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Development and Destruction of the Old City of Narmashir in Kerman Province; through the Lens of Kenneth Watt's Ecological Theory

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Abstract


Problem Statement: The historic cities in Iran have gone through many ups and downs, and development and decline, due to various internal and external factors. The study of these factors can help find the roots of cultural and social upheavals. The Old City of Narmashir in the southeast of Kerman is one of these Iranian historic cities. According to archaeological and historical documents, Narmashir has expanded from the Sāsānid Empire (AD 224–651) to the late Timurid period. However, as the archaeological materials suggest, the population of the city significantly decreased from the Safavid dynasty onwards. Also, The Old City was abandoned after the Afghans attack. Our question is “what environmental and ecological factors influenced the formation, development, and destruction of the Old City of Narmashir?”

Purpose: The purpose of this study is to explain the role of geographic and ecological factors in the formation, development, and destruction of the Old City of Narmashir through the lens of Kenneth Watt's ecological theory.

Research Methodology: Data were collected through documentary and field methods. The systematic survey in this site was carried out in July 2014 and was registered in the cultural heritage list. The research method in this paper is analytical. First, the historical documents were studied and analyzed by the “content analysis” method. Afterwards, the data were analyzed drawing on the five variables in Kenneth Watt's ecological theory: “material, energy, diversity, space and time.

Result: According to our data analysis, “Space” had not only the most effect on the formation and development of the Old City of Narmashir, but also on its departure and decline. “Material, diversity, and energy” had also a major role. However, there is not much awareness and evidence on the role of “material” and “diversity” in the abandonment of the city by its residents. Moreover, “time” did not play any significant role in the development and destruction of the city. Such changes in Narmashir might as well be affected by non-ecological factors. The authors believe that the ecological factors mostly led to the above-mentioned three phases.

Keywords: *The old cities, Narmashir, formation and destruction of the city, ecological factors.*

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Introduction

The Old City of Narmashir is located in the southeastern part of Kerman Province (map. 1), on the way of the Iranian central Plateau reaching the Coasts of Oman, Hormuz and Indian Sea. According to historical and archaeological evidences, people resided in Narmashir until the Timurid period; the city's population had a decline during the Safavid dynasty and finally was abandoned due to Afghans' invasion. Our question is: what environmental and ecological factors influenced formation, development, and destruction of the old city of Narmashir?

The purpose of this study is to explain the role of geographic and ecological factors in the formation, development, and destruction of the city through the lens of Kenneth Watt's ecological theory. The research hypothesis is that the most effective ecological factors in the formation of the old city of Narmashir were probably "energy" and "space" due to geographical location of the Narmashir plain. In addition, "space" has played a major role in the destruction of the city. This fundamental research is important in that it takes into account two issues: the role of the southeastern societies and cities of the Islamic era in political and cultural changes. Moreover, this research sheds a light on future researches on the unknown historical monuments near the Lut desert (Fig.1).



Fig. 1. Square: The old city of Narmashir – Ellipse: the cultural landscape of Narmashir. Source: Authors.

Research literature

The first field project in the old city of Narmashir was performed by an archaeological excavation in 1999 by Reza Asad Abadi. but, he never published a report on his project. Subsequently, some historic sites and monuments of Narmashir were identified in the second season of the archaeological survey of Bam (Zare, 2008). In 2014, another excavation was carried out to delimit the historic site of the Old city of Narmashir (Amirhajloo, 2014b). Then a file and some documents were prepared and registered as national monuments. Some M.A dissertations drew on these projects for data analysis: "an archaeological survey into the monuments of the Islamic era in Narmashir county" (Moghbeli, 2015), and "the study of the pottery of the Islamic era in Narmashir (Amirani Pour, 2016). Also, the architectural features and distribution pattern of the historic military buildings in the Narmashir plain were explained in an article (Moghbeli Gharaee, et al., 2018). The distribution of the monuments and sites of the Islamic era at Narmashir was the subject of another study (Saghaee & Amirhajloo, 2016). As well as the current article, there are others which have used Kenneth Watt's ecological theory for research on historic sites. As an instance, the role of "material," "energy," "diversity," "space," and "time" in the formation and destruction of the old city of Jiroft was investigated (Amirhajloo, 2014a). In another dissertation, the effect of climate on Sistan architecture during the Islamic era was assessed (Sa'adatian, 2012). Another investigation is about the impact of environment on formation and development of Makran coast architecture (Keykha, 2015). This dissertation is a good example: "the role of climate in the formation of the houses in Chabahar" (Saremi Naeini, et al. 2015).

Research Methodology

Data were collected through "field-documentary" method. Research methodology is "analytical". The evidence for historical documentation of Narmashir was collected in two ways: 1. an excavation project for delimiting Narmashir historic site in 2014 (under

the supervision of the second author) and 2. the third author's M. A. dissertation in 2015. Findings of field studies were compared and matched with documented data. Historical and geographical sources were analyzed by "Content Analysis". Using these historical sources, the process of settlement in Narmashir during the Islamic era was known. Finally, the findings were analyzed based on Kenneth Watt's ecological theory and GIS maps.

Theoretical foundations

In processual archaeology, a significant emphasis is placed on ecosystem and environment. Environmental changes are considered as an important factor in the process of formation and abandonment of cities. This is caused by interaction between environmental expansions, climate, and human activities (Rapp and Hill, 1998: 86). Such interactions can help explain patterns of settlements and cultural processes (Butzer, 1980: 419). Kenneth Watt has divided environmental factors into five groups: material, energy, diversity, time, and space; these factors contribute to the formation, development, continuation, and destruction of settlements.

Material: water resources, suitable soil for agriculture, and minerals are the main supplier of human needs. These factors have a great role in choosing the location of a settlement (Watt, 2014: 68-72). A settlement is formed in a place which has the highest access to the required materials in the economic system of the local inhabitants (Green, 1997: 52).

Energy: Solar energy is necessary for "photosynthesis and growth of plants, evaporation, sweating, temperature, and humidity" (Trivedi & Raj, 1992: 47-48). However, energy can act as a restricting factor. High amounts of light damage plants and endanger life (Emberlin, 1998: 146). Human life is guaranteed by a good relationship between plants, animals and humans in using the constructive energy of the environment (Trivedi & Raj, 1992: 46). Wind energy, speed and direction can have positive or negative effects on type of farming, architecture

and building materials (Amirhajloo, 2014a: 179). Wind energy has direct effects on human comfort, energy consumption, heating and cooling (Ranjbar, PourJafar, & Khaliji, 2010: 18); For this reason, it affects architecture.

Diversity: variety of vegetation and animal species, which are dependent on other variables, including area, geographical isolation, and environmental richness, affects human settlements (Watt, 2014: 94). **Time:** The length of time to reach a resource is one of the most effective factors in the life of a settlement (Watt, 2014: 91).

Space: Space results from the relationship between places and their features (Niknami, 2006: 12). The characteristics of a settlement are influenced by different factors such as a) Location of a settlement, b) the amount of space proportionate to every person or activity, c) distances from resources (Watt, 2014: 83), d) height and slopes of the land (Emberlin, 1998: 189), e) fertile lands, f) connecting ways, g) easy access, and h) proximity to other residential centers as well (Dollfus, 1995: 31).

