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PHOTO: A rock with a human hand pattern. Photo by: Amir Zafar Khan Zabol Gas Transmission Board

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Guide for Authors

Preface

The *Journal of Sistan and Baluchistan Studies (JSBS)* is devoted to South-Eastern Iran and welcomes articles in various areas of the world with a Sistan and Baluchistan legacy, especially adjacent areas such as Afghanistan, Pakistan, India, Oman, the Persian Gulf, and Central Asia with a chronological span from Paleolithic to Modern times. Contributions must be original and have not previously been published elsewhere. Please be ensure that there are no conflicts between the authors before submitting. Before being published, manuscripts submitted to the *Journal of Sistan and Baluchistan Studies (JSBS)* are critically reviewed. The purpose of the review is to reassure readers that the papers have been approved by competent and unbiased professionals. Manuscripts should be written in English, with the use of one spelling style throughout the entire manuscript. Both British and American spelling will be accepted. The manuscript should be submitted only via the *Journal of Sistan and Baluchistan Studies (JSBS)* the Editorial System (<http://www.jsbs.uoz.ac.ir/>). All papers are available free of charge at the Journal's webpage.

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The following types of contribution are published in the *Journal of Sistan and Baluchistan Studies (JSBS)*:

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Structure of Articles

The structure of the articles can be modified based on their subject. The text should be written in a succinct and cohesive manner, with an emphasis on significant points, conclusions, breakthroughs, or discoveries, as well as their broader relevance. All running text should be saved as a Word document with Times New Roman 12, 1.5 spacing. Figures and tables can be put within the text or at the bottom. Figures should have a high enough resolution to allow for refereeing.

Short communication consists of title page, text, acknowledgments, and references with figure and table captions.

The original research articles should contain the following sections:

Title page

The title page must contain the title that should be clear, intelligible to experts in different disciplines, and represent the substance of the article. Moreover, full name(s) of the author(s),

affiliation(s) of the author(s) containing the full name of the institution. The postal address and email address of the corresponding author must be mentioned.

Abstract

The title's information does not need to be duplicated in the abstract. The abstract should not be more than 350 words long. It must include the study's goal, methods, findings, and conclusions.

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Provide three – seven keywords, covering the most precise phrases in the article. They should explain the subject and results and should not be the same as the terms used in the title.

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State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

Material and methods

Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

Results

Results should be clear and concise.

Discussion

This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

Conclusions

The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

Appendices

If there is more than one appendix, they should be identified as A, B, etc.

Acknowledgments

Acknowledgments of persons, grants, money, and so forth should be included before the reference list in a distinct section.

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Curtis, J. (2012). *The Oxus Treasure*. London: British Museum Press.

Piperno, M. and Salvatori, S. (2007). *The Shahr-I Sokhtya graveyard (Sistan, Iran): excavation campaigns, 1972-1978*. Roma: ISIAO.

Chapter in an edited book

Vidale, M. (2020). Chlorite Containers from the Oxus civilization between technical choices and iconographic codes. In: B. Lyonnet, and N. A. Dubova, (eds.), *The World of the Oxus Civilization*. London: Routledge, pp.293-332.

Journal paper (electronic)

Perrot, J. (2008). Jiroft iv. Iconography of Chlorite Artefacts. *Encyclopædia Iranica*, 14, pp.656–664. [Online]. Available at: <https://www.iranicaonline.org/articles/jiroft-iv-iconography-of-chlorite-artifacts> [Accessed 25 August 2021].

Journal paper (printed copy)

Sajjadi, S. M. S. (2007). Wall painting from Dahaneh-ye Gholaman (Sistan). *Ancient Civilizations from Scythia to Siberia*, 13(1-2), 129–154.

Jarrige, J. F., Didier, A. and Quivron, G. (2011). Shahr-i Sokhta and the chronology of the Indo-Iranian regions. *Paléorient*, 37 (2), 7–34.

Website

Shahr-i Sokhta - UNESCO World Heritage Centre. [Online]. Available at: <http://whc.unesco.org/en/list/1456/> [Accessed 25 August 2021].

Thesis

Shirazi, R. (2008). *Etudes typologiques et comparatives des représentations humaines en terre crue, en terre cuite et en pierre de l'Asie centrale et de l'Iran oriental du Chalcolithique à l'âge du Bronze (4000-1800 av. J.-C.)*. Ph.D. Thesis. Panthéon-Sorbonne University.

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Figures should be used only if they clarify or reduce the text. All photographs, graphs, and diagrams should be referred to as a 'Figure' and they should be numbered consecutively (1, 2, etc.). Data should be presented only once in a graph or a table, not in both. Figures should be submitted in separate files. The required resolution is 300 DPI for greyscale images and at least 600 DPI for black-and-white drawings. All figures must be referred to in the text and the references should be typed in bold. Use (Fig.) at the end of the sentence and captions and use (Figure) in text.

Abbreviations

dates: 1980-1985, not 1980-85

pages: 250-275, not 250-75

following/s: f./ff.

centimeter/s: cm

meter/s: m

etcetera: etc.

circa: c.

videlicet: viz.

exempli gratia: e.g.

volume/s: Vol./Vols.

chapter: Chapt.

column: Col.

folio/s: Fol./Fols.

translator: transl.

second [II] century: 2nd century, etc.

century and millennium: never abbreviated

before Christ: BCE

after Christ: CE

plate/s: only when referring to author's plates within one's own text: Pl./Pls.

figure/s: only when referring to author's figures within one's own text: Fig./Figs.

fig./figs., pl./pls. in all other cases

note/s: fn./fns.

number/s: n./nn.

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ARCHAEOLOGICAL SURVEY OF THE ZAHEDAN-ZABOL GAS TRANSMISSION ROUTE

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Abstract: The Sistan sedimentary plain has been the habitat of various human communities in the past due to its favorable environmental conditions. Therefore there are many ancient hills and historical monuments in this area. Although this area is one of the important and rich ancient areas in East Iran, there are still many issues and uncertainties about the history of this area, and each of the existing works can answer many of these questions. Therefore, protecting such works against natural and human destructive factors is inevitable. The archaeological survey of the Zahedan-Zabol gas transmission route was carried out to identify the ancient sites on this route and protect them against any damage and destruction. Along the route designed to install the gas pipe, there are many ancient sites and important historical centers such as Shileh, Ramroud, Roud-Biaban, and Shahr-i Sokhta. This survey was conducted with an intensive and step-by-step method to identify and investigate all the sites of this important cultural area and thereby protect them from possible future dangers. In sum, 38 ancient sites and mounds were identified, and surface movable and immovable works, belonging to prehistoric, historical, and Islamic eras, were collected and documented. These cultural materials included 322 pieces of pottery and 157 index objects, all of which were categorized and studied. In this article, the authors try to provide a brief report of this study along with a description of the findings and results.

Keywords: Archaeological survey, Sistan plain, Ancient site, Gas transmission.

چکیده: دشت رسوبی سیستان به دلیل برخورداری از شرایط مناسب طبیعی در گذشته، استقرار گروه‌های مختلف انسانی را به خود دیده که نتیجه آن وجود تپه‌های باستانی و بناهای متعدد تاریخی است. از این رو این منطقه از پهنه‌های مهم و غنی باستانی در شرق کشور به شمار می‌رود، با وجود این، اما همچنان مسائل و ابهامات فراوانی درباره پیشینه این منطقه به جای مانده است که هر کدام از آثار موجود می‌تواند پاسخگوی بسیاری از این سوالات باشد. بنابراین حفاظت از این قبیل آثار در مقابل عوامل تخریب طبیعی و انسانی امری اجتناب‌ناپذیر است. بررسی باستان‌شناختی مسیر خط لوله انتقال گاز زاهدان به زابل با هدف شناسایی محوطه‌های باستانی موجود در این مسیر و محافظت از آنها در برابر هر گونه تعرض و تخریب به انجام رسید. در طول مسیر طراحی شده جهت قرار دادن لوله گاز تعداد زیادی از محوطه‌های باستانی و مراکز مهم تاریخی چون شيله، رامرود، رود بیابان و شهرسوخته قرار دارد، بنابراین روش بررسی در این طرح به روش پیمایشی فشرده و گام به گام انتخاب گردید تا تمامی محوطه‌های این محدوده مهم فرهنگی شناسایی و مطالعه گردند و از خطرات احتمالی مصون نگاه داشته شوند. در این بررسی، تعداد ۳۸ محوطه و تپه باستانی شناسایی گردید و آثار منقول و گاه‌ها غیر منقول موجود بر سطح این محوطه‌ها که بیانگر دوره‌های فرهنگی پیش از تاریخ، تاریخی و اسلامی است برداشت و مستندنگاری گردید. این مواد فرهنگی شامل تعداد ۳۲۲ قطعه سفال و ۱۵۷ شیء شاخص بود که تمامی آنها برداشت، دسته‌بندی و مطالعه گردید. در این مقاله تلاش نگارندگان بر این است تا گزارش مختصری از این بررسی به همراه شرح یافته‌ها و نتایج حاصل از آن را ارائه دهند.

کلیدواژه: بررسی باستان‌شناسی، دشت سیستان، محوطه باستانی، انتقال گاز.

I. Introduction

Archaeological research in Sistan, Iran has led to the identification of more than 1700 ancient sites from the prehistoric era to late Islamic centuries, which is unique in terms of the density of sites compared to the study area. The prehistoric sites mainly belong to the Bronze Age, and the historical sites include the Achaemenid, Seleucid, Parthian, and Sasanian periods. In the Islamic era, except for the early centuries AH, from the fourth century AH until now, there has been a continuous settlement in Sistan, Iran. Therefore, this plain has many dense ancient sites. Considering this issue, before the implementation of national development and construction projects, regular archaeological surveys should be done. Zahedan-Zabol gas transmission project is one of the country's construction projects, according to the plan, the area of archaeological

research was provided to the General Directorate of Cultural Heritage, Tourism, and Handicrafts. Along the route of gas transmission, there are many ancient sites and important historical centers such as Shileh, Ramroud, Roud-Biaban, Shahr-i Sokhta, and its satellite sites, which cover the period from the Bronze Age to the Islamic era. Based on this, the authors and the accompanying archaeology team conducted a step-by-step survey of the area to identify, protect, and save the ancient sites on this route. This research project was carried out with the official permission of the Cultural Heritage Research Institute in the early fall of 2020 for 28 days.

The most important objective of the archaeological survey of the Zahedan-Zabol gas transmission route was to identify and study the existing works on the gas pipe installation route. After that, the primary

protection measures were conducted, including the determination of the core zone, the suggestion of a buffer zone, and the landscape of the ancient sites. However, part of the study area (Tasuki area) was not easily accessible and surveyed due to the presence of dunes. Further, because of the movement of the dunes and flowing sand and the possibility of some ancient sites being hidden under sands and not being identified in the previous archaeological surveys, in this project, an attempt was made to survey the entire study area on foot to identify all the sites, which resulted in the identification of three ancient sites for the first time.

II. Methodology

Examining the sites can be done in different ways, depending on the research objectives, time, and research budget. Undoubtedly, the most effective archaeological surveys are those that are carried out systematically and with sufficient time on the ground surface. The surface survey is usually done by walking between lines or grids in the study area (Burke and Smith, 2004: 65). Archaeological survey, which is also called walking or visiting, refers to the detailed search of the ground in the study area, which is carried out methodically by several researchers (Renfrew and Bahn, 2010: 395).

Due to the landscape of the southern plain of Sistan and the large number of sites and ancient monuments in this area, the method of intensive and step-by-step survey was implemented. This route had a combination

of salt lands, dunes, sedimentary lands with clay structures, small Kaluts, and natural mounds. Based on the schedule and the number of survey team members, it was decided to survey a 200 m wide route step by step so that all man-made structures and ancient sites along the route are identified and protected from possible future dangers. Besides, all the identified ancient sites were mapped by the heli-shot photogrammetry and the visible core zone (according to the scattering of surface cultural materials) was laid out on it. This field survey was done with two teams, each consisting of 5 archaeologists. One team was responsible for participating in the field activity and the other team was responsible for recording information to speed up the report writing process. According to the width of the route, the distance of the archaeologists from each other was considered 40 m so that the survey could be carried out with high accuracy. By identifying each ancient site, the all members went to the site and described, photographed, collected surface cultural materials, and identified the area of distribution of the cultural materials, and investigated and recorded all correlations and dependencies of the site with other surrounding sites and natural features. The scope of this research project was from the Dashtak three-way area to Zabol County and the length of the route was about 100 km (Fig. 1). When necessary, the team members did not overlook the alternative routes, and every proposed route change in the gas transmission pipeline was made with the knowledge of the absence of cultural heritages in the new location.

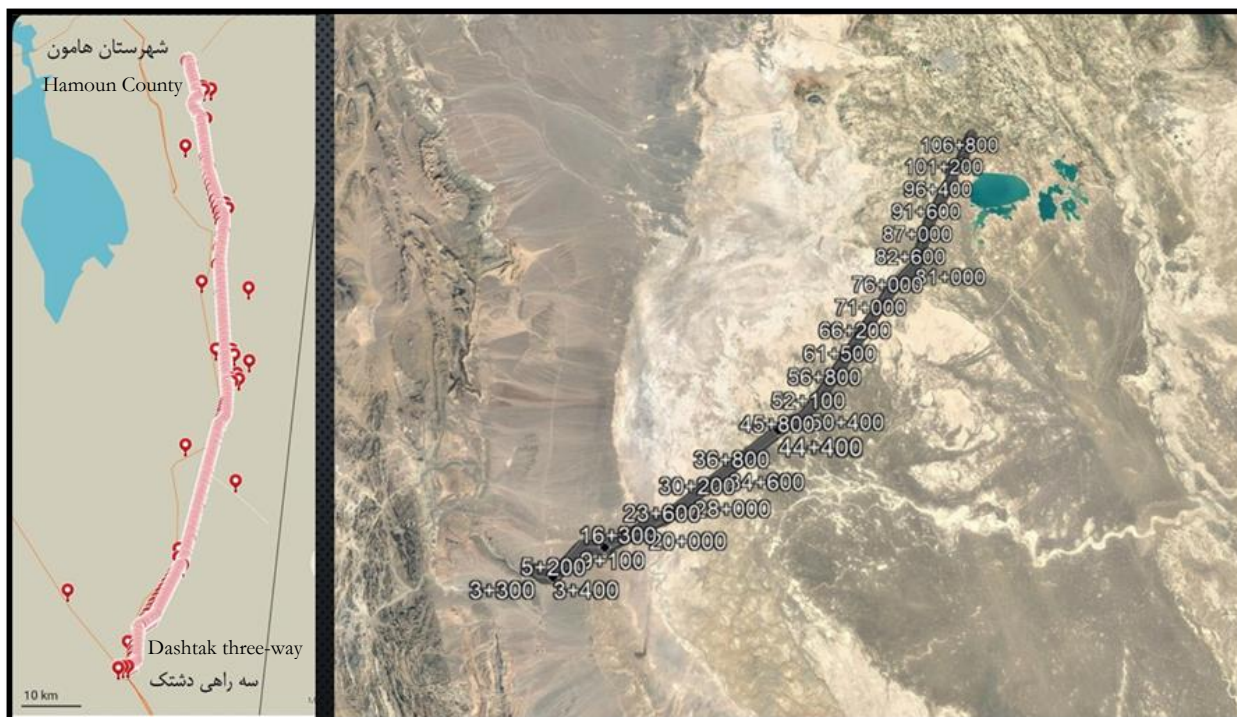


Figure 1. Aerial image and survey route map (Authors).

III. Geographical and Historical Overview of the Region

Sistan and Baluchistan Province has an area of about 187,502 km², equivalent to 11.5% of the country's total area. According to the latest political divisions of the country, this province is known as the largest province of Iran (Official Statistics of Sistan and Baluchistan, 2017: 37). The Sistan region is located in the northern part of this province. The Sistan Plain is a vast land on the eastern border of Iran with an area of about 8117 km² (Khosravi, 1989: 163). The Sistan Region includes five cities: Zabol, Zahak, Hirmand, Hamoun, and Nimrouz. Hamoun County is located in the southern part of Sistan and its center is Mohammadabad City

(Saadatian, 2019: 13) (Fig. 2). The study area is mainly located in the desert part of Sistan and within Hamoun County, and no modern settlement can be seen around this route.

More than 1700 ancient sites have been identified in the Sistan Plain of Iran, about 8000 km². These settlements belong to prehistoric, historical, and Islamic eras. Almost all the prehistoric sites belong to the Bronze Age and are contemporary with Shahr-i Sokhta. The sites of the historical era also include the Achaemenid, Seleucid, Parthian, and Sasanian periods. In the Islamic era, except for the early centuries, since the 4th century AH, we witness the continuity of residence in Sistan.

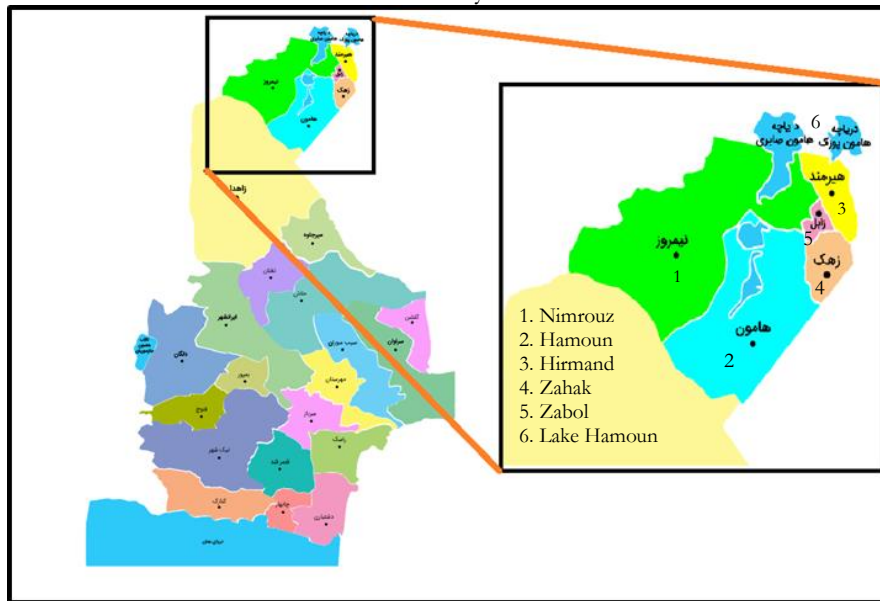


Figure 2. Map of Sistan and Baluchistan province, Sistan region (Authors).

IV. Background of Archaeological Surveys in Sistan

Like most regions of Iran, Sistan was also visited and studied by political and military advisors, orientalist, and tourists before it was studied archaeologically. Their reports contain valuable information, pictures, and maps of the region and its ancient artifacts, which are useful historical documents for the archaeological research of Sistan. Now more than a century has passed since the beginning of archaeological scientific activities in Sistan, Iran.

The first scientific survey of the Sistan Plain that led to the introduction of the valuable antiquities of the region was conducted by Sir Aurel Stein in 1915 and 1916 (Stein, 1928). In 1960, the Italian archaeological team headed by Umberto Cerato started an archaeological investigation in Sistan, which led to the identification of sites such as Dahan-e Gholaman, Qal-e Tepe, and Qal-e Sam (Mousavi Haji, 2002: 196). In 2004, Mousavi Haji carried out a methodical archaeological survey in the large site of Zahedan

Kohneh, during which he was able to determine the identity of this great city belonging to the middle Islamic centuries (Mousavi Haji, 2009). The survey of Zahak, one of the 22 districts of Sistan, in 2004 by Mehrafarin led to the identification of a large number of ancient sites belonging to the historical and Islamic eras (Mehrafarin, 2004). In 2007, the first phase of the archaeological survey of the landscape of Sistan was conducted under the supervision of Mousavi Haji and Mehrafarin in 11 geographical areas of Sistan, and as a result, 809 ancient sites were identified (Mousavi Haji and Mehrafarin, 2008: Vol. 1: 5-1). In 2008, the second phase of the survey was carried out in the remaining 11 geographical areas, and as a result, 854 ancient sites were identified and recorded (Mehrafarin and Mousavi Haji, 2018: Vol. 16: 2-5). In the end, it should be mentioned Sarhadi Dadian's archaeological surveys in the second phase of the Zahedan-Zabol Water Transmission Route (Sarhadi Dadian, 2018) and the survey and exploration of the water transmission route in the area of Zahedan Kohneh (Sarhadi Dadian, 2018).

V. Identified Sites

During this survey, 38 ancient sites were identified, and recorded, and their surface cultural materials were collected and documented (Fig. 3). As it was mentioned, these sites are located in the route of the gas pipeline with a width of 200 m and a length of 100 km, and they include different periods. According to the relative chronology obtained from the comparative typology of the surface data, especially the potsherds, the earliest findings belong to the third millennium BC, and the latest ones belong to the late Islamic centuries. 27 sites

were single period and 9 sites had data belonging to more than one cultural period. Two sites yielded no evidence of cultural indicators, so their chronology was not possible - there was non-indicative ancient evidence on the surface of these sites. In the following, based on the studies, the chronological table of the cultural and historical findings of the survey area is presented (Table 1). Based on relative chronology, the identified sites are divided into three groups: Bronze Age, historical, and Islamic eras, and will be evaluated and analyzed.

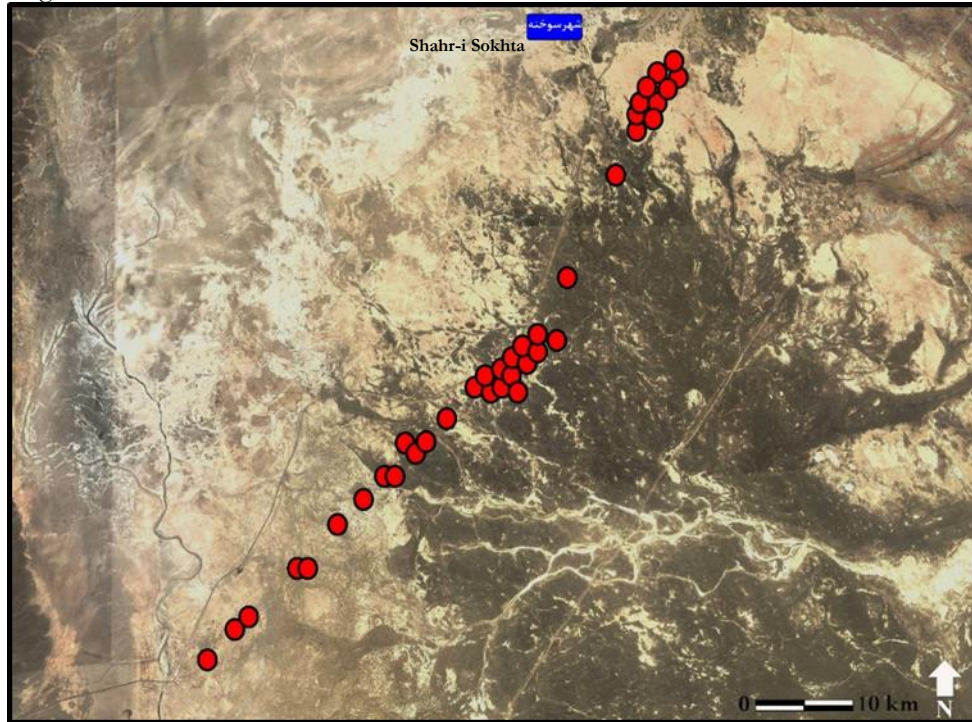


Figure 3. Distribution map of the sites identified in the survey of the gas transmission route (Authors).

Table 1- The relative chronology of the sites identified in the survey of the gas transmission route (Authors).

Chronology	Number of sites
Prehistoric era (Bronze Age)	17
Historical era	4
Islamic era	6
Prehistoric & Historical era	3
Prehistoric & Islamic era	1
Historical & Islamic era	4
Prehistoric & Historical & Islamic era	1
Without indicative cultural data	2

V.I. Bronze Age sites

South Sistan, or the desert part of Sistan, was prosperous from the mid-fourth millennium BC to the early second millennium BC due to various natural (proper environmental conditions) and cultural (being located on trade routes) reasons. The Shahr-i Sokhta site and the identification of more than 900 contemporary sites in this area confirm this claim. In the survey of the gas pipeline route, most of the identified sites belong to

the Bronze Age. Out of a total of 38 sites, 22 sites have settlement evidence of the Bronze Age, of which 17 single-period sites, three prehistoric and historical sites, one prehistoric and Islamic site, and one site also has evidence of all three eras, prehistoric, historical, and Islamic (Fig. 4). Four sites (no. 4, 15, 28, and 29) are important in terms of size, dispersion of cultural materials and variety of findings. In the following, the details of some of these sites are provided.

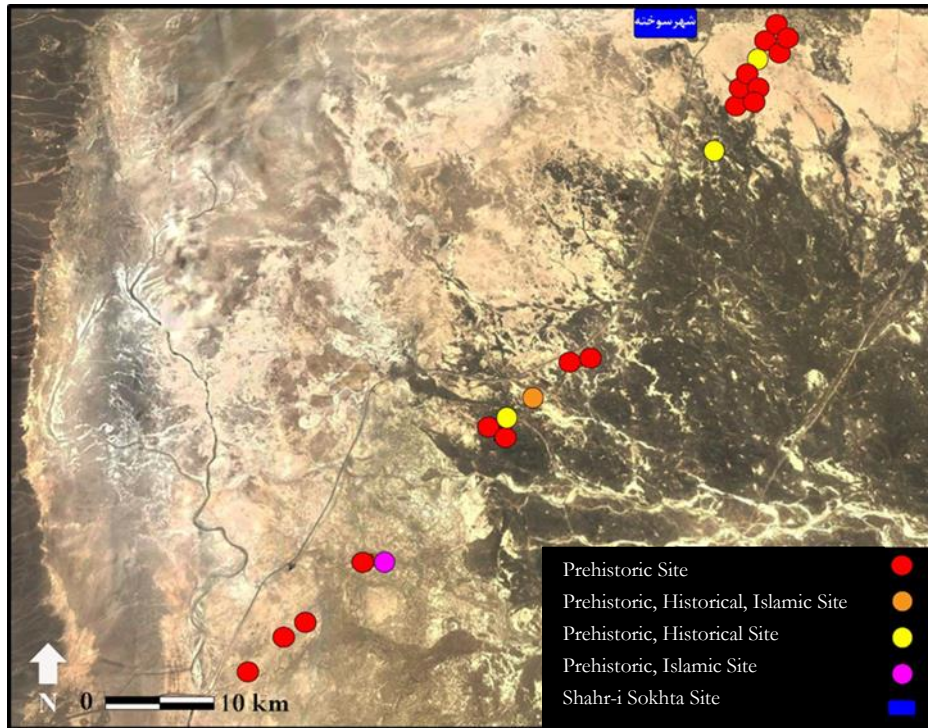


Figure 4. Distribution map of prehistoric sites identified in the survey of the gas transmission route (Authors).

Site no. 4, with an area of about 3.5 hectares and a maximum height of 5 m, is located about 50 m east of the gas pipeline (Figs. 5 and 6). The site is surrounded by low dunes, and on it, the bushes of Tamarix and Haloxylon have grown with a relatively low density, which has caused minor damage to the site. The density

and diversity of cultural materials on the surface of the site are very high and include simple and painted potsherds (Figs. 7 and 8), stoneware pieces (Fig. 9), stone objects and tools, stoneware, metal objects, metal smelting furnace slag, unspecified bone evidence, and evidence of several furnaces.



Figure 5. Site no. 4 and the density of surface cultural materials (Saadatian, 2020).

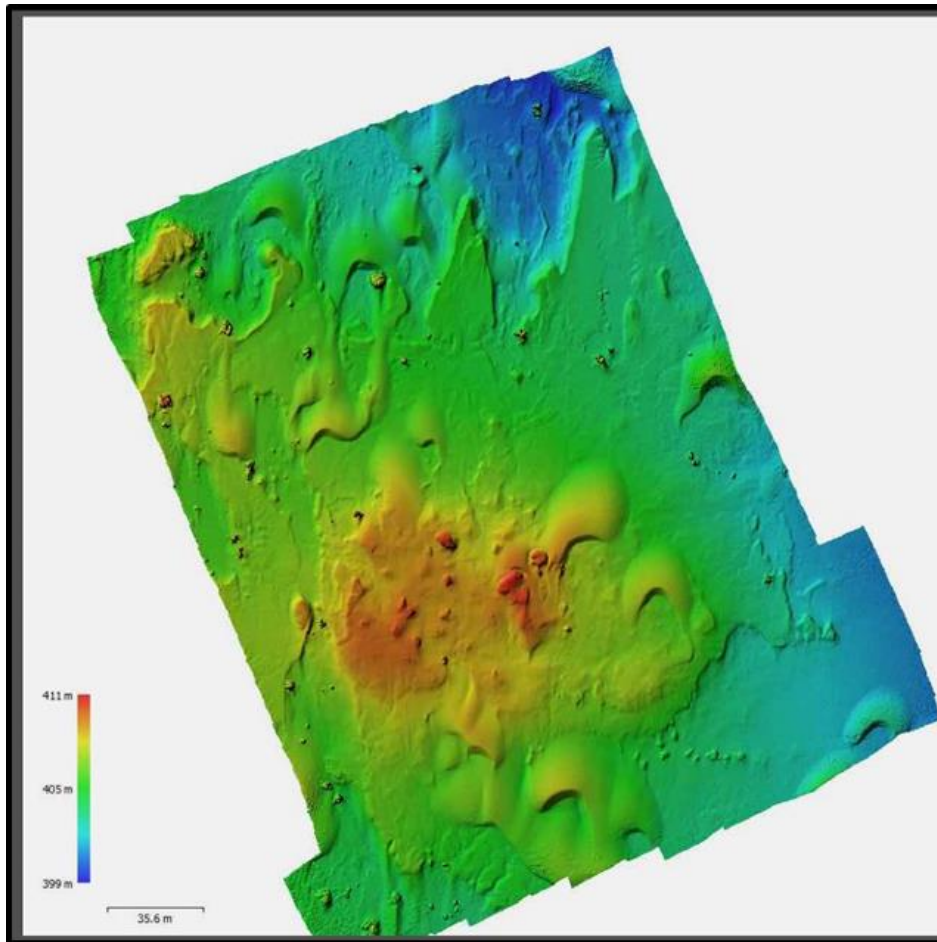


Figure 6. Photogrammetric map of site no. 4 (Saadatian, 2020).



Figure 7. Surface pottery collected from site no. 4 (Saadatian, 2020).

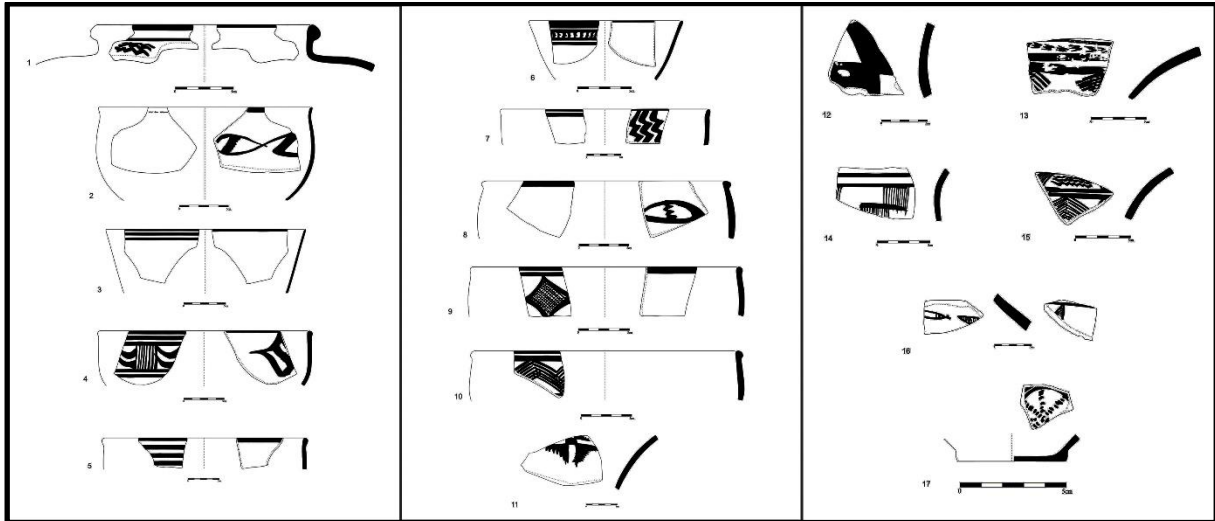


Figure 8. Designs of surface potsherds collected from site no. 4 (Saadatian, 2020).



Figure 9. Fragments of a stone vessel found at site no. 4 (Saadatian, 2020).

