

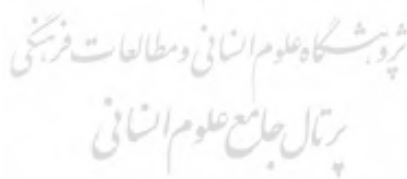
Effective Factors behind Formation and Collapse of Civilizations in Sistan, Iran

Reza Mehrafarin¹ 

Abstract

The Sistan region has played a prominent role in establishing and expanding civilization in the eastern region of Iran in different historical periods. The region's favorable environmental conditions, including abundant water, fertile soil, and diverse flora and fauna, attracted various ethnic groups to settle and achieve significant advancements by constructing numerous cities and settlements. Over its documented existence, Sistan with a rich collection of historic buildings and archeological sites has experienced three periods of extensive settlement and three periods of non-settlement, commonly referred to as gap periods. Multiple factors have contributed to the development of Sistan socially and settlement wise. This article aims to identify the influential factors in the cycle of formation and collapse of civilizations in Sistan by examining geographical, historical, and archaeological factors. Among these, water availability, political considerations, and other natural and human-related aspects stand out as the main contributors to this cyclic pattern.

Keywords: Sistan; Civilization; Archaeological Investigations; Geographical Phenomena.



¹ Professor of Archaeology, University of Mazandaran; Tissaphernes Archaeological Research Group, Tehran, Iran.

 reza.mehrafarin@gmail.com

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Introduction

Sistan and Baluchestan is one of Iran's provinces located in the southeastern part of the country. Today, Sistan refers to the narrow strip of the northern margin of the province, characterized by a flat and enclosed basin formed by the accumulated sediment from by ancient and present-day inland delta of the Helmand River. In this particular region, numerous civilizations have sprung up since the end of the fourth millennium BC. Some of them flourished and eventually disappeared over time (See Mehrafarin, 2021; Seyed Sajjadi & Moradi, 2022; Mehrafarin, 2022; Seyed Sajjadi, 2023).

Archaeological field investigations conducted in Iran's Sistan (Mousavi Haji and Mehrafarin, 2016: 17-31) reveal that from the late 4th millennium BC until the early 2nd millennium BC (Bronze Age), the entire southern Sistan region was dotted with ancient sites. Following this period, there was a hiatus in settlements, especially from the beginning of the second millennium BC until the Achaemenid era, spanning some 1500 years. In other words, there were no stable and long-lasting settlements akin to the cities and settlements related to the Bronze Age in the region. It is worth noting that this break in the settlement pattern can also be observed in pre-Bronze Age Sistan, Iran (Mehrafrin and Mousavi Haji, 2009: 145). The second phase of settlement in Sistan commenced concurrently with the rise of the Achaemenid Empire and lasted until the 4th century AD.

Sistan and Its Ancient Civilization

The narrative of the rise and fall of civilization in Sistan can largely be attributed

