

## Negotiating Saharan Heritage and Modernity: An Analysis of Fernand Pouillon's Hotels in Southern Algeria

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### Abstract

The article presents a critical analysis of Fernand Pouillon's hotel work in southern Algeria, considered as a pioneering experience of contextualized modernity. It explores how the architectural, constructive, morphological, and climatic logics of Saharan vernacular are reinterpreted in a modern language, expressing a post-colonial national identity. Beyond esthetics, the study analyzes how Pouillon translates operational principles of the vernacular -compactness, thermal inertia, introversion, continuity with the site, and mineral materiality- into an architecture adapted to contemporary demands of thermal comfort, passive cooling with energy efficiency, sustainable tourism, and institutional representation. In the context of building a modern national identity after 1962, the development of an Algerian Saharan tourism was accompanied by the construction of hotel infrastructures. However, starting from the 1970s, these projects tended to align with standardized international models, often unsuitable for the local climate and dependent on mechanical air conditioning. Pouillon's approach stands out distinctly from this evolution by proposing an architecture rooted in the logics of the site and the climate. The Saharan hotels he designs are situated at the intersection of colonial legacies, modernist influences, and vernacular references, contributing to shaping the tourist image of the Algerian Sahara after independence. The comparative analysis of three emblematic hotels -El-Gourara, M'Zab, and El Djanoub- highlights common principles: topographical integration, use of local materials, organization around patios (courtyards), and creation of adapted thermal atmospheres. The methodology is based on a cross-sectional approach combining morpho-stylistic analysis and qualitative evaluation of bioclimatic systems. The results show that Pouillon's architecture is neither an imitation nor a pastiche, but a reinterpretation of the fundamental logics of the vernacular. It embodies a functional Saharan regionalism, where cultural and environmental dimensions are inseparable, in contrast to later productions often reduced to mere decoration. Ultimately, the article highlights the relevance of this approach in the context of an energy and climate crisis. Pouillon's achievements appear as relevant references for rethinking architecture in desert environments, prioritizing passive and contextualized solutions rather than energy-intensive technical devices.

**Keywords:** *Vernacular Saharan Architecture, Modern Regionalism, Fernand Pouillon, Morpho-Stylistic Analysis, Bioclimatic Design, Sustainable Tourism, Post-Colonial Algeria.*

### Introduction

Saharan architecture offers a compelling domain of investigation where vernacular heritage, extreme climatic constraints, and contemporary tourism development challenges converge. In the post-independence Algerian context, the question of architectural modernity was not limited to the updating of a formal language; it also engaged with identity, cultural, and environmental issues closely linked to national reconstruction. From this perspective, the vernacular-built environment of southern Algeria -

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with its oasis landscapes, its *ksour* (plural of *ksar*), and its ingenious architectural and constructive assets based on urban compactness, spatial introversion, thermal inertia, and passive protection against the rigors of the desert climate - has been a privileged ground for questioning the compatibility between architectural modernity and cultural continuity (Nyssen, 1972; Bédarina, 2021).

It is within this framework that the hotel work of Fernand Pouillon is situated, particularly in the Gourara region and the M'Zab Valley, where he designed, during the 1960s and 1970s, a series of buildings emblematic of Algerian tourist architecture.

### **General Context of the Study**

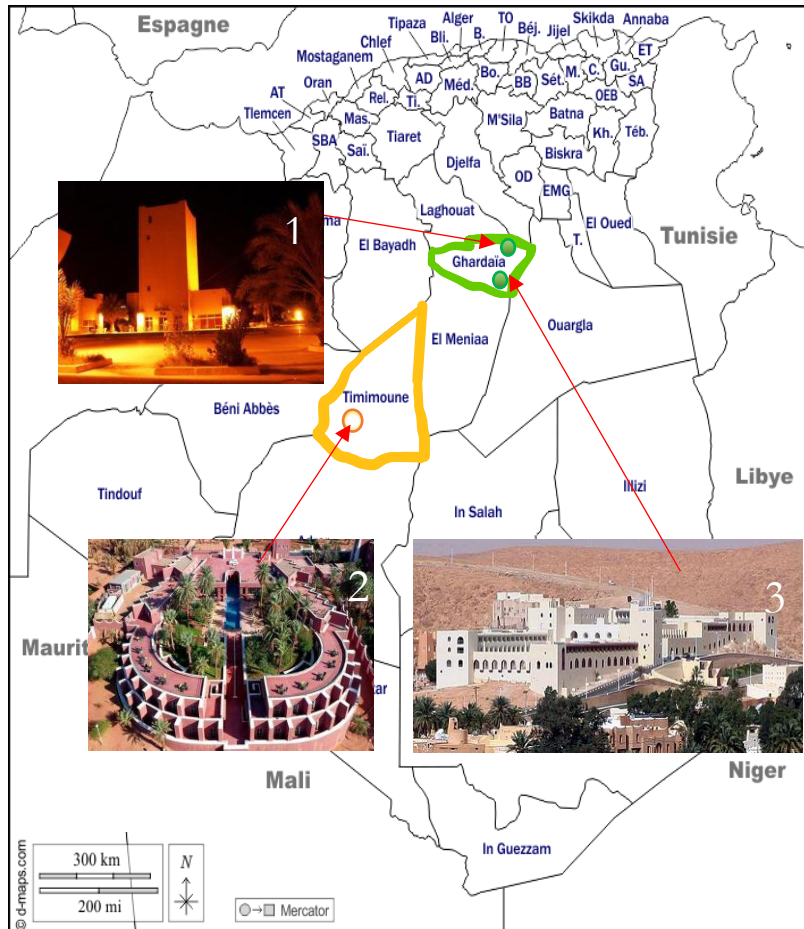
Since Algeria's independence in 1962, the reconstruction and modernization of the national territory have been a central concern of public policy. Among the strategic sectors mobilized to assert sovereignty, boost the economy, and build an international image of the country, Saharan tourism held a unique place. The vast desert spaces, the oasis landscapes, and the *ksour* heritage offered unprecedented development potential, necessitating the creation of hotel infrastructures capable of accommodating both national and international visitors. As a result, the newly independent state embarked on a proactive policy to enhance its Saharan territory, particularly thru cultural and Saharan tourism, conceived as a vector for economic development and symbolic consolidation of national identity. The ambition of the public authorities at that time was to promote a national architectural model, territorially rooted, capable of reconnecting with indigenous knowledge while projecting a modern image of the country (Boudjellal, 2000; Cote, 2015; Henni, 2017; Bentounes & Oulebsir, 2004).

However, this initial ambition was gradually eroded from the turn of the 1970s-1980s onward by the importation of international standards driven by rapid urbanization, the normalization of reinforced concrete construction, and the imperatives of the globalized tourism market. In many Saharan regions, traditional climatic strategies such as compactness, introversion, massiveness, and mineral materiality were progressively replaced by so-called neo-Orientalist architectural forms, where decorative signs (arches, domes, battlements, Arabesque motifs) supplant the original climatic and constructive logics (Kaihoul & Sriti, 2019; Merzelkad-Hallal, 2021). This shift marks a profound break between the *real vernacular*, based on proven environmental rationality, and a *stylized vernacular*, reduced to an esthetic and symbolic register, often energy-intensive and dependent on mechanical cooling.

Against this evolving landscape, the southern hotels designed by Fernand Pouillon stand as a foundational interlude, offering an alternative model in which modernity, tradition, and climate converge toward a situated and high-performing architecture. Rather than imitating the *ksour* as images, they translate their operational logics: massiveness, introversion, inertia, patios, topographical integration and formal economy. These hotels, often commissioned by public institutions, notably the National Tourism Company (SNAT), the Regional Tourism Offices (ONAT), and local authorities, constitute unique architectural objects: simultaneously tools for local development, showcases of national modernity, and experiments in an architectural language rooted in local culture while adapted to the hot and arid desert climate. They also reflect a desire to break away from colonial architecture, while sometimes selectively incorporating references to Saharan vernacular: patios, arcades, corner towers, local materials, ochre tones, interplays of shadow and light, and compact massing. Thus, an essential debate opens up: do these hotels contribute to the construction of a post-colonial Algerian architectural identity, or do they represent merely a modernized variant of standardized international models?