Site no. 15, with an area of about 2.5 hectares and a maximum height of 3.5 m, is located 50 m east of the gas pipeline (Fig. 10). In addition to the main mound, there are several mounds on its eastern side. Architectural remains (probably furnaces) are visible in

the northeastern part of the site. The density of cultural materials on the surface of the site is very high and includes simple and painted potsherds (Figs. 11 and 12), stone vessels (Fig. 13), stone objects and tools, semi-precious stones, and metal slag.



Figure 10. Site no. 15 (Saadatian, 2020).



Figure 11. Surface potsherds collected from site no. 15 (Saadatian, 2020).

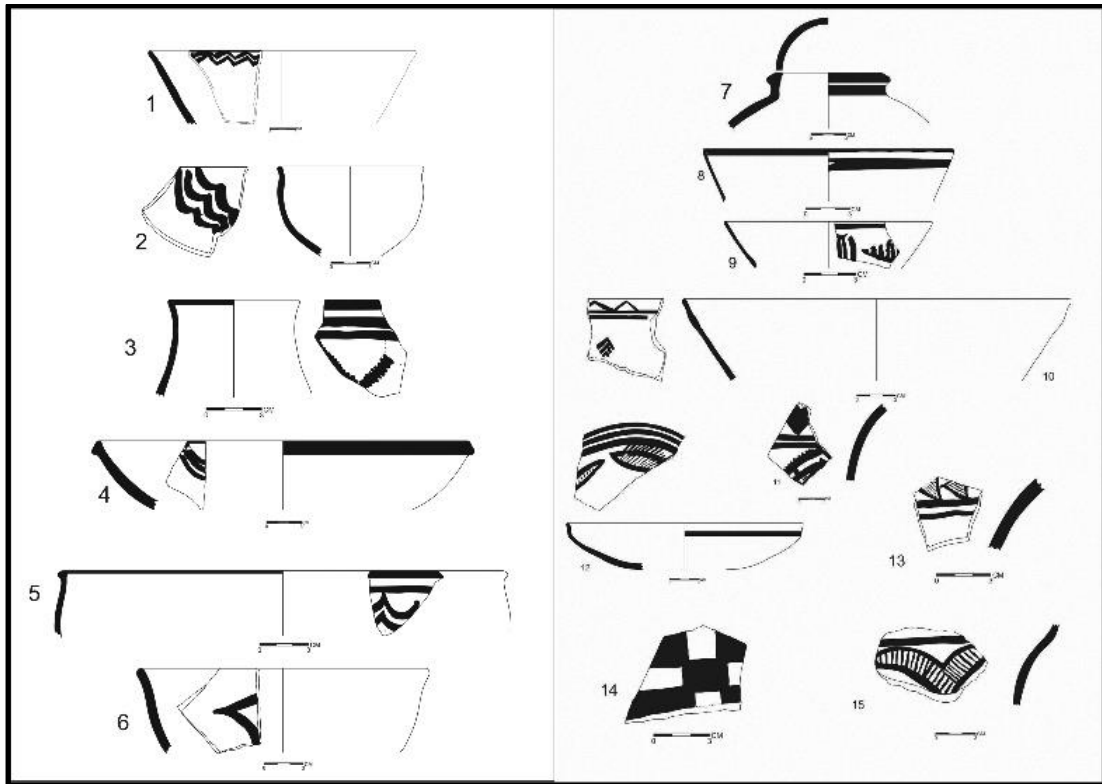


Figure 12. Designs of surface potsherds collected from site no. 15 (Saadatian, 2020).

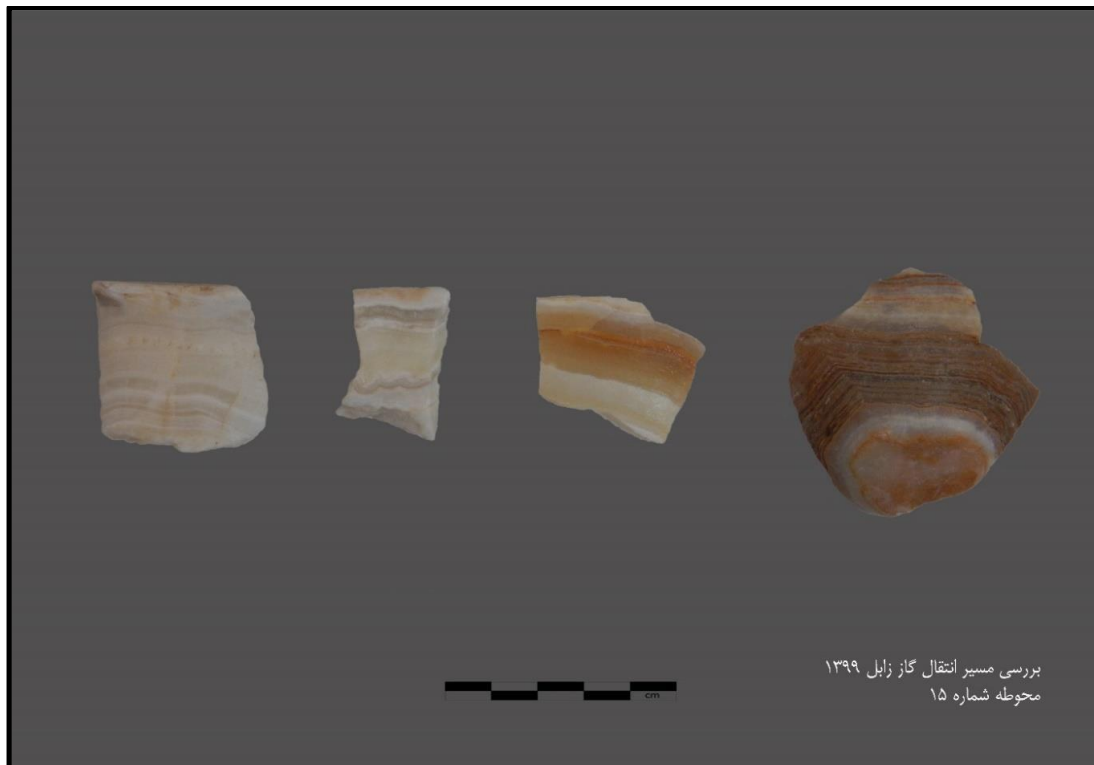


Figure 13. Fragments of a stone vessel found at site no. 15 (Saadatian, 2020).

V. II. Historical Sites

The sites belonging to the historical era are not very significant compared to the sites belonging to the Bronze Age and the Islamic era of the area. Due to the change of the Hirmand River to the north of Sistan during the historical era, important settlements such as the Dahan-e Gholaman, Qal-e Sam, and the complex of Khajeh mountain sites are concentrated in the northern Sistan region. Although the number of sites related to the historical era, especially the Parthian sites, is high in South Sistan, considering the size of the sites as well as the distribution and variety of surface data, these sites

are probably related to the nomadic subsistence system. Settlement evidence related to the historical era was found from 12 sites, of which four single-period sites, three prehistoric and historical sites, four historical and Islamic sites, and one site also has evidence of all three eras, prehistoric, historical, and Islamic (Fig. 14). All historical sites were related to the Parthian period and no other evidence from other historical periods were identified. The distribution of the surface cultural materials of these sites was not much, and therefore, many indicative samples for design, typology, and chronology were not collected (Fig. 15).

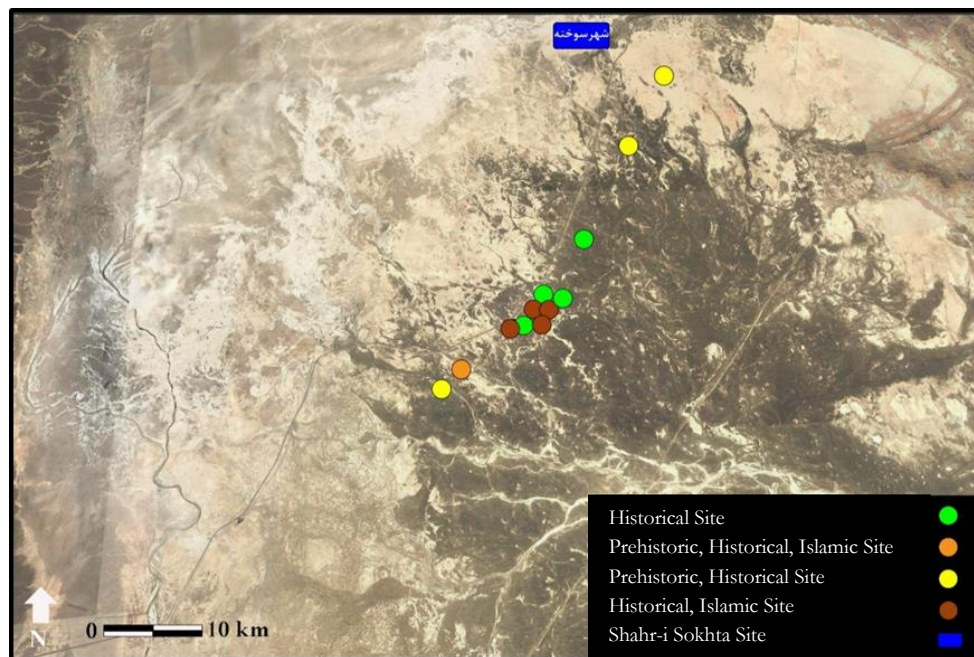


Figure 14. Distribution map of historical sites identified along the gas transmission route (Authors).

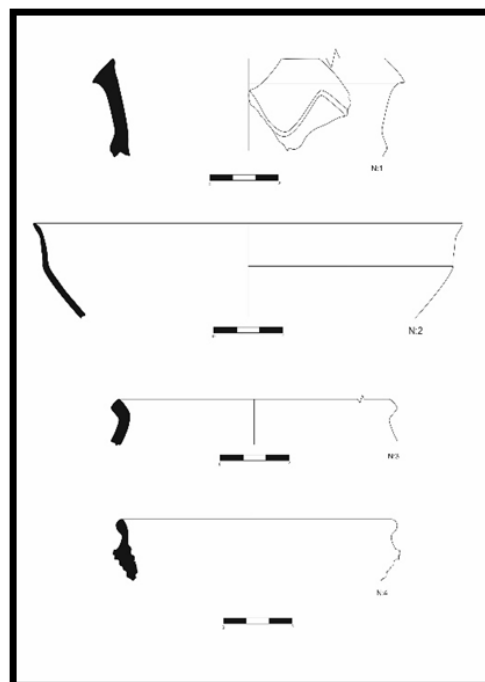


Figure 15. Designs of surface potsherds collected from the survey of the gas transmission route (Authors).

V. III. Islamic Sites

Since most of the sites identified in this survey are located in the geographic areas of Girdi and Shileh in South Sistan, and based on historical sources and archaeological research, this part of Sistan in the middle Islamic centuries (6th to 10th centuries AH) has been very important and prosperous, the chronology of the Islamic sites identified in this survey did not face any particular problem. The presence of prominent castles such as Girdi Castle and Ramroud Castle, not too far from the Islamic sites, shows the connection and interconnectedness of these works. Among the 38 sites

identified, 12 sites have settlement evidence related to the Islamic era, out of which 6 single-period sites, one prehistoric and Islamic site, 4 historical and Islamic sites, and one site also has settlement evidence of all three periods (Fig. 16). Among the important sites, it can be mentioned site no. 8, which is very rich in terms of distribution and variety of cultural materials. This site with an area of more than four hectares is located 6 km east of the Zabol-Zahedan road, and the proposed route of the gas pipeline passes exactly through its center. The remains of several furnaces can be seen in the eastern part of this site (Fig. 17).

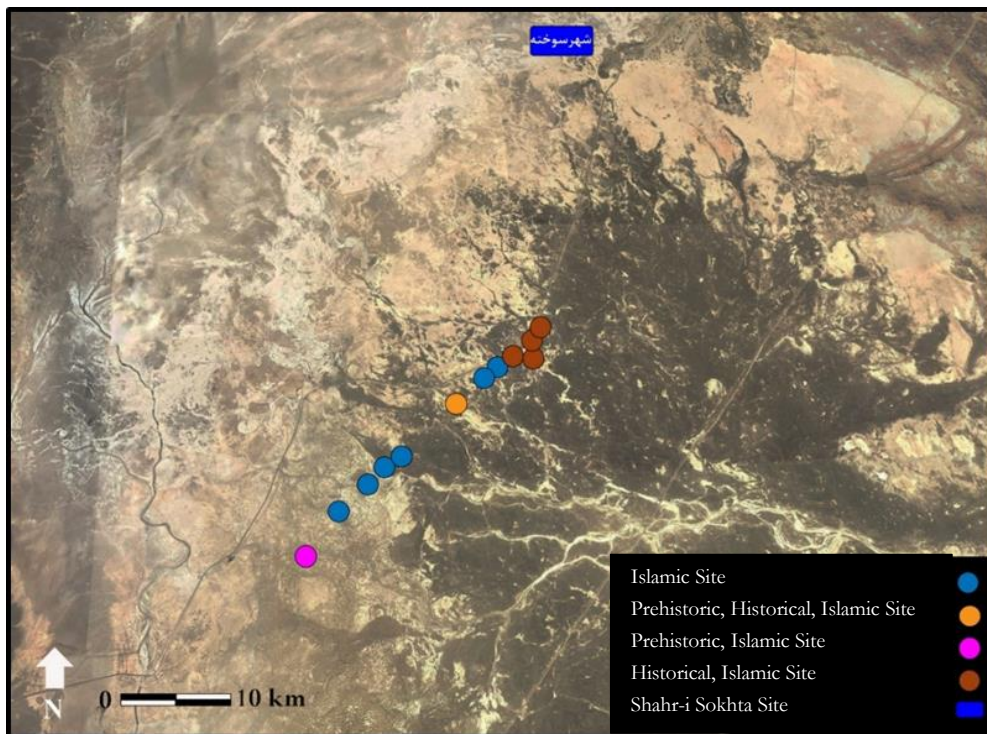


Figure 16. Distribution map of the Islamic sites identified in the survey of the gas transmission route (Authors).



Figure 17. Furnace remains; Site no. 8 (Saadatian, 2020).

The surface findings of this site include simple, painted, glazed, and unglazed potsherds (Fig. 18), copper coins (Fig. 19), a brick with a human hand pattern (Fig. 20), glass vessels (Fig. 21), and stone tools. According to the distribution of Islamic buildings

around the site, there was probably an important urban settlement belonging to the middle Islamic centuries in this area. It should be noted that Girdi Castle is located about 4 km south of this site and Ramroud Castle is located 3 km west of it.



Figure 18. Painted glazed potsherds; Site no. 8 (Saadatian, 2020).

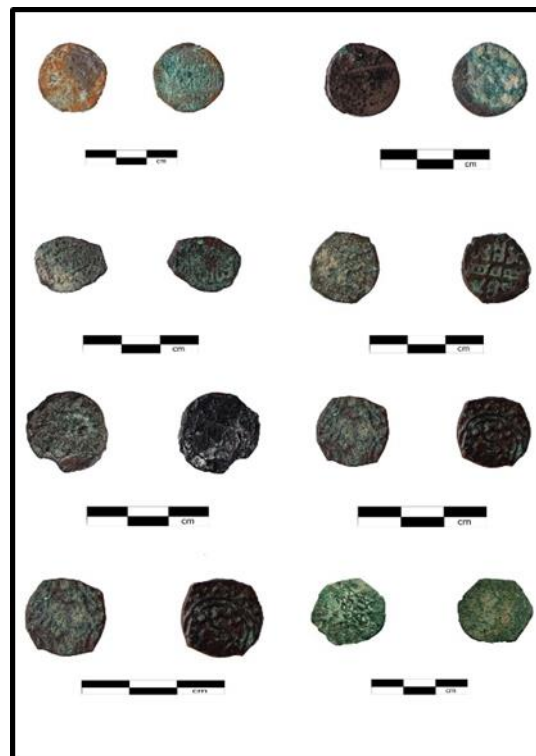


Figure 19. Copper coins identified from the survey; Site no. 8 (Authors).



Figure 20. A brick with a human hand pattern; Site no. 8 (Saadatian, 2020).



Figure 21. Glass vessels and objects obtained from the survey; Site no. 8 (Saadatian, 2020).

VI. Conclusion

In the archaeological survey of the Zahedan-Zabol gas transmission route, 38 ancient sites were identified with evidence of settlements from the Bronze Age, the historical era (Parthian period), and the Islamic era (6th to 10th centuries AH). Due to the nature of this investigation, it is not possible to analyze the distribution of the identified sites in different periods without paying attention to the results of previous archaeological research in this area. Out of 38 sites identified, 27 have evidence of the Bronze Age and are contemporary with Shahr-i Sokhta. Sites 4 and 15 are very important in terms of distribution and variety of surface data. The favorable environmental conditions of this part of Sistan in the Bronze Age caused the formation of many settlements due to the presence of water resources, especially the Roud-Biabab River as one of the main branches of the Hirmand River and Lake Hamoun. In the survey of Sistan's landscape, about 900 contemporary sites with Shahr-i Sokhta have been identified in South Sistan. So far, no settlement

from the Bronze Age to the beginning of the Achaemenid period has been identified in Sistan, Iran. This era is known as a historical gap in Sistan. In this survey, there was no evidence of settlement in this period. It seems that with the change in the environmental conditions of the region, i.e. the change of the direction of the Hirmand River and the drying up of its main branches, especially the Roud-Biabab River, this area has been abandoned.

From the middle of the first millennium BC and with the domination of the Achaemenids to the end of the Sassanid period, the conditions for the settlement of human societies in Iran's Sistan (North and South Sistan) became favorable again. The identification of more than 700 sites belonging to this era confirms it. In the survey of the pipeline route, 12 sites had historical settlement evidence. By carrying out a comparative typology of pottery samples, it was determined that all the historical sites belonged to the Parthian period. Sistan had a special importance and position, and a large population in the Parthian period, so that more than 400

sites belonging to this period have been identified in the Sistan region of Iran. In terms of the size of the sites as well as movable and immovable findings, the Parthian sites of the desert part of Sistan are not very significant. Important settlements such as cities and castles, of which there are several instances in North Sistan, have not been identified in South Sistan. Not many significant findings were obtained from the Parthian sites identified in this survey. It seems that according to the environmental conditions of this period in South Sistan, a nomadic subsistence system was going on.

The second important historical gap of Iran's Sistan is related to the early Islamic centuries. In previous surveys, no settlement related to the 1st to 4th centuries AH was identified. In this survey, 12 sites with settlement evidence of the middle Islamic era (6th to 10th centuries AD) were found. The chronology of the sites is based on comparative typology. The existence of

castles such as Girdi and Ramroud in this part of Sistan, along with tombs and industrial spaces that all belong to the middle Islamic centuries, strengthens the possibility of the existence of large and densely populated cities and settlements on the banks of the Roud-Biaban River.

An important point to be noted is the large number of settlements and the concentration of cultural and historical findings in this area. 38 ancient sites identified with the implementation of the Zahedan-Zabol gas transmission project are under threat and destruction. This shows the necessity of conducting archaeological research before the implementation of construction and infrastructure projects in the country. Protection and study of these ancient sites and monuments can be very useful in understanding the cultural and historical evolution of the Sistan region.

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ARCHAEOLOGICAL CHEMISTRY: A BRIDGE BETWEEN CHEMISTRY AND
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Abstract: The review takes into consideration the importance of chemistry in the study of the human past, mainly, for the authentication and the provenience determination as well as the characterization of archaeological artifacts. Archaeological chemistry is an unbreakable linkage between archaeology and chemistry and has rapidly grown in the last few decades. The use of chemistry in archaeology can help archaeologists provide valuable information for the learning of archaeological sites and artifacts. Over the years, new chemical techniques have been improved, and the vital role of chemists in evaluating the development of technology and other activities of ancient civilizations has been increased. In addition to discovering the past, chemists should consider the physicochemical and analytical degradation procedures for preserving the heritage of humanity for our children and the next generations to enjoy, benefit, and learn from the legacy of the past. Furthermore, here, some commonly used analytical techniques such as neutron activation analysis (NAA), inductively coupled plasma (ICP), gas chromatography-mass spectrometry (GC-MS), X-ray diffraction (XRD), and X-ray fluorescence (XRF) are briefly described regarding their use for archaeological artifacts. We hope that this article will be helpful for students who are new to the field, in addition to interesting productive argument among experienced researchers.

Keywords: Archaeological chemistry, Analytical methods, inductively coupled plasma (ICP), neutron activation analysis (NAA), X-ray diffraction (XRD), X-Ray fluorescence (XRF).

چکیده: این کار اهمیت شیمی را در مطالعه گذشته بشر، عمدتاً برای احراز هویت و تعیین منشأ و همچنین توصیف آثار باستان‌شناسی را نشان می‌دهد. شیمی باستان‌شناسی پیوندی ناگسستنی بین باستان‌شناسی و شیمی است که در چند دهه اخیر توسعه یافته است. کاربرد شیمی در باستان‌شناسی به محققین کمک می‌کند تا اطلاعات ارزشمندی از مکان‌ها و آثار باستانی بدست آورند. با گذشت زمان، روش‌های شیمیایی تکامل یافته و نقش کلیدی شیمی‌دانان در مطالعه تمدن‌های باستانی افزایش یافته است. علاوه بر کشف گذشته، شیمی‌دانان باید به فرآیندهای فیزیکی، شیمیایی و تجزیه‌ای که می‌توانند موجب تخریب آثار بازماندگان شود توجه کنند و آن را برای فرزندان ما و نسل‌های بعدی به درستی حفظ کنند. در این مقاله، همچنین برخی از تکنیک‌های شناسایی متداول آثار باستانی مانند آنالیز فعال‌سازی نوترون (NAA)، پلاسمای جفت شده القایی (ICP)، طیف‌سنجی جرمی-کروماتوگرافی گازی (GC-MS)، پراش اشعه ایکس (XRD) و فلورسانس اشعه ایکس (XRF) به‌طور مختصر توضیح داده شده است. امیدواریم این مقاله برای دانشجویان و محققان رشته شیمی و باستان‌شناسی مفید واقع شود.

کلیدواژه: شیمی باستان‌شناختی، روش‌های آنالیزی، پلاسمای جفت شده القایی (ICP)، تجزیه و تحلیل فعال‌سازی نوترون (NAA)، پراش اشعه ایکس (XRD)، فلورسانس اشعه ایکس (XRF).

I. Introduction

Archaeological chemistry, as a subclass of archaeometry, is the study of the human past, mainly, the authentication and the provenience determination, and characterization of archaeological objects through the analysis of material leftovers. Cultural evolution can be tracked in the continuing growth of the stone implements manufactured and the materials used by early humans. In the course of time, objects were prepared from native metals like gold, silver, and copper. As time passed, fire was applied to modify the physical features and the composition of some materials. Accordingly, solid objects including pottery, glass, and metals have chemical compositions that come from the natural or synthetic chemicals used through the development of human skills. Analytical methods can provide the data to answer many critical scientific questions in archaeological research. The usage of chemical analysis to improve our understanding of ancient materials, culture, technology, and society is not

new. Archaeological chemistry was begun by chemists (Pollard, 2007; Price & Burton, 2010; Nigra et al., 2015). John W. Mallet (1852) was the pioneer of chemical investigations of Celtic artifacts, in the 1880s. Mallet investigated the chemical compositions of the sources of the raw materials used and evaluated the data with his geological information. Accordingly, he established that through the early Christian period, the Celts utilized just native gold before it was possible to extract silver from ores. Since these early days, analytical methods have been developed, and the key roles of chemists in archaeology have been highlighted. A lot of elements and isotopes have been considered in the study of provenience. For instance, for a long time, Lead isotopes have been considered to identify the sources of bronze artifacts (Liu et al., 2018; Oudbashi et al., 2021). In general, bronze is comprised mostly of copper with about 12-12.5% tin and other metals. Copper or tin can separately include a small amount of highly radiogenic lead with the different ratios, which permits to identify

of their possible areas. Using the carbon and nitrogen isotopes from organic residues (e.g. wood, hide, bone, antler, and thatch, etc.) human diets, climate, and other aspects of the past can be studied. There are various other examples of the application of archaeological chemistry in exploring and understanding the past.

Archaeological chemistry is a continually developing field, and with new techniques and instruments come new information in detailed chemical studies of archaeological objects, helping to decrease the problems of data management and the deterioration of value added artifacts and materials. For careful analysis, the condition of the sample as very rare or valuable ingredients, the sample preparation procedure, the use of destructive or non-destructive testing techniques must be considered before the experiment run. Many apparatuses involve destructive sample preparation methods in powder or liquid forms. For instance, neutron activation analysis (NAA) and XRD use samples in powder forms. In addition, some instruments such as ICP and GC-MS are intrinsically destructive analytical techniques. In archaeological chemistry, it is vital to have a balance between key aspects of protecting and maintaining the heritage of humanity for the next generation and the importance of learning as much as we can about them.

In the following section, we give an overview of the most used and efficient tools in archaeological chemistry.

II. Neutron Activation Analysis (NAA)

Neutron activation analysis, discovered in 1936, is an instrumental technique for determining the concentration of elements through the measurement of gamma rays emitted from temporarily radioactive elements of a sample that was irradiated by neutrons. The energies of gamma rays are specific for each element and allow the identification and measurement concurrently. Various types of stone are analyzed by means of NAA, but since it is needed to grind samples into powder forms for analysis, this technique is destructive. There are a number of different neutron sources, but nuclear (uranium fission) source with high fluxes is the most sensitive mode. However, there are some obstacles such as the convenient use of NAA and disposing nuclear waste which limit the application of such reactors.

III. Inductively Coupled Plasma Mass Spectrometry (ICP-MS)

Inductively coupled plasma (ICP) can generate a torch with temperature between $\sim 6,000$ K and $\sim 10,000$ K (~ 6 eV – ~ 100 eV), which results in the degradation of the samples to individual elements and hence, this technique can be used for the rapid determination of trace element concentrations and elemental (or isotope)

ratios. ICP systems are capable of analyzing most elements (~ 82 elements) in the periodic table simultaneously. Based on the detection method, it can be classified into inductively coupled plasma optical emission spectroscopy (ICP-OES), of which the quantitation is based on measurements of the intensity of characteristic wavelength of the goal element, and inductively coupled mass spectrometry (ICP-MS) (Al-Hakkani, 2019) which measures an atom's mass. ICP-MS can be applied to sense very low concentrations (as low as parts per trillion, ppt) in comparison to ICP-OES (as low as parts per billion, ppb). For both techniques, the solid must be completely digested (dissolved) before injection into the instrument. As a hybrid mass spectrometer, multi-collector ICP-MS (MC-ICP-MS) can be used for high-precision measurements of isotopic compositions even at lower levels than those of ICP-MS.

IV. Gas Chromatography-Mass Spectrometry (GC-MS)

The GC-MS instrument combines two powerful techniques to separate and identify volatile organic compounds (approximately boiling points below 350°C) by the mass of each molecule/fraction as a function of retention time. It is one of the common tools for analyzing organic archaeological materials such as visible and absorbed pottery residues, pigments, binders, and other organic residues (Reber, 2020). It is important that the identity of the material is verified by comparing the GC-MS chromatograms with those of known materials.

V. X-Ray Diffraction (XRD)

X-ray diffraction (XRD) patterns are produced by the interaction of incident X-ray and power crystal samples (Holder & Schaak, 2019). The crystal planes in crystalline materials have distances equal to the X-ray wavelength and yield diffraction of X-rays with regions with increased or decreased X-ray intensity (Ali et al., 2022). XRD is one of the most powerful methods to investigate structures and composition of crystalline materials (inorganic and organic materials), crystalline orientation, crystal size (Scherrer equation), phase transformation, and crystal defects. The position of diffraction peaks associates with the interplanar distance based on Bragg's law:

$$n\lambda = 2d\sin\theta$$

where n is an integer number, λ is the wavelength of the X-ray source, d is the distance of near diffracting planes, and θ is the incident angle of the X-ray source.

Sample phase purity can be confirmed by comparing the experimental powder pattern with a reference pattern that is either simulated or achieved from an existing one. In archaeology, XRD is usually used to identify the minerals existing in ceramics, rock, and

sediment samples. The next advantage of the XRD technique is that the instrument is portable and allows simultaneous and real-time monitoring. However, it is needed to prepare powdered samples for careful analysis.

VI. X-Ray Fluorescence (XRF)

The X-ray fluorescence technique is the most common non-destructive tool for the identification of the type and amount of elements in an archeological sample of various forms through the determination of the wavelength and intensity of the X-ray fluorescence (or secondary waves) emitted from different atoms in the solid induced by X-ray beams (Pushie et al., 2014). However, elements lighter than magnesium are difficult to measure directly by XRF. XRF portable instruments permit fast and in-situ analyses.

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VII. Conclusion

In summary, we have outlined an overview of the chemistry in archaeology and the most common techniques used in the field. Indeed, archaeological chemistry is the study of the past through chemistry, art, and geology. Portable XRD and XRF are now available as small and light units for fast and in-situ characterizations. Archaeological chemistry is a developing and growing field, and with new techniques/portable instruments come new developments and information updates.

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ARCHAEOLOGICAL SURVEYS OF ANAR COUNTY, KERMAN PROVINCE

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Abstract: Archaeological surveys are the first phase in archaeological studies. Identifying the historical works in a geographical area, in addition to knowing the historical-cultural evolutions of that area is also very important from the administrative and executive point of view in the face of construction plans, and urban and rural development. Having sufficient knowledge of the historical sites of a particular geographical area increases the possibility of preserving historical monuments in the face of construction projects. Kerman, the country's largest province, is located in the southeast of Iran. This province is considered one of the main historical-cultural centers and one of the richest archaeological regions of Iran. Due to the climatic and environmental diversity and the diversity of plant, animal, and human habitats, this region has attracted human groups since prehistoric times. Anar County in the north of Kerman province and adjacent to Yazd province is one of the driest and most desert parts of Kerman province where no coherent archaeological studies have been conducted before. In 2021, archaeological surveys of this city were conducted to complete the archaeological map of the country. During these surveys, 120 cultural-historical works were identified, of which the earliest works are related to the Epipalaeolithic period, and the latest works are related to the late Islamic era (Qajar/Pahlavi). The identified works are divided into 6 different groups including 6 sites, 49 aqueducts, 15 water structures, 7 religious buildings, 39 historical monuments, and 4 historical contexts. Among these findings, 17 works have been registered in the list of national works of Iran.

Keywords: Archaeological survey, Kerman, Anar County, Settlement pattern, Relative chronology.

چکیده: بررسی‌های باستان‌شناسی نخستین گام، مطالعات باستان‌شناختی است. شناسایی آثار تاریخی موجود در یک منطقه جغرافیایی علاوه بر شناخت تحولات تاریخی - فرهنگی منطقه، از لحاظ اداری و اجرایی نیز در مواجهه به طرح‌های عمرانی، توسعه شهری و روستایی نیز بسیار حائز اهمیت هستند. داشتن شناخت کافی از مکان‌های تاریخی منطقه جغرافیایی خاص در مواجهه به طرح‌های عمرانی، امکان حفظ آثار تاریخی را افزایش می‌دهد. استان کرمان به عنوان پهناورترین استان ایران جنوب شرق ایران قرار دارد. این استان یکی از مراکز اصلی تاریخی ایران و از لحاظ باستان‌شناسی، یکی از غنی‌ترین نواحی ایران محسوب می‌شود که با توجه به گوناگونی‌های اقلیمی و محیطی و تنوع زیستگاه‌های گیاهی، حیوانی و انسانی، منجر به جذب گروه‌های انسانی از ادوار پیش از تاریخ تاکنون شده است. شهرستان انار در شمال استان کرمان و مجاورت استان یزد یکی از خشک و بیابانی‌ترین بخش‌های استان کرمان است که تاکنون مطالعات باستان‌شناختی منسجمی در آن صورت نگرفته بود. در سال ۱۴۰۰ خورشیدی بررسی‌های باستان‌شناسی این شهرستان با هدف تکمیل نقشه باستان‌شناسی کشور انجام شد. طی این مطالعات ۱۲۰ اثر فرهنگی - تاریخی شناسایی شد که از لحاظ گاهنگاری، قدیمی‌ترین آثار مربوط به دوره فرابرونسنگی و جدیدترین مربوط به دوران متأخر اسلامی (قاجار/ پهلوی) است. آثار شناسایی شده به صورت کلی به ۶ کلاس مختلف شامل: محوطه (۶ اثر)، قنات (۴۹ اثر)، سازه‌های آبی (۱۵ اثر)، بناهای مذهبی (۷ اثر)، بناهای تاریخی (۳۹ اثر) و بافت‌های تاریخی (۴ مورد)، تقسیم شده‌اند که از این میان ۱۷ اثر در فهرست آثار ملی ایران ثبت شده‌اند.

کلیدواژه: بررسی باستان‌شناسی، کرمان، انار، الگوی استقرار، گاهنگاری نسبی.

