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### **ANALYSIS OF BRONZE AND IRON AGES (YAZ CULTURE) SETTLEMENTS IN GOLBAHAR DISTRICT OF CHENARAN COUNTY: A LANDSCAPE ARCHAEOLOGY APPROACH**

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**Abstract:** Landscape archaeology is a multidisciplinary field that examines the relationship between humans and their environment throughout history. The Golbahar Plain is one of the widest intermountain plains in the northeastern region of Iran. Surveys and documentation of the Golbahar District of Chenaran County were done with the aim of identifying, registering, and compiling the chronology of ancient sites, as well as determining the role of environmental resources in the formation process of sites in this area. After identifying the sites, samples were collected systematically; the area of the sites was divided into 10-by-10-meter grids, and the samples were collected. After conducting a field survey and specifying the chronology of pottery, the settlement patterns in the studied landscape were analyzed using a GIS system. The most important results of the present study are the identification and discovery of 58 ancient sites from the Bronze Age to the Islamic period. In the present study, the settlement pattern of the identified sites that were related to the Bronze and Iron Ages has been investigated and analyzed. The findings indicate that in this particular environmental context, variables such as proximity to the river and altitude have played a crucial role in the formation of settlements on this plain. According to the relative chronology of the sites, it can be stated that most sites of Golbahar Plain have been inhabited from the beginning of Yaz I, and only in CHS-9 and CHS-22 sites, did habitation continue in them until Yaz III.

**Keywords:** *Settlement Pattern; Landscape; Golbahar Plain; Yaz Culture; GIS.*

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#### **INTRODUCTION**

Archaeological research focused on landscape typically examines the spatial organization of settlements, and considers the economic, social, and cultural interactions of communities with their environment. In this view, the environment is regarded as a breeding ground for human material and perceptual works.<sup>1</sup> Several factors contribute to human lifestyle, the location of settlements, and the scope of human activities, with geography being a fundamental and enduring influence.<sup>2</sup> The impact of human's behavior on location is in constant flux, with varying effects that are contingent upon

<sup>1</sup> ROBIN/ROTHSCHILD 2002, 163.

<sup>2</sup> CHANG 2010, 7.

temporal and qualitative aspects of social interactions. The landscape is formed due to the presence of humans in a place or movement from one location to another.<sup>3</sup> The study of landscapes aids in understanding settlements and the utilization of regional resources, emphasizing the indispensable role of intangible cultural processes in comprehending and appreciating a region. A complete understanding of a place necessitates an examination of both its physical and cultural aspects.<sup>4</sup> The relationship between landscape and settlement patterns is significantly influenced by factors such as the altitude and slope of the land, the presence of a suitable environmental context, and proximity to other settlement centers. Research on landscape archaeology benefits from the explanation and clear definition of a number of relevant terms. In this paper, landscape archaeology refers to all natural and human processes that lead to environmental changes, and its purpose is to investigate the relationship between the two during a specific period.<sup>5</sup> According to this, landscape archaeology comprehensively looks at environmental facilities and nature and the type of human behavior within this environment. An archaeological site is an instance of past human behavior or activity, where humans conducted some activity and left evidence of it behind. Place refers to small, culturally significant locales that exist within a landscape. Location refers to the place where a particular point or object exists. A locality is a human settlement: a city, town, village, or even archaeological site. Location also plays a role in the preservation and conservation of archaeological sites, as factors such as climate, soil conditions, and human impact can affect the integrity and survival of artifacts and structures.<sup>6</sup>

Despite the strategic position, special economic conditions such as its location on east to west route, and the presence of excellent mineral resources in Khorasan Province, there have been limited studies on prehistoric cultures in this area, so it was previously called “White Zone” due to the scarcity of archaeological studies and excavations.<sup>7</sup> However, in the last two decades, several surveys and excavations have been done, and our knowledge about the prehistory of northeastern Iran has become more complete. Among the studies that have been conducted in this region in recent years, we can mention the survey conducted by the author in the Golbahar Plain of Chenaran County, as well as the studies conducted in Roshtkhar Plain,<sup>8</sup> Esfarayen,<sup>9</sup> Jajarm,<sup>10</sup> the Upper and Middle Atrak basins.<sup>11</sup> This study focuses on Chenaran Plain, located in the upper part of the Kashafrood Basin, the largest plain in the region. Kashafrood River flows between Hezar Masjed and Binalood mountain ranges from northwest to southeast in the Chenaran-Mashhad plain.<sup>12</sup> Chenaran County is limited by Dargaz City from the north, Quchan City from the west, Mashhad County from the



Fig. 1. The geographical location of Chenaran County.

