

ARCHITECTURAL VALUES BEHIND THE FORMATION OF HERITAGE HOUSES AS A TOOL FOR PROMOTING CULTURAL IDENTITY IN SAUDI ARABIA

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ABSTRACT

Urban heritage is preserved through generational transmission, which involves the imitation of heritage-related vocabulary. It requires an in-depth understanding and cognition of the values and meanings of that heritage followed by monitoring and documentation to provide a benefit proportional to the present day. The physical expansion and geographical diversity of the Kingdom of Saudi Arabia (KSA) has resulted in it being characterized by its urban wealth. Therefore, this systematic review aims to define the architectural values behind the formation of heritage houses in the KSA and to identify the similarities and differences in their application. The importance of this study lies in strengthening Saudi Arabian identity and preserving the country's cultural heritage by highlighting and promoting the values of architectural heritage to ensure their sustainability in modern architecture. The systematic review focused on 11 studies that pointed to the similarity of the values of architectural heritage in all regions of the KSA and the differing methods of applying those values. The results also highlight a lack of relevant research in the eastern and southern regions of the KSA over the past ten years.

Keywords: architectural values, heritage houses, urban heritage, cultural identity, traditional houses, King Salman Charter for Urbanism.

1 INTRODUCTION

The Kingdom of Saudi Arabia (KSA) has become distinguished by its urban wealth because of the diversity of its geographic regions and its expansion, which has resulted in it neighboring with additional countries and experiencing some cultural fusion [1]–[3]. Several studies have noted that local buildings are compatible with their surrounding environments and the needs, prevailing customs, and traditions of their residents [4]. Building patterns in these areas vary according to the raw material available in the surrounding environment and regional climatic conditions [1], [4]. The King Salman Urbanism Charter, which launched at the end of 2021 with the aim to improve the urban environment to conform with the local culture and nature, emphasized that this diversity also falls within a unified framework of common principles, including Islamic, civilizational, and social values [3]. These buildings have survived until today because of the construction skills passed from generation to generation and the stability of the climatic and environmental factors that characterize each region [5]. The KSA has been divided into four sections according to the following architectural styles of the heritage buildings [6].

1.1 Central region (Najd)

Najdi architecture is one of the most prevalent architectural patterns in the KSA, as Najd is the vibrant center of the country [3] and was a crossroad for caravan and transport routes in the past [4]. The geography of the region is diverse, with a varied topography including mountains, plateaus, and plains [7]. With its central location in the Kingdom, it is bordered on the north by the Nufud Desert, on the south by the Empty Quarter Desert, on the east by the desert of the Al-Dahna, and on the west by the mountains of the Hijaz [8].



The dry desert climate of the Najd area has a clear impact on the formation of its urban fabric. It is characterized by an organic response to local climatic factors, with narrow, winding streets, some of which have no outlet [3]. Architectural blocks are close together, which reduces pedestrians' exposure to sunlight by increasing shadows to protect them [1].

The heritage houses in the Najd region are built from mud-bricks mixed with straw and water, and the roofs and doors are made from tamarisk wood – all materials obtained from the surrounding environment [9]. The heritage houses in Najd usually comprise one or two floors – in rare cases, they have three – around an inner courtyard, effectively providing natural ventilation and light. The upper floors are characterized by a lack of external openings, while the openings on the ground floors are very small to preserve the privacy of the residents [4].

The exteriors of Najd houses are characterized by a lack of ornamentation and architectural details. However, these details increase inside, where ornamentation directly reflects the social status of the owner of the house. The more ornamentation, the higher the living standard of the occupants [9]. Al-Naim argued, however, that this is not always the case, as some residents may have been wealthy but rejected this decorative affluence based on religious beliefs [10].

The external facades of Najdi heritage houses are also characterized by the presence of what is known as *Alsharaf*, graded units in the form of triangles, squares, or arrows covered with plaster, followed by an inclined decorative strip of prominent inverted triangles (*Altaf*; *Alhadair*; *Alafriez*) placed under a recessed strip (*Alhaqqaf*), which is an engraved line made of wood. This ornamentation serves as an architectural treatment that protects the exterior walls from rainwater [4]. In addition to the presence of triangular or rectangular holes, called *Alfuraj*, to provide light and ventilation, the *Tarma* element can be seen in the walls of the external buildings and near the doors to allow those inside to see who is outside without being seen in return [10] (Fig. 1).

The owners of these houses paid special attention to the decoration of the majlis (*Alqahwa*), which demonstrates generosity and expresses the joy of receiving a guest. This ornamentation varies between geometric, plant, symbolic, and epigraphic motifs and appears in bright colors, such as red, yellow, and blue. Some of these elements are prominent and others are sunken to create a distinctive aesthetic harmony [10], [11].

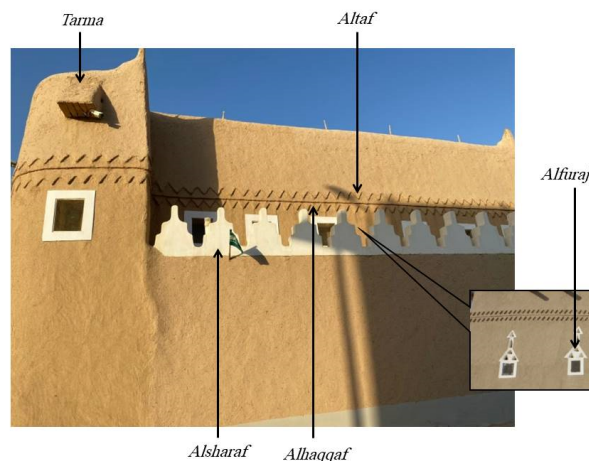


Figure 1: Architectural details of the exteriors Najd heritage houses.