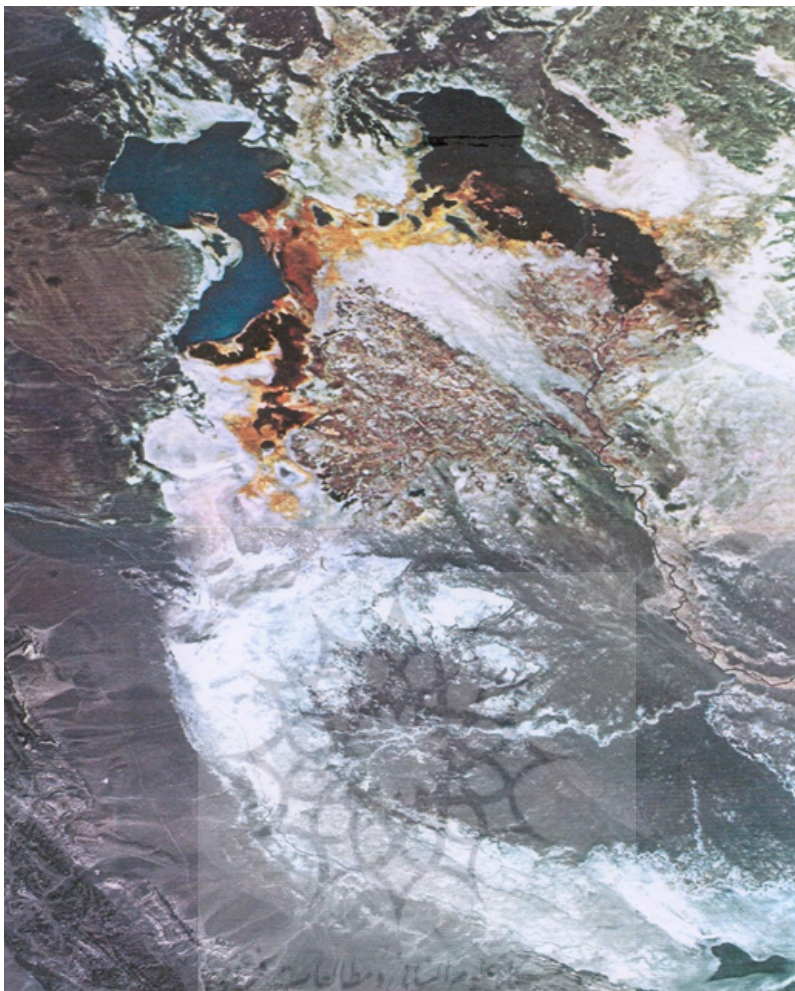
to the interplay of geographical and human factors but the environment played significantly and more influential role, as well.

A) Environmental Factors

The primary catalyst for the emergence and development of civilization in Sistan was the Hirmand River. Its natural flow enabled the irrigation of extensive agricultural lands as the river passed through cities and villages before reaching Hāmūn Lake. As a matter of fact, it helped sustain the livelihoods of the region's inhabitants, who relied heavily on agriculture, animal husbandry, and fishing. However, any alteration to this crucial factor, whether by natural occurrences like droughts or devastating floods, or human interventions such as dam construction, diversion, or hydropolitical issues, had the potential to completely disrupt the climatic, environmental, and human dynamics of the area, leading to significant transformations in the region.

Given the limited amount of precipitation and underground water resources, Sistan residents do not have alternative sources of dependence. The region experiences very low levels of rainfall, averaging around 47.5 mm per year (Zamardian and Pourkermani, 1978: 101). Additionally, due to the presence of sedimentary particles and dense soil, underground water tables have not formed in the area, depriving the people of Sistan from accessing this invaluable resource (Qahroodi Tali, 2010: 49).

As mentioned, Sistan is a land entirely reliant on the water flow of the Hirmand River, even the slightest change in its course can dramatically impact

