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CONTEMPORARY INTERPRETATIONS OF VERNACULAR ARCHITECTURE - CASE STUDY OF BENBEN, ASWAN, EGYPT

Maraam Adel Ebaid ^{1,*} and Omnia Ashraf Badawy ¹

¹ Department of Architecture, Faculty of Engineering, Canadian International collage, New Cairo, Cairo, Egypt

*Corresponding Author E-mail: maram_adel@cic-cairo.com

Abstract. This research revisits the idea of vernacular architecture, focusing on the use of local building materials, climatic adaptation, and topographical integration. The "BenBen" Hotel in Aswan exemplifies sustainable vernacular architecture through its innovative application of traditional materials and design solutions that harmonize with the natural environment. The hotel's approach minimizes negative environmental impacts while fostering cultural preservation.

The study addresses the challenge of cultural and environmental heritage preservation during the construction of modern architecture hotels. It aims to develop a process that enhances the preservation of cultural heritage and respects local environmental conditions, positioning the "BenBen" Hotel as a leading model in the region.

The methodology involves two key steps: first, conducting face-to-face interviews with the project owner to discuss design and construction challenges; second, conducting a site visit to photograph and document the project's environmental integration. This site visit will also showcase the details of using specific building materials and capture the site's atmosphere as designed on location.

The results findings present a process for applying vernacular architecture principles in contemporary projects. The research provides insights into the successful implementation of sustainable vernacular architecture. Highlighting the hotel's significant environmental benefits and unique architectural character. These findings offer valuable lessons for future projects in similar contexts and position the "BenBen" hotel as a model for sustainable hotel development in heritage areas.

Keywords: Vernacular Architecture, Local materials, Climate.

1 Introduction

The resurgence of contemporary vernacular architecture, which integrates traditional knowledge with modern design principles, has gained prominence worldwide. This trend emphasizes structures that respect their environment and reflect local traditions [1], The "BenBen" Hotel in Aswan, Egypt exemplifies a commitment to sustainable vernacular architecture by integrating traditional materials and harmonizing its design with the natural environment .

This research delves into the hotel's unique approach, specifically how it tackles the inherent challenges of sustainable construction in a desert environment with a unique character that honors the

archaeological significance of its location, were designed in harmony with local cultural, topographical, and climatic conditions. These principles include layout orientation, building form, and climatic elements. The hotel's concept achieving environmentally sustainable vernacular architecture without sacrificing quality [2].

This research aims to explore the application process of vernacular architecture, delineating three critical steps: identifying the location ("where"), determining key considerations ("what"), and implementing these factors ("how"). The research investigates the design and construction methodologies employed by the BenBen Hotel, with an emphasis on its sustainable practices through the use of vernacular architecture. By highlighting the successes and lessons learned from the BenBen Hotel project, the research seeks to establish the hotel as a leading model of sustainable vernacular architecture in the region.

The problem of this research is the challenge of achieving sustainable construction that respects its archaeological context. This includes finding ways to utilize traditional materials and methods that are both environmentally sustainable and sensitive to the historical and cultural significance of the area. By focusing on BenBen's approach, the research aims to identify solutions applicable to similar projects, contributing to the broader discourse on sustainable vernacular architecture in ecological and historical areas.

To achieve a multifaceted understanding of BenBen's sustainable approach, this research employs a mixed-methods approach. This methodology combines qualitative and quantitative data to provide a richer picture. In-depth interviews with the hotel owner served as the foundation, unearthing the vision behind BenBen and the design philosophy that guided its construction. This initial exploration was further enriched by on-site visits, allowing for firsthand observations and data collection, including photographs documenting the seamless integration of the hotel with its environment. Through the combined analysis of interview data and observational findings, this research aims to offer a comprehensive understanding of the design and construction processes that define BenBen's commitment to sustainability.