I. Introduction

Kerman Province, located in the southeast of Iran, with a population of 3,164,718 (according to the report of the Iranian Statistics Center in 2016) is the ninth most populated province in the country. Kerman with an area of 183,193 km² (almost the size of Syria) covering more than 11% of Iran's area, is the largest province of Iran. Further, Kerman is one of the most important and historical provinces of the country. Kerman City is the most important city in the southeast of Iran. In addition, Kerman Province has more than 660 registered national

works, of which 7 works have been registered in the UNESCO World Heritage (Fig. 1).

Anar County is located in the northwest of Kerman province. Anar District became a county in June 2009. Anar County (the central district of the county), Amin Shahr and Hossein Abad, Deh Raees, and Torab Abad districts are other parts of this county. Anar County borders Yazd Province from the north and northwest, Rafsanjan County from the east and southeast, and Shahr Babak County from the west and southwest. The occupation of the majority of the people of Anar County is agriculture, but due to the lack of water and

the poor quality of water, the only product that still resists and is cultivated is pistachio.

The Geography of Kerman Province during the Naseri period is the first book about the geography of Kerman, including the provinces of Kerman, Hormozgan, and Sistan and Baluchistan during the Qajar period. This book was written in 1824 by the order of "Naser al-Din Shah" under the supervision of "Etimad al-Saltaneh", and by "Khawaja Mohammad Amin Monshi Kermani". According to this book: "The Anar block is a block that is located 30 Farsangs from Yazd, 18 Farsangs from Bafq, and 18 Farsangs from Marvast, which is the border of Fars, and 18 Farsangs to Shahr Babak, and 9 Farsangs to the Dehaj village, one of the villages of Shahr Babak at the beginning of Shahr Babak (Monshi Kermani & Bastani Parizi, 2012: 241).

The book "Geography of Kerman" was written by Ahmad Ali Khan Vaziri during the Qajar period around 1871. According to this book: "Anar is located 36 Farsangs from the northwest of Gwashir (the old name of Kerman), in the west of Bafq and Zarand, in the north of Rafsanjan, in the east of Shahr Babak, and in the south of Yazd. Anar, from Bayaz to Zain al-Din, is 14 Farsangs from Yazd" (Vaziri, 1998: 295).

According to the Kerman villages, appendix to the book "Kerman Geography": There are many agricultural areas in Anar, between the west and the north of the city, Behesht-e Temthal - from the north, it is connected to Yazd, from the west to the block of Shahr Babak and Fars, from the south and the east to Rafsanjan and Zarand (Vaziri, 1998: 369). It is 40 Farsangs from Anar to Kerman City and 30 Farsangs to Yazd City. The size of Anar County is currently 2140 km² and it is located at an altitude of 1409 meters above sea level. The climate of Anar is hot and dry and its average annual rainfall is 89 mm.

In the pre-Islamic era, the name of Anar City was Aban, meaning flowing waters, from the attributes of Anahita, a goddess of ancient Iran in the era before the advent of Zoroaster, which indicates the very ancient history of this region. Further, Bastani Parizi wrote in the book "Khatun Haft Qala" (1965: 308), that Anar is attributed to Nahid (Anahita). "I consider a village like Anar, located in the Lut Desert of Kerman, to be attributed to Venus [Nahid] because we know that the Pomegranate (Anar) tree and also fish were two symbols of Venus.

In the north of Anar, there is a desert region with several mountains called "Shamash" which means Babylonian Sun God. The castle of Shamash (the sun) was probably related to the Elamite god and was a temple belonging to Mithra worshippers (Vaziri, 1998).

There is a region called Kermanshah, 110 km north of Anar City, which was part of Anar until 1950, that is, before the approval of the country partition law during the Pahlavi period. According to Mostofi Bafqi (2006:

700), Kermanshah is one of the regions attributed to "Shapur bin Narsi bin Bahram bin Bahramian bin Hormoz bin Shapur bin Ardeshir Babakan". All these evidences indicate that Anar (the ancient city of Aban) was one of the cities of ancient Iran.

II. Anar Historical Geography

Historical books of the early Islamic centuries, such as "Al-Masalek al-Mamalek" (Istakhri), "Masalek and Mamalek" (Ibn Khordadbeh), and "Ahsan al-Taqasim" (al-Maqdisi) are the oldest sources until the end of the 4th century AH in which the name of Aban City is mentioned. The name of Anar City was also mentioned for the first time in the book "Hodud al-Alam men al-Mashriq ela al-Maqrib" (Unknown, 372 AH) belonging to the last decades of the 4th century AH and also in the book "Surah al-Arz" (Ibn Hawqal).

According to the geographical distances of Iranian cities recorded by historians of the early Islamic centuries, such as Istakhri in the book "Masalek al-Mamalek", the historical city of "Aban" is the same as today's Anar. Therefore, the name of this city was still Aban until the early decades of the 4th century AH. Istakhri stated that the distance between Aban City and Fahraj, Yazd is 25 Farsangs (111 km) and the distance between Aban and Rudan (around present-day Rafsanjan) is 18 Farsangs (80 km) (Istakhri, 1961: 117). During the reign of Iranian kings, Aban City was one of the subordinate cities of the Istakhr state of Fars. Istakhr was the largest and most important state of Fars and the Persian kings lived there.

According to historians of the early Islamic centuries, "the cities of Aban, Anas, Azgan, Khabar and Kabs" were among the most important cities of Rudan. Rudan, which is also recorded in historical sources as "Ruzan" was a part of the Istakhr state of Fars. Of course, this Rudan is different from today's Rudan in Hormozgan province.

According to al-Maqdisi (1982: 651-652): Rudan City has a beautiful mosque that can be climbed by stairs. This city is paved with pebbles. All its mosques are on high ground. There are many Skafians and Mu'tazilies. The hot springs are dirty and the center is full of gas. It is surrounded by beautiful gardens and a dignified cemetery with amazing domes. They have many milk products and many aqueducts, some of which enter the city. There is a spring to heal from its water. There are lookouts on the ramparts of the city. There are no suburbs outside the city. Its population has decreased and sand has covered the city around. In addition, al-Maqdisi has introduced Aban City as one of the Ruzan cities in Kerman.

Ibn Khordadbeh (1992: 65) also wrote in his book "Masalek and Mamalek" (third century AH) that Aban is a city in Kerman, Ruzan District. The name of Anar City is mentioned for the first time in the books "Hodud

al-Alam men al-Mashriq ela al-Maqrib" and "Soura al-Arz". In Hodud al-Alam, Anar is described as a city on the way of the Rudan to Fars with many blessings (Unknown, 372 AH: 291). It can be concluded that the name of Aban changed to Anar in the second half of the fourth century AH. In addition, in the book "Surah al-Arz", the name of Anar City is mentioned as a city that has a Jame Mosque (Ibn Hawqal, 1987: 36). Ibn Hawqal traveled to Iraq, Khuzestan, and Fars between 350 and 358 AH (AD 961 to 969) and his description of

the historical geography of Anar City is related to these years.

Rudan City was located in the villages of Shahr Abad and Malek Abad and the surrounding lands up to the village of Lahijan located in the northwest of Rafsanjan. The exact location of Anas City was located in the lands of Gorgin Abad, Saadat Abad, and Faiz Abad after Sarcheshmeh three-way connected to the current city of Rafsanjan, and Aban City was in the location of the current Anar City (Bahrami Ahmadi, 1992: 40).

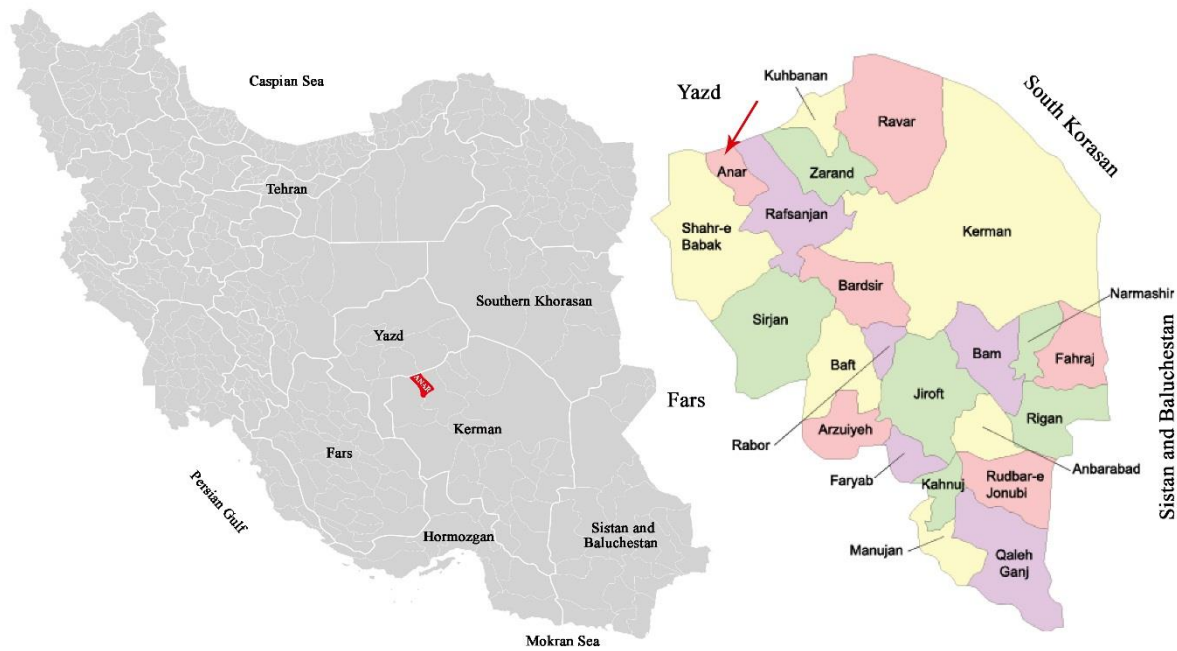


Figure 1: Map of Iran and the political divisions of Kerman Province.

III. Mountains and Rivers

Anar includes a large plain and two mountains. One is Station Mountain with a height of 1636 m located 12 km northeast of Anar, and the other is Gowd Chah Mountain with a height of 2484 m located 24 km southwest of Anar. Both mountains are from the central mountain range of Iran. Shour River, Anar River (Ishaq Abad River), Bayaz Seasonal River, Salt Lake, Farhang Abad Wetland, and Kaluts are among the rivers and natural attractions of Anar. Ishaq Abad River originates from Jozem Mountain in Shahr Babak and reaches Ishaq Abad Anar after traveling more than 50 km. Bayaz River also originates from the Mesinan mountains in Shahr Babak.

IV. Research Background

The southeastern region of Iran is very vast and covers about 20% of the total area of Iran. This region is limited to South Khorasan and Yazd provinces from the north, Fars province from the west, Hormozgan province and the Oman Sea from the south, and Pakistan and Afghanistan from the east. The first

reports about the cultures of Southeast Iran were presented by an English tourist, Percy Sykes, in the 1910s. This information is the result of his observations around Kerman City and on the southwestern edge of the Lut Plain (Sykes, 1957). In Stein's archaeological investigations in the early 1930s, many ancient sites were identified, surface sampled, and recorded. These sites include Tepe Yahya, Tepe Iblis, Noor Abad, and Daqianus City in Kerman, Shahr-i Sokhta in Sistan and Bampur, Damin, Khorab, and Chah Hosseini in western Baluchistan. He excavated important sites such as Noor Abad, Damin, Khorab, and Chah Hosseini (Stein, 1937). In the 1960s, five archaeological expeditions conducted archaeological exploration in eastern Iran. The results illustrated that during the early third millennium BC, rural communities in eastern Iran were progressing toward the stage of urbanization with an equal growth rate with Mesopotamia (Madjidzadeh 1989: 140). These excavations were conducted at Bampur in Baluchistan (Decardi, 1967), Tel Iblis in Bardsir Valley (Caldwell, 1967), Tepe Yahya in Soghan Valley between 1967 and 1975 (Lamberg-Karlovsky, 1970), Shahr-i Sokhta between 1967 and 1978 (Tosi,

1968). and Shahdad between 1969 and 1977 (Hakemi, 2006). In the 1940s, a team of Iranian archaeologists headed by Ali Akbar Sarafraz conducted surveys in Kerman province. Their activities were mostly concentrated in the northwest and west of Kerman province (Sirjan and Bardsir cities). In the 1950s, a team of British archaeologists headed by Bivar and Fahruri identified evidence from the prehistoric period in the northern part of the Islamic city of Ghabira, Kerman. These works were comparable to those discovered in Tel Iblis and Tepe Ali Abad (Mousavi 1990: 188).

Huckride, a German geologist, succeeded in discovering two ancient sites belonging to the Mesolithic period and the early Neolithic on the eastern bank of the Kuhbanan River (Huckride, 1961). Geological research has also been done on the side of the Fahraj River (DeHeizelin, 1974). Investigations by Martha Prickett (1976) from Harvard University in the Yahya research project in the Kushk River basin led to the identification of the Gaz Tavileh site belonging before the Yahya VII period. Based on this, the early settlements in Kerman date back to the mid-sixth millennium BC (Voigt and Dyson, 2003: 96). From 1975 to 1985, Sajjadi investigated five areas: Jiroft Plain, Rudbar Plain, Kahnuj Region, Blok Region, and Anar region (Eskandari, 2012).

After the Revolution of 1979, the survey and identification of the Bardsir area by Sajjadi (1987), the surveys and excavations of the Konaro, Esfandah, and Qarqutiye areas in Jiroft by Rahbar (1991), and the surveys of Sajjadi in Kerman are among the first archaeological investigations in this area. In addition, Kaboli explored the Shahdad site in 1990 to determine the buffer zone of the western part of the site. After that, he also conducted six seasons of excavations at the site between 1994 and 2002 (Kaboli, 1997). In 1998 and 1999, following the discovery of artifacts from the southeastern region of Jazmurian in the village of Rameshk Kahnuj, Chubak surveyed and explored this area and introduced the Jazmurian cultural area (Chubak, 2004). Another research in this cultural area was started after the unauthorized excavations in Jiroft in 1380. During this year, rescue excavations were carried out in Rig Anbar and Konar Sandel Jiroft by Chubak. Extensive and systematic excavations of Jiroft have been conducted for six seasons since 2001 by a team of Iranian and foreign archaeologists and experts under the supervision of Madjidzadeh at South Konar Sandal, North Konar Sandal, and Mahtut Abad Cemetery (Madjidzadeh and Pittman, 2008). Other archaeological investigations in this area were carried out by Abyan on the banks of Halilrud, Tofighian at the source of Halilrud, and Soleimani in the Raber region. Further, in the eastern part of this area in Bampur,

surveys and excavations have been conducted in recent years by Rahbar and Sajjadi (Chubak, 2004: 13). Garazhian's surveys in Daristan Bam and excavations at the Qale Atashi site led to the identification of evidence from the Neolithic period (Garazhian, 2009). Khosrowzadeh conducted archaeological surveys in Bardsir during two seasons (Khosrowzadeh, 2004, Khosrowzadeh and Aali, 2005). Besides, Alidadi Soleimani's investigations in Esfandagheh are among other research carried out in recent years (Alidadi Soleimani, 2009).

Despite the long history of archaeological research in Kerman province, the northern areas of this province have received less attention from archaeologists due to their desert nature and lack of identification of large sites. Except for Huckride, a German geologist who introduced a small number of ancient sites in Kuhbanan in his geological surveys, there is almost no archaeological information from the northern counties of this province. In 2021, with the necessary credit allocation by the Research Institute of Cultural Heritage and Tourism, two counties of Kuhbanan (Sardari and Khanipour, 2021) and Anar (Azizi Kharanaghi and Jamshidi, 2021) were archaeologically investigated. This article presents the information obtained from the archaeological survey of Anar County.

V. Archaeological Surveys of Anar County

Archaeological research was carried out in Anar County, Kerman Province in June 2020 with the permission of the Cultural Heritage and Tourism Research Institute. During these investigations, all districts and villages of this county were visited and many areas were surveyed. Before conducting the archaeological survey in each part, maps and Google Earth images of the area were reviewed and all the specified places were visited. In addition, the help of guides and local officials from different regions was used in all stages.

120 cultural/historical artifacts were identified during the investigations that took place in Anar County for almost a month. Chronologically, the oldest works were related to the Epipalaeolithic period, and the newest belonged to the late Islamic era (Qajar/Pahlavi). The identified works are generally classified into 6 different groups (Fig. 2), including (1) 6 sites, (2) 49 aqueducts, (3) 15 water structures, (7) 4 religious buildings, (5) 39 historical monuments, and (4) 6 historical contexts (Fig. 3). In the following, these groups are introduced and some important works are explained.

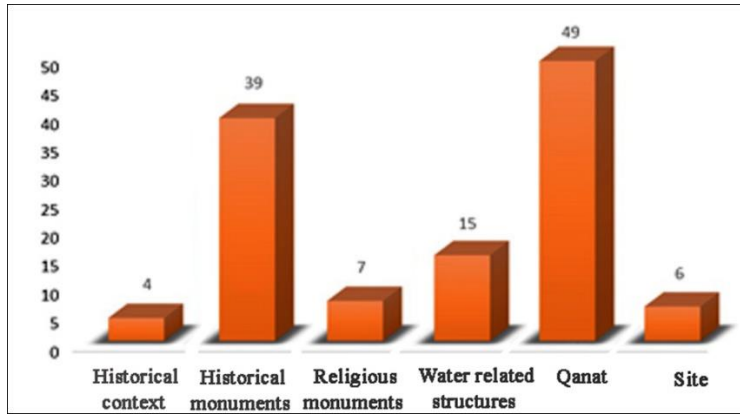


Figure 2: Classification of the works identified in the archaeological survey of Anar County.

VI. Historical Monuments

In the archaeological survey of Anar County, 39 historical monuments were identified, which can be dated from the historical era (Parthian/Sasanian) to the Pahlavi period (Fig. 4). These works are classified into 8 groups and each work is introduced separately. Most of these works have been destroyed or are being destroyed and unfortunately, there is no protection and

restoration plan to prevent their destruction. In addition to natural erosion and destruction, some of these works, such as the historical Citadel of Anar, have also been intentionally destroyed. The deliberate destruction of historical monuments of Anar County by the owners and lack of attention by the authorities, especially in the outskirts of cities and villages due to the expansion of pistachio orchards, is very worrying.

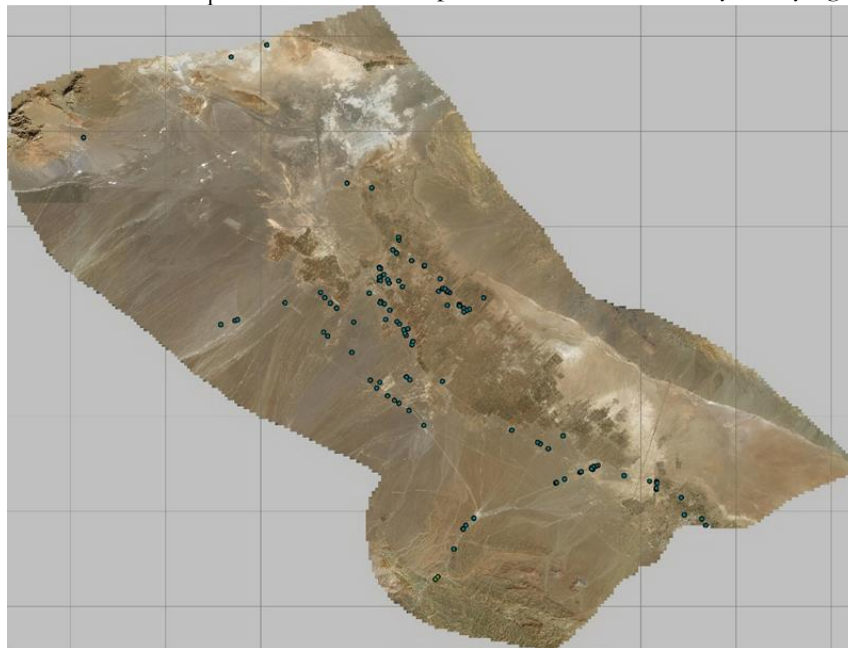


Figure 3: Distribution of identified works in Anar County.

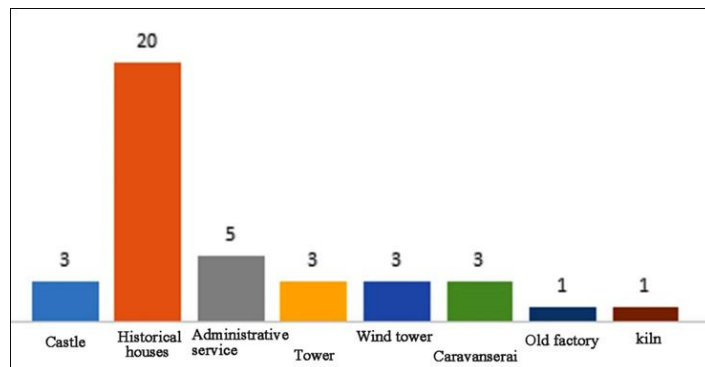


Figure 4: Classification of historical monuments and their number in each group.

Anar historical citadel is located in the center of the current city of Anar, with an area of about 1.5 hectares, and it was registered in the list of national monuments of Iran in 2010. Currently, the 8 towers of this building and the ramparts of the city are almost standing (Fig. 5). The tower and ramparts of this complex have been restored, but the central part and its buildings have been destroyed. The satellite images of 1963 show this citadel almost intact, but according to local people, it was destroyed in 1982 by the order of one of the officials. The thickness of the walls of the citadel fence is about 2 m and the diameter of the towers is about 4 m. The remaining evidence shows the existence of architecture up to 3 floors in different parts of the citadel. The materials used in this building are mud-brick, mud, mud-straw, and one of its towers has brick decorations. The citadel is built on a natural hill, which allows it to overlook the surrounding plains. The destructions caused the loss of the details and plans of the internal architectures, and for this reason, until extensive excavations and debris removal of this section, information on their characteristics cannot be obtained. However, based on the old satellite images taken before the demolitions, it seems that the inner space of the citadel is divided into several different parts, including the royal palace surrounded by towers as well as residential spaces. In the satellite images of 1963, there is evidence of the existence of another space on the northern side of the citadel, which was known as the old citadel. Today, the evidence of this building is buried under the park and green space (Fig. 6). Among local people, this citadel is known as a Sassanid citadel, but no cultural materials from this period were found during a superficial survey. Based on the available evidence such as pottery, the age of this building can be considered to be related to the middle and late Islamic centuries (Fig. 7).

The building of the Toroq (roads) Department belongs to the Pahlavi period (built in 1938) with an area of about 300 m². This department is a subset of the Roads and Streets administration, which was established to monitor and rebuild the roads built during the Pahlavi era (Reza Khani Roads). Among the actions of this department were the construction and improvement of a part of Rafsanjan, Bafq, and Yazd roads (Fig. 8). The building of this department is known as the only building of the Department of Roads registered in the list of national monuments of Iran. The entrance to the surrounding area of the building is from the northwest side. The main entrance of the building is from the southeast side and there is another entrance on the northeast side as well. The main corridor of the building is located along the entrance to the northwest, which intersects in the middle of the building with a corridor that runs from the northeast to the southwest.

At this intersection, there is an octagonal geometric skylight on a dome-shaped space. There is a staircase leading to the roof at the end of this corridor.

The plan of the building is square and includes seven covered rooms (Fig. 9). On the sides of the main corridor, there are two rooms on the right side and two rooms on the left side, which are symmetry. The rooms on both sides of the entrance to the courtyard also had a way. The rooms at the end of the main corridor also lead to the northwest corridor. There are three rooms on the northwest side. These rooms connect to each other as well as to the northwest corridor. All the rooms have a vaulted ceiling.

The historical context of Bayaz is a large mud-brick and clay architectural complex with an area of 18 hectares located 25 km southeast of Anar and 1 km northeast of modern Bayaz. Access to this complex is possible through the Bayaz-Shahamabad asphalt road, which passed through it and destroyed parts of it. This complex includes a large number of buildings, including residential houses, mosques, warehouses, castles, hosseiniyeh, reservoirs, manor houses, cemeteries, and alleys and passages that have formed the historical context of this village. For the construction of this complex, clay, and brick were used, and in some parts, including the walls enclosing the gardens and outdoor spaces, mud layers were used (Fig. 10). Buildings have different dimensions according to their use and importance. However, their construction pattern is mostly based on northeast-southwest or northwest-southeast directions and building houses with verandas around the yard. The construction technique of most of the buildings is based on the use of the toizeh arch and the barrel vault in the form of a trestle and a crescent. In every street or alley, traces of simple small mosques can be seen, which were mostly used as family and clan prayer rooms. There is a part of the gardens of this context enclosed in its southern part. The manor house, which is built in the form of 4 regular porches, is also located in the southern part of the context. A mud-brick castle, partially destroyed by the road, still exists in the center of the context. The drinking water of this historical context was supplied from the old Bayaz aqueduct and the twin reservoir, which is located on the northern edge of the context. The cemetery and Jame Mosque are also located on the northeast edge of the context. It seems that the settlement in this part took place after the destruction of the old structure of Bayaz City, which today is a flat area in the northern part of the context. This historical context was still inhabited until 20 years ago, but today it is abandoned and under destruction (Fig. 11). According to the cultural materials found, it seems that this historical context belongs to the Middle Islamic centuries (Fig. 12).

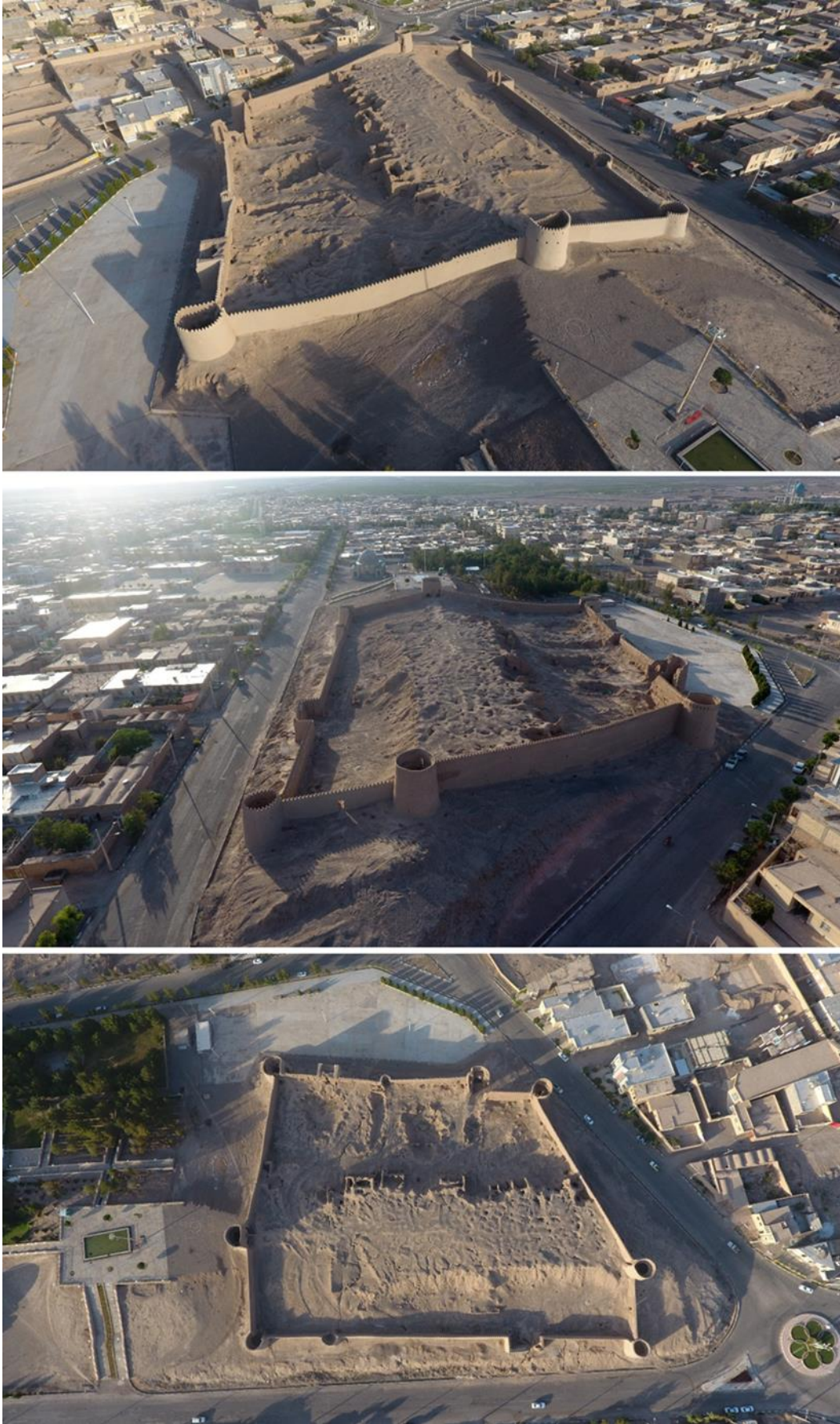


Figure 5: Aerial images of the Anar historical citadel.



Figure 6: 1963 satellite images of the city and the historical citadel of Anar before the complete destruction of the Citadel's interior.
On the left side, the remains of the old citadel are visible.

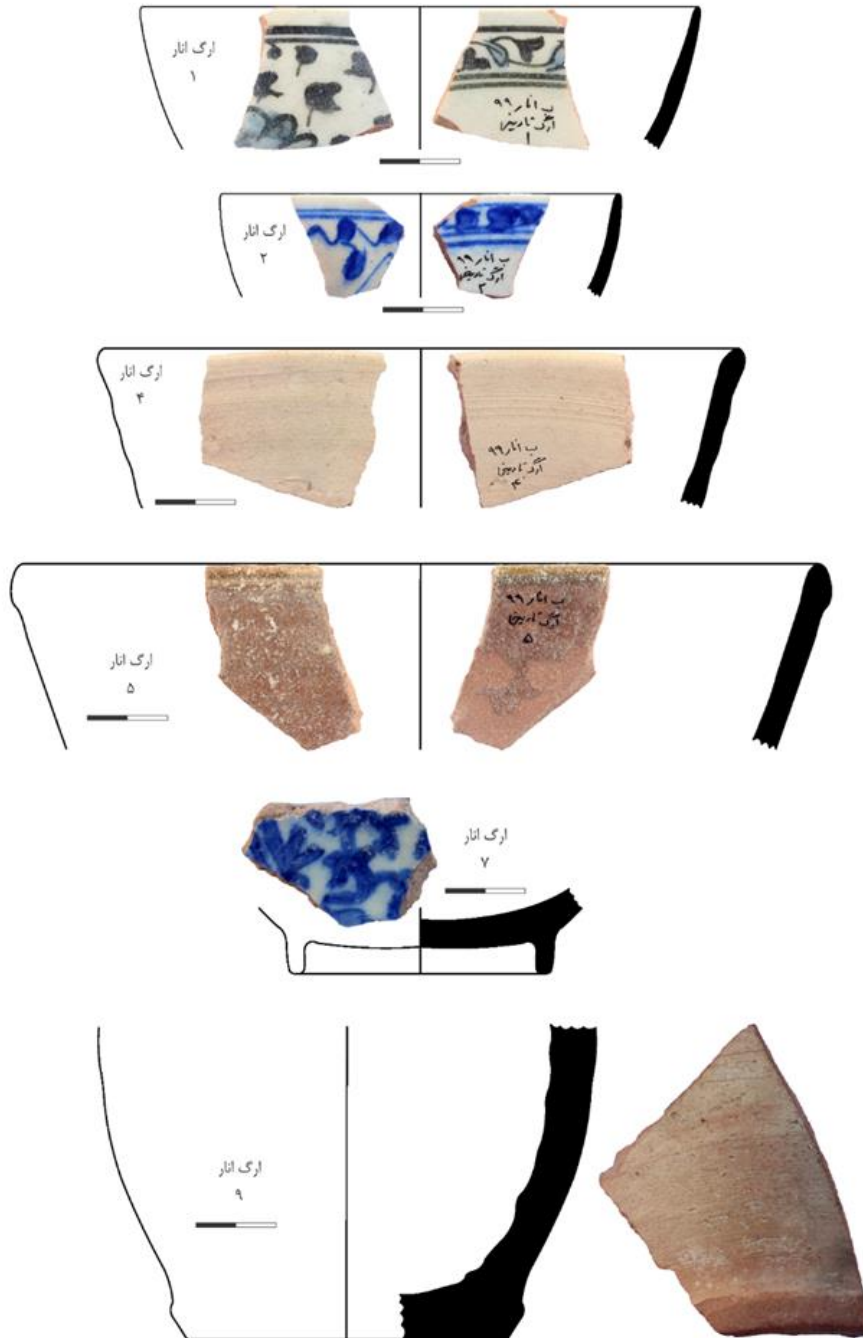


Figure 7: The design of Pottery found in the Anar historical citadel.

