



# Saudi Arabia's Colourful Culture: Exploring Colour in Saudi Heritage Homes' Al-Majlis Rooms

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## ABSTRACT

Saudi Arabia considers its architectural heritage a part of its wealth and has extensively tried to preserve it. Several studies on Saudi Arabia's heritage, particularly its architectural heritage, have been conducted; however, there is a lack of studies detailing elements of the interiors of historical buildings. This study analyses the colours in interior spaces of traditional Saudi Arabian houses. A descriptive-analytical method is applied to eight traditional houses from the four main regions of the Kingdom of Saudi Arabia: central, eastern, western and southern. This study demonstrates that the two houses selected from each of the four regions have similarities in the colour scheme and overall visual look and feel of the al-majlis interior space, with only minor differences. In addition, the study finds that each region is characterised by a distinct interior colour palette. Our findings will aid scholars in documenting colour as an important element of interior spaces in traditional houses and will provide a colour reference for designers, companies and paint factories for adaptation of contemporary designs and concepts to prevailing local identities. Additionally, our analytical framework may guide professionals when colour is considered as an element in interior design.

### KEYWORDS

Interior design, architectural heritage, colour design, traditional architecture, historic homes, local identities

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## 1. Introduction

Heritage is an important part of a nation's identity and reflects the development of a civilisation through the ages. Tangible examples of architectural heritage carry unique historical, social, religious and political values. Saudi Arabia has endeavoured to preserve its cultural heritage, tangible and intangible, through short- and long-term strategies.

The Saudi government has registered some locations, such as historic Jeddah, and practices, such as the traditional al-qatt art that adorns walls in the Aseer region, as part of the United Nations Educational, Scientific, and Cultural Organization (UNESCO)'s World Heritage list (UNESCO, 2020). The Kingdom also organises symposia and conferences, including the National Built Heritage Forum. To motivate researchers, students and those interested in conducting studies, the government has also established heritage scholarships (Ministry of Culture, 2020) and prizes, such as the Prince Sultan bin Salman Award for Urban Heritage (Al-Turath, 2021), to achieve its 2030 vision for the preservation of cultural heritage. To further these efforts, Bahmam (2000) asserts that traditional architecture should be integrated and valued in all architecture and interior design curricula, whether in theoretical modules or in practical designs.

Some traditional elements have been notably emulated on streets and on the façades of public and private buildings. For example, traditional elements can be seen in rawashin, or balconies, in Jeddah city; on the Sharfat Wall in Unayzah city; and in al-qatt wall paintings in Abha city. Some modern homes also reflect heritage style in their interior design. A study by Alawad (2015) found that in the Najd region, the strongest motive behind the acquisition, possession and application of heritage collectables in home interiors was the expression of identity. Selecting the appropriate heritage style and colour scheme is essential to presenting a complete traditional look and to sustaining identity in the midst of modernity.

Colour is a crucial element in design. Attiah (2016) argues the importance of colour as an interior design element as among the first

considerations of any design process. Designers generally have a clear idea of at least one of the colours to be applied in their designs, even in the initial inspirational phases. Studies analysing the colours in the interior living spaces of traditional Saudi houses are few, however. In this study, we apply a descriptive-analytical method to eight traditional houses from the four main regions of the Kingdom of Saudi Arabia and find that each region is characterised by a distinct interior colour palette. We look at the colours in the al-majlis (guest rooms/living rooms) of each house, built more than 60 years ago. Our study analyses the colours used in the interior design of each house and proposes colour boards for future reference.

## 2. Traditional Architecture and Colour

### 2.1. Traditional Architecture:

Saudi Arabia is divided administratively into 13 provinces, forming five general regions. As the regions vary in geographical area and climate, there is a visible diversity in the building materials and in the construction methods of traditional buildings. Each major region has its own style. Previous studies have identified four major architectural styles among traditional buildings, including those of Najd, Al Ahsa, Alhijaz and Tihamah (Rifai and Rifai, 1990). Other classifications include Najdi style in the central region, Arabian Gulf style in the eastern region, Sarah style in the southern region and Red Sea style in the western region. Based on these classifications, four regions have been chosen as the foci of this study: central (Al-Qaseem/Onaizah Governorate), eastern (Eastern Region/Al Ahsa Governorate, Hofuf City), western (Makkah region/Jeddah Governorate) and southern (Aseer region/Abha Governorate). No governorates from the north were chosen, as the Najdi style extends into the northern regions (SCTA, 2010).

There are variations in the type or design of buildings and materials used within each geographical section, such as the areas north and south of Najd (Rifai and Rifai, 1990), the coastal and mountainous areas in the southern region (Bahmam, 2000) and the coastal and

agricultural areas in the eastern region (Almegnem, 2016). A region's architectural type is influenced by its location and its cultural ties with neighbouring countries. Bahmam (2000) explains that the construction of traditional housing in Saudi Arabia occurred until approximately 60 to 70 years before the current study and that a new architectural type began to emerge with the availability of new building materials in the 1940s.