A look at historical and archaeological sources

The Old Narmashir was one of the main cities of Kerman and a good place for travelers to rest in the 3rd-4th centuries A.H. (Ya'qubi, 2002: 50; Ibn-e Hoggal: 1938: 307). It is introduced as one of the five counties of Kerman, a vast and crowded city with beautiful palaces and a great Jami mosque with a unique Minaret (Muqaddasi, 2006: 681). Narmashir was one of the Deylamies centers in Kerman too (Ibn-e Athir, 1972: 201; Ibn-e Khaldoun, 1984: 475). In the fifth century A.H., a battle took place between the rulers of Narmashir and Baghdad, and Amir Mas'ud Ghaznavi (Beyhaghi, 2010: 556). Then, Narmashir and Kerman came to capture the Saljuk ruler, Malek Qavord (Rahimloo & Salari Shadi, 2007: 124). The Saljuk rulers in Kerman cultivated the regions of this state. But, the attacks of Oghuz Turks began in Kerman after Qavord. They attacked Bam, Nesa, and Narmashir in 576 A.H. and destroyed Narmashir (Khabisi, 1964: 24). After its

devastation by the Oghuz, however, on the order of Malek Dinar, new buildings were constructed in Narmashir (Ibid: 133). As a result, agriculture and business began in the villages (Ibid, 137). During the Qara Khitai dynasty, calmness was restored to Kerman (Rahimloo & Salari Shadi, 2007: 125).

Mostoufi in his book mentioned the climate and position of Narmashir in the eighth century A.H. (Mostoufi, 2002: 202). But the name of Narmashir has not come from other historical sources of 8th-10th centuries A.H. due to the recession of Kerman's historiography. There is an abundance of shreds of ceramics remained from the Ilkhanid, Timurid, and Safavid periods in the old city of Narmashir. Study of these ceramics show that residence and settlement continued well in Narmashir until early Safavids. After this, the Afghans attacked Narmashir; and "those things were built up after the Oghuz, were destroyed by Afghans" (Mostoufi, 1969: 93).

In the historical sources of the Safavid to the Qajar periods, Narmashir is named as a "district" not as a "city". According to the book "The history of Nigarestan," Lotf Ali Khan Zand took refuge in the "ruler of Narmashir" in 1209 A.H (Ghaffari Kashani, 1983: 442). In this book, the word "city" is not applied to Narmashir; and the term "ruler of Narmashir" probably means the ruler of "Narmashir district". In 1226-1227 A.H. Drouville, unlike the others, described Narmashir as a "city," where Rashid Khan lived and rebelled against the rules of the time (Drouville, 1991: 365). It is probable that Drouville misused the word "city" because he was in Iran for a short time with little time to visit many historic cities; he copied most parts of his book from previous logbooks (Akbar Zadeh, 2005: 61; Ebrahimi, 2004: 75). Shirvani introduced Narmashir both as a city but as one of the sectors of Kerman with 20 villages, in 1247-1247 A.H. (Shirvani, 2010: 603). Therefore, in this period, Narmashir had only a few villages.

The castle of Narmashir is mentioned in the description of Nowruz Khan Qajar's attack on Mohammad Khan Afghan (Khavari Shirazi, 2001:

219). According to the text of Shirvani at the same time, perhaps the meaning of the castle was not the city's walls and forts. But it means "one of the castles of the Narmashir plain," as there are not any monuments belonging to the Qajar period in the old city of Narmashir. This is while Qajar castles have been identified in other regions of the Narmashir plain (Saghaee & Amirhajloo, 2016: 11, 18, 21).

In 1288 A.H. the road between Kerman and Narmashir was known as "the road of Narmashir" (Vaziri, 2007: 3). But the term "city of Narmashir" was not used to describe midway stations. Etemad al-Saltana has not used the word "city" for Narmashir; he has introduced Narmashir as a sector of Bam with 20 villages, farms and peasants (Etemad al-Saltana, 1988: 472). Therefore, based on historical and archaeological evidence (Fig. 2, 3), the old city of Narmashir grew in the late Timurid period; its

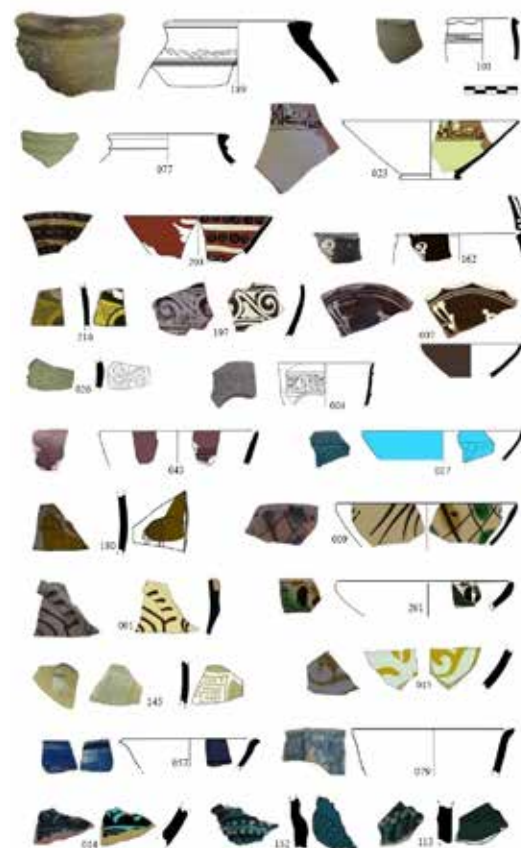


Fig 2. Samples of ceramics taken from the old city of Narmashir from the Timurid to Safavid era. Source: authors.



Fig 3. Samples of ceramics taken from the old city of Narmashir from the Sasanid to Timurid era. Source: authors.

population declined in the Safavid period and was abandoned. After that, it was only known as a region with a few villages (Table 1).

Discussion and analysis

Formation and development of the old city of Narmashir

Historical and archaeological evidence shows that the old city of Narmashir was founded in the Sasanid period and expanded until the late Timurid period. Although non-ecological factors influenced formation, development and destruction of Narmashir, ecological factors seem to have a main effect on these three phases (Fig. 4).

Material

One of the most important resources of Narmashir plain is the Nesa or Roodab River that stems from Jebal Barez Mountains. The whole regions of Narmashir to Aziz Abad share this river. Narmashir villages are located in the Alluvium of the river (Mostoufi, 1969: 94). Water resources of this region are some rivers such as Shoor, Adori, Tahrood, Poshtrood and some watercourses such as Gishoo, Ab Barik, and Kermanshah (Mostoufi, 1969: 94; Fesharaki, 1978: 12). The seasonal rivers such as Jamali and Kamraniyeh run up the north and down the south of the city. Some of the required water was supplied by the city's Qanats. Based on the field surveys, the agriculture of the time was conducted on the land between the northern and southern walls

of the city and the Kamraniyeh River and southern Qanats (Amirhajloo, 2014c: 16); (Fig. 5, 6).

The soil in the center of Narmashir plain is composed of clay and alluvial grains of the tiny gravel, sand, and silt while the soil of the boundary regions is composed of rubble and sand and gravel (Zare, 2008: 25-26); (Fig. 7, 8). These alluvial soils and the combination of clay and sand (loamy soil) in the center of Narmashir plain were suitable for cultivation and production of special crops. When the aggregate is formed of tiny clay and silt particles, the penetration of water in the soil increases and free space is provided for the growth of root in soil (Varavi Pour, 2010: 42). In other words, the flow of air and water increases in soil because of porosity at the intervals of sand, silt, and clay particles. As a result, root growth in soil is facilitated (Ibid: 43). Thereby, good soil and water, as two main materials, have had a direct impact on agriculture and horticulture in Narmashir and provided people with their needs. According to historical sources, Narmashir was a vintage city with rich fruit trees and tropical and chilly fruits (Muqaddasi, 2006: 681; Hodud al-alam, 2004: 143; Afzal al-Din Kermani, 1977: 129). Furthermore, the local soil was used for producing mud-bricks and mortar. The sand and gravel particles in this local soil were very useful in making architectural materials and increasing the quality of mud-bricks and mortar. The existence of little sand and gravel in this local soil strengthened mud-brick and prevented it from being cracked (Zomarshidi, 2008: 128). Therefore, the suitable materials for building construction were available to people of the old Narmashir (Fig. 7, 8).

