Tarbiat Modares University

The International Journal of Humanities

Received: 2024/10/10
Accepted: 2024/12/15
Published: 2024/12/20

1. Professor, Department of Archaeology, Faculty of Art and Architecture, University of Mazandaran, Babolsar, Iran. *. Corresponding Author. Email: r.mousavihaji@umz.ac.ir

2. Assistant Professor, Department of Archaeology, Faculty of Art and Architecture, University of Zabol, Iran. Email: javadalaei@uoz.ac.ir

How to cite this article: Mousavi Haji, R., & Alaee Moghaddam, J. (2024). The Historical City of Zahedan-e Kohneh: A Thousand-Year-Old Masterpiece of Iranian Urban Planning. *The International Journal of Humanities* 31(4): 92–118.

RESEARCH ARTICLE

The Historical City of Zahedan-e Kohneh: A Thousand-Year-Old Masterpiece of Iranian Urban Planning

Seyyed Rasoul Mousavi Haji[1*], Javad Alaee Moghaddam[2]

Sistan, situated between southeastern Iran and western Afghanistan, mainly falls within Afghanistan's present province of Nimroz. Iranian Sistan, or Western Sistan, lies in the northern part of Sistan and Baluchistan province, characterized by its flat terrain formed by Hirmand River sediments. Historical and archaeological studies reveal different cities throughout Sistan's history. Zaranka, Proftazia, and Ram Shahristan served as hubs in the Achaemenid, Parthian, and Sasanian periods, respectively. In Islamic times (7th to 18th century), Zarang, Shahr-e Sistan, and Shahr-e Nou Sistan emerged as significant centers. Except for Zahedan-e Kohneh, which preserves the remnants of Shahr-e Sistan, the second capital of Sistan in the Islamic era, little information is available about the location of other central cities from this period. Zahedan-e Kohneh has earned the moniker "London of the East" due to its grand ruins, showcasing meticulous craftsmanship. The aim of this article is to study the architectural features and urban structure of the historical city of Zahedan-e Kohneh, which was the second capital (Dar al-Hukuma) of Sistan during the Islamic era (5th to 9th centuries AH). The results of studies show that engineers from Sistan a thousand years ago were very successful in designing and building this city, and in order to build a good and flawless city, they applied various sciences such as geometry, geography, geology, climatology, and ecology.

Keywords: Iran; Sistan; Zarang; Zahedan-e Kohneh; Islamic Architecture; Islamic and Iranian Urban Planning.

Introduction

At the end of the 11th century, Sistan's architects and urban planners reached the decision that Zarang, the stronghold and the center of power of the Saffarian dynasty, could no longer serve as Dar al-Hukuma (the capital or seat of the Sistan region). This determination arose from the city's extensive damage incurred during prolonged conflicts, particularly during the invasions of Arabs and the reigns of Ya'qūb ibn al-Layth (861-879), Amr ibn al-Layth (879-902), and Khalaf ibn Ahmad Saffari (963-1003). Additionally, historical accounts and geographers from various Islamic centuries report that the city was situated in a low-lying area surrounded by a

[DOI: 10.48311/eijh.31.4.92]

deep moat, confirming Zarang's vulnerability to flooding (Al-Jayhani, 1989: 160-162; Al-Istakhri, 1968: 191-193; Ibn Hawgal, 1966: 151-153).

Consequently, Khalaf ibn Ahmad Saffari tasked Sistan's architects and urban planners with constructing a new city to replace Zarang as Dar al-Hukuma. This new city referred to as Shahr-e Sistan, boasted superior defensive positions and a strategic location immune to floods. This served as the center of Sistan from the late 11th century to the latter half of the 15th century.

Archaeological investigations affirm that the vast site of Zahedan-e Kohneh, located in Iranian Sistan, represents the remains of Shahr-e Sistan, Sistan's second Islamic-era Dar al-Hukuma, commissioned by Khalaf ibn Ahmad Saffari in 983. Ravaged by the assaults of Shuja-ud-din Timur (Amir Timur Gorkani) and his son, Shahrukh, in 1383 and 1409, Zahedan-e Kohneh was ultimately abandoned in 1437.

Our fieldwork, conducted between 2002 and 2008, sheds light on the meticulous planning carried out by designers, urban planners, and architects of Zahedan-e Kohneh. For instance, they conducted thorough scientific analyses of the region's natural geography prior to commencing the construction projects. This informed the creation of a city that harmonized with the local climate and environment, integrating comprehensive security and welfare considerations. Our purpose behind the archaeological survey was to identify and study the architectural features and urban structure of the historical city of Zahedan-e Kohneh and to collect the data needed to chronologize and determine the age of this city. A city that was determined by studying the pottery samples found there and used by inhabitants in the 5th to 9th centuries AH.

Research Methodology

The present study is classified as fundamental research, driven by its purpose, and falls under the category of historical research based on its nature and methodology. Two approaches employed for information gathering for this study include: documentary research that involved identifying and studying all relevant written sources and documents pertaining to the research topic, while field research included archaeological surveys conducted in the historical city of Zahedan-e Kohneh. To analyze the collected data, two theoretical frameworks were utilized: the hypothetico-deductive approach and the historical approach. In conducting this research, the authors have utilized historical sources related to Sistan and archaeological evidence found in the historical city of Zahedan-e Kohneh, such as pottery, architecture, and urban elements.

The Location, Extent, and Topography of Zahedan-e Kohneh

The ancient city of Zahedan-e Kohneh is located in the southeast of Iran, in the province of Sistan and Baluchistan (Figure 1), twenty kilometers southeast of Zabol and north of the Zahak domain of Sistan (Figures 2). In terms of geographic coordinates, Zahedan-e Kohneh is located

[DOI: 10.48311/eijh.31.4.92]

at 61°41'056" east longitude and 30°58'587" north latitude, with an average elevation of 485 meters above sea level. The area of the ancient city of Zahedan-e Kohneh does not have a private owner. The lands around the Sharistan (downtown) enclosed by it belong to denizens of villages including new Zahedan, Mohammaddadi, Khadang, Telfak, Navab, Mohammadabad, and Zainal (Figure 3).

Zahedan-e Kohneh is composed of five distinct parts named the Ghale or Kohan Dezh (castle), Arg-e Avval (the first citadel), Arg-e Dovvom (the second citadel), Sharistan (downtown), and Rabaz (suburb) (Figure 4). Except for Rabaz (suburb), which lacks a defensive wall, the other four parts of the city are encircled by robust and thick towers and ramparts. According to field studies conducted in 2007 under the author's supervision (S. R. Mousavi Haji) in Zahedan-e Kohneh, the city's area during its heyday reached approximately 156,645 square kilometers, equivalent to 15,664.5 hectares (Figure 5). Of this total, 7,300 square meters pertain to the castle section, 28,700 square meters to the first citadel, 73,500 square meters to the second citadel, 772,138.3 square meters to Sharistan (downtown), and the remainder to Rabaz (suburb), Unfortunately, over time and due to various natural and human factors, particularly construction activities, agricultural land development, and the expansion of numerous villages and settlements, much of the artificial structures and remnants in Rabaz (suburb) have been lost. Nonetheless, the minimum preserved area that can be attributed to Zahedan-e Kohneh today is approximately 15.7 square kilometers (Mousavi Haji, 2008: 53-59) (Figure 6).

The construction materials of towers, ramparts, buildings, and other architectural works in different parts of the city are mainly mud-brick and mud mortar, covered with thatch. Bricks are also used sporadically in the base and core of the walls, as well as in the construction of arches and roofs. Over time, and due to various natural and human factors, a significant portion of the city's architectural fabric has deteriorated, resulting in mounds of mud-brick and brick fragments. These remnants' alignment and connections can only be discerned through excavation. Nonetheless, despite damage incurred to it, Zahedan-e Kohneh can be considered among the most well-preserved ancient and historical cities in Iran, especially because towers, ramparts of the quad parts of the city, and many of its buildings remain intact (Figures 7 to 14).

The History of Archaeological Studies of Zahedan-e Kohneh

Before archaeologists embarked on studying Zahedan-e Kohneh, it was visited and mentioned by various individuals, including travelers, political or military officials, and western orientalists over the last two centuries. Notable figures such as Captain O. Smith (1999: 188-190), F. Goldsmid (1999: 263-265), H. Rawlinson (1999: 314-320), H. McMahon (1999: 350-380), P. Sykes (1999: 465-468 and 1984, 385-386), E. Huntington (1999, 571-572), S. Landor (1999, 624-662), and J.P. Tate (1999: 724-822 and 1983: 76-83 and 1985: 65-86) have referred to Zahedan-e Kohneh in their writings, occasionally discussing its age and identity.