1.2 Western region (Red Sea Basin style)

The western region has been influenced by other cultures, as it receives pilgrims and others coming to Makkah and Madinah from all over the Islamic world. The city of Jeddah is also an important commercial port for the KSA and has been subjected to a mixture of cultures [2]. The urban fabric in the region is characterized by the density of architectural blocks that are interconnected, as well as being interspersed with narrow, winding streets that provide shade and cool air for pedestrians [1]. The heritage houses vary between buildings with wide, open courtyards surrounded by rooms, as commonly found in Madinah; houses with external courtyards, as in Makkah; and houses without courtyards, as seen in Jeddah. The main building material in Hijazi houses is stone [12]. The types of stones may vary depending on which city the house is built in. Coral limestone is used in coastal settlements, such as the cities of Jeddah and Yanbu, and solid mountain stone is used in mountainous settlements, such as Makkah and Taif [13].

The ground floor typically consists of an entrance and a vestibule, which is a transitional corridor between the public areas occupied by visitors and the residents' private areas. It connects the entrance to the house with the house itself and has a staircase and seat (*Roshan*) for receiving guests, sleeping, and sitting. The number of rooms increases according to the location of the house and the financial condition of the family [4], [13].

The *Roshan* element is one of the most important architectural features of Hijazi architecture. It is a dynamic element that provides privacy for the residents, as it allows all family members, especially women, to watch what is happening in the streets without being seen from the outside. In addition, the presence of *Roshan* serves to refract the bright sunlight during daylight hours [14] and aids in the passage of air currents to provide natural ventilation inside the house [15]. The ornamentation varies between geometric shapes, plant shapes, and written elements, some of which are prominent and may be carved from small pieces of wood, then assembled to form large shapes. The capitals of the columns in Jeddah and Madinah are distinguished by their richness of decoration, unlike in the houses of Makkah. The sedimentary material found in Jeddah (limestone) and Madinah (clay) lends itself to formation and decoration more easily than the mountain stone that characterizes the houses of Makkah [4] (Fig. 2).



Figure 2: The Roshan in the Jeddah historic district.

1.3 Eastern region (Arabian Gulf style)

The eastern region is considered a link between merchants travelling from the east to the west. Its connection to a variety of civilizations, including Iraq, India, Persia, and Greece, led to a great deal of influence from these cultures and the adoption of urban features, such as construction methods and the forms of arches [1].

The urban fabric is affected by the hot, humid climate in summer. Historically, it had a medium density and a contiguous architectural block that was less exposed to extreme sunlight and better protected from wind and dust storms. The buildings are usually two floors high and consist of mud, plaster, and coral stone obtained from the surrounding environment [3]. Palm leaves and *Denshal* wood are also used to build roofs and other aspects due to their abundance, especially in the Al-Ahsa region [12].

The external facades consist of geometric perpendicular formations punctuated by large openings designed to preserve privacy and provide the greatest amount of light and natural ventilation. They also have a *Badgir*, a channel similar to air clamps with two openings, one of which opens to the exterior and another that opens to the roof or the interior rooms to provide cool air as needed [1]. The heritage houses are distinguishable on the inside by their open courtyards, decorated with circular arches, which other spaces extend from. The main entrance is far from the inner courtyard to achieve visual and audio privacy between the inside and the outside. To preserve privacy inside the houses, a reception room for guests is built at the side of each house to ensure that no sound is transmitted. The space, height, and number of windows in the reception rooms also demonstrate the social status of the owner [4]. Various types of stucco ornamentation, usually inspired by neighboring countries, are also distinctive of the eastern region [16] (Fig. 3).



Figure 3: Architectural details of the heritage houses in the eastern region.




1.4 Southern region (AlSarat style)

The southern region is characterized by a plurality of natural factors, such as geographic location, topography, and climate, which have a great impact on the multiplicity of urban patterns, as well as the materials and methods used in construction throughout the region [1]. Based on construction methods and available raw material, this region's urban patterns comprise three types:

1. Mud houses: These houses are found in several areas of Asir, such as Abha and its environs, Tathlith and Mha'il. The variety of house shapes include square, pyramidal, cylindrical, or rectangular [13].
2. Stone houses: Houses of this type are similar throughout the Asir region and are widely observed in mountainous areas. Paving stones, *Alraqf*, of equal size are used in construction. The stones are sometimes overlaid with clay in such a way that the clay is placed in layers – known as courses – and can reach up to five floors [12]. Doors and windows are designed to be small enough that a person cannot enter through the window and may need to bend over when entering through the door. The size of openings on the lower floors is further reduced to provide needed protection and retain warmth [17].
3. Straw houses or *Aleisha*: These may also be called *AlSaboul* or *Alarish*. They are hut-like houses built with straw, twigs, and mud and are square, rectangular, or conical. Straw houses are common in the Tihama plain (Jazan) and some places east of the Asir region (Bishah), where the *Aleisha* is covered from the inside with mud and plaster and engraved with animal, plant, and calligraphic drawings using colors or quartz stones [6].

There are usually multiple floors in heritage houses of the southern region, and the ground floor is sometimes devoted to livestock and storage. The ground floor is also where guests are first received and where the reception room is located. The second floor is designated for the family and includes the kitchen, other rooms, and open spaces (terraces) that are used for family gatherings or for observing the outside [18] (Table 1).

Table 1: Different types of urban patterns in the southern region of KSA.