Energy

The direction and axis of the buildings are important in Iranian architecture. The position of the building is determined according to climatic conditions, type of soil, angle of sunshine and direction of the favorable or undesirable winds (Shaterian, 2013:372). Natural and undefeated forces such as sunshine and wind are always important for Iranians because they can improve thermal conditions of settlements.

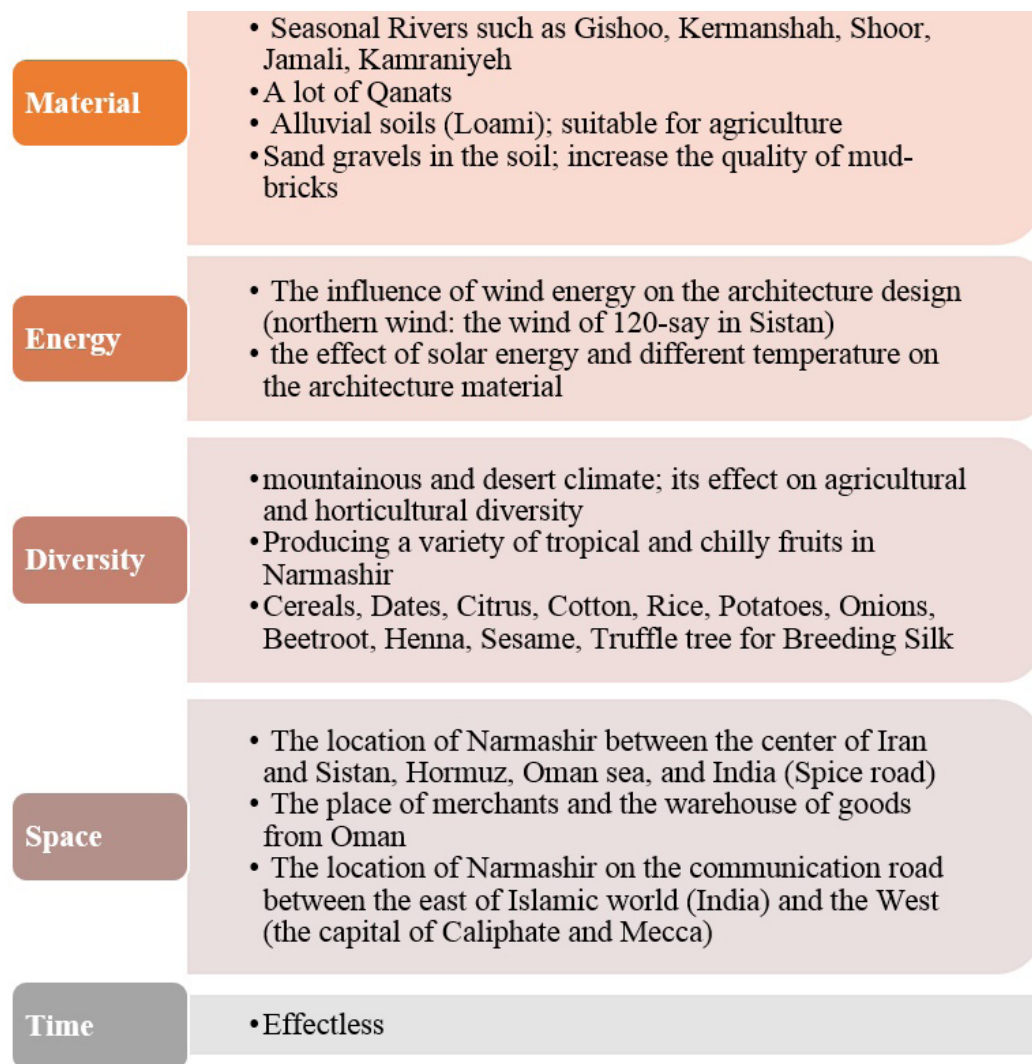


Fig. 4. Ecological factors influencing the “formation and development” of the old city of Narmashir. Source: Authors.

These forces have such benefits as saving power consumption and improving quality, comfort, health, and hygiene of buildings or houses (Mowlanaee & Soleymani, 2016: 58). One of the characteristics of a hot and dry climate is that wind and storm blow in some days of the year (Shaterian, 2013: 100). The map of Narmashir architectural ruins shows that the direction of the buildings is often East-West. It appears that the buildings were designed in the opposite direction of the northern winds. The source of the north wind of Narmashir is the 120-day wind in Sistan (Darya Gasht, 1991: 84). The East-West direction in buildings is very suitable because it

creates an appropriate angle to the winds and reduces the negative effects of them. Therefore, the energy of the wind affected formation of architecture and urban organization in Narmashir. Sunlight in summer and cold winter in this region makes the use of mud-bricks inevitable. The thick walls and their coatings were insulated against heat and cold (Ja’fari Farsani, Shamsipour & Naghdi Dorobati, 2013: 5). The walls made of mud-brick would warm later in the day and keep this heat for the night. Due to differences in temperature between day and night, the use of mud-bricks in the hot and dry climate adjust the temperature of the building (Ghobadian, 2006: 142).

Also, the insulation of the mud-bricks prevented heat dissipation during the winter. Therefore, energy from wind and sun affected the “direction of the buildings” and “type of materials used in them” during the formation of the old city of Narmashir.

Space

The specific location of Narmashir had the most significant role in its formation and development. Narmashir is located on a route stretching from the central Iranian plateau, the coasts of Oman Sea and India (map. 6). Most geographers of Islamic

Table 1. The features of ceramics from the old city of Narmashir. Source: Authors.

Reference for comparison	Kor River, Siskit (whitcomb, 2003; b, 2003;	Southeast Iran (Priestman, 2013: 467), the	Southeast Iran (Priestman, 2013:	Ray (Treptow, 2007: 34)	Raq (Peterson, 2008: 1083)	South Iran, Siraf (Priestman, 2007: 38)	South Iran, Siraf (Priestman, 2013: 609)	Nishapur (Wilkins on, 1973: 110,120)	Southeast Iran (Priestman, 2013: 687, 467)			
Relative Chronology A.H centuries	The place of	5-8 th Hijri	5-7 th Hijri	3-6 th Hijri	5-6 th Hijri	8-11 th Hijri	3-4 th Hijri	7-9 th Hijri	6-9 th Hijri	3-5 th Hijri	5-7 th Hijri	
The features of ceramics	ornaments	extir	extir	interior	both sides	interior	interior	interior	interior	interior	extir	
	Type of ornament	Pseudo prehistoric	unglazed molded	Slip-painted monochrome	Scattered green glaze	Underglaze painting	Lustrous are	Underglaze painting	Carving under monochrome glaze	Slip-painted	unglazed molded	
	Production quality	medium	fine	medium	fine	medium	medium	medium	medium	fine	medium	
	Production method	Hand-made	wheel	wheel	wheel	wheel	wheel	wheel	wheel	wheel	mold	
	temper	mineral	mineral	mineral	mineral	mineral	mineral	mineral	mineral	mineral	mineral	
	Exterior covering	Buff slip	-	Brown slip	Buff slip	-	White glaze	-	Turquoise glaze	cream slip	Buff slip	
	Interior covering	-	-	Brown slip under transparent	buff slip under transparent glaze	Turquoise glaze	white glaze	Turquoise glaze	Turquoise glaze	cream slip under transparent glaze	-	
	Color of the body	red	gray	red	red	buff	buff	buff	buff	white	red	buff
	Form	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	fritte	Clay	Clay
	code	Body and handle	rim	rim	rim	rim	body	body	body	rim	rim	body
	Type of the body	NCH001	NCH004	NCH007	NCH009	NCH014	NCH015	NCH016	NCH017	NCH023	NCH026	