### 2.1.1 Central Region

The urban fabric of Najd is characterised by interconnectedness. The streets are narrow and curved to protect pedestrians from the sun's heat and from the wind and storms of the desert climate, which is hot and dry in the summer and cold and rainy in the winter (Bahmam, 2000; AMA, 2003). The minimally decorated buildings, with plain exterior façades, have small, high openings to allow air circulation and ensure residents' privacy (Bahmam, 2000; SCTA, 2010). On the exteriors of traditional buildings, no distinction indicates social class; the exteriors are similar in height, building material, decoration and general appearance (SCTA, 2010). These buildings feature external decorations, such as tarma, triangle-shaped cavernous designs and engravings (CPD, 2000), and sharfat, seen on top of walls as square, pyramidal or triangular forms (AMA, 2003). In addition to beautifying the structure, these decorations have functional tasks: the sharfat protects the building from rain, and the tarma allows residents to look outside while maintaining their privacy (CPD, 2000).

Owing to the Najd region's distance from the coast, its traditional buildings are the least influenced by neighbouring countries' architectural styles (Bahmam, 2000). When the buildings were constructed, materials were sourced locally and included mud, which was freely available at a low cost, easy to use and durable. Buildings' walls are very thick, which strengthens the structures (Rifai and Rifai, 1990) and provides heat insulation (Babsail and Al-Qawasmi, 2014; Rifai and Rifai, 1990). Roofs are built from tamarisk tree trunks stacked horizontally on the edges of walls with palm tree trunks placed over the stack and covered with mud. Flat stones also appear in roofs and floorings (subject to their availability at the time of construction; SCTA, 2010; Bahmam, 2000; Rifai and Rifai, 1990). Doors and windows are made using wooden and metal nails (AMA, 2003). Interior walls are painted with white plaster up to one third or half of the full height of the wall (SCTA, 2010), and the floors are painted as well (AMA, 2003).

The buildings have inner courtyards to aid in ventilation and lighting (Bahmam, 2000; Rifai and Rifai, 1990). The family rooms are placed around the courtyard with windows and doors that open into them (Rifai and Rifai, 1990). Some buildings have more than one inner courtyard. The space varies according to the number of family members and the economic status of the family. The courtyards are divided into two sections: one for men and guests and the other for the rest of the family, each with a private entrance (SCTA, 2010). The windows and doors are made of wood decorated with cavernous details and engravings; they are painted with plants and flowers (AMA, 2003; Rifai and Rifai, 1990) and geometric motifs (Bahmam, 2000). The windows are of different sizes and placements; the windows of the façade are small and high, while the windows inside are lower and large.

The al-majlis is an integral part of the house and is an area to host guests. People pay considerable attention to the al-majlis because it represents the host's identity (SCTA, 2010; CPD, 2000). The al-majlis was designed to be self-sufficient for serving guests (CPD, 2000) and is characterised by high ceilings to help with ventilation and cooling (AMA, 2003); the walls sport several kinds of motifs. Sometimes walls are covered with gypsum and decorated with geometric patterns, while other walls have plain gypsum up to only a certain height, either a meter or the height of a man (CPD, 2000). In one corner of the al-

majlis is a wujar, where coffee and other hot beverages are made (AMA, 2003; Rifai and Rifai, 1990). The wujar is connected to the camer, carved shelves decorated with gypsum that store the coffee-making tools and other materials (AMA, 2003). The wujar also has a space for firewood – a small room with a pointed-arch opening, and a frame decorated with small triangles or squares. There are alcoves in the wall to place lighting units, such as those made by Siraj (CPD, 2000).

### 2.1.2 Eastern Region

The eastern region is characterised by a moderate level of housing interconnectedness and a decrease in overall height, with buildings reaching only up to two floors (Bahmam, 2000). The streets are narrow and curved to ensure privacy and protection from the heat (CPD, 2000). Coastal areas along the Arabian Gulf are very hot and humid in summer; thus, limestone acquired from the Gulf is used as the primary building material (Babsail and Al-Qawasmi, 2014; Bahmam, 2000) and affixed with clay and plaster (King, 1998).

Environmental diversity has fostered diversity in building patterns; however, in both coastal and agricultural lands, interior space and courtyards are both common features (Almegnem, 2016). Here, the exterior façades are in orthogonal geometric shapes that incorporate large openings in a manner that maintains privacy and provides good ventilation (Bahmam, 2000). However, houses have a limited number of small outside windows (CPD, 2000).

The houses are remarkably private, with the semblance of a box with a few holes poked in it fixed to the roof overlooking the main entrance, the tarma; the owner of the house can look outside, but no one can peek inside (King, 1998). The eastern region's architecture reveals influences from its commercial contacts with other regions in its construction style and the shape of its arches (Bahmam, 2000). Traditional houses have an inner courtyard surrounded by rooms, arches over doors, windows decorated with gypsum (Babsail and Al-Qawasmi, 2014; Bahmam, 2000) and thick walls (King, 1998).

The environment influenced the craftsmen who created carvings in the plaster; while carvings in the coastal areas show the influences of the local surroundings, including sea waves and fishing nets, carvings in the agricultural areas have palm fronds and trunks (Almegnem, 2016). Although the structures do not correspond to any one shape, the patterns are consistent (Rifai and Rifai, 1990), with the gypsum engravings inspired by neighbouring countries (Babsail and Al-Qawasmi, 2014). The interior walls are usually covered with plaster and painted white (Babsail and Al-Qawasmi, 2014; King, 1998; Rifai and Rifai, 1990). Both the walls and the decorations are white (King, 1998), while roofs are made from wooden beams and covered with palm trunks and leaves (Rifai and Rifai, 1990).