		
<p>1. Mud houses. Reproduced from Al-Qamadi et al. [18].</p>	<p>2. Stone houses. Reproduced from Saudi Contractors Authority [12].</p>	<p>3. Aleisha. Reproduced from CPD [4].</p>

Al-Qatt Al-Asiri ornamentation, found in the Asir region of the south, is renowned throughout the Kingdom. It consists of varying geometric shapes and repetitive lines that form a specific pattern to be decorated with different colors, most of which are taken from the surrounding environment [19]. The names for this ornamentation represent its various forms, such as *Albnah*, *Alaryash*, *Almaharib*, and *Alamshat* [20]. The work of this ornamentation was historically limited to women, as they used them to decorate their homes and freely express themselves and their tastes. They are also considered to be symbolic of women’s courage, patience, and endurance [21].

2 ARCHITECTURAL VALUES IN HERITAGE HOUSES

The architecture in the KSA contains a set of values that led to its formation, and the heritage architecture embodies the values that express the spirit of the era in which it developed, the conditions of its inception and the local environment and fit with its local residents, their customs, and traditions [3]. Saidam defined the values of architectural heritage as “a set of architectural, intellectual and in-kind standards [...] through adherence to them, a state of

psychological, intellectual and emotional balance can be reached, and commitment to them gives a person a sense of security, tranquility, self-respect, and pride in urban identity” [22, p. 2].

The urban heritage in the Kingdom is closely related to religious values, the implications of which are manifested in preserving privacy and respecting neighbors by not revealing or elevating them by the building design, in addition to separating the living and sleeping spaces of men and women [4].

The heritage houses in the KSA also express functional values such that the shape fits the function for which it was constructed. Necessity drove the creation of many heritage architectural elements, which function to serve human beings, meet their requirements, and protect them from a variety of climatic conditions [3]. In addition to their aesthetic qualities, these functions are translated into decorative forms that distinguish each region and are also characterized by such aspects as abstraction (from the surrounding environment), proportions, proportionality, and rhythm [22]. Examples are found in the wood carvings that cover *Roshan* and allow the smooth passage of air [15] and in the various types of ornamentation in the mud-brick architecture of Najd in addition to some southern regions and the eastern region. This ornamentation has proven to be sustainable as a processor for climatic conditions [4], [18].

Social values also clearly appear in the consideration for guests and the attention paid to the spaces designated for them, as well as in that given to neighbors by preserving the privacy of the people in the house. The idea of preserving privacy is reflected in the fact that most of the openings in the external facades are small in Najd and the southern region and in how openings and windows in the eastern region are directed toward the inner courtyard or covered with *Mashrabiya*s in Hijazi architecture [1].

Social values are also evident in how the compact texture of the buildings bridges the distances between people, increasing intimacy and communication [3]. This value is evident in *Roshan* found in Hijazi architecture. Hariri stated that they also shade passersby from sunlight, creating a sense of mutual understanding and compassion [14].

It is clear from the above that the differences in geography, topography, and climate, as well as the diversity of building materials provided by the surrounding environments, have had a clear impact on the diversity and formation of architectural patterns in the KSA.

3 METHODOLOGY AND PROCEDURES OF THE STUDY

To achieve the objectives of the study, a systematic literature review was conducted for the topic of “architectural values that helped form the heritage houses in the Kingdom of Saudi Arabia”. An objective, quantitative methodology was used to classify a large number of previous studies on a specific topic and then analyze their results. The aim was to provide other researchers with a comprehensive idea of the current state of the literature on this topic and identify key research gaps or topics that have not been addressed and require further study and analysis.

This study aimed to inventory the architectural values behind the formation of the heritage houses in various regions of the KSA and to shed light on the similarities and differences between their styles. The importance of this study lies in strengthening Saudi identity and preserving the country’s cultural heritage by highlighting and reinforcing those values to ensure their continuity in a manner that serves architecture today, as the King Salman Urbanism Charter called for encouraging research aiming for a deep understanding of the KSA as a human, place, and culture [3].

The main question of the study revolves around what architectural values lie behind the formation of heritage houses in the regions of the KSA, what similarities and differences

exist in the methods of their application, and which require further study and analysis (Fig. 4).

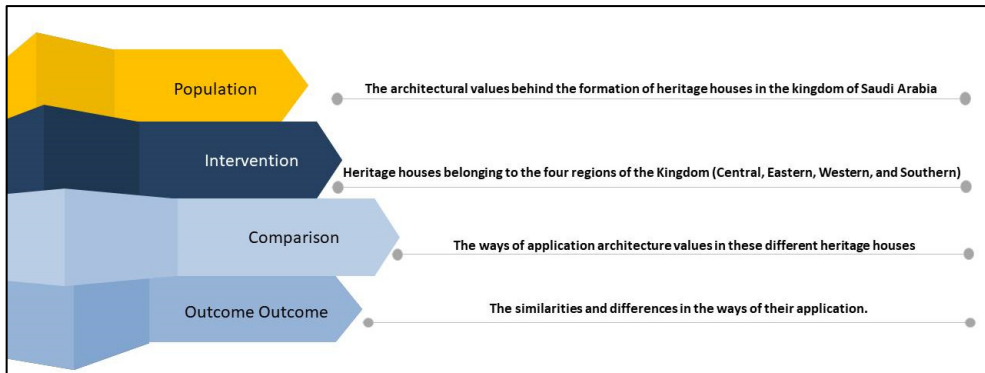


Figure 4: PICO strategy search questions.