rest of Table 1

The old city of Jiroft (Choobak, 2012: 110)	The old city of Jiroft (Choobak, 2012: 109)	-	The old city of Jiroft (Choobak, 2012: 109)	South Iran, Almatat (Priestman, 2013: 623-624), Malin	Ra's Al khaima (Kennet, 2004: 53,175),	Siraf, Susa, South Iraq (Priestman, 2013: 49, pl. IIIa), the	Siraf (Whitehouse, 1979: 49, pl. IIIa), the	Almatat Ra's Al khaima (Kennet, 2004: 58, Almatat	South Iran (Priestman, 2013: 624-625), Almatat
6-7 th Hijri	6-9 th Hijri	Middle Islamic	6-9 th Hijri	7-11 th Hijri	7-8 th Hijri	2-4 th Hijri	2-4 th Hijri	8-9 th Hijri	8-11 th Hijri
interior	interior	-	-	interior	interior	exterior	exterior	both sides	interior
Carving under monochrome glaze	Carving under monochrome glaze	-	relief under monochrome glaze	Blue and white ware	Underglaze painting	Carving	relief under monochrome glaze	Underglaze painting	Underglaze painting
fine	fine	rude	fine	fine	medium	medium	medium	fine	fine
wheel	wheel	wheel	wheel	wheel	wheel	wheel	wheel	wheel	wheel
mineral	mineral	mineral	mineral	mineral	mineral	mineral	mineral	mineral	mineral
violet glaze	Blue glaze	-	Blue glaze	-	-	-	green glaze	white glaze	Light green glaze
violet glaze	Blue glaze	-	blue glaze	white glaze	Cream glaze	-	green glaze	white glaze	Light green glaze
white	white	buff	white	white	buff	buff	buff	red	buff
fritte	fritte	Clay	fritte	fritte	Clay	Clay	Clay	Clay	Clay
rim	rim	rim	rim	body	body	rim	body	rim	rim
NCH043	NCH057	NCH077	NCH079	NCH082	NCH085	NCH101	NCH113	NCH122	NCH125

rest of Table 1

South Iran, Almatat (Priestman, 2013: 7-11 th Hijri	South Iran, Almatat (Priestman, 2013: 7-11 th Hijri	Siraf (Priestman, 2013: 563, 695), The old city of Jiroft (Choobak, 2012: 106), Siraf,	Siraf (Whitehouse, 1979: 49, pl. IIIa), The	Southeast & South Iran (Priestman, 2012: 109), Ra's Al	The old city of Jiroft (Choobak, 2012: 109),	Haji Abad, Tepe Yahya, Sirjan, Pasargad, Sasanian to 4 th Hijri	Malin (Khodadost et al., 2017: 166),	Nishapur (Wilkinson, 1973: xiv, 67), Siraf	Nishapur (Wilkinson, 1973: xviii, 169) Southeast	Raq (Peterson, 2008: 1083), Malin	Nishapur (Wilkinson, 1973: 1973: 3-5 th Hijri
both sides	both sides	both sides	exterior	exterior	interior	exterior	exterior	interior	both sides	interior	interior
Blue and white ware	Blue and white ware	Lusterware	relief under monochrome glaze	Slip-painted	Carving under monochrome glaze	Carving	Slip-painted	sgraffiato	Slip-painted	Underglaze painting	Slip-painted
fine	fine	fine	fine	fine	fine	rude	rude	fine	fine	fine	fine
wheel	wheel	wheel	wheel	wheel	wheel	wheel	wheel	wheel	wheel	wheel	wheel
mineral	mineral	mineral	mineral	mineral	mineral	mixed	mixed	mineral	mineral	mineral	mineral
white glaze	white glaze	white glaze	green glaze	Brown slip	white slip under yellow glaze	Buff-green slip	-	Green glaze	Brown slip	Buff slip	white slip under yellow
white glaze	white glaze	white glaze	green glaze	Brown slip	white slip under yellow glaze	buff slip	-	white glaze	Brown slip	Turquoise glaze	white slip under yellow
white	white	buff	buff	red	red	red	buff	red	red	red	red
fritte	fritte	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
rim	rim	body	body	rim	body	rim	rim	rim	rim	rim	body
NCHI37	NCHI38	NCHI45	NCHI52	NCHI62	NCHI80	NCHI89	NCHI97	NCH201	NCH203	NCH205	NCH216

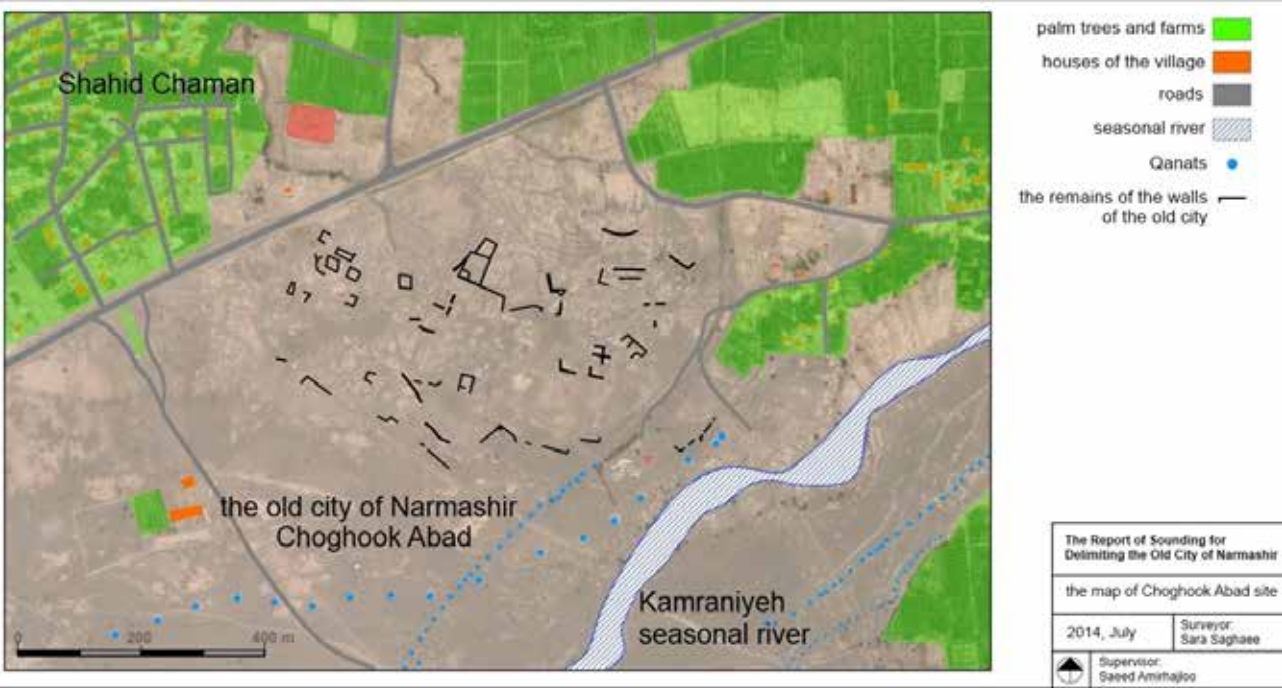


Fig. 5. The seasonal river of Kamraniyeh and the Qanats of the old city of Narmashir. Source: Authors.