This research is structured to unveil the intricacies of BenBen's sustainable design into several sections. The introduction sets the stage by outlining the growing importance of sustainable hotel design and the unique challenges faced by BenBen due to its commitment to respecting the surrounding environment and utilizing traditional materials. Following this foundational section, the literature review will delve into the vernacular architecture and its factors and principles, on the methodology section details the research approach, including the insightful interviews conducted with the hotel owner and the on-site data collection process, the case study section refers to the reason for select this location, the results and discussion sections will present the findings of data analyzing. Finally, the concluding section summarize the key insight on the significance of BenBen as a case study for sustainable hotel design and offer recommendations that can be applied to future projects in similar ecological contexts.

2 Literature review

Vernacular architecture is regionally specific, harmonizing with both environmental and cultural site conditions, and serving as a material manifestation of the profound interactions between people and place [3, 4]. This close connection to the site is often linked to the use of local resources, processes, and technologies, endowing vernacular architecture with a self-sufficient, autonomous, and nearly autarchic or circular-economy nature. Based on the previous studies about vernacular architecture, vernacular architecture is referred as a traditional architecture [5], however other researches analyze the difference between them, some refers that vernacular architecture has a very strong local content and philosophy and is contextual in nature according to its era, while traditional architecture is a vernacular masterpiece that is handed down from generation to generation for a long and even very long time [3]. It contributes significantly to sustainable development by leveraging local materials and energy-efficient designs developed over centuries [6].

Vernacular architecture refers to place and people characteristics [7], regarding the people characteristics, vernacular architecture advocates the importance of preserving the local culture traditions of people, promote the importance of engaging the local residents in the process of design and construction. Regarding the place's characteristics, vernacular architecture advocates the importance of harmonizing the design with the surrounding environment, the choice of materials with a deep interaction from the surrounding environment [8]. Christopher Alexander (1977) was one of the pioneers who advocated the effect of people culture and social behavior in shaping the architecture design, he emphasized the importance of non-professionals in shaping their environment [9]. It is essential to examine the factors that influence the character of vernacular architecture. These critical factors include climate, topography, materials, and culture [10, 11]. This paper verifies the descriptions of these factors based on previous studies. Consequently, many architectural researchers describe vernacular architecture as a temporal process heavily informed by past experiences, where trial and error facilitate the development of undocumented or unformalized knowledge [12].

There are four factors critical to place conservation, first regarding the climate, Vernacular architecture underscores the significant impact of climate on architectural form [13]. Previous studies reveal that, despite geographical distances and limited communication between regions, there are remarkable similarities in indigenous architectural styles. This underscores the necessity of recognizing that climatic variations directly influence architectural styles. These climatic conditions range from hot and dry climates in Middle Eastern countries, hot and humid climates in South Asia, cold climates in the Arctic, to temperate climates in Europe and North America [14]. Variations in climate and humidity affect architectural forms in terms of shape, size, orientation, occupancy-space ratio, and construction techniques. These, in turn, influence design elements such as windows, balconies, eaves, and roofs [11, 15]. Previous studies such as the work by Seyda Emekci (2023) refers that the vernacular architecture can cope with the climate change and there are different factors that affect the success of the project such as the building form, orientation, semi-open spaces in buildings, open spaces, construction techniques, building materials [16].

Second, regarding the topography, the layout is also affected from regions with a mountainous regions and flat plains, coastal areas and desert forest and woodland areas also river valley and deltas. Topography plays a vital role in vernacular architecture. The change in topography affected the layout distribution between compacted layout or dispersed layout, also the inner distribution of dwellings various depending on the topography conditions [10].

Topography is particularly in determining the relationships between buildings. Elements such as the distance between structures and their relative heights are primarily influenced by topography. In settlements located on steep terrain, buildings are often situated at various levels and are spaced apart, as observed in the rural settlements of the Black Sea Region [17].

Third, regarding the materials used for construction [13], vernacular architecture it differs based on the site environment conditions, for example the forest environment advocates the use of

wood and bamboo, for desert environment, mudbrick, stone and clay are more effective and support the climate conditions, for coastal environment, coral stone, bamboos and timber and more effective [10, 18, 13].

Forth, preserving cultural traditions in vernacular architecture is contingent upon addressing three fundamental questions. The first question, "By Whom," pertains to the creators of vernacular architecture, which is typically constructed by non-professionals and through self-building practices. The second question, "For What," concerns the purposes of vernacular architecture, highlighting its intrinsic connection to originality, domestic activities, and manifestations of everyday livelihoods. The third question, "How," focuses on the process of creation, emphasizing the significance of the construction process over the final product [18].