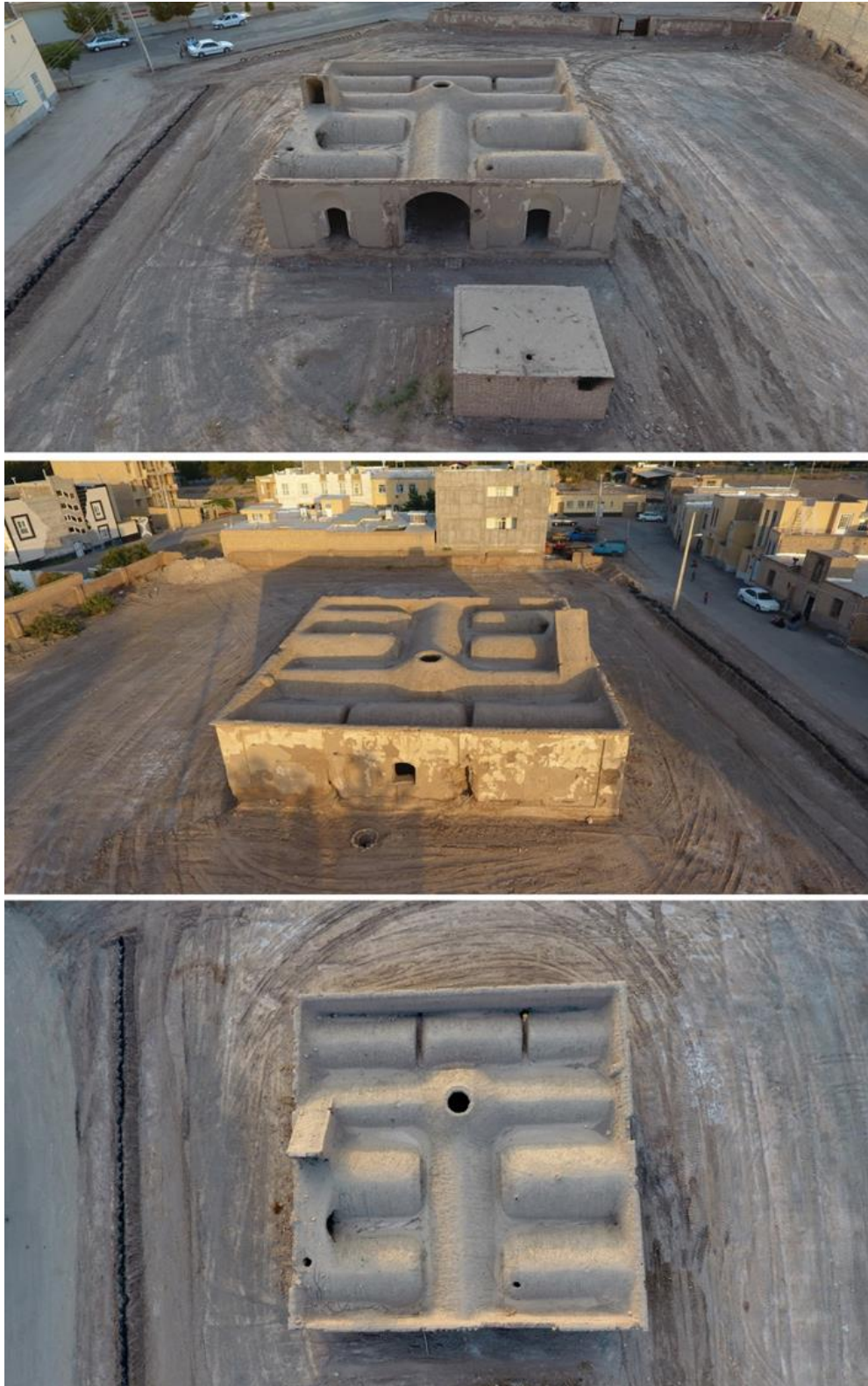


Figure 8: Aerial images of the Anar Road Administration.

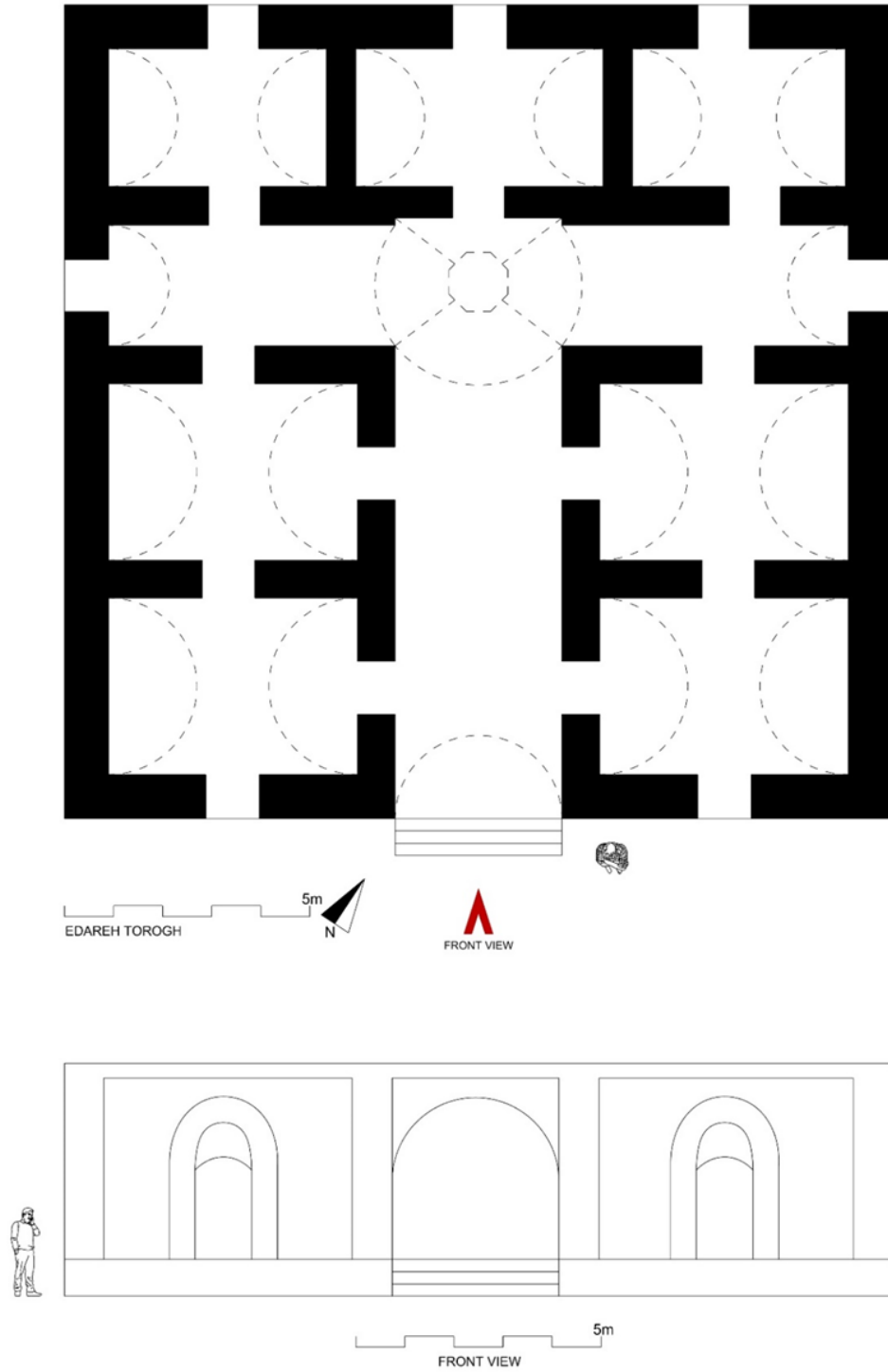


Figure 9: Plan of the Anar Road Administration.

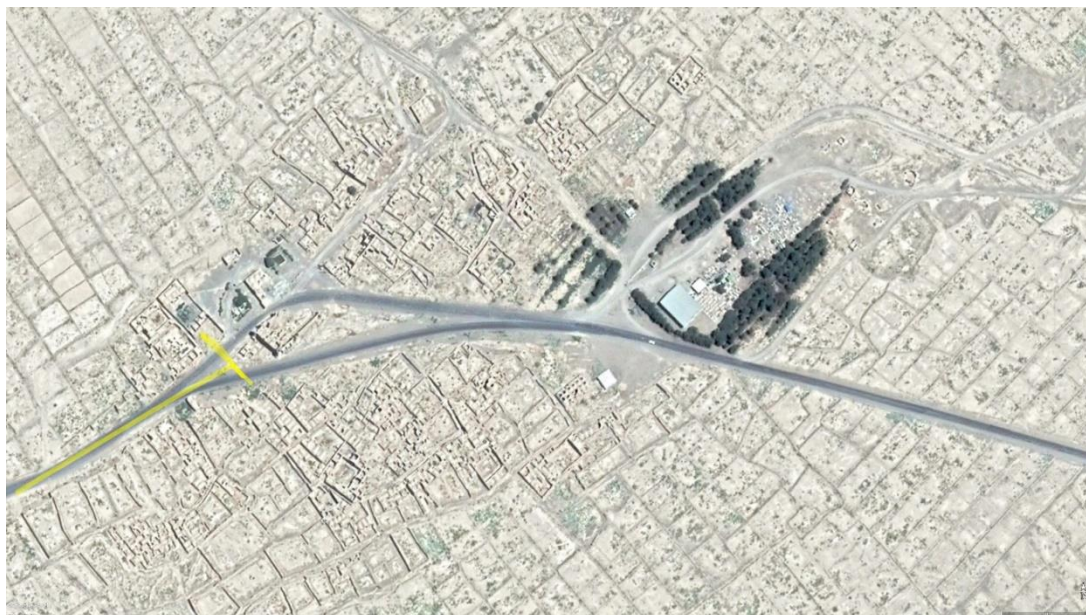


Figure 10: Aerial image of the historical context of Bayaz.

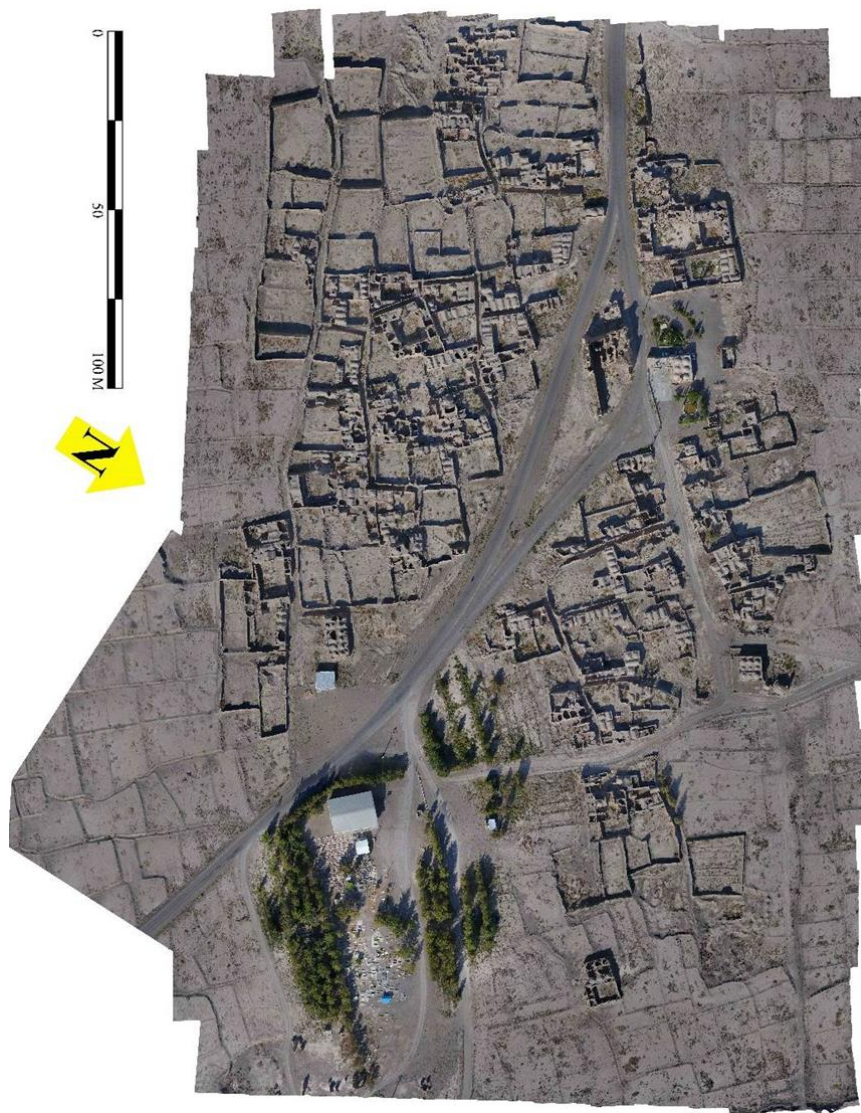


Figure 11: Aerial image of the historical context of Bayaz.



Figure 12: Pottery obtained from the historical context of Bayaz.

VII. Historical Sites

During the archaeological survey in Anar County, six historical sites were identified. Chronologically, the oldest sites belong to the historical era (Parthian/Sasanian) and the newest ones belong to the late Islamic era (Qajar/Pahlavi). The largest area identified in this survey is the old city of Bayaz, which has an area of about 57 hectares. According to local people, the old city of Bayaz was destroyed due to a great flood, and then people decided to change their residence and build a new city next to the old city. Like other monuments of Anar County, archaeological sites and cemeteries have been severely destroyed and subjected to unauthorized excavations, so that the possibility of conducting archaeological research in some of them has been lost.

The old city of Bayaz with an area of about 57 hectares, is a flat area in the north of the old city of

Bayaz and on the edge of the old mosque (Fig. 13). This area is located at a distance of 24 km from Anar City and 1 km northeast of the Bayaz village, and it can be accessed through the Bayaz-Shahamabad asphalt road and the dirt road next to the old Bayaz cemetery. This is the only part of this site that today is in the shape of a pentagon outside the pistachio orchards and northern fields of this area. A part of it may be buried under the gardens. According to local traditions, this site was the old city of Bayaz, which was destroyed during a flood and then was leveled and plowed by farmers in the past decades. On the surface of the site, there are no traces of the architectural remains, but there is a very high concentration of cultural materials, including pottery. Based on the evidence and cultural materials found on the surface, the age of this site can be estimated in the Middle Islamic centuries.



Figure 13: Aerial image of the site of the old city of Bayaz.



Figure 14: Pottery obtained from the site of the old city of Bayaz.

VIII. Water Structures

During the survey of Anar, 15 works have been identified and classified in the group of water structures. These works are divided into 4 categories: (1) icehouse/ice storage, (2) historical water path, (3) reservoir, and (4) water mill (Fig. 15). Reservoirs have generally restored or changed use. The historical water

path has been abandoned and many parts of it have been destroyed, and a path has been created next to it, which still carries water to Bayaz. Icehouse, which is the only work of this group in Anar City, has been restored, but the originality of the work has not been preserved, so a new form has been created. The water mills are all abandoned and under destruction.

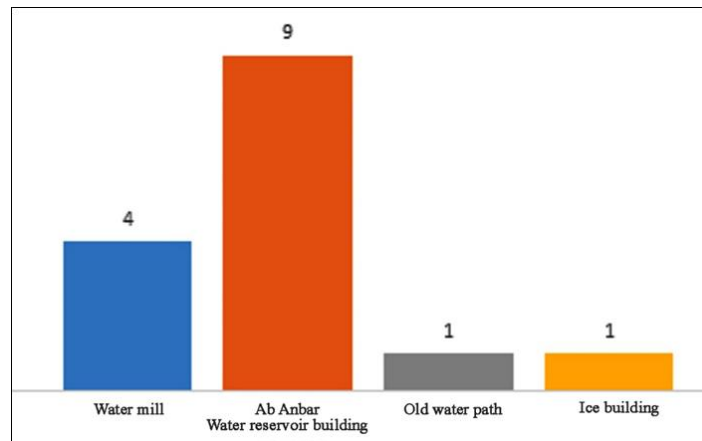


Figure 15: The variety of water structures identified in the archaeological survey of Anar City, Kerman.

The icehouse belongs to the Qajar period; it is built with a circular plan and in the form of a stepped cone with a corbelled dome with a diameter of approximately 15 m and a height of approximately 13 m. The entrance of the building is from the northwest side and the shading wall extends in the northeast-southwest direction of the building. The shade wall is a long and tall wall with a height of 7 m, which prevented the sun from shining on the ice during the day. In the northeast direction of the building, there is a row of stairs to access the upper space of the icehouse, which is placed as a segment of a circle between the building and the shade wall (Figs. 16 and 17).

The ice pond inside the icehouse is filled and no traces of it can be seen. The depth of the ice pond depends on the amount of humidity and cold. The materials used in the building are mud-brick and mud-straw mortar but in today's restoration, brick has been also used. Mud-brick and mud straw mortar are the best insulators to prevent the penetration of heat from the outside to the inside and cold from the inside to the outside. The water source of this building was the Hormozabad aqueduct, which has now dried up and there is no trace of it.



Figure 16: Icehouse of Anar.

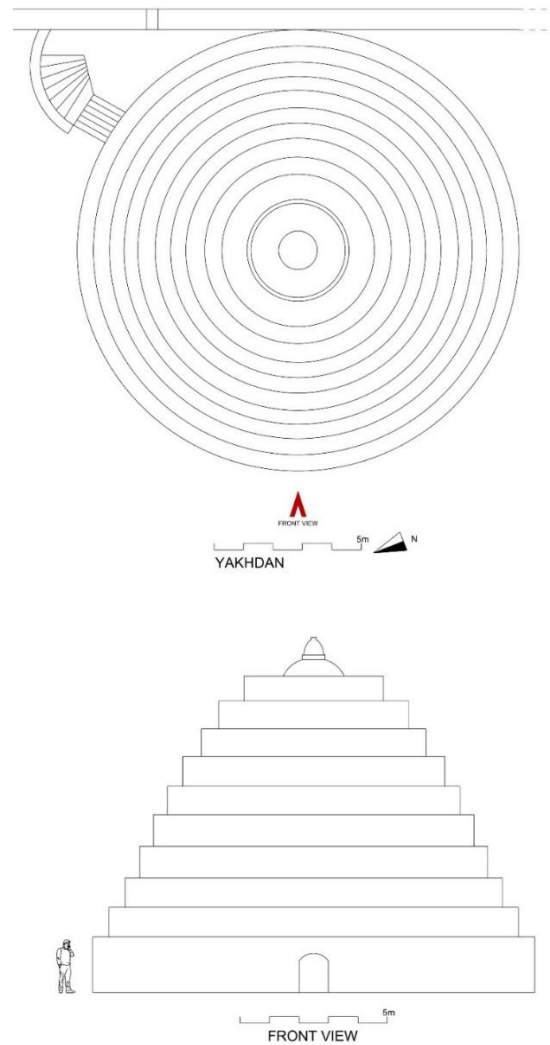


Figure 17: Plan and view of the Anar icehouse.

The Reservoir of Amin Shahr City is located 5 km northeast of Anar City. The building was built next to the main street of the city, attached to the Amin Shahr Mosque, and today there are residential buildings around it (Fig. 18). The Amin Shahr Reservoir dates back to the Pahlavi period. This building is still standing and restored. The reservoir is not used today, but it still has water. The Amin Shahr Reservoir has a dome with a height of 3 m and three windbreaks in the northwest direction. The length of the reservoir is 18 m, its width is 17 m and its area is 140 m². The height of the wind deflectors is 5 m, their plan is square and they have openings in four directions on which there are brickwork decorations. The entrance door of the reservoir is located in the northeast direction and there are two platforms on both sides of the entrance door of the reservoir. A space can be seen in the upper part of the entrance, which was probably the place of decorations that have disappeared today. The material of the reservoir is brick, lime, sand, and wood (Fig. 19).

An aqueduct is a channel with a gentle slope that is created almost horizontally and is excavated to a depth

that breaks the underground water table. With the construction of the aqueduct, underground water penetrates the canal flows along its gentle slope, and flows as a stream on the surface of the earth. Diggers must have access to the outside space while digging these canals and transfer the materials (rocks and soil) resulting from digging outside. The dug channels are connected to the ground by rods that are placed every 50 to 150 m along the aqueduct route. The ends of these rods are surrounded by the mass of excavated soil to create well rings on the surface of the ground.

This water supply network was widely used in deserts for various reasons. (1) The aqueduct does not need any source of power other than gravity to continue the flow. (2) Water can travel significant distances in these underground channels with minimal evaporation or risk of contamination. (3) The water flow in the aqueduct is proportional to the water in the underground aquifer, and if these channels are properly maintained, the water infiltration tunnels provide a reliable source of water supply for centuries.



Figure 18: Aerial image of the Amin Shahr Reservoir.

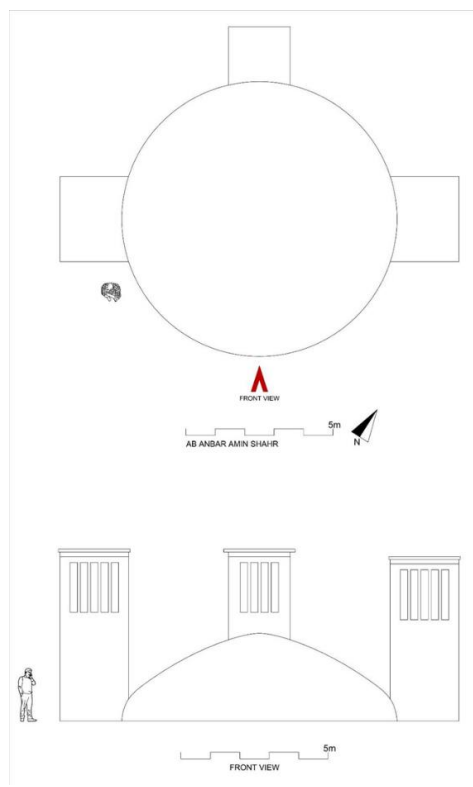


Figure 19: Plan and view of the Amin Shahr Reservoir.

The sizes of the aqueducts are different. Aqueducts in mountainous areas are usually short and shallow channels only a few meters deep and in some cases deep and long, which absorb surface water from alluvium. Aqueducts are engineering masterpieces that supply water to cities like Kerman, Yazd, and Birjand in Iran. In Kerman, the aqueducts extend for more than 50 km to the south to penetrate the underground table at the bottom of Jopar mountain. The Kerman plain is full of thousands of vertical bars, the deepest of which is between 100 and 125 m deep. These bars mark the route of a large number of series of aqueducts that bring water to the city. The deepest recorded aqueduct is located in

the Gonabad village near Birjand. This aqueduct is 27 km long and the mother of its wells has a depth of more than 300 m (English, 2015).

In the archaeological survey of Anar City, 49 aqueducts were identified. The geographical location and dry climate of Anar, the presence of mountains around this city, and the fertile lands located in the center of the plain have caused the construction of aqueducts to supply water from ancient times to before the Islamic Revolution in the region. The large number of aqueducts built in this area shows the prosperity of this profession (Fig. 20). The identification of these aqueducts in this county indicates the tireless efforts of

the people living in the desert in this part of the country to provide water needed for agriculture. Unfortunately, after the revolution, with the construction of deep wells and excessive exploitation of underground water, most of these aqueducts have dried up, and only 5 of them still provide part of the agricultural water in the region.

An aqueduct is considered one of the most complex water supply structures in the world, the construction of which requires very high technology and knowledge regarding the geology of the region, subsurface water

flows, vegetation, and understanding and accurate calculation of the length between the well mother and the aqueduct outlet. Unfortunately, a large part of this knowledge has been lost in many central areas of Iran due to the loss of experts in digging canals. The digging of deep wells, which increase in depth every year, has led to the abandonment of the irrigation system by aqueducts, which for thousands of years contributed to the prosperity of all the central cities of Iran.

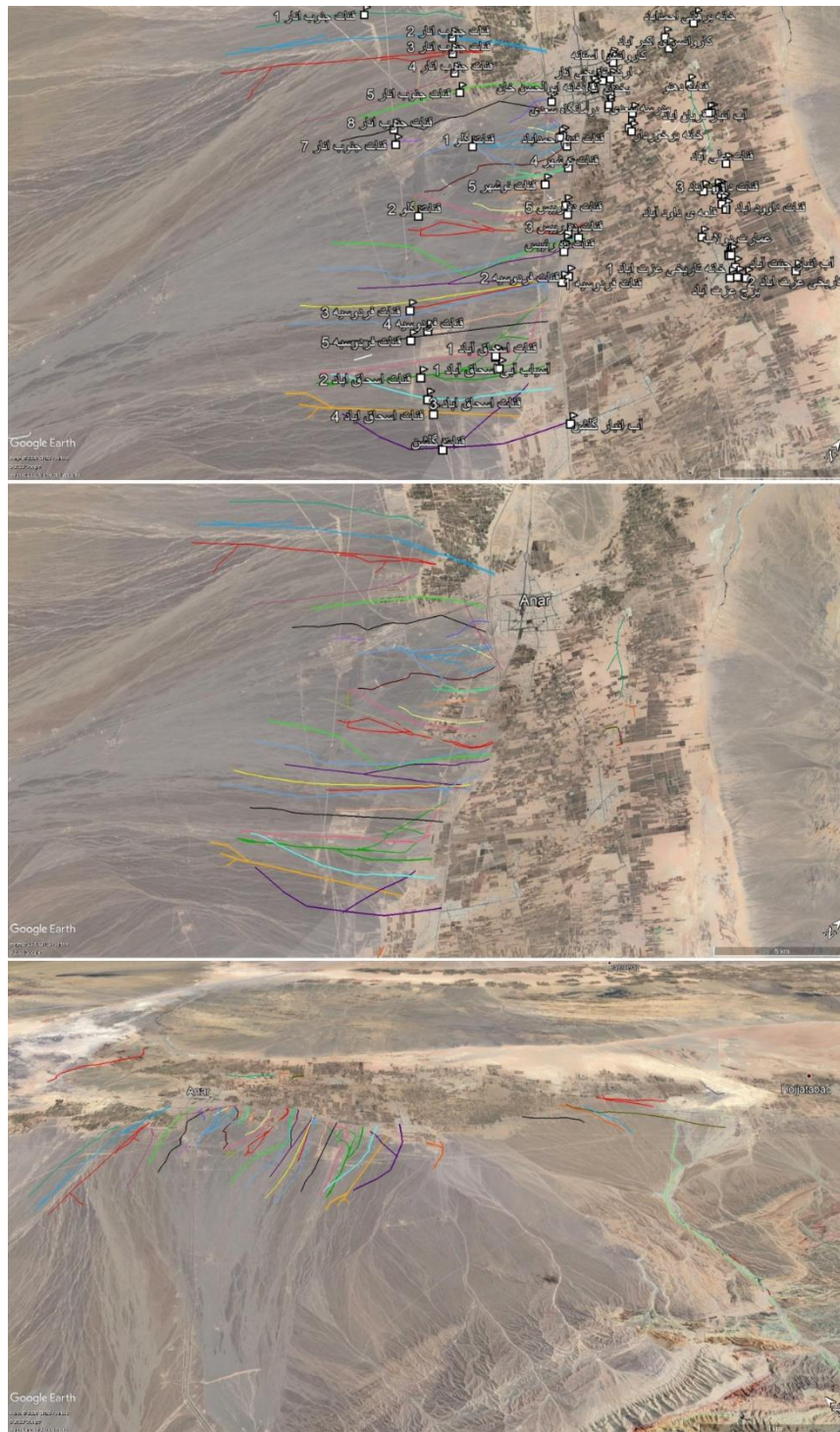


Figure 20: Density and number of aqueducts in the Anar Plain.

IX. Conclusion

Archaeological investigations in Anar County, Kerman Province led to the identification of 120 cultural-historical works. Despite the long history of archaeological studies in Kerman, the northern areas of this province have received less attention from archaeologists because of the desert environment. Due to special climatic and environmental conditions, Anar County has been inhabited more than the historical period, with the usage of aqueduct construction technology, like other central regions of Iran. Unfortunately, due to extensive destructions or repeated reconstructions in the Islamic era, except for the historical citadel of Anar City and a small number of ancient sites, many historical works were not identified in this county. The peak of settlement in the central areas of Iran goes back to the late Islamic era and Qajar period. In this period, with the formation of villages and the digging of canals generally by feudal lords, agriculture in these areas became very widespread and

led to the attraction of the population to this area. The identification of 49 aqueduct rings indicates the flourishing of this technology, the widespread transfer of water for agriculture, and the expansion of villages. Water has been very vital in this part of Iran, and the people in the past used various techniques to maintain and use water optimally. Identifying different types of water structures, especially water reservoirs indicates this importance. Unfortunately, in recent years, due to the increasing growth of industrial pistachio cultivation and its high income, the works, buildings, and historical structures of Anar have been severely destroyed and leveled, so that in Anar city, except for a few historical monuments that could not be destroyed, there is no historical context left. The continuation of archaeological research activities in Anar County will bring valuable results regarding the establishment of human societies in the central regions of Iran and how humans and the environment have interacted since long ago.

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THE ORIGIN OF THE SERPENT MOTIF IN CULTURAL MATERIALS OF SOUTHEASTERN IRAN DURING THE THIRD MILLENNIUM BC: A SIGN OF RELATIONSHIP WITH ELAM AND MESOPOTAMIA

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Abstract: In the case of the Archaeology of southeast Iran, many archaeologists have paid attention to the objects that were produced there and considered them as commercial items in Susa and Mesopotamia. This commercial relationship, in its trans-regional form, caused the transference of beliefs and Ideologies. The evidence of such relationships can be seen in the evidence of Tepe Yahya, Shahdad, South Konar Sandal, and Shahr-i Sokhta all are located in southeastern Iran. However, there is some evidence of a kind of relationship between Mesopotamia and the inhabitants of southeast Iran, but there is no evidence of direct contact between them. Based on the classic interpretation of the intercultural material it seems that this relationship was not limited only to raw or processed materials and meantime some ritual and ideological notions were transferred directly or indirectly between these two worlds. A good example is the presence of the serpent motif in southeast archaeological sites in Iran that comes with different forms and concepts over seals, metal vessels, painted and plastic pottery, and other products of the existing cultures like Tepe Yahya, Shahdad, Jiroft, Bampur, and Shahr-i Sokhta. The serpent-like motifs have been seen from the 6th and 5th millennium BC as a sign or symbol of the underworld god. Perhaps no other motif like the serpent can represent the transference of beliefs and thoughts from low to high lands and it seems as we move farther from the borders of cultural Iran, it declines in importance and presence.

Keywords: Bronze Age, Southeast Iran, Susa, Mesopotamia, Serpent motifs.

چکیده: در مورد باستان‌شناسی جنوب شرقی ایران، بسیاری از باستان‌شناسان به اشیایی که در آنجا تولید می‌شد توجه کرده و آنها را از اقلام تجاری شوش و بین‌النهرین دانسته‌اند. این رابطه تجاری در شکل فرامنطقه‌ای خود باعث انتقال باورها و ایدئولوژی‌ها شد. شواهد چنین روابطی را می‌توان در شواهد تپه یحیی، شهداد، کنار صندل جنوبی و شهر سوخته مشاهده کرد که همگی در جنوب شرقی ایران قرار دارند. شواهدی دال بر نوعی رابطه بین بین‌النهرین و ساکنان جنوب شرقی ایران وجود دارد، ولی شواهدی دال بر تماس مستقیم بین آنها وجود ندارد. بر اساس تفسیر کلاسیک از ماده بین فرهنگی به نظر می‌رسد که این رابطه تنها به مواد خام یا فرآوری شده محدود نبوده و در این میان برخی مفاهیم آیینی و ایدئولوژیک به طور مستقیم یا غیرمستقیم بین این دو جهان منتقل شده است. نمونه بارز آن وجود نقش مار در محوطه‌های باستان‌شناسی جنوب شرقی ایران است که با اشکال و مفاهیم مختلف بر روی مهرها، ظروف فلزی، سفال‌های منقوش و نقش‌افزوده و دیگر محصولات فرهنگ‌های موجود مانند تپه یحیی، شهداد، جیرفت، بامپور و شهر سوخته آمده است. نقوش مار مانند از هزاره ۶ و ۵ قبل از میلاد به عنوان نشانه یا نماد خدای عالم اموات دیده شده است. شاید هیچ نقوش دیگری مانند مار نتواند بیانگر انتقال عقاید و اندیشه‌ها از سرزمین پست به بلند باشد و به نظر می‌رسد هر چه از مرزهای ایران فرهنگی دورتر می‌شویم از اهمیت و حضور آن کاسته می‌شود.

کلیدواژه: عصر مفرغ، جنوب شرقی ایران، شوش، بین‌النهرین، نقشمایهٔ مار.

