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Between Tradition and Modernity: Urban Courtyards and Canopies in Residential Areas of Historic Arab Cities

Abstract:
This paper discusses the functional, compositional and aesthetic role of urban canopies in the residential areas of Arab cities. Residential areas are understood across three problem scales: those of the district, the plot and the residential building itself. The objective of this study was to identify traditional and contemporary solutions in terms of spatial, functional and formal urban courtyard and canopy design. The study included an analysis of selected cases of various types of architectural and urban solutions present in residential areas with a focus on their accessibility, form of use, and architectural forms, as divided into traditional and contemporary solutions. The analyses resulted in recommendations for contemporary interpretations of urban canopies with the intent to preserve the value of local construction tradition, as well as modern needs linked to the necessity of implementing pro-environmental solutions on the architectural and urban scales.

Keywords: courtyards, urban canopies, traditional and modern coverings, pro-environmental orientation, Arab architecture

Introduction

Indigenous urban and architectural patterns of residential areas are found in many parts of the Arab world, reflecting the cultural lifestyle of its inhabitants. These patterns underline their relationship with the natural environment in which the inhabitants live. One of these patterns is the courtyard, which was invented millennia ago and was first observed to be used in Neolithic settlements, and is an element of Mesopotamian architecture (Sumerian and Babylonian). As a prototype, courtyards originally performed two functions. In the first, the internal environment is controlled and an optimal climate is provided, considering the environmental aspect of sustainability; in the second, it offers privacy and isolation from external factors. As underlined by Fathy (1986), the courtyard, especially in Arab culture, is something more than an architectural solution intended to ensure privacy. It is a part of the microcosm that illustrates the order of the universe. In Arab architecture, the urban courtyard has many functions. It serves a social, environmental and aesthetic purpose. As it is a meeting place for users, its presence is essential. There are many types of buildings that contain courtyards, including public buildings, but courtyards and urban canopies are of special significance within residential areas and private buildings. Nevertheless, globalization, urbanization, and technological development affect traditional architectural and urban patterns. Consequently, most of the developments lack proper links to the social and cultural roots of their occupants. Remarkably, the courtyard style of the buildings has been disappearing from Arab architecture and due importance is not always given to preserving and implementing these elements – which once played a significant compositional and functional role – in contemporary housing areas.

1. Problem Identification, Research Scope and Method

Nowadays, there is an observable lack of consideration for regional characteristics and local climate in contemporary housing in most Arab countries. Conversely, vernacular courtyard housing is highly adaptable to a variety of climatic conditions. As a result, its architecture offers key lessons that contribute to today's vibrant Green Architecture agenda, which is based on passive, low-energy design and environmental sustainability. It should be accomplished not solely through technological development, as is commonplace in Western countries, but by using a variety of other techniques. These include a reinterpretation of vernacular strategies in order to align them with the lifestyles and cultural background of current residents. Furthermore, in Arab countries, the rules and regulations governing housing and planning law are modeled after Western practices (Amer, 2007, p. 18). As a consequence, it has become necessary to implement advanced mechanical ventilation systems in order to create habitable and comfortable living conditions for the inhabitants of contemporary urban housing in hot climates. Energy consumption is high as a result of this situation. In addition, in the Arab world, the use of imported design methods, building materials, and construction systems results in the development of unsustainable housing.

In reference to above mentioned aspects, this paper tackles the problem of urban courtyards and canopies in the context of their functional, compositional and aesthetic meaning within residential areas of Arab cities. The authors, by presenting the state of research and

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their own original analysis, made an attempt to answer the question as to how should traditional solutions be currently interpreted, as they could preserve local construction tradition and meet the requirements of pro-environmental civil engineering and architecture. The objective of this study was to identify the spatial, functional and formal solutions (divided into traditional and contemporary) in terms of urban courtyards and canopies located in residential areas. In this study, residential areas were investigated across three problem scopes:

- that of the district, with a specific emphasis on the role of the street as a buffer between public and private spaces,
- that of the plot, along with the development of garden space,
- that of the residential building itself.

The authors identified urban layout elements such as architectural solutions, distinct for the traditional architecture of the residential areas of Arab cities. The analysis of urban courtyards and canopies, as divided into traditional and contemporary solutions, was performed in reference to:

- their accessibility,
- space type,
- form of use,
- and architectural forms.

The analyses resulted in recommendations for contemporary interpretations of urban canopies with the intent to preserve the value of local construction tradition, their functional, compositional and aesthetic role, as well as modern requirements that necessitate the application of pro-environmental solutions on the architectural and urban scales.

2. Theoretical Background – Role of Urban Courtyards and Canopies in Arab Housing Architecture

Sustainable development is a major paradigm of contemporaneity. It considers the balance of various factors, including the value of cultural heritage (Bouvier, Wu, 2021). In reference to the above, the preservation of traditional Arab architecture, which is sustainable, climate-stable and vernacular,[1] well-adapted to its local cultural requirements and cost-effective, is of profound significance (Salat, 2010). Space, architecture and nature must constitute a unity of functionally and spatially interconnected elements that affect that aesthetic and visual quality of a given space (Seruga, 2021, p. 67).

The use of distinctive architectural and urban solutions presents in traditional patterns that can be adapted to modern functional, formal and aesthetic needs is therefore acting in the interest of not only the preservation of heritage, but sustainability as well. Creating modern architecture, including architecture that utilizes the benefits brought by technological progress, should always be compliant with the spatial and cultural specificity of a given region (Frampton, 1983, p. 21). Contemporary architectural solutions should account for the environment in which they will be placed (Zumthor, 2010, p. 51), they should be rooted in knowledge about the place, its values and impressions associated with its perception (Eberle, 2018, p. 21), which consider the needs and habits of the region's inhabitants (Avsec, Jagiełło-Kowalczyk, 2021; Jagiełło-Kowalczyk, 2021, pp. 116, 118). The use of existing cultural codes that reference a given region's tradition and history are essential in the contemporary, global world (Chmielewski, 2017). Urban courtyards and canopies, traditional in Arab cities, can support the shaping of pro-environmental spaces which, by reflecting traditional urban layouts, are also attractive from a contemporary perspective (Ill. 1). When reorganizing old layouts with the use of modern solutions, one can create a suitable spatial structure that expresses its identity while being defined anew (Abtahi, 2015, p. 525).