Creang, E., et al. (2010) emphasize the importance of balancing the factors that influence vernacular architecture, including climate, the use of various construction materials such as clay, and the overall environment of the country. Their research also highlights previous case studies related to contemporary architecture [19]. When these factors are carefully balanced, they collectively contribute to the unique identity of different countries. The principles of vernacular architecture support the preservation of a region's local identity by responding to these factors [20].

This approach not only ensures functional and sustainable living environments but also maintains the unique character and heritage of each community [10, 11]. Through the thoughtful integration of these factors, vernacular architecture serves as a testament to human ingenuity and adaptability across different landscapes and cultures [18, 21].

Santorini in Greece shows a good response regarding the materials used in construction, the climate and the topography, the city has very steep volcanic cliffs with a hot and dry summer, the architecture features utilizes the buildings into the cliffs for a good insulation properties of volcanic rock that keep the interiors cool in summer and warm in winter, also the whitewashed exterior reflects sunlight to reduce the heat absorption. In addition the domed roofs minimize the heat gain and withstand strong winds [22, 23]. The narrow streets and clustered houses are designed to maximize shade and airflow, enhancing comfort during the hot season. Additionally, the use of local volcanic stone not only provides thermal benefits but also ensures the buildings blend seamlessly with the natural landscape. The island's architecture also includes semi-circular arches and barrel vaults, which are not only aesthetically pleasing but also structurally efficient, distributing weight and resisting seismic activity common in the region [23].

African vernacular architecture prominently features the use of mud-brick constructions with thatched roofs, as exemplified by the traditional dwellings in East Africa. In contrast, Asian vernacular architecture is distinguished by structures such as the Japanese Minka and the Indonesian Rumah Adat. European vernacular architecture is characterized by distinctive forms such as Alpine chalets, English cottages, and Mediterranean stone houses. In the Americas, vernacular architecture includes diverse forms such as Native American tipis, Southwestern adobe homes, and Appalachian log cabins [24, 25, 26].

An example of vernacular architecture refers to the southwestern United States which has a hot summer and cold winters, the architecture features support the presence of thick adobe walls suitable for that climate that provides an excellent isolation [27].

Vernacular architecture encounters significant challenges concerning conservation, which is crucial for maintaining cultural heritage and identity [10, 11, 21]. Additionally, urbanization, modernization, and globalization pose modern challenges to these traditional building styles. Previous research indicates that a balance must be struck between development and preservation to ensure that vernacular architecture can be sustained amidst contemporary advancements [28].

Another challenge refer that Vernacular architecture is affected by social issues [29], as the owners of traditional buildings are usually more interested in comfort, functionality, and maintenance than in aesthetic. Vernacular houses are not always adapted to present-day needs, and, therefore, their preservation is currently a serious challenge. Some countries have made efforts to preserve areas with masterpiece vernacular through specific legislation and consideration regarding the development through a good practice guideline, organizing awareness about the importance of culture heritage [11].

3 Methodology

To comprehensively understand BenBen Hotel's sustainable approach, this research adopts a mixed-methods approach. This methodology combines qualitative and quantitative data collection methods to provide a multifaceted understanding of the hotel's sustainability practices.

The first method (Qualitative Data Collection by Interviews): An interview was conducted with the hotel owner to uncover the vision behind BenBen Hotel and the design philosophy that informed the construction techniques. This interview served as the foundational element of the research, providing insights into the core principles guiding the hotel's sustainability initiatives.

The second method (Quantitative Data Collection by site Visits): On-site visits were conducted to observe the hotel's integration with its environment firsthand. During these visits, data was collected through structured observations and documentation, The objective was to investigate the influence of integrating traditional architectural elements into contemporary projects, with a focus on enhancing local identity and respecting the natural topography. The research also examined the outcomes of architecture designed without professional architects, exploring projects executed by non-professionals. The research employed direct observation and photographic documentation to capture architectural details, materials, and construction techniques. Data collection included digital cameras for photographs and notebooks for field notes. The observation was conducted over a period of seven days, with daily, in-depth examinations of the traditional materials used and culturally significant architectural features. Photographs and field notes were systematically analyzed to identify architectural elements and patterns. A limitation of the observation was the difficulty in accessing certain private chalets, as they were occupied by guests.

