

# Reflections on the vernacular mosques in the Souf region, Algeria: An attempt to inventory the local architectural language

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## Abstract

The architectural design of mosques has evolved and been interpreted within various Islamic countries, influenced by diverse local contexts and specific circumstances. This article investigates the vernacular mosques in the Souf region, located in the southeast of Algeria. The study aims to reveal the local architectural language used in these mosques in order to develop an inventory of vernacular mosques. The investigation employs a hybrid approach, combining historical research methods, morphological analysis, and typology. The tools and techniques of data collection were based mainly on architectural surveys, in-situ observations, and non-directive interviews with the local inhabitants (testimonies). The findings confirmed that although the architecture of the vernacular mosques of the Souf respects the archetype of the Arab mosque and expresses a vernacular style particular to the region. However, their three-dimensional morphology presents a specific silhouette that is not found elsewhere in Algeria. These mosques are distinguished by their staircase minaret and raised dome (on a double tambour), which often dominates the mosques by their height and monumentality.

## Keywords

Architectural language, Inventory, The Souf region (Algeria), Vernacular mosques.

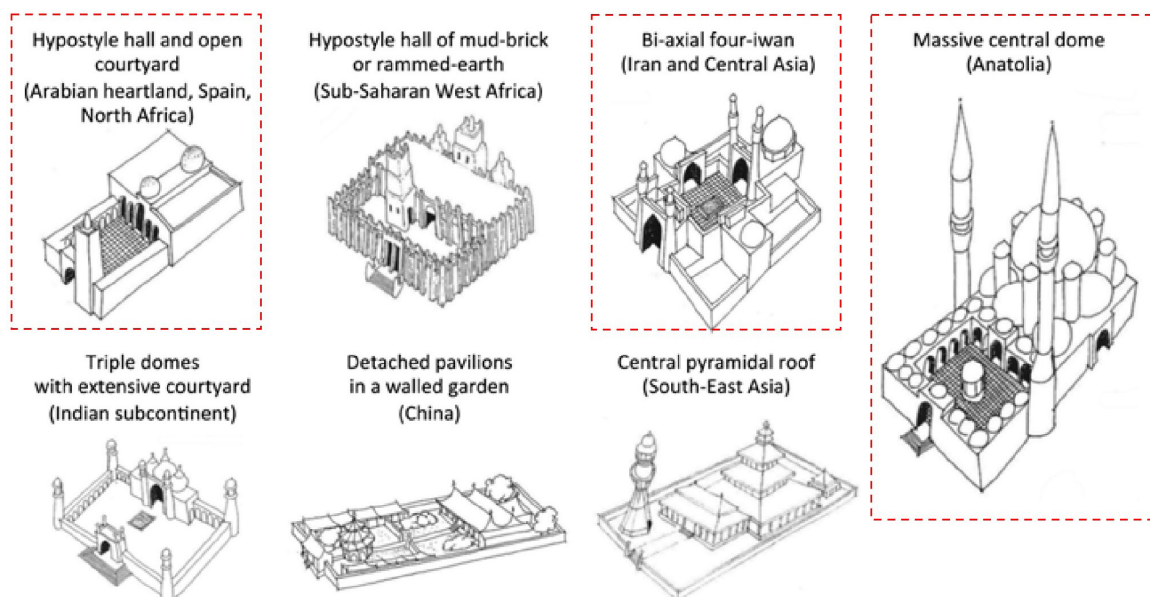
## 1. Introduction

From the earliest human communities, religion has played a pivotal role in shaping the identity of people through various dimensions. Over time, religious buildings and places of worship have evolved into enduring elements of cultural heritage, passed down from one generation to the next. Temples, churches, and mosques are among the most prevalent embodiments of religious architecture, serving as spaces for veneration, meditation, and spiritual practice for groups as well as individuals.

The emergence and widespread adoption of Islam since the 7th century A.D. have bequeathed an undeniable cultural legacy. The mosque stands as the principal religious structure in Islam, serving a multitude of functions, including congregational prayer (*salat al-jama'ah*). In its most elemental and widely prevalent form, the medieval mosque encompasses a courtyard surrounded by a portico adjoining a covered room. However, this description, despite its deliberate inclusiveness, hardly captures the diversity of forms and uses that define this quintessential religious edifice (Hillenbrand, 1985). The mosque embodies the meanings of the Muslim religion in its symbolic and aesthetic aspects. As a sacred building, the mosque is an iconic system through which a religion shows how the world is represented in all its aspects and vital spheres (Knott et al., 2016; Sklair,

2010). In this sense, by configuring the vital space of a city and a village, the mosque can reflect the specific characteristics of the natural environment and the anthropic space in which this sacred building was built (Becci et al., 2013).

The architecture of mosques presents a wide range of styles, shaped by influences such as cultural and geographical environments, the patron's intentions, and the skills of the builders and artisans involved in the construction process (Taib & Rasdi, 2012). Furthermore, political factors have significantly contributed to shaping artistic styles, with each authority and dynasty seeking to imprint its own artistic personality on the environment (Benyoucef, 2005, p.13). This has resulted in a diversity of stylistic interpretations across different parts of the Islamic world. Most scholars of Islamic art and architecture categorise mosque architecture into three major stylistic families (or stylistic models): the Arab Mosque (also known as a hypostyle mosque), the Persian Mosque (Iwan mosque), and the Ottoman Mosque (central-dome mosque). Each stylistic family has its developmental stages, from its inception to the zenith of its architectural expression. In addition to these three main stylistic families (Figure 1), Saoud and Al-Hassani (2002) add a fourth. This is a category of mosques that were developed by Mongol patronages in the Indian subcon-



**Figure 1.** Mosque types around the world (Van-Der-Wusten, 2015).

tinent. The morphology of Mongolian mosques is the result of a combination of the three styles mentioned above with a taste for a new style derived from the local culture. These mosques feature a horizontal hypostyle hall, a flat roof covered by a large bulbous dome, and a large entrance porch reminiscent of Persian mosques. Other styles, such as the Chinese style or the African style, also exist but are not considered to be the main forms of mosques and are not called typical mosque models, as their countries do not form Islamic empires and have less influence (Kamiya, 2006).

The architecture of the Arab mosque has been interpreted in two different ways. In major capitals, the mosques were constructed under the patronage of the rulers, who have given them a monumental appearance. It was the time of the emergence of the so-called “Hispano-Maghreb” or “Hispano-Moorish” style that reflected the potency and prestige of the rulers. In contrast, in villages and hamlets, the adoption of the Arab mosque model gave rise to vernacular architecture (Zerari et al., 2023), as exemplified in the Saharan regions of Algeria, where mosque architecture exhibits a diverse array of designs, each reflecting the characteristics of its respective region.

In this regard, most researchers and academicians agree that the term “vernacular” expresses usage in everyday life by ordinary people in a particular region. Thus, “vernacular architecture” can be defined as an architectural style shaped by local needs, the availability of building materials, and adherence to local traditions at a particular time and place; usually of unknown authorship and making little reference to the “chief styles” or theories of architecture. “Chief styles” refer to architectural expressions and designs that typify a particular architecture during a defined period (Zwerger, 2019).

Vernacular architecture comprises diverse architectural forms, whether they are used for sacred or profane purposes. It is shaped not by formally educated architects, but by the design aptitude, expertise, and traditions of local builders. Giuseppe Pagano was the first to coin the term “spontaneous

architecture” to describe vernacular architecture, emphasising its natural rather than haphazard character (Asadpour, 2020). Paul Oliver was among the pioneering scholars who dedicated significant efforts to researching vernacular architecture, its typology, and related definitions. The term “vernacular” in the context of architecture was popularised through his contributions to the field of linguistics (Asadpour, 2020; Damyar & Nari Ghomi, 2012, p.72; Oliver, 1996). According to Hourigan (2015), the term “vernacular” and its associated vocabulary such as “traditional”, “everyday”, “local”, and “indigenous” are not clearly defined or interpreted across educational disciplines. The study of the vernacular in architectural research seems to wage a continuing battle against the questioning of its relevance and boundaries.

As Islam spread across the Saharan regions of Algeria, various local architectural styles developed, some of which remain relatively unknown, particularly in minor cities, villages, and hamlets. This knowledge gap is particularly noticeable in the Souf region, located in the south-eastern part of Algeria. Surprisingly, the unique architectural style of vernacular mosques in the Souf has remained unexplored in previous scholarly investigations. These mosques have been overlooked in academic studies conducted within the region, despite their significance.

This oversight means that the vernacular mosques of the Souf represent a neglected aspect of the region’s architectural heritage. They face the risk of gradual deterioration due to human activities and natural forces. Consequently, there is an urgent need for in-depth research and exploration of these mosques before they potentially vanish. This provides a substantial rationale for selecting the Souf region as the focus of the investigation.

While the fundamental principles of the Arab mosque archetype are retained, the architectural design of vernacular mosques in the Souf appears to be shaped by local specificities, resulting in a distinct typology specific to the region. It is worth noting that this notion of specificity is comprehensive, encompassing various dimen-

sions related to the local environment, including the physical, sociocultural, historical, geographical, and the incorporation of exogenous stylistic influences. Additionally, the vernacular mosques seem to share morphological similarities with vernacular residential architecture. Consequently, to enrich the present study and understand the architectural logic underlying these mosques, it is necessary to give a brief overview of residential architecture.

This article aims to reveal the local architectural language of the vernacular mosques in the Souf to develop a comprehensive inventory of vernacular mosques. It fills the existing knowledge gap by offering a deeper insight into the architectural and cultural dimensions of these vernacular mosques. By doing so, it contributes to the broader discourse on architectural diversity and cultural heritage, paving the way for their appreciation, conservation, and continued cultural significance.