I. Introduction

Some archaeologists believe that the archaeology of southeast Iran has been over-focused on trading issues (Kohl, 1978: 463) and some use the term “imposition of trade insanity” for the archaeology of the Iranian plateau (Lamberg-Karlovsky, 1977: 40). This is because many archaeologists have paid their attention to status-bearing objects that were produced in southeast Iran and considered them as commercial items in Susa and Mesopotamia. This commercial relationship, in its trans-regional form, caused the transference of beliefs and Ideologies (Kohl, 1979: 77). However, it appears that during the late 4th and early 3rd millennium BC, the availability of valuable raw materials in the Iranian plateau turned Mesopotamian city-states to establish commercial relationships with this region (Beale, 1973: 133). This can be easily apprehended through relics that have been found in the Ur royal cemetery and other Mesopotamian cities such as chlorite vessels, semi-

precious stones like lapis-lazuli, etc. (Majidzadeh, 2002; Fig. 160-162, 326-327). Meanwhile, Susa, as an intermediary between the Iranian plateau inner regions and Mesopotamia had a lucrative commercial activity in geopolitics of the region.

The evidence of such relationships (not only exchange relationships) can be seen in proto-Elamite tablets, cylindrical seals, and beveled rim bowls of Tepe Yahya (Lamberg-Karlovsky & Potts, 2001: 195-199) and proto-Elamite tablets and cylindrical seals impressions at Shahr-i Sokhta (Tosi, 1974a: 13; Moradi, 2022; Sajjadi & Moradi, 2022). Based on different studies, three valuable natural materials were exported to Elam and Mesopotamia: chlorite and copper from the Kerman region (Beale, 1973: 133) and lapis-lazuli from Badakhshan in Afghanistan through Shahr-i Sokhta (Tosi, 1974b: 155-157). There has been some evidence of a kind of relationship between Mesopotamia and inhabitants of southeast Iran

(Pitman, 2008; Ascalone, 2020), yet, the presence of Susa artifacts such as proto-Elamite tablets (Amiet & Tosi, 1978: fig. 16; Lamberg-Karlovsky & Potts, 2001: 195) in these sites is much more prominent than direct cultural signs of Mesopotamia.

It seems that this relationship was not limited only to raw or processed materials and meantime some ritual and ideological notions were transferred directly or indirectly. A good example is the presence of the serpent motif in southeast archaeological sites in Iran that comes with different forms and concepts over seals, metal vessels, painted and plastic pottery, and other products of the existing cultures like Tepe Yahya, Shahdad, Jiroft, Bampur, and Shahr-i Sokhta.

II. Mythological Background of Serpent Motifs

As a Mythological background, the serpent, in many ancient cultures, is one of the oldest animal motifs with various meanings including immortality, fecundity, and in some cases a symbol for other world's spirits (Frazer, 1919: 66). The serpent was a symbol for water among farmer societies of the ancient Middle East (Golan, 1991: 205) and the figure of two inter-twisted snakes is a sign of fertility, welfare, and prosperity (Van Buren, 1934). The serpent-like motifs have been seen from the 6th and 5th millennium BC as a symbol of the underworld god (Leak, 2007: 182-183). Perhaps no other motif like the serpent can represent the transference of beliefs and thoughts from low to high lands and it seems as we move farther from the borders of cultural Iran, it declines in importance and presence.

III. The Evidence of Serpent Motif in Mesopotamia

The serpent-like motifs have been reported much less in the cultural materials of Mesopotamia compared to the southwest and center of the Iranian plateau during the 6th and 5th millennium BC. It is most likely that, in Mesopotamia, the first serpent motif was found over a fragment of Halaf (5000-4000 BC) pottery, showing a two-headed coiled serpent (Mallowan and Rose, 1935: fig.77). The important point is that this fragment is the only shard in Halaf pottery assemblage bearing the serpent motif (Fig. 1A). The fragment, probably, was not found in the stratigraphic context and the archaeologist does not give any comment about this issue (Maiseles, 1999: fig. 3.2). The main evidence about the presence of the serpent motif in Mesopotamia

belongs to the Jemdet Nasr period (Rankin, 1959: 28-33) which together with proto-cuneiform tablets and beveled rim pottery have been seen all through the Iranian plateau and Mesopotamia. In the cylindrical seal collection of the Morgan museum that is from late Uruk IVA (3200-3000 BC), there is a motif of two double-headed, inter-twisted serpents (Frankfort, 1939: 20) (Fig. 1B) that can be compared with proto-writing motifs of southwest Iran and Choghamish from early literature period (Delougaz & Kantor, 1996: Plt.27). Other older examples of this serpent-like motifs have been Susiana plain (Susa A/I) from 5th and 4th millennium B.C (Pitman, 2013: 297).

Meanwhile, there is no obvious trace of the serpent motif in the cylinder seals of the Diyala region from the protoliterate period (3400-2900 BC), north of Iraq (Frankfort, 1955). However, from the Early Dynasty III (2600-2350 BC) there is some evidence that can be interpreted as a stylistic serpent motif¹ (Ibid: Plate 39: 416). Unlike Mesopotamia, in Susa and southwest Iran that serpent motif can be seen individually or in combination over seals and seal impressions, here it is totally absent and only from early dynastic periods I-II (2900-2600 BC), we start to see serpent motif over the seals. Among different motifs, the motif of a double-headed serpent with two inter-twisted bodies emerges for the first time in this period and perhaps it is a prologue for the motif to become a symbol for the popular Neo-Sumerian (2150-2000 BC) god, Ningizida². The style of this seal is similar to Jiroft's chlorite vessels from the mid-3rd millennium B.C (Ibid: Plate, 24: no. 244). On another seal from the early dynastic period II, there is a serpent with five heads with a man in front of it holding two other serpents (Ibid: no. 497). This picture is complete with another seal from early dynastic period III over which a man stands full-faced holding two serpents in his hands (Ibid: no.535). This motif had already been seen in a seal from Susa A and Hakalan & Parchineh cemeteries (White & Dyson, 2003: 37). Furthermore, in these works, we face a double-headed serpent with an upward twisted body in the Akkadian period (Ibid: nos. 590-593).

The serpent motif can be found in large numbers over proto-literate seals of Tepe Gawra. The emergence of this motif in Tepe Gawra, as a key site for understanding the cultural process in northern Iraq, is quite remarkable (Speiser, 1935). Many seals and pottery-bearing serpent motifs similar to Susa's examples have been found from Gawra VII-XI (3300-3000 BC) (Speiser, 1935: Pl.LXXVI)³. For instance,

¹ Only two pieces of cylinder seals impression with a realistic serpent motifs can be seen in the collection of ED from Dylala region that not linked to reliable chronology of ED (See Francfort 1955: plates 47 and 51).

² NIN-G \square IŠ-ZID-DA

³ The stratigraphy of Tepe Gawra published by Speiser 1935 are unreliable. For new chronological proposals see:

other specimens belonging to Gawra IV-VI (3000-2250 BC) have plastic serpent motifs over the body while the heads are lying on the rim (Ibid: Pl.LXXVI, nos. 7,12,13). Gawra VI is concurrent with early dynasties. On the other hand, White and Dyson hinted at great similarities among seals of Hakalan and Parchineh in Lurestan (Zagros Mountains) and Gawra XII (White & Dyson, 2003: 100). It appears that the presence of such seals in the Iraqi Zagros foothills was mostly under the influence of eastern regions and Iranian Zagros rather than Mesopotamia.

Southern Mesopotamia, unlike its north, has a completely different history regarding the serpent motif. In this region, the serpent motif apart from its meanings and mythological or legendary backgrounds is a symbol for Ningizida that emerged from late Uruk (Frankfort, 1939: 20) and flowered in the Neo-Sumerian period. Indeed, the application of inter-twisted serpents began in late Uruk and transferred to the early Akkadian period (Lambert, 1966: 68) and finally in early Sumer, after the invasion of Guteans⁴ to Mesopotamia, King Gudea popularized it as the symbol of his favorite god, Ningizida (Ward, 1910: 131; Van Buren, 1934: 73; Buchanan, 1971: 5). It is noteworthy that Guteans were Zagros dwelling tribes who described by Sumerians as ferocious, savage, serpents of the mountain, and sacrilegious people (Cooper, 1983:31) and only after their hegemony over Sumerians, Gudea fostered serpent motif as the symbol of the most favored god of Ur III (Ningizida) (Buchanan, 1971: 5). Guteans ruled over Mesopotamia from 2200-2100 BC and there are 21 Gutean names in the list of Sumerian kings (Potts, 1999: 129). Apparently, Sumerian gods as serpents were institutionalized in south Mesopotamia during this period (Ward, 1910: 131). Although Ningizida is a second-degree god in the order of Sumerian gods, in the Neo-Sumerian period earns a high status and is portrayed as a serpent (Frankfort, 1934: 8-13) and stands next to the first-degree gods, but later attracts less attention and at the end vanishes during the Babylonian and Assyrian period (Van Buren, 1934: 61-70) (Fig. 1C).

According to Amiet, Guteans transferred the seal engraving style with an expression of the master of animals to Mesopotamia (Amiet, 1993: 31). Before that, depicting the figure of gods had no place in Mesopotamian art, and the master of animal's motif in its mythological background emerged on the cylindrical seal of Susa A from 5th and 4th millennium B.C (Amiet, 1993: 41; Majidzadeh, 2002: 4). Also, the picture of a hero controlling serpents first appeared in Iranian art

iconology during the 5th millennium BC (Pittman, 2015:37). In Susa A/I the serpent motif has been seen over pottery frequently and the fine snifter of Susa A/I in the Louvre museum is a good example of the art of depicting serpent in 5th millennium BC (Hyut, 2010: Fig 123). It can be suggested that this motif penetrated into Mesopotamian art from the southwest and west of Iran. Hints, also, points out that Mesopotamians were unfamiliar with the motif of the serpent with a human head and its ritual concept, and suggests it first emerged in Elam (Hints, 1992: 47-48).

Finally, based on the existing evidence about Mesopotamian Art, it seems the emergence of the serpent motif in Mesopotamia dates back to the late Uruk period or 3300 B.C and from this period on the double-headed, inter-twisted serpents appear in the region's art. In the southeast and central Iranian plateau, the serpent motif probably appeared in Sialk II and then concurrently in Susa A/I, Bakun A, and Sialk III during the 5th millennium BC. This is an indication of the importance of this motif in material relics and beliefs of human societies of southwest and central Iran that will be discussed in the following sections.

IV. The Central Plateau, Susa Plain, and Southwest Iran

In the central plateau and southwest Iran, the serpent motif had a quite different situation than in Mesopotamia. There is remarkable evidence showing the importance of this motif in those regions and when compared with Mesopotamia we are dealing with extensive and various applications of this motif over pottery and seals. This situation continued until after the proto-literate period and the constant and complicated contacts between the west and southwest Iran with Mesopotamia.

The first evidence should be tracked in Sialk II (5500-5000 BC) pottery. It appears that in Sialk II the origin of the serpent is from wavy vertical lines paired next to each other (Ghirshman, 1993: 57). According to Ghirshman, Sialk II continued its evolution process without any influence from contemporaneous cultures and this stage was part of its normal progress (Ibid: 80). He rejects the presence of any foreign element completely and adds contemporaneous cultures were not acquainted with the Idea of the depiction of the animals creatively and artistically (Ibid: 82) and this period, chronologically, precedes the realistic depiction of animals in Susa A (Ibid: 83). In Sialk III, those animal motifs are repeated copiously over pottery and therefore Sialk III can be considered as the evolution

Rothman, Tepe Gawra. The Evolution of a Small Prehistoric Center in Northern Iraq, University Museum Monograph, Philadelphia 2002.

⁴ Gu-ti-um

stage of the previous period. In Tepe Qabrestan, north of Sialk, the serpent motifs have been seen numerously in a horizon concurrent to Sialk III (5000-4500 BC) (Talai, 2011: 369, Fig. 89). To the west, the seals of Godin VII show a close relationship with Sialk III4-5 and the hook-like handle vessels are comparable with Godin VII specimens (Ibid: 143) showing the relationship between Sialk and Godin (Zagros). The form of some Sialk III4-5 is comparable with Susa A Seals (Ibid: 37) indicating relationships with southwest Iran.

The first evidence of the serpent motif over cultural materials of southwest Iran comes from Susa A/I (4200-3800 BC) (Alizadeh, 2010: table. 1). The motif can be seen in Susa A/I (Vanden Berghe, 1959: fig. 201) and Tal-i-Bakun A (Alizadeh, 2006: fig. 51) under the influence of middle and late Susiana pottery (Alizadeh, 1992: 22-26) Showing the stylistic ties with Susa, southern and central Zagros (Alizadeh, 2003: 88) (Fig. 2A). The relationship between Susa A and Mesopotamia is also examinable via their seals. Over a stamped seal from Susa A, a man with an Ibex head holds two serpents in his hands and Pittman believes this is the first time this motif to emerge in the Iranian plateau (Pittman, 2013: 37) (Fig. 2B). The relationship between these seals and Lurestan is so prominent that Amiet studied the seals of Susa A and Lurestan as a distinct Seal-making tradition (Amiet, 1972: 5-36).

The iconography of gods using the serpent symbol is considered a characteristic of the art in Elam and Susa plain by Hinz and he introduces serpent and woman as two Elamite religious elements (Hints, 1992: 48). Furthermore, in Hakalan and Parchineh cemeteries there is clear evidence for the presence of different pottery styles such as Mesopotamia, Susa, and central plateau suggesting multilateral relationships of the herders and pastoralists of this part of the Zagros Mountains (Alizadeh, 2013: 62). It is likely that due to high similarity between seals of this region and Gawra XI-XII in northern Mesopotamia and late Susiana in the southern side of the Zagros range, Hakalan and Parchineh had a key role in transferring beliefs and artistic traditions in the Middle East, especially from low lands of southwestern Iran to the northern Mesopotamia.

Another piece of evidence that can be useful in rooting out the origin of the serpent motif and many other prevalent motifs in Uruk art is the collection of the seal impressions from the 6th millennium B.C up to Susa A/I and early and middle Uruk that has been discussed in a paper by Pittman, comprehensively. (Pittman, 2013). She believes that the art of engraving seals with the scenes of legendary stories, figures of gods, and mythological characters first emerged in Susa A/I and served as controlling sources, then traveled to southern Mesopotamia and during the late Uruk period

became the main engraving style over the seals (Ibid: 294). She mentions that the specific iconology of Uruk (discussed above) appeared for the first time on seal impressions of the Susa plain during the 6th millennium BC in places like Jafar Abad and Jooy (Ibid: 296). It was then completed during Susa A/I and in early and middle Uruk served for administrative purposes finally the Jemdet Nasr and late Uruk penetrated into south Mesopotamia. These developments continued until the beginning of the early dynasties I and at this period that iconographical style got fixed and earned the Mesopotamian identity. Indeed, the art of engraving seals which was customary in Susa plain was totally absent among Halaf and Ubaid relics (Ibid: 296). In the sequence of Susa Acropolis I.27 which is concurrent with Susa A/I, the first evidence for the application of stamp seals in administrative affairs is a broken seal impression showing a serpent-like god (Ibid: 297) (Fig. 2B). The new art of engraving in the Susa II period applied for cylindrical seals and the scenes are similar to Susa A/I (Le Brun, 1999). Amiet prompts that the art of engraving over the seals of late Uruk in Mesopotamia has indeed its origin in the Susa Plain, specifically Susa A/I (Amiet, 1972: 37) because not only the pottery of Susa A/I has realistic animal motifs of serpents and other reptiles but also the seals depict different animals including serpents in a mythological context that made many scholars believe this representation for the first time emerges in the Iranian plateau (Amiet, 1993; Majidzadeh 2004; Pittman 2015) and is absent in the Mesopotamia at the same time (Halaf and Ubeid).

Moreover, a seal impression with the serpent-like motif has been unearthed from Acropolis I.20 which is older than the king-priest motifs of Uruk and seems to be a pre-depiction of this god in the art of the Uruk and Sumer (Pittman, 2013: 299). Among pottery relics of Choghamish, the motif of two inter-twisted serpents can be seen in the mid-4th millennium B.C which might be a pre-depiction of the god Ningizida (Delougaz and Kantor, 1996: Plts. 27,156,158) (Fig. 2D). A plastic serpent over the pottery (Ibid: Plt. 28) and a serpent attacking a goat (Ibid: Plt. 26) are two other examples from Choghamish in the proto-literate period that also have been seen in Susa A (Delougaz and Kantor, 1996: Plt.142.F; LeBerton, 1957: fig.8. nos.7and11) and Uruk (Rashad, 1990: Abb. 5-8) seals (Fig. 2C).

Dittmann believes that depictions used over the seals of the Susa plain during the 4th millennium B.C (Susa A/I) are related to the economic situation of the region. He recognizes many of these motifs that later became prevalent during the late Uruk period in south Mesopotamia as Susa style from southwest Iran and introduces only two of them as inter-cultural motifs (Dittmann, 1986).

V. The Serpent Motif in Southeast Iran

Southeast Iran was increasingly in contact with Elam and Mesopotamia through inter-regional commerce that aimed to transfer luxurious goods and rare raw materials from the inner lands of the Iranian plateau (Alden, 1982: 613). During the first half to the mid-3rd millennium B.C, trans-regional commerce linked the human societies of Mesopotamia and the Susa Plain with the inner regions of the Iranian plateau which were rich in raw materials and natural resources (Beale, 1973: 143-5). The high demand for these goods such as chlorite vessels, semi-precious stones like agate and lapis-lazuli, and copper objects pushed the wealthy Elamites and Mesopotamians to trade with faraway lands. The abundance of the serpent motif among artistic works of South Konar Sandal and Shahdad, similarities between Khafajeh and South Konar Sandal and Tepe Yahya chlorite vessels (Amiet, 1974: 106; Majidzadeh, 2004: 7); human figurines buried with corpses in Shahdad (Pittman, 2013: 37); and tablets of Konar Sandal the south which are compositions of similar Elamite and local specimens (Desset, 2014: 92), are powerful aspects of the relationship with Susa plain and Elam. The reflection of this operation has been recorded in the Arata myth in Mesopotamian sources (Majidzadeh, 1976: 105-107). It appears that some Ideologies, beliefs, and thoughts have been transferred through this inter-regional trading (Kohl, 1979: 76).

In southeast Iran, the serpent motif can be seen for the first time over Iblis 0 or on the rough Lalehzar pottery (4300-4000 BC). Over two pottery fragments of Lalehzar type, the plastic serpent motifs are shown both horizontally and vertically (Caldwell, 1967: fig.3). The Lalehzar phase (4300-4000 BC) in Iblis is concurrent with Yahya VI and early Yahya V (White & Dyson, 2003: 72). The style of these pottery is comparable to Bakun B and has been compared by the excavator to the pottery of this site located in Fars province (Ibid:120). In Tal-i-Iblis these two fragments from the 5th millennium BC are the only ones bearing the serpent motif and unlike the Susa plain the motif kept its presence up to the Neo-Elamite period, there is no trace of this animal over the pottery of the following periods (Fig. 3A).

There has been no sign of serpent motif in older phases of Tepe Yahya (Lamberg-Karlovsky & Beale, 1986), but from Yahya IVC that is contemporary to Jemdet Nasr (late 4th and early 3rd millennium BC), there is a great deal of evidence such as cylindrical seals and pottery showing this motif over artistic works. For instance, a plastic serpent motif over the body of a buff ware from the IVB period (Lamberg- Karlovsky, 1970: fig. 28) and a pottery fragment with a serpent that its head approaches the tail, are considerable examples of this period (Ibid: fig. 32). An etched serpent motif over

a pottery fragment from Yahya IVB5 is another example worth mentioning (Lamberg-Karlovsky and Potts, 2001: fig. 4.30). From the same period in Yahya, also serpent-like motifs over pottery have been found (Ibid: figs. 2.22, 7.1). The serpent motif has also been seen in Yahya IVC on many chlorite objects like vessels and weights (Ibid: figs.5.16,9. 9, 9.14) (Fig. 3B).

A cylindrical seal from Yahya IVB shows two face-to-face deities and underneath them, there is a serpent with two inter-twisted bodies and two heads (Pittman, 2001: fig.10.48). Stylistically, it is similar to Mesopotamian seals and can be attributed to the early dynastic II period (Potts, 1981: 135-136) (Fig. 3C). This seal has been found in the so-called Persian Gulf room and Kohl recognizes the style of the chlorite vessels of this room as inter-cultural style (Kohl, 1978: 464). Amiet believes that the styles of both seal and chlorite vessels are inter-cultural and reflect the influence of Akkadian and southeastern Iranian art (Amiet, 1974: 106). He introduces the seated deity as Ningizida, but Potts rejects this opinion and reminds that the Ningizida symbol is a man, yet the deity in Tepe Yahya's seal is a woman (Potts, 1981: 138). Indeed, the cylindrical seal of Tepe Yahya has an Iranian style, and only some Mesopotamian artistic elements were included in it (Ibid: 138). Finally, it is concluded that based on existing evidence the seal-maker of Tepe Yahya, having a full understanding of the Mesopotamian beliefs, made this seal with an Iranian-adopted style (Ibid: 140) which shows the cultural relationships between Southeast Iran and Mesopotamia. It should be noted that after the conquest of Akkadians over the Elam and Susa plain many Sumerian and Akkadian gods were worshiped in their original or Iranian forms (Ibid: 141). This seal reflects the extensive relationships between Tepe Yahya and Mesopotamia and Elam during the 3rd millennium BC. The other seal found in Jalalabad (Fars Province) shows a strong relationship with the eastern Iran plateau, Central Asia, and the Indus valley (Ascalone, 2008: 254)

Another important archaeological site in southeastern Iran that presents numerous serpent-like motifs in its cultural material is Shahdad. The serpent-like motifs can be seen in a realistic style over pottery, metal works, and chlorite (Hakemi, 1997). As an example, there are plastic serpent motifs over the pottery of Shahdad which are similar to Iblis Lalehzar (Caldwell, 1967: fig. 3) but date back to the 3rd millennium BC (Hakemi, 2006: 667). Another example is a plastic motif of a winder serpent around the belly of the vessel with the serpent taking its tail in the mouth (Ibid: 777). The serpent motif can also be seen over bronze objects of Shahdad (Meier, 2008: Tafel 81) for instance a coiled serpent over a bobby pin (Hakemi, 2006: 751) or a man holding two serpents in his hand again over a bobby pin which resembles Elamite,

Mesopotamian and Konar Sandal specimens (Hakemi, 2006: 789) (Fig. 3D). There is also a serpent over the bronze plaque or banner of Shahdad (Ibid: 747) and a coiled serpent over a model building made out of chlorite (Hakemi & Sajjadi, 1988: fig.6) (Fig. 3E). A similar motif can be seen inside a bronze vessel from Shahdad (Ibid: fig. 3). The stamp seals of Shahdad contain depictions of animals like goat, serpent, and birds and the cylindrical seals show mythological, astrological, animal and plant motifs (Ibid: 146) (fig. 3F).

Konar Sandal on the Halil bank, Kerman province presents valuable evidence of the 3rd millennium BC art of southeast Iran (Majidzadeh, 2004). The most considerable works in Jiroft include engraved and inlaid motifs over the body of vessels and chlorite objects that date back to the mid-3rd millennium B.C (Majidzadeh, 2004: 3). These motifs mainly show the master of animals including the encounter of two wild animals like eagle Vs serpent, eagle Vs leopard, or serpent Vs leopard (Ibid). There are also plenty of scenes showing an encounter between a man and two serpents and the serpents are in the hands of the man (Fig. 3G). According to Pittman the scene of a hero holding two serpents in his hand first emerged during the 5th millennium B.C in the iconography of central Iranian plateau art (Pittman, 2013: fig. 6). Moreover, the cylindrical seals like the Jalalabad cylinder seal that were produced locally suggest relationships with Indus valley, central Asia, and Mesopotamia (Ascalone, 2008: 256) and the diversity of the seals indicates that Konar Sandal located at the center of this active trans-regional commercial network (Pittman: 2012: 55). Many of these seals are comparable with the seals of the Ur royal cemetery and have been dated to the same period (Ibid: 56, fig. 2). For instance, on three seals from Konar Sandal, three characters can be seen: A god, a woman, and a bird. The bird attacked the serpent and took it in the beak (Ibid: 57). A similar scene has been found in layer VIIA of the Inanna temple in Nippur (Aruz, 2003). The mythological motifs in Halil art divulge that in the mythology of bronze age inhabitants of the Halil basin, there were epic characters of both humans and animals who controlled the natural and supernatural forces and the realistic style over the seals shows that they were transferred from Iranian plateau to Mesopotamia (Pittman, 2015: 37-44).

Bampur valley and some archaeological sites are located in the east of Kerman province, inside the Iranian Baluchistan region but I did not have an important role in trans-regional trading (Tosi, 1974c: 60-61). Although there is no sign of the serpent over the pottery of Chah Hosseini horizon and concurrent site (5th and 4th millennium BC) (Moradi, et al., 2014; Mutin

et al., 2017), the motif is still visible on the pottery of Bampur I-VI of 3rd millennium B.C. An example of this is a horned serpent that is depicted over a pottery fragment from the 2nd period of Bampoor (Moradi, et al., 2014; Mutin et al., 2017) (Fig. 3H & I). This horned serpent reminds us of the serpent motifs of Elam and Mesopotamia. On another pottery from Bampur IV, the serpent motif is depicted in simple and stylistic forms and similar to the plastic serpent motif on Shahdad (the serpent taking its tail in the mouth) (De Cardi, 1970: fig. 23, nos. 173 & 191). Khurab ax with the motif of a Bactrian camel from a grave in Khurab, a site near Tepe Bampur (Maxwell-Hyslop, 1955: 161) made this connection more believable.

In Shahr-i Sokhta, a 3rd millennium BC site in Sistan, the serpent motif has been seen over cylindrical seals, buff wares, and a special game board. The serpent motif can be seen over a cylindrical seal from the period I (3200-2800 BC) and pottery of the periods II and III. The former shows a serpent with some stylistic motifs that might be quadrupeds and it is comparable with a seal from Susa (Amiet, 1983: Plt. LXXXIV, fig. 2). In addition, the serpent motif is one of the relatively abundant animal motifs in over the buff wares of Shahr-i Sokhta period II and III that has been depicted in both realistic and stylistic forms. In most cases, the potter of Shahr-i Sokhta focused on the head of the serpent and using a big triangle and a simple body, depicted the animal (Biscione & Bulgarelli, 1983: 233, nos. 0115-0118, figs. 9-11; Vidale & Salvatori, 1997: figs. 112, 126) (Fig. 3J). The serpent motif has also been found over a game board in the cemetery of Shahr-i Sokhta (Piperno & Salvatori, 1982: figs. 3-5) (Fig. 3K) that is similar to a board from Ur royal cemetery (Piperno & Salvatori, 1983: 172; Seyed Sajjadi, 2010: 117) and is an exceptional specimen hinting to the relationship with Mesopotamia during the 3rd millennium BC.

Far away from southeast Iran, some pieces of evidence of the presence of serpent motifs on cultural materials have been found in Afghanistan and the Oxus region. For example, a stamp seal with the motif of a man holding two serpents in his hands (Pittman, 1984: fig. 29a) or a stamp seal with the motifs of a bird and a pair of serpents (Tosi & Karlovsky, 2003: fig. 263), both from central Asia and also a broken golden beaker with the motif of an eagle and two serpents from Tepe Fullol in Afghanistan (Lamberg Karlovsky & Tosi, 1989: fig.53). These are all signs of the distribution of serpent motif with Iranian concepts in the northeastern regions of the Iranian plateau. The serpent motif has been rarely seen in the art of the Indus Valley and Harappa.

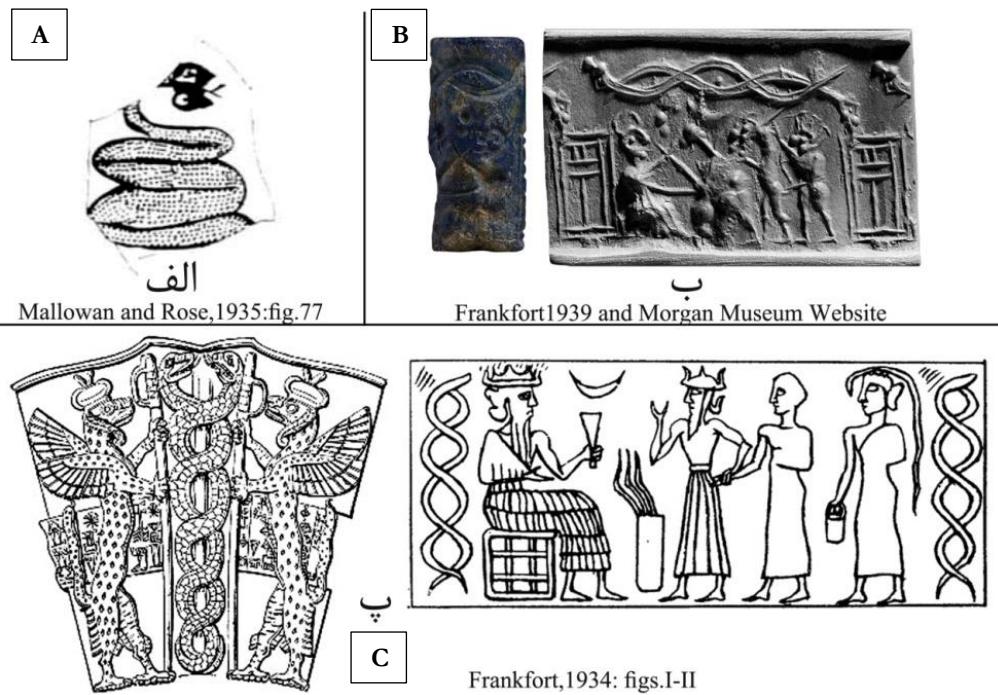


Figure 1: The serpent motif in Mesopotamia. (A) The only serpent motif found over the Halaf pottery; (B) A cylindrical seal from Jemdet Nasr in south Mesopotamia with a double-headed serpent motif; (C) Depiction of Ningizida on the seals of Lagash rulers.

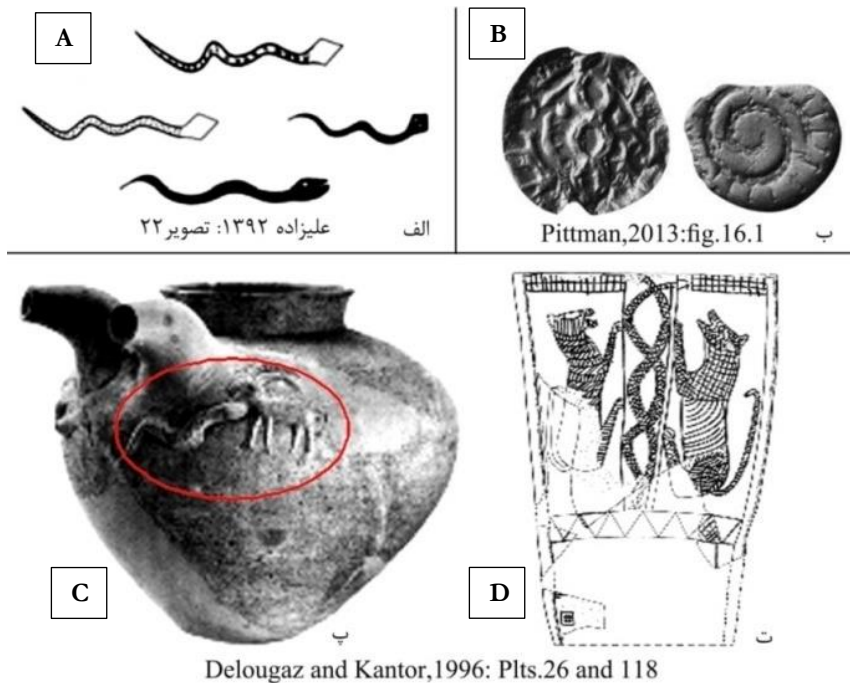


Figure 2: The serpent motif in southwest Iran. (A) The serpent motif over Susa A and Bakun B pottery; (B) A stamp seal from Susa A with two inter-twisted serpents; (C) A spouted jar from proto-literate Choghamish with plastic double-headed serpent motif; (D) A shouldered pottery jar from proto-literate Choghamish with inter-twisted serpents similar to Ningizida depiction in Fig 1C.