The third method (Data Analysis): The qualitative data from interviews and the quantitative data from on-site visits were analyzed together to offer a comprehensive understanding of BenBen Hotel's sustainable design and construction processes. By synthesizing these different types of data, this research aims to provide a holistic view of the hotel's commitment to sustainability.

4 Case study

The research was conducted in Aswan, an old and historical tourism destination in Egypt. on the old Nubian Island of Hiessa, Aswan , Egypt located in front of Philae temple [30]. The Philae Temple is a magnificent example of ancient Egyptian architecture and mythology [31]. Philae Temple offers invaluable insights into the religious practices, social structures, and dynastic histories of ancient Egypt [32]. (Fig. 1) shows the location of the Philae Temple and its relation to the case study location.



Fig. 1. Philae Temple Location [33]

○ Philae Temple ○ Ben-Ben Hotel

The selection of the case study is based on being one of the hotels that serves as a beacon for heritage architecture enthusiasts, distinguishing itself from other renowned establishments in the vicinity. Embracing its identity as a heritage architecture hotel, it has garnered recognition on a global scale, being honored as one of the top ten hotels worldwide by Dhara Hotels. This accolade is further substantiated by specific certifications awarded to the hotel, affirming its commitment to excellence in hospitality and preservation of architectural heritage. Following the successful completion of the hotel project, progress is now underway on the second phase of development. This advancement stands as a testament to efficiency and achievement. (Fig. 2) shows hotel awards 2024.



Fig. 2. Benben by Dhara Hotels awards 2024 [10]

Ben-Ben hotel is built on a granite rock that's known to balance the earth's energy and cleanse the soul, making you feel at ease and aiding in your health and stress relief [34], it also investigates environmental sustainability within the chosen area. This decision stems from the perception that this hotel destination offers greater opportunities and lessons learned for further constructions [35].

5 RESULTS

The face-to-face interviews with the owner of the Ben-Ben Project in Aswan highlighted several key aspects concerning the vision, design, and construction processes of the project.

The interview with the owner addressed specific questions regarding the rationale behind the site selection, the impact of climate conditions on the design process, the use of traditional local materials during construction, and the influence of cultural aspects on the design. Additional questions focused on the challenges encountered during the construction phase.

The site was chosen due to its rich local heritage and proximity to the Philae Temple. The island was selected for developing as a touristic hotel because of its natural beauty and scenic surroundings along the Nile River.

First, in terms of climate conditions, the site experiences a hot, dry climate in summer while during the winter season, the prevailing climate is characterized by notably low temperatures. Consequently, the thermal properties of cork, which efficiently absorb sunlight, assume heightened significance. This emphasis on winter climate conditions supersedes considerations for summer conditions due to the extreme cold experienced. Accordingly, the selection of stone and granite as a primary material aligns with this climatic context. This decision reflects a strategic utilization of locally available materials, indicative of a deliberate effort to optimize resource efficiency and environmental compatibility. He also referred that utilizing locally available materials facilitated the construction process and granite, known for its eco-friendliness, symbolizes strength, resilience, and beauty. Granite's mineral hardness, ranking between 6 and 7 out of 10, makes it one of the hardest minerals, and it contains no harmful chemicals or pollutants [36] as shown in (Fig.3).



Fig. 3. Materials used to adapt with the climate conditions.

Source: Author in 22-4-2024

Regarding the local culture paintings, and patterns that adorn the buildings. The local culture identity for this city involves the use of white and blue colors only in addition to the sand colors, as the use of multiple colors is not traditional in Nubian architecture. Regarding the building's facades, the project incorporates minimal decorations, ensuring they remain authentic to the local community. Traditional Nubian motifs, such as triangles, is utilized to reflect the local aesthetic and cultural heritage. To preserve authenticity and respect for local architectural traditions, the design will avoid dome-shaped roofs, which are not characteristic of traditional Nubian architecture as shown in (Fig.4).