To achieve these objectives, the present article employs a hybrid approach, combining morphological analysis, typology, and historical research methods.

## 2. Overview of the Arab Mosque architecture

Throughout the history of architecture, various mosque styles have evolved worldwide. However, to align with the focus of this study, it is pertinent to delve into the evolution of the Arab mosque.

The Arab Mosque is the oldest and most widespread style. It derives its name (Arab mosque) from the Arab ethnic group predominantly residing in the Arab world (or Arab homeland). The Arab Mosque typically consists of an open courtyard with a surrounding portico, a minaret with a square section, and a prayer room with several rows of columns (hypostyle prayer room), which are arranged parallel and/or perpendicular to the Qibla wall. The style of the Arab Mosque is primarily prevalent in regions such as the Maghreb (North Africa), Egypt, Arabia, and Syria, albeit with significant regional variations (Allani-Bouhoula, 2014; Hillenbrand, 1985). Over time, the Arab mosque architecture has

evolved from simple designs and functions to more intricate forms and layouts.

The development of the Arab Mosque can be traced back to the Umayyad Empire (660–750 A.D.), followed by the Abbasid Empire (750–10th century). After the fall of the Abbasid, local dynasties emerged, asserting their hegemony in all Muslim territories. In the Maghreb, for instance, the influence of the Kharidjites in Spain and Egypt during the 9th–10th centuries resulted in the “Hispano-Maghreb” or “Hispano-Moorish” style mosque. This style drew inspiration from Umayyad mosques, particularly the Great Mosque of Damascus, featuring a rectangular shape, a wide, shallow prayer hall, naves parallel to the Qibla wall, and an axial nave (or axis of the Mihrab) perpendicular to the Qibla wall [1]. The Hispano-Maghreb style reached its zenith during the Almoravid (10th–12th centuries) and Almohad (12th–13th centuries) periods (Benyoucef, 2005, p.14; p.18). While retaining the fundamental characteristics of the Arab Mosque at the level of spatial organisation, the Hispano-Maghreb style introduced unprecedented dimensions of artistic expression, including intricate decoration.

In the introduction to his book “L’art religieux musulman en Algérie,” Bouruiba (1973, p.5) noted that no important religious monuments have been left in Algeria by the Almohads, who succeeded the Hammadids and the Almoravids. Indeed, the Almohads certainly worked on the great mosque of Tlemcen and founded the Qubba of Sidi Abu Madyan. The absence felt in terms of important Almohad production was explained, according to the same author, by the fact that Abd Al-Mumin and his descendants were mainly interested in Morocco and Andalusia, which were so dear to them. Emblematic examples from the Almohad period, such as the Mosques of Tinmal, Kutubiyya, the Kasbah of Marrakech, the Mosque of Taza, the Mosque of Hassan in Rabat, and the Great Mosque of Seville, attest to the birth and flourishing of Hispano-Moorish art, serving as inspirations for subsequent generations.



Despite the Ottoman Empire's arrival in the 16th century, leading to the end of local dynastic rule in the Maghreb, the adoption of the Arab Mosque plan continued, particularly in regions less influenced by Turkish-Ottoman regency. The Saharan regions in the south of the Maghreb, in particular, maintained the Arab mosque style, showcasing distinctive stylistic expressions.

During the rule of local dynasties in the Maghreb, the architecture of Arab Mosques developed differently in major capitals compared to villages and hamlets. In major cities, rulers patronised mosques, imparting them with a monumental and prestigious appearance. In contrast, in rural areas, mosque construction evolved into vernacular architecture. Local builders interpreted the Arab Mosque according to their tastes, traditions, and site constraints. The communities collectively engaged in the construction process, under the guidance of skilled builders, thus creating vernacular mosque styles specific to each locality.

In this context, it is essential to recognise that vernacular mosques are the oldest and most continuous style in the history of Muslim religious architecture. Among the most universal vernacular mosques in the Maghreb are the Ibadite mosques found in Djerba, Tunisia, and the M'Zab Valley, Algeria. These mosques are distinguished from Arab-style mosques by several characteristics. According to Benkari (2019) and Prévost (2009), the most important characteristics of Ibadi mosques are the multiplication of mihrabs and the existence of an open-air prayer space in addition to the covered prayer room. Ibadi mosques present a sort of affinity, which relates them both to their Arab-Berber origins and to the principles of Ibadism [2].

### **3. The state of the art in morphological analysis and typology: A focus on mosques**

Typo-morphology is a fundamental concept in architectural and urban studies, representing a multidisciplinary approach that focuses on the relationship between urban form, architecture, and the physical environment. This approach

seeks to analyse and understand how the built environment and its spatial organisation shape and are shaped by society, culture, and history.

At its core, typo-morphology combines two key elements: "typo," referring to typology, which deals with the classification and categorisation of architectural and urban elements, and "morphology," which explores the formal and spatial characteristics of these elements (Khaznadar & Baper, 2023). Together, they form a comprehensive method for investigating the physical structure of cities, buildings, and public spaces.

According to Trotta-Brambilla and Novarina (2019), typo-morphology was developed in Italy by architects and urbanists in the early 1960s. It presents a diverse set of theoretical references, urban studies and analyses, projects, plans, and realizations, and can, for this reason, be considered as an urban planning model. Twenty years after its creation, typo-morphology spread to France, where French architects and urbanists drew from some of the elements that make up this model, interpreting and combining them with other urban references, with the perspective of inventing a new discipline: urban design.

The review of the state of the art is organised into two sections. The first section provides an overview of previous studies that have employed morphological analysis and typology as methods to investigate mosque architecture. The second section highlights the lack of research on vernacular mosques in the Souf region. The purpose of the state of the art is to establish an epistemological position concerning the subject of study within this article, emphasising its uniqueness and its scholarly contribution to existing knowledge.

Morphological analysis and typology have been instrumental in studying various categories of architecture, including places of Muslim worship. Notably, numerous studies have been conducted on mosques in regions where Islam has thrived, including Iraq, Tunisia, Turkey, Indonesia, Malaysia, Iran, Greece, and more. By critically evaluating these studies and comparing

their findings, it becomes evident that morphological analysis and typology often encompass a hybrid of chronological, stylistic, cultural, geographical, and other contextual factors. These methodologies have typically been applied to a set of mosques or specific mosque components such as domes and minarets. Moreover, architectural research on mosques has delved into formal, constructional, organisational, and decorative criteria, determined by scholars according to the objectives of their respective investigations (Alamdari et al., 2017; Asadi & Majidi, 2015; Ashkan et al., 2012; Budi & Wibowo, 2018; Ghouchani et al., 2019; Hüsni, 2013; Istiqomah & Budi, 2013; Loukma & Stefanidou, 2017; Mustafa & Hassan, 2013; Mustafa & Ismael, 2019; Othman et al., 2008; Ouedraogo, 2007; Shah et al., 2016; Zerari et al., 2020; Zerari et al., 2023).

The application of morphological analysis, as developed by the *Laboratoire d'Analyse des Formes* (LAF) under the guidance of Professor Duprat, appears to have been primarily adopted in the Maghreb. Notable examples include studies conducted by Chakroun (2005) and Cherif and Allani-Bouhoula (2017). Chakroun's (2005) study aimed to analyse the morphology of a collection of minarets from the Ottoman period to define the characteristics of the Ottoman architectural style. Cherif and Allani-Bouhoula's (2017) research delved into ancient Tunisian mosques, creating a morphological classification of these structures.

Bourouiba (1987) in the book *“L'apport de l'Algérie à l'architecture arabo-musulmane,”* offered a detailed method for describing and analysing mosques. This seminal work was concerned primarily with local dynasties in the central Maghreb and the Ottoman period, which extended from the 16th century until the onset of French colonisation in the early 19th century. Bourouiba (1987, p.24) employed a canonical definition of the mosque, comprising five fundamental structural elements: the prayer hall (with its mihrab carved into the Qibla wall), the courtyard (enclosed), the rear part of the courtyard (*mu'akhar*), the side parts of the courtyard (*mudjannabat*),

and the minaret. Bourouiba's study focuses on the general morphology of mosques (mosque shape, prayer room shape, courtyard shape and layout, mihrab and minaret styles, etc.), concluding with architectural details. While this study was concerned with mosques built during significant dynasties or historical periods in Algeria, thus neglecting vernacular mosques, it nonetheless represented a pioneering accomplishment in the realm of cultural heritage in Algeria, particularly concerning mosques. Given its significance, several Algerian scholars have adopted the structure of Bourouiba's book to analyse the morphology of mosques in Algeria. Noteworthy examples include Menhour's master's thesis (2012) on the evolution of Ottoman mosques in Constantine as religious architectural heritage, Merzoug's thesis (2012) on the architectural and artistic study of minarets in Tlemcen's mosques, and Redjem's study (2014), which explored the evolution of architectural and architectural elements of mosques as a design reference, focusing on historical mosques in Constantine.

Except for the M'Zab Valley, the religious architecture of southern Algeria remains an understudied area in terms of morphological and typological research. Indeed, the mosques of the Souf region require in-depth scientific investigation. Although some published and unpublished studies have explored the residential architecture and natural environment of the Souf, these investigations have not extended their focus to encompass vernacular mosques (Bataillon, 1955; Côte, 2009, 2005; Échallier, 1968; Najah, 1971; Remini & Souaci, 2019; Remini, 2006; Zerari et al., 2022).