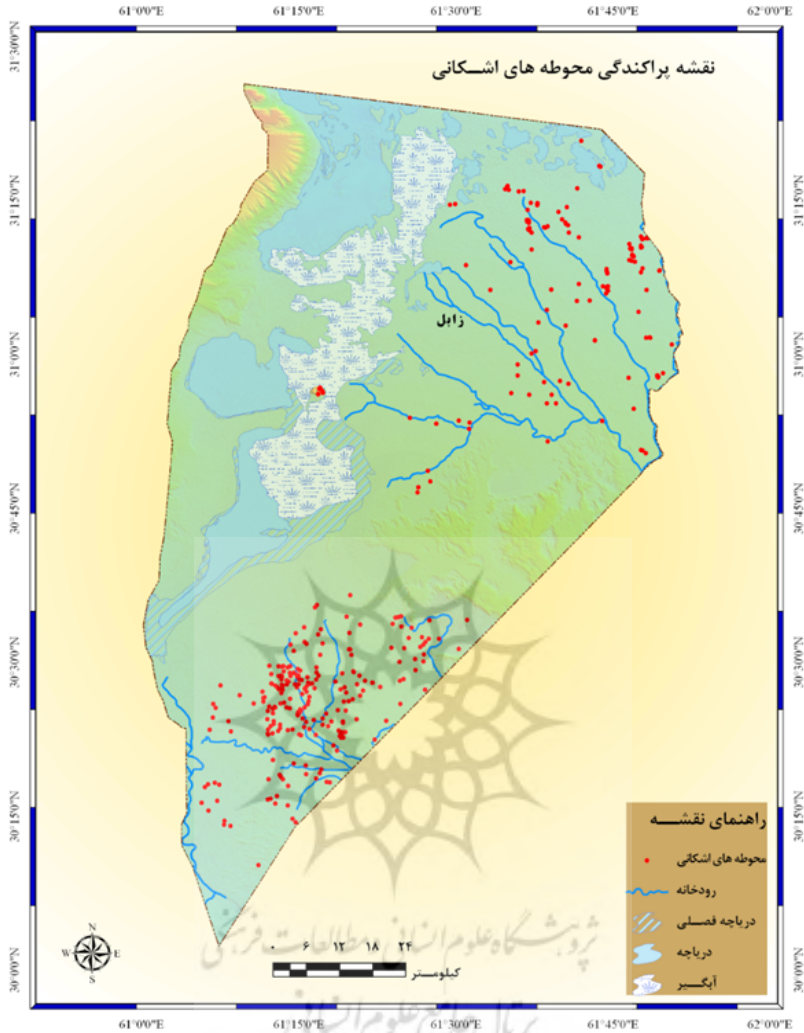


Map. 1. Satellite Image of Sistan

the landscape. In other words, the hydrology of the region is predominantly connected to Hirmand and several other seasonal rivers that contribute to Hāmūn Lake. Consequently, if these rivers dry up, the water in Hāmūn Lake would also diminish. In the words of Herodotus, just as Egypt thrived due to the Nile, Sistan owes its prosperity to the blessings of the Hirmand River. Yāqūt ibn-ʿAbdullāh al-Ḥamawī further attests that countless streams merged into this river, and

countless streams diverged from it (Bosworth, 1981: 70).

The soil composition in Sistan primarily consists of granular sediments, making it impractical to dig deep wells or construct aqueducts as seen in other arid regions of Iran and widely known as the *qanat system*. Additionally, due to the absence of mountains in the area, there are no natural springs flowing within its boundaries. Consequently, whenever the flow of the Hirmand River ceases,



Map. 2. Distribution of Sites from the Parthian Period in Sistan

whether due to natural factors or human intervention, the residents of Sistan are inevitably compelled to abandon the region. This recurrent pattern has occurred numerous times throughout Sistan's history, resulting in significant migration of its inhabitants.

During the periods when the Hirmand River brought ample water to ev-

ery corner of Sistan, the region grew and flourished rapidly due to its fertile soil. During such times, Sistan attracted various human groups from other areas who migrated and settled there, leading to the emergence of numerous cities and villages. However, when the flow of water from the Hirmand River dwindled, the situation was vice versa as the area was aban-



Fig. 1. Water and Vegetation Cover in Hirmand District

doned and the residents were forced to migrate to other regions within Iran. The principal cause behind this cycle of alternating development and devastation in Sistan was the complete dependence on the Hirmand River, coupled with the absence of springs, aqueducts, water wells, and sufficient rainfall in the region.

Due to the flat nature of Sistan and the substantial sediment coverage on its surface, local winds, including the powerful 120-day wind prevalent in the region, cause the rivers to accumulate sediment and subsequently smoothen their beds. This phenomenon led to continuous changes in the course of Hirmand and its numerous tributaries. Consequently, there is a possibility that prior to the existence of the Shahr-i-Sokhta or burnt city (3200 BC) and its subsequent settlement hiatus (from the beginning of the second

millennium BC to the middle of the first millennium BC), traces of human settlements in Sistan may not have been identified. It is likely that the Hirmand River and its tributaries shifted their direction towards the south or east (now located in Afghanistan), resulting in the continuation of cities and settlements in eastern Sistan (Mehrafarin, 2011: 2). In other words, unfavorable environmental conditions in Lower Hirmand (Iran) possibly led to the formation of such settlements in Upper Hirmand (Afghanistan). Additionally, the occurrence of droughts in Sistan should not be overlooked, as such phenomenon prompted significant population movements towards the northern regions of Iran in recent centuries. It is plausible that similar patterns of migration occurred in ancient times as well.

The land of Sistan can be likened to a



Fig 2. Old Zahedan. A City Destroyed by Tamerlane

moving bowl, where the limited water fills one-half of it and empties from the other part with each movement. The Hirmand River, situated within this vast bowl, experiences constant displacement, causing the streams and even Hāmūn Lake to shift back and forth. Consequently, with the movement of the Hirmand River causes cities and residential centers to relocate and shift their positions.