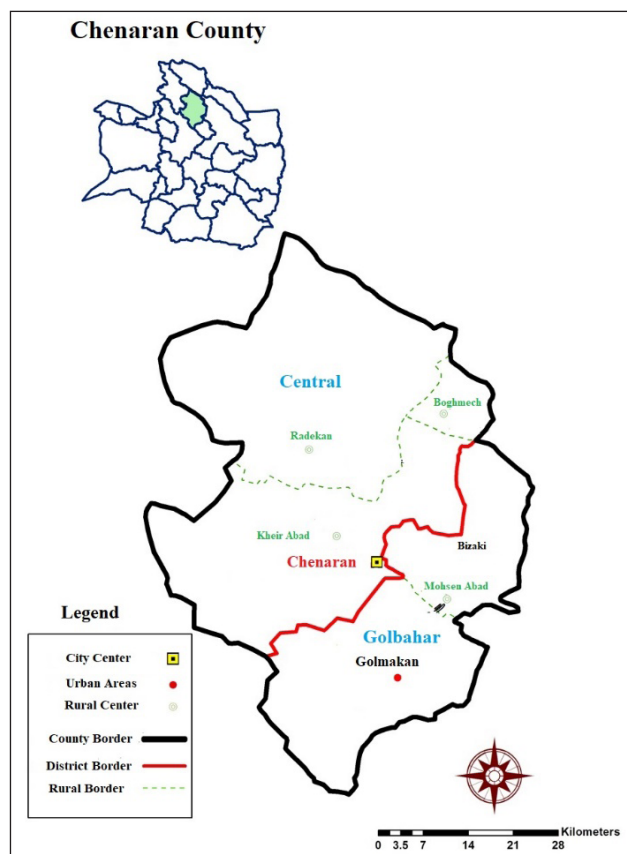


Fig. 2. The geographical location of Chenaran County with districts and dehestans.

<sup>3</sup> LABAF KHANIKI 2006, 113 sqq.

<sup>4</sup> BUTTON 2009, 8.

<sup>5</sup> COOPER et alii 1995, 185.

<sup>6</sup> ASHLEY/JONES 2001.

<sup>7</sup> KOHL/HESKEL 1980, 160.

<sup>8</sup> REZAEI/ZANGANEH EBRAHIMI/BASAFI 2018.

<sup>9</sup> VAHDATI 2015.

<sup>10</sup> DANA/HOZHABRI 2019.

<sup>11</sup> DANA/MIRZAEI 2022; MIRZAEI/DANA 2016; HEJEBRI NOBARI/BISCIONE/JUDY 2021; HEYDARI DASTENAEI/DANA 2022.

<sup>12</sup> MAJIDI/ALIZADEH/GHORBANI 2011, 776.

east, and Neyshabur and Mashhad Counties from the south (Fig. 1).<sup>13</sup> The county is divided into Golbahar and Merkazi districts, where Chenaran City, the capital of the county, is located (Fig. 2). The average annual rainfall of this county is 250 mm.<sup>14</sup> The study area is located in the BSh climatic

<sup>13</sup> GHANBARI 2002, 5.

<sup>14</sup> HASHEMI TABAR 2009.

zone according to the Köppen-Geiger Climate Classification (B: Arid – S: Steppe – H: Hot arid). It has a dry and semi-dry climate.<sup>15</sup>

The archaeological study of the Golbahar district of Chenaran County was carried out in July 2017 with the support of the General Directorate of Cultural Heritage, Handicraft, and Tourism of Khorasan Razavi Province and the Cultural Heritage Office of Chenaran County. Studies of the Golbahar District of Chenaran County were done with the aim of identifying, registering, and compiling the chronology of ancient sites, as well as determining the role of environmental resources in the formation process of sites in this area. This led to the identification and discovery of 58 ancient sites from the Bronze Age to the Islamic period. In the present research, we will study the discovered sites that were related to the Bronze and Iron Ages.

## RESEARCH BACKGROUND

We have little information about the northeastern region of Iran, especially Khorasan. The only research work conducted in Chenaran is a preliminary analysis by Hassan Basafa in 2012 to determine the prehistoric settlement site of Chenaran.<sup>16</sup> The current research is the first archaeological study in the region. It should be noted that, simultaneously with the present study, another archaeological investigation was conducted by Maryam Arefipour to document and identify the sites within the Markazi District of Chenaran County.