While some studies address tourism in Algeria, the architectural analysis of these Saharan hotels remains largely absent from the scientific literature (Widmann, 1976; Dali & Belakehal, 2023; Abbou et al. 2025). This article aims to fill this gap by examining how Pouillon's post-independence hotel architecture articulates three complementary dimensions: (1) national ambitions of modernization, (2) the expression of cultural and territorial identity, and (3) climatic adaptation in a desert environment. The objective is to understand how these establishments position themselves at the intersection of colonial legacies, modernist influences, and vernacular references, and to what extent they have contributed to shaping the tourist image of the Algerian Sahara.

To this end, the study relies on a morphological, stylistic, and bioclimatic analysis of three emblematic hotels built after 1962: the El-Gourara Hotel (Timimoun), the M'Zab Hotel, and the El Djanoub Hotel (Ghardaïa) [Fig. 1]. The results will highlight the design logics specific to Pouillon, the adaptation strategies to the Saharan climate, and the symbolic choices embedded in these architectures.



**Figure 1:** Map of Algeria showing the locations of the three hotels studied: 1. Hotel El Djanoub (Ghardaia, the M'Zab Valley); 2. Hotel M'Zab (Ghardaia, the M'Zab Valley); and 3. Hotel El-Gourara (Timimoun). (Source : Authors).

Through a comparative approach, the aim is to understand how these touristic infrastructures express a modernized Saharan identity, and to what extent they align with the logics of modern regionalism. More broadly, the article poses the following question: do the hotels designed by Pouillon in southern Algeria represent a genuine architectural continuity with Saharan vernacular, or are they merely a pastiche anchoring of a stylized identity intended for tourist consumption? The guiding hypothesis of this article is that Pouillon's hotel work constitutes one of the earliest successful forms of *functional Saharan regionalism*, that is, an architectural model where environmental performance and cultural identity do not oppose each other but mutually reinforce each other. More generally, the study examines the role of architecture in the construction of a national image of the Sahara after 1962, the tensions between vernacular and technical modernization, and the climatic limitations of a model still heavily reliant on mechanical air conditioning. Finally, the conclusion opens a reflection on how these legacies might inspire a sustainable reinterpretation of Saharan architectural design in the era of energy transition.

### Theoretical and Historical Framework

Saharan architecture constitutes a complex system, shaped by extreme environmental constraints, long-term civilizational dynamics, and construction practices deeply rooted in oasis societies (Fathy, 1986 ; Djeradi, 2012 ; Layachi, 2016 ; Ravereau et al., 2003 ; Boumerzoug et al., 2022 ; Zaghez et al., 2024 ; Benbrahim et al., 2025). Understanding the significance of Fernand Pouillon's approach involves situating his work within a cultural and climatic genealogy, while also confronting it with the identity issues of the post-independence context and contemporary theories of contextualized modernity. This theoretical framework thus articulates three dimensions: the logic of Saharan vernacular, post-independence architectural transformations in light of debates on modern regionalism, and the incorporation of tourism into the national policies of independent Algeria.

### Saharan Vernacular: Morphological and Climatic Logics

The Saharan ksour, notably present in M'Zab, Gourara, Ouargla, and Touat, constitute dense urban organizations based on millennia-old climate adaptation mechanisms (Fig.2). Their urban compactness reduces solar exposure, limits thermal fluctuations, and generates urban canyons conducive to continuous shading. The narrow alleys oriented according to the prevailing winds and the organization into closed blocks contribute to an optimized management of light and ventilation.



**Figure 2:** Examples of ksour and oases in Southern Algeria: 1. El-Golea, the old ksar; 2. Ksar of Taghit (Bechar); 3. Ghardaia, the M'Zab Valley; and 4. An old ksar in Timimoun (Gourara).

(Source : Nyssen, 1972 )

Morphologically, the mass and thermal inertia of the materials (rammed earth, stone, raw bricks) help stabilize indoor temperatures by storing nighttime coolness and delaying daytime solar gains. Patios play a central role: these introverted spaces create thermal gradients, promote upward ventilation, and serve as microclimatic regulators while structuring domestic intimacy. Light, on the other hand, is managed not as a homogeneous flow but as a rare and controlled resource: oculi, restricted openings, filters, light-dark transitions. This architecture is therefore not just "earthen" or "traditional"; it is a reasoned climatic system where form, material, and ambiance are inseparable. It is this operational foundation - rather than its esthetic expression - that establishes the idea of a functional Saharan vernacular (Daoudi et al., 2019).

### Post-Colonial Architecture in Algeria and National Identity

After 1962, Algeria sought to reconstruct a decolonized architectural identity, breaking away from European models and colonial urban policies. In the early years, the official discourse emphasized a return to local craftsmanship, particularly Saharan, seen as the foundations of an authentic national identity. However, starting in the 1970s, public and tourist architecture shifted toward a neo-Orientalist esthetic, employing a standardized Islamic iconography: pointed arches, battlements, decorative domes, symmetrical colonnades (Boussora, 1990). This formal Arabization responds to political and symbolic issues, but often remains superficial, as it is dissociated from the structural and climatic logics that underpinned traditional architecture. This process is accompanied by a generalization of industrialized materials (reinforced concrete, prefabricated facades, extensive glazing) and an increased dependence on mechanical air conditioning, justified by the abandonment of the principles of inertia and compactness. The break is therefore not only cultural but also thermodynamic:

architecture stops producing comfort thru form and becomes energy-consuming (Miloudi & Biara, 2026).

What was happening in Algeria in the early years of its independence was in tune with an international fervor centered on the notions of modernity and architectural regionalism (Shadar, 2010; Canizaro, 2012; Giamarelos, 2022). Since the 1970s, international theoretical debates have opposed two paths of regionalism: 1) figurative imitation, which consists of adapting vernacular motifs to modern syntax; 2) contextualized modernity, integrating the structural, material, and climatic logics of the place. Kenneth Frampton, in his theory of "Critical Regionalism," advocates for an approach where modernity is nourished by local conditions (climate, topography, materials), without falling into pastiche (Frampton, 1983 ; Frampton, 1987). On their part, architects like Rasem Badran propose a socio-symbolic reading of the Arab territory, articulating urban heritage, social processes, and geomorphological continuity (Steele, 2005). Pouillon's Saharan approach fits into this debate: it neither imitates nor cites the ksour, but transposes their climatic operativity and spatial structure, producing a regionalism that is neither folkloric nor purely modernist.

### **Hotel Architecture as A Tool of National Identity**

In the aftermath of independence, Algeria inherited an architectural landscape heavily marked by colonial influence. The cities of the North bore the marks of Haussmannian urbanism, while the Sahara had been transformed into a military and tourist territory serving the French Orientalist imagination. In this context, the construction of hotels is not just about architecture: it transforms the territory. Each establishment creates a new urban centrality - roads, businesses, services, airports - and physically inscribes the State into the territory. We can speak of a tourist territorialization: the hotel establishes the institutional, economic, and symbolic presence of the nation. It becomes a forward post of modernity (Widmann, 1976 ; Bédarina, 2021; Abbou et al., 2025).

In this respect, post-independence hotel architecture could not be reduced to a tourist production. It constitutes an architecture-representation, which materializes a national narrative: an Algerian modernity that is situated, autonomous, and visually rooted in local history. As a result, the hotels built after 1962 are not mere tourist facilities: they become symbolic instruments intended to inscribe a new representation of the territory and the nation. Thus, as shown by several studies on post-colonial architecture, public buildings constitute a space of political representation (Çelik, 1997; Amrouche, 2013). The construction of hotels in major Algerian cities thus serves to affirm the government's technical expertise and its ambition for economic modernization. Hotel architecture becomes the showcase of a modern Algeria. The hotels are designed as visible urban landmarks: monumental volumes, situated on high points, with viewpoints overlooking the coasts, palm groves, and sand dunes. Their architecture must impress, reassure, and seduce, while conveying a clear political message: Algeria is independent, welcoming, and forward-looking.

### **Pouillon's Hotel Architecture: A Modernity Rooted in Saharan Vernacular**

At independence, Saharan tourism appears as a strategic sector allowing for the affirmation of a modern, sovereign Algeria, capable of transforming its territory and welcoming international visitors. The hotel infrastructures built in the 1960s and 1970s are part of a strategy aimed at opening the oasis regions to cultural discovery while stabilizing isolated populations. However, in the Sahara, the state's objectives were to avoid adopting colonial references or the standardized models of international chains. Hotel architecture, on the contrary, had to mobilize local identity elements-earthy colors, massive volumes, patios, arcades, screens, simple lines-constructing what can be called a "Saharan national aesthetic." This choice was not neutral; it marked a break with colonial architecture as well as affirming a continuity with the culture and know-how of the desert while conveying an "authentic" image of Algeria for tourism. The hotels then became identity objects: they embodied the idea that Algerian modernity could take root in local culture and not depend on an imported international model. The interest of public authorities in the vast southern territory is not coincidental [Fig. 3].