One of the primary factors contributing to this displacement is geological factors, encompassing tectonic events, erosion, and sedimentation in the region. Among these, erosion has notably played a significant role in shaping the area. These influential factors remain active, ensuring their continued impact on the lives of the people of Sistan over the long term (Ebrahimzadeh *et al.*, 2004: 16).

The satellite imagery of Sistan effectively illustrates the historical path of

water currents within the region. By analyzing these images, one can identify the rivers and ancient sites of the area.

Periodic droughts in Sistan also prompt its residents to migrate towards more favorable geographical areas. During the drought from 1967 to 1972, a majority of the population of Sistan relocated to the Gorgan Plain (Bastani Parizi, 1987: 90), which resulted in a decline in the region's population.

The presence of water and a suitable climate are considered the most crucial elements for the stability of human communities in a particular region. In other words, unfavorable weather conditions diminish people's inclination to settle in a specific location. In terms of climate, Sistan experiences hot and desert-like conditions, characterized by two seasons, summer and winter.

When Hāmūn Lake is filled with wa-



Fig. 3. The Surface of Many Ancient Sites in Sistan is Covered with Cultural Materials. Tasuki Area

ter, the living conditions are tolerable. However, when the lake dries up, the area transforms into a desert, making life challenging.

The challenge multiplied by the 120-day incessant windy condition which has a destabilizing effect on human communities in the region. As the wind blows, loose sands are set in motion, gradually accumulating behind any obstacles they encounter, eventually covering it.

As sand accumulates in the streams, rivers alter their course, resulting in the displacement of dry arable lands and human settlements. In general, "the wind carries away fertile soil, stirs up the lake's water, and then evaporates. It transforms the land into a salty marsh where people and even camels are sometimes buried. It is said that, in Sistan, one walks on sand" (Bastani Parizi, 1987: 8).

Another factor contributing to Sis-

tan's development is its sedimentary and fertile soil, which has accumulated over millions of years due to the deposition from the Hirmand River. But the process has had adverse impact also, as it transformed Sistan into a flat plain, causing the bed of Hirmand and its other streams to change with each flood that resulted in the abandonment of cities and villages located along the previous riverbanks and canals due to drought, while new settlements and villages emerged along the new riverbeds. This process resulted in numerous ancient sites throughout Sistan, with only a small number being visible, while many remaining concealed beneath the substantial volume of water and wind-borne sediments.

Two additional geographical phenomena that have had a significant impact on the rise or fall of civilizations in the Sistan plain are Kaloutaks and Ter-



Fig. 4. The Ruins of a Windmill. Old Zahedan

race. Vegetation can be observed in various forms across fields, forests, and deserts. Typically, desert vegetation consists of scattered bushes devoid of plants. In these plant-free areas, furrows gradually form in alignment with the wind's direction, resulting in prominent ridges where bushes and vegetation are located. Flood currents also contribute to this phenomenon. The Hirmand River exhibits four well-known terraces, with many ancient sites in Sistan, including the burnt city found located on the Ramrud Terrace (Mousavi Haji, 2012: 58-59).

The geopolitical position of Sistan serves as an additional factor for the emergence of civilizations within this region. Other than what is perceived today, this area was once regarded as the gateway to India. Its unique geographical location, along the communication routes

between the East and the West, turned into a significant cultural, military, and commercial center in different historical periods. Trade caravans from various regions of Iran would travel to Sistan, stopping at its center to exchange goods before continuing their journey towards India and eastern regions (Mehrafrin, 2002: 130).

b) Human Factors

Apart from natural factors, it is important to acknowledge the role of humans in the rise and fall of civilizations in Sistan. The tale of Afrasiab closing the water to Iranshahr and the invasion of Turanian and Scythian tribes in the Sistan region is well-known in Persian literature and mythology. Currently, with the construction of an upstream dam on the Hirmand River (in Afghanistan) and the diversion

of its water, the downstream area or Lower Hirmand (in Iran) has become desert. Hasn't this process been repeated during the periods when no interventions were made in Sistan?