Material selection, with a specific emphasis on domestic materials that contribute to the quality of the built environment, energy consumption and climate quality, is also crucial. When designing new architectural and urban solutions, one must currently consider precepts

Ill. 1. Vernacular courtyard housing in Syria by Mahmoud Elwerfalli, source: Contemporary Courtyard Houses of Libya: New Directions in Sustainable Housing Development, Manchester 2016, p. 45

that foster the best possible combination of a building's use and massing, a harmonious integration with the environment, a pursuit of improving energy efficiency and provide an eco-friendly comfort of use (Kamionka, 2022, p. 65). Properly designed courtyard canopies for housing development also provides access to a suitable amount of daylight (Acosta et al., 2018) and contribute to proper air circulation (Amiriparyana, Kiani, 2016).

3. Research Part -Identification of Major Characters of Urban and Architectural Patterns in Arab Cities

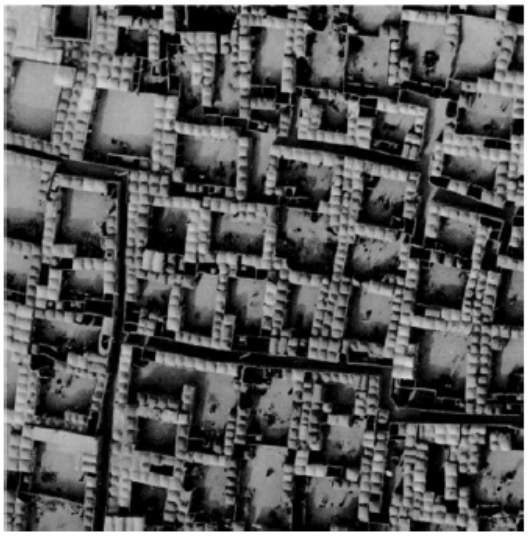
3.1. Historical Background

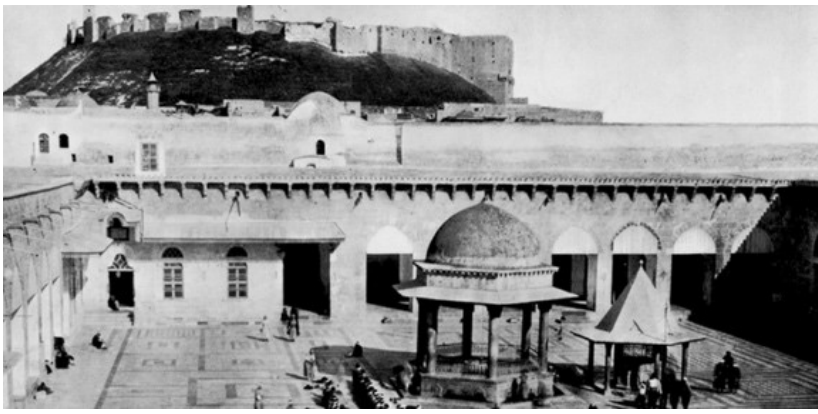
When we look at the broad region of the Arab world, we will find that all traditional Arab cities have the same general composition and planning (Ill. 2), making it difficult to distinguish them or to locate them based on pictures or plans (Febri, 2014, p. 3). Despite their differences in climate, language and customs, all Muslims have settled in a similar manner regardless of where they live in the world. Islam was introduced at a time and place where there was no sense of community in urban life. Thus, the Arab urban social organization had some architectural implications. There is no traditional Arab city that does not have a Friday mosque (*Masjid al-Jami*) as its focal point. Another strong element is a central bazaar (*soug*) where each trader had his own quarters along its only two main thoroughfares. Many citadels and palaces were isolated from the rest of their local city by massive walls. A massive wall surrounded the city, with several gates and watch towers to prevent outsiders from invading. There were densely populated neighborhoods within the city walls, with each tribe and ethnic group having their own district (apart from small mosques and baths). Any Arab city can be divided into two parts according to its planning. The first part is the overall rigid section of the city or its planned part, which was usually arranged by the city's sultan or amir, and was strongly influenced by the communal needs of society. The second part was the residential area, which had great freedom in terms of construction.

The courtyard dates back more than 5000 years ago. The courtyard has been used as a gathering place since prehistoric times (7500–5400 BC): by ancient civilizations that existed more than 5000 years ago, including Egypt, Iran, China and Mesopotamia, as well as classical civilizations such as Greece, Rome and Byzantium, as well as in medieval Europe. It is a well-known fact that the Sumerian courtyard house, with its open interior looking towards the sky and closed outdoors, has been referred to as the most famous courtyard house in Mesopotamia. The human race has been building houses for thousands of years. It is generally accepted that this design is more recognizable in the arid climate of the Middle East. As time progressed, courtyards began transforming from open to covered ones, enabling formerly exclusively outdoor activities to be carried out indoors (Malik, Rashid, 2016, p.78).

Following Mesopotamian civilizations, in the Middle East empires, most Arab countries used courtyards in their residential houses as well as temples and palaces. In addition, they placed temples and palaces in their residential areas. In Islamic ideologies, the basic house or dwelling is regarded as a model of simplicity. There is a character of simplicity that can be seen in the shape of the holy house of Allah, which is one of the most sacred places in the world. It is built in the modest shape of the Kaaba – a cube. This is in accordance with the religious beliefs of Muslims. The design of the house is also influenced by the teachings of the Qur'a n and the Sunnah. Traditionally, a courtyard house was meant to resemble paradise, with an enclosed garden in the middle containing a pond to represent divine patterns (Malik, Rashid, 2016, p. 78).