When examining the construction techniques employed in residential architecture within the Souf region, Côte (2009, p.33) underscored an outward similarity between vernacular houses and mosques. This French geographer (1934-2022) specifically highlighted that the utilisation of construction techniques involving domes and barrel vaults extended beyond residential structures to encompass mosques in the region. Marc Côte's observation

represents a significant step forward in the exploration of vernacular mosques and the alignment of researchers' positions for reading these mosques.

Travelogues and scientific explorations from the French colonial period do not provide substantive textual insights into the architecture of Souf mosques (Cat, 1892; Daviault, 1947; Jacqueton & Gsell, 1911; Largeau, 1881). Cauvet (1923), like Côte (2009), stressed the similarities between religious and civil architecture in interpreting the diversification of mausoleum forms in the Maghreb but did not single out any particular region.

Iconography (photographs, paintings, etc.) from the French colonial period is not abundant regarding the vernacular mosques of the Souf. An intriguing source features photographs of several vernacular mosques in the Souf, depicting them in their original condition. However, it lacks a comprehensive discussion of the architectural aspects of these religious places. This source is part of a series centered around art and culture, which was published in 1970 through the collaborative efforts of the Algerian Ministry of Culture and Information, along with various actors in the cultural heritage domain. Table 1 summarises the typology and morphology of mosques in previous studies.

Most of the studies mentioned above applied morphological analysis and typology as methods, but without explicit reference to any specific school or theory (Table 1). Typological classification and morphological analysis can be a complex process, and researchers may choose different attitudes to approach case studies, depending on their research objectives and the availability of data. The following is a general approach to the steps that can be followed in classifying mosques typologically:

- **Data collection:** The first step involves gathering data about a set of mosques to be studied. This may include information about their geographic location, historical period, architectural style, size, spatial layout, specific architectural features, etc;
- **Establishment of classification criteria:** Depending on the goals of the

analysis, classification criteria are established. The main criteria used in the typological and morphological analysis of mosques can relate to the architectural style; historical period; geographic location; size and scale; spatial organisation; specific architectural features; function and usage of spaces; cultural and religious influences; construction history, etc.

- **Initial classification:** Mosques are initially classified based on the established criteria. This may involve grouping mosques with similar characteristics into preliminary categories;
- **Comparative analysis:** Researchers can conduct a comparative analysis of mosques within each category. This may include examining similarities and differences between mosques in terms of architecture, history, culture, etc;
- **Refinement of classification:** Based on the results of the comparative analysis, the classification may be refined. Some categories may be merged or subdivided based on specific emerging characteristics;
- **Documentation and report:** Once the typological classification is completed, the results are documented and presented in a research report. This report may include illustrations, diagrams, maps, and other visual elements to better convey the findings.

The state of the art in morphological analysis and typology sets the stage for an epistemological positioning regarding the vernacular mosque in the Souf region, a style that has been overlooked in previous studies.

#### **4. Methodology and data collection tools**

This paper is focused on one of the most disputable regions in the Algerian Sahara, the Souf. Administratively, this region corresponds to the wilaya (province) of El Oued, located in the south-east of Algeria, bordering Tunisia and many other Algerian wilayas such as Biskra and Ouargla (Figure 2). Over its history, the Souf knew the passage of various civilisations and cultures, including prehistoric influences,

**Table 1.** *Typo-morphology of mosques in previous studies (developed by authors).*

Author(s)	Typological and morphological analysis criteria
Zerari et al., 2023	Size and spatiality of mosques; presence or absence of certain elements (mausoleum and minaret).
Zerari et al., 2020	Presence or absence of certain basic components of the minaret; external silhouette of the minarets; form of the balcony; presence or absence of decoration.
Ghouchani et al., 2019	Layout and spatial organisation; hierarchy of spaces; circulation patterns.
Mustafa & Ismael, 2019	Spatial organisation and layout.
Budi & Wibowo, 2018	Floor level; main building material; roof forms; number of minarets.
Cherif & Allani-Bouhoula, 2017	Segmentation of the mosque plan; shape of the courtyards.
Loukma & Stefanidou, 2017	Degree of complexity, spatial organisation; roof forms.
Alamdari et al., 2017	Access patterns; method and relationship between certain spaces.
Shah et al., 2016	Typological element; spatial organisation; roof form; building technology; articulation in design.
Asadi & Majidi, 2015	Architectural styles; layouts and spatial organisation; functional aspects.
Istiqomah & Budi, 2013	Number of masses composing the building; presence or absence of transitional space; roof forms.
Hüsni, 2013	Location; form of mosques; architectural layout; relationship with the surrounding urban environment.
Mustafa & Hassan, 2013	Spatial organisation; roof forms; functional efficiency.
Ashkan et al., 2012	Form and silhouette of domes; structural elements of domes.
Othman et al., 2008	Layout and spatial organisation; functional aspects.
Ouedraogo, 2007	Design development; construction technology.
Chakroun, 2005	Segmentation of the minarets, shape of the different segments composing the minarets.
Bouruiba, 1987	Form of mosque; form of the prayer hall; form of courtyard, style of minarets, form of the mihrab.

Arab-Muslim penetration, and French colonisation from 1872 to 1962. Notably, the Souf did not experience Ottoman rule (Côte, 2009; Zerari et al., 2023).

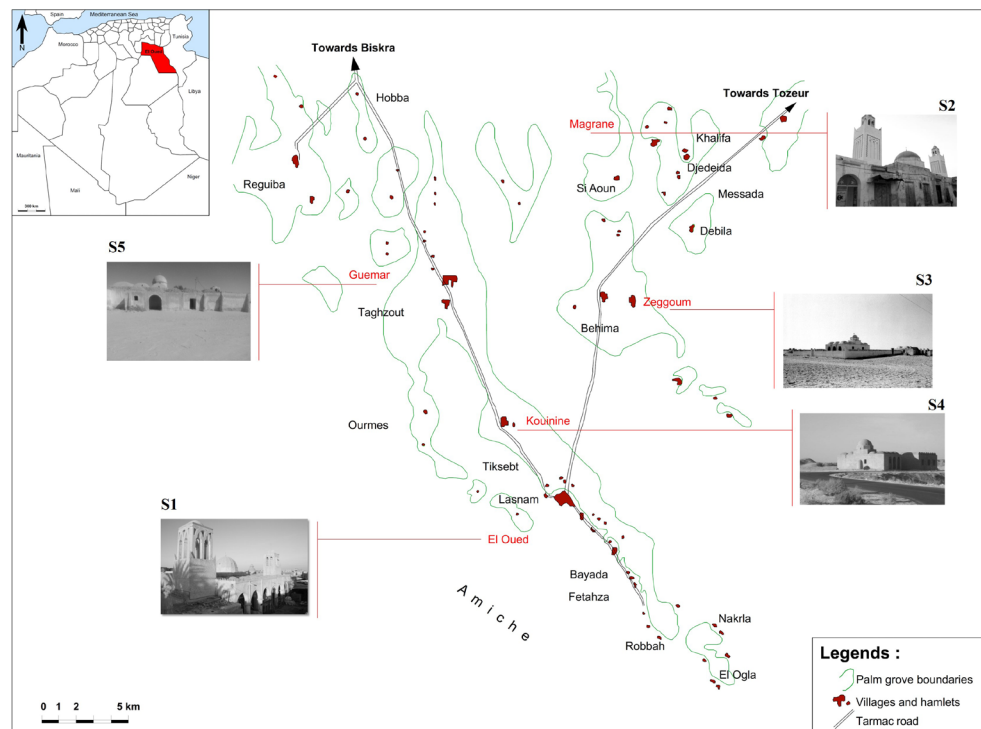
To achieve the objectives of the present study and ensure its feasibility, a hybrid approach was employed, combining morphological analysis, typology, and historical research methods. This approach primarily relied on architectural surveys that emphasised the original appearance of mosques, with transformations or alterations of the specimens not considered within the present analysis. At this stage, on-site observation of mosques played a crucial role in comprehending their architectural logic deeply.

It is important to highlight that this study did not heavily rely on local institutional archives due to the absence of specific graphical documentation related to vernacular mosques. In fact, Algeria faced significant challenges in archival management, and a considerable number of restoration initiatives were undertaken by private people without conducting prior architectural

surveys on the structures in question. This shortcoming posed a number of constraints on the study of vernacular mosques in the region. In addition, in the Saharan regions of Algeria, the archiving of vernacular buildings began with the French colonisation, through the restoration of certain local buildings or through exploratory research. Unfortunately, the Souf region has not been as fortunate as neighbouring regions in terms of restoration efforts. Consequently, there seems to be a limited availability of colonial-period archives that could be utilised in this study.

The study focused on mosques constructed from the 7th century until Algeria's independence in 1962. The post-independence period was excluded from the study, as it marks a shift away from the local building culture. A representative sample of mosques (S1, S2, S3, S4, and S5), reflecting the local architecture, was documented. These mosques were randomly selected and are dispersed throughout the Souf region (Figure 2 and Table 2).





**Figure 2.** Maps showing the location of the Souf region and the studied mosques (developed by authors).

**Table 2.** Plan and layout of the vernacular mosques in the Souf (developed by authors).

Codes	Identification	Plans	Notes
S1	The mosque of Sidi Massoud in El Oued		The mosque was built towards the end of the 16th century. It underwent restoration and renovation during the French colonial period. Additional facilities, including the courtyard, were incorporated into the mosque during the post-colonial period. This mosque remains operational to this day.
S2	The mosque of El Atik in Megrane		This mosque was founded in 1816 and built in 1932. Two minarets were added to the mosque in 1970. In the late 1980s, arcades were also incorporated on each side and behind the prayer room. This mosque remains operational to this day.
S3	The mosque of Sahn Gharbi in Zeggoum		This mosque was built in the early 1960s. It is in a state of neglect.
S4	The mosque of Omayya Bahi in Kouinine		This mosque was built in the early 1920s. It is in a state of neglect.
S5	The mosque of El Houde (or Salman El Farissi) in Guemar		This mosque was built between 1944 and 1945. It is in a state of neglect.
<b>Legends</b>		(1) prayer hall; (2) sand-covered open courtyard; (3) sabat (portico); (4) minaret; (5) annexes.	