[DOI: 10.48311/eijh.31.4.92]

The scientific study of the ruins of Zahedan-e Kohneh was commenced in 1915 by British archaeologist Stein. He provided descriptions of several ruins and historical buildings within the site, such as the central castle, the wall of Sharistan, the Timur castle, the mosque, and a building known as the cistern and Qasim Abad minaret. Stein also collected pottery fragments from the surface level of the site and published their designs in his report. Based on Tate's writings and local narratives, Stein suggested that Zahedan-e Kohneh was the capital of Sistan, destroyed by Shuja-ud-din Timur (Amir Timur Gorkani) in 1383 (Stein, 1981: 932-936).

W. Fairservis was the second archaeologist to conduct a brief study of Zahedan-e Kohneh. His research took place during an archaeological survey of the Sistan plain between 1949 and 1951. Fairservis identified numerous sites, with Zahedan-e Kohneh being one of them. He marked its location as number 7 on his drawn map of the region (Fairservis 1961: 39 and 94).

The third archaeological study, by Seyed Rasool Mousavi Haji, took place in 2002 which involved careful examination and survey of Zahedan-e Kohneh, yielding significant findings. The most notable results are as follows:

- The city of Zarang served as the center of Sistan from the end of the Sasanian period until the early 11th century. Subsequently, due to extensive damage inflicted by prolonged wars, particularly during the invasions of Arabs and the rule of Ya'qūb ibn al-Layth, Amr ibn al-Layth, and Khalaf ibn Ahmad Saffari, Zarang lost its defensive capabilities. As a result, a new city "Shahr-e Sistan" was established under the orders of Khalaf ibn Ahmad.
- From the 11th to the mid-15th century, Shahr-e Sistan served as the seat of government or Dar al-Hukuma of Sistan. Therefore, it was not Zarang but Shahr-e Sistan that fallen victim to the attacks of Shuja-ud-din Timur (Amir Timur Gorkani) and his son Shahrukh.
- During this period, Zarang did not hold political or executive authority and was not regarded as the center of Sistan.
- Zahedan-e Kohneh is not a remnant of Zarang, as it lacks the characteristic features of Zarang.
- Zahedan-e Kohneh is the actual location of "Shahr-e Sistan," the second Dar al-Hukuma of Sistan during the Islamic era (11th to 15th centuries). This site possesses all the features and characteristics described in historical sources[4].

The fourth and last archaeological activity at Zahedan-e Kohneh occurred in 2007, also led by Seyed Rasool Mousavi Haji. This was aimed at determining the site, its layout, and proposes the arena of Zahedan-e Kohneh through extensive borehole excavations in Rabaz (suburb) (Mousavi Haji 2008).

[DOI: 10.48311/eijh.31.4.92]

Discussion

According to historical sources, “Shahr-e Sistan,” known today as “Zahedan-e Kohneh,” was constructed at the beginning of the 11th century during the reign of Khalaf ibn Ahmad Saffari. The significance of this event is underscored by the rebellion against Khalaf ibn Ahmad, triggered by his arrest and execution of his son Tahir in 1014. Subsequently, dissidents captured “Shahr-e Sistan,” which served as the Dar al-Hukuma (the seat of the Sistan region), and even minted coins in the name of Sultan Mahmood of Ghaznavi (Sistani 1965: 71-72). Although the exact date of Shahr-e Sistan’s construction under Khalaf ibn Ahmad is unspecified, historical evidence strongly suggests it occurred around 994. Prior to historical accounts exclusively referenced locations such as Zarang, the gateway of Pars, and the gateway of Nishk, which are associated with Zarang. It is worth noting that “Shahr-e Sistan” (Zahedan-e Kohneh) retained its status as Dar al-Hukuma of Sistan uninterrupted from its construction until 1461. In that year, "Zahedan-e Kohneh" was completely deserted, giving way to a new city named “Shahr-e nou-ye Sistan” (New Shahr-e Sistan), the exact location of which remains unknown.

The decline of “Shahr-e Sistan” was accelerated by the ruthless attacks of Shuja-ud-din Timur (Amir Timur Gorkani) and his son Shahrukh in 1383 and 1409. The destruction of Sistan’s famous dams by Shahrukh further exacerbated the city’s demise. However, it is important to clarify that the abandonment of “Shahr-e Sistan” following the destruction of its dams was not immediate. Ehya al-Moluk’s account of Malik Shams-al-Din Ali’s reign (1419-1439) indicates that he acquired private lands from Miran Mir Abdullah and commissioned the construction of a new city, located away from the sand and close to the waters of the Hirmand River. He [Malik Shams-al-Din Ali] initiated the construction of the city-state, residences, the grand mosque, schools, Khanqahs, caravanserais, and markets on the 17thof Muharram, 826 AH (January 9, 1423), and entrusted the finishing touches to the diligent and skilled workforce. In a brief period, the city was erected (Ibid., 123).

As deduced from the narrative provided, the construction of the new city, Shahr-e nou-ye Sistan, commenced in 1423 and extended until 1436. This conclusion is drawn from Ehya al-Moluk's account, which mentions Malik Shams-al-Din Ali's journey to Tabriz in 1434, where he resided for two years. Upon his return from Tabriz in 1436, he brought along skilled craftsmen, architects, painters, stonemasons, and substantial quantities of marble to Sistan. These artisans and materials played a pivotal role in the construction of the city (Ibid., 123-124).

A question arises now: why was it necessary to establish the new city of “Shahr-e Sistan” despite the existence of Zarang? In fact, with the advent of an autonomous government in Sistan under Khalaf ibn Ahmad, Zarang lost its viability as the capital it once held. This was primarily due to the extensive damage inflicted upon Zarang during numerous prolonged conflicts, notably the invasions by Muslim Arabs and the reigns of Ya’qūb ibn al-Layth, Amr ibn al-Layth,

[DOI: 10.48311/eijh.31.4.92]

and Khalaf ibn Ahmad Saffari. These conflicts significantly weakened Zarang's defensive infrastructure, rendering it unsuitable as a stable administrative center. Additionally, historical and geographical records from various Islamic centuries indicate that Zarang was surrounded by a deep moat containing numerous springs (as documented by historians and geographers, see, for example: Al-Istakhri 1968: 192; Ibn Hawgal 1966: 151). This suggests that Zarang was situated in a low-lying area, making it susceptible to flooding and posing a threat to the city's existence.

What has been stated clearly justifies the necessity of relocating Dar al-Hukoma from Zarang to "Shahr-e Sistan." Clearly, the new city needed superior defensive capabilities compared to Zarang and in a location that would not be threatened by flooding. Overall, Zahedan-e Kohneh stands out as the only vast site within the expansive flatland of Sistan that meets both of these criteria. The robust towers and ramparts of this city, with some of its castle towers boasting a diameter of up to 18 meters and its ramparts reaching a thickness of 4.5 meters, serve as evidence that the builders and designers of the city prioritized security and defense.

Furthermore, Zahedan-e Kohneh distinguishes itself as the preeminent site from the Islamic era in the Sistan region, situated atop a natural terrace and high ridge, safeguarded against floodwaters. The deliberate choice of Zahedan-e Kohneh as the site for constructing the new Dar al-Hukuma indicates that the decision to relocate from Zarang to "Shahr-e Sistan" was not solely driven by the inadequacy of Zarang's defenses. Rather, the city's susceptibility to natural threats played a significant role in the pivotal decision to transfer the seat of government.

The findings from studies conducted in the historical city of Zahedan-e Kehneh unequivocally demonstrate the keen awareness of Sistan's architects and urban planners regarding the region's natural conditions. They meticulously incorporated elements of security, comfort, and well-being into the city's design and construction. Below are some prominent examples:

1- Geomorphological Studies and their Role in Identifying City's Location

From a geological perspective, the expansive and elliptical plain of Sistan is characterized by low, alluvial terrain that is relatively flat, sloping gently from southeast to northwest. The sedimentary deposits within this plain primarily consist of river sediments, with an average thickness of about five hundred meters (Zomorodian and Pourkermani, 1988: 103). At times, these sediments comprise Cretaceous rocks, while at others; they consist of conglomerates from the late Tertiary period. The geological formation of the Sistan region is heavily influenced by intermittent floods and fluctuations in river flow. Notably, the region's geological feature is the ancient sediment deposit spanning the entirety of the Hirmand basin, likely originating from the conclusion of the Ice Age (Wurm) and the subsequent melting of ice from the Hindu Kush (Jux and Kempf, 1983: 28).

[DOI: 10.48311/eijh.31.4.92]

The Sistan region is identified as a tectonic depression of the Graben II type, serving as the deposition for the Hirmand River during the late third and early fourth geological periods. Over time, the sedimentary basin has experienced gradual settling, a process that has persisted into the present era (Khosravi, 1989: 161). The sedimentation resulting from the flow and flooding of the Hirmand River has extensively covered most parts of Sistan, transforming the landscape into one of the flattest terrains on the Iranian plateau. Consequently, cities, towns, and villages in the Sistan region face significant exposure to flood threats. Due to the absence of natural barriers, the region is highly vulnerable to the unimpeded flow of floodwaters into residential areas during periods of inundation.