Ill. 2. Left: Aerial photo of the west-central area of Tunis Medina, source: Hakim B.S., Arabic-Islamic Cities Building and Planning Principles, Kegan Paul International, London 1986, p. 40. Right: Islamic architecture's most ecologically adaptive urban dwellings are found in traditional Islamic cities, source: Islam and the Arab World, New York 1976, p. 109





Ill. 3. Left: Azzam Palace Courtyard, source: Andrew Petersen, Dictionary of Islamic Architecture, London 1996, p. 2. Right: Courtyard of the Umayyad Mosque in Aleppo, Syria, source: Islam and the Arab World, New York 1976, p. 42

3.2. Analysis of Courtyards and Canopies in Residential Areas

3.2.1. Residential Blocks

In each block, the population was homogeneous, with the same occupation, income, origin and religion (different sects of Islam and other non-Muslim minorities). The blocks were the size of small villages, with fifty or more blocks per settlement. Traditional Muslim settlements had many blocks, but the feeling of unity and solidarity was strong. This solidarity can be attributed to religion, the homogeneity of social classes, wealth, and occupation. Most blocks close to a citadel were wealthier than those adjacent to a city's walls. Families or household members' feelings and responsibilities were strongly influenced by the inner organization of the blocks (Elwerfalli, 2016).

There are two types of courtyards that can be classified as interior and exterior courtyards, respectively (Ill. 3). There were interior courtyards placed somewhere in the middle of the dwelling, surrounded by other rooms, acting as a kind of atrium. Conversely, exterior courtyards provide a protected area adjacent to the house, bordering it from the outside. In addition, they are adjoined to the dwelling units, but are not enclosed by the surrounding rooms.

3.2.2. Streets

- Different types of streets exist depending on their function,
- Urban patterns are organic and irregular,
- Walls are high and streets are narrow. There is very little detail on the exterior walls, giving the impression of walking in a trench,
- Views are interrupted by sudden angles and closed vistas when moving,
- Narrow streets give a sense of security. By keeping the streets cold and far from sunlight, narrow organic planning helps the environment.

As already mentioned, Arab Islamic studies on traditional urban fabric (Hakim, 1986, p. 124), in order to determine the urban form of an Arab city, it appears that three variables have to be taken into consideration:

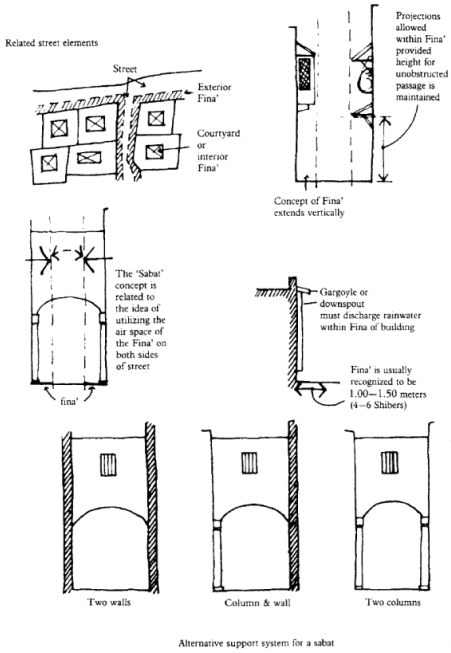
- The number of variables involved in determining organizational, planning and design considerations according to streets and paths as well as the global physical frame, as well as local housing relations and types of buildings,
- Buildings and organizational elements should be combined as a whole,
- A description of the basic building elements and their values in terms of materials and techniques.

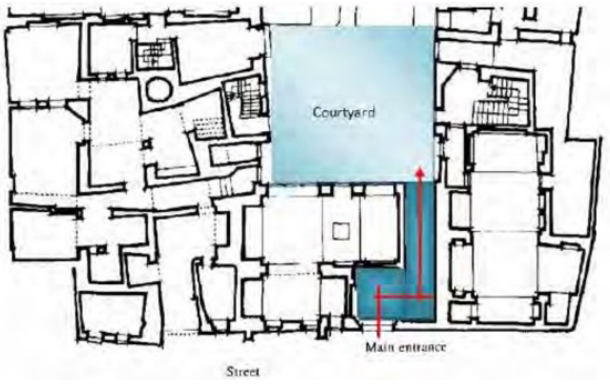
Hakim also explained that organizational, planning, and design variables are related to a wide range of elements, such as: the street system in place as well as elements that are located above the streets (Ill. 4).

3.2.3. Gardens

Gardens always feature water, usually a fountain or a small pool in the center, with a palm tree and some pots around it in a lush garden with a fountain and shade-giving trees around it (Ill. 5). Even though there may be many flowers and plants in the garden, there is

Ill. 4. Left: Streets of old neighborhood in Tunis, source: Hakim B.S., Arabic-Islamic Cities Building and Planning Principles, Kegan Paul International, London 1986, p.24. Right: Streets, related elements, source: Hakim B.S., Arabic-Islamic Cities Building and Planning Principles, Kegan Paul International, London 1986, p. 28



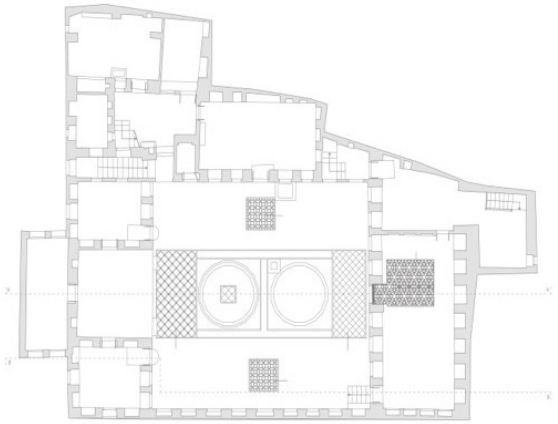


Ill. 5. Left: a traditional Muslim house in Jordan, source: Steele, James, The Architecture of Rasem Badran, Narratives on People and Place. London,2005, pp.70–72. Right: The entrance opens into the courtyard, Al-Suhaymi house, Cairo, source: International Journal of Civil &Environmental Engineering IJCEE-IJENS Vol:10 No:04, p. 16

always water. There used to be a tendency for houses to be quite high, often being 2–3 stories or higher, with a flat roof on which one could sleep during the hot summer months. The windows opened up into the courtyard, a miniature paradise garden within the walls of the house.