To enhance the study, old photographs were employed to investigate the appearance of certain mosques that may have been demolished or reconstructed in recent times. These old photographs provided valuable insights into the original appearance of the mosques, contributing to the reliability of the analysis.

In addition to architectural surveys and old photographs, another complementary tool was utilised: the survey sheet. This survey sheet outlined the primary characteristics of the studied buildings, incorporating headings epistemologically developed based on a review of the state of the art in morphological analysis and typology, the objectives of the research, and a critical examination of a sample of mosques. The survey sheet was organised into seven (07) headings, encompassing all relevant morphological aspects of the mosques under investigation: 1) identification of the mosque; 2) complexity of the mosque; 3) general shape of the mosque; 4) configuration of the prayer room; 5) roofing system and building materials; 6) architecture of the minaret; and 7) state of the premises.

Each survey sheet included the date(s) of the field trip(s) (Table 3). This proposed survey sheet primarily served to establish criteria for the morphological and typological analyses of the selected mosques.

In this research, data collection also incorporated non-directive individual interviews (testimonies) by giving the floor to different actors including former inhabitants and users of the mosques. These interviews aimed to compile important events in the history of the mosques. Given the open-ended questions in these interviews, the authors (interviewers) provided general direction to the conversations, encouraging interviewees to delve further into their oral history and allowing them to guide the process. The interviews were carried out in 2021/2022 and 2022/2023, and conversations primarily revolved around topics such as the dating and potential transformations of the mosques, as well as insights into the origins of the builders. This approach aimed to detect external contributions and stylistic variations

in the studied architecture. Interviews were either transcribed in written form or recorded in audio, as appropriate. The number of interviewees varied according to the locality of the surveyed mosque. For example, samples S3, S4, and S5 are located in abandoned areas, and the interview was therefore only conducted with a few people found near their gardens. As for samples S1 and S2, they are still largely functional, and the interview was conducted with dozens of people. A meticulous cross-referencing of testimonies specific to each mosque was carried out to verify and ensure the accuracy of each mosque's identification. Notably, the individuals interviewed expressed great pride in sharing insights about their cultural heritage.


The collected data were analysed and interpreted in an attempt to develop an inventory of vernacular mosques. The interpretation focused on the spatial organisation and layout of the mosques, the outward form of the mosques, and especially distinctive architectural elements, including domes and minarets.

## **5. Presentation of the built environment in the Souf region: An introduction to understanding the architecture of vernacular mosques**

Urbanisation in the Souf region began with the sedentarisation of nomadic and semi-nomadic populations. This transformation coincided with the successive arrival of the Banu Hillal tribes [3]. As a result, numerous Ksourian settlements emerged across the region. These settlements followed the principles of Arab-Muslim medinas, with the sacred building as a focal point within the urban fabric.

The vernacular houses in the Souf are characterised by their geometric forms, typically centered around a large open courtyard surrounded by a few rooms. Each house typically features one or two sabats, serving as feminine spaces, and may include a loom and a stone grain mill. Regardless of whether they are found in villages or hamlets, these houses are divided internally by load-bearing walls constructed from local stones (tefza and lous). The

**Table 3.** The proposed survey sheet for an analytical study of the mosque (developed by authors).

Survey sheet number ....						
<b>The date of the survey</b>	.. /.. / 20...	.. /.. / 20...	.. /.. / 20...			
<b>Identification of the mosque</b> 	Name of the mosque	.....				
	Locality	.....				
	Date/period of construction	.....				
	Historical peculiarity	.....				
<b>The complexity of the mosque</b>	Individual building (mosque free from any annexes)				.....	
	Situation in complex	Presence of mausoleum			.....	
		Presence of the room for the recitation of the Qur'an			.....	
		Other supplementary spaces			.....	
<b>The general shape of the mosque</b>	Regular mosque		Rectangular		.....	
	Square		Wider than deep		.....	
	Irregular mosque		Deeper than wide		.....	
<b>Configuration of the prayer room</b>	The shape of the prayer room	Regular prayer room	Rectangular	Wider than deep	.....	
			Square	Deeper than wide	.....	
		Irregular prayer room				.....
	Type of prayer room plan	Prayer room with naves perpendicular to the qibla wall			.....	
		Prayer room with naves parallel to the qibla wall			.....	
		Prayer room with naves perpendicular and parallel to the qibla wall			.....	
<b>Roofing system and building materials</b>	Dome	Number	One dome		.....	
			Two domes		.....	
			Three domes		.....	
			Four domes		.....	
		Disposition	On the mihrab axis	Before the mihrab	.....	
			In the centre of the prayer room		.....	
	Above the mausoleum		.....			
	Above other annexed spaces				.....	
	Flat roof made of palm wood					.....
	Vaulted roof	Barrel vault			.....	
		Groin vault			.....	
		Other .....			.....	
Construction materials	Earth			.....		
	Stone			.....		
<b>The architecture of the minaret</b>	Number of minarets	Without minaret			.....	
		With minaret			.....	
	Position of the minaret in relation to the mosque's composition	.....				
		.....				
	Silhouette of the minaret	.....				
		.....				
	Decoration of the minaret	Decoration with niches			.....	
		Lyse or other linear elements			.....	
		Harmonious segmentation			.....	
		Rhythm of the openings			.....	
Merlon			.....			
Other.....			.....			
Lantern	Present	.....	Lantern shape and decoration	.....		
	Absent	.....		.....		
<b>State of the premises</b>	State of conservation					
	Possible transformations	Spaces		.....	.....	
		Date/ period		.....	.....	
		Description		.....	.....	

rooms are usually covered with domed or barrel-vaulted roofing systems, and the facades of the houses often exhibit plain surfaces punctuated by buttresses, giving them a fortified appearance. This vernacular architectural style reflects the contributions of Arab-Muslim, Berber, and Sudanese cultures, which have shaped the local architectural identity (Zerari et al., 2022).

While the similarity between residential and religious architecture mainly concerns construction techniques and outward morphology, as Côte (2009, p.33) indicated, the spatial organisation and layout of the mosques of the Souf region feature specific elements that differentiate them, particularly in relation to their sacred purpose, which is Muslim prayer (Figure 3).

## 6. Analysing and discussing the morphology and typology of vernacular mosques in the Souf region from a historical perspective

Based on the main headings outlined in the survey sheet, which was devised notably in accordance with the state of the art in morphological analysis and typology of mosques worldwide, the following discussion and analysis will focus on two levels: 1) spatial organisation and layout of the mosques, and 2) architectural attributes of minarets and domes.

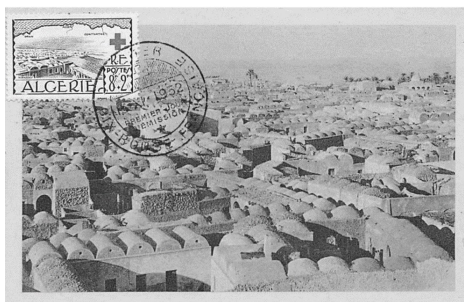
### 6.1. Spatial organisation and layout of the mosques

At this level, the discussion is structured in accordance with the Arab mosque model, which predominantly consists of a hypostyle prayer room, an open courtyard surrounded by porticos, and a minaret.

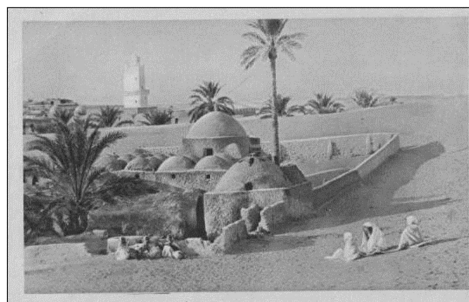
At first glance, vernacular mosques in the Souf region exhibit simplicity in their design. They are typically single-story structures, with their size determined by their location within the urban fabric and the population density they serve. Therefore, mosques in villages tend to be larger than those in hamlets, which were primarily inhabited by farmers during the summer, giving these mosques a more rural appearance.

These mosques are enclosed spaces comprising a square or rectangular prayer hall and an open courtyard covered in sand. Geometric precision characterises their layout, following the principles of the Arab mosque model. However, what sets these mosques apart is the absence of minarets in their spatial organisation scheme.

The topological relationship between the courtyard and the prayer hall varies. The courtyard can be located on one side, behind the prayer room, or in front of the prayer room (behind the Qibla wall). In some cases, the courtyard may be absent. This absence could be due to the mosque's isolated location, where the surroundings effectively serve as the courtyard, or in compact urban fabrics with limited space (Table 2 and Table 4). Importantly, the architecture of these mosques evolved over time to adapt to the needs of the inhabitants. Local oral history indicates that some vernacular mosques initially began as open-air sacred spaces demarcated from the profane space by date palm leaves (*Djrid*), resembling primitive places of worship. These places were often located near water sources (wells). As the population decided to build proper mosques for protection



a)

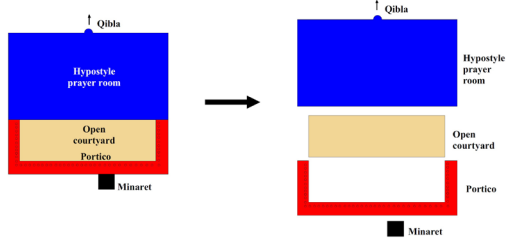

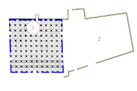




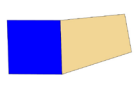




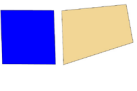





b)

**Figure 3.** Old postcards showing similarity between residential and religious architecture: a) Overview of El Oued city showing the vernacular houses; b) Mosque in El Oued ([www.delcampe.net](http://www.delcampe.net)).