Limited knowledge about the prehistoric culture of Khorasan has led researchers to rely on the well-studied chronology and cultural divisions of Central Asia as a foundation for understanding the chronology and cultural divisions of the Khorasan region. The archaeological material from this study, from the Golbahar Plain, was compared to the nearest most important sites in Turkmenistan and northeastern Iran. The general specifications of the identified sites are listed in Table 1. The sequences of the Turkmenistan cultures after the Neolithic Jeitun culture, i.e., the Neolithic through the Chalcolithic, are known from the remains of the Anau and Namazga cultures. According to investigations of the Anau and Namazga (from Neolithic to Bronze Age) and Yaz (Iron Age) cultures, they complement Turkmenistan's chronology from the Neolithic to the end of the Iron Age.<sup>17</sup> In this research, the chronological terminology of Turkmenistan's prehistoric cultures was used to categorize and date the materials from this survey of Golbahar (Northeastern Iran). From the distribution of the significant pottery classes, it was possible to define the borders of the Namazga and Yaz cultures on one side and those of Hissar-Gorgan and Archaic Dahistan on the other, from the Chalcolithic to the Early Iron Age, in Khorasan.<sup>18</sup>

## METHODOLOGY

After identifying the sites, samples were collected systematically; the area of the sites was divided into 10-by-10-meter

grids, and the samples were collected. To organize the collected information and data for ease of reference, the sites were identified, marked on the map, numbered, and preliminarily described. After that, additional information gathered in the field was recorded in a special survey form. Field research was preceded by mapping potential sites using remote sensing methods. After collecting the pottery found from the Golbahar plain sites, the pottery was washed and labeled, after which only diagnostic shapes were selected for further study—rims, bases, and sherds containing decoration. The pottery was labeled using a three-letter code, followed by the season and the number of sherds. For instance, the first and second letters (Ch) denote Chenaran, while the third one (S) refers to the method of pottery collection (survey). In the classification of pottery, the rims were divided according to their shapes and ware, while the body fragments were divided by their decoration. In general, it can be said that pottery includes red, gray, and buff in terms of coating. The pottery found from the surface survey of sites is of sufficient quality in terms of firing, and pottery temper is often mineral; also, both handmade and wheel-made techniques have been used to make pottery. After conducting field studies, environmental data and information were analyzed. Accordingly, by studying the appearance and technical features of pottery finds, they were compared with similar samples from other locations inside and outside the region, and, finally, the relative chronology for the sites under study was determined. After the material was examined, the archaeological sites were studied using the GIS method to better understand the settlement pattern of the area.

## RESULTS

As mentioned in the introduction section, during the archaeological study in the Golbahar district of Chenaran County, 58 sites from the Bronze Age to the Islamic period were identified (Fig. 3), among which only seven sites provided evidence of the Bronze or Iron Age (Table 3 and Fig. 4). During the survey, we came across different types of sites, including multi-period or single-period sites, as well as sites such as cemeteries belonging to the Qajar period. The detected sites differed in size, height, and visible surface features. In the present article, we only refer to the factors affecting the distribution of sites related to the Bronze Age and Iron Age and do not deal with the detected sites from other periods. The sites from the Bronze and Iron Ages found in Golbahar Plain, which show pottery data similar to Bronze Age Namazga and Iron Age material culture assemblage of Yaz, are evidence that this area belonged to the Central Asia cultural zone during the mentioned periods; we will introduce these cultures in the following.

<sup>15</sup> RUBEL/KOTTEK 2010, 137.