The Islamic architecture in this region, under the direction of the Muslims, also reflected the separation between private and public spaces. As a result of this distinction, traditional Islamic architecture evolved into a unique form. It seems therefore logical to also state that, if a Muslim house does not have any windows facing the street, and is generally built around an inner courtyard from which the rooms receive light and air, then this is not only simply a reaction to the climate, but is also clearly symbolic (Ansari 2011, p. 32).

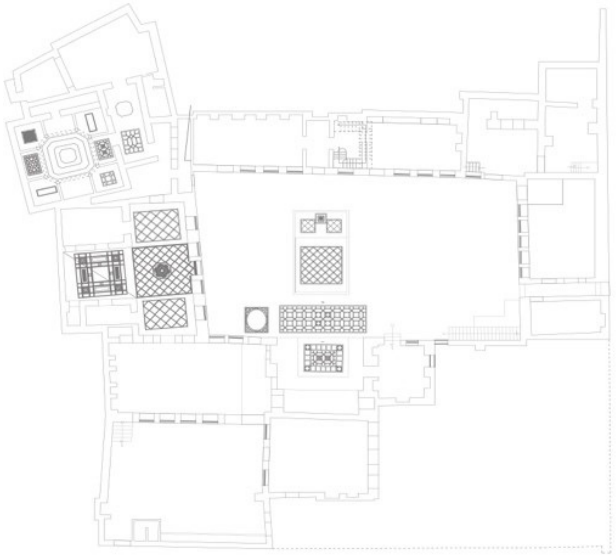
Ill. 6. Up: Courtyard of Agkbash House in Aleppo – Syria, source: Common Architectural Features Aleppo and Gaziantep, Syrian and Turkish Interregional Cooperation Program, Gaziantep, 2010, p. 358. Down: plan of Agkbash House in Aleppo – Syria, source: Common Architectural Features Aleppo and Gaziantep, Syrian and Turkish Interregional Cooperation Program, Gaziantep, 2010, p. 361



3.2.4. Houses

- In Arabic cities, the house is a building block,
- Houses reflect the nature of Muslim families,
- All activities take place inside the house in a very protected environment, as the Muslim house is enclosed and inward-oriented,
- The building typology supported the high level of privacy needed by the Muslim family in Arab culture,
- As an ecological system, the house and its internal courtyard work in harmony with alleys and streets,
- Neighborhoods usually had a clear entrance and sometimes a gate (Ill. 6).

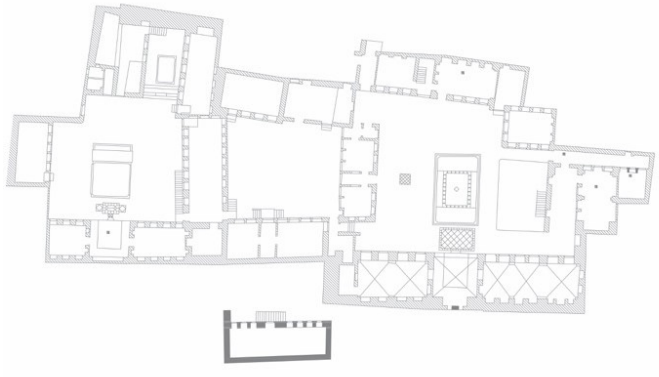
Historically, houses were first built around courtyards or open spaces in Ur, in what is currently southern Iraq. From a symbolic standpoint, the first Arab house built was Prophet Mohammad's house when he first arrived in Medina. He used His house as both a home and a meeting place. One of the most distinctive features of this building is its courtyard, which is surrounded by walls and has a lot of character. There is a sun shelter on the wall facing the Qibla/Mecca. Room entrances facing the courtyard were surrounded by palm branches. When facing the courtyard, these entrances could be screened with camel hair curtains if necessary. There is an annex of Riwak-style rooms at the front of the house. The dwelling is connected by a moving screen reminiscent of nomadic tents. Besides serving as a vestibule, it was also used to store clothes. These features rapidly became an essential part of the Arab house. The courtyard house and the aggregated organizational pattern it represents are suitable for the application of this principle. Therefore, the external walls of the building are kept simple or relatively simple, with a limited number of openings. It is not uncommon for the owner of a property to adorn the courtyard with a high level of artistic sophistication, regardless of the fact that it is only accessible and enjoyed by the occupants, and occasionally their close families and friends.



← Ill. 7. Up: Courtyard of Ghazaleh House in Aleppo, Syria, source: Common Architectural Features Aleppo and Gaziantep, Syrian and Turkish Interregional Cooperation Program, Gaziantep, 2010, p. 351. Down: plan of Ghazaleh House in Aleppo, Syria, source: Common Architectural Features Aleppo and Gaziantep, Syrian and Turkish Interregional Cooperation Program, Gaziantep, 2010, p. 350

Traditionally, the courtyard in the Arab world was called a *hosh, a wast ed-dar, and a sahn ed-dar, all of which denote an enclosed space or the center of the house in Arabic* (Ill. 7). An example of this would be a situation where there is a gap between the living spaces of the house and the courtyard, which can be filled by building a high wall around the court (Canaan 1933). There is no doubt that it is an influential design element for the Arabic vernacular house. This is because it has become much more than just a means of obtaining privacy and protection. There is no doubt that the courtyard is the main focal point of the house and represents its main representational space. There are several other adjacent spaces that are connected to it and by it, so that almost all the circulation lines running from and into the surrounding spaces pass through the courtyard on their way out and into them. In addition to offering privacy to its occupants and serving as a private, open-air living room during the summer, the courtyard can be entered from the street via a bent-axis entrance designed so that passers-by cannot see in. As a matter of fact, the courtyard is likely to be the most commonly used living space in a vernacular house. Courtyards are frequent in the housing architecture of the Mediterranean, North Africa, and Arab Gulf countries, which have a hot and humid climate, as well as in the Arabian desert and Iraq, which have hot and dry climates.