**Table 4.** Morphological and typological characterisation of the layout of the studied mosques (developed by authors).

Characterisation of the layouts						
Morphological decomposition of the Arab mosque model						
	Mosque codes	S1	S2	S3	S4	S5
Plans						
Morphological composition of mosques						
Morphological decomposition of mosques						
Type of prayer rooms	Groin-vaulted prayer room		Doomed prayer room			
	<b>Note:</b> mosques with doomed prayer room are generally located in hamlets and are small in size, while mosques in villages and cities are covered with groin vaults and are large in size.					
Morphological components	Prayer room	X	X	X	X	X
	Courtyard	/	X	X	/	X
	Portico	X	/	X	X	X
		/	/	/	/	/
Minaret	<b>Note:</b> in the case of S1 and S5, there is no minaret section, but there is a staircase leading to the terrace.					
Topological relationship (prayer room/courtyard)		No courtyard (absence)	The courtyard on one side of the prayer room (adjacency)	The prayer room included in the courtyard (enclosure)	The surrounding of the mosque used as a courtyard (absence)	The courtyard in front of the prayer room (adjacency)

from the harsh climate, they primarily constructed covered prayer halls and gradually added more spaces.

The courtyards, where they exist, often feature a mihrab carved into the enclosure wall, confirming their use as an open prayer area, especially during the Maghrib and Isha prayers (sunset and night prayers) in summer to take advantage of the cooler weather. This is notably due to the sand covering the courtyard: sand plays an essential role in moderating indoor temperatures by absorbing excess heat during the day and quickly releasing it at night to maintain more comfortable conditions. The courtyards were also used in winter when the covered rooms became crowded, especially during the Friday prayer (weekly prayer). The courtyard often had sabats in the form of porticos with semi-circular arcs, serving as

spaces for relaxation and socialisation for the inhabitants. In some cases, additional sabat were added on either side of the prayer room, functioning as entrance porches to prevent sand from entering the prayer space.

Vernacular mosques in the Souf may include annexed spaces, such as room for recitation and memorisation of the Qur'an or storage. The well, which is the source of water for ablution, may either be located within the courtyard or separate from the main mosque structure.

The structural grid of the prayer room is divided into units, each covered by a surbased dome or groin vault and supported by four circular or polygonal pillars, creating a hypostyle space with rows running parallel and perpendicular to the Qibla wall. The mihrab's axis is marked by a single

monumentally raised double-tambour dome, often with squinches. These tambours are pierced with small openings, allowing natural light and ventilation into the prayer space.

The mihrab extends into the Qibla wall and overlooks either the courtyard or the outside (public space) depending on the courtyard's position relative to the prayer hall. Unlike many other Algerian Saharan regions, the terraces of Souf mosques, like the houses, are not accessible to users (Figure 4 and Figure 5).

These mosques are constructed entirely from locally available stones, namely Lous and Tefza, employing a consistent building logic characterised by load-bearing walls and domed or vaulted roofs. Notably, most vernacular mosques in the Souf do not include burial spaces, in contrast to many Saharan regions in Algeria. For instance, Zerari et al., (2019) conducted research in the Ziban region, which revealed that it is home to mosques associated with mausoleums of Muslim saints, named after them.

## 6.2. Minarets and domes of the Souf as a local architectural language

A typical minaret comprises four main sections: the base, tower, gallery-balcony (from which the muezzin calls to prayer), and the lantern. Builders have ingeniously combined these basic elements, resulting in significant morphological diversity among minarets (Zerari et al., 2020).

The Arab Mosque model that evolved in the Maghreb region features a single minaret with a square or rectangular section. The design and ornamentation of this minaret exhibit variations influenced by regional and historical factors. In the Saharan regions of Algeria, the minaret serves as a distinguishing criterion, influencing the appearance of mosques. The presence or absence of a minaret has led to different mosque configurations; its shape also varies and reveals regional architectural specificities. This is evident in the Souf region.

Originally, vernacular mosques in the Souf did not feature minarets. Instead, they were identified by a prominent dome above the prayer

hall, dominating the entire mosque and its surroundings. In general, this dome is raised on a double tambour—a square and an octagonal shape—creating squinches. Squinches are present in each corner of the square plan and consist of filled-in spaces that transform the square plan into a polygonal shape so that the circular base of the dome can rest on it. This technique is prominently observed in the religious heritage of Tunisia, particularly originating from the Ottoman period.

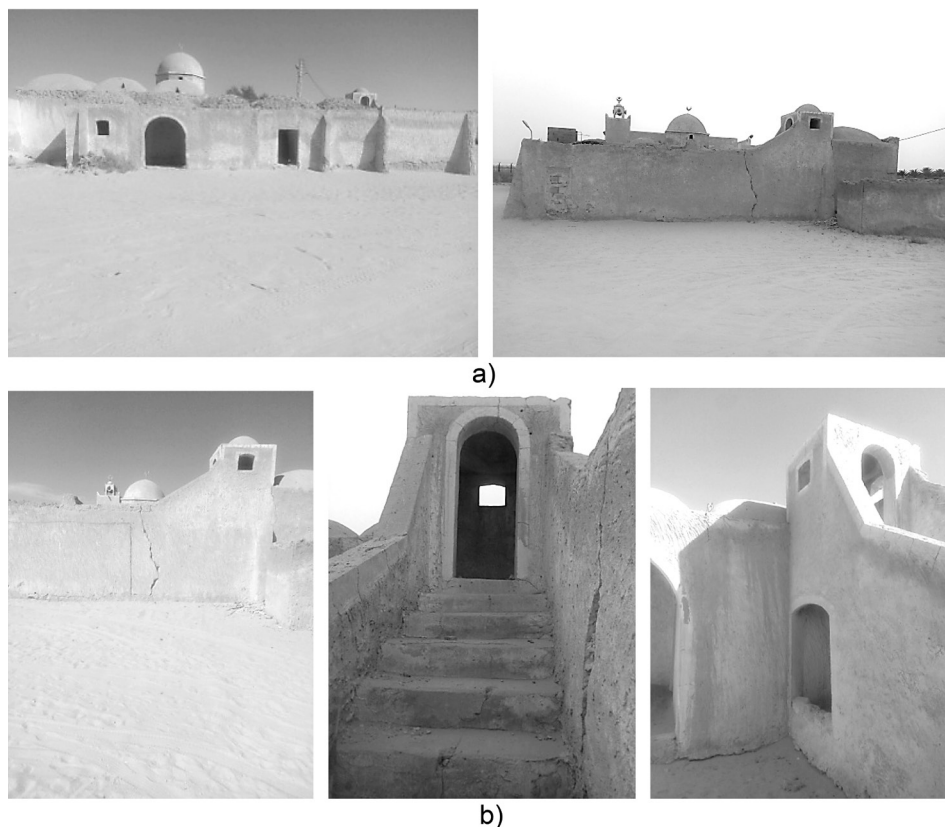
In the absence of minarets, the call to prayer was made either from the sabat or from the low enclosure wall of the mosque. In some mosques, the call was made from the terraces, and in these cases, a modest structural device was provided to shield the muezzin from the hot sun. This structural device consists of a straight staircase, terminated by a covered resting platform (resembling a box-like structure without a lantern), from which the muezzin calls to prayer five times a day. In this regard, this structural device adopted in the vernacular mosques of the Souf can be termed a “staircase-minaret” (Figure 6). Regrettably, most vernacular mosques have lost their authentic charm due to successive unprofessional transformations and renovations. For example, in 1970, two tall minarets were added to the mosque of El Atik in Magrane locality to increase its visibility, but these minarets did not align with the local architectural language of the Souf (Figure 2 and Table 2). Other mosques have been entirely demolished and rebuilt, with only photographs remaining to depict their original appearance.

Based on the testimony of the local population, several hypotheses can be advanced to explain the absence of minarets in most vernacular mosques of the Souf, and to elucidate the reasons for the adoption and prevalence of the so-called “staircase-minaret.”

Some elderly locals suggest that minarets were deliberately omitted in the vernacular mosques of the Souf because people aimed to emulate the Prophet's mosque in the medina, where the minaret was not present. Another logical explanation for the absence of



**Figure 4.** Interior views of El Houde Mosque in Geumar (authors).



**Figure 5.** Views of El Houde mosque in Geumar: a) general views of the mosque; b) views of staircase-minaret (authors).