The al-majlis is considered an integral part of the house; its design differs from other rooms. It has many windows as well as high ceilings about 6 m off the ground that guarantee light and ventilation. The room is furnished with luxurious carpets, cushions and furniture, including built-in cupboards with wooden doors. Built-in shelves store perfume sprays known as marash and coffee tools used to prepare coffee and tea at the al-megaed in the centre of the al-majlis (CPD, 2000).

### 2.1.3 Western Region

The western region is characterised by the intensity of its interconnected architectural blocks, which are interrupted by narrow, zigzagging roads that provide shade and cool air for pedestrians (Bahmam, 2000). The terrain of the western region varies, a reflection of the diversity of the climate that reaches a high of 50°C in Mecca and a low of 18°C in Ta'if. Economic activities include pilgrimages (the Hajj and the Umrah), commerce, fishing, and agriculture and herding

services (SCTA, 2010).

In coastal areas, such as Jeddah, the houses are built of limestone and pieces of wood (takaleel) placed horizontally to the wall to ensure a fair distribution of weight on the walls and prevent cracks (Bahmam, 2000; Rifai and Rifai, 1990). Houses in the mountainous areas of Mecca are built of mountain stone, and the roofs are built with wooden plywood supported by wooden panels; a layer of coral limestone is then placed on the wood, followed by sand (Bahmam, 2000). The *Encyclopedia of Traditional Cultures* mentions that the ceiling height in Jeddah is no less than 3 m to allow for good ventilation (CPD, 2000).

Traditional houses in this region are influenced by the architectural styles of a number of countries (Rifai and Rifai, 1990). The design differs from one city to another. Some have an interior courtyard or an external courtyard, while others lack a courtyard but have an alternative surface, as seen in Jeddah houses, owing to the lack of space (CPD, 2000). Over the years, buildings have been influenced by other cultures; in this way, the western region is distinguished from the rest of Saudi Arabia by its construction methods and architectural treatments (Bahmam, 2000).

The construction of these houses is influenced by two factors: privacy and natural ventilation (Bahmam, 2000). Houses in this region are characterised by height and multiple levels, their façades decorated with rawashin, projecting latticed window balconies (Bahmam, 2000; Rifai and Rifai, 1990), which reflect the family’s social standing and wealth (CPD, 2000). The exterior walls are covered with a layer of lime to protect the building stones from the climate and then painted white or with light colours, such as cyan. The doors and windows are made of imported wood engraved and coloured locally (Bahmam, 2000; Rifai and Rifai, 1990), with motifs ranging from floral to geometric; some are even decorated with words (CPD, 2000). Owing to the use of materials like limestone and mud in Jeddah and Al-Madinah, the engraving patterns are more prominent than those found in Makkah, where the building material is generally stone.

In these houses, guest rooms called magad are generally on the ground floor. In some areas of the Hijaz region, the guest room is either placed on the upper floors, or there is more than one guest room. The number of rooms depends on how large the family is and on their social status. Very often one space can be used for multiple activities. Some magads have floor levels. In Jeddah, the magad has a long, high wooden bench, along with a sitting area on the floor, which is covered with colourful carpets. It has an area to prepare coffee and tea for guests, equipped with canon to heat water, and the wall has recessed camer shelves; a fabric sheet or curtain covers the tea, coffee, and utensils and lends an aesthetic element to the wall (CPD, 2000).

2.1.4 Southern Region

The climate of the southern region varies by specific location, from the coast to the mountains. It is characterised by agricultural housing complexes scattered across the region in the mountains and the coastal plain of the Tihama (Bahmam, 2000). In Aseer, houses are made of stone and mud. Houses on the mountains and hills converge in a vertical stretch to use the designated horizontal areas (CPD, 2000). Houses differ in terms of construction style; for example, in the highlands, houses are built of stone and mud, and the structures are stacked with flat stones that stick out to protect the mud wall from rain. Construction methods also differ in Fayfa and Tihama (Bahmam, 2000), and the use of stone in the exterior wall is a unique feature of Aseer architecture (King, 1998). The taller the building, the narrower its top space appears; this space is usually in the shape of a pyramid. This narrowing is meant to stabilise the building (Bahmam, 2000).

The ground floor was originally designated for animals and the storage of grain, and this floor stands isolated from the main façade

with an entrance at the back. The other floors are much like those in houses within other areas of Saudi Arabia (CPD, 2000). Mud is used to plaster the walls and stairs, and the interiors are painted with colours extracted from plants (Bahmam, 2000; Rifai and Rifai, 1990). Called al-qatt, this form of art is applied around the windows in geometric patterns of yellow, red, blue and green (Bahmam, 2000). The al-majlis guest room is placed on the upper floors.

2.2. Colour Used in the Interiors:

Colour is a major design element requiring focused and detailed attention in the interior design process. In her PhD thesis, Attiah (2016) demonstrates that colour is usually part of the initial stages of design. When no designers or architects are hired to make choices related to colour, layout, furniture or materials, house owners and builders take on the aesthetic and decorative tasks. These tasks, generally recognised as interior decorating, usually involve minute reversible interventions, such as providing dressing spaces in selected materials and colours (Coates *et al.*, 2009). Interior decoration is unlike the new professions of interior architecture and interior design that address major tasks.