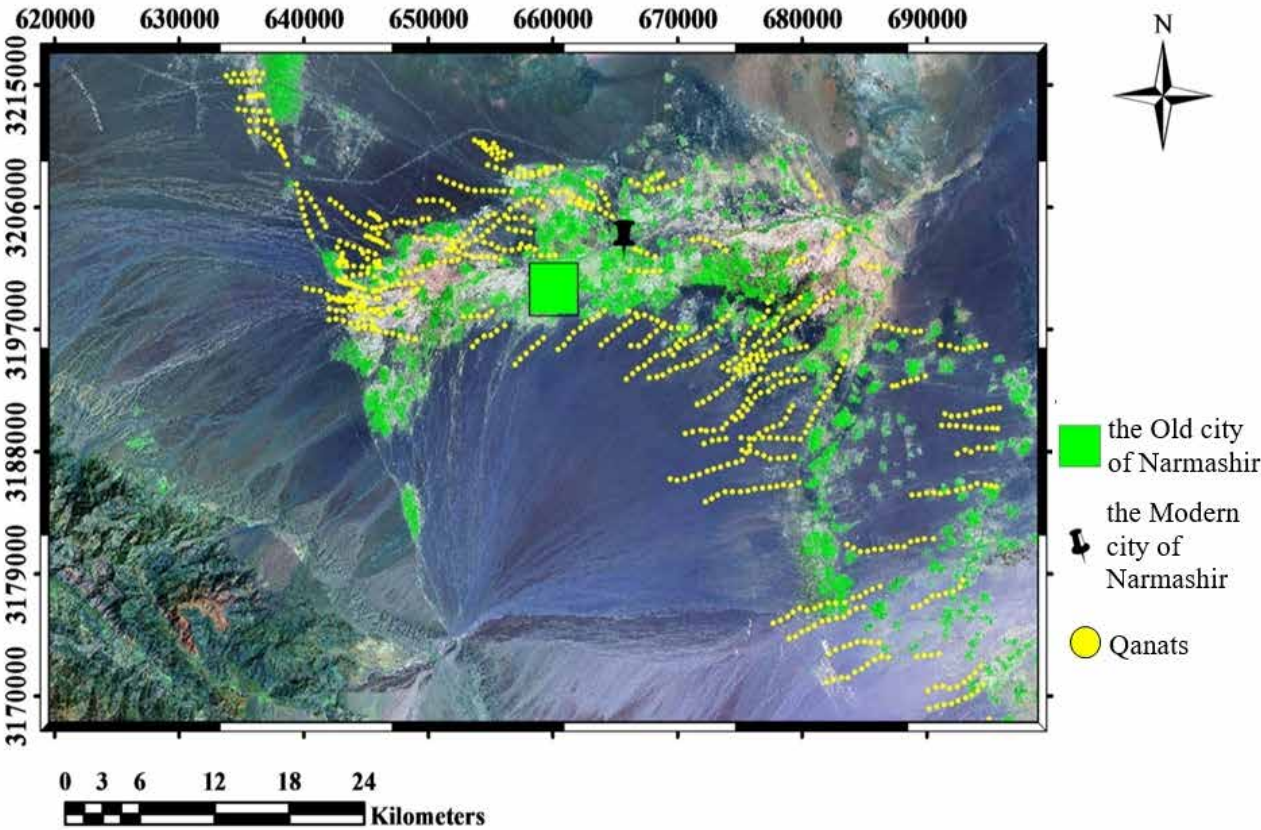


Fig. 6. The Qanats of Narmashir plain. Source: authors.

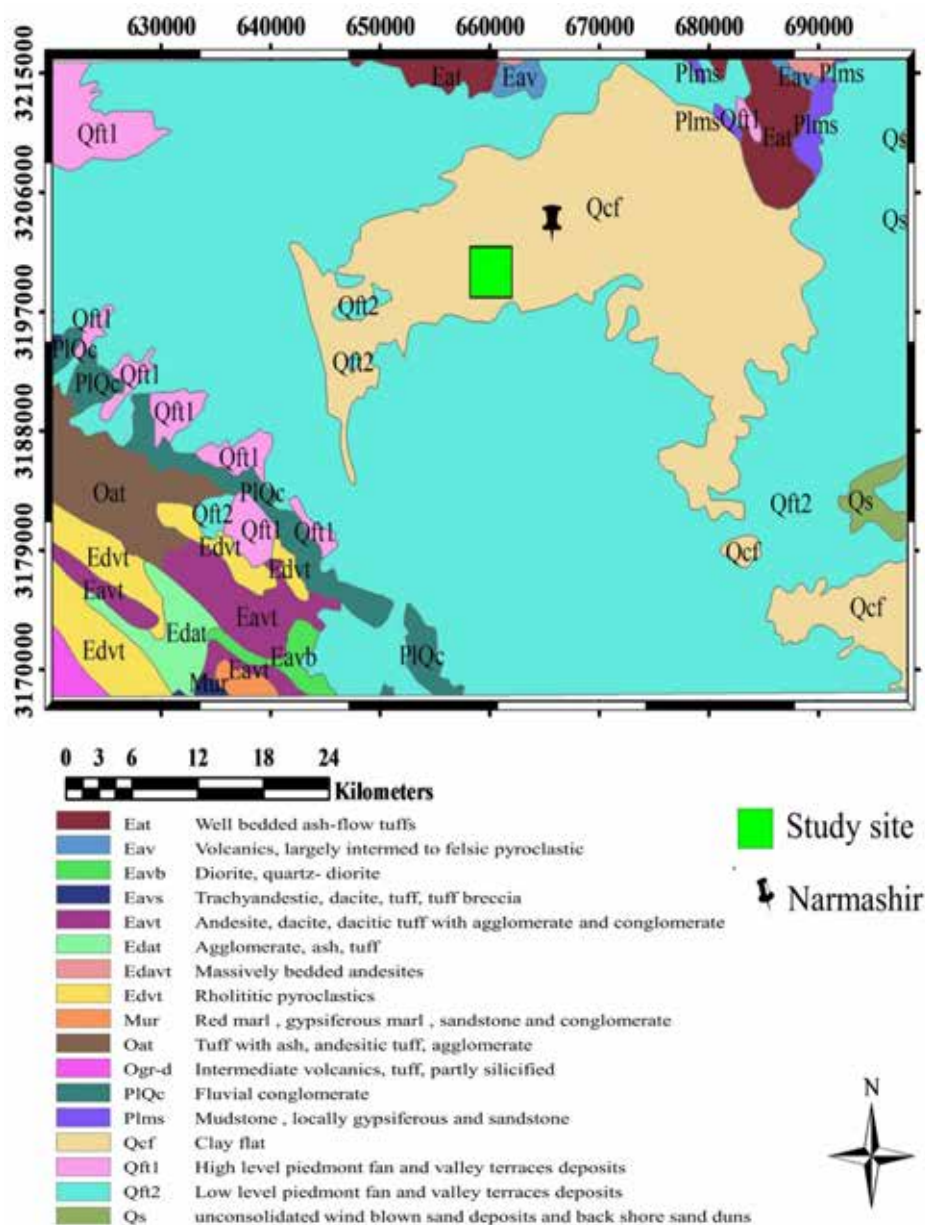


Fig. 7. The geological map of Narmashir plain. Source: authors.

era have introduced the city of Narmashir as one of the main stations in the southeast direction (Ibn-e Khordadbeh, 1992: 54; Qudama Ibn-e Ja'far, 1991: 30). As such, Narmashir was the warehouse and homeland of merchants (Muqaddasi, 2006: 681; Hodud al-alam, 2004: 143). Three spatial factors influenced the formation and development of the old city of Narmashir: "the trade route between the eastern Islamic societies (India) and western region

of the Islamic world (the center of the Islamic caliphate)", "the residence of merchants" and "possibility to store commercial goods". Because there was a great distance between western and eastern regions of the Islamic world, the crossroads around communicative routes turned into urban centers. Owing to an increase in exchange of goods between western and eastern parts of the Iranian plateau, economy of these centers were strengthened