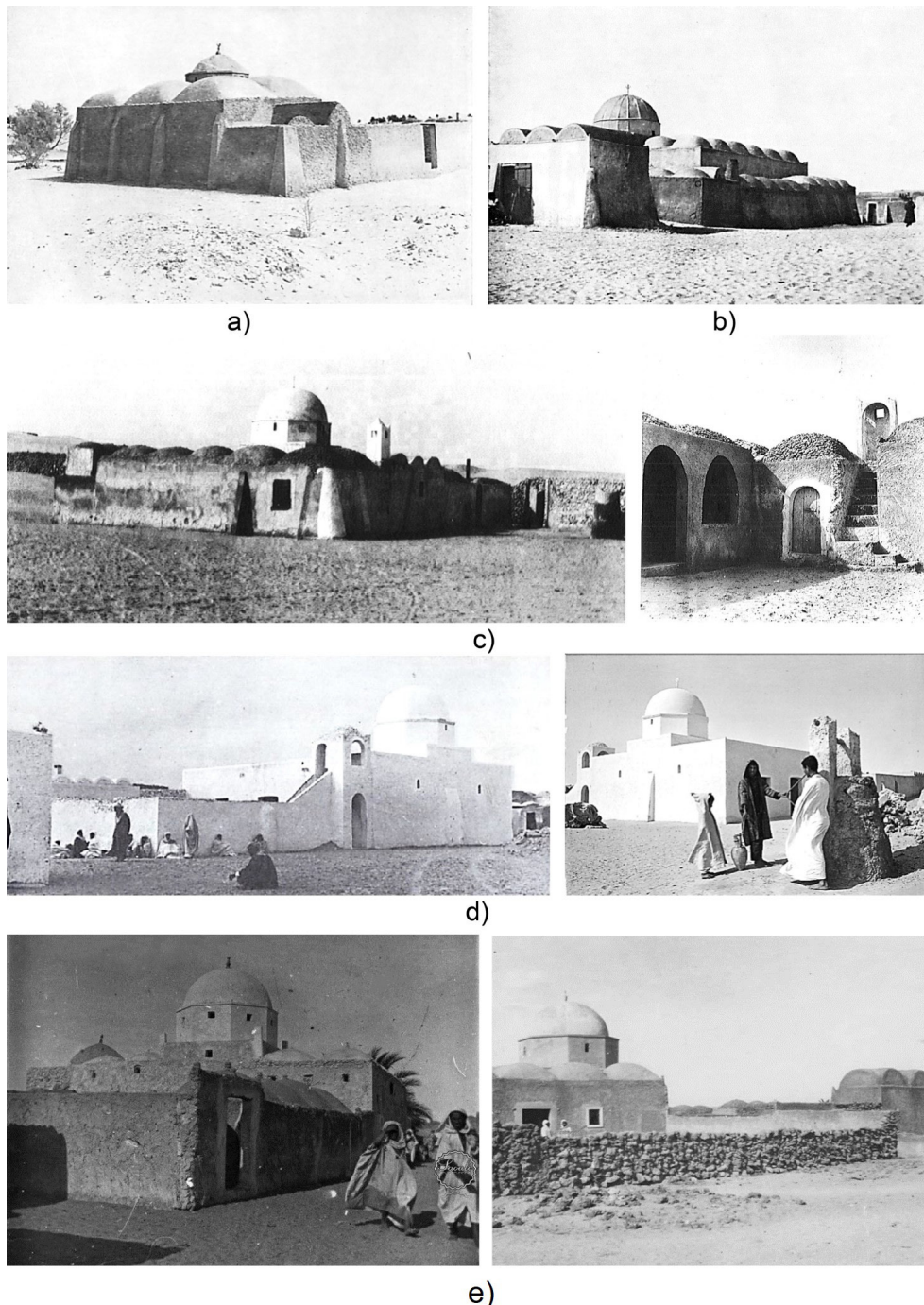
minarets is social and cultural. During the call to prayer (adhan), the muezzin might inadvertently transgress the privacy of the houses surrounding the

mosque, which are introverted onto the open courtyard. To address this concern, the minaret was ingeniously incorporated at a low height to preserve



the privacy of the residents within their domestic space. The staircase-minaret serves the function of the call to prayer without being associated with a towering structure. Some residents propose a geographical explanation, suggesting that the desert climate, characterised by winds accompanied by sand whirlwinds, has discouraged the adoption of tall minarets as vertical elements. Consequently, these

constraints render the construction of such minarets functionally unnecessary. Furthermore, the heat and dryness of the environment do not seem to explain the particular shape of the minaret, as other Algerian Saharan regions have adopted tall minarets with covered balcony. In the Souf, vernacular mosques are primarily identified by their raised domes, as explained earlier (Figure 6).



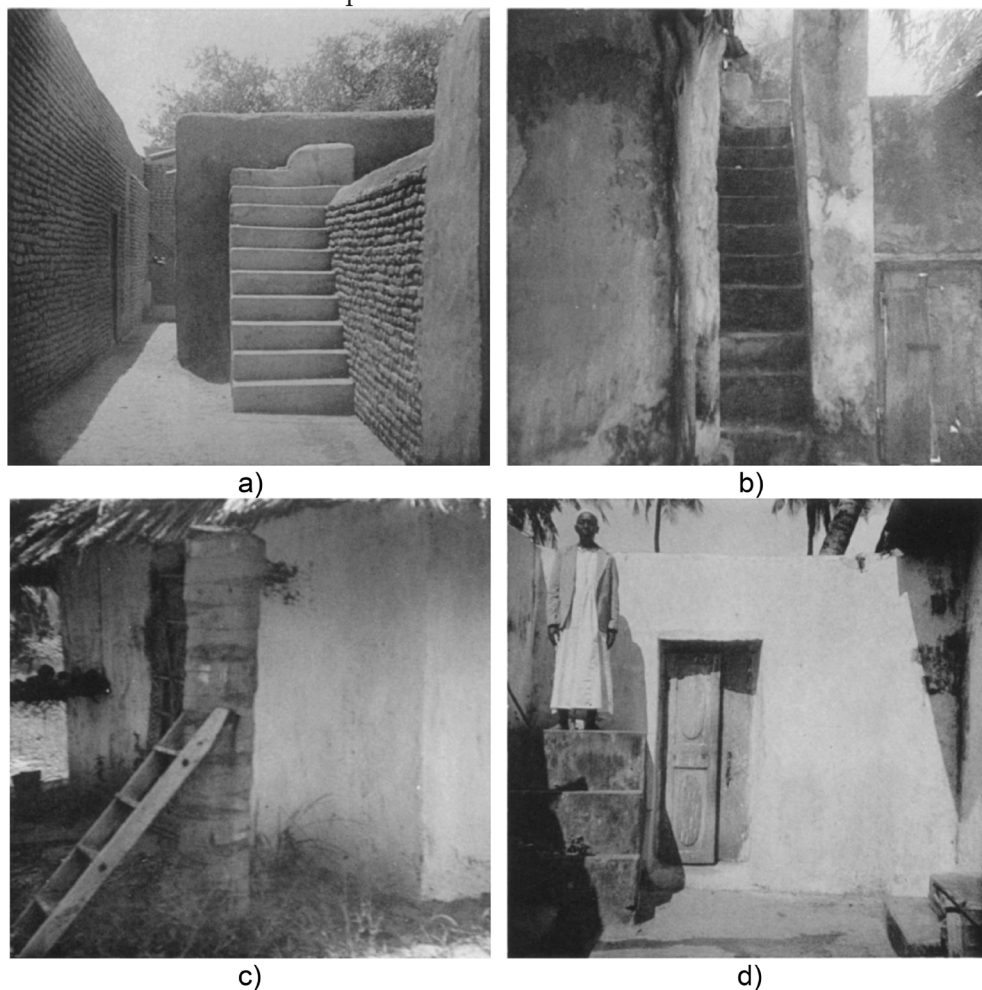
**Figure 6.** Views of vernacular mosques in the Souf (location unidentified): a) & b) mosques without minaret; c) mosque with a staircase-minaret; d) general views of a mosque, showing the water well, the raised dome, and the staircase-minaret (Algerian Ministry of Culture and Information, 1970; [www.delcampe.net](http://www.delcampe.net)); e) mosques without minaret ([www.facebook.com/ffathi.saouli](https://www.facebook.com/ffathi.saouli)).



Despite these suppositions and proposed explanations, which are based on limited evidence, the origin of the staircase-minaret remains a rather contentious subject. This type of minaret has been used in various parts of the Muslim world, even in regions with different climatic conditions, since the early days of Islam. Prévost (2009), in *“Les mosquées ibadites du Maghreb,”* provides an overview of this subject, citing Bloom (1989) and Schacht (1954, 1961). The staircase-minaret was common in the East during the 7th century A.D., corresponding to the first century of the Hegira. The earliest examples of staircase-minarets were built in Egypt at the request of Caliph Muawiya, who ordered that the mosque of Amr ibn al-As in Al-Fustat (Cairo, Egypt) be equipped with four minarets. These minarets likely consisted of staircases leading from the street to modest structures resembling gatehouses built at each corner of the mosque’s roof.

Other parts of the Muslim world have also adopted the use of staircase-minarets over the centuries. These distinctive architectural elements can be found in various locations, including rural Egypt, Central and Western Anatolia, Ajdabiyya in Libya, the Persian Gulf city of Siraf, East Africa, and Fulani mosques in West Africa and the Sahel (Figure 7).