Fig. 4. Nubian architecture

Source: Author in 25-4-2024

Second, the design consideration regarding the topography, he referred that the project layout is configured with an emphasis on on-site engagement. However, the design proposition derived from specialized architectural input exhibits a disregard for the topographical features. Such an approach is anticipated to incur significant financial expenditures and may yield outcomes that lack homogeneity with the surrounding environmental context. He benefits from the inclusion of non-professional or local architects who possess a deeper understanding of traditional construction practices and cultural nuances. Furthermore, the implantation for the engineering drawings for electricity and communication lines in the traditional format due to the irregularity of the surface. Instead, they were custom designed specifically for the site. Ramps and stairs were designed, complemented by the provision of golf cars. Additionally, where there was a significant slope, it was utilized as a large amphitheater.

In terms of site orientation to maximize views, the owner highlighted a divergence from the architects' initial proposal. While the architects recommended flattening the land as the first phase of construction, the owner chose to preserve the island's existing topography and geological formations. This approach involves treating each small parcel of land as a distinct project, thereby maintaining the natural landscape and inherent characteristics of the site as shown in (Fig.5).

The project's infrastructure is formulated subsequent to the design phase. However, the proposals put forth by professionals and architects exhibit features that render them impractical for implementation within the infrastructure framework. This discrepancy necessitates further exploration and discussion to ascertain viable alternatives that align with project requirements and constraints.



Fig. 5. The Rocky Ground at The Project Site
Source: Mr. Tharwat Mohamed, the owner

The decoration of the bathrooms and the interior design of the reception area, particular attention is given to the selection and placement of materials to achieve a cohesive aesthetic. Notably, the incorporation of a large stone element in the reception counter exemplifies this approach, serving both functional and decorative purposes. This deliberate choice underscores a commitment to meticulous design detailing, wherein materials such as granite, wood, and stone are thoughtfully employed to convey a sense of durability, sophistication, and harmony within the architectural ensemble as shown in (Fig.6).



Fig. 6. Decoration Using Stone, Wood, and Granite Materials
Source: Author in 22-4-2024

Third, Regarding the construction phase, the project utilizes the use of mixing gravel, cement, and sand, we produced our own bricks and allowed them to air-dry as shown in (Fig.7) below. The project through this phase showed a significant adherence to vernacular principles, ensuring durability, sustainability, and harmony with the natural surroundings. The hotel also integrates traditional building techniques into its design, such as the use of ancient Egyptian stone crushing methods. A material called ‘Blanco’ is used instead of a Cement during the construction phase, this material is locally available and durable, the characteristic of this material is famous with the fact that it provides heat and sound isolation.

Regarding the Local Labor, the project employed a specialized workers who utilized the ancient Egyptian technique of stone crushing. In efforts to reduce foreign materials to the island building blocks were forged from the rocks and granite, this helped to save the cost of buying and transporting bricks, save emissions from manufacturing and transporting the bricks, The interview also refers that working on the project requires paving a road linking the site to the beginning of the coastline of the Nile River to transport the materials and equipment necessary for construction.



Fig. 7. Using Crushed Granite and Blanco in construction

Source: Mr. Tharwat Mohamed, the owner

The Interview reflects also the most faced challenges facing Ben-Ben Dhara Hotel, he referred that the land conditions were not favorable for construction. Being a rocky island comprised of solid granite, Limited access to resources such as sand and construction materials, Lack of available electricity and other essential infrastructure further compounded the challenges, (Fig. 8) shows the rocky ground at the project site.



Fig. 8. Construction Phase and Dealing with Topography

Source: Mr. Tharwat Mohamed, the owner

Reflecting on the initial challenges encountered at the project's inception, the owner notes a significant degree of opposition from various quarters. However, despite these initial hurdles, significant progress was achieved, with approximately 30% of the project completed during the construction phase. This milestone served as a pivotal turning point, attracting increased attention and interest from potential investors who expressed a desire to collaborate as partners in the venture. This shift in sentiment underscores the project's evolving trajectory and the growing recognition of its potential for success and profitability within the investment community.