During some periods, Sistan experienced significant development, with its entire surface becoming fertile and cultivable. The pastures surrounding Hāmūn Lake and its internal reeds provided suitable locations for livestock and cattle breeding. Hāmūn Lake was abundant with various fish and was home to migratory birds. Naturally, during such times, tribes and different social groups from other regions migrated there, leading to the emergence of numerous cities and villages in a short span of time. Sometimes, the power of these newcomers surpassed that of the native residents, resulting in their dominance over local tribes through warfare and conflict. For instance, when the Scythians entered Sistan in the second century BC, their formidable military strength allowed them to expand their dominion from Sistan to the banks of the Indus River.

During those prosperous periods, Hirmand and other rivers in Sistan had abundant water, to the extent that excess water flowed into Hāmūn Lake, causing the reservoir to reach its capacity. The presence of numerous archaeological sites from this era indicates a large population influx to the region. It is highly likely that Sistan attracted immigrants due to favorable environmental conditions in those days, drawing various ethnic groups from other areas. The Soren Pahlavi family, considered to be one of the seven great families of the Parthian era, resided in and had connections to

the clans of Sistan. The immense wealth of Sistan, acquired through agriculture, animal husbandry, trade, and industry during this period, made this family affluent and powerful. They held significant influence, akin to wearing the crown of a deceased king. Many of Iran's heroic and epic stories unfolded in Sistan during this era.

The third significant aspect of Sistan, particularly during the Sasanian era, was its profound religious significance. It turned into one of the main and crucial centers of the Zoroastrian religion. The Sasanians, who strongly adhered to their religious belief, regarded Sistan as a sacred land. The presence of one of their most significant fire temples there and the elevated status of religious leaders from Sistan in the Sasanian court exemplify this reverence.

The favorable environmental conditions, characterized by abundant water, fertile soil, mild weather, pastures, hunting opportunities, and trade, attracted various cultures such as Greeks, Scythians, and Parthians to Sistan. The influx of diverse ethnic groups with different professions and needs, along with the density of the population, which engendered competition, served as another driving force for progress and influence of Sistan's civilizations. Archaeological surveys and excavations conducted in Sistan, particularly in Shahr-i Sokhta, reveal the presence of a substantial population. Through their relentless endeavors, these inhabitants were able to establish industries, agriculture, commerce, livestock rearing, fishing, and other sectors, fostering growth and prosperity in response to the increasing needs of the residents.

Other than agriculture, industries, and trade, hunting and fishing played a significant role in sustaining the livelihoods during the Bronze Age. This is evident from the depiction of fish and birds on pottery fragments scattered across numerous areas in the southern vicinity of Rostam Castle. Bird hunting and fishing have always been occupations associated with a tribe known as Sayyad (Fisher) in Sistan. Therefore, alongside meeting public needs through crop cultivation, which received considerable attention due to the availability of ample water and fertile soil, it is crucial to acknowledge the provision of protein to the people through fishing and hunting.

At later times, the establishment of political borders and restrictions by governments impeded the growth of civilizations. The political borders demarcated by the British colonial rulers in the 19th century had a detrimental impact on Sistan, leading to its stagnation, cultural isolation, and the disruption of previous exchanges with closely-connected regions. As a result, Sistan lost its former dynamic and progressive nature, becoming marginalized in the realm of cultural and civilizational interactions. During the partition of Sistan, not only control over the Hirmand River water was given to Afghanistan but Sistan was additionally deprived of access to its crucial eastern territories.

The region experienced an environmental and cultural catastrophe as a result of this unjust partition. The people stripped of their control over Hirmand were unable to dredge the Ramrud to