The results of geomorphological studies indicate that within the expansive Sistan flatland, there exists only one location situated on a high and elongated terrace, thereby shielded from the dangers posed by flooding from the Hirmand River. In essence, this particular site, where the historical city of Zahedan-e Kohneh was erected, remains impervious to floodwaters (Stein, 1981: 933; Tate, 1999: 857). This demonstrates a clear understanding on the part of the city's designers, planners, and architects, who, prior to commencing construction, recognized the hazards associated with the overflow of the Hirmand River and flooding. Through extensive surveying of the region, spanning over forty thousand square kilometers, they successfully identified a site positioned atop a hill, ensuring that floodwaters could not breach its fortifications or jeopardize its residential structures.

For instance, historical sources recount a devastating flood that struck Sistan province on Friday, April 7, 1244. This catastrophic event resulted in human casualties, significant loss of livestock, and widespread destruction of fields and crops throughout the region. The floodwaters surged to such an extent that for a duration of four months, transportation between the surrounding areas and "Shahr-e Sistan" (Zahedan-e Kohneh) had to be conducted by boat (Sistani, 1965: 77-78; Anonymous author, 1935: 397). Remarkably, despite the ferocity of the flood, the integrity of "Shahr-e Sistan" remained unscathed due to its strategic location, impervious to the inundating waters. However, the surrounding regions were submerged, necessitating the use of boats by inhabitants from neighboring areas to access the city. Presently, it is evident that only one location in Sistan possesses such distinct and elevated terrain—the elevated grounds upon which the remnants of Zahedan-e Kohneh stand (Mousavi Haji and et al. 2010: 88-89).

2- Construction of the city and its buildings in the northwest-southeast direction

In terms of climate, Sistan experiences a hot and arid desert climate characterized by scorching summers and chilly winters. July stands out as the hottest month of the year, with maximum temperatures soaring between 40 to 53 degrees Celsius. Conversely, January marks the coldest month, with temperatures plummeting to as low as 12 degrees below zero. The average annual

[DOI: 10.48311/eijh.31.4.92]

temperature in the Sistan region hovers around 21.7 degrees Celsius, with relative humidity fluctuating between 26 and 52 percent. Notably, there is a substantial temperature contrast between day and night throughout the year, with variations reaching up to 32 degrees Celsius within a single day and a staggering 61 degrees Celsius over the course of the year (Khosravi 1989: 68).

Sistan is renowned as the "land of wind," with gusts prevailing across the region on most days of the year. Among the notable winds in the Sistan region are the 120-day winds, Qos winds, seventh winds, and Panjak winds, with the 120-day winds being the most prominent and dominant. This wind pattern commences in early June and persists for a duration of four months, totaling 120 days until the end of September. Referred to as the Lavar wind, it arises from pressure disparities between the airflow originating from the mountains of Afghanistan and northern Iran and the airflow emanating from the southern regions of Iran and Pakistan. The direction of this wind is from northwest to southeast, exerting its influence primarily over the Sistan plain. Initially, the wind speed measures at 36 kilometers per hour, gradually intensifying to exceed 120 kilometers per hour as it progresses (Hosseinzadeh 1977: 119).

It's noteworthy that the layout of the historical city of Zahedan-e Kohneh and its structures were deliberately aligned in the northwest-southeast direction, corresponding precisely to the path of the 120-day winds (Figures 4 and 5). Furthermore, each building within Zahedan-e Kohneh features two sizable entrances one on the northwest side and the other on the southeast side. This design consideration holds particular significance, especially when considering the prevailing conditions in modern-day Sistan. Interestingly, contemporary residential houses in Sistan typically lack entrance doors or windows on the northwest side. This omission is a direct response to the challenges posed by the 120-day winds which carry significant amounts of sand and debris, which tend to infiltrate homes through openings around doors and windows, creating considerable discomfort for residents.

So, what was the rationale behind the deliberate alignment of Zahedan-e Kohneh's layout and buildings with the direction of the 120-day winds, as well as the inclusion of large windows and doors on the northwest side? With a closer examination this decision can be understood in light of the differing natural conditions that prevailed in Sistan during the city's heyday (11th to 15th centuries), contrasting starkly with the environment observed today.

During the prosperous era of Zahedan-e Kohneh, Sistan boasted abundant vegetation cover and its lakes teemed with water—a far cry from the arid landscape prevalent today. It is under these favorable conditions that the city's orientation and architectural features find their justification. When the 120-day winds swept over the surface of lush, water-filled lakes and verdant vegetation, they carried not dust, but rather a refreshing, cool breeze. By strategically channeling this breeze through the large entrances on the northwest side of buildings, residents

[DOI: 10.48311/eijh.31.4.92]

enjoyed relief from the scorching summer temperatures, making daily life more tolerable (Mousavi Haji and et al., 2010: 89).

Undoubtedly, designers and builders of the historical city of Zahedan-e Kohneh possessed a keen understanding of the pivotal role that wind played in the daily life of Sistan, particularly during the sweltering summer months. The presence of wind alleviated the oppressive heat, rendering the weather more tolerable for residents. Moreover, the wind served as a natural purifier, carrying away air pollution and imbuing the atmosphere with freshness and purity. Yet, perhaps the most significant benefit of the wind lay in its ability to cleanse the air of Sistan from the myriad insects that proliferated in the region's dense forests and marshlands. Among these pests, the Sistan fly stood out as particularly notorious. Infamous for its potent bite, the Sistan fly posed a considerable nuisance to inhabitants. While it remains uncertain whether this species of fly directly caused fatal diseases in animals and humans, there is no denying their pivotal role in the transmission and propagation of such diseases through their biting activity (Tate 1999: 785).

One of the intriguing adaptations of the people of Sistan to the persistent winds of the region involved harnessing the wind to cool the air within their rooms and houses during the scorching summer days. This ingenious method, known as "Kharkhaneh" or thistle house, bears striking similarities to the contemporary water chillers, found in Iran today. J. P. Tate, who resided in Sistan from 1902 to 1905, provides a vivid description of this system: *"My hut spanned approximately 60 square meters, boasting mud-brick walls standing around three meters tall. Two central columns within the hut facilitated the installation of a sturdy roof structure. Positioned in the wall facing the prevailing wind direction was an aperture measuring 120 square centimeters, adorned with a dense cover crafted from nettle bushes. By periodically moistening this cover with water, the incoming wind would pass through, cooling the air within the room. The effect of this method was remarkably discernible. On one particularly scorching day during my second summer in Sistan, with temperatures outside soaring to 59 degrees Celsius, the wind passing through the dampened cloth succeeded in lowering the rooms temperature to a more bearable 39 degrees Celsius*" (Ibid., 785). This innovative approach exemplifies the resourcefulness of the residents of Sistan, who ingeniously utilized the natural elements to enhance their comfort and mitigate the oppressive heat of the summer months.

3- Subsurface Waters and their Role in Picking Materials

The scarcity of precipitation in Sistan, attributed to its arid climate and considerable distance from the sea, renders it one of the driest regions in Iran. According to a survey by A. H. Adl, the average rainfall over nine years in Sistan was 47.5 mm[25]. Rainfall in Sistan has minimal impact on replenishing the region's lakes and underground water reserves. Instead, it serves primarily to moisten the parched soil, which, owing to its composition, hinders immediate water penetration, leading to rapid evaporation and wastage (Adl 1998, 210). The results of this study

[DOI: 10.48311/eijh.31.4.92]

reveal that Sistan experiences only six days of rain annually, and most, if not half, of the scant rainfall may occur in a single day (Ibid. 211).

The findings from studies on the underground water conditions in the Sistan plain reveal that the alluvial sediments consist primarily of fine-grained materials such as clay and cement particles. This hard clay layer, with a thickness ranging from 850 to 1000 meters, acts as a barrier, preventing water from penetrating underground and forming continuous aquifers. Instead, small aquifers and subsurface saline waters are scattered throughout the Sistan plain, with their depth varying across different irrigation seasons. On average, these subsurface waters lie approximately 50 to 85 cm beneath the earth's surface, reaching their peak levels in April (Zomorodian and Pourkermani, 1988: 113-114).

It is evident that the designers, urban planners, and architects of the historical city of Zahedan-e Kohneh were well acquainted with the region's high subsurface water levels. With this understanding, they meticulously constructed the city's towers, ramparts, and buildings. Investigations into the foundations of these structures reveal a strategic approach to mitigate the effects of ground moisture. Initially, the architects erected foundations, walls, and towers up to 1.20 meters high using Saroj mortar—a blend of lime and ashes—alongside moisture-resistant bricks measuring 5x20x20 and 6x30x30 cm. Subsequently, the remaining portions of the walls were constructed using mud-brick and mud mortar, ensuring the longevity and structural integrity of the buildings amidst the region's unique hydrological challenges[2] (Mousavi Haji and et al., 2010: 90-91).