In a vernacular Arab house, the number of courtyards depends on the house's size and design (Ill. 8). Small houses usually have one courtyard, while large houses can have two or more. A courtyard is directly entered from a street entrance, where the men of the household would entertain guests. In addition, there could be a courtyard in which the women of the household would entertain in a smaller, more intimate setting. From the street, the entertainment rooms would be the men's reception rooms, which would be the man's entertainment rooms without going into the women's quarters. A courtyard's shape and size will also be determined by the shape and size of the building plot as well as the size and shape of the courtyard. The shape of the courtyard is usually rectangular or square, but it can sometimes take on irregular shapes as well. It is not common to expand the courtyard of larger houses, even when the area of the plot allows for it, because any larger open space would have less shade provided by the surrounding buildings. Instead of featuring a single large and exposed courtyard, the design provides two or more courtyards which are clustered around each other, with rooms grouped around them (Elwerfalli 2016, p.53).



→ Ill. 8. Up: Courtyard of Ibrahim Qataragassi House in Aleppo, Syria, source: Common Architectural Features Aleppo and Gaziantep, Syrian and Turkish Interregional Cooperation Program, Gaziantep, 2010, p. 370–371. Down: Plan of Ibrahim Qataragassi House in Aleppo, Syria, source: Common Architectural Features Aleppo and Gaziantep, Syrian and Turkish Interregional Cooperation Program, Gaziantep, 2010, p. 368

3.2.5. The Architectural Elements of the Syrian Traditional Courtyard House

A *mashrabiya* is a wooden external balcony. It provides women with a cool screened space to view public spaces from without being seen. In a *mashrabiya*, an external wall anchors two cantilevered wooden beams. The windows are divided into two types: those located on the exterior facade of the house and those situated on the courtyard facade. Due to the house's inward orientation, the external facade windows are small, plain, and located on the first floor to prevent pedestrians from looking inside. Providing light and ventilation to the rooms, courtyard windows are more spacious and decorated. Windows on the ground floor are within the wall space, while wooden shutters are mounted to a wall's outer face. At the base of the courtyard are other types of windows. They are small and arched with no decorations, providing light and ventilation. In the ground floor rooms, there are two-leaf wooden doors with minimal ornamental carvings; on the first floor, the doors are relatively plain.

In the main reception hall, wall cabinets built into the thickness of the walls display ornaments such as intricate wood carvings. Some cabinets have calligraphic carvings on the walls surrounding them. Decorative wooden panels displaying intricately linked geometric shapes adorn the ceilings. This is especially true in the main reception hall, where the ceiling consists of intersecting wooden panels carved with rich, gold-plated carvings. There is a strong emphasis on symmetry in the ceiling decorations. Four types of patterns are used to decorate the interior:

- Poetry or Qur'anic calligraphy,
- Plant stems and leaves create floral patterns,
- Animal forms such as birds,
- Triangles, squares, rectangles, and circles combine to form geometric patterns,
- The geometric patterns are created by stone inlays and intersecting timber slats as well as floor and ceiling decorations. They are most evident in the main reception hall, the *iwan*, and the courtyard area in front of it (Ill. 9).

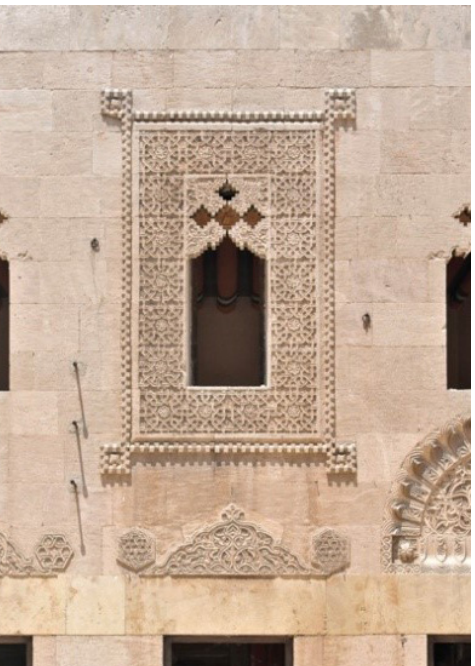
3.3. Model Examples of Contemporary Urban Courtyards and Canopies in Arabic Residential Architecture – Characteristic Features

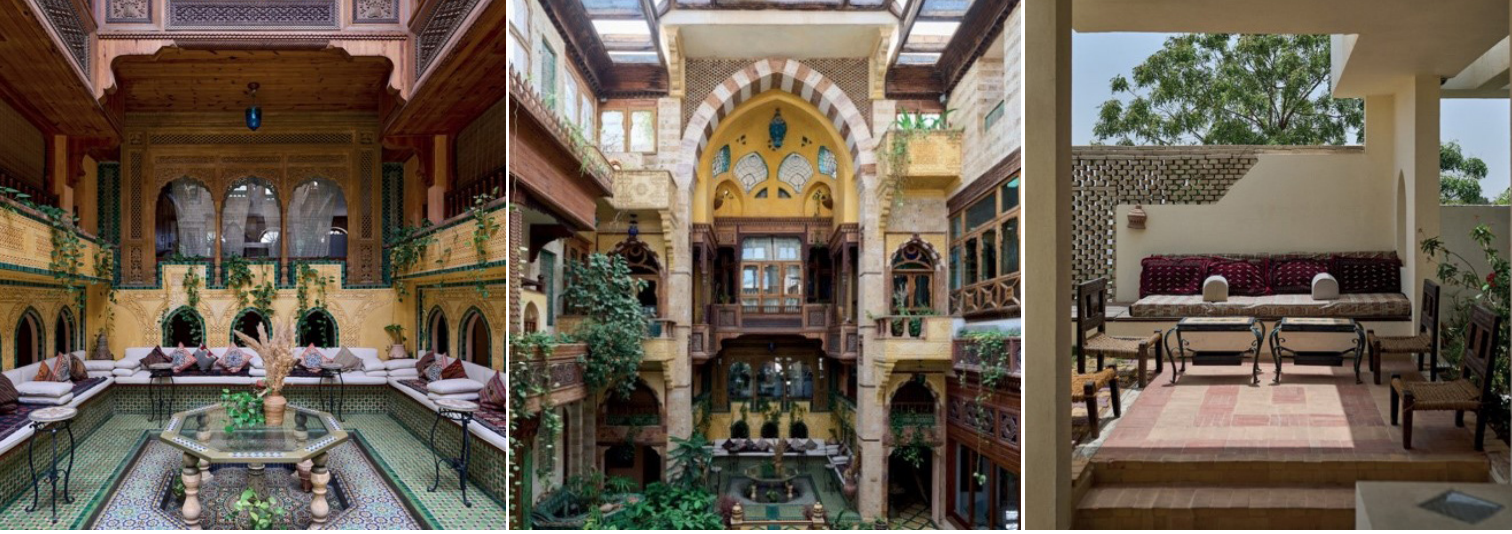
3.3.1. Angawi House in Jeddah – Saudi Arabia