The methodology used in this study comprised four phases:

1. The relevant study was assembled according to the criteria of inclusion and exclusion by focusing on scientific papers and master's and doctoral theses and excluding news articles and reference research. Several databases and search engines were used (Scopus, ScienceDirect, Web of Science, Wiley, and Google Scholar), and the study was limited to research published during 2011–2021 to ensure that the information was up-to-date and comprehensive. The goal was not to document heritage but rather to document the latest studies that highlight architectural values.
2. The following key words were used: (“cultural identity”, “heritage identity”, “heritage buildings”, or “architectural values”); (“the Kingdom of Saudi Arabia”, Najd, Hejaz, eastern or “southern region”); (“interior design” or architecture).
3. Previous studies were classified related to the subject of the study (architectural values that aided in the formation of heritage houses in the KSA).
4. The studies were analyzed from their classifications from the previous phase.
5. The similarities and differences between the application of architectural values in the various regions of the KSA were identified.

The studies were analyzed according to the aforementioned criteria. The study assessed 11 of the total number of studies found, 683 studies were excluded due to repetition, and 235 other studies did not address the issue of urban heritage but were about heritage in general. In addition to several studies that discussed the urban heritage of mosques, villages, and others that did not specifically address the 187 heritage houses, many (105) did not address the country of study – the KSA – and also excluded books and types of publications that had previously been excluded (a total of 312); (Fig. 5).

4 RESULTS

The selected studies discussed the architectural values of heritage homes in the Kingdom in a variety of ways and also addressed several different topics. Some of them dealt with more than one value, and others focused on a specific architectural value. In addition, there was a

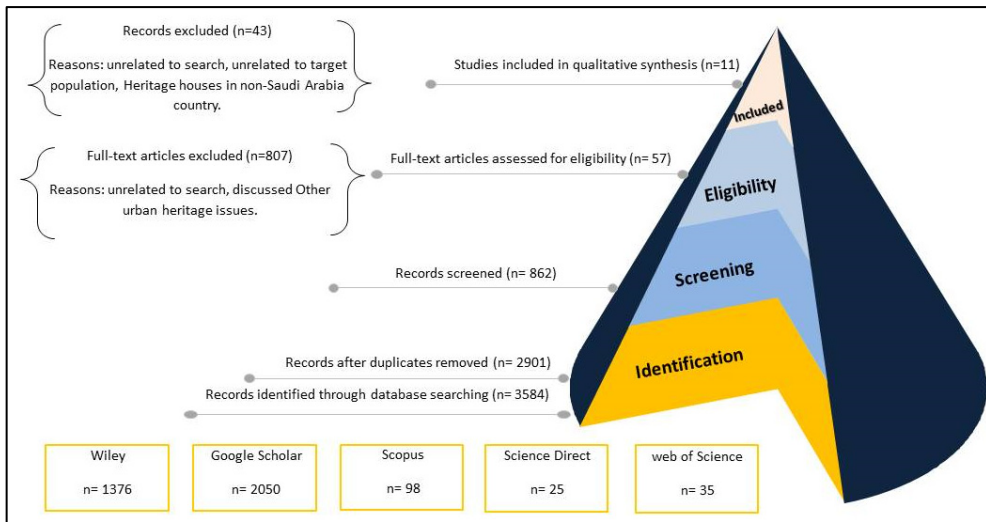


Figure 5: Prism scheme for selecting eligible studies.

diversity of data collection methods among them because the values addressed in previous research encompassed religious, social, cultural, environmental, and aesthetic values, as shown in Table 2.

4.1 Religious values

The results of several studies indicate that religious values had a clear impact in shaping the urban heritage environment at the architectural and urban levels. Alnaim identified many religious values in Najd, including the rights of pre-emption and easement and the principles of non-harm and eligibility. This is likely due to the absence of written law at the time, which allowed maximum flexibility for people to adapt religious principles to suit their own social and economic needs [24]. Al-Ban also found that Islamic sensibility is reflected in houses in Jeddah (without courtyards), which prevent strangers from looking inside, thus preserving the sanctity of the house and its people. It is also noticeable in the ornamentation of Hijazi residences, which are free of animate beings [29].

4.2 Social and cultural values

Religious values have influenced the formation of the social and cultural values of society. Alnaim argues that the social and cultural values observed in Najdia villages reflect established religious beliefs in addition to the fact that the residents created those spaces based on their needs while preserving shared and agreed-upon social and cultural meanings [10]. Many studies have also agreed that privacy is one of the most important principles that heritage houses have sought to achieve. Hijazi points out that the two elements of *Roshan* and the inner courtyard are the most important elements demonstrating the principle of privacy in the Hijazi dwelling [15]. As described by Al-Ban [29] and Alawad [28], *Roshan* effectively achieves privacy for internal spaces.

Table 2: Analysis of the studies assessed.

N	Author/year of publication	Study sample	Top results	Heritage architectural values
1	Atiah and Alawad [11]	The reception room was empty in eight houses (to from each of the four regions of the Kingdom: central, western, eastern, and southern regions)	The study considered the aesthetic value represented by the colors that distinguish each area from the others. The reception space was analyzed in each chosen house, and the results indicated that for every two houses in one of these four regions, there was a similar color scheme, general visual shape, and sense of inner space (the reception area).	Aesthetic values
2	Bagasi et al. [23]	Baeshen house in historic Jeddah	The study demonstrated the role of <i>Mashrabiya</i> in regulating internal temperatures during high fluctuations, thus affecting the level of relative humidity in a Baeshen house in Jeddah. It noted that the surface temperatures of the outer wall around the open <i>Mashrabiya</i> absorbed a lower temperature than the outer surface of the <i>Mashrabiya</i> due to the characteristics and color of the plaster on the outer wall.	Environmental values
3	Alnaim [24]	Five villages in Najd (<i>Ushaiqer, Sudos, Diriyah, Khabura, Old Riyadh</i>)	The study refers to the social and cultural values represented by tribal groupings located near each other and who share common beliefs. It also discusses how the role of women in society has affected the degree of integration or separation between the inside and the outside, as well as social and cultural needs, privacy, and security. They were all key in producing the hierarchical arrangement of spaces.	Social and cultural values



Table 2: Continued.