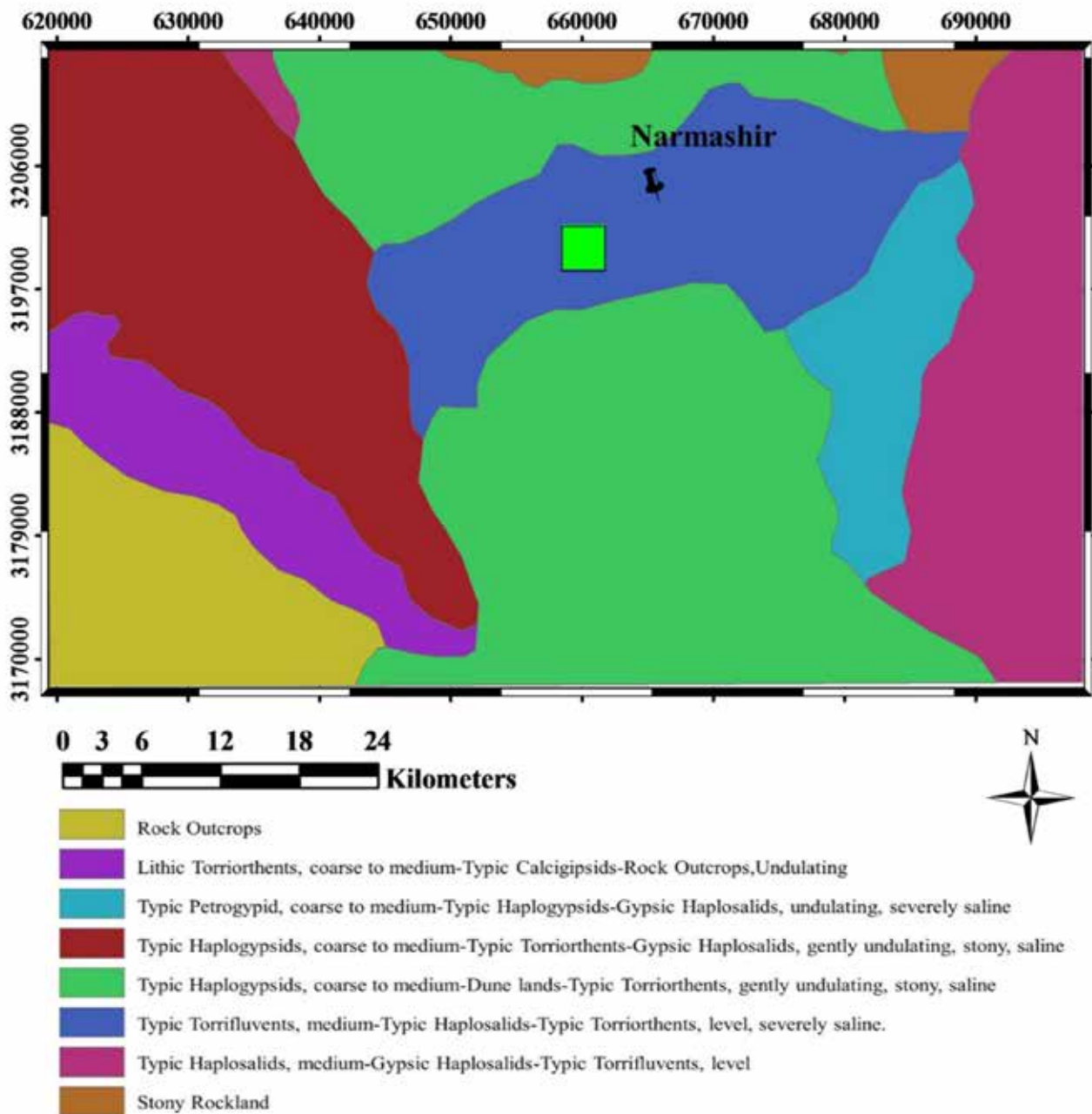


Fig. 8. The soil composition map of Narmashir plain. Source: authors.

(Barimani, 2004: 84). Narmashir was one of these economic centers, located on the central Iranian Plateau, southeast of Iran. The trade exchanges along India, Sistan, Baghdad and Khorasan were as so big that caravans with 10000 camels passed there (Ibid: 92). Therefore, Narmashir was the center for production of export products, as well as the center of warehouses of goods of other lands. Muqaddasi

mentioned Narmashir as having a “warehouse of goods from Oman” and “producing date products” (Muqaddasi, 2006: 681). Edrisi explained the domestic and foreign markets and trade in this city (Edrisi, 1988: 435-436); (Fig. 9).

Fig. 9. the location of the old city of Narmashir in the southeast of Iran – dashed line: the road of Persian Gulf and India to Narmashir and the center of Iran.

Furthermore, Hajjis (Haj pilgrims) of Sistan crossed Narmashir road (Muqaddasi, 2006: 681). The function of Narmashir as one of the stations on the road from Sistan to Mecca indicates its importance and security. In the 6th AH century, roadside inns named “caravanserai” were available to travelers from Sistan; there were two routes from Kerman to Sistan that crossed through Narmashir (Edrisi, 1988: 443). Thus, Narmashir developed because of: “having a specific road stretching to Sistan and Mecca in the 4th century A.H.,” “being located on the commercial routes between southeast and central plateau of Iran,” “the existence of warehouses and merchants in this city from 4th to 6th centuries A.H.”. The importance of the road of Narmashir was preserved in 7th century A.H.. Also, Narmashir was known as one of the most famous cities of Kerman connected to Sistan through a specific road (Hamavi, 1990: 281). The road of “Hormuz-Narmashir-Sistan-Dabhol seaport in India” prospered and developed, in this period (Chamankar, 2005: 12). Although Hormuz was displaced in the 8th century A.H., and its inhabitants migrated to Hormuz Island (old Jaroon), it still maintained its centrality and dominated over the entire Persian Gulf (Whitcomb, 2014: 51). In addition, commerce from Hormuz Island to Sistan prospered increasingly. Narmashir developed due to its location along with this long road, which was a part of “spice road,” connecting Iran and the Indian Ocean beaches (Chamankar, 2005: 19). Also, the importance of Narmashir increased during the Ilkhanid period due to the development of the road of “Balkh-Herat-Zarang-Narmashir-Hormuz” which was connected to Khuzestan and Iraq via the Persian Gulf (Ibid: 18).

Diversity

The mountains of Reyen, Jebal Barez, and Kabudi are located in the west, northwest and north of the Narmashir plain. They have peaks at altitudes over 3000 meters. The mountains of Shahkooh and Namdad in the South of the Narmashir plain are more than 2000 meters high. The lowest altitude is about

500 meters (Fesharaki, 1978: 4). The differences in height on the one hand and “cold-hot” dual climate on the other created a variety of vegetation and agriculture in the plain and highland regions. Therefore, Agriculture in Narmashir developed. It had both winter products, e.g. wheat and barley, and summer products, e.g. legumes, potatoes, onions, cotton and sugar beet (Ibid: 9-10). Although fruit gardens were smaller than cereal farms in Narmashir, they were larger than other farms. The diversity of these fruit gardens increased in the highlands. There was such a variety of pattern in agriculture and horticulture in the past centuries. Because, according to Muqaddasi and Afzal al-Din, Narmashir was a center of tropical and chilly fruits (Muqaddasi, 2006: 681; Afzal al-Din Kermani, 1977:129).