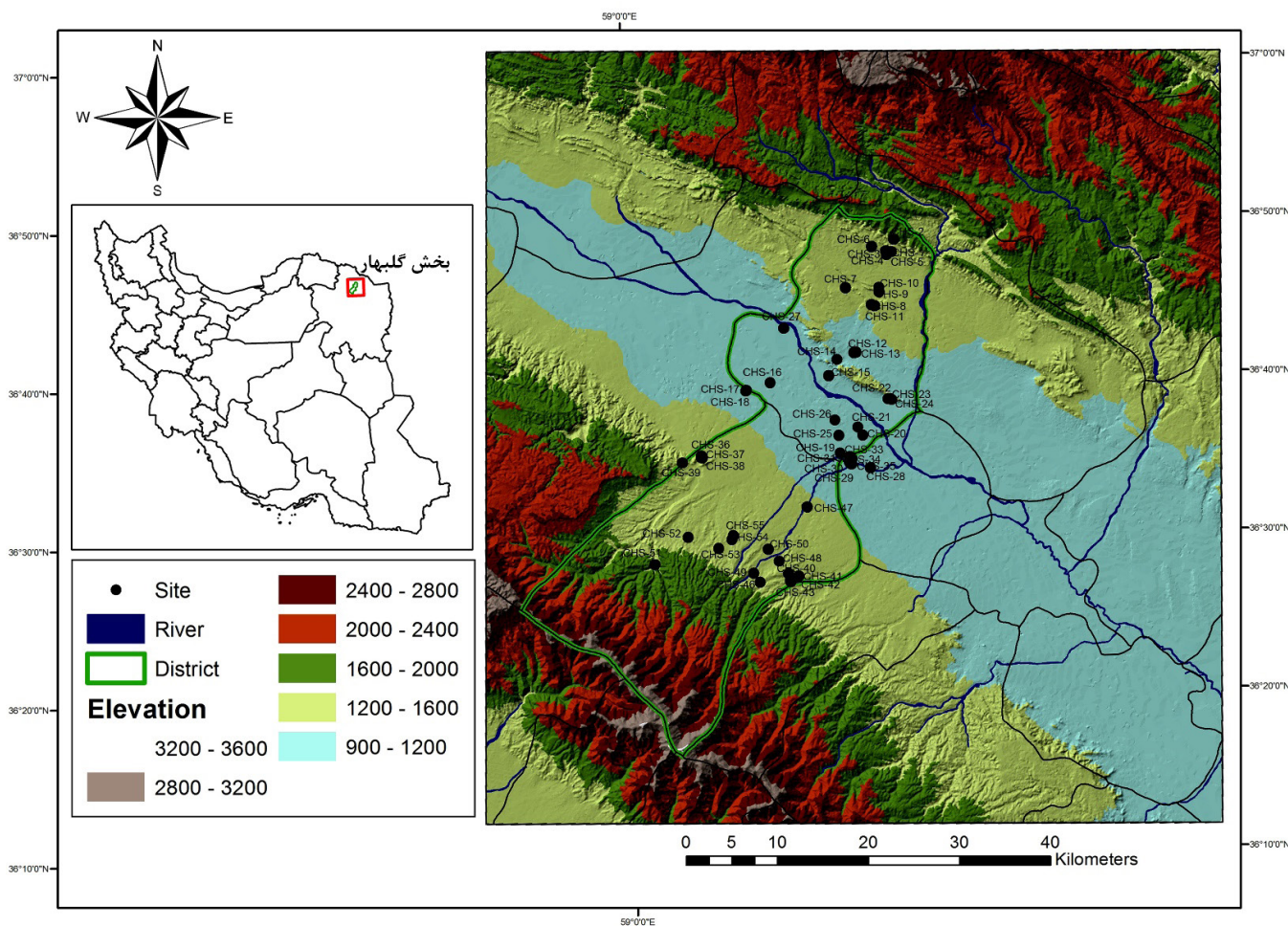
<sup>16</sup> BASAFA/REZAEI 2014.

<sup>17</sup> REZAEI/ZANGANEH EBRAHIMI/BASAFA 2018, 5.

<sup>18</sup> BISCIONE/VAHDATI 2012, 356.

**Table 1.** Location of prehistoric sites identified in Golbahar district

Number	Sites	Altitude(M)	Latitude	Longitude	Extent (M2)	Early Bronze (Namazga IV)	Middle Bronze (Namazga V)	Early Bronze (Namazga VI)	Yaz I (Iron Age I)	Yaz II (Iron Age II)	Yaz III – Achaemenid
1	Qaleh Kohneh Shirin – (CHS-9)	1250	36° 43' 14.7"	59° 19' 58.06"	20000		x	x	x	x	x
2	Tape Takht-e Padeshah (CHS-11)	1230	36° 42' 27.1"	59° 19' 34.2"	18200	x			x		
3	Cheshmeh Gilas West Site-(CHS-22)	1130	36° 36' 51.7"	59° 20' 12.4"	19500				x	x	x
4	Cheshmeh Gilas North Site – (CHS-23)	1140	36° 36' 51.9"	59° 20' 21.2"	1400				x		
5	Cheshmeh Gilas East Site – (CHS-24)	1143	36° 36' 49.5"	59° 20' 26.09"	3000				x		
6	Site (No Name) – (CHS-37)	1305	36° 33' 57.00"	59° 6' 15.4"	2000				x	x	
7	Site (No Name) – (CHS-38)	1330	36° 33' 56.1"	59° 6' 18.1"	3000				x		



**Fig. 3.** Distribution of sites of the Golbahar Plain (Author).

**BRONZE AGE AND THE BMAC/ OXUS CIVILIZATION**

The Bronze Age in Central Asia corresponds to the Namazga Depe IV, V, and VI periods or the Anau III phase. Early Bronze Age artifacts in southwestern Turkmenistan have been identified from Namazga IV and the lower layers of Anau III. Early Bronze Age pottery (Namazga IV) in

Golbahar Plain was found in the two sites of Qaleh Kohneh Shirin (CHS-9) and Takhte-Padeshah site (CHS-11), which are comparable with samples found in Esfaryen<sup>19</sup> and Roshtkhar plains (Fig. 5, 1-3).<sup>20</sup> The Bronze Age Oxus Civilization (ca. 2300-1700 BC), which includes

<sup>19</sup> VAHDATI 2015, 267.