4-Utilizing Standard Plans Suitable for the Region's Climate

During an extensive archaeological research season in 2002 by Seyed Rasool Mousavi Haji, a total of 92 residential houses were documented in the Sharistan (downtown) section of the historical city of Zahedan-e Kohneh. These houses were found to adhere to two distinct floor plan designs:

1. Central Courtyard Design: This layout features a central courtyard with wide entrances situated in both the north-west and south-east directions, serving as the focal point. Surrounding each entrance, as well as along the east and west sides of the central courtyard, numerous rooms have been constructed on one or two floors. Notably, all these structures exhibit a uniform orientation, aligning with the prevailing 120-day winds, specifically oriented from North-West to South-East.
2. Courtyard Cluster Design**:** In this layout, a central courtyard is complemented by two smaller courtyards positioned on the eastern and western flanks. Each of these courtyards is adorned with grand entrances on the northwest and southeast sides. Surrounding these courtyards and entrances are multiple rooms spread across one or two floors. Similar to the central courtyard design, this cluster of buildings also

[DOI: 10.48311/eijh.31.4.92]

conforms to the prevailing 120-day wind patterns, maintaining alignment from North-West to South-East (Mousavi Haji, 2008: 45).

The buildings identified in Zahedan-e Kohneh's Sharistan exhibit a diverse range of dimensions, varying from small to medium to large and bulky structures. It is evident that these buildings feature several rooms distributed across one or two floors, indicating a level of wealth and economic power among the city's residents. The construction of such buildings with central courtyards and large entrances suggests significant expenditure, beyond the means of ordinary or low-income individuals. Moreover, the consistency in the layout and design of these buildings suggests adherence to fixed and standard plans, likely tailored to the region's climate. It is conceivable that both homeowners and government officials, along with supervised architects, observed these standardized plans during construction. Notably, no deviation from these established plans has been identified in Zahedan-e Kohneh's Sharistan, underscoring the meticulous planning and adherence to architectural norms prevalent in the city (Ibid. 46).

5- Selecting Construction Materials

In the construction of Zahedan-e Kohneh, a variety of materials were utilized, including thatch, mud mortar, mud-brick, and brick. Additionally, brick and Saroj mortar (plaster of lime and ashes) were employed in the foundation of the buildings. These materials were readily available in the region, cost-effective, and boasted a long history of use. Moreover, they exhibit favorable thermal properties, as they heat up slowly during the day and retain heat well into the night, thereby moderating temperature fluctuations within the buildings (Ghobadian 1998, 142). An interesting feature of the residential units identified in Zahedan-e Kohneh's Sharistan is the substantial thickness of their surrounding walls, reaching up to 1.5 meters. This considerable thickness serves as an effective insulation barrier, preventing the infiltration of cold winter air into the buildings and minimizing heat loss from the interior spaces to the external environment. Essentially, this thickness acts as a robust and efficient insulating layer, contributing significantly to the thermal comfort and energy efficiency of the structures.

6- Utilizing Advanced Water Supply System

Indeed, the Hirmand River stands out as the primary water source in Sistan, serving as the cornerstone for the region's growth and development. While Sistan boasts other water resources, including the three lakes of Hamun, irregular surface waters, and small underground aquifers, their significance pales in comparison to the vital role played by the Hirmand River. Given the region's heavy reliance on the flow of this river, these alternative sources are marginalized and are not considered reliable water sources for sustaining livelihoods in the area.

Historical accounts penned by various Islamic scholars and geographers, including Jihani (1989: 162), Istakhri (1968: 194), Ibn Hawqal (1966: 152), the anonymous author of Hudud al-Alam (1983: 319), Hamadollah Mustufi Qazvini (1983: 142) and others, highlight the

[DOI: 10.48311/eijh.31.4.92]

longstanding practice of diverting branches from the Hirmand River into Sistan's cities via multiple streams. This water was utilized for drinking, daily household needs, and irrigation purposes, underscoring the critical importance of the Hirmand River as a lifeline for the region's inhabitants throughout history.

Fortunately, through a systematic archaeological survey conducted in Zahedan-e Kohneh, remnants of old streams scattered throughout the city were identified. These streams, which once meandered through various parts of the city, were directed towards different residential areas during the city's development. Illustrated in Figure 4, the primary stream entered the city from the southwest of Sharistan (downtown), where it branched off into several tributaries. One branch led to the castle and citadel complex, while the remaining branches extended into the residential areas of Sharistan (downtown) and its suburbs (Rabaz). Eventually, all these streams converged in the east and northwest sectors of the city. The presence of a canal outside the Sharistan (downtown) towers and ramparts provides evidence that the water from these streams, upon entering the alleys and residential areas, flowed towards the east and into the canal, where it was eventually diverted out of the city.

The entry point of the main water stream from the southwest side of Sharistan (downtown) provides clear evidence that one of the branching channels of the Hirmand River traversed the western vicinity of Zahedan-e Kohneh. Sistanians ingeniously diverted a stream from this river, directing it into the city from the southwest side to supply water to residential areas and irrigate agricultural lands. Sykes refers to this river as the "Nasro River," identifying it as a principal branch of the Hirmand River. Its path through the west of Zahedan-e Kohneh continued northward, eventually merging into the Hamoun Lakes (Sykes, 1999: 457). In contrast to Sykes's perspective, S. Landor holds the belief that the Nasro River, during the zenith of Zahedan's existence, flowed from the east of the city. Landor expresses his disagreement with Major Sykes, disputing the notion that the Nasro River ran westward of the city during its flourishing period. He contends that while there are indications of a significant channel, it is situated to the east of the city (Landor, 1999: 658). However, the remnants uncovered during the 2002 systematic archaeological survey of the site align more closely with Sykes's viewpoint, supporting the notion that the Nasro River indeed coursed through the west of the city during its prime.

The water supply system of Zahedan-e Kohneh presents a remarkable feat of engineering ingenuity. Notably, outside the towers and ramparts of Sharistan (downtown), as well as in the city's suburbs (Rabaz), there are no visible traces of the branching streams. This deliberate concealment indicates a strategic decision by the city's designers and builders to safeguard the water supply system from potential threats. By keeping the tributary streams clandestine and covertly directing them into the city, they effectively obscured the source of water from enemy forces. This tactical maneuver deprived attackers of the opportunity to disrupt the city's

[DOI: 10.48311/eijh.31.4.92]

resistance and coerce its residents into surrendering by besieging the city and cutting off its water supply.

Indeed, both popular lore and historical sources underscore the significance of Zahedan-e Kohneh's clandestine water supply system and robust fortifications. Consensus among these sources highlights the formidable challenge posed to conquerors in penetrating the city's defenses. It is widely acknowledged that the city's impregnability was largely attributed to its concealed water supply network and formidable towers and ramparts. The prevailing belief is that the city could not be subdued unless an act of treachery occurred, wherein an individual betrayed the populace by divulging information about the secret source of water entering the city.

Local traditions recount the surrender of "Shahr-e Sistan" (Zahedan-e Kohneh) to Shuja-ud-din Timur (Amir Timur Gorkani) with the treachery of Malik Qutb-al-Din's daughter during the period of 1403-1419. According to accounts from the Sistan region, the towering ramparts and sturdy fortifications of "Shahr-e Sistan" (Zahedan-e Kohneh) proved impregnable, thwarting Amir Timur's soldiers' attempts to breach them. However, the daughter of Malik Qutb-al-Din, who had developed affection for Amir Timur, conveyed a secret message to him, providing the key to conquering the city: ""... *Go miles away and pour straw into the water of Hirmand. Wherever the straw turns on the water and sinks into the water, there is the opening of the underground water of this fortress. Close it, and the city will surrender in waterlessness"* (Tate 1999: 842). The enemy followed her instructions and implemented the plan, which ultimately led to the conquest of the city.

There are two notable aspects in this narrative: firstly, the formidable fortifications of "Shahr-e Sistan" (Zahedan-e Kohneh), consisting of strong and thick towers and ramparts, which made it difficult for the enemy forces to breach and infiltrate the city. Secondly, the provision of water to "Shahr-e Sistan" (Zahedan-e Kohneh) through a stream diverted from the Hirmand River, entering the city covertly.

7- Thoughtful Placement of Urban Elements and Spaces

Through a meticulous archaeological survey supervised by Mousavi Haji in 2001, the area surrounding "Timur Castle," the residence of Sistan's ruling family (Figures 13 and 14), was thoroughly examined. Remarkably, in the vicinity between the modern villages of "Mohammeddadi" and "Deh-e Sangi," no traces of architecture were found (Figure 3). This area appeared to have served as a green space or city garden (Figure 15). Placing this green space strategically on the northwest front, aligning with the prevailing 120-day winds, suggests a deliberate urban planning strategy. The intention was twofold: firstly, to purify and freshen the city's air by allowing the winds to sweep through the green space, and secondly, to mitigate

[DOI: 10.48311/eijh.31.4.92]

the intensity of the summer heat by harnessing the cooling effect of the breeze passing over the greenery, thus enhancing the comfort of the city's inhabitants during hot summer days.