N	Author/year of publication	Study sample	Top results	Heritage architectural values
4	Alnaim [10]	<p>Traditional Najdi settlement architectural elements</p> <p>Four Najd architectural elements (entrance, <i>Tarmah</i>, <i>Faraj</i>, and <i>Shraf</i>)</p>	<p>The study concluded that the Najd villages in the study were formed on the principles of spatial arrangement, influence of the surrounding environment, degree of building capacity, available materials, and strongly held social and cultural values based on established religious beliefs.</p>	<p>Religious, social, and cultural values</p>
5	Al-Qamadi et al. [18]	<p>The formal characteristics of a traditional house in the city of Najran, the KSA</p> <p>Heritage houses in Najran</p>	<p>The study analyzed the determinants of heritage architecture in Najran (economic, natural, building materials, social, political), which helped determine the formal characteristics of a heritage house in Najran and its differing patterns. Vocabulary and elements, formalism, color, and aesthetics were also analyzed.</p>	<p>Aesthetic and environmental values</p>
6	Samir et al. [25]	<p>Examining the potential values of vernacular houses in the Asir region of Saudi Arabia.</p> <p>Two houses that represent the typical characteristics of the mud architecture in Asir</p>	<p>This study indicates that the sustainable preservation of heritage architecture of Asir depends on the relationship of buildings to the surrounding environment and spatial organization in the design of houses, the characteristics of the building materials used, and the forms of facades.</p> <p>The environmental sustainability of Najd art in the local materials used and the ornamentation of Najd doors was characterized by several aesthetic values (rhythm, balance, ratio, proportion, and unity).</p>	<p>Aesthetic and environmental values</p>
7	Nabawi [26]	<p>The aesthetics of Najd door decorations</p> <p>Najd doors</p>	<p>The environmental sustainability of Najd art in the local materials used and the ornamentation of Najd doors was characterized by several aesthetic values (rhythm, balance, ratio, proportion, and unity).</p>	<p>Aesthetic and environmental values</p>

Table 2: Continued.

N	Author/year of publication	Study sample	Top results	Heritage architectural values
8	Ahmed [27]	Visual vocabulary of historic Jeddah dwellings: (<i>Roshan-Takalil-Kharijat</i> , Housing ends-Surface-Treatments-Entries-Housing gates- <i>Tayyrama-Shabura-Mirzab-Qumaria</i>)	The study concluded that the visual character of housing in the historical city of Jeddah was closely related to the spatial and environmental context; integrated with it, its tools, and nature; and formed a clear urban and architectural identity with a distinct personality.	Environmental, cultural, and social values
9	Alawad [28]	Residential buildings in Jeddah City	The study examined the glass of <i>Roshan</i> in terms of access to direct sunlight to the interior spaces and its effect on vitamin D deficiency. The results of the study indicated that a glass window allows more sunlight to enter, but it also allows moisture and hot air to build up and reduces the level of privacy when opened. This is in contrast to <i>Roshan</i> , which allowed entry of the sun's rays with a lower level of humidity and temperature, while maintaining privacy.	Environmental values
10	Al-Ban [29]	Three houses in Jeddah (<i>Balad</i>): Nassif's house, Nour wali's house and Baeshen's house	The study reveals that Hijazi architecture is formed from the merging of different cultures that are dominated by religious values that emphasize women's comfort in the family.	Religious and social values
11	Hijazi [15]	The inner courtyard and <i>Roshan</i> .	The study concluded that achieving privacy in the Hijazi dwelling is a key concern. A great deal of interest in this principle appears in heritage architecture, and it is found in most buildings in a variety of forms, such as the <i>Roshan</i> and interior courtyards.	Social values



These heritage houses have also focused on women, who spend most of their time inside the house. Al-Ban referred to the impact of women on the Hijazi housing in particular, where a review of the plans of the houses in that study showed that the majority of the space is dedicated to women [29]. The ornamentation in Hijazi houses is concentrated in the women's reception room (*Hramlik*) more than in the men's. The distance between the two rooms also ensures women's freedom and privacy. The balconies make it possible for women to communicate with the outside world and watch what is happening in the street, enabling them to see and become acquainted with their neighbors while maintaining their privacy. Alnaim also notes that common Najdi social beliefs and the role of women in society strongly influenced the hierarchical arrangement of urban spaces [24]. Samir et al. also referred to the role of women in decorating the interior spaces in the Al-Asiri houses, where the walls are painted and sport decorative units (*Al-Qatt Al-Asiri*) [25].