<sup>20</sup> REZAEI/ZANGANEH EBRAHIMI/BASAFI 2018.



Qaleh Kohneh Shirin - (CHS-9)



Tepe Takht-e Padeshah- (CHS\_11)



1- Cheshmeh Gilas West Site-(CHS-23)

1- Cheshmeh Gilas North Site-(CHS-23)  
1- Cheshmeh Gilas East Site-(CHS-24)

Site (No name) – (CHS-37)



Site (No name) – (CHS-38)

**Fig. 4.** Bronze and Iron Ages sites of the Golbahar Plain (Author).

parts of Namazga V and VI periods, also known as the «Bactria-Margiana Archaeological Complex» (BMAC), or more recently «Greater Khorasan Civilization» (GKC), occupied the territory of southern Central Asia and northeastern Iran, namely the south of present-day Turkmenistan, Uzbekistan, Tajikistan, northern Afghanistan, and northern parts of Iranian Khorasan. Archaeological research indicates extensive contacts between the BMAC and a vast region stretching from the Indus Valley on the east to Mesopotamia and the Persian Gulf area to the west and south.<sup>21</sup> Evidence of the BMAC culture in Khorasan has been identified from

<sup>21</sup> BISCIONE/VAHDATI 2021, 541–543; VAHDATI/MEIER 2020.

Yusuf Abad or Nishabur-p,<sup>22</sup> Tepe Yam,<sup>23</sup> Shahrake Firouzeh Site,<sup>24</sup> Tepe Damghani,<sup>25</sup> Tepe Chalow,<sup>26</sup> Tepe Eshgh,<sup>27</sup> Razeh Site in the south of Khorasan,<sup>28</sup> Atrak basin,<sup>29</sup> the Kale-Shor basin,<sup>30</sup> and in the Roshtkhar plain.<sup>31</sup> Middle and Late Bronze

<sup>22</sup> HIEBERT/DYSON 2002.

<sup>23</sup> VENCO RICCIARDI 1980, 57–58.

<sup>24</sup> BASAFA/RAHMATI 2011.

<sup>25</sup> FRANCFORT et alii 2014.

<sup>26</sup> VAHDATI/BISCIONE 2012.

<sup>27</sup> VAHDATI 2014.

<sup>28</sup> SOROUGH/YOUSEFI 2013.

<sup>29</sup> YOUSEFI ZOSHK/BAGHIZADEH 2012.

<sup>30</sup> VAHDATI 2015.

<sup>31</sup> REZAEI/ZANGANEH EBRAHIMI/BASAFA 2018.