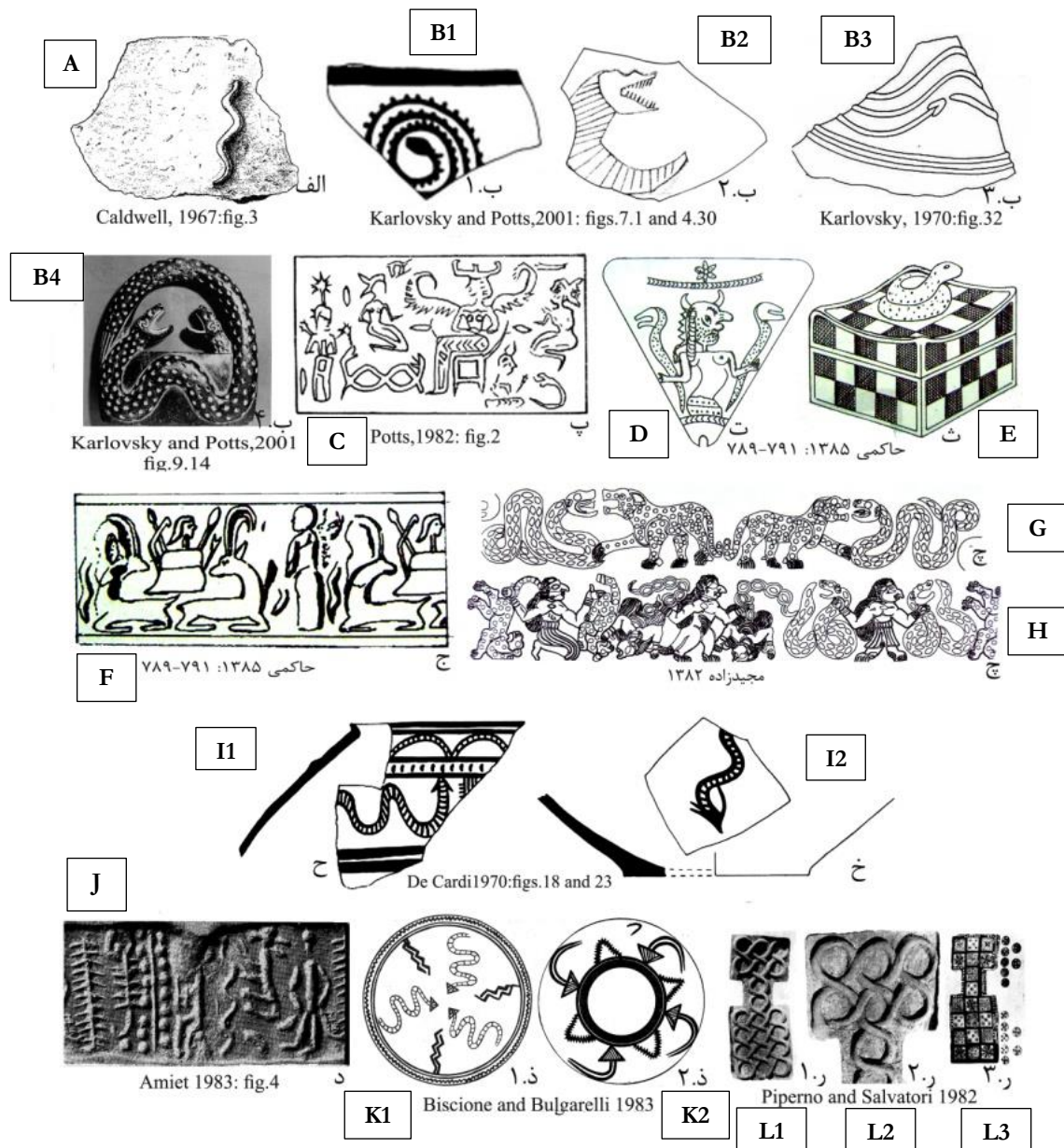


Figure 3: The serpent motif over the cultural materials of southeast Iran. (I) A plastic serpent motif on Iblis (rough Lalehzar) pottery. (B1-3) The serpent motif over Tepe Yahya IVB pottery. (B4) The serpent motif over chlorite objects from Tepe Yahya IVB. (C) A cylindrical seal from Yahya with a serpent motif and Elamite deities. (D) A bronze plaque from Shahdad with a man holding two serpents. (E) A chlorite building model with a serpent figure from Shahdad. (F) Cylindrical seals with serpent motif from Shahdad. (G & H) The serpent motifs over chlorite objects from South Konar Sandal, Jiroft. (I1-2) Horned serpent motif over Bampur II-IV pottery. (J) A cylindrical seal from Shahr-i Sokhta I similar to Susa. (K) A buff ware from Shahr-i Sokhta II-III with a serpent motif. (L1-2) A wooden game board with an inter-twisted serpent motif from grave No. 731 Period I. (L3) A game board from Ur royal cemetery.

VI. Conclusion

Although it is difficult to demonstrate where the serpent motif first emerged in the ancient Middle East, it is only natural to think that in the semi-arid terrain of Iran life is dependent on springs and underground waters, an animal like the serpent who lives underground, earned special attention and was considered as the god of underground waters. It appears the motif emerged almost simultaneously in a vast region of the Iranian plateau. The realistic depiction of the serpent was first reported from Sialk III4-5, Susa A/I, and Bakun A in the Middle East and during the late Uruk period, the motif penetrated into south

Mesopotamia and became a part of the artistic tradition. The presence of this motif in northern Mesopotamia such as Tepe Gawra is undoubtedly due to the extensive relationship with the nomads of the Zagros and the evidence of such relationships has been demonstrated by the seals and pottery of Hakalan and Parchineh cemeteries with Gawra.

However there is no firm evidence for the political, economic, or military dominance of Mesopotamia over the Susa plain during the proto-literate period, but after the establishment of the first Mesopotamian city-states, Southwest Iran became culturally and politically part of south Mesopotamia. In this period, during the mid-3rd

millennium BC, the cultural stream reversed, and the elements that had been Iranian earned Akkadian identity in the new belief system and returned to their homeland. The serpent motif is one of those artistic elements that can be discussed in the context of long-term cultural-material transactions between the Iranian plateau and Mesopotamia. The motif first emerged in the Iranian artistic works, then went to Mesopotamia and returned to the Iranian plateau with a new and redefined form in the religious context of Mesopotamia. The acceptance of this motif as an important symbol by Elamites was not due to the political dominance of Akkad over the Susa Plain, but it was because of the long cultural-ritual background of this motif among the inhabitants of the Iranian plateau. Many shreds of evidence indicate that in Elam both Sumerian-Akkadian (in their Iranian forms) and Elamite gods were worshiped by Elamites (Potts, 1981: 140-41).

On the other hand, the emergence of this motif in the art of southeast Iran should be considered a result of the trans-regional relationships done by Susa plain inhabitants across Iran after the proto-Elamite period. Although the serpent motif has no place in the cultural materials of southeast Iran before the 3rd millennium B.C widely but since the early 3rd millennium BC. At the beginning of period IV at Tepe Yahya (late 4th and 3rd millennium BC), there is a lot of evidence of a relationship with western regions. Cylinder seals, seal impressions, and engraved chlorite vessels are the indicators of such relations that are all depicted by serpent motifs and particularly show an artistic depiction of serpents in an epic-mythological context. The situation in Shahdad and Jiroft was similar to Tepe Yahya and signs of this motif can be seen on cylindrical seals, bobby pins, etc.

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IDENTIFYING STRATEGIC PRIORITIES FOR BALUCH WOMEN'S ATTIRE IN SISTAN: AN EMPHASIS ON ANCIENT BACKGROUND AND CULTURAL IDENTITY

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Abstract: The traditional attire worn by Baluch women in the Sistan region has evolved in response to the geographical conditions, encompassing cultural, social, economic, and natural factors, spanning extended historical periods. Adaptations have emerged with technological advancements over time. This distinctive clothing not only serves as a key element of identity but also stands as a representative expression of the authentic Baluch ethnicity. Rooted in the historical antiquity of the Sistan region, the dressing culture of Baluch women exhibits unique characteristics and features, shaped by diverse developments across cultural, social, historical, and climatic dimensions from ancient times to the present day. Hence, considering historical precedents and current conditions, this paper aims to scrutinize the attire of Baluch women in Sistan, specifically emphasizing the ancient background and cultural identity. The objective is to discern strategic priorities and glean insights from Baluch women in Zabol regarding the criteria guiding the selection of dress types and overall decision-making processes pertaining to the cultural aspects of women's attire, through a comparative analysis of the past and present. The central research question is formulated as follows: What constitute the most important selection criteria for Baluch women's dresses in Sistan, with a focus on ancient background and cultural identity? The research methodology employed is descriptive-analytical, relying on documentary, library studies, and field surveys. Additionally, the analysis utilized the Analytic Network Process (ANP) model, breaking down the data into 3 clusters (groups) and 9 sub-groups (nodes). The findings reveal that, in the analysis of Baluch women's dresses, the node "Compatible with traditional culture" (0.708) within the "Preference of Baluch Women in Zabol City" cluster, the node "Stemming from neighboring lands" (0.668) within the "Traditional Attire" cluster, and the node "Adhering to Sistan traditional culture" (0.525) within the "Modern Attire" cluster, have been assigned higher priority compared to alternative options. These results hold significance for decision-makers, planners, and officials involved in cultural matters, providing valuable insights for prioritizing strategies concerning women's dresses. Implementing these insights can contribute to the preservation and safeguarding of Iran's indigenous and traditional culture.

Keywords: Attire, Baluch Women, Archaeology, Sistan, Zabol City.

چکیده: لباس زنان بلوچ منطقه‌ی سیستان، طی دوره‌های متمادی تاریخی از شرایط جغرافیایی محیط انسانی (فرهنگی، اجتماعی، اقتصادی و ...) و محیط طبیعی تبعیت نموده است، با گذشت زمان و تحولات فن‌آوری، تغییراتی داشته است. این لباس بخشی از هویت و معرف قوم اصیل بلوچ است، با توجه به قدمت تاریخی منطقه‌ی سیستان و بر اساس تحولات مختلف در عرصه‌های گوناگون فرهنگی، اجتماعی، تاریخی و اقلیمی از دوره باستان تاکنون، فرهنگ لباس زنان بلوچ منطقه‌ی سیستان دارای مشخصه‌ها و ویژگی‌های منحصر به فردی است. از این رو، با توجه به سوابق گذشته و شرایط کنونی، هدف مقاله حاضر، بررسی لباس زنان بلوچ سیستانی با تأکید بر پیشینه و هویت باستانی جهت تعیین اولویت‌های راهبردی و اخذ دیدگاه‌های زنان بلوچ شهر زابل نسبت به معیارهای گزینشی نوع لباس و بطور کلی تصمیم‌گیری در خصوص مسائل فرهنگ لباس زنان در تطبیق گذشته با حال است. روش تحقیق توصیفی - تحلیلی و مبتنی بر مطالعات اسنادی، کتابخانه‌ای و بررسی‌های میدانی است همچنین با استفاده از مدل ANP، ۳ خوشه (گروه) و ۹ زیرگروه (نود) مورد تحلیل قرار گرفتند. نتایج نشان می‌دهد، نود «متناسب با فرهنگ سنتی» (۰.۷۰۸) از خوشه «انتخاب زنان بلوچ شهر زابل»، نود «منبع از سرزمین‌های همجوار» (۰.۶۶۸) از خوشه «پوشش سنتی»، و نود «تابع فرهنگ سنتی سیستان» (۰.۵۲۵) از خوشه «پوشش جدید»، در اولویت انتخاب، نسبت به سایر گزینه‌ها در تحلیل وضعیت لباس زنان بلوچ قرار گرفته‌اند، این نتایج برای تصمیم‌گیران، برنامه‌ریزان و مدیران مرتبط با مسائل فرهنگی می‌تواند در تخصیص اولویت‌بندی‌ها و راهبردهای لباس زنان جهت حفظ و صیانت از فرهنگ بومی و سنتی ایران مورد توجه قرار گیرد.

کلیدواژه: لباس، زنان بلوچ، باستان‌شناسی، سیستان، شهر زابل.

I. Introduction

Apparel across the globe is influenced by the geographical conditions of the human environment, encompassing cultural, social, economic, and neighboring factors, as well as the natural environment. The attire worn by Baluch women in the Sistan region reflects a millennia-long continuity of cultural identity. Rooted in the historical antiquity of the Sistan region and shaped by diverse developments in both human and natural landscapes from ancient times to the present,

the clothing culture of Baluch women in the Sistan region boasts distinctive characteristics, authenticity, and notable features.

The significance of Baluch women's attire remains steadfast even in the face of contemporary cultural shifts and global interconnectedness. Its enduring uniqueness and distinct identity highlight the need for scholarly investigation to safeguard, preserve, and elevate the role of Baluch women's clothing across various dimensions, encompassing techniques, designs,

patterns, and more. This initiative is crucial not only for preserving cultural heritage but also for fostering its role as a cultural reservoir in the creation and advancement of Iranian-Islamic clothing on the global stage.

Relying on archaeological data and historical insights, this study delves into the evolution of women's clothing in the Sistan region. Given that Zabol serves as the focal point of the Sistan region, boasting a population of approximately 500,000 (half a million) residing within a radius of about 50 kilometers around Zabol, encompassing seven cities and 900 villages, the research specifically addresses the state of Baluch women's clothing. Employing the "Analytic Network Process (ANP)" model with active female participation, this article aims to analyze and prioritize aspects, particularly focusing on the present scenario in Zabol. The utilization of this model facilitates strategic decision-making. By scrutinizing the current status, especially in Zabol, and involving women significantly, the research seeks to establish a comprehensive understanding before any substantial alterations to the cultural fabric of Sistani Baluch women's clothing, emphasizing the importance of a thorough examination and a form of "pathology."

II. Methodology

Considering the expansive scope of the Sistan region and the extensive workload involved, the research focused exclusively on Zabol City during the years 2020 and 2021. The research methodology adopted a descriptive-analytical approach, relying on documentary, library, and field survey studies conducted within Zabol. Cluster and multi-stage sampling methods, as outlined (Hafeznia, 2000: 109), were employed to administer questionnaires and gather data, allowing for the weighting of criteria and indicators. This approach proves more suitable considering the extensive geographical spread (horizontal expansion of Zabol City) of the units under analysis, coupled with the absence of a statistical population framework. Following a pilot phase to establish questionnaire reliability, 250 questionnaires were distributed, completed, and subsequently input into the computer after the completion of methodological steps. It is noteworthy that, aligning with the research focus and, more significantly, the evolving status of criteria and indicators over time, the ANP model facilitates the scientific extraction of priorities. Given the intricate and voluminous nature of calculations involved, the Super Decisions software was employed. The weighting of criteria and indicators in the ANP model is determined based on the output derived from field survey data at the Zabol City level, utilizing a numerical range of 1 to 9 within the ANP model.

III. Review of Literature

This section emphasizes studies that delve into the historical, identity, and distinctive facets associated with Baluch women's clothing. In a study conducted by Keshavarz and Javadi (2019), the primary objective was to identify the aesthetic elements of Baluch embroidery, recognized as the foremost indigenous art in the Baluchestan region, and to extract its key components. The findings of their research revealed that geometric patterns constitute the most crucial shared aspect of this art. Moreover, symbolic abstraction emerged as the paramount aesthetic feature of Baluch embroidery art (Keshavarz & Javadi, 2019: 5). Pourheydari and Sabet (2019) explored the feasibility of a novel venture within the realm of traditional Baluch clothing, adopting an innovative approach. They identified the traditional embroidery of the Baluchestan region as a potential avenue for fostering home businesses (Pourheydari & Sabet, 2019: 1). In a study conducted by Mounesi Sorkkeh (2017), the examination of clothing's role as a manifestation of cultural identity and the exploration of components within Iranian clothing were paramount. The study aimed to reconstruct Iranian clothing and proposed solutions for revitalizing it following transformations prompted by external influences. The research findings indicate that the role of design, color, texture, and decorations in clothing extends beyond mere aesthetics; it contributes to the preservation of human dignity. Moreover, these elements align with native and national ideologies, harmonize with temporal and spatial conditions, and exhibit cohesion with the representational values found in traditional Iranian arts (Mounesi Sorkkeh, 2017: 107).

In a study conducted by Hashemi Nia (2017), a detailed examination of the distinctive embroidery of Baluch women was undertaken. Employing a comparative method based on description and analysis, the research delves into the historical, cultural, and authentic significance of carpet designs, patterns, and other similar handmade fabrics within the same region. The comparison results lead to the advocacy for the preservation of this art, emphasizing the meaningful embroidery and carpet patterns (Hashemi Nia, 2017: 1). In an anthropological study by Javahari (2017), examples of indigenous clothing for women and girls are identified and introduced as a cultural asset among the Baluch and Turkmen ethnic groups, presented in pictorial form. The research findings reveal that these patterns can contribute significantly to the admirable objective of fostering greater interest among young women and girls in Iranian-Islamic dressing (Javahari, 2017: 1). In a study conducted by Paidar (2016), the primary objective was to identify and prioritize the factors contributing to the decline of Baluch handicrafts and arts in the rural areas of Qasrqand County. The research highlighted that the villages in question possess

substantial capabilities and capacities in handicrafts. However, the effective management of the supply and sale of their products encounters fundamental barriers (Paidar, 2016: 215).

Yasini (2016) conducted a sociological-aesthetic evaluation of traditional women's clothing in the desert areas of Iran, with a specific focus on the cultural and natural climate. The study considered four fundamental components - "geography, culture, religion, and occupation" - in analyzing the various types of clothing. The results underscored that the primary influential factor shaping the form, design, and texture of women's clothing in Iran's desert areas is the natural climate, followed by cultural geography. Additionally, religion and occupation were identified as significant variables, each ranking subsequently after the first two components (Yasini, 2016: 163). Furthermore, Yasini (2016) conducted a study investigating traditional women's clothing within the cultural geography of Iran. Drawing upon scholars' perspectives on fashion, tradition, and identity, the aim was to identify indicators and characteristics of authentic Iranian women's clothing. Employing inductive and comparative methods, Yasini examined women's traditional clothing in four countries - Tajikistan, Turkmenistan, the Republic of Azerbaijan, and Afghanistan. Through this approach, he elucidated the distinctive features of women's clothing in these regions, seeking to identify components integral to authentic Iranian women's clothing (Yasini, 2017: 53). Mousavi Haji et al. (2014) introduced and analyzed the clothing of Baluch men and women. The research revealed that Baluch local clothing is intricately linked to their way of life. The presentation of Baluch people through their clothing serves as a clear testament to their identity as one of the indigenous Iranian ethnic groups (Mousavi Haji et al., 2014: 179). Nazari et al. (2015) aimed to investigate the relationship between motifs in Kulporgan pottery art and Baluch embroidery, both drawing from a common cultural context. The study delved into the similarities and potential differences between these two forms of art. The findings indicated that both arts share common features such as the presence of geometric patterns with abstract and symbolic expressions inspired by nature and Baluch beliefs, as well as simple and composite patterns. Additionally, there is a parallel structure in the naming and selection of patterns based on the natural phenomena of Baluchestan (Nazari et al., 2015: 31). Ghasemi et al. (2014) sought to elucidate and showcase Baluch embroidery art, specifically focusing on the communicative aspects of its pattern structure intertwined with natural elements. The outcomes of their investigation unveiled that Baluch embroiderers, in crafting natural patterns, not only considered aesthetic harmonies and their surroundings but also pondered over their functional utility in accordance with the

geometric design style (Ghasemi et al., 2014: 61). In a study conducted by Khamooshi (2008), an examination of the traditional embroideries of two ancient Iranian ethnic groups, Baluch and Turkmen, highlighted the distinctions and resemblances in the application of traditional and contemporary ornaments in the embroideries of these ethnic groups (Khamooshi, 2008: 73). Experiences and historical context demonstrate a prevailing emphasis in most research on conserving the identity values embedded within cultural artifacts, particularly in the realm of Baluch women's clothing.

IV. Theoretical Principles

In this section, the content is succinctly outlined in light of the chosen subject, case study, and selected model. Due to the necessity of elucidating the status of Baluch women's clothing in both the broader Sistan region and the specific context of Zabol, the historical evolution of women's clothing in the Sistan region is initially explored, followed by an examination of the present situation in Zabol.

Historical Record of Women's Clothing in Sistan Region According to Archaeological Studies

The historic land of Sistan, with its illustrious civilizational legacy, has significantly contributed to the inception and advancement of culture and civilization in Iran. Abundant ancient artifacts, particularly the *Shahr-I Sokhta* of Sistan (circa 3200 years BC), stand as crucial archaeological evidence shedding light on the styles of women's clothing in this region for researchers.

The *Shahr-i Sokhta* harbors valuable artifacts that facilitate a relatively accurate reconstruction of the economic, social, and cultural milieu of the region. Situated along trade routes, the city exerted influence on and engaged in interactions with neighboring areas. Its trade and cultural ties extended to northern neighbors, such as the Namazgah culture in southern Turkmenistan, and eastern and southern counterparts like Bampur in Iranian Baluchestan and Miri Kalat in Pakistan, thus illustrating these interconnected relationships (Jahanbakhsh et al., 2018: 30). Regarding the attire worn by women in the *Shahr-I Sokhta* of Sistan during the 4th and 3rd millennia BC, archaeologists analyze the available data and evidence. In this context, the initial series of studies scrutinizes the unearthed clay and metal figurines and statues, which offer valuable insights into this aspect.

Research on figurines excavated from the *Shahr-I Sokhta* indicates that women's attire during that period was extensive, covering a significant portion of their bodies. Among the noteworthy discoveries in this realm is a bronze figurine depicting a woman, discovered within the *Shahr-I Sokhta* archaeological site. This depiction portrays a standing woman, her right hand gently positioned beneath her left breast, while her left hand securely holds a vessel atop her head. The woman

is adorned in a modest yet snug dress that extends to her knees, as illustrated in Figure 1. The lengthy, form-fitting garment lacks the typical soft texture associated with conventional fabrics. The presence of a ring encircling the woman's neck raises ambiguity regarding whether it constitutes the upper segment of her dress or serves as a slender collar (Tozi, 2006: 643, 654). An additional instance is represented by a standing female figurine measuring 4 centimeters in height, adorned with petite decorative tassels that extend down to the figurine's knees (Seyed Sajadi, 2004: 42). These embellishments are meticulously arranged in three distinct rows, demarcated by a belt, bearing a striking resemblance to contemporary artistic practices in Baluchestan, specifically the tassel embroidery found on women's aprons (Yaqubi, 2013: 170). Refer to Figure 2 for a visual depiction of the attire worn by this figurine.

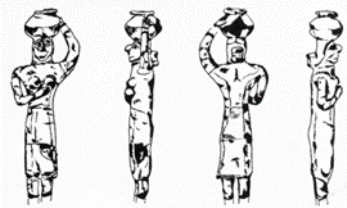


Figure 1: Bronze figurine of a woman in full attire, discovered in the Shahr-I Sokhta (Tozi, 2007: 666).

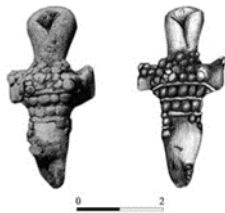


Figure 2: Clay figurine of a woman adorned with bead decorations, found in the Shahr-I Sokhta (Shirazi, 2007: 155).

Ancient artifacts discovered by archaeological teams on the Iranian plateau and in ancient India suggest a history of close ties and ongoing trade exchanges between the inhabitants of Iran and India from ancient times (Nurinezhad & Talebpoor, 2015: 162). Cultures are not isolated systems devoid of interaction with the external world; instead, they are perpetually engaged in interactions with other cultures. This interaction takes place within the context of economic or political relationships between various regions. The evolution of women's clothing in different periods in Iran has been shaped by the attire of both dominant and subordinate cultures (Babaei & Akbari, 2014: 245). It appears that the *Shahr-I Sokhta* represented a multicultural society, a characteristic inferred from the examination of artifacts retrieved from its burial sites. The racial, cultural, and civilizational attributes discerned from these burial sites affirm that the residents of the *Shahr-I Sokhta* originated from diverse locations (Seyed Sajadi, 2004: 45). Presently, the attire of Baluch women bears a significant

resemblance to clothing styles prevalent in the Indian subcontinent, particularly in Pakistan. In essence, it is noteworthy that the limited communication routes and the absence of mass media (in the past) between the Sistan region and inland Iran have exposed this area to the material and spiritual aspects of Indian culture (Moeidfar & Shohli Bor, 2007: 196). The hems of women's attire in Sistan and Baluchestan are embellished with intricate mirror work, embroidery, and vividly sewn strips. Moreover, the adorning of garments with beads, coins, and tassels constitutes another decorative technique that enhances their unique beauty and allure (Yasini, 2016: 185). Within a collection of prehistoric clay figurines excavated from Baluchestan, this particular figurine stands out as a notable representation of the mother goddess, particularly noteworthy for its attire (Zaboli Nezhad, 2009: 38). As depicted in Figures 3 and 4, the present-day fashion of women's clothing in Sistan, influenced by neighboring regions and adorned with intricate details, closely mirrors the tassel embroidery observed on the clothing of the figurine.

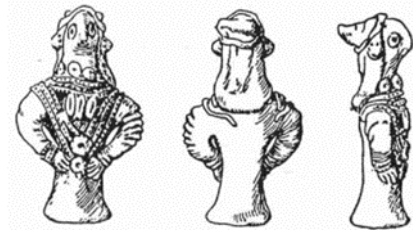


Figure 3: Clay figurine with bead-adorned dress, originating from prehistoric Baluchestan (Zaboli Nezhad, 2009: 36).



Figure 4: Illustration of Sistani women's attire, reflecting influences from neighboring lands (Pakistan and India) and featuring beads, at the central bazaar of Zabol City (Author: 2021).

Several archaeological reports highlight intriguing facets of the affluent clothing culture in this region. An additional illustration is the stone statue portraying a woman attired in a Saree, discovered in the *Shahr-I Sokhta* (Figs. 5 and 6). The configuration of this woman's garment closely mirrors the traditional Indian women's attire, specifically the "Saree." Additionally, the woman has elegantly draped a shawl or a scarf over her shoulders.

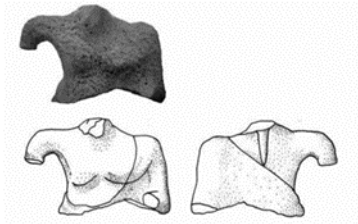


Figure 5: Stone figurine of a woman wearing a Sari, crafted from soapstone, excavated from the Shahr-I Sokhta (Vidale, 2018: 112 & Moradgholi, and Srivastav, 2018: 64782).



Figure 6: Reconstruction of a woman wearing a Sari stone figurine from Shahr-I Sokhta, showcasing a dress reminiscent of Indian women's attire (Moradgholi and Srivastav, 2018: 64782).

Another series of studies involves anthropological research focusing on the physical dimensions, height, stature, corpulence, and slimness of the individuals in that society. The aim is to develop models of the clothing worn by the inhabitants of the *Shahr-I Sokhta*. Additionally, meticulous attention is paid to various pieces of unearthed fabrics, with efforts directed towards identifying clothing components and their adornments—a crucial aspect in determining the nature of the attire. Recent research has unveiled an intriguing revelation: a substantial number of garments and textile tools utilized by the residents of the *Shahr-I Sokhta* bear striking resemblances to contemporary clothing and textile implements (Seyed Sajadi et al., 2009: 4-5).

The ancient city of *Shahr-I Sokhta* stands as one of the most crucial archaeological sites in Iran, housing a valuable assortment of prehistoric and early historical textiles. Through a meticulous series of comprehensive anthropological studies and attentive examination of various fabric fragments, the reconstructed clothing closely aligns with the authentic characteristics of that society. This alignment encompasses not only the fabric types but also reflects the physical dimensions, appearance, and physique of the people from that historical period. An intriguing observation discerned from these studies is the comprehensive nature of women's attire during that era, encompassing and concealing a significant part of their bodies. Notably, within the ornate embellishments adorning textiles from the *Shahr-I Sokhta*, likely components of upper garments, the utilization of decorative tassels is noteworthy on depictions of female figurines. In areas of the fabric weave exhibiting greater strength relative to others, discernible along the edges are meticulously incorporated additions. These additions, manually

inserted and sewn, serve the dual purpose of averting the unraveling of warp and weft threads and enhancing the aesthetic allure of the fabric. Figure 7 presents a model illustrating the application of these textiles. This depiction is informed by anthropological investigations conducted on human remains extracted from the *Shahr-I Sokhta* cemetery, allowing for the determination of the physical attributes and dimensions of the city's inhabitants (Seyed Sajadi et al., 2009: 4, 25, 31).



Figure 7: Analysis of clothing culture among the people of the Shahr-I Sokhta through technical examination of unearthed fabrics, with models based on female figurines (Seyed Sajadi et al., 2009: 36).

Archaeological research undertaken in the *Shahr-I Sokhta* reveals that women adhered to the prevailing fashion of the era and placed significant emphasis on adorning themselves with makeup, incorporating decorative elements in their clothing, and wearing jewelry.

V. The Present Attire Worn by Baluch Women in Zabol

The cultural manifestation of Baluch women's attire in the Sistan region reflects a systematic historical evolution steeped in their artistic preferences. The continuity between some contemporary clothing and the historical identity of the land is evident. In times past, the entirety of women's shirts bore intricate embroidery. However, in the present day, owing to the intricacy and complexity of the patterns, embroidery is reserved for three specific pieces of women's shirts, with the upper piece commonly referred to as "zi" or "ziq," signifying the collar. The pocket segment of a garment is referred to as "gofan" or "guptan," while the wrist cuff is known as "astinak" (Mohammadi Seif, 2015: 62). Illustrated in Figures 8 and 9 is the overarching design of Baluch women's shirts in the Sistan region, showcasing intricate embroidery adorning the collar, pocket of the garment ("guptan"), wrist cuff, and trouser hems. Presently, the art of embroidery in Baluchistan, commonly recognized as "Baluch needlework," thrives as a decorative-practical craft. Beyond the aesthetic appeal of its patterns and colors, Baluch embroidery also contributes to the fabric's resilience and durability. Baluch embroidery designs

exhibit a diverse array, drawing inspiration from nature and the imaginative ingenuity of Baluch women, often incorporating geometric shapes. In their artistic endeavors, Baluch women have strategically selected areas of a garment or fabric with optimal visibility to showcase their designs, demonstrating a deliberate approach to highlighting the embroidery (Nazari et al., 2015: 43 and 39).



Figure 8: Exemplification of Baluch girls' attire adorned with intricate embroideries on the collar, "guptan" dress pocket, sleeve cuff, and trouser leg ends, from the Sistan region, Zabol City (Author: 2021).



Figure 9: Overview of the design of Baluch women's shirts with embroidery, as per corrections made by the author (Yavari, 2014: 61).

The embroidered elements are meticulously affixed to the garment, enveloping the unstructured square-shaped upper body entirely (Mohammadi Seif, 2014: 62). Despite numerous transformations in the attire of urban Iranian ethnic communities over the last century, the cultural ethos of the Baluchestan region, encompassing Sistan, persists. Even in urban settings, members of this ethnic group continue to demonstrate a dedicated commitment to donning their traditional clothing, underscoring the enduring significance of their cultural heritage (Keshavarz & Javadi, 2019: 14). A noteworthy aspect of Baluch women's attire in Sistan is the prominent display of handicrafts, notably embroidery, Yaraghdoozi, and blackwork, enhancing the aesthetic appeal of the clothing (Omran Nasab, 2007: 120). This tradition has endured across various historical epochs, evident in the present day where such characteristics, along with others outlined below, are observable in the central bazaar of Zabol City.

A) It has been influenced by neighboring regions such as Iranian, Pakistani, and Indian Baluchestan.

B) The traditional hand-embroidered garments, renowned for their exceptional quality, command significantly higher prices compared to typical attire in Iran, with the current price range (2020) starting from 25 million Rials and above.

C) Conversely, the traditional machine-embroidered garments (e.g., those produced by the machine industries of Yazd province) exhibit lower quality in comparison to their hand-embroidered counterparts but are more budget-friendly, with the current price range (2020) starting from 5.2 million Rials and above. Figure 10 depicts an example of Baluch girls' attire available in the central bazaar of Zabol city in 2021.