4.3 Environmental values

The heritage houses have protected their inhabitants from variable climatic factors and difficult environmental conditions. Ahmad pointed out the role that climate has played in shaping urbanization and spaces in Hijazi architecture. This is reflected in the bends and cracks of the urban fabric, in addition to the narrowness and width of spaces, residential proximity and distance, the formation of *barhat*, and the varying spatial proportions in the movement corridors, which are nearly covered with *Roshan* [27]. Alawad mentioned that *Roshan*, when compared with glass windows, has proven to be more efficient at introducing sunlight into interior spaces while reducing moisture by absorbing it into the wood [28]. Samir et al. also mentioned that the local materials with which Asiri houses were built, such as mud and timber, helped to balance the fluctuations in summer and winter temperatures. Another important role is played by repeated rows of panels inserted into the walls, thereby protecting the external walls from rainwater [25]. Al-Qamadi et al. mentioned that the color scheme of heritage houses in Najran reflects the local environment through the use of natural materials, such as clay, plaster, and wood [18]. Nabawi believes that Najdi art has achieved environmental sustainability because it uses local materials from the surrounding environment, and the dyes are made from local plants [26]. A study conducted by Bagasi et al. found that *Mashrabiya* played an active role in Hijaz architecture, as they contributed to regulating internal temperatures by increasing air flow inside and reducing relative humidity [23]. At a broader level, Al-Ban saw that the Hijazi urban fabric considered ventilation, natural light, and the formation of shadows through the heights of dwellings and their proximity to or distance from each other [29].

4.4 Aesthetic values

Ornamentation is considered one of the most important elements reflecting aesthetic values in heritage houses in the KSA. Nabawi believes that the decorative units of Najdi art demonstrate the skill of Saudi folk artists, and this ornamentation derived from the local environment is characteristic of simplicity, spontaneity, and distance from complexity and fabrication [26]. Furthermore, Nabawi noted that the ornamentation on Najd doors particularly represents the aesthetic values of rhythm, balance, ratio, proportion, and unity [26]. Al-Ban mentions that the *roshan* is distinguished for its ornamentation and that the external ornamentation reflects the status of the family [29]. The greater the number of floors, the more decorated the external surfaces are. Attiah and Alawad were also interested in

documenting the color elements as an aesthetic value in heritage buildings, especially in the guest reception rooms, which displayed a diversity of colors according to each region [11].

Al-Qamadi et al. mentioned a number of architectural characteristics (proportion, color, light and shade, texture, and rhythm) that form the ornamentation elements of heritage houses in Najran [18].

5 DISCUSSION

As can be seen, most of the studies concentrated on the areas of Najd and the western region, and there is a lack of research discussing these values in the eastern and southern regions over the past ten years (Fig. 6).

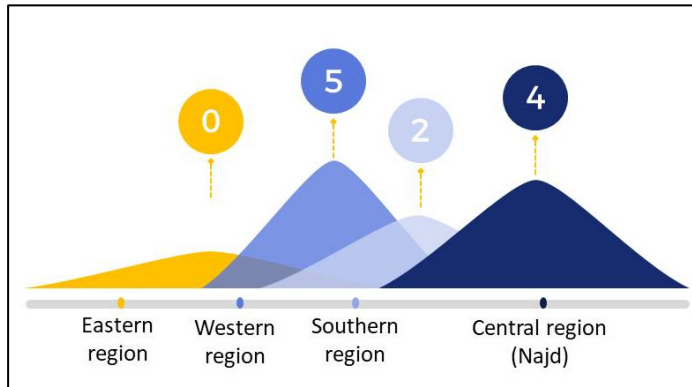


Figure 6: The number of studies that discussed the values of architectural heritage by region.

Social and cultural values were addressed most often, followed by environmental and climatic factors. Few studies related to religious and aesthetic values, perhaps due to their connection with social and cultural values. Some of the studies that did consider religious values discussed a specific value, while others discussed multiple values, as shown in Table 3.

Table 3: The heritage architectural values included in the selected studies.

N	Author/year of publication	Religious values	Social and cultural values	Environmental values	Aesthetic values
1	Attiah and Alawad [11]				✓
2	Bagasi, et al. [23]			✓	
3	Alnaim [24]		✓		
4	Alnaim [10]	✓	✓		
5	Al-Qamadi et al. [18]			✓	✓
6	Samir et al. [25]		✓	✓	
7	Nabawi [26]			✓	✓
8	Ahmed [27]		✓	✓	
9	Alawad [28]			✓	
10	Al-Ban [29]	✓	✓		
11	Hijazi [15]		✓		

Several studies on heritage houses in the KSA discussed the issue of architectural values representing the social and cultural values that stemmed from the religious values approved by the Islamic religion. In addition, they looked at the environmental values that enabled humans to adapt to and draw inspiration from their environment, as well as provided the raw materials to build residences and efficiently deal with regionally specific climatic factors. Aesthetic values are reflected in unique ornamentation, inscriptions, and colors associated with each region, which are inspired by the surrounding environment and create a distinct decorative style in each area. The values that determine the architectural and urban design features of the heritage houses in the KSA were concluded from the studies and are summarized in Fig. 7.

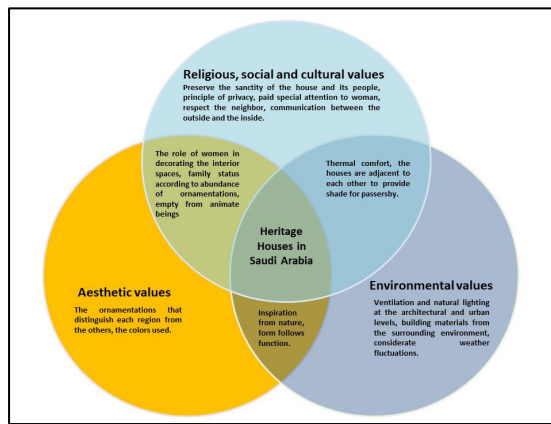


Figure 7: Summary of the values addressed by the studies that affect the formation of heritage buildings in the Kingdom.