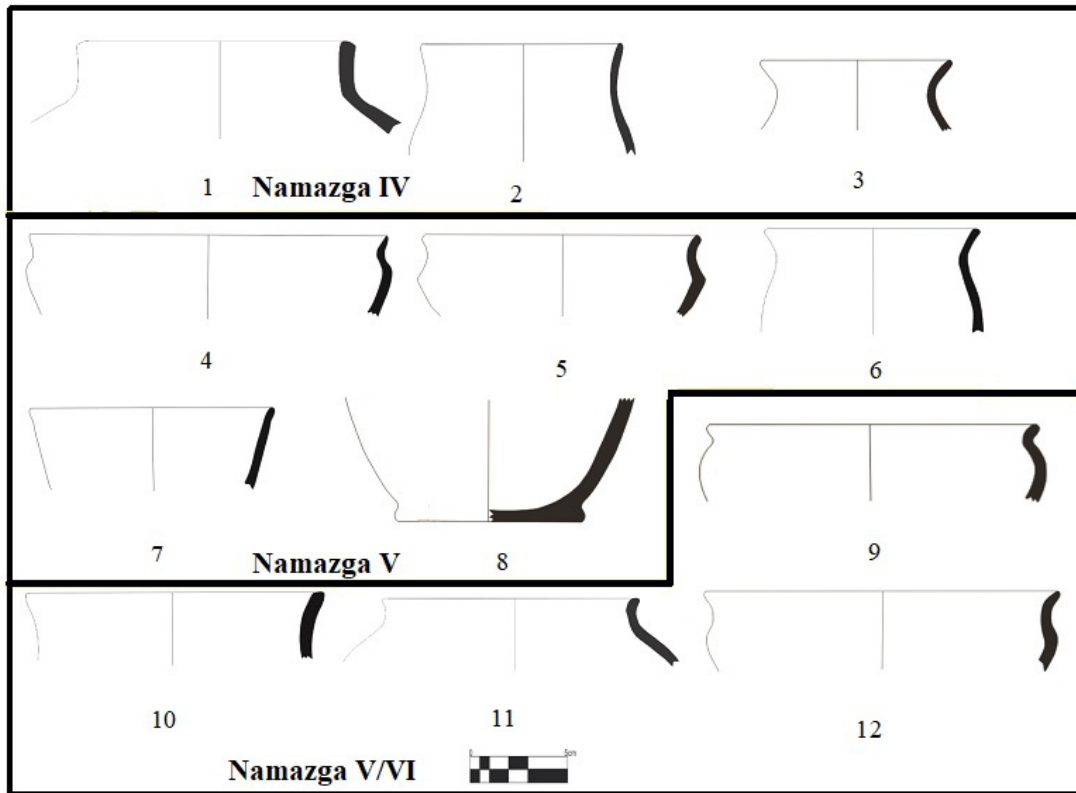


Fig. 5. Pottery sketches of Namazga IV, V/VI periods.

Table 2. Catalog of Figure 5.

Label Number	Site	Form	Manufacture	Firing	Decoration	Texture	Interior cover	Exterior cover	Temper	Chronology	parallels
1	Qaleh Kohneh Shirin (CHS-9)	Rim	Wheel-Made	Well Fired	-	Gray	Gray	Red	Sand	Namazga IV	VAHDATI 2015, 267. Fig, 5.14
2	Tape Takht-e Pade-shah (CHS-11)	Rim	Wheel-Made	Well Fired	-	Red	Red	Red	Sand	Namazga IV	HIEBERT/DYSON 2002, 141. Fig, 8.6; REZAEI/ZANGANEH EBRAHIMI/BASAFSA 2018 5. Fig, 3.7
3	Qaleh Kohneh Shirin (CHS-9)	Rim	Wheel-Made	Well Fired	-	Red	Red	Red	Sand	Namazga IV	HIEBERT/DYSON 2002, 141. Fig, 8.6; SARIANIDI 2007, 59. fig. 74
4	Qaleh Kohneh Shirin (CHS-9)	Rim	Wheel-Made	Well Fired		Gray	Gray	Gray	Sand	Namazga V	MASIMOV 1981, 5.7-8
5	Qaleh Kohneh Shirin (CHS-9)	Rim	Wheel-Made	Well Fired		Gray	Gray	Gray	Sand	NamazgaV	SALVATORI 2002, fig. 19.1
6	Qaleh Kohneh Shirin (CHS-9)	Rim	Wheel-Made	Well Fired	-	Buff	Buff	Buff	Sand	NamazgaV (BMAC)	PYANKOVA 1989, 1.63
7	Qaleh Kohneh Shirin (CHS-9)	Rim	Wheel-Made	Well Fired		Gray	Gray	Gray	Sand	Namazga V	MARKOFSKY 2010, 179, fig, 66:1
8	Qaleh Kohneh Shirin (CHS-9)	Bottom	Hand-Made	Unfired		Red	Red	Red	Sand	Namazga V	MASIMOV 1981, fig. 3.44
9	Qaleh Kohneh Shirin (CHS-9)	Rim	Wheel-Made	Well Fired		Gray	Gray	Gray	Sand	Namazga V/VI	HLOPINA 1972, fig. 6.6; HIEBERT/DYSON 2002, 141, Fig 9.5
10	Qaleh Kohneh Shirin (CHS-9)	Rim	Wheel-Made	Well Fired	-	Red	Red	Red	Sand	Namazga V/VI	MARKOFSKY 2010, 179, fig 66:2
11	Qaleh Kohneh Shirin (CHS-9)	Rim	Wheel-Made	Well Fired	-	Red	Red	Red	Sand	Namazga VI	MIRZAEI/DANA 2016, 224. Fig, 8. 3)
12	Qaleh Kohneh Shirin (CHS-9)	Rim	Wheel-Made	Well Fired	-	Red	Red	Red	Sand	NamazgaVI	HLOPINA 1972, Fig. 6.6

Age potteries (Namazga V/VI) in Golbahar Plain were found only in the Qaleh Kohneh Shirin site (CHS-9) (Fig. 5, 4-12), which are comparable to the samples recovered from Tape Arg Shirvan in the Upper Atrak Basin (Fig. 5-3).<sup>32</sup>