In Jeddah, Saudi Arabia, the Angawi House is the current residence of Dr. Sami Angawi, who is known for his architectural designs. It is a study of western Saudi Arabia's traditional Hijazi architecture. The building not only evoked Arabic vernacular traditions in its formal design, but also developed and tested concepts that could serve as a basis for developing a sustainable agenda while maintaining the continuity of a historical culture. Therefore, the *hosh* (courtyard) serves as a traditional gateway between public and private spaces, but it also serves as an element of climate control. So as to keep the air stream circulating throughout the house for much of the year, Angawi designed his house so that it would take full advantage of the prevailing winds in Jeddah, which naturally flow from the north and west. Due to the hot climate in this part of the world, this has greatly reduced the need for air conditioning.

In order to enter the heart of the home, one will need to walk out into the courtyard. Located on the right side is the *saramlic*, which is the guest room, and on the opposite side is the *haramlic*, which is the family room. It also features a symphony of soft finishes of Islamic calligraphy that is arranged alongside spiritual charms, as well as sea stones and corals that offer different textures to the courtyard's symphony. In the center of the home (courtyard) there is a beautifully tiled indoor swimming pool whose bottom is covered with a mosaic tile pattern that resembles the pattern on a Persian carpet. This pool

Ill. 9. Left: Stone work presenting local pattern in Ghazaleh House in Aleppo, Syria, source: Common Architectural Features Aleppo and Gaziantep, Syrian and Turkish Interregional Cooperation Program, Gaziantep, 2010, p. 349. Right:Courtyard of Ghazaleh House in Aleppo, Syria, source: Common Architectural Features Aleppo and Gaziantep, Syrian and Turkish Interregional Cooperation Program, Gaziantep, 2010, p. 354–355





Ill. 10. Left: Iwan of Angawi Housein Jeddah – Saudi Arabia. Middle: Courtyard of Angawi House in Jeddah, Saudi Arabia. Right: Outdoor Terrace of Angawi House in Jeddah, Saudi Arabia, source: https://en.vogue.me/culture/al-makkiyah-dr-sami-angawi-family-house-jeddah-saudi-arabia--rare-pictures/ (accessed: 7.05.2023)

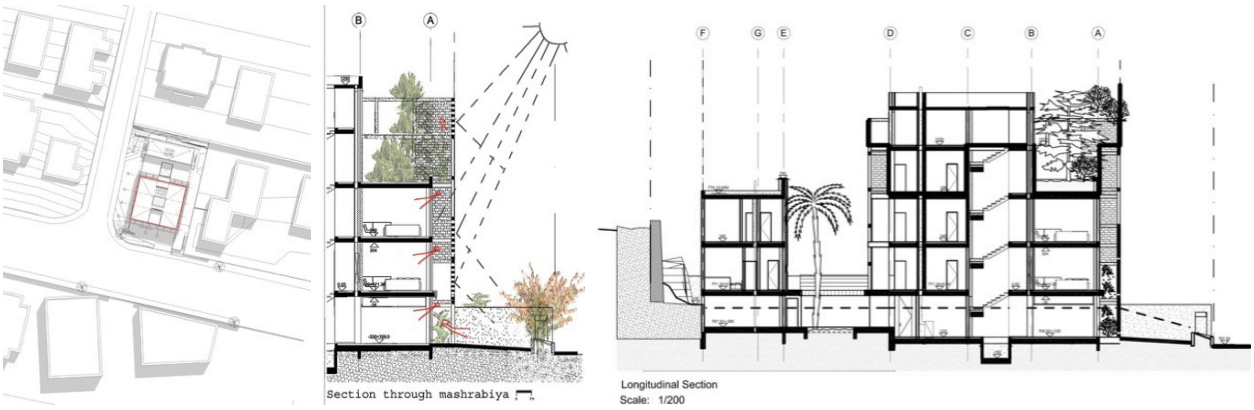
is the focal point of the house. In the center of the house, there is a courtyard surrounded by rich carved wood on multiple levels and hanging plants, which represents a traditional Arabic house in an updated manner (Ill. 10). In order to create a balance, the Architect considers and creates an equilibrium between six main points: the environment, economics and social culture, material and technology, the purpose or function of the building, as well as the regulations and laws of the place in which the building is situated. A lot of thought has gone into every detail of the Angawi House so that it can provide comfort for the people who are living in the house and their guests. A mix of traditional Arab elements is used, such as a pool which represents a traditional fountain in Arab tradition, *mashrabiyas* as decorative elements to create privacy, plants and gardens, and calligraphy as ornamentation.

3.3.2. The Mashrabiya House in the Palestinian Arab Village of Beit Safafa

The Mashrabiya Houseis located in Beit Safafa, a Palestinian Arab village between Jerusalem and Bethlehem, Israel. While it features new and imaginative solutions for the changing social and cultural landscape of the village on the brink of urbanization, the house also reinterprets traditional elements of Arab vernacular architecture.