**Figure 3:** Map of Algeria showing the locations of some marinas, holiday villages and hotels designed by Pouillon.

Source : (the Authors, 2026).

The Sahara occupies a central place in the national imagination. It represents both the historical depth of the country, resistance, spirituality, and territorial expanse. By mobilizing vernacular references (ksour, ochre, palm groves, smooth walls, compactness), the hotels transform this memory into architectural language. However, this reference is often more symbolic than technical. Thermal inertia, natural ventilation, or traditional materials are rarely fully adopted. The vernacular becomes a "visual grammar" intended to express identity rather than a construction system. This identity staging is aimed as much at the foreign visitor as at the Algerian citizen. It is in this interstice - between identity aspiration and decorative drift - that Pouillon's work constitutes a counter-model. The architect Fernand Pouillon holds a major place in the history of Algerian architecture from the post-independence period. If his name is mainly associated with urban reconstruction, social housing, and new towns, his intervention in both the north and south of the country - particularly in Sidi Fredj, Ghardaïa, Bechar, Tamanrasset, and Timimoun - has profoundly influenced Algerian hotel architecture (Maachi-Maïza, 2008; Merzelkad-Hallal, 2021). Unlike the standardized modernist approaches that were developing elsewhere during the same period, Pouillon proposed a unique architectural style, rooted in culture, history, collective memory, attentive to the landscape and local materiality.

## **Pouillon and the Algerian Interpretation of Saharan Regionalism**

For Pouillon, the Sahara was not an exotic backdrop, but a territory possessing its own constructive laws, its own implantation logics, and a spatial genius derived from the millennia-old experience of ksour and oasis towns (Pouillon, 1968). In this context, he draws from the compactness of forms, the massiveness of walls, the geometric sobriety, the mineral textures, and the profound alternation of shadow and light that characterize traditional Saharan habitat. However, this anchoring never amounts to a submissive imitation or an Orientalist pastiche: Pouillon adapts and reinterprets these principles critically, in order to project them into a contextualized modernist writing. This approach is based on three major orientations. Firstly, the integration into the site, which is reflected in belvedere placements, an assumed topographical continuity, and thoughtful morphoclimatic orientations. Secondly, a materiality rooted in the place, using local stone, mineral plasters, and rough textures that absorb the Saharan light rather than ostentatious industrial materials. Thirdly, a human scale, articulated around patios, alleys, covered passages, and protected public spaces, which reconnects with the introverted and social spatiality characteristic of oasis fabrics (Merzelkad-Hallal, 2021; Kaihoul et al., 2025).

From this synthesis emerges a refined Saharan esthetic, far from the post-independence drifts where the vernacular is reduced to a decorative repertoire of "neo-Moorish" motifs. For Pouillon, sobriety is not formal minimalism, but a direct consequence of constructive logic: low fragmented volumes, continuous walls drawing architectural horizons, massive shadows from arcades and recesses, patios playing both the role of thermal regulators and social spaces. The absence of superfluous decoration asserts a beauty derived from the material itself, producing a discreet monumentality where the building appears less as an object placed and more as a continuation of the inhabited landscape. This positioning has profoundly redefined the imagery of Saharan tourism. Rather than reproducing the exotic model of an artificially air-conditioned oasis isolated from its context, Pouillon proposes a tourism based on cultural and spatial dialog with the existing city. The hotel becomes a meeting place rather than an enclave: the patios and terraces are designed as public spaces, the built presence integrates into the environment rather than dominating it, and the visitor is invited to experience the desert rather than be distanced from it. This approach breaks with the Western paradigm that opposes hotel comfort to the desert environment perceived as hostile.

Its Saharan architecture does not simply imitate the form of a *ksar*: it functions as a Saharan system while preserving a modern expression. In this, it constitutes an early example of modern Saharan regionalism where identity and environmental performance converge. The influence of this approach goes beyond Pouillon's direct work. Starting from the 1960s, numerous Saharan projects-hotels, public facilities, housing-consciously or unconsciously adopted his invariants: the use of stone and earthen plasters, massive and simple volumes, topographical continuity, central patios, ochre and sandy palettes. Thus, a true "modern Saharan school" is formed, where the vernacular heritage becomes a critical resource for designing sustainable, contextualized architectures capable of producing a sense of place without falling into nostalgia.

### **Climatic Dimension in the Saharan Architecture of Fernand Pouillon**

The Saharan architecture of Fernand Pouillon is rooted in a deep understanding of the environmental constraints of the desert, where temperature fluctuations, the intensity of solar radiation, and aridity impose a careful design of material, form, and space. Unlike the modernist approaches imported from European metropolises, often dependent on mechanical air conditioning, Pouillon favors passive solutions inherited from vernacular architecture, adapted to the rhythms of the oasis climate. His project is not to reproduce ancestral models, but to extract the climatic logics - compactness, shading, introversion, inertia, - to reformulate them thru a modern constructive language (Zineddine et al., 2018; Kaihoul et al., 2021; Kaihoul et al., 2024). At the morphological level, volumetric compactness constitutes a recurring principle: low, continuous, and massive volumes that reduce surfaces exposed to direct radiation and integrate into ridge lines or natural slopes. The organization into fragmented clusters and the systematic presence of patios allow for the creation of internal microclimatic gradients where thermal exchanges are moderated. These patios act as nocturnal coolness wells, promote cross ventilation when the winds are favorable, and serve as spaces for thermal and social transition. The covered walkways, deep arcades, and recesses ensure a structured production of shade, transforming the architectural journey into a climatic sequence rather than a simple functional distribution.

From a construction perspective, the use of materials with high thermal inertia - local stone, heavy blocks, mineral plasters - allows the built envelope to smooth out temperature variations between day and night. This strategy stands in contrast to the reliance on modern materials (e.g., reinforced concrete

and cement), which are typically lightweight and possess low thermal mass, making them poorly suited to absorbing the 15-25°C daily temperature fluctuations characteristic of the Saharan climate. Furthermore, the rough texture of the walls, their ochre or sandy color, and the hollow joint masonry contribute to absorbing rather than violently reflecting light, creating a softened visual ambiance while limiting surface heating. The roof, generally flat and accessible, becomes a ventilated nocturnal space, extending the habitat toward the sky - a use in continuity with ksourian architecture. The position of the building on the site is also designed as a climatic device. The placements in a belvedere or slight elevation allow for capturing the cooler nocturnal winds, while the orientation of the facades minimizes frontal exposure to the southwest solar rays and opens the openings to more protected directions. Rather than creating a stark contrast between air-conditioned interiors and arid exteriors, Pouillon designs a controlled porosity where the thermal ambiance gradually evolves thru loggias, vestibules, courtyards, and dry gardens.

These architectural choices profoundly alter the perception of comfort in Saharan hotels: thermal comfort is not produced by a technological break with the climate, but by a spatial and material mediation that channels the forces of the environment. It is a *climatic modernity* where the desert becomes a resource rather than a constraint. This stance makes Pouillon a precursor to contemporary sustainability approaches in arid regions, offering an alternative to the energy-intensive model that would later dominate many Saharan destinations.

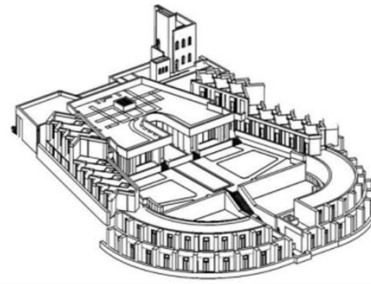
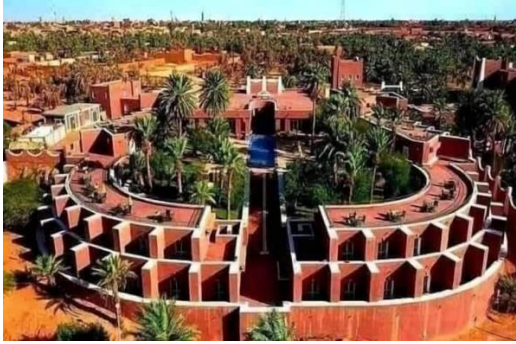
## **Methodology**

The methodology adopted in this article aims to articulate morpho-stylistic analysis, climatic reading, and comparative evaluation of three Saharan hotels designed by Fernand Pouillon. It is based on a multidisciplinary approach, intersecting morphological, architectural, material, landscape, and environmental dimensions, in order to understand how formal and constructive devices simultaneously contribute to climatic performance and architectural expression. This approach is conceived as an analytical tool rather than a descriptive one: it is less about describing forms than about uncovering their operational logics. The analysis unfolds in four stages: (1) corpus constitution; (2) morpho-stylistic analysis; (3) evaluation of environmental and climatic assets; (4) comparison to reveal common elements and variations. The details of the analysis are presented in Tables 1, 2, and 3.