Furthermore, sediments and alluvial deposits from mountains gathered in the center of Narmashir’s plain (Amirhajloo, 2014b: 17). They formed a suitable soil for agriculture. Consequently, Narmashir was the main region for grain production in the east of Kerman (Fesharaki, 1978: 7). It was the center of the cereal preservation in Kerman (Ibid: 10). Other products of Narmashir included henna and sesame (Ibid: 23). In the 6th century A.H., Edrisi observed and described plenty of palm trees and farms (Edrisi, 1988: 443). Citrus was also one of the most important products of Narmashir (Mostoufi, 1969: 94). There were also a lot of truffle trees all over Narmashir which gives evidence to silkworm breeding in the past (Ibid: 95). According to Afzal al-Din, a lot of silk was produced in the 6th century A.H. (Afzal al-Din Kermani, 1977:129). Therefore, plants, horticultural and agricultural products were very diverse in the Narmashir plain and foothills.

Time

Quick access to materials, lead to saving time, creating opportunities for other daily activities & supplying human physical and mental needs (Bird and O’Connell, 2006: 146). In the pre-historic era, the distance between habitat and water resources and the length of time to obtain these resources affected

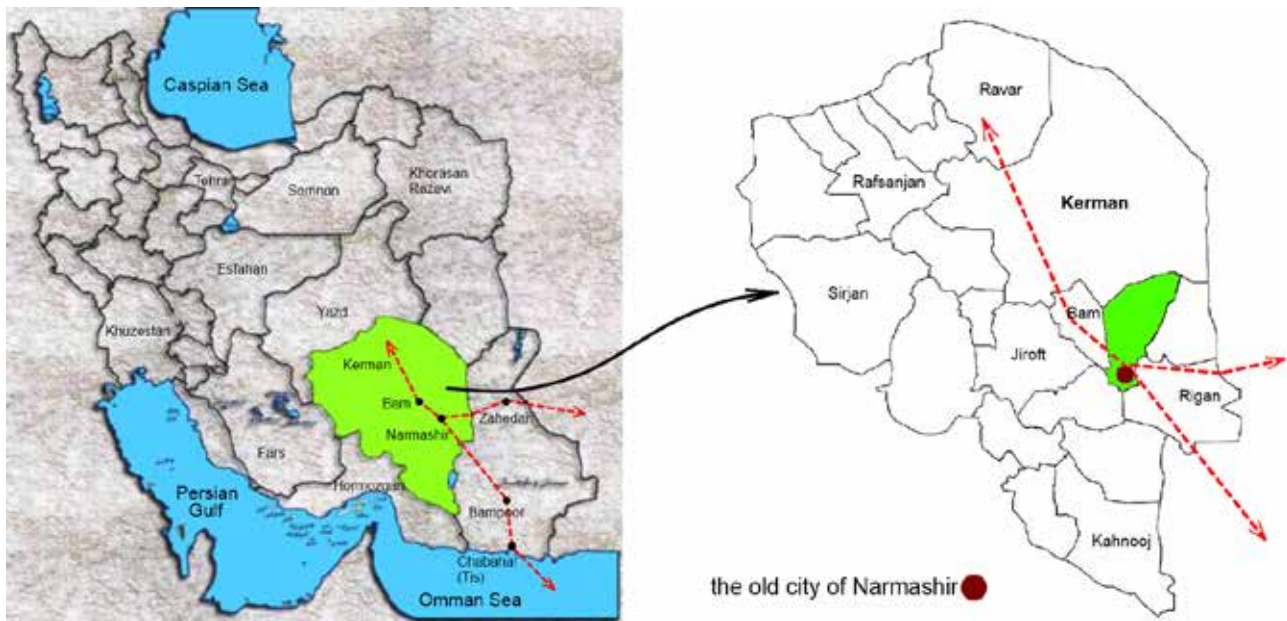


Fig. 9. the location of the old city of Narmashir in the southeast of Iran – dashed line: the road of Persian Gulf and India to Narmashir and the center of Iran. Source: authors.

settlement and residence. Water resources such as wells, Qanats and canals were available at every point in the Islamic period (Amirhajloo, 2014a: 186). In addition, regional and trans-regional interactions and exchanges made these resources available to other resources. Regarding time as a factor, it did not play any role in the formation, development, and destruction of Islamic cities such as Narmashir.

The abandonment and destruction of the old city of Narmashir

According to archaeological evidence, the population of the old city of Narmashir declined from the late Timurid and early Safavid period. From the late Safavid period, only the villages remained around it. The role of five ecological factors in the abandonment and destruction of the city was studied based on the process of rise and fall in the population of Narmashir. It was not possible to study the effect of material and diversity on the city abandonment for two reasons: first, lack of evidence about reduced sources and raw materials (such as drying or reduced water resources) and second, the lack

of evidence about changes in the climate and diversity of the sources. In the other word, so far, there has not been sufficient geographical research on climatic changes and reduced resources in the late Islamic period. There is not any clue to this in the books written on Safavid to Qajar period. More extensive archaeological excavations and experimental studies are needed to get more knowledge about the process of abandonment and destruction of the old city of Narmashir. However, “the devastating earthquake in Narmashir” is also considered as a hypothesis, as Narmashir and Bam are located on one of the active earthquake faults in Kerman province. Verification of this hypothesis is not possible before extensive archaeological excavations. However, the abandonment and destruction of the city had other reasons too. According to the historical sources, Narmashir was a center of tensions and battles, especially from the Safavid period onwards, that caused “Geographical Isolation” of this city. This isolation could have facilitated the abandonment of the city. From the Safavid period onwards, Bam, a historic city near

Narmashir, became more important² (Fig. 10).

Space

Narmashir had great ups and downs as a result of political events in the middle and late Islamic era. It was a battleground for clans and rulers because it was located on the borderline between Kerman and Sistan. One of these political turmoil periods coincided with the late government of the sons of the Qavord in the Seljuk period as well as with the attacks of the Oghuz to Kerman. Although the development of Narmashir is praised in the books of the 6th century A.H. (Afzal al-Din Kermani, 1977: 129), by the end of this

century, most of the cities in Kerman did not have the ability to withstand Oghuz attacks. From 575 to 610 A.H, Kerman became a place for the power-up of the Oghuz. They ruled most parts of Kerman; and the people of Bam and Narmashir lived under their oppression. In order to meet their daily needs, the Oghuz harassed Narmashir residents by force and military power. This plunder led to social insecurity and economic downturns. The attack of the Oghuz on Narmashir and other cities of Kerman has been described as a violent attack in the historical sources (Khabisi, 1964: 24; Sykes, 2001: 70). Narmashir was the place of battles in the 8th century too. In