2.2.1. Colour-Design Terms and Colour Harmonies

Major terms and references in the field of colour design are used to indicate colour names, relationships and harmonies. Table 1 summarises the most commonly used colour design terms referenced in this study.

**Table 1: Common Terms in Colour Design**

Colour Term	Definition	Reference
Colour Wheel	For designers and artists, the colour wheel refers to the specific placement of hues along the circumference of a wheel/circle to assist in illustrating and constructing colour relationships. The colour wheel can have as few as six hues and can be doubled as more colours are distinguished.	(Bleicher, 2012)
Hue	A pure hue (the name of a specific wavelength) is one without any addition of black, white, grey or a complementary colour (the opposite hue on the colour wheel).  The hue for artists and designers is relative to the industry and the available resources. There are thousands of colour names (hues), as many have been created by the pigment, cosmetic and other industries simply to lend identity to related colours.	(Feisner, 2006)  (Hornung, 2005)
Saturation	The intensity and purity of a given hue, or the brightness or dullness of a colour.	(Bleicher, 2012)
Intensity, Purity	Synonyms for saturation (used in colour design but not in colour science).	(Fisher and Zelanski, 1999; Attiah, 2016)
Chroma	Another synonym for saturation.	(Feisner, 2006)
Value	The degree of lightness or darkness in a hue. In pigment mixtures, value can be adjusted by adding black or white to the hue.	(Fisher and Zelanski, 1999)
Colour Temperature	The temperature of a colour determines if the hue is cool or warm. (In this study, a neutral colour is a colour that is neither warm nor cool).	(Feisner, 2006)
Tint	White added to a hue creates its tint.	(Fisher and Zelanski, 1999)
Shade	Shade(s) is/are created by adding black to a colour (hue).	(Fisher and Zelanski, 1999)
Tone	Used to describe a hue mixed with grey.	(Fisher and Zelanski, 1999)
Desaturated	When a colour is desaturated, it becomes greyer and more washed out.	(Bleicher, 2012)

Fisher and Zelanski (1999) refer to the term ‘colour scheme’ as a combination of colours that creates pleasing harmonies; they argue that certain colour groupings are thought to be far more aesthetically appropriate than others. Attempts have been made to list and prescribe the groups that work well together. Frequently used colour schemes (harmonies) most relevant to this study are listed in Table 2 (Attiah, 2016).

**Table 2: Common Colour Schemes (Attiah, 2016)**

Colour Scheme Term	Definition	Reference
Monochromatic	Believed to be the simplest colour scheme, it is a combination of a single hue with variations in value and saturation to avoid monotony.	(Bellamy, 2004)
Achromatic	Colour in relation to changed saturation. Achromatic greys, however, lack hue and saturation.	(Hornung, 2005)
Analogous	Uses several hues next to each other on a colour wheel.	(Feisner, 2006)
Complementary	Consists of hues opposite each other on the colour wheel.	(Bellamy, 2004)
Triadic	Three colours that are similarly distanced on the same colour wheel.	(Attiah, 2016)

Hornung (2005) believes that it is impossible to describe any colour with absolute precision, but by focusing on describing the hue, value, saturation and temperature, as Feisner (2006) points out, colour can

be discussed with some clarity.

### 3. Methodology

Four regions in Saudi Arabia have been chosen as subjects for this study. The interior colours of the al-majlis, or reception/living areas, of eight historical houses, two in each region, are analysed by:


- Collecting photos (some photos were collected onsite using a professional camera, and some were collected from different resources without adding any camera effects or changing any settings).
- Creating Excel sheets to provide detailed analyses of the visual elements of all the surfaces of the interior spaces (colours/hues are labelled by general names only) and general information about the locations of the al-majlis and the exterior façades.
- Creating a colour board for each of the eight houses after analysing each surface of their interiors for colour.
- Discussing each region separately and revising the Excel tables with all the details, a summary of each region/region discussion and keywords on colour harmonies derived from the discussion.
- Comparing discussions among the four regions to provide a summary discussion and conclusion.
- Proposing colours to symbolise Saudi Arabia's four regions and providing guidelines for interior colours in the country's four geographic regions.
  - Proposing a method to analyse colour generally.
  - Providing a reference for heritage interiors.
  - Suggesting proportions for heritage look and feel.

After collecting images of each house, the five steps shown above were designed and planned out. The analysis began with Microsoft Excel tables that detailed the main colours of each al-majlis and included extra notes on design. It is important to note that the colours of each house were labelled as the general name of that particular hue/colour and the house name/region. We noted the following:

- Exterior façade colours (the significant environmental colour of the region, if any).
- Location of al-majlis and level in the house.
- Structural surfaces (walls, flooring, ceiling).
- Furniture (mainly seating) and accessories.
- Derived colour scheme and spatial interaction notes.

This step was followed by the development of colour boards for each house.

The suggested colour boards served as approximate visual communication tools to unify the boards of all of the analysed houses. A common board size needed to be developed for future design projects and to be used as a reference for the interior colours of Saudi Arabian houses. To simplify this communication tool, the authors devised a calculation method to create the proposed board size as follows (see Table 3), with an average room size of  $5 \times 4$  m and an average room height of 3 m.