## **Corpus Constitution**

The adopted approach is based on a qualitative method grounded in case studies. The corpus, deliberately limited, consists of three hotel establishments created by Fernand Pouillon in Algeria between the 1960s and the early 1970s, all situated in Saharan oasis contexts. These buildings were selected for their foundational role in the emergence of a state-initiated Saharan hotel model. They share a set of common concerns, notably topographical integration, the use of mineral materials, the development of an introverted spatiality, and continuity with surrounding vernacular forms. They are also distinguished by their status as major tourist facilities, their integration within recognized oasis landscapes and Saharan heritage contexts, and their capacity to express an architectural language that reconciles modernity, identity, and climatic adaptation. Their comparison allows for the identification of generic principles - or invariants - while distinguishing the circumstantial choices related to each site.

Although these three projects share the same geographical context and are the work of a single author, each exhibits its own specificities. Built in 1968, the El-Gourara Hotel (Timimoun), stands out for its location on a cliff crest, establishing a monumental relationship with the landscape [Fig. 4.a]. In contrast, the M'Zab Hotel (Ghardaïa) dating from 1970, maintains a close dialog with the palm grove and reflects the urban stratification characteristic of the M'Zab Valley [Fig. 4.b]. Finally, the El Djanoub Hotel (Ghardaïa), which was completed in 1974 is characterized by its compactness and introverted logic, reflecting a predominantly defensive organization [Fig. 4.c].



**Figure 4.a:** Hotel Gourara, 1968, (Timimoun).

Source: (Dubor, 1986).



**Figure 4.b:** Hotel M'Zab, 1970, (Ghardaïa, the M'Zab Valley).

Source: (Dubor, 1986).



**Figure 4.c:** Hotel El Djanoub, 1974, (Ghardaïa, the M'Zab Valley).

Source: (Dubor, 1986).

### **Morpho-stylistic Approach**

Morpho-stylistic analysis in architecture lies at the intersection of several theoretical fields, articulating urban morphology, architectural typology, and the cultural reading of built forms. It aims to understand the architectural object not only as a formal configuration but also as a situated expression, resulting from complex interactions between constructive constraints, environmental contexts, and cultural value systems. In this perspective, the works of Saverio Muratori and Gianfranco Caniggia constitute a fundamental foundation. Their typo-morphological approach considers architectural forms as the result of evolutionary processes, allowing for the identification of formal invariants and compositional logics. The authors have demonstrated that the built environment evolves through historically stratified processes, where forms are not isolated objects but part of continuous urban tissues shaped over time (Caniggia & Maffei, 2001). This interpretation is extended by Philippe Panerai, Jean Castex, and Jean-Charles Depaule, who highlight the connections between urban forms, social

practices, and modes of space occupation (Panerai, Castex, & Depaule, 1997). Moreover, the contribution of Aldo Rossi foregrounds the role of architectural typology as a tool for understanding the permanence and recurrence of forms within the city. In *The Architecture of the City*, Rossi (1982) argues that urban artifacts embody collective memory, thus linking morphological structures to cultural and symbolic meanings.

Beyond formal and typological considerations, morpho-stylistic analysis also engages with the cultural dimension of architecture. Thinkers such as Amos Rapoport highlight that built forms are deeply embedded in socio-cultural systems, where spatial configurations reflect values, lifestyles, and symbolic structures (Rapoport, 1969). This approach aligns with vernacular architecture studies, which interprets architecture as a material expression of cultural identity and environmental adaptation. It is particularly relevant for the analysis of vernacular architectures and their reinterpretation in contemporary contexts. Furthermore, the notion of place, developed by Christian Norberg-Schulz thru the concept of *genius loci*, allows for the integration of the phenomenological dimension of architecture. It highlights the sensitive relationship between architecture and place, integrating landscape, climatic, and perceptual dimensions (Norberg-Schulz, 1980). Finally, environmental and constructive constraints play a determining role in shaping architectural form. As argued by Kenneth Frampton in his theory of critical regionalism, architecture emerges from the interplay between universal technological conditions and specific local contexts, including climate, topography, and material resources (Frampton, 1983). This perspective reinforces the idea that morpho-stylistic characteristics cannot be dissociated from the environmental and tectonic logic that underpins them.

Thus, the morpho-stylistic analysis adopted in this research is based on an integrated approach, combining formal (morphological) reading, typological understanding, and cultural interpretation. It aims to identify the underlying logics in the production of architectural forms, distinguishing generic (invariant) principles from specific adaptations related to the context. In the case of the Saharan hotel architectures by Fernand Pouillon, this approach allows for an evaluation of the extent to which the formal devices, which are the origin of the Saharan esthetics he claims, stem from a constructive logic rather than a mere figurative reference. It thus aims to determine whether the stylistic expression stems from a genuine contextual rooting or a pastiche approach. In this perspective, an analytical framework has been developed to examine the relationships between urban morphology, architectural form and materiality, cultural expression, and spatial organization. It is based on a multi-criteria analysis applied at several levels:

- *Relationship to the site and landscape*: topographical anchoring methods, integration of the silhouette into the oasis horizon, management of visual relationships with the palm grove or the escarpment.
- *General volumetry*: degree of massiveness and compactness, articulation of the built/unbuilt relationship, overall composition principles (notably the tiered stratification devices).
- *Facade composition*: treatment of the envelope, proportion and distribution of openings, depth of embrasures, rhythm of perforations, continuity of walls, and types of decorations.
- *Materiality and textures*: use of local materials (stone, stabilized earth), sandy plasters, concrete with a mineral expression, and a color palette dominated by ochre and sand tones.
- *Internal spatial organization*: sequences of light transition, gradual access routes, hierarchy of spaces (public/private), structuring role of patios as circulation nodes.

### **Environmental and Climatic Analysis for Passive Design Strategies Identification**

The second methodological component focuses on the evaluation of bioclimatic strategies implemented, in relation to the specificities of the hot-arid Saharan climate [Tab. 1]. It is characterized in particular by a particularly scorching summer season, a high thermal amplitude between day and night, intense solar radiation, very low precipitation, as well as dry air accompanied by variable wind patterns depending on the periods. The analysis focuses on the passive architectural strategies and devices employed by Pouillon, which will be evaluated using a qualitative approach. Indeed, the objective is not to produce a thermodynamic model that would require a quantitative analysis, but to demonstrate thru the architecture itself the existence of a structured climatic logic. The passive strategies adopted by Pouillon in southern Algeria allow for a fine adaptation to the harsh climate. They mainly focus on the summer period: reduction of solar radiation, thermal regulation through inertia, control of openings, and natural ventilation. In this context, the analysis aims to assess the ability of architectural devices to modulate these climatic constraints and produce suitable comfort conditions. It

relies on a cross-sectional analysis, both qualitative and, when data permits, semi-quantitative, structured around the following axes:

- *Situation and orientation*: positioning of the building in relation to prevailing winds, the solar path, and the topography, in order to promote useful climatic contributions (ventilation, shading) and limit overheating.
- *Compactness and morphology*: degree of compactness of the building, introverted or open organization, and effect on the reduction of exposed surfaces on thermal exchanges with the exterior.
- *Shading devices*: depth of facades, presence of galleries, awnings, arcades, or patios, contributing to protection against direct radiation and the creation of microclimates.
- *Thermal inertia and materiality*: use of massive materials (stone, earth, concrete) promoting thermal lag and dampening temperature variations.
- *Natural ventilation*: organization of openings, air passages, devices promoting air circulation and renewal in a context of dry heat.
- *Spatial organization*: role of patios and intermediate spaces as thermal regulators, transition sequences between exterior and interior.