The results for the second method regarding the site visit to the land, observations

Firstly, Influence of Integrating Traditional Architectural Materials. The observation revealed a significant positive influence of integrating vernacular architectural elements into contemporary projects. Structures that incorporated local materials, such as stone, demonstrated a harmonious blend with the natural environment of Aswan. These elements enhanced the local identity and created a sense of place and cultural continuity as (Fig.9).



Fig.9. Facades, topography, and harmonious natural environment

Source: Author in 22-4-2024

Second, the project exhibited a deep understanding of local climatic conditions and resource availability of stones. The use of passive cooling techniques, such as thick walls and swimming pools demonstrated practical and effective solutions for the climate. The combined effect of water and rocks can significantly lower the ambient temperature, making outdoor spaces more usable during hot periods. In addition, it enhances the aesthetic appeal by reflecting the natural topography and

geological features of the region, reinforcing a sense of place and continuity with the natural environment as shown in (Fig. 10).



Fig. 10. Harmonious integration with the surrounding environment

Source: Author in 22-4-2024

Third, Architectural Details and decorations, the photographic documentation and field notes captured a wealth of architectural details and construction techniques. The use of natural ventilation systems and decorative elements reflected local craftsmanship. Facades and paintings demonstrated a harmony with the surrounding environment, presenting traditional aesthetics in a contemporary context for modern architecture. BenBen Hotel in Aswan has initiated the second phase of its construction project, continuing its commitment to integrating vernacular architecture principles with modern sustainability practices as shown in (Fig. 11). This phase focuses on expanding the hotel's



capacity and enhancing its environmental and cultural responsiveness.

Fig. 11. Second Phase of BenBen construction

Source: Author in 23-4-2024

6 Discussion

The case study of BenBen Hotel in Aswan has elucidated a systematic approach that offers valuable insights for future projects seeking to enhance the application of vernacular architecture. These insights underscore the critical importance of conducting a comprehensive site analysis as an initial step. This analysis should specifically emphasize the surrounding environment, taking into account factors such as climatic conditions, soil type, availability of local materials, and economic and cultural constraints.

The lessons learned for the above-mentioned case study emphasize the importance of addressing three main questions: Where, what, and how as (Fig. 12). **The first step: where?** is to determine the specific location 'Where' the project has to be implemented, necessitating a comprehensive analysis of the regional climate conditions. This includes assessing temperature variations across seasons, humidity levels, wind patterns, and other pertinent environmental factors crucial for successful implementation. Subsequently, it is imperative to examine the local cultural identity and the availability of indigenous materials in the vicinity. Understanding the cultural identity and traditional practices of the project region ensures that the architectural design and building facades harmonize with and perpetuate the local cultural continuity.

The second step: what? in the design process involves several key considerations to ensure that the project is both functional and contextually appropriate. These considerations include topography, orientation, ventilation, and the design of walls and roofs. With regard to topography, the

design must be tailored to the specific topographical features of the site, whether mountainous, flat plain, or coastal. Understanding and respecting the natural terrain enables the creation of structures that harmonize with the landscape, minimize environmental impact, and utilize natural features for both aesthetic and functional benefits. Regarding orientation, proper alignment is crucial for optimizing natural light and heat gain, which varies according to geographic location and climate. Buildings should be oriented to maximize solar gain during the winter and minimize it during the summer, while also considering prevailing wind directions for natural ventilation. The design of walls and roofs should be adapted to the local climate conditions. In hot and arid climates, thick walls and reflective roof materials can provide insulation and reduce heat gain. Conversely, in cooler climates, walls and roofs should be designed to retain heat. Utilizing locally sourced materials for these elements not only enhances thermal performance but also preserves the cultural authenticity of the architecture.

By carefully considering these factors topography, orientation, ventilation, and the design of walls and roofs the design process can effectively integrate vernacular architectural principles. This ensures that the resulting structures are environmentally responsive, culturally appropriate, and sustainably constructed.