The Ibadis of Djerba introduced the staircase-minaret to West Africa. Indeed, the Ibadis of the Maghreb held a monopoly on trans-Saharan trade for several centuries and played a significant role in Islamizing the regions they engaged with. They transmitted numerous architectural traditions that were preserved by the Fulani ethnic groups. Consequently, Malekite mosques among the Fulani adopted the staircase-minaret design, distinctively lacking a minbar and featuring a rectangular mihrab—characteristics inherited from the Ibadis. It is worth



**Figure 7.** Views of the adoption of the staircase-minarets: a) Omdurman, the mosque of the Khalifa Abdallah; b) Bagamoyo, the great mosque; c) Kilomo, wooden ladder serving as a minaret; d) Pangani, masjid Mwana Sukali (Schacht, 1961).

noting that the diffusion of the staircase-minaret does not appear to serve a purely religious purpose, as it was also used in Malekite mosques in Djerba. Nonetheless, this architectural element remains a subject of debate in the context of Ibadi mosques in the Maghreb (Chekhab-Abudaya, 2017; Prévost, 2009; Schacht, 1954, pp. 17-21). Furthermore, in the M'Zab valley, each of the five ksour contains a tall pyramidal minaret, commonly referred to as the "Saharan style" or "Mozabite style." As Chekhab-Abudaya (2017) suggested, this choice was likely influenced by the fact that the mosques of the M'Zab valley served as places of refuge during enemy attacks, with the tall minarets functioning as watchtowers for defensive purposes. Prévost (2022) added that despite the presence of tall pyramidal minarets in the M'Zab Valley, several mosques in the region's cemeteries

feature staircase minarets, reaffirming the widespread use of this design and its connection to the Ibadi tradition.

To deeply investigate the formal and stylistic variations of a building compared to others in its category, it is crucial to contextualise it comprehensively. Cauvet (1923, p.286), when interpreting the diversification of mausoleum forms in the Maghreb, whether independent or associated with mosques, stated that the mindset, habits, and mentality of nations influence their tastes in construction. However, these tastes can vary depending on the factors that bring about changes in the lives of nations.

In this context, some vernacular mosques in the Souf exhibit stylistic variations distinct from the prevalent style in the region. For instance, the Sidi Massoud Mosque is a variant, featuring four minarets. Located in El



**Figure 8.** Views of the Sidi Massoud Mosque in El Oued: a) before the construction of the minarets; b) after the construction of the minarets ([www.delcampe.net](http://www.delcampe.net)); c) aerial view showing the four staircase-minarets (Richer de Forges & Jarrige, 2017).

Oued, the capital of the Souf, within the traditional Al-Aachache district near the marketplace, this mosque was established towards the end of the 16th century by Sheikh (preacher) Massoud Al-Chabi. According to Daviault (1947, p.10), Massoud Al-Chabi was a revered figure known for his kindness and piety, highly venerated by the locals. The mosque was erected in his honour and named after him (the mosque of Sidi Massoud), even though he was not buried there. According to Najah (1971, p.125), this Sheikh is from the region of Tozeur in Tunisia; he wanted to gather the predominantly nomadic or semi-nomadic population to increase the rank of his followers and facilitate his relations as well as to establish his spiritual and congregational prestige.

Originally constructed without a minaret, the mosque underwent changes in the early 20th century when four minarets were added, as evidenced by a comparison of old postcards taken at different times (Figure 8). These minarets are relatively modest in height, not surpassing the main dome's elevation above the prayer room, which formerly served as the sole identifying feature of the mosque. The silhouette of these four added minarets appears to draw inspiration from local staircase-minarets. They are situated at the four corners of the mosque's roof and are accessible via a ground-floor staircase, leading to the terrace and then to the tops of each minaret.

In light of these observations, vernacular mosques in the Souf region can be categorised into two groups (or types). Since the raised dome above the prayer room is a prominent element in all these mosques, the classification is based on the presence or absence of a minaret. These groups consist of mosques without minarets and mosques featuring a box-like structure resembling a staircase-minaret. The adoption of the staircase-minaret in the Souf is not constrained by chronological factors. Regardless of the mosque type, the dome above the prayer room serves as a defining feature of the vernacular Souf style (Table 5).

It is worth mentioning that a limited number of vernacular mosques in

which the minarets are intentionally designed to resemble tall towers; thus, this architectural style is not prevalent/predominant in the Souf region. In such cases, the minaret becomes a dominant architectural element in vernacular mosques. One example is the mosque of Sidi Salem in El Oued. Originally established without a minaret in the early 19th century, additional structures, including a tall minaret and other facilities, were added around 1830, giving the mosque significant character. This initial minaret had a pyramidal shape and featured a covered balcony. According to local testimonies, this minaret was reconstructed at the end of the 19th century, as evidenced by two postcards taken before and after the reconstruction (Figure 9). The silhouette of the reconstructed minaret bears a resemblance to the minaret of the Great Mosque of Kairouan in Tunisia. It stands at a total height of approximately 19 meters. It comprises two superimposed towers with square sections: the first measuring 4.90 x 4.90 meters and ending in an open cantilevered balcony, while the second approximately 4 x 4 meters, terminates in an open balcony-terrace and a lantern. This minaret has been preserved and is considered a local landmark in El Oued. During the French colonial period, it was well-known to visitors of the Souf region. In 1899, the writer and journalist Isabelle Eberhardt (1877-1904) ascended to the top of this minaret and had a comprehensive view of the locality. This is how she gave El Oued the famous expression "the city of a thousand domes," given that the vernacular architecture was distinguished from other Algerian Saharan regions by the exclusive and widespread use of an original roofing system dominated by domes.

The mosques of the Souf exhibit certain similarities with the vernacular mosques of the Maghreb, not only at the minaret-staircase level but also at the level of the roof type. In an architectural and historical study of the Sabaa Rggoud Mosque (Mosque of the Seven Sleepers) in Chenini-Tataouine, Tunisia, conducted by Ladhari (2018), common features in morphology were discovered between this mosque and



**Table 5.** Morphological and typological characterisation of the façades of the studied mosques (developed by authors).

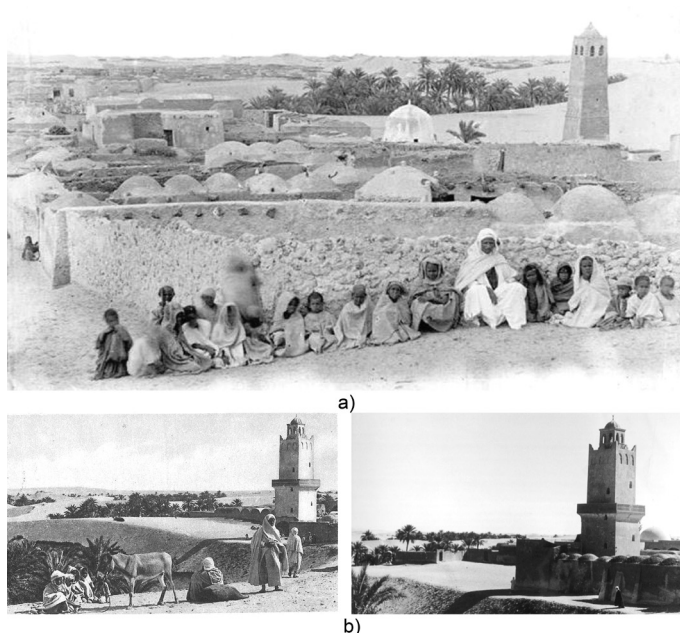
Characterisation of the façades					
Arab mosque model (plan, elevation, and silhouette)	<div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></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some heritage mosques in Libya and the Souf region. These features are primarily related to the type of roof and its distinct silhouette. In general, the raised dome signifies religious spaces and distinguishes sacred buildings from the surrounding built environment. In light of the lack of archaeological evidence and historical sources, Ladhari (2018) proposed an interesting hypothesis regarding the architectural style of the Seven Sleepers Mosque (Figure 10), suggesting that it reflects certain Ottoman influences, notably observable in the central dome with a raised tambour.

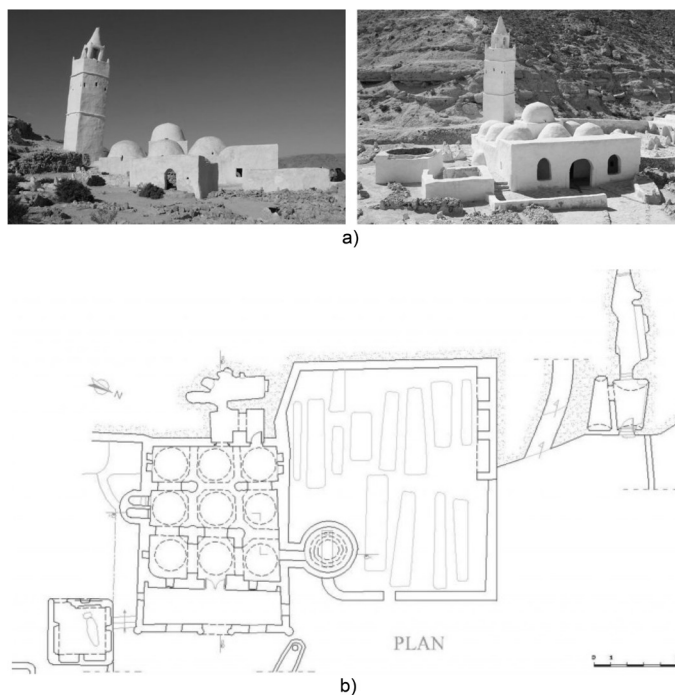
By cross-referencing all the information presented, the vernacular mosques

of the Souf region, much like the houses, seem to embody a hybrid style influenced by architectural acculturation, shaped by various cultural contexts characterising the genesis of architecture in the Souf. Indeed, the contributions of Arab-Muslim, Berber, and Nubian-Sudanese cultures have played a pivotal role in shaping the architectural identity of the vernacular mosques of the Souf. Concerning the Ottoman influence on the architectural style of these mosques, it is plausible that this influence was imported from Tunisia, as the Souf region was not under Ottoman rule and maintained contact with the Djerid and northern Ifriqiya during medieval and modern times [4].





**Figure 9.** Views of the minaret of the Sidi Salem Mosque: a) before its reconstruction (mosque's archive); b) after its reconstruction (www.delcampe.net).