**Table 1: Environmental and Climatic Analysis Framework**

| Climate Criterion          | Indicators Analyzed   | Tools / Approach                                |
|----------------------------|---|---|
| Orientation & implantation | Solar axes, wind relations, topographic masks                   | Mapping, planimetric surveys                    |
| Compactness & volumetry    | Envelope surface/volume ratio, built continuity, wall thickness | Morphometric calculations + Spatial observation |
| Thermal inertia            | Materials, density, thermal capacity                            | Material analysis                               |
| Solar management & shading | Depth of openings, porticos, loggias, patios                    | Photographic study + measurements               |
| Natural ventilation        | Air circulations, depressions, thermal draft                    | Qualitative analysis                            |

This approach allows for the identification of the climatic adaptation logics at work in the studied projects, and to assess to what extent these are a continuation of the bioclimatic principles of Saharan vernacular architecture or a contemporary reinterpretation adapted to hotel programs.

**Comparative Analysis Grid**

In order to systematize the reading of case studies, a cross-analytical grid is employed [Tab. 2]. This grid articulates the two previous analytical sections around five transversal axes:

**Table 2: Comparative Analysis Grid**

| Axis                       | Morphological+Stylistic Dimensions              | Climatic Dimension                   |
|----------------------------|---|--------------------------------------|
| 1) Massiveness/Compactness | Monumental expression, continuity of volumes    | Reduction of thermal inputs, inertia |
| 2) Patios/ Introversion    | Spatial sequences, intimacy, gradual transition | Microclimate, upward ventilation     |
| 3) Topography              | Staging of the landscape, terracing             | Solar masks, orientation             |
| 4) Mineral façade          | Figurative erasure, local materiality           | Thermal and luminous filter          |

|                  |                                       |   |
|------------------|---------------------------------------|---|
| 5) Outdoor space | Relation to the desert and palm grove | Thermal regulation, shade, and evapotranspiration |
|------------------|---------------------------------------|---|

This grid will be used in the next section to systematically compare the three hotels.

### Scientific Justification of the Approach

This protocol is grounded in the premise that Saharan architecture cannot be reduced to a mere assemblage of forms or technical solutions. Rather, it must be understood as a *situated system*, in which spatial configurations, construction logics, environmental responses, and cultural meanings are deeply intertwined. In this perspective, the architectural object is not only evaluated for its aesthetic qualities or stylistic references, but as the outcome of a complex interaction between climate, material resources, social practices, and symbolic values.

Adopting a cross-cutting approach makes it possible, first, to *avoid a reductive reading of architecture as decoration*, a tendency often associated with neo-Orientalist interpretations that privilege image and exoticism over substance. Instead of focusing on surface elements—arches, textures, or ornamental motifs—the analysis re-centers attention on the underlying principles that structure space and regulate environmental performance.

Second, this approach allows the study to *move beyond a purely patrimonial or nostalgic reading of the vernacular*. Rather than considering Saharan architecture as a fixed heritage to be preserved or replicated, it is approached as a dynamic repertoire of adaptive strategies—such as compactness, introversion, thermal inertia, and controlled openings—that can be reinterpreted within contemporary architectural production.

Finally, the protocol seeks to *redefine environmental performance as a core dimension of architectural identity*. In the Saharan context, identity is not only expressed through formal language, but through the capacity of buildings to mediate extreme climatic conditions—heat, aridity, solar radiation—while ensuring thermal comfort and spatial coherence.

From this standpoint, the analysis aims to demonstrate that the specific value of Pouillon's Saharan hotels lies less in their visual evocation of a regional aesthetic than in their *operational logic*, that is, in the way they function as climate-responsive systems embedded in their environment. This distinction is crucial: it marks the difference between a *functional regionalism*, grounded in environmental adaptation and constructive intelligence, and a *superficial stylization*, limited to the reproduction of formal signs detached from their original context and meaning.

### Case Studies: Comparative Analysis of Fernand Pouillon's Saharan Hotels

This section examines three major works by Fernand Pouillon in southern Algeria - the Gourara Hotel (Timimoun), the M'Zab Hotel, and the El Djanoub Hotel (Ghardaïa) - by articulating two levels of analysis: (1) morpho-stylistic; (2) climatic and environmental. Each case study is structured according to the same framework to allow for a coherent comparative reading. The objective is not to produce an architectural monograph, but to identify the invariants of a functional Saharan regionalism.

#### El-Gourara Hotel (Timimoun)

##### 1. Territorial context and location

Situated on a viewpoint overlooking the palm grove and the ochre dunes of Gourara, the hotel is integrated into a monumental relationship with the desert. Its tiered layout follows the natural topography, avoiding any violent break with the terrain while offering filtered panoramic views. This cliff position also acts as a natural sunshade, reducing the midday exposure of the facades.

##### 2. Spatial organization and volumetry

The building adopts a compact and stratified morphology, favoring solid masses and a continuity of mineral walls. The internal patios structure the circulation and offer microclimatic pockets, while the public spaces (lobby, terraces, lounges) are oriented toward the landscape but maintain deep shaded areas.

##### 3. Materiality and Language

The use of local ochre stone, cut into massive blocks, establishes a strong chromatic continuity with the surrounding cliffs while providing significant thermal inertia. The openings remain limited, deep,

and often oriented obliquely, allowing for controlled daylight penetration and minimizing direct solar exposure.

#### 4. Climatic Strategies

The climatic strategies implemented are based on a coherent set of passive design principles adapted to the desert environment. The orientation of the buildings is carefully aligned with northeast wind flows in order to capture prevailing breezes and enhance natural ventilation. Internal patios play a key role in promoting upward air movement, facilitating thermal regulation through stack effect. In addition, the significant depth and thermal inertia of the walls act as effective buffers against extreme temperature variations, ensuring indoor comfort. Finally, architectural elements such as covered terraces, loggias, and deep arcades function as solar filters, reducing direct solar gain while creating shaded transitional spaces [Fig. 5].