In contrast, the southeast front of Sharistan (downtown) was characterized by metal slag, furnace welds, and industrial activity, evidenced by the presence of a pottery kiln, two industrial furnaces, and a large Asbad (windmill). This deliberate placement of urban elements by the engineers and designers of Zahedan-e Kohneh was driven by the prevailing 120-day winds, which carried away pollution, particularly thick smoke from ceramic and metal furnaces, preventing it from entering the city (Figure 15).

8- Ensuring Physical Security

As previously mentioned, the historical city of Zahedan-e Kohneh comprises five distinct sections: the castle, the first citadel, the second citadel, Sharistan (downtown), and Rabaz (suburb). With the exception of Rabaz (suburb), which lacks defensive walls, the remaining four sections are fortified with robust and imposing towers and ramparts (Figure 4).

The Zahedan-e Kohneh castle boasts an irregular rectangular shape, measuring 78 by 98 meters with an area of 7300 square meters. Its interior reveals no traces of buildings or architectural structures. Encircling the castle is a formidable defensive wall, punctuated by remnants of nine sturdy towers scattered throughout. Interestingly, these towers lack a uniform spatial arrangement or consistent distance between them. In certain sections of the wall, the gap between two towers measures 12 meters, while in others, it extends to 14 meters. Furthermore, this distance varies significantly, ranging from 32 meters to 52 meters in different parts of the wall. Notably, the four towers situated at the corners of the castle feature larger diameters compared to the rest. For instance, the tower located in the southeast corner boasts a diameter of 16 meters, while those in the northwest and northeast corners measure 18 meters in diameter each (figures 7 and 8). Although precise information regarding the diameter of the tower in the southwest corner is unavailable due to the collapse of its walls, aerial photographs suggest a diameter of approximately 16 meters.

Indeed, the towers also vary in shape. While three towers positioned at the northwest, northeast, and southwest corners feature a rectangular design, the remainder are semi-circular. All towers were constructed with hollow interiors, spanning three floors, each accessible via a staircase. Traces of one such staircase are discernible on the second floor of the northwest tower. The third floor of this tower is partitioned into four octagonal chambers situated at the corners of the main tower. Each chamber boasts a diameter of four meters and is connected to the main tower's inner space through an entrance measuring 1.20 meters in width (Figure 8). The inner surface of these chambers is adorned with two rows of arched windows, serving to illuminate the interior space, facilitate observation, and, if necessary, enable shooting at potential attackers (Figure 9). None of the rooms on the first and second floors of the castle towers have an external

[DOI: 10.48311/eijh.31.4.92]

exit; however, the rooms on the first floor have a door leading to the inner space of the castle. The ramparts of the castle, like the towers, are hollow and have a width of at least four meters. Unfortunately, much of the rampart has been severely damaged. Unlike the towers, which are constructed on three floors, the ramparts of the castle consist of two floors. The first floor of these ramparts contains several interconnected rooms, each accessible from the inside and equipped with an entrance door leading to the inner space of the castle. For security reasons, none of these rooms have access to the exterior of the castle. On the second floor of the ramparts, there is a corridor measuring 2.30 meters in width, where guards and security personnel would stand watch, protecting the castle through the use of loopholes for observation and defense.

The castle towers and ramparts are constructed primarily of mud-brick and mud mortar, with their foundations comprised of bricks and Saroch mortar. The presence of numerous rooms within the towers and ramparts suggests that the city's architects and designers envisioned the castle as a refuge for the ruling family during times of conflict. Moreover, these rooms were equipped with essential amenities to ensure the comfort and well-being of the inhabitants during their stay within the castle walls.

The first citadel is encircled by a robust mud-brick tower and rampart. Currently, remnants of eight towers are discernible on the rampart, although they have suffered significant damage. Notably, the four towers situated at the citadel's corners are larger and sturdier than the others, rising higher than the ramparts themselves. These towers, with the tallest remaining wall exceeding 3.50 meters, serve as prominent features of the citadel's defense structure. The first floor of the rampart accommodates several rooms constructed within its hollow space. Accessible through entrance doors, these rooms connect to the inner area of the first citadel. However, none of these ground-floor rooms provide access outside the citadel, a precautionary measure for security purposes. Positioned atop the rampart, the second floor hosts a security corridor measuring 1.60 meters in width, facilitating the movement and deployment of guards and security personnel.

The second citadel is encircled by a robust rampart featuring semi-circular towers, with remnants of fourteen towers still identifiable in their current state. Similar to the first castle and citadel, the towers positioned at the four corners of the enclosure boast a larger diameter compared to those along the ramparts' midsection. The corner towers measure approximately 18 meters in diameter, while the middle towers, lining the ramparts, vary between eight and ten meters in diameter. All towers of the second citadel are structured across three floors, mirroring the architectural layout of the first citadel and the castle. The rampart, like its predecessors, consists of two floors. The ground level harbors several rooms, accessible via entrance doors leading into the citadel's interior. Meanwhile, the second floor features a security corridor measuring 1.20 meters in width. Notably, the corridor's inner and outer walls boast a thickness

[DOI: 10.48311/eijh.31.4.92]

of sixty centimeters. Positioned on the outer wall of the corridor, at a height of 1.20 meters, rectangular loopholes measuring 70 x 45 cm and with a depth of 60 cm have been strategically incorporated. These loopholes are evenly spaced at intervals of 2.20 meters along the wall.

The Sharistan of Zahedan-e Kohneh boasts a rectangular shape, measuring 2500 x 1320 meters, encompassing an expansive area totaling approximately 3,138,772 square meters. Encircling Sharistan (downtown) is an adobe rampart, albeit one that has regrettably incurred significant damage over time, owing to various natural and human interventions.

There is no doubt that the designers and builders of the ancient historical city of Zahedan-e Kohneh prioritized the city's security and protection. To achieve this objective, they deliberately and consciously divided the city into five separate parts, with four of them fortified by thick towers and strong ramparts. This strategic layout ensured that in the event of a military attack, the city's inhabitants could seek refuge within the fortified enclosure of Sharistan. Should Sharistan fall, they could then retreat to the second fortified citadel, and subsequently to the first citadel and the castle if necessary (Mousavi Haji, 2008: 37-51).

Conclusion

From the evidence presented, it is evident that the designers, urban planners, and architects of the ancient city of Zahedan-e Kohneh, around a thousand years ago (11th century AD), conducted thorough scientific studies to understand the natural geography and climatic conditions of the region. With careful consideration of both welfare and security aspects, they constructed a city that harmonized with the regional climate and environment. This meticulous planning aimed to provide comfort and peace to the city's residents, showcasing their advanced understanding of urban development even in ancient times.

The construction of the city on a high natural terrace to safeguard against flood damage, the use of durable materials like baked bricks and Saroj mortar for foundations, towers, and ramparts to withstand the underground waters of Sistan, and the utilization of earthen materials suitable for the region's climate all highlight the meticulous planning by ancient architects. Furthermore, the adoption of standard maps tailored to the local climate reflects disciplined urban design overseen by government officials and architects. The implementation of an advanced water supply system ensured the city's water needs while safeguarding against enemy exposure. Conscious placement of urban elements, coupled with stringent physical security measures, fortified the city against enemy infiltration. Additionally, aligning the city and its structures with the 120-day winds facilitated natural cooling in residential areas, showcasing the sophisticated scientific and technical prowess of Sistan's architects and urban planners a millennium ago.

[DOI: 10.48311/eijh.31.4.92]

Undoubtedly, the cool breeze experienced in Sistan during summer is a result of winds passing over the watery lakes and lush vegetation. Given the region's hot and arid climate, this vegetation cover couldn't have solely consisted of wild plants; rather, it likely comprised extensive human plantations sustained by abundant water and fertile soil. Historical records and archaeological findings affirm that agriculture and animal husbandry formed the backbone of Sistan's economy during the rise of Zahedan-e Kohneh. Thus, the key to Sistan's survival and prosperity lies in revitalizing agriculture and animal husbandry. Any other endeavor in the region's sustainable development would likely fall short without prioritizing these foundational activities.

Footnotes

[*] Throughout this article, all dates have been converted to the Gregorian calendar.

[**] Its remnants can probably be found in the historical site of Naad-Ali located in Afghanistan's Sistan

References

[1] Adl, A. H. (1960). *Iran's Weather*. Tehran: University of Tehran.

[2] Al-Istakhri, A., (1968). *Al-masalik wa al-mamalik (5th and 6th century AH)* (I. Afshar, trans.). Tehran: Bongah Tarjome va Nashr-e Ketab.