It is clear that the values of architectural heritage are similar in all regions of the KSA, but they differ in how they are applied in each region relative to its climate, surrounding environment, availability of materials, and raw materials that aided in the construction of these houses. Table 4 shows how the methods of applying these values differ in the four regions of the KSA – central, western, eastern, and southern – despite the similarity of their principles.

Table 4 shows the similarities and differences in the architectural values of heritage houses in the KSA and how they are applied in the country's different regions. In summary:

1. All the heritage houses in the KSA are similar in their observance of religious values, such as separating the space for males and females, in addition to the absence of ornamentation that includes animate beings, except in the southern regions, where some ornamentation contains images of animals. These houses also respect the sanctity of their inhabitants by allowing those inside to look out without being seen. They also employ different elements according to the local area.
2. The houses show concern for preserving social values, as the collection of areas have a similar compact urban fabric. The exception is the southern region, which consisted of residential groups governed by tribal and family norms. All the houses consider the

Table 4: Methods of applying architectural heritage values in the regions of the KSA.

Value/definition	Resulting principles	Methods of application in the central region (Najd)	Methods of application in the western region
<p>Religious values: the rules and standards taken from the Islamic religion</p>	<ul style="list-style-type: none"> ● Maintaining privacy ● Respecting neighbors' rights 	<ul style="list-style-type: none"> ● The use of balcony rooftops to increase the height of the roof ● <i>Tarma</i> to allow someone to see who is outside without being seen inside ● A lack of external openings and their small size to block vision ● Separation of guest and family spaces ● Separation of males and females in the spaces ● Ornamentation without animate beings 	<ul style="list-style-type: none"> ● <i>Roshan</i> to allow people in the house to see who is outside, but people outside cannot see inside the house ● Separation of males and females in the spaces, such as separating the men's and women's reception rooms(<i>Hramlik</i>) ● Reliance on Islamic ornamentation
		<p>Methods of application in the eastern region</p> <ul style="list-style-type: none"> ● The principle of privacy demonstrated by the presence of an inner courtyard, to which all internal doors and windows open ● Openings in the facade on the second floor so passersby cannot see what is inside ● Separation of males and females in the spaces 	<p>Methods of application in the southern region</p> <ul style="list-style-type: none"> ● Openings in the outer facade made to be small, so people outside cannot hear what is inside ● Separation of males and females in the spaces

Table 4: Continued.

Value/definition	Resulting principles	Methods of application in the central region (Najd)	Methods of application in the western region
<p>Social values: morals and positive qualities desired by the members of a particular society</p>	<ul style="list-style-type: none"> Strengthening the social ties in the community Participating in social activities for the family Considering the functional activities of the community Distribution of public and private spaces Attention to communication between the inside and the outside 	<ul style="list-style-type: none"> The compact texture of architectural blocks and the narrowness of the passages to help strengthen communication between residents Common spaces for family meetings Division of spaces in proportion to the needs of the population, e.g., the presence of the wood house in the reception room, and the <i>Jusa</i> used to keep dates Considering the internal distribution of working and private spaces (entrance, <i>Lhwan</i>, reception room, then inner courtyard – the heart of the house) Social status reflected in the abundance or lack of ornamentation and the multiplicity of floors 	<ul style="list-style-type: none"> The urban fabric comprising compact and adjacent blocks and narrow passages to strengthen communication between residents The reception space for guests (the vestibule) usually decorated with luxurious carpets or furnished with sand according to the social status of the family External ornamentation to reflect the status of the family; more floors mean more decorated external surfaces Balconies to help women communicate with the outside world and watch what is happening on the street, enabling them to see and get to know their neighbors while preserving their privacy
		<ul style="list-style-type: none"> Methods of application in the eastern region Compact, medium density fabric and inner courtyard to strengthen communication between residents Main entrance is the most important external element and includes stucco ornamentation indicating the status of the owners Transitional corridor (the bridge) facilitates interaction between neighbors and provides a safe place for children to play 	<ul style="list-style-type: none"> Methods of application in the southern region The southern region often had a different townsman urban fabric, in contrast to the old Islamic cities with a compact urban context, consisting of several residential communities governed by tribal and family standards Space is divided to suit the needs of its residents – the ground floor for livestock and grain preservation and the second floor for housing and living Function is served by hierarchical buildings that narrow as the wall rises, stabilizing the building Women decorate houses with <i>Al-Qatt Al-Asiri</i>



Table 4: Continued.

<p>Value/definition</p> <p>Cultural values: beliefs, customs, and traditions that characterize a community or group belonging to a specific area</p>	<p>Resulting principles</p> <ul style="list-style-type: none"> • Reflecting the regional cultural identity • The particularity of the character that is distinct to each region 	<p>Methods of application in the central region (Najd)</p> <ul style="list-style-type: none"> • Mud architecture characteristic of the Najd region and some distinguishing ornamentation (<i>Zarnouk</i>, <i>Shanaf</i>, stucco ornamentation, sunken and prominent triangles) • Common spaces for family meetings (<i>Alqahwa</i>), usually decorated and ornate, a symbol of hospitality and honoring guests 	<p>Methods of application in the western region</p> <ul style="list-style-type: none"> • Islamic architectural style characterizes the region; inscriptions and ornamentation using wood as a basic material • Most Hijazi dwelling space reserved for women, who spend most of their time there
	<p>Methods of application in the eastern region</p> <ul style="list-style-type: none"> • Reflecting the importance of guest hospitality while maintaining privacy, the house includes separate areas for guests and family • Arches create a local architectural identity distinct from other regions 	<p>Methods of application in the southern region</p> <ul style="list-style-type: none"> • A diverse topography results in a variety of styles that give the southern region a distinct cultural architectural identity 	



Table 4: Continued.