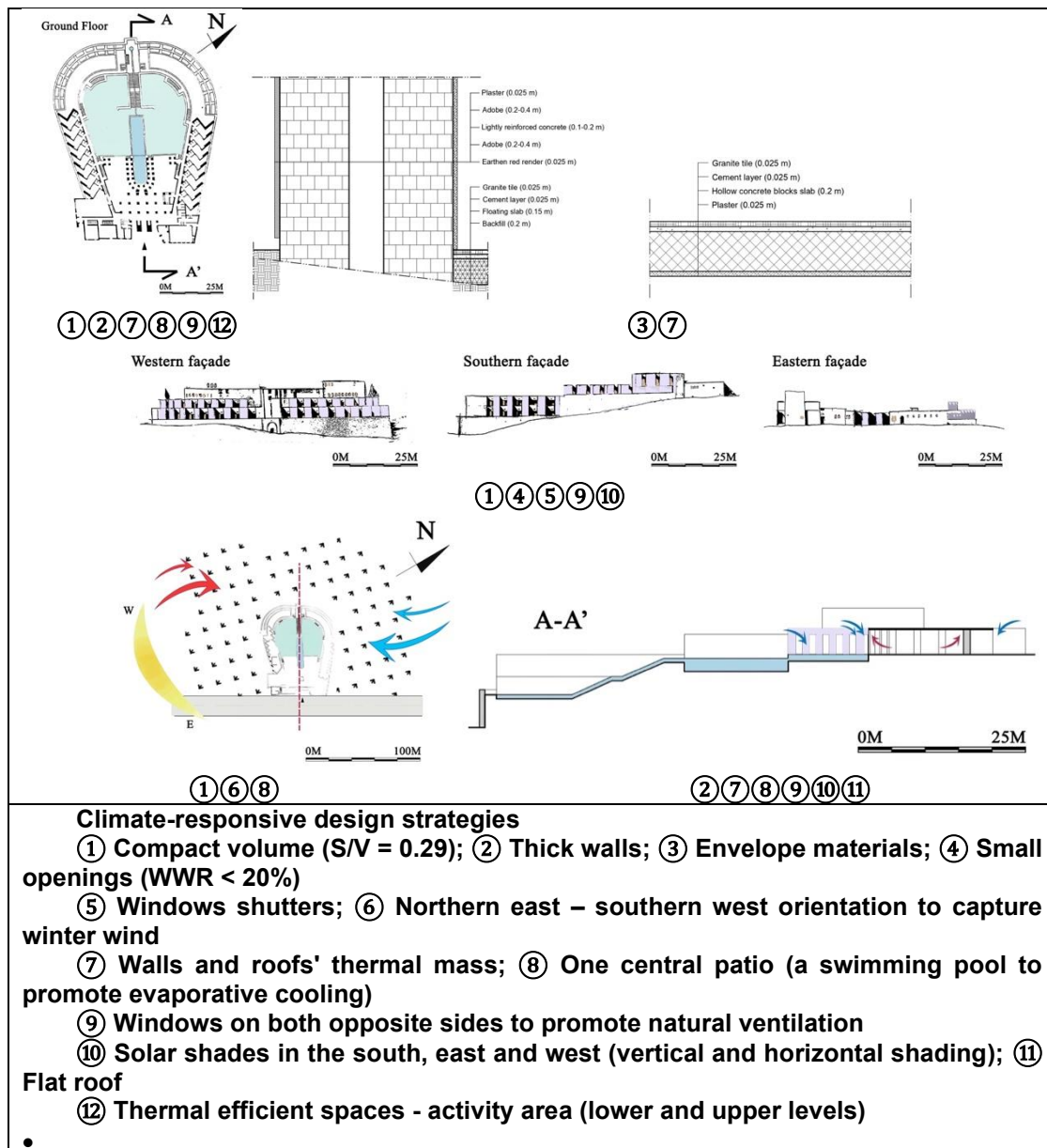


Figure 5: Climate-responsive design and passive strategies in El-Gourara Hotel (Timimoun)

#### Hotel M'Zab (Ghardaïa)

1. Context and relationship to the palm grove

Unlike Gourara, the site here is in direct contact with the palm grove. The building extends horizontally, aligning with the curves of the terrain and creating voids between the constructed wings to preserve landscape views and optimize air circulation. It is a model of supportive architecture, not territorial imposition.

## 2. Morphology and Spatial Structure

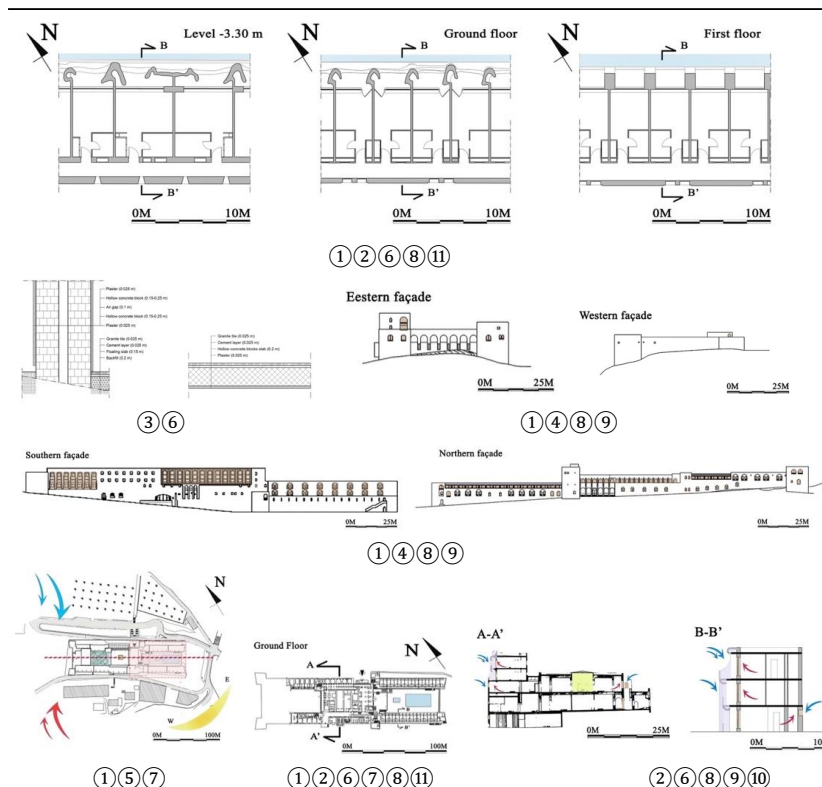
The project is organized around a network of interconnected small patios, generating a labyrinthine system reminiscent of the semi-covered passages of M'Zab. This segmentation minimizes the perceived scale, giving the impression of an urban ensemble rather than a single building

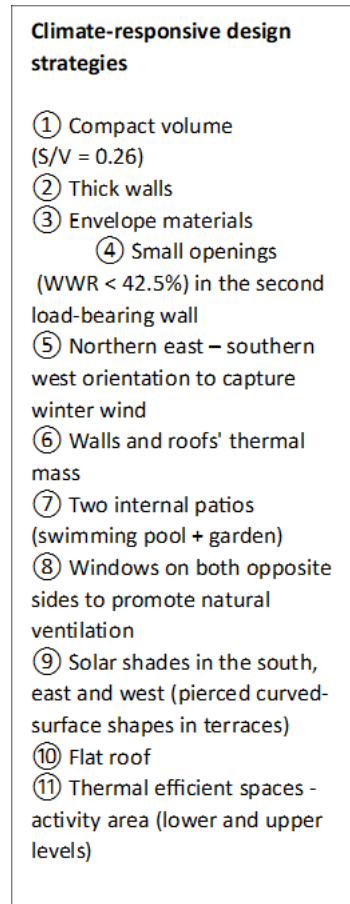
## 3. Materiality and façade

The mineral materiality is deliberately raw and massive, emphasizing thickness and density. The rough textures absorb and diffuse light, reducing glare and limiting solar reflections - an important advantage in high-radiation desert environments. At the same time, this massiveness enhances thermal inertia, helping to moderate temperature variations.

## 4. Climatic Strategies

The spatial organization is structured through a careful sequencing of spaces, allowing the creation of progressive thermal gradients between exterior and interior zones [Fig. 6]. This is reinforced by the multiplication of courtyards and patios, which enhance cross-ventilation and facilitate natural air circulation. The substantial thickness of the walls, combined with their light coloration, contributes to reducing the mean surface temperature (MST) by limiting heat absorption and promoting reflection. In parallel, low, tiered planting strategies are introduced to create layered shading effects, fostering interactions between built forms and palm canopies that further improve microclimatic comfort.





**Figure 6:** Climate-responsive design and passive strategies in in M'Zab Hotel (Ghardaïa)

### **Hotel El Djanoub (Ghardaïa)**

#### 1. Defensive logic and extreme compactness

El Djanoub exhibits an even more pronounced compactness, with a nearly fortified silhouette, cubic volumes, and restricted openings. Introversion dominates: the building asserts itself as a massive island where public space is filtered thru a series of thresholds.

#### 2. Spatial Organization

The internal structure is based on a main central patio, flanked by stacked spaces and shaded peripheral circulations. This arrangement resembles the kasbahs, not thru stylistic imitation, but thru a functional translation of the same thermal logics.

#### 3. Materiality

The mineral materiality is intentionally rawer and more massive, emphasizing solidity and thickness over refinement. This choice reinforces the building's anchorage within its geological context, echoing the surrounding rocky landscape. The rough, uneven textures play a key environmental role: they absorb and diffuse light rather than reflecting it, thereby reducing glare and preventing harsh solar reflections typical of desert conditions. In addition, this material density contributes to thermal inertia, helping to stabilize indoor temperatures by slowing heat transfer.

#### 4. Main bioclimatic strategies

The architecture adopts an introverted configuration, where successive spatial layers filter light and heat, ensuring effective passive thermal regulation. This gradation -from open to semi-covered to enclosed -acts as an effective passive mechanism for thermal regulation. At the constructive level, the emphasis on mass and continuity helps limit thermal bridges, allowing the building envelope to maintain a more stable internal climate. The façades are predominantly solid, with minimal openings, reducing direct solar gains and protecting interior spaces from overheating. In addition, the integration of semi-

subterranean spaces introduces thermal buffer zones, benefiting from the cooling effect of the ground and further enhancing overall climatic performance [Fig. 7].