[3] Al-Jayhani, A., (1989). *Ashkal al-alam* (*4th century AH*) (A. Abd Al-Salam Katib, trans.)., Tehran: Behnashr.

[4] Anonymous (Unknown author). (*1983). Hudud al-Alam [Boundaries of the World])* (M. Sotuda, trans.). Tehran: Tahouri.

[5] Anonymous (Unknown author). (1935). *Tarikh-i Sistan [History of Sistan]* (M. Bahar, correction.). Tehran: Kalaleh Khavar.

[6] Fairservis, W. A., (1981). "Archaeological Studies in the Sistan Basin of Southwestern Afghanistan and Eastern Iran", Anthropological papers of the American museum of natural history, Vol. 48, Part.1, New York.

[7] Ghobadian, V., (1998). *Climatic Study of Traditional Iranian Buildings*. Tehran: University of Tehran.

[8] Goldsmid, F., (1999). A part of the book of eastern Iran. *In Joqrafiya-ye Tarikh-ye Sistan (safar ba safarname-ha) [Historical Geography of Sistan (Travelling with Travelogues)]* (H. Ahmadi, trans & ed.). Tehran: Author, Pp. 244-290.

[9] Hosseinzadeh, S., (1997). 120-day winds of Sistan. *Geographical Researches*. Year 12; No. 3, Pp. 103-127.

[10] Huntington, E., (1999). Eastern bowl of Iran and Sistan. *In Joqrafiya-ye Tarikh-ye Sistan (safar ba safarname-ha) [Historical Geography of Sistan (Travelling with Travelogues)]* (H. Ahmadi, trans & ed.). Tehran: Author, Pp. 498-572.

[11] Ibn Hawgal, M. A., (1966). *Safarname-ye Ibn Hawgal* [*Travelogue of Ibn Hawgal (4th century AH)* (J. Shoar, trans.). Tehran: Amirkabir.

[12] Jux, U. Kempf, E. K., (1983). Regional Geology of Sistan (Southwest Afghanistan). *In Prehistoric Sistan* (ed Tosi, M.) (Ismeo – Rome) Pp. 3- 61.

[13] Khosravi, M., (1989). Adverse bioclimatic caused by natural factors in Sistan plain. *Geographical researches*. Year 14; No. 13, Pp. 163-184.

[14] Landor, S., (1999). In the forbidden land. *In Joqrafiya-ye Tarikh-ye Sistan (safar ba safarname-ha) [Historical Geography of Sistan (Travelling with travelogues)]* (H. Ahmadi, trans & ed.). Tehran: Author, Pp. 584-722.

[15] McMahon, H., (1999). Mapping and New Discoveries in Sistan. *In Joqrafiya-ye Tarikh-ye Sistan (safar ba safarname-ha) [Historical Geography of Sistan (Travelling with Travelogues)]* (H. Ahmadi, trans & ed.). Tehran: Author, 364-433.

[DOI: 10.48311/eijh.31.4.92]

[16] Mousavi Haji, S. R., (2008). *Zahedan- e Kohneh*: *The AbandonedCcity in Sistan*. Mashhad: Pazh.

[17] Mousavi Haji, S. R., Mehrafarin, R. & Alaei Moghadam, J., (2010). Investigating the environmental characteristics of the historical city of Zahedan- e Kohaneh. *Journal of Ggeography and Development*, Year 8, No. 20, Pp. 79-96.

[18]Mustufi Qazvini, H., (1983). *Nuzhat al- Golub* (G. Le Strange, trans.). Tehran: Donya-ye Ketab.

[19] Rawlinson, H., (1999). Notes of Sistan. *In Joqrafiya-ye Tarikh-ye Sistan (safar ba safarname-ha) [Historical Geography of Sistan (Travelling with travelogues)]* (H. Ahmadi, trans & ed.). Tehran: Author, Pp. 302-328.

[20] Sistani, M. Sh., (1965). *Eḥyāʾ al-moluk* (M. Sotuda, trans.). Tehran: Bongah Tarjome va Nashr-e Ketab.

[21] Smith, O., (1999). Eastern Iran. *In Joqrafiya-ye Tarikh-ye Sistan (safar ba safarname-ha) [Historical geography of Sistan (Travelling with Travelogues)]* (H. Ahmadi, trans & ed.). Tehran: Author, pp. 132-243.

[22] Stein, A., (1981*). Inermost Asia, Detailed Report of Eexploration in Central Asia, Kan Su and Eastern Iran.* Vol. II, New York.

[23] Sykes, P., (1984). *A Travelogue or Eight Years in Iran* (H. Saadat Nouri, trans.). Tehran: Loheh.

[24] Sykes, P., (1999). "A Fourth Journey to Persia". *In Joqrafiya-ye Tarikh-ye Sistan (safar ba safarname-ha) [Historical geography of Sistan (Travelling with Travelogues)]* (H. Ahmadi, trans & ed.). Tehran: Author, Pp. 450-481.

[25] Tate, J. P., (1999). Borders of Baluchistan. In *In Joqrafiya-ye Tarikh-ye Sistan (safar ba safarname-ha) [Historical Geography of Sistan (Travelling with Travelogues)]* (H. Ahmadi, trans & ed.). Tehran: Author, Pp. 724-822.

[26] Tate, J. P., (1983). Sistan: *A Memoir on the History, Topography, Ruins, and Ppeople of the Country* (Gh. Raeisolzakerin, trans.). Zahedan: Edare Kol-e Ershad-e Eslami-ye Sistan va Baluchestan [The office of Culture and Islamic Guidance of Sistan and Baluchistan Province].

[27] Tate, J. P., (1985). *Sistan* (S. A. Mousavi, trans.). Zahedan: Edare Kol-e Ershad-e Eslami-ye Sistan va Baluchestan [The office of Culture and Islamic Guidance of Sistan and Baluchistan Province].

[28] Zomorodian, M., Pourkermani, M., (1988). A Discussion on the Geomorphology of Sistan and Baluchestan Province (2), Zabol. *Geographical Researches*, Year 13, No. 9, Pp. 100-121.

[DOI: 10.48311/eijh.31.4.92]

FIGURES

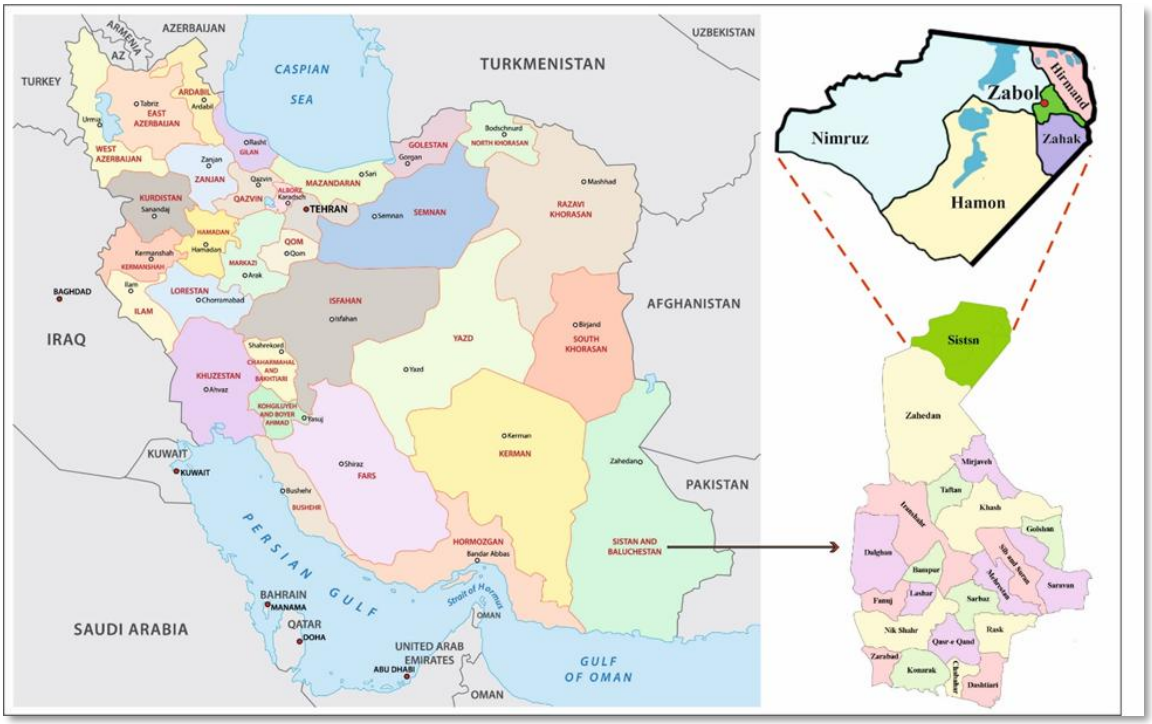

Figure 1. The location of Sistan and Baluchistan Province on the map of Iran (by the authors).