During the end of Namazga V and Early Namazga VI, the two major centers of Altyn Depe and Namazga Depe reached their highest extent (over 25 and 50 hectares, respectively), while other settlements (previously mentioned) were small villages. As described above, toward the end of Namazga V, the major centers faced a crisis, and, with the beginning of Namazga VI (1950-1500 BCE),<sup>33</sup> a transformation took place. Khabuz Depe and possibly Altyn Depe were abandoned. However, new data from Berdysyčran-depe shows that settlement in the oases of the Tedjen River continued even after the Middle Bronze Age.<sup>34</sup> The remains of Namazga VI have been identified from thirteen sites, including five cemeteries, in southwestern Turkmenistan.<sup>35</sup> Nearly 400 additional sites were documented and targeted excavations were made, refining our knowledge of the later phases of the Bronze Age and the transition to the Iron Age, a period of major social and environmental shifts in the Murghab landscape.<sup>36</sup> The latter half of the 2nd millennium BC, as a transitional period between the archaeologically-defined later Bronze and Early Iron Ages, which entailed numerous changes in both the social and physical landscape, is still not fully understood.<sup>37</sup>

### IRON AGE (YAZ I, II, III)

Toward the end of the Bronze Age, a new culture expanded to Central Asia and southwestern Turkmenistan, which is known as Yaz, derived from Yaz-Depe in the Murghab Delta. Several sites in Merv Oasis and Murghab alluvial fan provide additional information on the transition from the Bronze Age to the Iron Age. Two sites from Takhirbaj Oasis give further information. In the Takhirbaj 1 site, Late Bronze Age pottery has been found among surface data as well as in small amounts from layers and sublayers of Yaz I.<sup>38</sup> In southern Bactria, a small number of ancient Iron Age settlements have been excavated, and the remains of Tillya Tepe are the only site where some evidence may indicate continued habitation from the Bronze Age to the Iron Age.<sup>39</sup> At this site, there is a one-meter thick layer of virgin soil, which is related to the Bronze Age. This layer also contains two pieces of painted pottery related to type I painted pottery, while the Bronze Age wheel-made pottery still comprises most pottery types. On top of this layer, the layers of Yaz I related to different stages of habitation were identified. In north Bactria, conditions appear to be different from those observed at Kopet Dagh piedmont, Merv Oasis, and south Bactria, and stratigraphic data are associated with evidence of continued morphology of pottery. In southern Uzbekistan (northwest Bactria), only the Dzharkutan site was inhabited during the

Bronze Age and Iron Age.<sup>40</sup> We could say that a similar condition is visible in southwestern Tajikistan (northeast Bactria). In the Karim-Berdy site, two pieces of wheel-made pottery belonging to Bronze Age footed vessels were found in Early Iron Age pit houses along with Yaz I type pottery.<sup>41</sup> In the Golbahar District, Qaleh Kohneh Shirin is the only site that shows evidence of continuous settlement from the Bronze to the Iron Age, and this site was almost continuously occupied from the Middle Bronze to the Yaz III periods.

The first accurate description of the Iron Age culture was that of Masson in the late 1950s. His first task was to identify the chronology of Yaz Depe and about 30 other sites in Merv Oasis, as well as other Iron Age sites in Central Asia.<sup>42</sup> The material culture assemblage of Yaz is obtained from Yaz Depe as well as from Central Atak Depe and Ulug Depe, Margiana, Bactria, and the Upper Atrak Valley on the east.<sup>43</sup> Today, Ulug Tepe is recognized as one of the key sites for studying the interaction among Central Asia, Elam, Mesopotamia, and Sindh Civilization.<sup>44</sup> The material culture assemblage of Yaz, which is attributed to the Early Iron Age, was discovered about a hundred years ago, and the source and origin of its ethnic culture are still not well understood.<sup>45</sup>