**Figure 10.** The mosque of the Seven Sleepers in Chenini-Tataouine, Tunisia: a) exterior views of the mosque; b) plan of the mosque (Ladhari, 2018).

### 7. The vernacular mosques of the Souf as a source of inspiration for Western architects

Throughout the French colonisation of Algeria, Western architects created a variety of architectural styles and expressions, each reflective of a distinct period. Towards the end of the 19th century and the start of the 20th century, they displayed a keen interest in the

revival of local architecture. This revival encompassed the restoration of existing local structures and the reinterpretation of specific local architectural languages, particularly in the context of religious architecture, for the design of new edifices that introduced functions foreign to the local culture of the time, such as railway stations, institutions, post offices, banks, and more. This endeavour at acculturation is commonly referred to by authors [5] as the “neo-Moorish style.”

Mosques, being the primary religious edifices, inevitably served as a wellspring of inspiration for Western architects. They have drawn inspiration from the architectural elements and design principles of mosques. Elements like arches, domes, and minarets have found their way into European architectural styles. Some buildings look like mosques from the outside.

Given that the vernacular architecture of the Souf, including mosques, features elements of the “Sudanese style,” [6] the idea of reviving the local built heritage led to the emergence of the “neo-Sudanese style.” This style, though not extensively explored in current research, can be found in several regions of southern Algeria where the “Sudanese style” is distinctly expressed. As a result, the “neo-Sudanese style” varies according to the specific local styles it reinterprets, thereby giving rise to diverse stylistic expressions. This phenomenon underscores the concept of “regionalism” in architecture. The “neo-Moorish style” and the “neo-Sudanese style” are emanations of the differences in vernacular architectural languages between northern and southern Algeria.

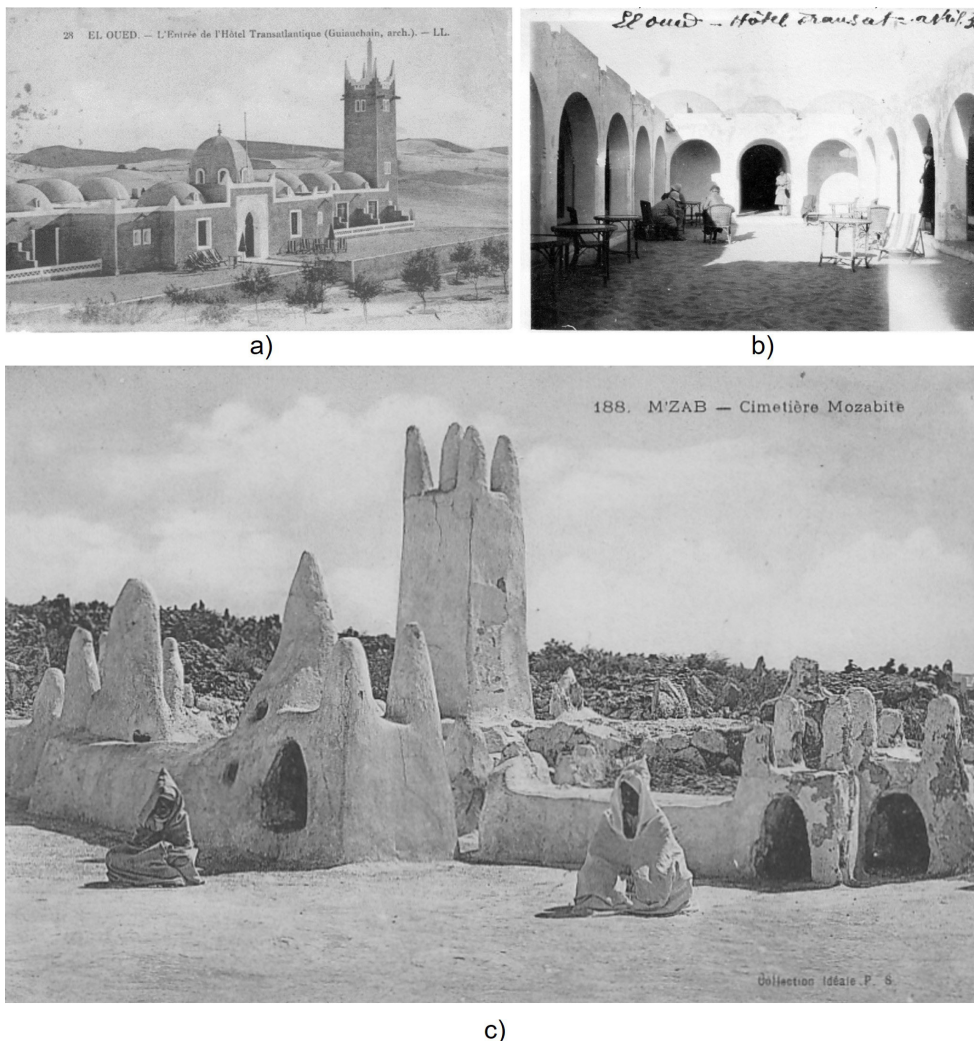
The neo-Sudanese style particular to the Souf region stands out due to its eclecticism. Since most mosques in the Souf are characterised by the absence of minarets (or the presence of staircase-minaret), Western architects imported these architectural elements from neighbouring Saharan regions and incorporated them into the design of new buildings in the Souf. An illustrative example is the Hôtel Transatlantique in El Oued, designed by architect Jacques Guiauchain (1884-1960). Guiauchain reinterpreted elements such as domes, open sand-cov-

ered courtyards, and porticos from the local architecture of the Souf, drawing inspiration for the minaret's style from the M'Zab Valley (Figure 11). It is worth noting that the pinnacles at the minaret's corners are a distinctive feature of the M'Zab style and can also be found in the Oued Righ region at the corners of mausoleums. According to Ravéreau (1981, p.155), this architectural element traces its origins to the Ibadi community of Algeria, given that the Ibadis of Algeria settled in the Oued Righ before isolating themselves in the M'Zab Valley.

The Hôtel Transatlantique in El Oued presents similarities with the local mosques, especially at the level of its silhouette, traced by the raised dome and the surbased domes that characterises the mosque in the Souf.

## 8. Conclusion

This study delved into the vernacular architecture of mosques in the Souf region, located in south-east Algeria. It aimed to reveal the local architectural language of the vernacular mosques in the Souf to develop an inventory from a historical perspective. This research stemmed from a compelling necessity to conduct comprehensive and rigorous scientific inquiries into the vernacular mosques of the Souf region, with a primary focus on highlighting their architectural significance and cultural importance. The underlying motivation behind this study lies in the recognition that the vernacular mosques of the Souf constitute a rich and distinctive architectural heritage that has remained largely unexplored and underrepresented in academic research.



**Figure 11.** a) View of the Transatlantique Hotel in the locality of El Oued; b) view of the portico and the sand-covered courtyard of the hotel; c) View of the funerary monuments in a cemetery in M'Zab Valley ([www.delcampe.net](http://www.delcampe.net)).

The findings unequivocally established that the architectural style of vernacular mosques in the Souf is unique and distinct from any other found in Algeria. These mosques adhere to the two-dimensional architectural model of Arab mosques while distinctly embodying the vernacular style of the region in three dimensions. In general, these mosques differ from the Arab model in that there is no minaret in their spatial organisation; instead, they have a distinctive staircase-minaret and a raised dome (on a double tambour), often dominating the mosque with its height and grandeur. This gave the mosque a particular silhouette. Staircase-minaret was common in many parts of the Muslim world including rural Egypt, Central and Western Anatolia, Ajdabiyya in Libya, the Persian Gulf city of Siraf, East Africa, and Fulani mosques in West Africa, and the Sahel. Furthermore, the investigation revealed that the stylistic influences on the vernacular mosques in the Souf encompass elements of Saharan/Sudanese, Berber, and Arab architectural styles. This architectural acculturation has created a distinctive style that differs from those of mosques throughout the Algerian Sahara.

This study ultimately shed light on the role of European architects in re-interpreting the local architectural language, which, in turn, played a pivotal role in the emergence of the “neo-Sudanese style.” This style marked a significant departure from traditional architectural forms and ushered in a new era of design and construction in the region. Western architects, seeking to blend local influences with their own expertise, created a unique architectural fusion that had a profound impact on the architectural landscape of the Souf region. This “neo-Sudanese style” reflects the dynamic interplay between cultural exchange and the evolution of architectural traditions in the context of the vernacular mosques of the Souf.

Despite certain limitations in the data collection process, the study's findings are promising. They have provided the means for the exploration and inventory of a previously undiscovered vernacular architectural language of these mosques. This research

has the potential to inspire scholars from diverse cultural heritage fields to delve deeper into the study of vernacular mosque styles, to preserve and valorise their cultural and historical importance.

### Endnotes

[1] For a comprehensive understanding of Umayyad architecture, refer to (Saoud, 2002).

[2] Ibadism is one of the principal sects within Islam, with adherents residing as a minority in various regions of the Muslim world. Notably, Ibadism is prevalent in Oman, East Africa, Algeria's M'Zab valley, the Nafus mountains in Libya, and the island of Djerba in Tunisia. The Ibadi community in Algeria is known as Mozabites, and they primarily inhabit the M'Zab valley in the northern Sahara of Algeria.

[3] To delve deeper into the Banu Hillal tribes, consult (Zerari et al., 2022).

[4] For insights into the interactions and exchanges between the Souf and Tunisia's Djerid region, refer to (Araar, 2021).

[5] For a comprehensive exploration of the neo-Moorish architectural style, see (Béguin, 1983; Bacha, 2011; Zerrouki, 2021).

### References

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