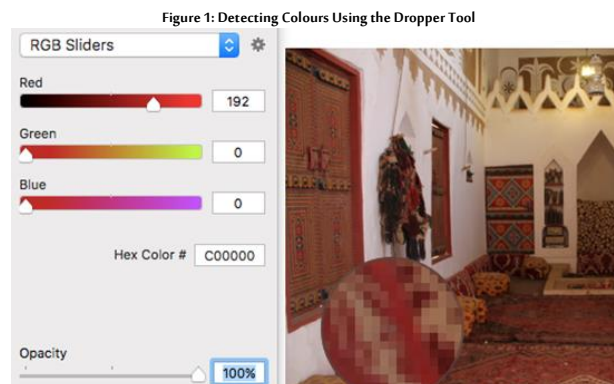
Room Size	Average chosen: $5 \times 4$ m
Room Height	Average height: 3 m
Walls (including doors and windows)	Usually four walls in the room: $(5 \times 3 \times 2) + (4 \times 3 \times 2) = \text{approx. } 54 \text{ sq m.}$
Floor	$5 \times 4 = 20 \text{ sq m}$
Ceiling	$5 \times 4 = 20 \text{ sq m}$
Furniture	 <p>Common layout - seating Less than <math>17 \text{ sq m}</math> From <math>1</math> to <math>3 \text{ sq m}</math></p>
Additional Accessories/Decorations	From $1$ to $3 \text{ sq m}$

Al-majlis rooms follow a common layout, where seating (built-in or low seats) constitutes the major furniture and lines the room's borders, usually in linear arrangements off the walls. Approximate proportions are communicated as visually perceived shapes.

General colours were extracted and named from the collected photos, with no attention given to unifying camera settings or lighting

options, as the goal in this research was to identify and extract a generic colour. In addition, the photos were taken from different angles, as our interest was in highlighting the elements involved in the analysis.

The Dropper tool in Microsoft Office was used to select the main colours from the photos and to detect and name the main family of each hue/colour, for example: red (dark or light), black, white, etc. Figure 1 presents an example of colour extraction.



A series of extant studies have investigated, assessed and compared the appearance and use of colour in heritage sites, including studies by Tantcheva *et al.* (2008; 2013) that combined the scientific method of measuring colour with the physical representation of the human perception of a particular colour within the Munsell colour-notation system (Tantcheva *et al.*, 2013). Tantcheva *et al.* (2013) employ analytical methods using the Munsell colour-notation system that allows for a scientifically precise translation of colorimetric data for the purpose of historical art investigation. Based on this research, the authors of the current study sought out and analysed primary colour names and schemes in relation to Saudi Arabian al-majlis heritage interiors.

Based on the summative analysis of the Excel tables and the completed colour boards, our discussion focuses on a general assessment of each region, followed by a specification of the major colours of each region on the colour boards. The major colours that symbolise the region are suggested using common colour harmony terms.

Table 4 contains the codes assigned to the eight houses examined in this study. It is worth mentioning that in Saudi tradition, houses are usually named after the owners' family names.

House Code	House Name
C. 1 (Central region - House 1)	Albassam House
C. 2 (Central region - House 2)	Alsalhi House
W. 1 (Western region - House 1)	Baashen House
W. 2 (Western region - House 2)	Almatboul House
E. 1 (Eastern region - House 1)	Almulla House
E. 2 (Eastern region - House 2)	Almelhem House
S. 1 (Southern region - House 1)	Abu-Milha House
S. 2 (Southern region - House 2)	Alhisan House

While surfaces and other primary elements are analysed in this study, lighting aspects are not. At the time these houses were built, daylight was the primary source of light, and lanterns were lit at night. When electricity was brought to these regions, some people began to use incandescent lights (yellow/warm in temperature) to illuminate their spaces at night, again with lanterns or small light fixtures. Because the type of window varies according to region, natural lighting was insufficient in the selected homes, and photos were taken during the day using artificial lighting.

Table 5 presents the Excel table used to analyse one house (W. 1).

Table 5: Analysis of Al-Majlis' Interior Colours: House W. 1

Primary colour detected	Interior space code	Main colours used (names)	Exterior façade's colours	Significant environmental colour	Location of al-majlis (level)	Adjacent function
General information: Exterior façade, significant environmental colour, location of al-majlis and adjacent functions	Interior space code	Blue-green, white, brown, metallics	Brown door, white paints	Sand and sea (Jeddah overlooks the Red Sea)	Ground level	Indoor corridors
	W.R.1					
Structural surfaces (flooring, walls, ceiling) of al-majlis	Structural surface	Material	Colour	Surface characteristics	Colour association (cultural, semiotic, environmental)	
	Colours, characteristics	Flooring	Terrazzo tiles	White and green	Affordable and popular in the region	-
		Flooring	Rugs/decorative	Green	Persian or Indian	Cultural
		Walls	Paint	White	-	Plain white to add space
Colours, characteristics	Ceiling	Wood	Brown	-	Tracks for spotlights (newly added)	
Architectural openings (doors, windows, arches, if any)	Architectural opening	Colour	Surface characteristics	Colour Association (cultural, semiotic, environmental)		
Colours, characteristics	Door1	Red, yellow, blue, green	Colourful glass door top	Cultural association		
	Door2	Brown	Wooden main door	Cultural association		
	Window1	Brown	Wooden frame glass panels	Cultural association		
	Arch	Brown	Wood-framed arches	Cultural association		
Main furniture in al-majlis	Furniture	Colour	Surface characteristics	Colour Association (cultural, semiotic, environmental)		
Colours, characteristics	High seating	Blue-green, beige	Floral pattern	Abutair pattern (cultural)		
	Seat cover	White	Lace protective cover	Cultural - Turkish		
	Side tables	Brown	Wooden tables	-		
Decorative elements	Decorative	Colour	Colour characteristics	Impact on main colour scheme		
Colours, characteristics	Vases	Copper-metal	-	Neutral		
	Picture frames	Gold, brown, white...	Extra decorative	Neutral		
Main derived colour scheme	Derived colour scheme	Spatial interaction notes				
Additional spatial impact in regard to colour	Complementary-monochromatic	Red, blue-green, warm shades				
		White on walls was used the most, making the room appear larger				
		Brown woods (shades of yellow and/or orange) - lighter shades				