Value/definition	Resulting principles	Methods of application in the central region (Najd)	Methods of application in the western region
<p>Environmental values: people's efforts to adapt to climate changes and the environment around them and to adapt the environment to their interests and needs</p>	<ul style="list-style-type: none"> • Considering the harsh climatic factors of each region • Diverse construction methods and materials from the surrounding environment • Providing ventilation and natural light • Creating thermal moderation 	<ul style="list-style-type: none"> • Furaj or Shamarikh triangular openings that allow air and sunlight to enter • The use of clay in construction, aiding in thermal moderation • The use of local materials, such as clay, tamarisk wood, palm leaf, and plaster 	<ul style="list-style-type: none"> • Hijazi urban fabric provides ventilation, natural light, and the occurrence of shadows through the height of dwellings and their proximity to or distance from each other • <i>Roshan</i> used to ventilate the house, and wood thermally insulates the house from the scorching sun and moderates the atmosphere • <i>Roshan</i> allows natural light to enter while directing the movement of air inside the house • The main building material, <i>Manaqib</i> stone (coral stone), held together by sticky black clay
		<ul style="list-style-type: none"> • Methods of application in the eastern region • Multiple architectural treatments, such as a <i>Badgir</i>: a channel on the wall that opens to the roof and the rooms of the house to direct cold air into the rooms • Use of local building materials, such as limestone, clay, palm trunks, and <i>Denshel</i> wood 	<ul style="list-style-type: none"> • Methods of application in the southern region • Local materials used in construction, including clay in Najran, mud and stone combined (Raqaf) in parts of Abha and Sarat Ubaida, and pure stone in mountainous areas; reeds and bamboo used to build Aleisha in the Tihama coastal plain • Cylindrical buildings in Viva houses roofed with local timber to reduce the effect of heavy rain

Table 4: Continued.

Value/definition	Resulting principles	Methods of application in the central region (Najd)	Methods of application in the western region
<p>Aesthetic values: the positive or negative reaction that one has to a visual stimulation or sight</p>	<ul style="list-style-type: none"> • Diverse urban formation • Reflection of aesthetic principles (unity, ratios and proportions, harmony, rhythm) • A variety of ornamentation methods 	<ul style="list-style-type: none"> • The urban fabric created by overlapping blocks, creating an aesthetic image • Repeated decorative units to create a proportional rhythm • Diverse decorative elements created by engraving or building or employing colors to doors, windows, and shutters <p>Methods of application in the eastern region</p> <ul style="list-style-type: none"> • Houses distinguished by stucco ornamentation and circular arches decorated with stucco above the doors and windows • Ornamentation inspired by the surrounding environment (e.g., palm ornamentation) 	<ul style="list-style-type: none"> • Roshan distinguished by wooden surfaces with geometrical and interlocking architectural ornamentation, comprising eaves and cornices that create a distinct aesthetic and architectural character to the facades of buildings, in particular, and the architectural blocks in general <p>Methods of application in the southern region</p> <ul style="list-style-type: none"> • Buildings decorated from the inside, around the edges of the doors, windows, ceilings, and lower parts of the walls, in bright colors renowned in the Asir region (<i>Al-Qatt Al-Asiri</i>); houses in Fifa decorated with quartz stone • Plant, geometric, and animal ornamentation on the walls of <i>Aleisha</i> covered with mud

needs of the individual and family by providing spaces that meet their desires and needs. Public and private spaces have been separated by transitional corridors, and generosity is evident in the presence of special spaces, which have been specially decorated and furnished for guests.

3. Each region has preserved its unique cultural identity as reflected in its architecture and distinctive style. This appears in the mud architecture found in Najd, the Red Sea Basin of the western region, and the Arabian Gulf style in the eastern region. The southern region has many styles in line with the topography of each city (Al-Sarat has mud-brick and mud-stone architecture), in addition to the particular consideration given to women, as they spend the majority of their time at home.
4. Those houses have adapted to harsh climates through building methods in each region that use local materials from the surrounding environment, and the houses display architectural treatments that differ from one region to another.
5. A variation of ornamentation and color distinguishes each region from another, as these houses demonstrate aesthetic values at the urban level by overlapping and the proximity of the blocks. At the architectural level, it is found in individual houses, either on the exterior or in the interior spaces, by employing decorative elements that reflect the aesthetic principles of unity, ratio and proportions, harmony, and rhythm.

6 CONCLUSION

The purpose of this systematic review was to examine the current state of the research that discusses the architectural values in heritage houses in the KSA. It aims to provide an understanding of the meaning behind the formation of the houses, demonstrating their efficiency at the time of construction and their ability to meet the needs of their residents. Furthermore, this review emphasizes that the study of architectural values and methods of application helps us understand our heritage and derive the constants and principles from it to apply them in line with the needs of the present day. Therefore, engineers and architects must seek to attain those values in contemporary homes without the application of one value cancelling another. For example, the present-day application of the concept of privacy has led to many openings being removed, thus eliminating the environmental value of providing natural light and ventilation.

Notably, the number of studies discussing architectural values has declined during the last ten years, especially in the eastern and southern regions. This enables researchers to conduct such research to provide a valuable reference for engineers and designers and suggest contemporary strategies that would simultaneously preserve the values and identity of the region. Such research also contributes to the promotion of the initiative of the King Salman Urbanism Charter launched by the Architecture and Design Commission, which stems from the most important national cultural strategies of the Kingdom's Vision 2030.

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