Figure 10: Illustration of Baluch girls' dresses, observed at the central bazaar of Zabol City (Author: 2021).

prominence, with historical records indicating their residence in the small village of Khajeh Ahmad beside the Sistan River (Tate, 1985: 179). The dispersion of the Naroei tribe has led to diverse considerations regarding their original homeland, including the Barez mountains, the Naroei mountains of Khash, the Bampur region, and Sistan itself (Ebrahimzadeh, 2009: 247). The "Sanjarani" tribe inhabits the villages of Dostmohammad in the Miyankangi district, Ghalehno in the Shahraki district, and Naroei in Sistan (Afshar Sistani, 1991: 449, 487). The "Saravani" tribe, originating from Saravan in Baluchestan, has established their residence in Hoseinabad, an ancient and foundational area in Zabol City, following their migration (Ebrahimzadeh, 2009: 250). The elders of the "Saravani" tribe trace their roots back to Saravan in Baluchestan. Their migration was prompted by an ethnic conflict and a power struggle, compelling them to move under the leadership of an individual named Haj Malek. Their journey took them first to India (present-day Pakistan), then to Afghanistan, ultimately settling in Sistan (Raeis Al-Zakerin Dehbani, 2009: 68). The "Barahoei" tribe, known for their stronghold in the villages of Lutak, Sekuhe, and various other regions of Sistan, held considerable influence throughout Sistan and Baluchestan from ancient times until the end of the Qajar era. Similarly, the "Gorgich" tribe resides in villages such as Malek Heydari, Lutak, and other locales across Sistan (Afshar Sistani, 1991: 293, 471). A

significant observation lies in the settlement of Baluch tribes in the Sistan region, reflecting their dispersion. In authentic Baluch embroidery designs, distinct variations in form and color usage across regions have resulted in the southern areas of Baluchistan exhibiting more intricate embroidery patterns and vibrant, lively colors,

whereas the northern and eastern regions feature simpler patterns and softer hues (Nazari et al., 2015: 32). This distinction is aptly manifested in the embroideries adorning the clothing of Baluch women in the Sistan region, particularly in Zabol City.



Figure 11: Exemplars showcasing the utilization of colors, shapes, and intricate textures in the embroidery of Baluch women's attires (Author: 2021).

This art predominantly employs geometric shapes characterized by sharp corners, with triangular forms being the most prevalent. Baluch embroidery is renowned for creating a dense, intricate, and diverse texture through the repetitive use of visual elements, exemplified by numerous instances. In essence, the visual culture of Baluch women's clothing embroidery is distinguished by a high volume of ornaments, intricate patterns, and meticulous attention to small details, emphasizing delicacy (Fereydonzadeh et al., 2019: 73). Figure 11 illustrates examples of the vibrant colors, geometric shapes, and intricate, delicate textures employed in Baluch women's clothing embroidery.

Today, due to urban development, coats, pants, and black chadors have become commonplace among women; however, traditional clothing still holds sway in the majority of Sistan (Yaghoubi, 2013: 173). In such circumstances, the Baluch people's steadfastness toward their traditional attire and the art of embroidery is immensely valuable. By identifying and promoting the most pivotal cultural aspect of the Baluch as an ethnic and cultural emblem, there is hope for the perpetuation of this cultural and ethnic bond amid the influence of dominant cultures. Art and handicrafts stand as the foremost visual expressions of a society's culture, and their preservation offers one of the optimal means for safeguarding cultural identity (Keshavarz & Javadi, 2016: 15). Given the significance of comprehending the

clothing preferences of Baluch women in Zabol City for decision-makers, planners, and managers involved in various cultural sectors, this article deems it imperative to introduce a suitable model—the ANP model.

VI. Results

In the current investigation, the model has been meticulously designed utilizing the Analytic Network Process (ANP) framework. This design takes into account the structure of the ANP process, considering both the data type and content, as well as the intricate interrelationships among all criteria and options, as illustrated in Table 1 and Figure 12. The selection of the three primary criteria, organized into clusters, is informed by the status of available data and the essential alignment required with the numerical matrix and network calculations. It is imperative that the data type is compatible with the ANP analysis, emphasizing the need for a cohesive integration with the model. Consequently, the three main criteria identified are:

A) Traditional Attire: Derived from the rich historical tapestry of the Sistan region and adjacent territories such as Iranian, Pakistani, and Indian Baluchistan.

B) Modern Attire: Reflecting the "present," it is an amalgamation of Sistan's traditional culture, Iran's overarching cultural influences, the cultural tapestry of

neighboring lands, and a synthesis of traditional, prevalent Iranian, neighboring, and global elements.

C) Preference of Baluch Women in Zabol City (Strategic Considerations): Options include "Traditional Style with High-Quality Hand Embroidery," and "Traditional Style with Machine Embroidery at a Lower Cost," aligning with the city's traditional culture as detailed in Table 1. Criteria and Sub-Criteria Effective

in the ANP Model Based on the Analysis of Baluch Women's Clothing Situation in Zabol City Criteria are delineated as clusters (groups), while alternatives are specified as subgroups or sub-networks (nodes). In this current investigation, the model's design incorporates 3 clusters (groups) and 9 subgroups (nodes) (refer to Table 1), as illustrated in Figure 12, and undergoes comprehensive analysis.

Table 1: Criteria as clusters (Groups) and alternatives as subgroups (Nodes).

Criteria/Cluster (Group)	Subgroup (Node)
1 Traditional Attire	Stemming from (past history) Sistan region Stemming from neighboring lands Adhering to Sistan traditional culture Adhering to Iran's general culture
2 Modern Attire	Adhering to neighboring lands culture Adhering to combined (traditional, common Iranian, neighboring and global) situation High quality
3 Preference of Baluch Women in Zabol City	Low cost Compatible with traditional culture

As depicted in Figure 12, each box is identified as a criterion, with the contents inside representing sub-criteria. Each criterion is associated with a calculation matrix, and similarly, there exists a calculation matrix among all the content inside the boxes (sub-criteria). Notably, the boxes (criteria) engage in matrix calculations not only with the sub-criteria but also with other boxes (criteria), leading to intricate and time-intensive computations, including supermatrix calculations, among others.

The arrows within Figure 12 denote the interconnection among the boxes or criteria (matrices, etc.). It is essential to underscore that, in the present study's model, the connections between all criteria and sub-criteria are multidirectional and thoroughly defined. Figure 12 presents the overarching framework of the ANP model, elucidating the analysis of the Baluch women's clothing situation at the city level of Zabol. The titles delineate clusters, while the subtitles elucidate nodes within the model.

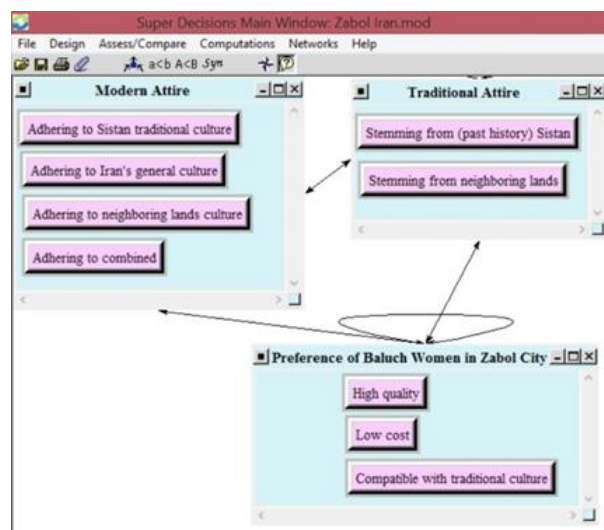


Figure 12: Comprehensive depiction of the ANP model derived from the analysis of Baluch women's attires in Zabol City.

Figure 13 illustrates the network of interactions among dimensions and indicators, represented as clusters and nodes. These connections are derived from the network of interactions within the core process dimensions and indicators. The modeling outputs serve

as inputs for the ANP software, delineating the relationships and prioritization of cluster dimensions and nodes within the software model, subsequently executing these specifications.

Cluster Node Labels	Modern Attire				Preference of Baluch Women in Zabol City			Traditional Attire
	Adhering to combined	Adhering to Iran's general culture	Adhering to neighboring lands culture	Adhering to Sistan traditional culture	Compatible with traditional culture	High quality	Low cost	Stemming from (past history) Sistan
Modern Attire	Adhering to combined	0.097644	0.084909	0.089854	0.096867	0.072988	0.208098	0.088261
	Adhering to Iran's general culture	0.042852	0.021326	0.032152	0.035233	0.024346	0.038315	0.012922
	Adhering to neighboring lands culture	0.018106	0.031692	0.014140	0.016920	0.013530	0.012625	0.025848
	Adhering to Sistan traditional culture	0.174731	0.195406	0.197188	0.184313	0.222469	0.074296	0.206302
Preference of Baluch Women in Zabol City	Compatible with traditional culture	0.238146	0.110778	0.243968	0.233658	0.258038	0.233592	0.248793
	High quality	0.028235	0.100737	0.027475	0.035382	0.018651	0.026669	0.026801
	Low cost	0.066953	0.121818	0.061890	0.064293	0.056645	0.073073	0.057740
Traditional Attire	Stemming from (past history) Sistan	0.250000	0.266667	0.277778	0.066667	0.055556	0.277778	0.291656

Figure 13: Demonstration of the weighted supermatrix method derived from data and information collected through survey studies in Zabol City, employing the ANP model (resulting from clusters).

Results of the ANP Model Based on the Analysis of the Clothing Situation of Baluch Women in Zabol City. Each cluster (group) and the overall model yield distinct outcomes. Due to the intricacies of the presentation process, we provide a summary of noteworthy findings resulting from the model implementation. In essence, some impactful results are elucidated in the format of the model software output. In Figure 14, a comparative analysis is presented between the node status of "low cost" in the "Preference of Baluch Women in Zabol City" cluster and the nodes within the "Contemporary Attire" cluster. This visualization highlights the significance and priority assigned to the "Adhering to

Sistan traditional culture" node in contrast to the "Adhering to neighboring lands culture" node. Understanding the priorities within the "women's clothing status" is imperative for effective cultural planning and management. Consequently, identifying these priorities through various forms of ANP model network analysis unveils strategic insights. The conclusive outcomes of prioritizing the clothing status of Baluch women at the city level of Zabol, derived from calculations involving clusters (groups) and subgroups or nodes of the ANP model, are presented both numerically as normalized figures, accompanied by cluster statuses, and graphically in Figure 14.

Icon	Name	Normalized by Cluster	Limiting
No Icon	Compatible with traditional culture	0.70758	0.235861
No Icon	Low cost	0.19650	0.065500
No Icon	High quality	0.09592	0.031972
No Icon	Adhering to neighboring lands culture	0.05226	0.017421
No Icon	Adhering to Sistan traditional culture	0.53477	0.178257
No Icon	Adhering to Iran's general culture	0.09580	0.031934
No Icon	Adhering to combined	0.31716	0.105721
No Icon	Stemming from neighboring lands	0.66778	0.222594
No Icon	Stemming from (past history) Sistan	0.33222	0.110739

Figure 14: Final prioritization of the status of Baluch women's attires in Zabol City, based on calculations from clusters (groups) and sub-groups or nodes of the A

As depicted in Figure 14, the prioritized nodes in the analysis of Baluch women's clothing status in Zabol City include "Compatible with traditional culture" (0.708) from the "Preference of Baluch Women in Zabol City" cluster, "Stemming from neighboring lands" (0.668) from the "Traditional Attire" cluster, and "Adhering to Sistan traditional culture" (0.525) from the "New clothing" cluster. These prioritizations signify the emphasis on cultural considerations in the selection process, reflecting the historical clothing culture of Baluch women in the Sistan region and the contemporary situation in Zabol City.

VII. Discussion and Conclusion

The attire of women in the Sistan region boasts a historical lineage dating back to the archaeological excavations of the *Shabr-i Sokhta* and its satellite mounds. According to research conducted by a collaborative Iranian-Italian group, over 51 types of fabrics have been unearthed and studied in the *Shabr-i Sokhta*, affirming the historical depth of women's clothing in the Sistan region. Moreover, ancient figurines and statues provide visual evidence of the diverse styles of women's clothing across various historical periods.

The evolution of women's clothing throughout historical epochs has been shaped by diverse factors and elements, all of which find expression in the creation and representation of cultural artifacts associated with women's attire. The enduring presence and consistency of cultural and identity elements in the clothing of Baluch women in Sistan are substantiated by historical evidence. Crucial to note is the sustained connection between historical and cultural identity spanning from the past to the present. This study demonstrates that the implicit prioritization of traditional women's clothing aligns with the historical background of the Sistan region. In addressing clothing-related decisions, the examination and analysis of criteria and indicators associated with the ANP model have been deemed essential. This model facilitates the determination of priorities grounded in the defined criteria and alternatives.

The conclusive outcomes of prioritizing the clothing status of Baluch women at the city level of Zabol, derived from calculations involving clusters (groups) and subgroups or nodes of the ANP model, are presented in both numerical format (normalized alongside cluster statuses) and graphically. As indicated by the results, the prioritized nodes include "Compatible with traditional culture" (0.708) from the "Preference of Baluch Women in Zabol City" cluster, "Stemming from neighboring lands" (0.668) from the "Traditional Attire" cluster, and "Adhering to Sistan traditional culture" (0.525) from the "Modern Attire" cluster, surpassing other options in the analysis of

Baluch women's clothing status. These findings underscore the historical clothing culture of the Sistan region and the current scenario in Zabol. They can be valuable considerations for decision-makers, planners, and managers involved in women's clothing issues when prioritizing strategic initiatives.

VIII. Strategic Suggestions

In light of the results obtained from the current study, which include interviews with Baluch women, discussions with sellers situated in the traditional (central) bazaar of Zabol, and insights from local tailors in Zabol, the following suggestions and strategies are put forth:

The prices of hand-embroidered sets of Baluch women's clothing in Zabol have surged in recent years, concurrently with a decline in customers' purchasing power to afford them.

The escalating costs of "hand-embroidered" fabrics pose a threat, resulting in the flourishing demand for "machine" embroideries. However, these machine embroideries often compromise on artistic intricacy and quality (including color, shape, texture, etc.) compared to their hand-embroidered counterparts.

An additional concern arises from the diminished quality and aesthetic appeal of machine embroideries, potentially leading to reduced interest among the new generation of Baluch women in Zabol towards this particular style of clothing.

Over the forthcoming decades, the economic viability of Zabol's traditional (central) bazaar, specifically in the domains of sewing, retail, and occupations associated with Baluch traditional embroidered clothing, may confront the risk of extinction due to a declining demand from the emerging generation of Baluch women.

A segment of Zabol's traditional (central) bazaar has long been dedicated to the production, sewing, and sale of Baluch traditional embroidered clothing, contributing to the authentic identity of the locale. The potential threat or risk of decreased sales is anticipated to bring about modifications in the operational dynamics of these establishments.

A significant facet of the genuine identity of Zabol city's traditional (central) bazaar has been intricately involved for numerous years in the production, sewing, and sale of traditional Baluch hand-embroidered clothing. The impending threat or risk of decreased sales is poised to instigate alterations in the operational dynamics of these shops. Consequently, it is imperative to safeguard and preserve the functions of these establishments within Zabol's bazaar, which embody crucial elements and symbols of identity, particularly those related to professions and trades associated with Baluch women's clothing. Urban planners, managers, and officials should formulate and implement incentives

to ensure the protection and continuity of these integral aspects.

The advancement and flourishing of the artistry and craftsmanship behind Baluch women's hand-embroidered clothing, both nationally and internationally, can have a significant impact with comprehensive backing extending from production to showcasing in domestic and foreign exhibitions. This approach proves effective in preserving, safeguarding, enhancing quality, generating employment opportunities, and stimulating economic activities in the Sistan region and Zabol City.

Reviving and creating opportunities to enhance the promotion of Baluch women's hand-embroidered dresses can serve as a preventative measure against the threats and risks of the potential extinction of this

valuable technique and art form. Moreover, fostering enthusiasm and momentum within the production, sales, and consumption chains at both national and international levels will contribute to the comprehensive promotion and development of associated professions and Baluch women's hand-embroidered clothing in the Sistan region, particularly in Zabol City.

The Baluch women's dresses in Sistan stand out as some of the most exquisite elements within the authentic attire of Iranian women. In order to safeguard the identity of Iranian-Islamic dressing culture, cultural officials responsible for women's clothing matters should attentively address both opportunities and threats within this domain.

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ANALYSIS OF THE CONDITION OF THE SHAHR-DRAZ SITE IN THE DAMAN RIVER BASIN BASED ON POTTERY FINDINGS FROM SURFACE SURVEY AND SOUNDING TO DETERMINE THE CORE ZONE

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Abstract: The Shahr-Draz site is located in Southeast Iran in the Daman River basin in the center of the Shahr-Draz village of Iranshahr County in the center of Sistan and Baluchistan Province. The Bampur River basin is one of the important ancient areas in the Baluchistan region. Bampur River is formed by the joining of small rivers such as Karvandar and Daman and many other small branches and flows in the east-west direction. Daman and Bampur Rivers were the center of the formation of significant sites in the Bronze Age, which played an essential role in the formation of human communities. The Daman River basin has been a communication corridor between the north, center, and south of Baluchistan. To protect the Shahr-Draz site, the first author was commissioned by the General Directorate of Cultural Heritage of Sistan and Baluchistan Province to conduct a field survey and sounding to determine the core zone and propose the buffer zone for this site in the summer and fall of 2020, which lasted 45 days. During this period, the site was carefully surveyed step-by-step, and 14 trenches with 1 × 1 m dimensions were dug in different directions. During the project, 112 potsherds were identified, registered, and studied. The present research aims to study the found pottery from this site and compare it with other simultaneous sites in neighboring areas. This work has been done with the purpose of a comprehensive understanding of the condition of this site and the extent of its cultural interactions to realize the cultural dynamics of the region. In this research, two methods of documentary and field research have been used. The results show that the Shahr-Draz site with an area of about 35 hectares in the Daman River basin had cultural continuity during the Bronze Age and the pottery of this site has the most similarities with the pottery of the ancient sites of Bampur and the Pakistan region. In addition, based on the typology of pottery, it seems that in the Bronze Age, the Daman River basin had not only extensive regional and extra-regional relations, but was also one of the important communication routes and the connecting point between the sites of Central Baluchistan and the sites of Soghan Valley, Makran, Sistan, and Baluchistan of Pakistan.

Keywords: Shahr-Draz site, Baluchistan, the Daman River basin, Bronze Age, Pottery, Comparative typology.

چکیده: محوطه شهردراز در جنوب شرقی ایران در حوضه رودخانه دامن در مرکز روستای شهردراز، شهرستان ایرانشهر در مرکز استان سیستان و بلوچستان قرار دارد. حوضه رودخانه بامپور یکی از مناطق مهم باستانی در منطقه بلوچستان است. رودخانه بامپور از بهم پیوستن رودخانه‌های کوچکی چون کارواندر و دامن و بسیاری از شاخه‌های کوچک دیگر تشکیل شده و در جهت شرقی - غربی جریان دارد. رودخانه‌های دامن و بامپور مرکز شکل‌گیری مکان‌های مهمی در عصر مفرغ بودند که نقش اساسی در شکل‌گیری جوامع انسانی داشتند. حوضه رودخانه دامن یک کریدور ارتباطی بین شمال، مرکز و جنوب بلوچستان بوده است. برای حفاظت از محوطه شهردراز، اولین نویسنده از سوی اداره کل میراث فرهنگی استان سیستان و بلوچستان مأموریت یافت تا در این محوطه بررسی میدانی و گمانه‌زنی برای تعیین عرصه و پیشنهاد حریم انجام دهد. این پروژه در پاییز و زمستان سال ۱۳۹۹ به مدت ۴۵ روز انجام شد. در این مدت محوطه به صورت گام به گام مورد بررسی دقیق قرار گرفت و ۱۴ ترانشه به ابعاد ۱×۱ متر در جهات مختلف حفر شد. در این پروژه ۱۱۲ قطعه سفال شناسایی، ثبت و مطالعه شد. پژوهش حاضر با هدف بررسی سفال‌های کشف شده از این محوطه و مقایسه آن با سایر محوطه‌های همزمان در مناطق همجوار و به منظور شناخت همه جانبه از وضعیت این محوطه و میزان تعاملات فرهنگی آن برای تحقق پویایی فرهنگی منطقه انجام شد. در این تحقیق از دو روش اسنادی و میدانی استفاده شده است. نتایج نشان می‌دهد که محوطه شهردراز با وسعتی در حدود ۳۵ هکتار در حوضه رودخانه دامن در عصر مفرغ تداوم فرهنگی داشته و سفال‌های این محوطه بیشترین شباهت را با سفال‌های محوطه‌های باستانی بامپور و پاکستان دارد. علاوه بر این، بر اساس گونه‌شناسی سفال، به نظر می‌رسد، در عصر مفرغ، حوضه رودخانه دامن نه تنها روابط گسترده منطقه‌ای و فرامنطقه‌ای داشته، بلکه یکی از راه‌های ارتباطی مهم و نقطه اتصال بین محوطه‌های بلوچستان مرکزی و محوطه‌های دره سوغان، مکران، سیستان و بلوچستان پاکستان بوده است.

کلیدواژه: محوطه شهردراز، بلوچستان، حوضه رودخانه دامن، عصر مفرغ، سفال، گونه‌شناسی مقایسه‌ای.

I. Introduction

One of the goals of archaeological field research is to determine the status of the core zone of ancient sites concerning natural complications and human effects for protection, chronology, and determination of their intra-regional or inter-regional cultural interactions.

One of the most significant cultural areas in the southeast of Iran is the Daman River basin in Sistan and Baluchistan Province. This river is located about 5 km south of Iranshahr County and about 3 km west of the village and the ancient site of Shahr-Draz, at geographical coordinates 27112100N, 60434620E (Fig.

1). Daman River and Valley with north-south direction, which covers about 40 km², is of great importance in the archaeological studies of the Baluchistan region. The Daman River basin contains a collection of ancient monuments, of which little systematic and coherent information has been published so far. This area has long been a suitable place for the formation of human settlements. Archaeological surveys and excavations in one of the sites in this area, named Shahr-Draz, indicate that it was inhabited during the Bronze Age (Stein, 1937:

115). Recent archaeological research in the Daman River basin has made it possible to study these cultural features. This research aims to obtain a clear state of the structure and dimensions of the Shahr-Draz site in this cultural area. Furthermore, based on the study of the pottery found from the surface survey of the site, an attempt has been made to suggest the relative chronology of the site and to explain the cultural interactions of this part of Baluchistan with a comparative study of cultural materials.

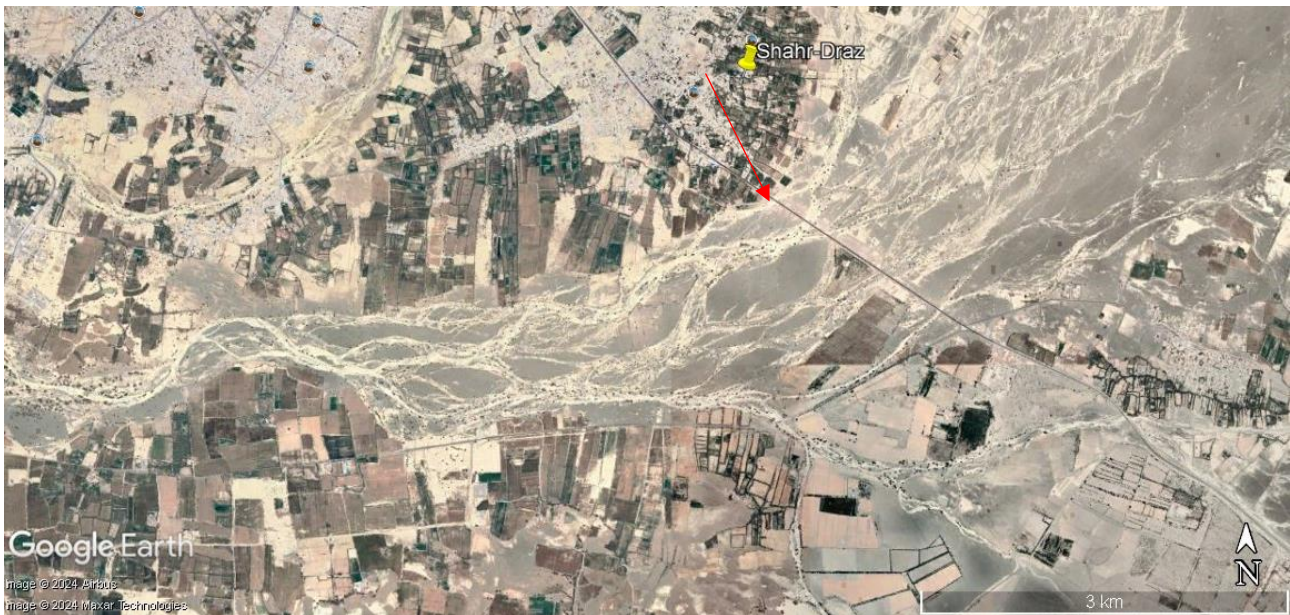


Figure 1: Location of the Shahr-Draz site concerning the Daman River (Google Earth, 2023).

II. The Topographical Condition of the Shahr-Draz Site

The Shahr-Draz archaeological site is located in the southeast of Iranshahr County and about 800 m east of Daman River. This ancient site is located in the village of the same name in the form of two separate low mounds. Mound A with coordinates 27112100N, 60434620E, an area of nearly 35 hectares, and a height of about 70 cm from the ground is located in the center of the Shahr-Draz village. Mound B with coordinates 27119070N, 60436520E, an area of about 1 hectare and a height of about 20 cm above the ground is located in the north of the village (Fig. 2) (Keikha, 2020: 20). The distribution of cultural materials is different on the mound A. Most of the pottery is scattered in the central

and southern parts of this mound, and as we move towards the west, east, and north, the distribution of pottery decreases due to the extensive construction of the villagers. Unfortunately, the southern, eastern, and southeastern parts of this mound have been seriously damaged because it is used as a cemetery. The distribution of cultural materials in different parts of the mound B is also different. The high density of pottery is in the central and eastern parts of this mound, and as we move towards the west, south, and north, the distribution of pottery decreases drastically due to construction activities. The eastern parts of this mound have been also destroyed because it is used as a cemetery. Parts of the south of this mound have also been destroyed because of the residential constructions and an alley called Hafez 23 (Keikha, 2020: 80).

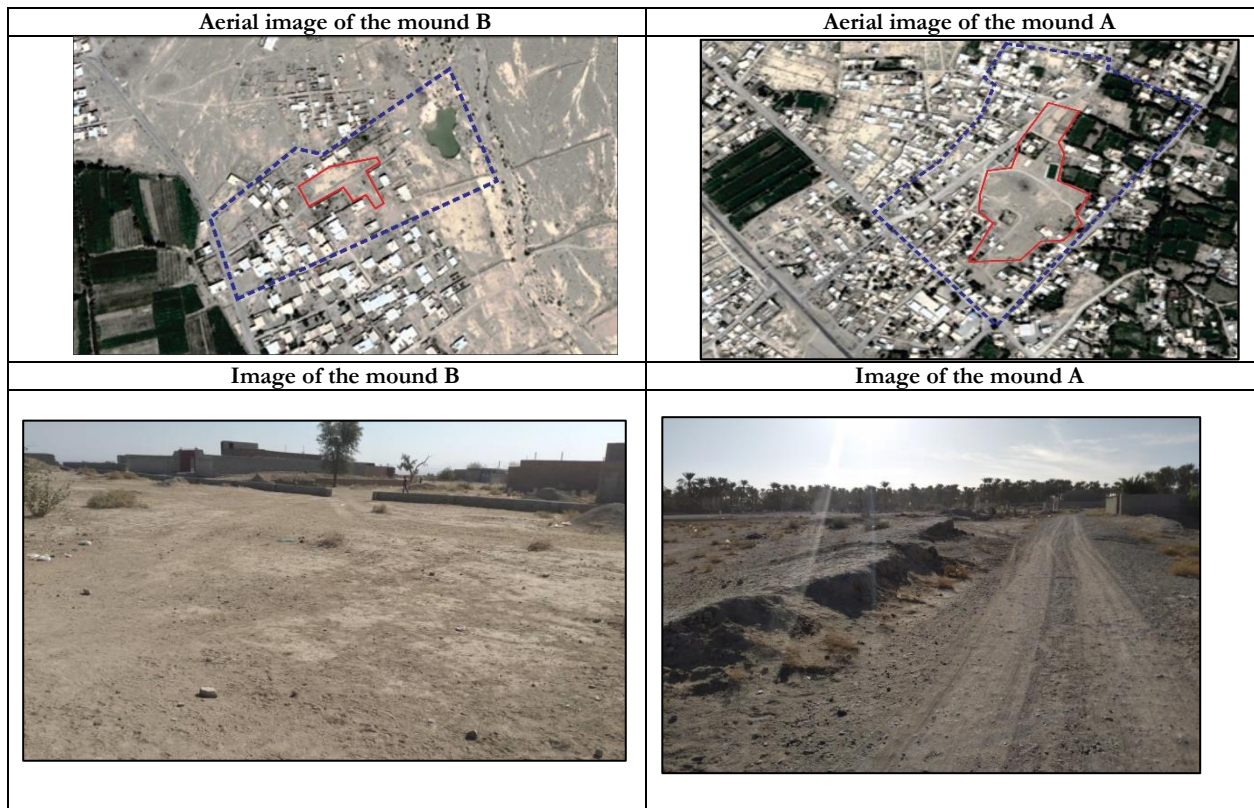


Figure 2: Images of the mounds A and B of the Shahr-Draz site (authors, 2020).

III. Archaeological Research at the Shahr-Draz Site

The fieldwork of the archaeological team at the Shahr-Draz site was conducted in two stages: (a)

surveying the site, and (b) sounding. Before sounding to determine the core zone of the site, the research team found it necessary to survey the surface and around the Shahr-Draz site in an area of 4 km² (Fig. 3).



Figure 3: Surface survey of the site (Keikha, 2020: 5).

This was important in several ways: (1) determining the extent of the distribution of surface archaeological artifacts of the site (2) investigating the density of cultural materials in different parts of the site (3) checking the cultural periods of the site (4) the amount and type of destructions that took place In the site (5) specifying the natural complications and human effects on the surface and around the area (6) choosing the right place to excavate test trenches to determine the core zone and propose the buffer zone of the site. To achieve this goal, a team of 4 archaeologists conducted a survey on this site for 7 days. This survey showed that the Shahr-Draz site has two separate mounds, one in the central part and the other in the northern part of the Shahr-Draz village. Destructions of these two mounds can be identified in several parts: The expansion of residential houses in the village and the establishment of the village cemetery on the core zone of the site, the construction and widening of the alleys and streets of the Shahr-Draz village, construction of non-profit buildings such as the village health center, the village administration, the mosque, and the school in different parts of the core zone and the buffer zone of the site. Unfortunately, a large part of the Shahr-Draz site has been destroyed. During the surface survey of the site, a

number of archaeological findings (potsherds, stone vessel fragments, stone and bronze beads, and a bronze arrowhead) were collected from different parts by random sampling method. Then the archaeology team chose the location of the trenches and excavated them to identify the core zone of the site based on surface and non-surface artifacts. In this research project, 9 trenches measuring 1 x 1 m were excavated around the mound A and 5 trenches measuring 1 x 1 m around the mound B. In some places due to existing restrictions such as communication roads, residential houses, agricultural fields, and some sections created by natural or human factors, the location of the trenches was chosen at distances of about 120 m and in some places at distances of about 60 m. These trenches were excavated at a suitable distance from the last distribution of surface cultural materials. At first, the geographical coordinates of each trench were recorded and from all its angles were photographed. It should be noted that the excavations were conducted using a contextual method. No cultural data was obtained from any of the trenches. In this way, the core zone of the Shahr-Draz site was determined. The names of the trenches TSHA and TSHB were abbreviated for "trench Shahr-Draz mound A/B" (Fig. 4, Tables 1 and 2).

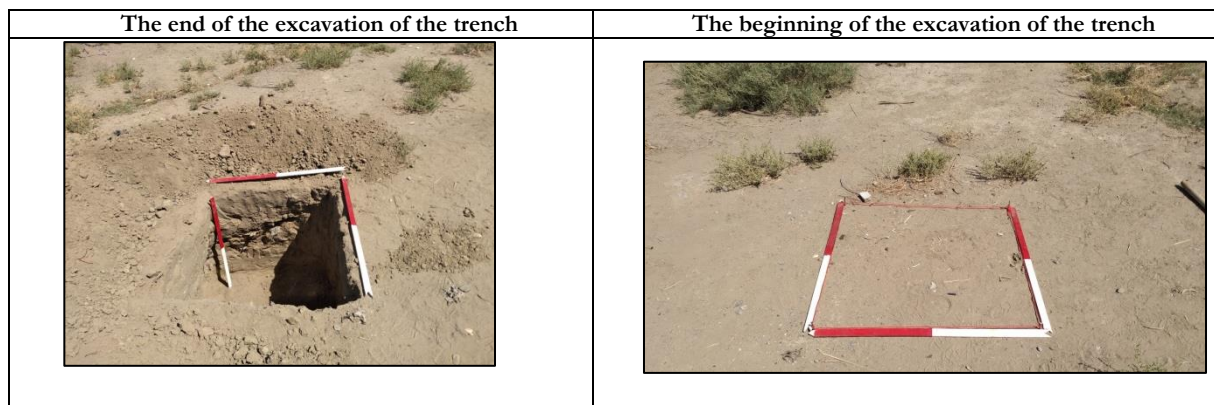


Figure 4: An Example of the excavation of experimental trenches to determine the core zone of the Shahr-Draz site; Trench TSHA4 (Keikha, 2020: 111-112).