restore its former state. Consequently, they lost the ability to construct a dam similar to the Rostam Dam at the southern entrance of Hirmand and cultivate the terraced plains of Sistan, particularly the areas of Ramrud and Houzdar, by constructing numerous canals. According to McMahon "As long as the lands of Traghon-Ramrud are in the hands of Iran and Kamal Khan Dam are in the hands of Afghanistan, these lands must remain without water. Because supplying water to these lands is possible only from the soil of Afghanistan, and that is impossible under the current conditions" (Ahmadi, 1999: 411). Consequently, Sistan will never be able to recreate its prosperous past. This situation can be observed in Bundahišn, which traces back to the mythological history of ancient Iranians. According to Farnabagh Dādegi (1990: 76), it is said about Afrasiab that he trampled a thousand springs, big and small, as high as a horse, as high as a camel, as high as a cow, and as high as a donkey in the Kayanseh Sea. In the same sea, he trampled the spring of Zaravmand, which is (except) Helmandrud Taft. He trampled the Vateni River and the six waters of Nauru in the same sea and drove out the people of Nashandeh." Afrasiab, representing the embodiment of drought, brought about the destruction of Sistan and forcibly displaced its inhabitants to Turkestan. However, even if Afrasiab had not done so, some of the people of Sistan would have migrated to other regions of Iran due to the drought. Furthermore, following the partition of Sistan and the diversion of the Hirmand River's water, and the closure of its dam by the Afghan

government, Sistan experienced a severe drought, leading many residents to abandon their homes and villages and relocate to other parts of Iran (Mehrafarin, 2002: 62).

Due to its strategic location on the trade routes connecting the civilizations of the Indus Basin and the northern Hindu Kush, as well as the Iranian plateau and the civilizations of the Mesopotamia Basin, Sistan held immense significance. This importance extends even to prehistoric civilizations.

The extensive network of communication routes between Sistan and its neighboring civilizations played a vital role in the growth and prosperity of the region during prehistoric, historical, and Saffarid periods. Along these trade routes, caravans were able to transport goods from the banks of the Hirmand River to the banks of the Indus as well as to the Kabul Valley. The northern routes served as a bridge connecting Sistan to Khorasan, Central Asia, and even the interior regions of Iran. However, there were instances where these roads were exploited by enemy forces to inflict destruction and devastation upon the area. The imposition of artificial borders within the closed ecosystem of Sistan disrupted this rule and transformed Sistan into an isolated region or a dead-end alley, destroying its previous commercial and cultural importance.

Conclusion

The alternating cycle of dryness and humidity is recognized as a significant factor influencing changes in the pattern and shape of settlements, and population size in Sistan. In order for archaeolo-

gists to identify and analyze ancient sites and their various components, including settlement structures from different time periods, they must possess knowledge of the region's hydrological, climatic and ecological changes as well as historical background. This understanding enables them to conduct extensive fieldwork accordingly.

Sistan has consistently attracted diverse ethnic groups in the past but the influx multiplied since the Bronze Age (3200 BC) due to its unique geographical conditions and favorable environment. Archaeological investigations reveal three distinct periods of widespread settlement activity in Sistan, interspersed with three periods of discontinuity. These periods are commonly referred to as the golden ages of Sistan and include:

1. The Bronze Age (3200 BC to 2000 BC);
2. The Achaemenid era until the middle of the Sasanian period;
3. The 6th to 8th century AH.

Conversely, no ancient artifacts have been discovered in Sistan from three specific periods:

1. The period preceding the Bronze Age (Copper Age);
2. The period from 2000 BC to the Achaemenid era (Iron Age);
3. The early Islamic period.

It is important to note that Sistan was a vast territory in the past, with a significant portion of it currently being in Afghanistan, which has yet to be fully explored archaeologically. It is highly probable that the conclusion drawn from the archaeological surveys of Sistan in

Afghanistan's Helmand, Nimruz, and Farah provinces may challenge or contradict existing findings.

The waxing and waning of civilizations in Sistan can be attributed to two primary factors, each comprising multiple components. These factors encompass natural and human elements, with particular emphasis on water, soil, climate, flora, and fauna, all of which have played significant roles in either fostering the growth or precipitating the decline of civilizations in Sistan. Among these, the role of water holds the utmost significance, as it has been instrumental in the growth and prosperity of cities and settlements in Sistan. However, a decrease

in water flow, either due to natural causes such as droughts and floods, or artificial causes like the closure of the dam in Upper Hirmand and the diversion of water, has led to their eventual collapse. While the human factor has often been responsible for the birth of civilization in this region, the invasion and plundering by foreign tribes, the forced displacement of its inhabitants, the destruction of dams in Lower Hirmand, and the manipulation of water flow through the closure of the dam in Upper Hirmand and the establishment of artificial political borders are regarded as the primary factors contributing to the downfall of civilizations in Sistan.

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