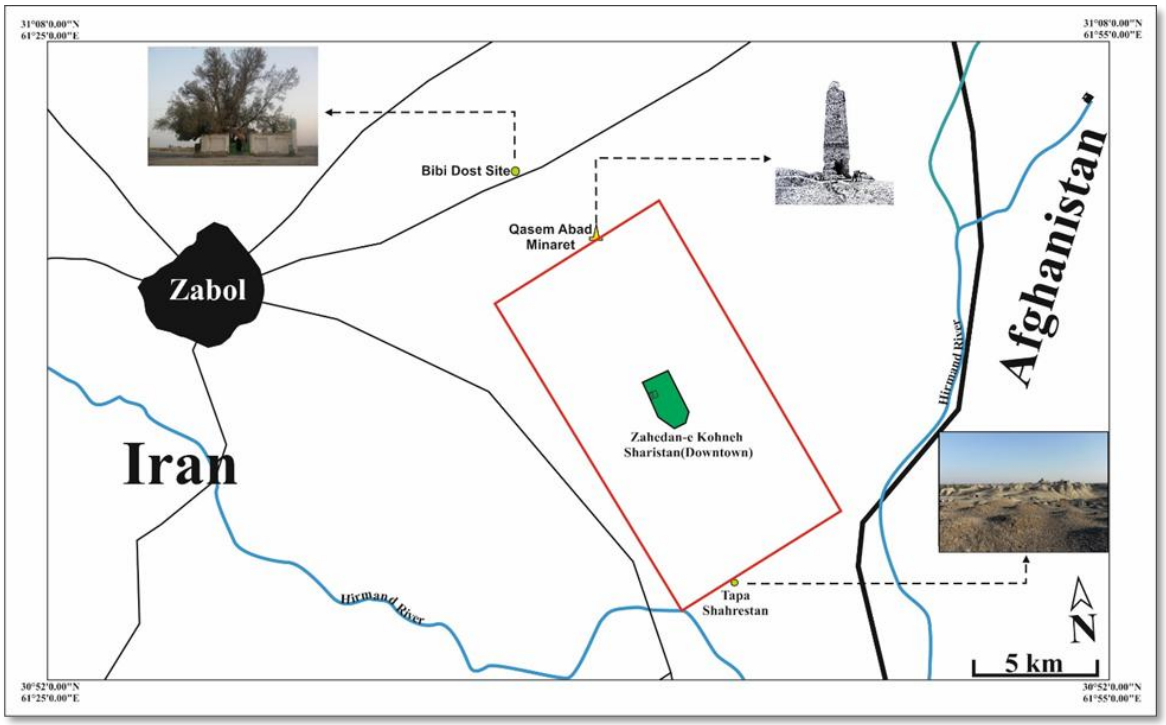

Figure 2. Geographical location and construction direction of the historical city of Zahedan-e Kohneh (by the authors).

[DOI: 10.48311/eijh.31.4.92]

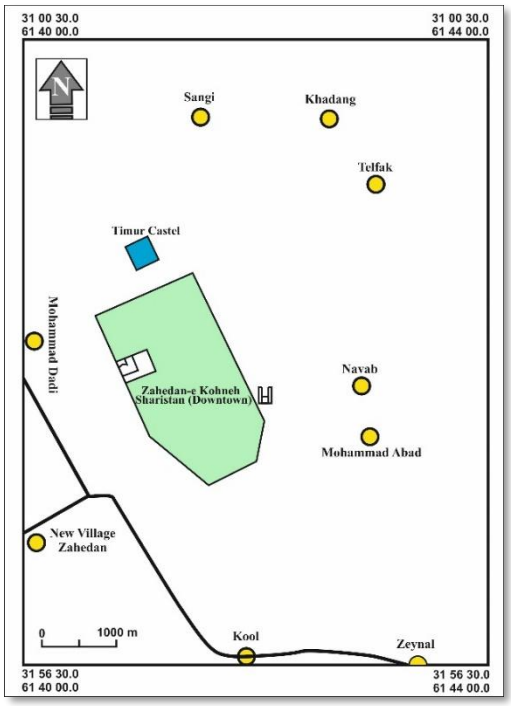

Figure 3. The location of Zahedan-e Kohneh and surrounding villages (free scale) (by the authors).

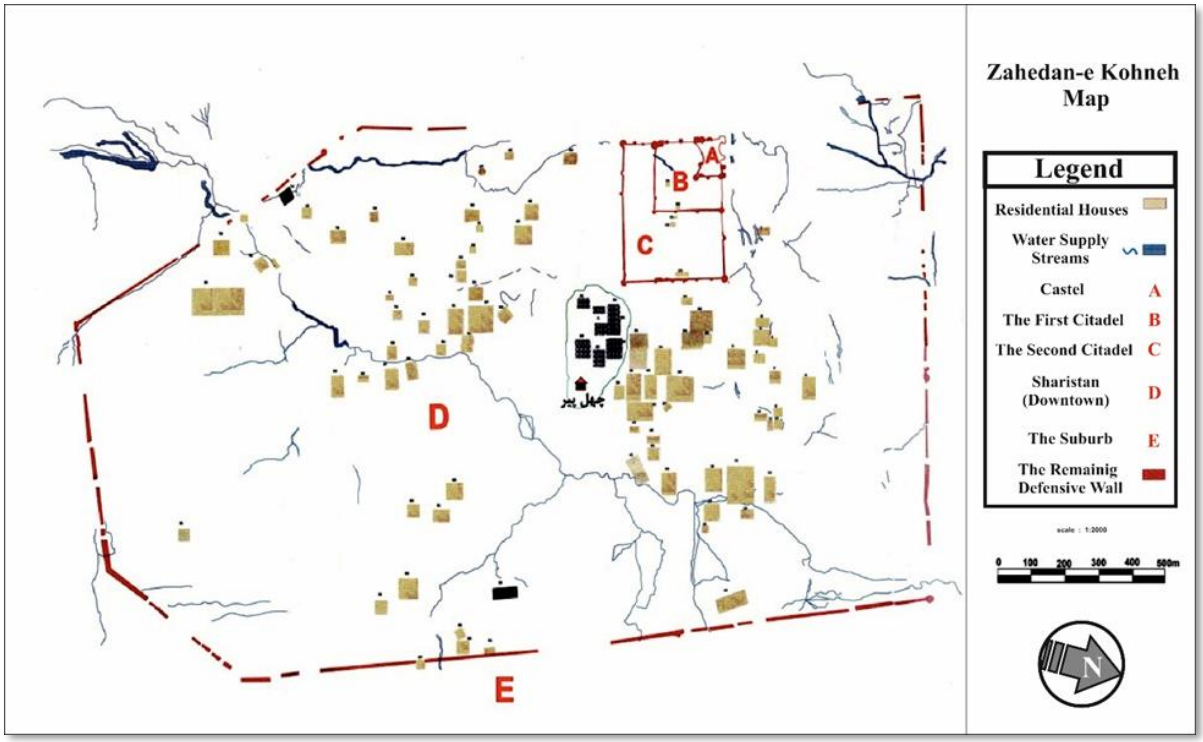

Figure 4. Map of Zahedan-e Kohneh (drawing from an aerial photo) (by the authors).

[DOI: 10.48311/eijh.31.4.92]

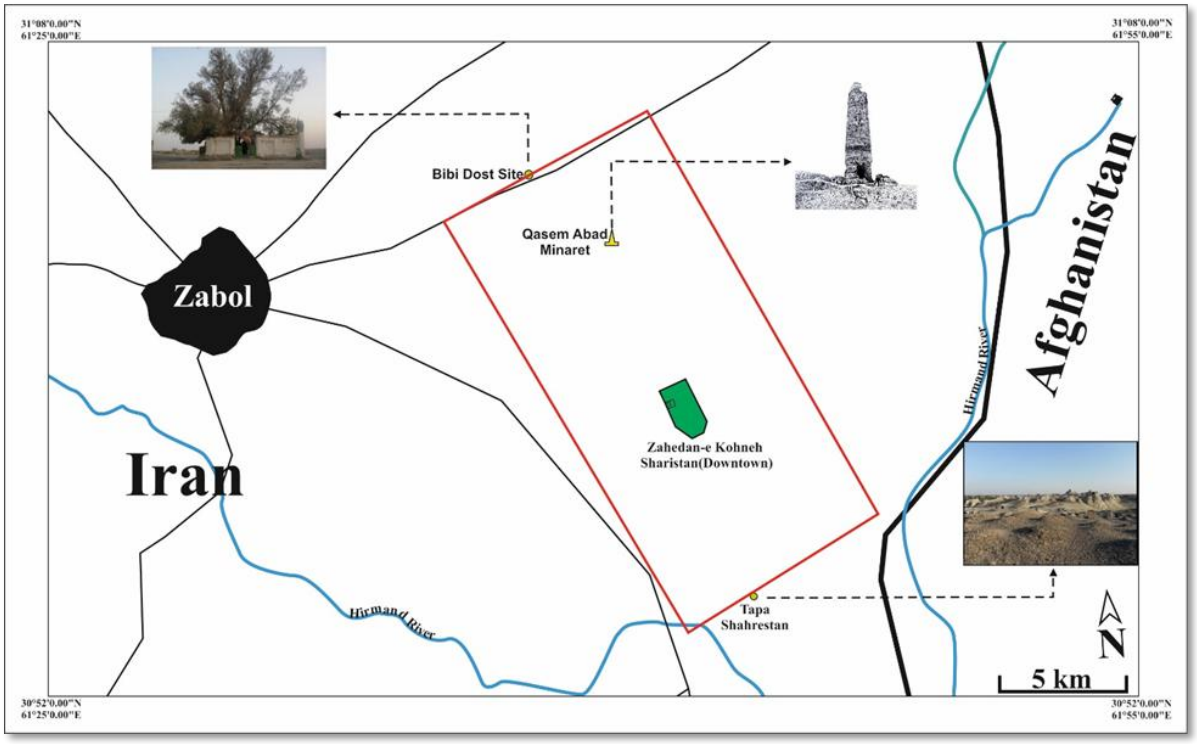

Figure 5. The extent of Zahedan-e Koneh from Bibi Dost to Tepe Shahrestan (by the authors).