The third consideration: how? pertains to the practical application and implementation of the previously discussed aspects during the construction phase. This step involves selecting the most appropriate construction techniques and engaging local laborers who possess the expertise to effectively utilize the site and adapt to the surrounding environment. In the case of BenBen Hotel, local laborers employed specific methods for breaking down stones and contributed to the manufacturing of bricks by mixing gravel, stone, and cement. Additionally, they utilized "Blanco" material as a substitute for cement in the construction of walls, demonstrating their ability to leverage local materials and techniques.

These methods enhance the structure's thermal performance and reduce the carbon footprint associated with transporting and producing non-local materials. Engaging local labor is vital for the successful implementation of vernacular architecture. Utilizing local craftsmen and builders ensures the preservation and application of traditional skills and knowledge, which supports the local economy and aligns construction with cultural practices, resulting in high-quality, contextually appropriate buildings. To ensure structural durability, it is crucial to select materials and construction methods that can withstand local environmental conditions, such as extreme temperatures, humidity, and potential natural disasters. Additionally, the design should accommodate the surrounding environment by incorporating features that enhance resilience and sustainability, such as rainwater harvesting systems, natural ventilation, and passive solar heating.

Focusing on these aspects' appropriate construction techniques, local labor utilization, and ensuring durability and environmental adaptation enables the construction phase to effectively translate vernacular architectural principles into tangible, functional, and sustainable structures.

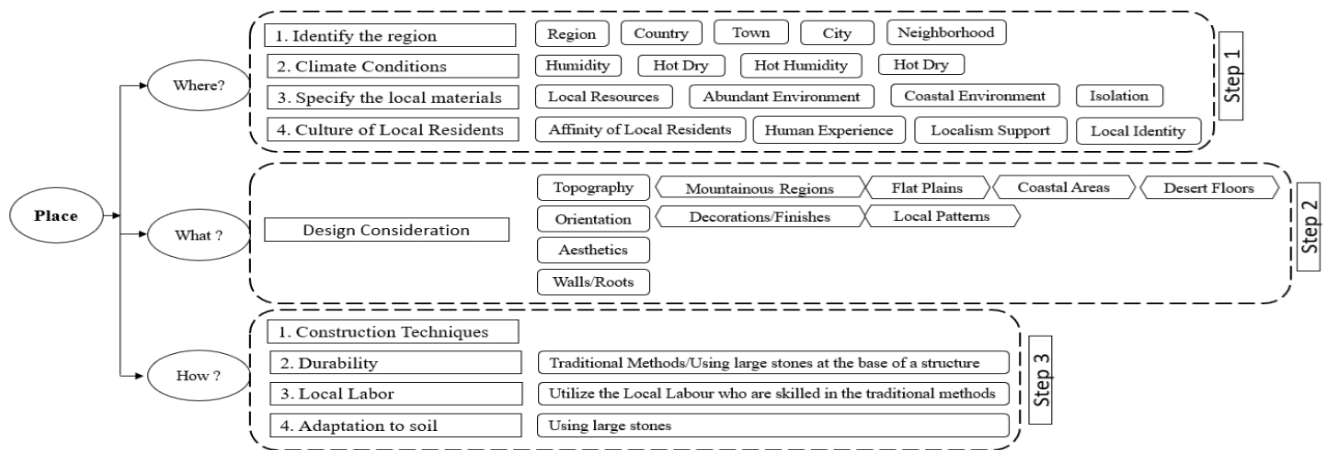


Fig. 12. Strategy for Applying Vernacular Architecture Principles

Source: Author

7 Conclusion

In conclusion, by addressing the questions of Where, what, and how, and focusing on these critical aspects during the design and construction phases, future projects can successfully integrate vernacular architectural principles. This approach ensures the creation of environmentally responsive, culturally appropriate, and sustainably constructed structures, contributing to the broader goals of environmental sustainability within the hospitality industry. The increased interest and research in this field reflect its potential to address current environmental challenges and preserve cultural heritage, providing a valuable framework for future architectural endeavors. Additionally, to provide a more rounded view of the hotel's sustainability efforts, we recommend that future studies include user experiences and feedback, enriching the findings and offering deeper insights into the practical implications of the design and construction choices.

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