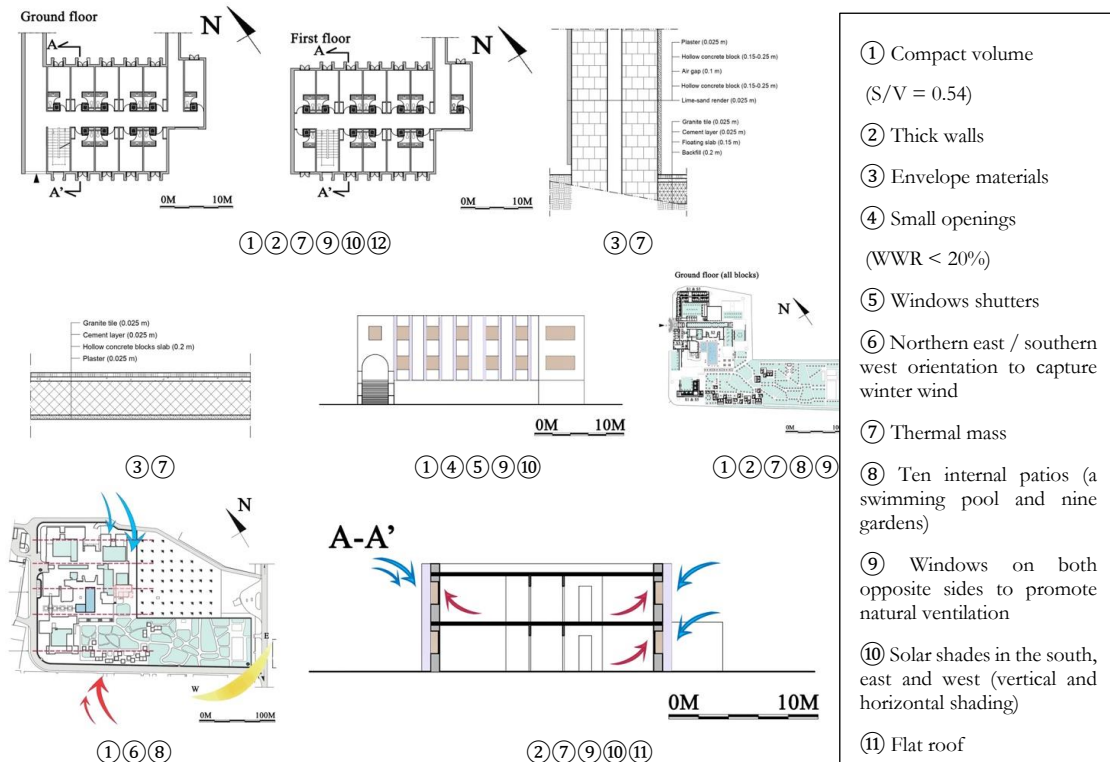


Figure7: Climate-responsive design and passive strategies in El-Djanoub Hotel (Ghardaia)

### Synthetic Comparative Table

- The comparative analysis of the three Saharan hotels highlights both shared principles and distinct architectural responses shaped by their specific contexts [Tab. 3].
- In terms of their *relationship to the site*, the El-Gourara Hotel in Timimoun adopts a belvedere position, asserting a monumental presence over the landscape. In contrast, the M'Zab Hotel develops a more supportive and continuous integration with its surroundings, while the El Djanoub Hotel is conceived as a compact and introspective enclave, emphasizing enclosure.
- Regarding *spatial organization*, El-Gourara combines patios with panoramic views, establishing a dialogue between interior and landscape. The M'Zab Hotel is structured around multiple sequential patios, generating a complex and porous spatial system. El Djanoub, by comparison, is organized around a central patio complemented by buffer spaces, reinforcing its introverted logic.
- In terms of *materiality*, El-Gourara relies on solid stone, reinforcing its visual and thermal mass. The M'Zab Hotel combines stone with sandy coatings, producing a lighter and more diffuse material expression. El Djanoub adopts a rougher and more massive approach, characterized by coarse stone textures.

The *stylistic expression* of the three hotels reveals distinct architectural intentions, each closely tied to its relationship with landscape, scale, and materiality. At El-Gourara, the architecture conveys a form of *landscape-based monumentality*, where the building's massing and ochre tones establish a strong visual continuity with the surrounding cliffs and desert terrain. Rather than dominating the site through contrast, the project achieves monumentality through integration, extending the chromatic and tectonic qualities of the landscape into the built form.

The M'Zab Hotel, by contrast, adopts a *fragmented and articulated composition*, evoking an almost urban scale. Its organization into multiple volumes and patios recalls the spatial complexity of traditional ksour, where built forms are perceived as an aggregation of units rather than a single object. This approach softens the overall presence of the building and fosters a more intimate, human-scaled environment.

El Djanoub, on the other hand, is characterized by a *radical compactness and formal abstraction*, appearing as a Saharan monolith. Its architectural expression emphasizes mass, enclosure, and continuity of surfaces, with minimal openings and a strong sense of inward orientation. This produces a powerful image of solidity and protection, aligning with a defensive logic rooted in both climatic and cultural considerations.

Finally, the *dominant climatic strategies* clearly reflect the underlying architectural logics and the specific modes of environmental adaptation adopted in each project. At El-Gourara, climatic performance is primarily ensured through a combined strategy of *thermal inertia, solar control, and careful orientation*. The use of massive stone construction allows the building envelope to absorb and store heat during the day and release it gradually at night, thereby moderating indoor temperature fluctuations. This is reinforced by the strategic positioning of the building on a belvedere, which not only enhances its visual dominance but also optimizes exposure to prevailing winds and reduces direct solar incidence on the most exposed façades. Deep loggias, arcades, and recessed openings further contribute to shading, creating transitional spaces that filter solar radiation before it reaches interior zones.

In contrast, the M'Zab Hotel adopts a more *dynamic and permeable climatic strategy*, centered on *natural ventilation and spatial porosity*. The multiplication of patios and the fragmentation of built volumes generate a network of air corridors that facilitate cross-ventilation and promote continuous air movement. This configuration allows hot air to rise and dissipate while cooler air circulates through shaded intermediate spaces. The spatial sequencing-alternating between enclosed, semi-open, and open areas-produces thermal gradients that enhance passive cooling. In this case, climatic comfort is less dependent on massiveness than on the building's ability to "breathe" through its internal organization.

El Djanoub, on the other hand, represents a more *defensive and introverted climatic model*, relying on *extreme compactness, substantial wall thickness, and controlled openness*. The building minimizes its exposure to external climatic stress through near-blind façades and a highly enclosed configuration. Thick walls act as thermal buffers, significantly delaying heat transfer, while the central patio functions as a regulated microclimatic core. The succession of internal spaces-from exterior thresholds to deeply shaded interiors-creates a progressive filtering of heat and light. In addition, semi-subterranean or recessed spaces further enhance thermal stability by benefiting from the cooling effect of the ground.

Taken together, these three strategies illustrate different yet complementary approaches to passive climatic design in a hot-arid environment: El-Gourara mediates climate through mass and orientation, the M'Zab Hotel through airflow and spatial permeability, and El Djanoub through enclosure and thermal buffering.

**Table 3: Comparative Analysis of the Three Saharan Hotels**

| Criteria                     | El-Gourara (Timimoun)           | M'Zab Hotel                     | El Djanoub Hotel                   |
|------------------------------|---------------------------------|---------------------------------|------------------------------------|
| Relation to site             | Belvedere, monumental           | Supportive, continuous          | Compact, introspective enclave     |
| Spatiality                   | Patios + panoramic views        | Multiple sequential patios      | Central patio + buffer spaces      |
| Materiality                  | Solid stone                     | Stone + sandy coatings          | Rough stone, coarse texture        |
| Stylistic expression         | Landscape + ochre monumentality | Fragmented urban scale          | Saharan monolith                   |
| Dominant climatic strategies | Inertia + shading + orientation | Ventilation + internal porosity | Inertia + introversion + thickness |

## Discussion

The comparative analysis of the three Saharan hotels by Fernand Pouillon highlights a coherent set of architectural strategies where formal expression, environmental performance, and cultural continuity do not function as separate registers, but as an integrated system. This section offers a critical interpretation of these results by confronting them with four axes: (1) the notion of functional regionalism; (2) the distinction between real vernacular and stylized vernacular; (3) the implications for contemporary tourist architecture; (4) the heritage and prospective challenges of a sustainable Saharan model.

## **A Functional, Non-Figurative Saharan Regionalism**

The three case studies show that Fernand Pouillon does not merely transpose a European-inspired modernity into a Saharan context, but rather develops a situated modernity based on an operational understanding of climate, materiality, and landscape. Unlike Orientalist approaches where cultural references operate thru symbolic citation (overstepped arches, crenellations, Arabesque motifs), Pouillon's approach is situated within an interpretative logic, through which vernacular principles are reexamined within a modern architectural language as genuine design matrices.