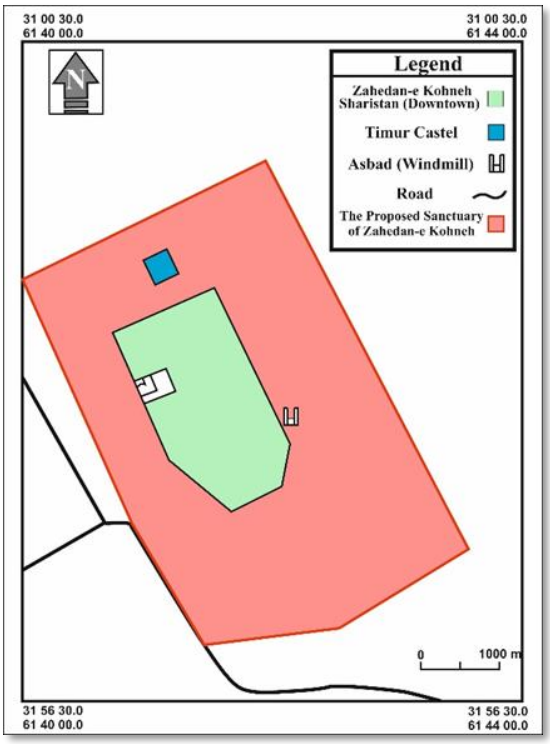

Figure 6. The location of the arena and the proposed sanctuary of Zahedan-e Kohneh (by the authors).

[DOI: 10.48311/eijh.31.4.92]

Figure 7. Zahedan-e Kohneh: tower in the northwest corner of the castle (by the authors).

Figure 8. Zahedan-e Kohneh: the entrance to the chamber on the third floor of the tower in the northwest corner of the castle (by the authors).

[DOI: 10.48311/eijh.31.4.92]

Figure 9. Zahedan-e Kohneh: interior view of one of the rooms on the third floor of the tower in the northwest corner of the castle (by the authors).

Figure 10. Zahedan-e Kohneh: tower in the northeast corner of the castle (by the authors).

[DOI: 10.48311/eijh.31.4.92]

Figure 11. Zahedan-e Kohneh: the room in the rampart on the west side of the castle (by the authors).

Figure 12. Zahedan-e Kohneh: the remains of the eastern wall of the second citadel (by the authors).

[DOI: 10.48311/eijh.31.4.92]

Figure 13. Zahedan-e Kohneh: the remains of three palaces in Timur Castle complex (by the authors).

Figure 14. Zahedan-e Kohneh: Central Palace in Timur Castle (by the authors).

[DOI: 10.48311/eijh.31.4.92]

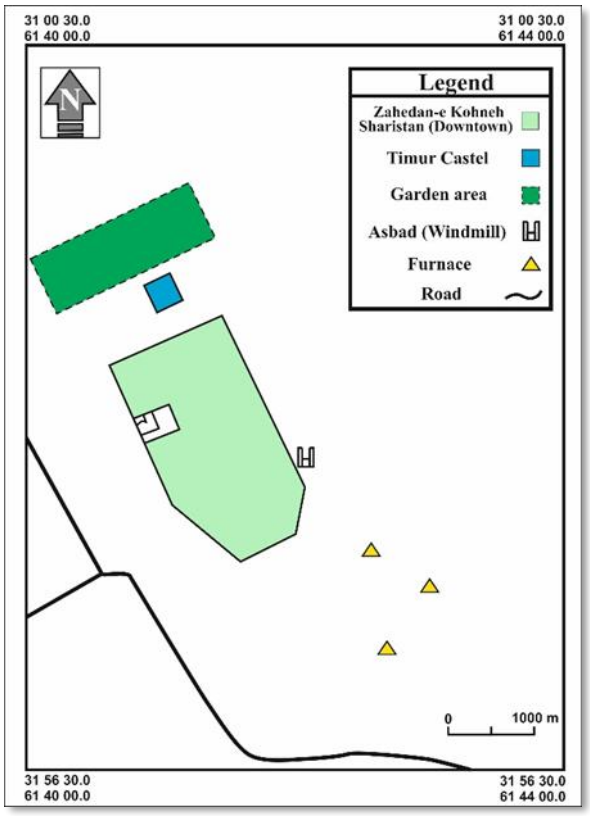

Figure 15. The location of the garden and industrial units in the historical city of Zahedan-e Kohneh (by the authors).

[DOI: 10.48311/eijh.31.4.92]

The International Journal of Humanities (2024) Vol. 31 IS.4 (92–118)

The International Journal of Humanities

شهر تاریخی زاهدان کهنه: شاهکار شهرسازان ایرانی در هزار سال پیش

سید رسول موسوی حاجی[1*]، جواد علائی مقدم[2]

۱. استاد، گروه باستان‌شناسی، دانشکده هنر و معماری، دانشگاه مازندران، بابلسر، ایران.

*. نویسندهٔ مسئول

Email: r.mousavihaji@umz.ac.ir

۲. استادیار، گروه باستان‌شناسی، دانشکده هنر و معماری، دانشگاه زابل، ایران.

Email: javadalaei@uoz.ac.ir

چکیده

سیستان نام سرزمینی پهناور در جنوب شرقی ایران است که امروزه بخش اعظم آن در خاک افغانستان واقع شده و با نام «ولایت نیمروز» خوانده می‌شود. سیستان ایرانی یا سیستان غربی که در شمالی‌ترین قسمت استان سیستان و بلوچستان واقع شده است، سرزمین نسبتاً صاف و هموارى است که بیشتر زمین‌های آن از رسوبات و ته‌نشست‌های رودخانه هیرمند تشکیل شده است. نتایج مطالعات انجام شده در تاریخ و باستان‌شناسی سیستان مؤید آن است که مرکزیت این منطقه بزرگ در دوران هخامنشی با شهری موسوم به «زرنکا»، در دوره اشکانی با «پروفتازیا»، در دوره ساسانی با «رام شهرستان» و در طول دوران اسلامی (از سده اول تا سده دوازدهم ه.ق) با شهرهای: «زرنگ»، «شهر سیستان» و «شهر نو سیستان» بوده است. غیر از محوطه عظیم زاهدان کهنه که بقایای همان «شهر سیستان» دومین دارالحکومه سیستان در دوران اسلامی (سده ۵ تا اواسط سده ۹ ه.ق) است، از محل واقعی دیگر مراکز دوران اسلامی و تاریخی سیستان اطلاع دقیقی در دست نیست. وسعت و عظمت خرابه‌های بر جای مانده در محوطه باستانی زاهدان کهنه به حدی زیاد است که سیاحان و خاورشناسان غربی پس از بازدید از زاهدان کهنه در قرن بیستم، لقب «لندن شرق» را به آن داده‌اند. هدف از نگاشتن این مقاله، بررسی ساختار شهری و ویژگی‌های معماریِ شهر تاریخی زاهدان کهنه، دومین دارالحکومه سیستان در دوران اسلامی است. نتایج مطالعات اسنادی و میدانی حکایت از آن دارد که شهر تاریخی زاهدان کهنه در نهایت دقت، ظرافت و مهارت ساخته شده و سازندگان آن از نظر علمی، هنری و فنی پیشرفت‌های چشمگیری داشته و بر علوم و فنون مختلف: هندسه، اقلیم‌شناسی، جغرافیا و زمین‌شناسی تسلط داشتند.

کلیدواژگان: ایران، سیستان، زرنگ، زاهدان کهنه، معماری اسلامی، شهرسازی ایرانی و اسلامی.

[DOI: 10.48311/eijh.31.4.92]