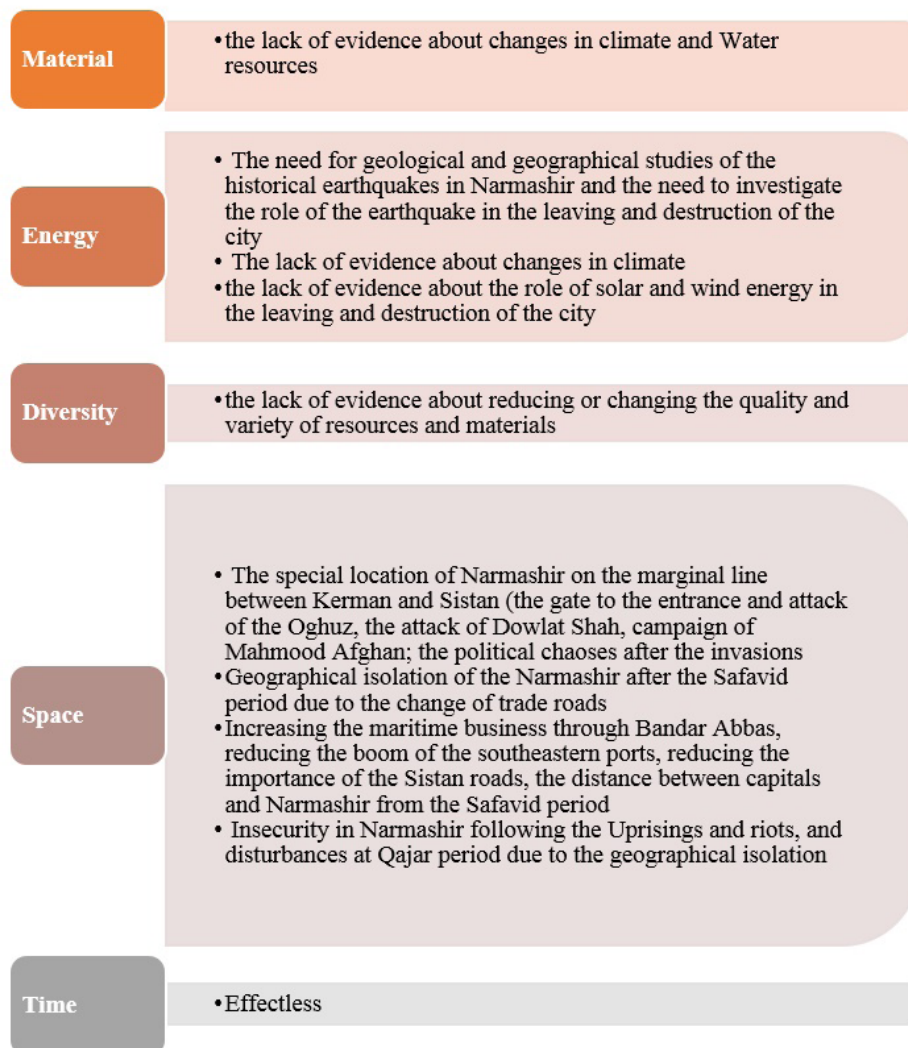


Fig. 10. The role of ecological factors in the “abandonment and destruction” of the old city of Narmashir. Source: authors.

765 A.H. Dowlat Shah (one of Khawaja Helal Atabak's attendants), sent his brother to Bam, Nesa, Narmashir, and Rigan for a malignant purpose; he intended to attack and destroy these cities (Hafez-e Abru, 2001: 365).

Narmashir suffered a lot in the aftermath of the Safavid period, particularly after the attack by Mahmood Afghan to Iran (Mar'ashi Safavi, 1983: 53, 76). Mahmood ravaged villages of Narmashir and went to Kerman (Sykes, 2001: 320). Drouville investigated rebellions in the Qajar period in Narmashir. He introduces the city as one of Rashid Khan's hometowns (Drouville, 1991: 365). Also, Mirza Mohammad Khan Afghan rebelled against Ibrahim Khan (ruler of Kerman) in Bam and Narmashir (Vaziri, 2007: 92).

Foreign and domestic clashes for ruling over Narmashir reduced security and power of local rulers and people. Such anarchy disrupted cities and villages and undermined their economies. Chaos in the southeast of Kerman on one hand and establishment of the capitals of the Safavid and Qajar dynasties in the center of Iran on the other hand led to geographical isolation of the southeast. This geographical isolation coincided with cultural, economic and political decline (Barimani, 2004:94), in turn a result of enweakened cultural and social interactions. Furthermore, the highway of international trade of Iran was shifted to the southern seas and ports (especially the port of Gambroon or Bandar Abbas). Therefore, previous traffic on the ancient southeast road reduced (Ibid).

In addition, a lot of goods and wealth were accumulated in Narmashir during the Middle Islamic period because Narmashir was one of the settlements and stations for merchants' deals on the "spice way". Some historians have praised great wealth of people in Narmashir in the early and middle Islamic period (See. Muqaddasi, 2006: 681; Afzal al-Din Kermani, 1977: 129). Such wealth would have led to bandit's greed. The entry of the bandits into Narmashir increased chaos. Qufch or Qofs tribes were among these bandits who looted both caravans passing

main roads of Kerman and ports of Tis and Hormuz (Chamankar, 2005: 22). Their attacks frightened all people of Kerman and the frontiers of Sistan and Fars (See. Afzal al-Din Kermani, 1977: 122). Therefore, the main effective factors on the leaving and destruction of the city were: "the accumulation of the wealth of merchants in the middles Islamic period", "Plundering people's wealth", "political chaos and clashes", "converting Bam city to the political center in the east of Kerman during the Safavid period", "shifting of the southeast trade roads to the south of Iran", and "geographical isolation of Narmashir".

Energy and Time

According to archaeological and historical studies, two factors of energy and time did not have much effect on the abandonment and destruction of the old city of Narmashir. There are two reasons for this: on the one hand, all of the monuments of the city are built on the east-west axis. The angles devised in these buildings prevent destructive wind blow. Thereby, there is not any evidence on the negative effect of winds leading to the abandonment and destruction of the city. Similar to the past, today, the 120-day winds blow on cities located on marginal regions of the Lut desert. However, because architectural qualities are the same as the past, life has continued in these cities. In the Islamic era, resources were available without delay through creative methods. As a result, time, as a factor, was insignificant in the abandonment and destruction of settlements.

Results

Based on archaeological, historical, and geographical studies, four factors including "space, material, diversity, and energy" were effective in the formation and development of the old city of Narmashir. However, the abandonment and destruction of the city was mainly caused by the "Space" factor. Therefore, we must add to the first part of the hypothesis the "diversity and material" factors. The second part of the hypothesis, as mentioned at the beginning of the article, is confirmed in this research.

Sufficient water resources and suitable alluvial soil (with sand and silt) as the main materials played an important role in the development of agriculture and horticulture and provision of the needs of the people. Sand particles in this soil increased the strength of mud-bricks and mortars. The energy of the wind and sun were effective in the direction of the buildings and type of their materials. The northern wind (a part of 120-day wind in Sistan) has forced architects to build monuments with east-west axis. Mud-bricks were also used extensively owing to the sun's energy and the characteristic of the hot and dry climate. The mud-bricks attracted warm during the day, and they lost their heat at night later.

However, the most important reason for the development of the old city of Narmashir was the "Space" factor: "the location of Narmashir as a main passage for commercial caravans between Oman and Hormuz and the center of Iranian plateau," "several warehouses in it" and "the location of the city on the pilgrim road of Sistan-Mecca". Tropical and chilly plants and products on the one hand, and agricultural and horticultural products on the other, had a great role in the development of Narmashir.

The most effective factor in the abandonment and destruction of the city was "space". Because Narmashir was the entrance to the central Iranian plateau from the southeast, it had a lot of rises and falls during political events. The conditions that led to destruction of Narmashir were as follows: "the attack by the Oghuz, in Al-e Mozaffar period, after the Safavid and simultaneously with the destructive attack by Mahmood Afgan, and in the Qajar period". These battles threatened the security and economic power of the people. In sum, conditions that led to a decline in the importance of Narmashir were as follows: "political chaos," "relocation of international trade of Iran on sea roads," "importance of southern ports instead of southeastern coasts of Iran in the Safavid period," and "development of Bam city in the Safavid period".

Endnote

1. Bam and Kerman developed during the Ganj Ali Khan's period because the Safavid rulers of Isfahan dominated the rulers of Kerman

(Karimian, 2004: 65).

2. development of Bam and its transformation into political and economic center in the eastern regions of Kerman seems to be one of the reasons for decline in the importance of Narmashir.

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