## 4. Results and Discussion

### 4.1. Central Region Colour Analysis:

Two houses from this region were chosen for analysis, the Albassam House (C. 1) and Alsalhi House (C. 2). Following the detailed Excel sheets, multiple elements in the al-majlis were analysed in both houses (Figure 2; C. 1 and C. 2).

Figure 2: Central Region Traditional Houses' Al-majlis: (a) C. 1 Albassam; (b) C. 2 Alsalhi



Here, both al-majlis were located on the ground floor, overlooking exterior corridors that acted as courtyards. Both façades were painted in white and beige (with tints and tones of yellow) to blend the man-made enclosures into the region's natural environment (sand and desert). Both C. 1 and C. 2 had al-majlis with walls painted in white and decorative shapes in yellow (tones: dark beiges) depicting palm

trees, popular in the central region. Ceilings were made from and covered fully by natural wood in brown colours (shades of reds or yellows or both).

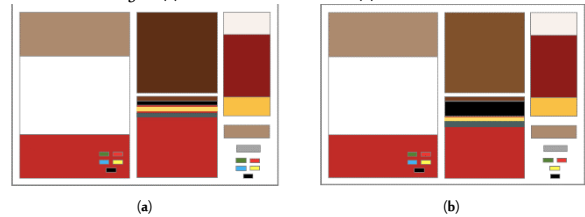
The flooring of each al-majlis was almost entirely covered in rugs, with patterns associated with Indian or Persian culture, sourced during the years of active trade with those countries. C. 1's rugs were primarily red, and C. 2's were both black and red, adding warmth to the space. Both rugs had limited amounts of other colours, such as green and orange.

Architectural features, such as doors and windows, in both houses of the central region made use of reds and browns and made minor use of greens and yellows. C. 1's main door was painted red, with minor touches of green and yellow, while C. 2 seemed to have two main doors; the first was similar to C. 1's, and the second was brown. Both houses had arches framed in white, as openings between spaces, and brown windows with wooden frames.

The central region seemed to rely on low seating in red and beige colours with the traditional floral pattern known as abutair. In C. 1, the armrests of the seats had floral patterns primarily in yellow, complemented by red and green. In C. 2's seating, the armrests appeared to be in the same red and beige patterns used for the rest of the furniture.

Coffee pots, scent diffusers and colourful fabrics in red, copper and some gold were used as accessories in both C. 1 and C. 2. As shown in Figure 3, red was the primary colour of the al-majlis rooms in the central region of Saudi Arabia. A monochromatic colour scheme dominated both houses, with some analogous colours added for visual harmony.

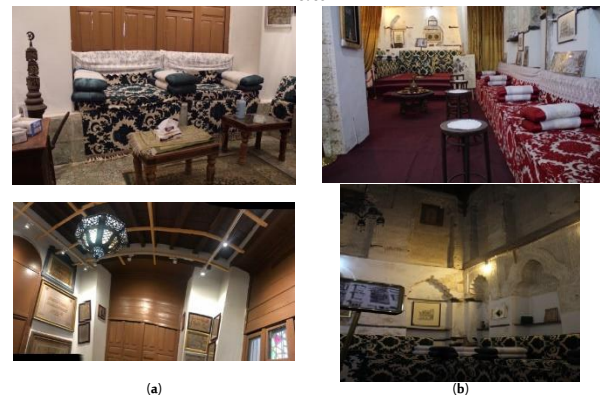
Figure 3: Monochromatic-Analogous Colour Scheme (with Minor Multi-Coloured Aspects) in the Central Region: (a) C. 1 Albassam Colour Board; (b) C. 2 Alsalhi Colour Board



### 4.2. Western Region Colour Analysis:

The two houses chosen for analysis in the western region of Saudi Arabia were the Baeshen House (W. 1) and Almatbouli House (W. 2; see Figure 4).

Figure 4: Western Region Traditional Houses' Al-Majlis: (a) W. 1 Baeshen House; (b) W. 2 Almatbouli House



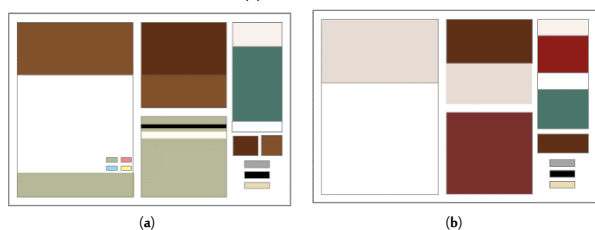
Both al-majlis in these two houses were located on the ground floor with separate entrances. The exterior façades of both houses made maximal use of brown (wood), complemented by the rawashin (projecting oriel window) element and white painted panels. Indoor corridors appeared adjacent to both rooms. W. 1 had terrazzo tile

flooring in white and green colours, whereas W. 2 had red carpets. Terrazzo tiling was popular in most western houses built around the time of W. 1.