Thus, the compactness of the buildings appears as a direct response to solar radiation, while the organization around patios plays both a role in thermal regulation and spatial structuring. The use of mineral materials with high inertia is part of a passive air conditioning strategy, while the introversion of spatial devices is more a matter of functional logic than formal. Moreover, the integration of the project into the topography simultaneously helps to optimize or potentially protect against solar radiation and to anchor the architecture in the landscape.

This positioning echoes the notion of critical regionalism developed by Kenneth Frampton, according to which the place does not refer to a fixed tradition, but to a set of geographical, climatic, and material conditions that constitute the architectural form. In this perspective, Pouillon's hotels are not "local" in appearance, but in their ability to function in harmony with the logics of the Saharan environment.

## **From Real Vernacular to Stylized Vernacular: A Historical Break**

The analysis of the three hotels reveals a significant paradox: while Fernand Pouillon was among the first architects to transpose Saharan vernacular principles into a functional modern architectural language, subsequent production-particularly from the mid-1970s onward-gradually distanced itself from this approach. During the 1960s–1970s, corresponding to Pouillon's works, a logic of "real vernacular" prevailed, deeply integrated with both climate and site. Architecture was grounded in principles such as compact building forms, the thermal inertia of materials, patio-centered spatial organization, and strong adaptation to topography-features widely recognized as characteristic of climate-responsive vernacular systems (Rapoport, 1969; Fathy, 1986).

From the mid-1970s to the 2000s, this approach progressively gave way to what may be described as a "stylized vernacular." In this phase, references to traditional architecture were often reduced to decorative motifs-arches, ornamental patterns, and monumental volumes-without meaningful integration of underlying climatic or constructive logics. This shift reflects a broader tendency observed in post-colonial contexts, where vernacular forms are frequently reinterpreted as symbolic markers of identity rather than as operational systems (Frampton, 1983; Çelik, 1997).

Between 2000 and 2020, a further transformation can be identified, marked by increasing *global standardization*. This period is characterized by the widespread use of reinforced concrete, extensive glazing, and a growing dependence on mechanical air conditioning systems, often at the expense of passive design strategies. Such trends align with globalized construction practices that prioritize universal models over climatic specificity, contributing to a growing disjunction between architectural form and environmental performance (Boussora, 1990; Steele, 2005; Miloudi & Biara, 2026). As a result, architectural identity becomes increasingly superficial: the aesthetic sign replaces constructive logic, leading to greater reliance on energy-intensive systems. In this context, Saharan hotels may appear "Saharan" in their imagery, yet no longer function as climate-adapted environments-thus marking a reversal of the paradigm established by Pouillon.

From this perspective, the distinction between two registers becomes essential. On the one hand, the *real vernacular* may be understood as a coherent system-climatic, constructive, and spatial-valued for its operational efficiency and environmental intelligence. On the other hand, the *stylized vernacular* is reduced to a formal and representational repertoire, detached from its original performance-based logic. Pouillon's contribution lies precisely in his ability to mobilize the former without succumbing to the pitfalls of the latter, aligning his work with a broader conception of *contextualized modernity* rooted in both cultural continuity and environmental adaptation (Frampton, 1983).

## **Contemporary Implications and Heritage Significance of Saharan Architecture**

In a context marked by the energy and climate crisis (IPCC, 2022; United Nations, 2023), the dominant model of contemporary Saharan tourist resorts calls for critical reassessment. In Algeria, this model remains largely characterized by reinforced concrete structures, extensive glazing, and a strong

dependence on mechanical air conditioning-often accounting for a significant share of energy consumption (Amraoui et al., 2021; Benzerzour et al., 2021; Alshawaf et al., 2023) -while neglecting climatic orientation and passive design strategies. As a result, the desert is frequently reduced to a visual backdrop, rather than understood as a structuring biophysical environment.

In contrast, the work of Fernand Pouillon illustrates an approach in which the desert operates as a constraining ecological system guiding architectural design. His projects demonstrate that energy performance relies primarily on reducing thermal loads through passive means -particularly thermal inertia-rather than on active cooling systems, echoing principles identified in vernacular architecture studies (Rapoport, 1969; Frampton, 1983; Edwards, 2021). Recent research confirms that traditional Saharan dwellings -integrating thick earthen walls, shaded courtyards, and optimized orientation-achieve high levels of thermal comfort with minimal energy input (Bougdah & Sharples, 2019; Salama, 2020). They also show that architectural identity can emerge from climatic and material conditions, rather than decorative formalism or imported aesthetics (Kaihoul et al., 2024; Miloudi & Biara, 2026).

From this perspective, the renewal of Saharan architecture requires reactivating these passive principles while reinterpreting them through contemporary techniques, including bio-based materials (e.g., stabilized earth) and hybrid environmental systems (Liebard & De Herde, 2006; Dabaieh, 2013; Attia et al., 2022; Asdrubali et al., 2023). Pouillon's hotels thus constitute a strategic heritage at the intersection of environmental performance and cultural identity (Ciattoni & Croci, 2021). However, they remain vulnerable to transformations driven by standardized tourism models, which tend to privilege aesthetic appearance over climatic functioning (UNESCO, 2021).

The principal risk is therefore that of *aesthetic museification*, where forms are preserved while their environmental logic is lost (Choay, 1992; Joffroy et al., 2022). Any intervention should prioritize the *operational functioning* of architectural systems rather than their formal replication. More broadly, *Pouillon's legacy* invites a reconsideration of the Sahara as a *laboratory of alternative modernities*-where vernacular architecture is understood not as an aesthetic reference, but as a form of *climate-responsive design* (Salama, 2020; Attia et al., 2022).

## Conclusion

The cross-analysis of Fernand Pouillon's Saharan hotels allows for a renewed reading of his work within the post-independence Algerian context. Far from constituting a mere regionalist adaptation marked by symbolic references, the projects examined reveal an architectural positioning where modernity is not imported but negotiated based on the constructive and climatic logics of the Saharan environment. The results demonstrate that vernacular architecture does not manifest here either as decoration or as an identity citation, but as an *operational system* whose core principles -compactness, thermal inertia, introversion, light management, and integration with the environment -actively structure the architectural design.

This conclusion nuances the reductive interpretations that equate Pouillon's work with a simple continuation of colonial neo-Moorish architecture or a purely aesthetic form of regionalism. It highlights a *functional Saharan regionalism*, where climatic performance and cultural identity mutually reinforce each other. In contrast, the post-1970 neo-Orientalist trend, based on the overproduction of signs and the abandonment of passive devices, appears as a historical rupture that has led to constructive standardization and dependence on mechanical air conditioning. In this regard, the study confirms that the gap between the *real vernacular* and the *stylized vernacular* is not only formal but also *energetic, environmental, and cultural*.

Consequently, the contemporary relevance of this work is significant. In a period marked by the climate crisis, water scarcity, and the need to reduce the energy dependence of buildings in hot regions, Pouillon's Saharan work constitutes a conceptual framework for reinventing low-impact tourism models. It demonstrates that climatic sobriety should not be understood as a technical limitation, but rather as a *generative design principle* capable of informing architectural form and spatial organization. In this perspective, performance is achieved not through technological escalation, but through the intelligent mobilization of passive strategies: constructive thickness replaces excessive glazing by regulating heat transfer and ensuring thermal inertia; shaded spaces and filtered light conditions provide comfort without reliance on mechanical cooling; and the careful use of topography allows buildings to benefit from natural protection, ventilation, and solar control.

To extend this research, several avenues may be considered:

- Develop thermal and microclimatic comparative models between the studied hotels and contemporary establishments;
- Explore current applications of solid stone, stabilized earth, and hybrid structures in a Saharan context;
- Engage in heritage and policy reflection on the conservation and requalification of existing Saharan infrastructures;
- Analyze in parallel other figures of contextualized modernism in arid environments (Badran, Bawa, Hassan Fathy) to situate Pouillon within a transregional genealogy.

Thus, the hotels of El-Gourara, M'Zab, and El Djanoub are not merely milestones in Algerian architectural history, but elements of an active theory: that of an anchored modernity, where climate, territory, and culture form a foundation irreducible to mere visual representation. Returning to the work of Fernand Pouillon means acknowledging that Saharan architecture is not simply to be contemplated, but to be critically conceived, materially constructed, and continuously inhabited as a dynamic system of environmental adaptation.

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