preserve local customs and cultural values.

The evaluation of the new design methods according to the five criteria shows positive results and, therefore, the suggested method of residence design model has potential applications in any other private culture for housing modelling. In answer to the research questions posed in introduction section, traditional housing features influenced by protective requirements safeguard inhabitants' privacy and safety; hence, their employment in the proposed new house design will fully satisfy residents' privacy needs. The suggested model has potential applications not only in Islamic cultures, but in other private cultures as well where we can connect culture and form again in private culture.

ACKNOWLEDGEMENT

The authors would like to thank Ms. Maria Christina Hidalgo, Al Seddah Décor, Saffarini Traiding LLC, who produced the drawings for the article.

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