The walls in both houses were painted white; however, in W. 2 the white was accentuated with a few brown shelves and carved woodwork painted in white and a darker shade of beige. W. 1's walls were covered by the wooden frames of the big rawashin windows, while in W. 2, closed arches primarily overlooked the interior spaces. Wood was used for both W. 1's and W. 2's ceilings, with green colour added to the latter. W. 2's ceiling was much higher than that of W. 1, almost double the usual 3 m height. Furniture used in the al-majlis of the western region generally had high seats and used fabric patterns similar to those used in the central region, but in hues of blue-green. Red-patterned fabric, however, was used in W. 2 in addition to the blue-green fabric. Both W. 1 and W. 2 demonstrated the use of white decorative lace to cover the furniture.

To accompany the high seating, high-sided tables in brown wood were seen in both houses. Copper vases and picture frames appeared as decorative accessories in both houses as well. W. 2 had heavy wall carvings in its arches. It is clear from Figure 5 that the primary colour in the western Saudi Arabian al-majlis rooms is blue-green, with red and brown following as significant colours. Just as in the central region, a monochromatic colour scheme seemed to dominate, with the addition of visually complementary tones, hues and colours.

Figure 5: Monochromatic–Complementary Colour Scheme in the Western Region: (a) W. 1 Baeshen House; (b) W. 2 Almatbouli House



### 4.3. Southern Region Colour Analysis:

The two houses chosen for analysis in the southern region of Saudi Arabia were the Abu-Milha House (S. 1) and Alhishn House (S. 2; see Figure 6).

Figure 6: Southern Region Traditional Houses' Al-Majlis: (a) S. 1 Abu-Milha House; (b) S. 2 Alhishn House

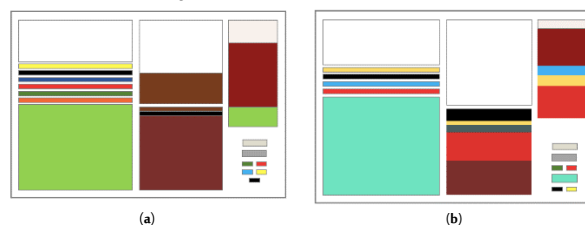


Unlike in the other regions, both al-majlis rooms were located on the upper floors, because housing and storage for crops and animals occupied the ground levels. The al-majlis rooms overlooked other interior living areas on the upper floors of the houses. The floors in both S. 1 and S. 2 were covered with red rugs. The walls were generally white with painted motifs characteristic of the southern region's al-qatt art. The lower halves of the walls of both houses were painted in yellow-green colours, with multi-coloured detailing. S. 1 had rich al-qatt detailing in blue, green, red, orange and black,

whereas S. 2 utilised the al-qatt in a minimal style using simple lines in similar decorative colours. In both houses, brown wood was seen on the ceilings along with white paint. Highly saturated green paints (from natural dyes) were used around all openings and connections to the upper-floor al-majlis rooms (stairs, doors and corridors) of both houses.

Furniture in southern region al-majlis rooms consisted primarily of seating. S. 1 appeared to have built-in seating painted in the same yellow-green saturated colour as the wall, with cushions in red with floral patterns (mixed the traditional abutair pattern and other floral patterns). Red appeared dominant in the low seating of S. 2's al-majlis as well, in addition to other floral patterns in a blue colour. For the decorative elements, S. 1 and S. 2 relied heavily on al-qatt art and its colourful spirit. S. 2 had small niches in the walls painted in colours similar to the walls. S. 1 had very rich patterns on the walls in the al-qatt art style, traditionally drawn by hand and maintained by female artists, whereas S. 2 showed the same colourful impact in simple lines. It is astonishing how women of the region were trained to maintain the beauty of their houses using traditional natural dyes (Marzouq, 2017). Historically, the main colours used in the southern region are green saturated tones, along with the red, blue, yellow, orange and black found in natural dyes (see Figure 7). Later, artificial dyes became popular, owing to their ease of application and sourcing (Al-Hababi, 2012).

Figure 7: Multi-Coloured (Complementary or Triadic)—Monochromatic Colour Scheme in the Southern Region: (a) S. 1 Abu-Milha House; (b) S. 2 Alhishn House



### 4.4. Eastern Region Colour Analysis:

Eastern region houses showed maximal use of the colour white as well as simple designs (see Figure 8).