Table 1: Geographical coordinates of trenches excavated in the mound A core zone (Keikha, 2020: 98-99).

Trench	Latitude (N)	Longitude (E)
TSHA1	27112100	60434620
TSHA2	27111750	60434550
TSHA3	27111030	60434530
TSHA4	27111050	60435370
TSHA5	27111630	60435890
TSHA6	2711638	60435899
TSHA7	27113190	60435870
TSHA8	27113280	60435450
TSHA9	27112460	60435030

Table 2: Geographical coordinates of trenches excavated in the mound B core zone (Keikha, 2020: 98-99).

Trench	Latitude (N)	Longitude (E)
TSHB1	27118950	60436300
TSHB2	27119070	60436520
TSHB3	27119190	60436810
TSHB4	27118890	60436910
TSHB5	27118720	60436370

IV. Archaeological Findings of the Shahr-Draz Site

During the step-by-step surface survey of the site and sounding to determine the core zone and propose the buffer zone of the site, 112 potsherds were found and recorded. In the following, statistical studies and comparative typology are described in two sections.

V. Statistical Study of Pottery Samples

Based on the study of 112 potsherds found in the Shahr-Draz site, there are 4 types of pieces, including incomplete pottery, rim, body, and base. The rim of

pottery with 73 pieces (65%) is the most type and the incomplete pottery with 1 piece (1%) is the least. 27 pieces (24%) belong to the pottery body and 11 pieces (10%) belong to the pottery base (Fig. 5). There are 110 wheel-made potsherds and only 2 handmade potsherds, which indicates the wide use of the pottery wheel in the Shahr-Draz site. Besides, most of the pottery in this collection had sufficient firing. Sufficient firing of pottery indicates the progress of pottery kilns in this area during the Bronze Age. The main chamotte of the pottery was of mineral type consisting of fine gravel and sand, and there was no evidence of plant chamotte among the pottery samples.

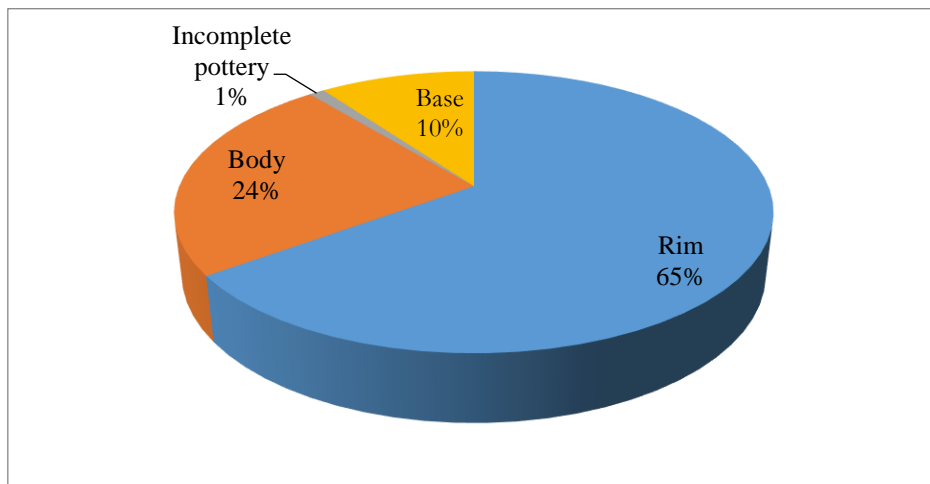


Figure 5: Statistical study of samples based on the type of potsherd (Authors, 2022).

VI. Statistical Study of Samples Based on the Type of Form

The pieces of pottery found from the Shahr-Draz site are divided into 5 different types in terms of form, which are: bowls, cups, pots, jars, and plates. The bowl form with the number of 31 pieces (42%) was the most type of form and the plate form with the number of 1

piece (1%) was the least. The form of the pot included 22 pieces (30%), the jar with 5 pieces (7%), and the cup with 15 pieces (20%). It should be noted that there were 38 pieces, including the body and the base, and the form of these potteries could not be identified. Therefore, a statistical study of the form typology was carried out based on 74 pieces of rims that could be used to identify the form of pottery (Fig. 6).

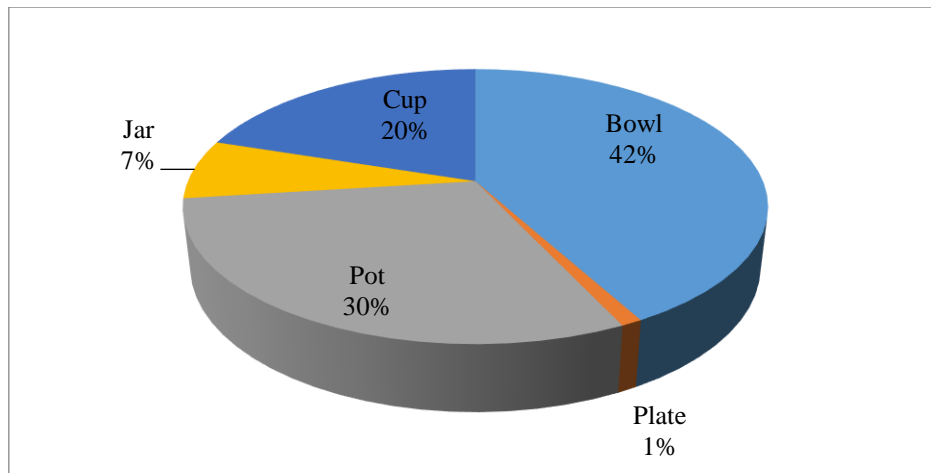


Figure 6: Statistical study of pottery samples based on the form typology (Authors, 2022).

VII. Statistical Study of Pottery Samples Based on the Type of Decoration

Studying the pottery of the Shahr-Draz site shows that 76 potsherds are decorated and 36 are undecorated. Decorations of pottery are divided into 5 types, which are painting, carved patterns, burnished patterns, added patterns, and paintings along with added patterns. Painting decoration with 48 pieces (63%) is the largest number of pottery decorations and painting along with

added patterns with 5 pieces (6%) is the least. Carved patterns include 8 pieces (11%), burnished patterns 8 pieces (11%), and the added patterns 7 pieces (9%) (Fig. 7). Most motifs are geometric, which occupy most of the pottery decorated with paintings and carved patterns. There are 66 geometric motifs (87%) and 2 animal-geometric motifs (3%). Besides, 8 pieces (10%) of decorated pottery are of the burnished pattern type, which was not considered as a motif (Fig. 8). Black, red, and brown colors have been used to color the motifs.

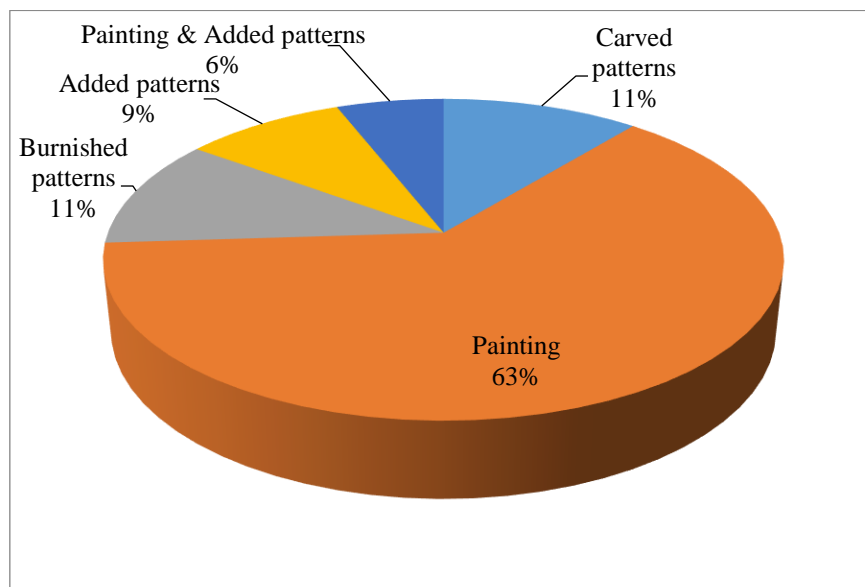


Figure 7: Statistical study of pottery samples based on the type of decoration (Authors, 2022).

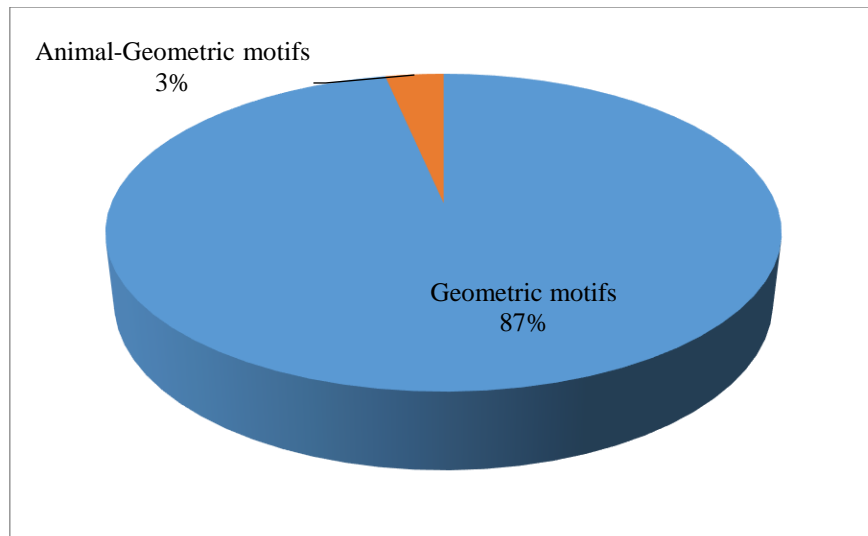


Figure 8: Statistical study of pottery samples based on the type of motif (Authors, 2022).

VIII. Statistical Study of Samples in Terms of Fineness

These pottery are divided into 3 classes in terms of fineness, which are: fine (1-3 cm), medium (4-7 cm), and

rough (8 cm and more). Pieces with medium fineness are the most with 91 pieces (81%) and fine pieces with 10 pieces (9%) are the least number. Rough pieces also include 11 pieces (10%) (Fig. 9).

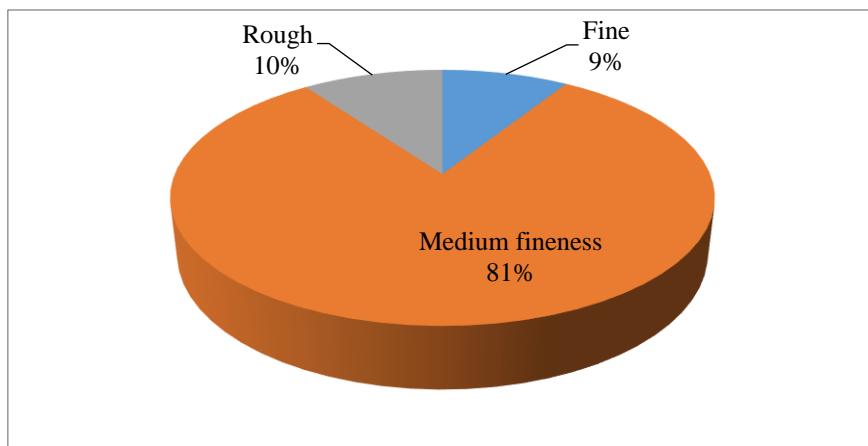


Figure 9: Statistical study of the samples in terms of pottery fineness (authors, 2022).

IX. Statistical Study of the Samples Based on the Pottery Paste Color

In the study collection, there are 4 colors of pottery paste: pale brown, red brownish, red, and gray. The red

brownish paste is the most with 77 pieces (69%) and the red paste is the least number with 9 pieces (8%). Further, there are 16 pieces (14%) with gray paste and 10 pieces (9%) with pale brown paste (Fig. 10).

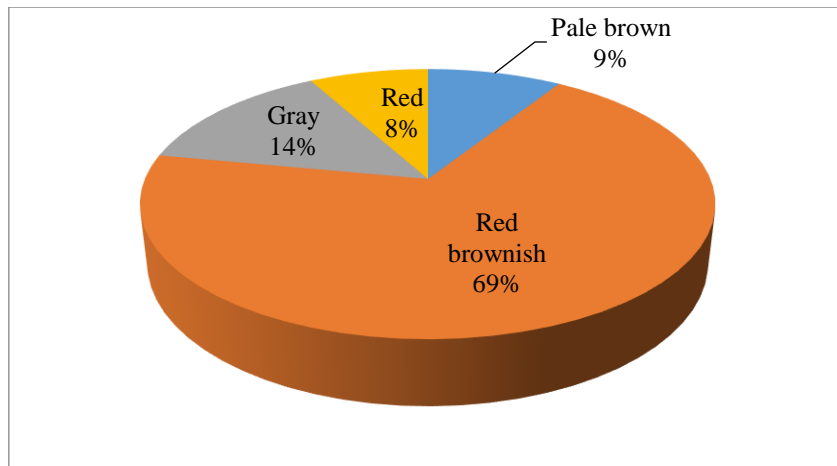


Figure 10: Statistical study of the samples based on the pottery paste color (authors, 2020).

X. Statistical Study of Samples Based on the Pottery Firing

In the studied pottery collection, 105 pieces (94%) have sufficient or appropriate firing and only 7 pieces

(6%) have insufficient firing. Therefore, the majority of pottery has sufficient firing, which indicates the use of kilns with proper thermal control (Fig. 11).

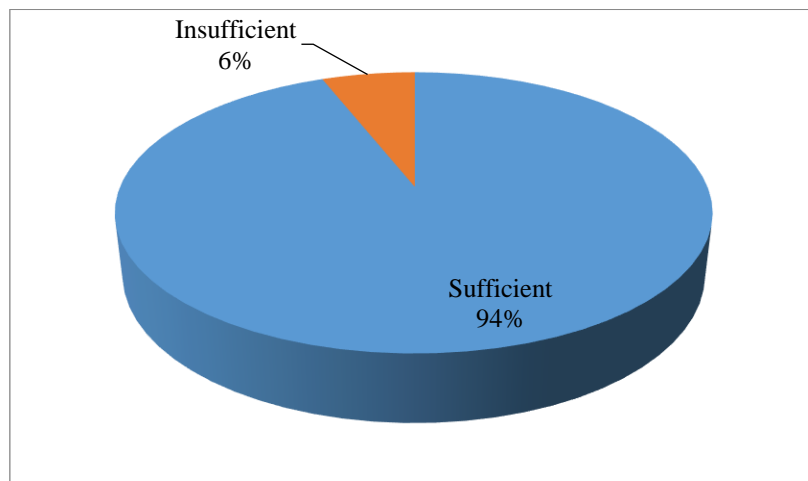


Figure 11: Statistical study of samples based on the quality of pottery firing (authors, 2022).

XI. Typological Comparisons of Pottery

This comparative study was done with the two purposes of determining the chronology of settlement and the cultural relations of this region with the neighboring regions. Since the Daman River basin and Iranshahr County in the center of the Baluchistan region of Iran are located near and adjacent to regions such as Pakistan, Makran, Sistan, and Afghanistan, comparisons have been made with the pottery of these regions:

a) Sistan plain sites in Iran: Shahr-i sokhta, Tepe Dasht, Rudbiaban mounds, Gratziani, Tepe Sadeq, and Tepe Taleb Khan 1 and 2;

b) Baluchistan sites in Iran: Bampur, South Makran sites, Dambigan, Khorab, and Daman;

c) Afghanistan sites: Gardanrig and Mundigak;

d) Miri Kalat site in Pakistan;

e) Tepe Yahya in Kerman.

For the typological comparison of pottery, two common indicators have been considered, that is, pottery form (according to the rim and base) and decorations. This study was carried out on undecorated pottery based on evaluation criteria, in the order of priority: rim, base, handle, and pottery form, and on decorated pottery based on the type of decoration and the type of motifs (Fig. 12, Plates 1, 2, 3). It is obvious that the priority is to compare with the pottery found in the excavated sites, and then the pottery found in archaeological surveys.

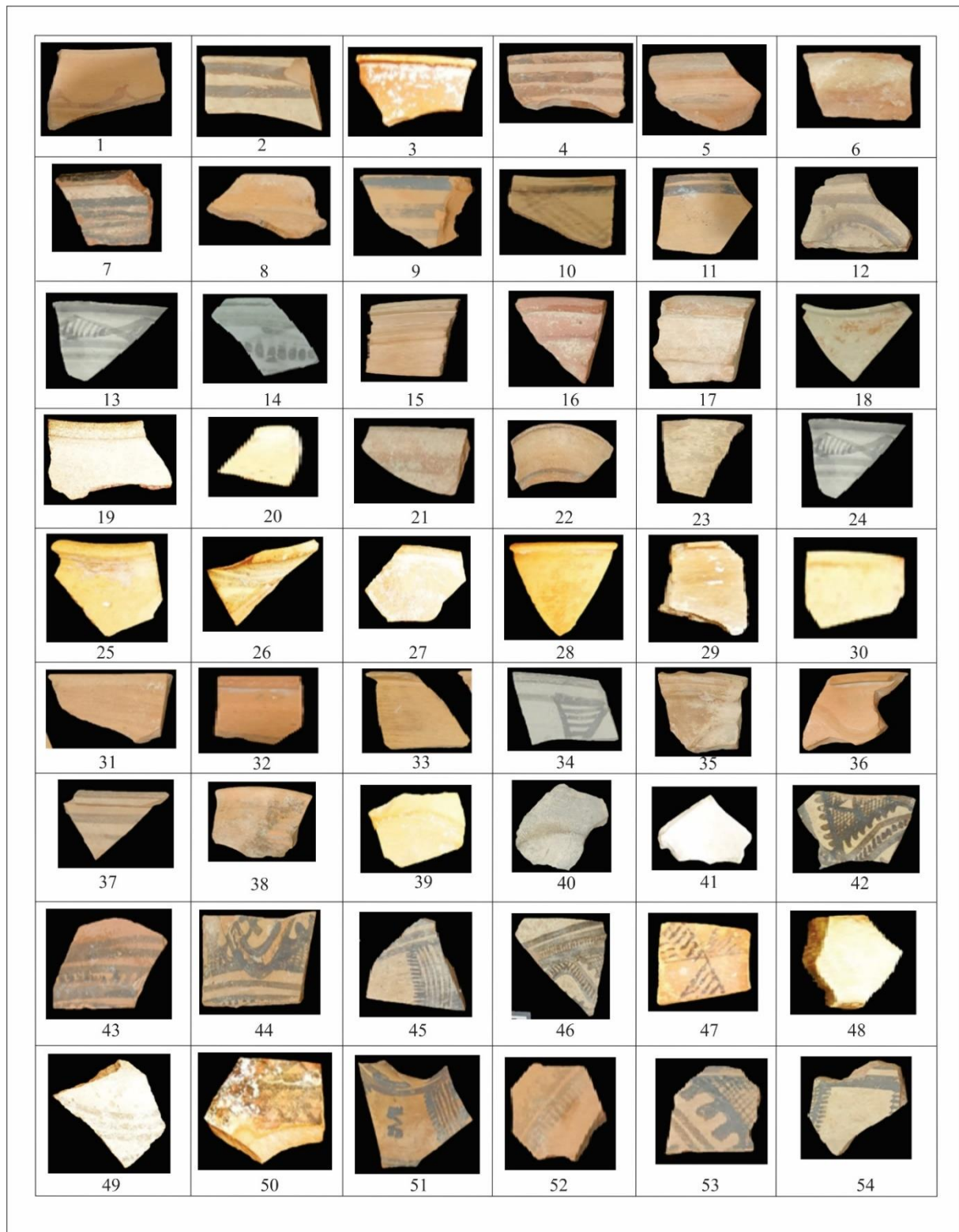


Figure 12: The indicative pottery samples of the Shahr-Draz site (Authors, 2022).

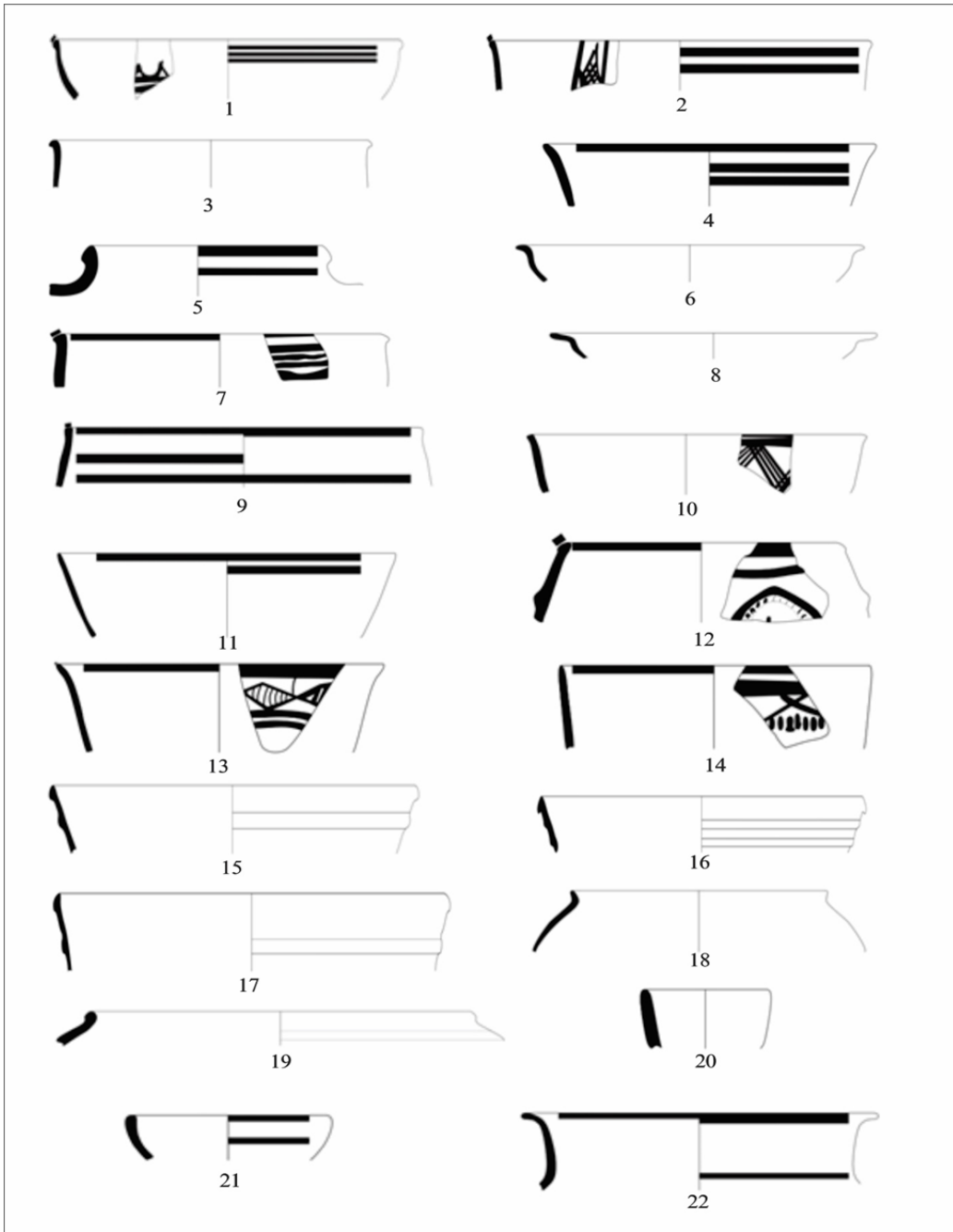


Plate 1: Designs of the indicative pottery samples of the Shahr-Draz site; Samples 1-22 (Authors, 2022).

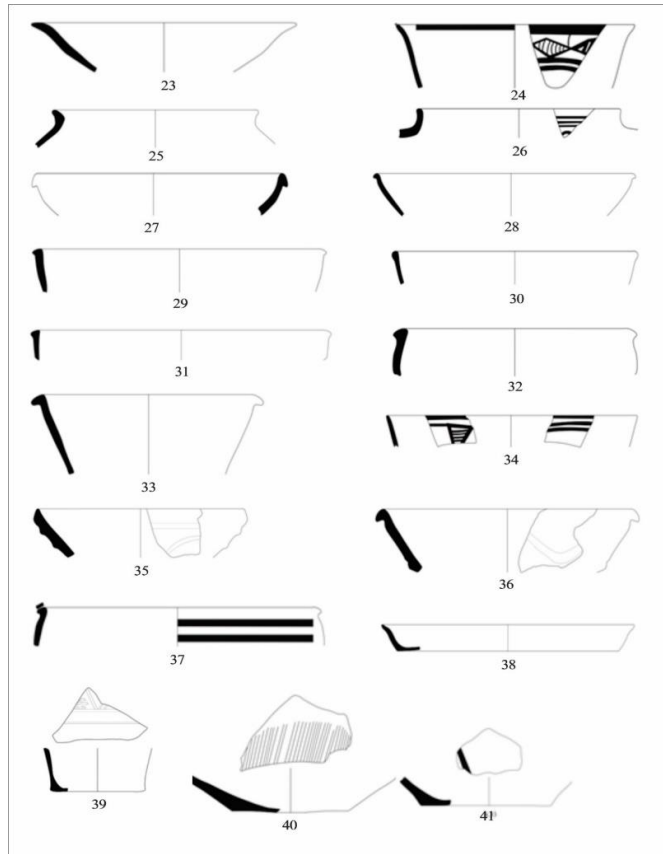


Plate 2: Designs of the indicative pottery samples of the Shahr-Draz site; Samples 23-41 (Authors, 2022).

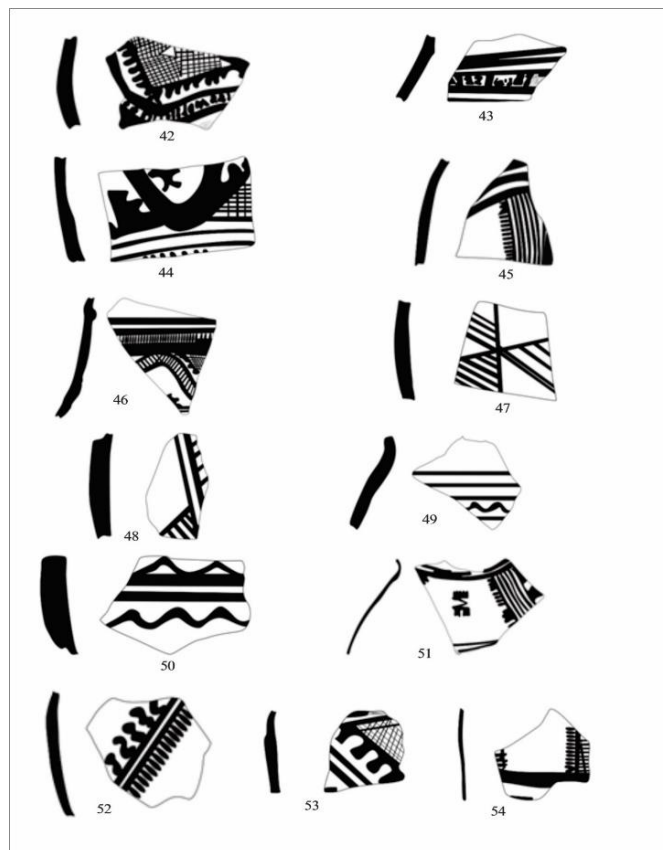


Plate 3: Designs of the indicative pottery samples of the Shahr-Draz site; Samples 42-54 (Authors, 2022).

Based on the comparative study of the pottery, the Shahr-Draz site was continuously inhabited during the 4th and the 3rd millennia BC, i.e. the Bronze Age of the region. In addition, the pottery of the Shahr-Draz site in the Daman River basin is similar to those of Shahr-i sokhta II (Vidale & Salvatori, 1997: figs. 104-105, figs. 198-199; P. 126, fig. 192, No. I; Salvatori & Vidale, 1978: 102, fig. 116, No. I), Shahr-i sokhta III (Salvatori & Vidale, 1978: 150, fig. 200, No. 7), Shahr-i sokhta IV (Tosi & Lamberg-Karlovsky, 1973, fig. 63, No.2), and Tepe Dasht (Shurestani, 2010: Table 7-3-4) in Sistan, Iran; Mundigak (Shaffer, 1978: 135, fig. 3.30, No.8), Mundigak IV1 (Shaffer, 1978: 130, Fig. 3.25, No. 8), Mundigak IV2 (Shaffer, 1978, P. 133, Fig. 3.28), and Gardanrig (Fairservis, 1961, P. 113, No. 111) in Afghanistan; Bampur I and II (Seyed Sajjadi, 2008: fig. 1-7; DeCardi, 1970: fig. 8), Bampur II (DeCardi, 1970: 280, fig. 18, No. 59, P. 285, fig. 21, No. 104, P. 298, fig. 30, No. I), Bampur III (DeCardi, 1970: fig. 22), Bampur IV (DeCardi, 1970: fig. 8, fig. 24, fig. 29, fig. 31, P. 296, fig. 29, No. 284, P. 298, fig. 30, No. I), Bampur I-IV (Besenval, 1997: fig. 27-28; DeCardi, 1970: 298, fig. 43, No. 264), Bampur V (DeCardi, 1967: fig. 35), Bampur VI (DeCardi, 1970: 317, fig. 43, No. 446; Seyed Sajjadi, 2004: Fig. 8), the Sarbaz River basin, Tepe Keshari (Moradi, 2010: Fig. 7-4-2-138 b), the Sarbaz River basin, Tepe Dekali (Moradi, 2010: Fig. 3-5-3, Plan 14), Khorab (Stein, 1937: P1XXXII), Damin (Tosi, 1974, fig. 20-30; Tosi, 1970: 40, fig. 23, No.e), the Dambigan site in Qasr Qand County (Jozi, 2018: 94) and South Makran (Shirazi & Dahmardeh, 2016: 90) in Baluchistan, Iran; Tepe Yahya IVb1 (Lamberg-Karlovsky et al., 2001: 173, fig. 6.12, No. I), Tepe Yahya IVb2 (Lamberg-Karlovsky et al., 2001: 157, fig. 5.18, No. E), Tepe Yahya IVb6 (Lamberg-Karlovsky et al., 2001: 98, fig. 3.18, No. O), and Yahya IVc (Lamberg-Karlovsky, 1970: fig. 24) in Kerman; Lal Shah (Biscione, 1987: 398, fig. 5, No. B), Miri Kalat IIIc (Didier, 2007: fig.9), and Kach Makran IIIb (Didier, 2007: 23, fig. 7, No. 3) in Pakistan.

XII. Conclusion

In this research, an attempt was made to provide a comprehensive insight into the Shahr-Draz site located in the Daman River basin, Iranshahr County, Baluchistan region of Iran. Then based on the pottery findings obtained from field surveys and excavations, the chronology of the site, and regional and extra-regional connections are to be evaluated. This research

was conducted based on archaeological field studies of this site in the summer and fall of 2020 and documentary studies. The Shahr-Draz site is located in the center and north of the Shahr-Draz village in the form of two relatively low mounds, separated from each other. The area of mound A is about 35 hectares and the area of mound B is about 1 hectare. It is necessary to mention that large parts of mound A have been severely destroyed based on the modern structures created by the residents of the Shahr-Draz village. In the second part of the research, the total pottery findings obtained from the surface survey and sounding to determine the core zone and propose the buffer zone of the Shahr-Draz site were 112 pieces, and all these pottery were subjected to statistical studies based on the type of piece, form, decoration, etc. The clay of all pottery is reinforced with sand particles. Some of the pottery is also decorated with geometric and animal motifs. 54 pieces of pottery were subjected to a typological comparative study, and it was found that the Shahr-Draz site was inhabited in all six periods of Bampur I-VI, i.e. during the fourth and third millennia BC. Further, the results indicated that the economic and cultural interactions between the Daman River basin and neighboring regions such as Afghanistan, Pakistan, Makran, and Kerman have been almost continuous. These connections can be seen in the pottery art of the Shahr-Draz site with the neighboring regions during the Bronze Age. The typological comparisons of the pottery clearly show the similarity of the pottery of Shahr-Draz with that of the neighboring regions, especially the Bampur River basin. The great cultural connections between the Daman River basin and the Bampur River basin can be seen from the similarity of the pottery of the Shahr-Draz site with the sites of Bampur and the Khorab cemetery. In addition, the comparison of some pottery with that of Tepe Yahya sheds light on the connection of Shahr-Draz with Kerman and its western neighbors in the Bronze Age. The pottery comparable to that of the Sistan region (Iran and Afghanistan) also shows that the Shahr-Draz site was not only connected with the neighboring regions but also with the northern and eastern regions and beyond, with the lands of Afghanistan, Pakistan, and the Indus Valley. There has been communication. At the same time, these cultural and artistic similarities confirm the existence of a wide cultural and communication network throughout this region during the Bronze Age.

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