An earthbound, partially inhabited "landscape ground" is formed by terraces and retaining walls, a typical feature of the traditional Arab landscape. The basement is carved into the hillside like a deck with sunken courtyards as light wells. The deck houses a workshop, studio, and gallery, separating the public and working areas of the house. In the back of the plot, this platform folds up into an enormous, inhabited stone-clad retaining wall (Ill. 11). Landscaped ground forms a stage for the building. The vertical structure contrasts with the heaviness of the ground. *Mashrabiyas*, traditionally used to divide private and public spaces, are creatively interpreted to achieve a floating effect. In this example, the wooden screen is re-imagined as a stone envelope that surrounds the building, combining the *mashrabiya* motif with stone. A semi-transparent effect has been achieved by spacing the stones irregularly, creating a feeling of lightness and porosity. A narrow gap separates the stone envelope from the actual apartment building. A playful arrangement of small and large openings allows for views from the interiors out into the landscape while maintaining privacy.

Ill. 11. Left: Site exterior elevation of the Mashrabiya house. Middle: Ventilation – interior elevation of the Mashrabiya House. Right: Interiors of the Mashrabiya House, source:https://www.archdaily.com/175582/the-mashrabiya-house-senan-abdelqader?ad_medium=gallery (accessed: 7.05.2023)



Ill. 12. Left: Site plan of the Mashrabiya House. Middle: Ventilation diagram of the Mashrabiya House. Right: Section through the mashabiya of the Mashrabiya House, source:https://www.archdaily.com/175582/the-mashrabiya-house-senan-abdelqader?ad_medium=gallery (accessed: 7.05.2023)

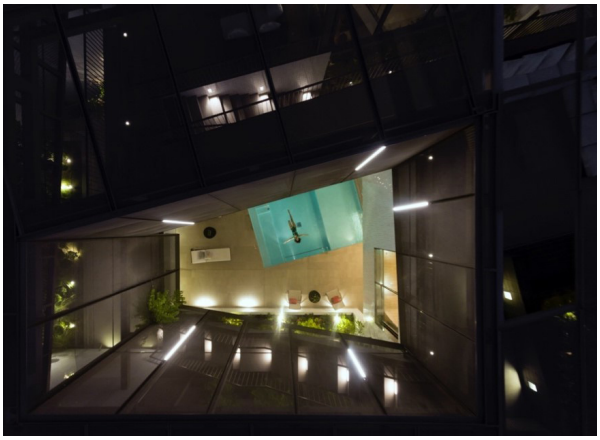
A sensitivity to traditional Arab elements informs the concept of open spaces within and around the house. The *mashrabiya* at the top of the building becomes a garden wall for a rooftop garden following the *bustan* motif: an enclosed garden with privacy and tranquility. The raised courtyard between the rear retaining wall and the *mashrabiya* is reminiscent of an old courtyard (Ill. 12).

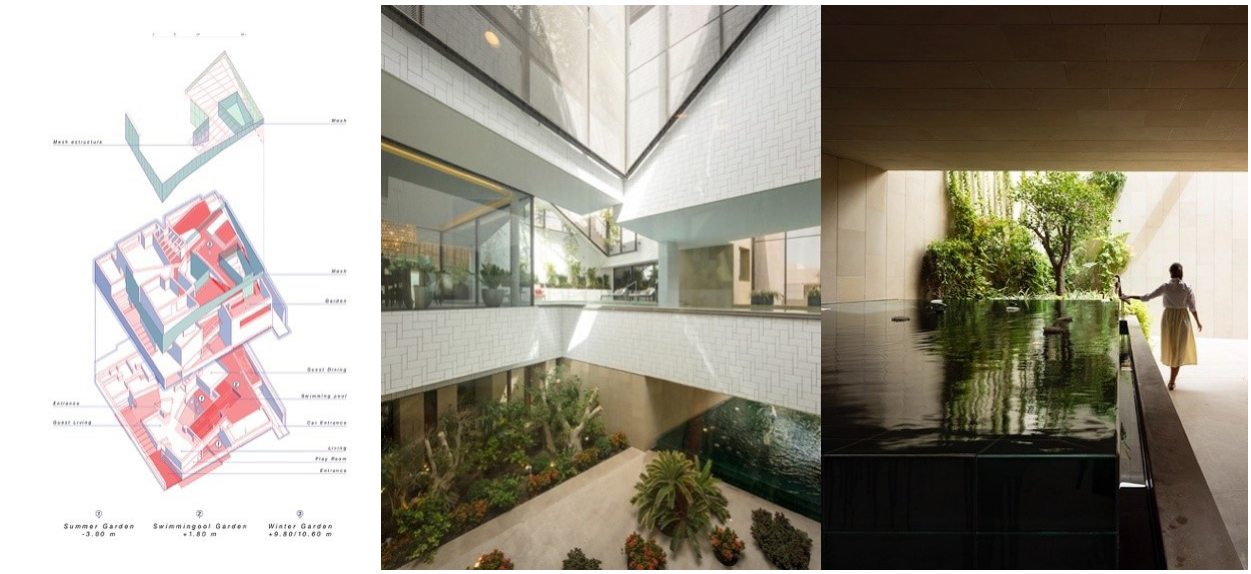
3.3.3. Three Gardens House, Al Funaitees - Kuwait

In Kuwait, Three Gardens House is an excellent example of modern architecture in housing that incorporates traditional Islamic courtyard concepts into its design. A contemporary design element is combined with traditional Islamic architectural principles, particularly in the use of courtyards, in this residential project.