Figure 8: Eastern Region Traditional Houses' Al-Majlis: (a) E. 1 Almulla; (b) E. 2 Almelhem

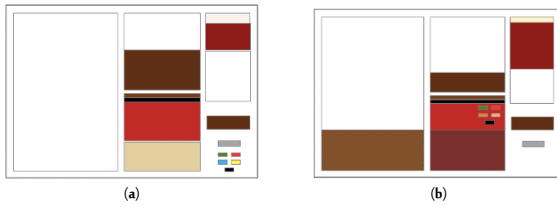


E. 1's al-majlis room was located on the upper floor with terrace access; E. 2's was located on the ground floor, with another located on the upper floor. E. 2 had an interior courtyard that was the main connection to most of the other rooms and functions of the home. Red rugs covered most of the flooring in both E. 1 and E. 2, and all of the walls were painted white. E. 2 had an additional multi-coloured rug. E. 1 had high wooden ceilings, while E. 2's wooden ceilings were at normal height. Both houses used brown wooden doors, and white painted arches seemed to be common. The abutair pattern was popular for the seating areas in the houses of the eastern region. Another pattern was unique to E. 2 but in similar colours and with a similar feel. E. 1, however, used simpler white fabrics with minimal red floral patterns. Accessories included metallic tea/coffee pots and scent diffusers, all decorating recesses in the arches and walls.

White seemed to be the primary colour of the simple interior style

found in the eastern region, complemented by red rugs and fabrics (see Figure 9).

Figure 9: Maximised White–Monochromatic Colour Scheme in the Eastern Region: (a) E. 1 Almulla House; (b) E. 2 Almelhem House



### 5. Conclusion

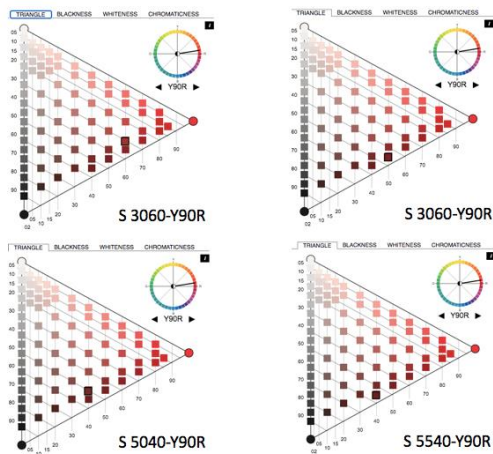
The colour boards developed in this study can be used as references for future projects, as they summarise the different interior design styles in each of the regions of Saudi Arabia. They may also be used to identify the colours of the regions, if the colours are used in the suggested proportions. Each region was found to follow monochromatic colour schemes, as shown in the colour boards, with additional complementary colours in the western region and multi-coloured aspects in the southern region. White and beige neutral-coloured paints were used across all regions. Patterns in either dark green or red colours were common factors in each of the main seating arrangements.

The aim of this research was to propose a common colour-design language for future use, in terms of both style application and future research. It is important to note that the colours in each of the study’s colour boards are approximated (not exact colour attributes). These colours simply suggest the names of the main colours and do not represent precise colour measurements. Colour codes can be suggested in the next stage of research using the Natural Colour System (NCS) coding system. For example, (S 3060-Y90R) and (S 3560-R) may represent the colour red, dominant in this study’s findings (NCS Navigator). As presented in Figure 10, NCS codes can be interpreted as follows: S = standard; the first two numbers = blackness; the following numbers = chromaticness; after the dash = hues, as shown in letters and numbers. Figure 11 presents multiple reds that were detected and that match the dominant red found in the study results.

Figure 10: NCS Nuances Showing the Blackness, Chromaticness and Hue of Detected Colours  
This capture was taken from <http://46.16.232.131/freemium.html> in the process of detecting the nuances of the colour red found to be dominant in this study (NCS Navigator)



Figure 11: NCS Notations for Relative Colours Matching the Dominant Red Found in This Study (NCS Navigator)



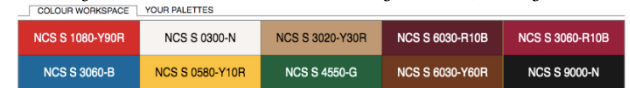
This study demonstrates that the two houses selected for each of the four regions in Saudi Arabia had similarities in their al-majlis interior space colour scheme and overall visual look and feel, with only minor differences. Table 6 presents a summary of the colour boards and colour schemes of each of the four areas studied. By analysing more historic houses in each region, researchers can theorise and define an absolute colour scheme to associate with each specific region. It may be possible to associate elements of the colour schemes with environmental backgrounds, availability of resources and semiotics or meanings as well.

Table 6: Al-Majlis Colour Boards

Region in Saudi Arabia	Colour Boards		Main Colour Scheme/Harmony
Central			Dominant Red Colour + Monochromatic–Analogous, Some Multi-Coloured (Minor)
Western			Monochromatic–Complementary
Southern			Multiple Colours + Complementary or Triadic–Monochromatic
Eastern			Dominant White Colour + Monochromatic

Figure 12 presents an example (for House C. 1) of potential detected colours with corresponding NCS notations (codes) for potential next-step research to delve deeper, utilising NCS notations. This level of detail in colour-detection may lead to a revolution in Saudi architecture and interior design styles derived from Saudi heritage and applied in modern contexts. It is important to note here that Table 6 shows colour boards in visual proportions, unlike Figure 12, which presents only the detected colour nuances by NCS code. Details similar to those in Figure 12 will allow artists and designers to be creative in how they apply the detected heritage colours; these applications and designs will not necessarily be in the same proportions as the colours that are presented in Table 6.

Figure 12: Detected Colours in Central Saudi Heritage House C. 1 (NCS Navigator)



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