The designers designed three gardens according to the time of year and hours of the day when these activities can be developed. Wet Gardens allow to activate related spaces during the hottest periods. There is a pool and some fountains in this garden, which is surrounded by the house's main social areas. The Summer Garden is 4 meters below street level, in the coldest layer. With the soil's thermal mass and the projected shadows of the housing volume, a large sheet of water is placed to catalyze evapotranspiration that rises through convection and refreshes the upper spaces. There is a third one on the roof, perfect for summer nights and cold winter days. Perforated skin covers the Winter Garden, avoiding direct solar radiation and enhancing privacy. Through exterior stairs, the three gardens are connected as a single outer space, articulating the program of required uses around the voids. In addition, clients' concept of "family" is strongly reflected in the internal circulation of the dwelling. From the main entrance, the separation of spaces and levels acts as a filter with guests; therefore, only those closest to the family (including household workers) circulate through it. The circulation inside the building – both vertical and horizontal – is conceived in a fluid way, creating multiple routes and possibilities for the inhabitants to reach the rooms in a more or less direct way. The routes can be interior or exterior, offering differently qualified views and experiences. In this sense, all "public" areas are visually connected, leaving the most private rooms more intimate and looking outwards. Opposite to the closed volume towards the outside – emphasized by the uniform stone cladding – is the total transparency of the spaces facing the interior courtyard – covered in white ceramic tile – which reflect the light and help to illuminate the rooms in a natural way. The same perforated skin that serves as a filter on the roof – a "deployé" metal mesh of anodized aluminum – has been used for privacy, filtration of direct sunlight, and shelter for vegetation within the aggressive Kuwaiti climate.

Ill. 13. Left: Areal view of Three gardens house. Right: Wet Garden, source:https://www.archdaily.com/806319/ three-gardens-house- agi-architects (accessed: 7.05.2023)





Ill. 14. Left: Axonometric drawing of Three Gardens House. Middle: Internal view of the garden/Courtyard. Right: the summer garden view https://www.archdaily.com/806319/three-gardens-house-agi-architects (accessed: 7.05.2023)

4. Conclusions

As to conclude the similarities and differences concerning courtyard's specifications, elements, use, and design between traditional Islamic and modern architecture may be compared in the following way (Table 1):

Table 1. Comparison of the traditional and modern elements of urban courtyards and canopies in Arab Cities, authors' elaborated by Abdelmuniem Khamui, Bartosz Kaźmierczak, Anna Kulig

	Traditional courtyards and canopies	**Specifics of modern solutions**
Residential Blocks		
	Interior courtyards acting as a kind of atrium	Interior courtyards acting as a kind of atrium
	Exterior courtyards bordering house from the outside	Exterior courtyards bordering house from the outside
	Internal courtyards are in harmony with alleys and streets	Internal courtyards are not always are connected directly to the street and alleys
Streets		
	Urban walls are high and streets are narrow	Urban walls height is depending on the design of the unit
Gardens		
	Greenery and water are main features are designed in geometrical forms	Greenery and water depending on the needs of the residents and they are following the general architectural style of the unit
Courtyards		
Specifications	In traditional Islamic courtyards, open spaces are surrounded by buildings - typically rectangular or square which are achieved by carefully proportioning and orienting them. **Fountains and pools provide cooling and aesthetic benefits**	Modern courtyards vary in shape, size, and layout in reference to architectural style allowing different functions and aesthetics to be accommodated. **Sustainable design principles, innovative materials, and technology are often used**
Elements	Traditional Islamic courtyards combine natural and architectural elements - colonnades, arcades, geometric patterns, intricate tileworks, lush gardens, and water features to provide a serene and contemplative atmosphere	Modern courtyard design emphasizes functionality, flexibility, and integration with the surrounding architecture - glass walls, skylights, modern landscaping, sculptures, and minimalist design are commonly used so as to provide light, transparency, and seamless indoor/outdoor connections
Use	Traditional Islamic courtyards serve a variety of purposes - social gatherings, religious activities, relaxation so as to provide privacy, tranquillity, and connection to nature	In modern courtyards, multiple functions can be performed - outdoor living, dining, swimming pools, outdoor kitchens, fitness areas, and green spaces
Design	Geometric patterns, intricate ornamentation, symmetry and balance characterize traditional Islamic courtyard design so as to interplay lights and shadows	Modern courtyard design embraces a variety of styles - minimalistic, eclectic and experimental. Indoor and outdoor areas are seamlessly integrated with clean lines and open spaces. **Modern courtyards incorporate sustainable design principles**

5. Recommendations – Modern Interpretations of Urban Canopies and Courtyards

Considerations should be made for the preservation of architectural heritage and traditional urban patterns as a result of its historical significance and the current trend of its disappearance in residential buildings. The purpose of a courtyard is to be a space that can be used in multiple ways so that it can achieve multiple benefits at the same time. It is extremely necessary for architects to innovate with the use of courtyards to reduce the demerits to the bare minimum. There are also a number of functional advantages to urban courtyards and canopies which are of high importance in the context of environmental protection and use of pro-ecological solutions to be provided within modern interpretations. We can further reinforce the idea that courtyard houses are very flexible and can satisfy the various demands of the modern era. From a functional point of view, there are three main uses of the courtyard that can be changed depending on the situation. The primary function of the courtyard could be to act as a circulatory element, as it could play a fundamental or secondary role in residents' movement between interior spaces as they move from one place to another. Second, it can be used as a private space for the residents to engage in social activities in a way that is fundamental or secondary to the courtyard as a private space. Third, use of the courtyard for providing daylight and ventilation, which is always essential for a healthy environment to thrive. Since the courtyard has always played such an important role in the design of a courtyard house, it has managed to maintain its status as one of the most important elements of the design.

In addition to being relevant to the specific context, these recommendations are also relevant to courtyard housing across the Arab World and beyond. Firstly, it is essential to study the design characteristics that are associated with adaptability. This will allow us to clarify the exact influence and the relative importance of the different aspects of design on the adaptation process. As early as the design phase of a project, concepts and issues of sustainability need to be introduced and articulated. This needs to be ingrained at the outset of the project. In the end, this will ensure that the built form is designed and constructed in a way that meets environmental performance as well as social preferences. Further, it is essential that building policies incorporate sustainable architectural design principles based on vernacular strategies in order for them to be effective.

PRZYPISY / ENDNOTES

1 Vernacular architecture is very aptly defined by Rytel (2015, p. 143) as "anonymous, everyday, taking the highest basic need, which is improved by users from generation to generation – as long as there is no temptation to interpret sophisticated, modern patterns of architecture."

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