In the Early phase of the Iron Age and around the latter half of the second millennium BC, the territory of present-day Turkmenistan was divided into two cultural regions: southwestern and southeastern. The former covers the area between the Caspian Sea and the Kopet Dagh Mountains, which includes valleys in northwestern Iran and is part of Dahistan culture. The latter, which extends from the central part of the Kopet Dagh Mountains to the fertile delta of the Murghab River, is part of the material culture assemblage extension zone of the Yaz I.<sup>46</sup> Most of the potteries from Dahistan, except for kitchen utensils, are wheel-made pottery, where utensils with tripods are the most common type of pottery; in addition, there are also pottery types of cups and tubular jugs.<sup>47</sup> Yaz I period coincides with Early Iron Age, i.e. 1400-900 BC, Yaz II spans 900-550 BC, and Yaz III is simultaneous with 550-300 BC.<sup>48</sup> The most distinctive feature of the material culture assemblage of Yaz I is the presence of handmade painted pottery with geometric patterns.<sup>49</sup> Ancient structures, which were used as palaces and temples and were often built on high mud brick platforms, are other features of this culture. Such structures have been found in Yaz Depe in Merv, Tillya Depe, Kuchuk Depe in Bactria, and Nadi Ali in southern Afghanistan, as close links.<sup>50</sup> During this period, it seems that the number of settlements has significantly increased and the distribution of remains has reached the southern and western regions of Khorasan. Scattered pottery on the surface of sites from this

<sup>32</sup> MIRZAEI/DANA 2016, 224.

<sup>33</sup> LYONNET/DUBOVA 2021.

<sup>34</sup> BUŁAWKA/KAIM/RZEPLIŃSKA 2021.

<sup>35</sup> KHLOPINA 1981, 44.

<sup>36</sup> ROUSE/CERASETTI 2017, 25.

<sup>37</sup> IBID 31.

<sup>38</sup> CATTANI 1998, 98-99; LHUILLIER 2016, 518.

<sup>39</sup> SARIANIDI 1989, 17.

<sup>40</sup> ASKAROV 1976; ŠAJDULLAEV 2000.

<sup>41</sup> TEUFER/VINOGRADOVA/KUTIMOV 2014, 139-140; FOG.36; LHUILLIER 2016, 518.

<sup>42</sup> BUŁAWKA 2017, 144.

<sup>43</sup> VAHDATI 2018, 63.

<sup>44</sup> BENDEZU-SARMIENTO/LHUILLIER 2016, 522.

<sup>45</sup> SARIANIDI 1989; SARIANIDI 1998, 162-166.

<sup>46</sup> BUŁAWKA 2011, 121.

<sup>47</sup> ASKAROV 1992, 446.

<sup>48</sup> SEYED SAJJADI 2010, 490.

<sup>49</sup> BUŁAWKA 2011, 121.

<sup>50</sup> SARIANIDI 2007, 135.

**Table 3.** Catalog of Figure 6.

Label Number	Site	Form-Register Number	Manufacture	Firing	Decoration	Texture	Interior cover	Exterior cover	Temper	Chronology	parallels
1	Qaleh Kohneh Shirin (CHS-9)	Rim-1	Wheel-made	Well Fired	-	Red	Red	Red	Sand	Yaz I	VAHDATI 2018, 57. Fig. 4.4
2	Qaleh Kohneh Shirin (CHS-9)	Rim-4	Wheel-made	Well Fired	-	Red	Red	Red	Sand	Yaz I	VAHDATI 2018, 57. Fig. 4.7
3	Qaleh Kohneh Shirin (CHS-9)	Rim-7	Wheel-made	Over Fired	-	Red	Red	Red	Sand	Yaz I	VAHDATI 2015, 271. Fig. 9.14
4	Qaleh Kohneh Shirin (CHS-9)	Rim-8	Wheel-made	Over Fired	-	Red	Red	Red	Sand	Yaz I	VAHDATI 2015, 270. Fig. 8.11
5	Tape Takht-e Padeshah (CHS-11)	Rim-4	Wheel-made	Well Fired	-	Red	Gray	Red	Sand	Yaz I	VAHDATI 2018, 57. Fig. 4.6
6	Cheshmeh Gilas West Site-(CHS-22)	Rim-1	Wheel-made	Well Fired	-	Red	Red	Red	Sand	Yaz I	VAHDATI 2015, 270. Fig. 8.11
7	Cheshmeh Gilas West Site-(CHS-22)	Rim-2	Wheel-made	Well Fired	-	Red	Red	Buff	Sand	Yaz I	LHUILIER <i>et alii</i> 2013, 140. P1.2.20; REZAEI/ZANGANEH EBRAHIMI/BASAFI 2018. Fig 4.9
8	Cheshmeh Gilas West site-(CHS-22)	Rim-3	Hand-made	Over Fired	-	Red	Red	Red	Sand	Yaz I	VAHDATI 2018, 57. Fig.4.6)
9	Cheshmeh Gilas West Site-(CHS-22)	Rim-4	Hand-made	Well Fired	-	Red	Red	Red	Sand	Yaz I	VAHDATI 2018, 62. Fig. 11.3; VAHDATI 2015, 270. Fig. 8.12
10	Cheshmeh Gilas West Site-(CHS-22)	Rim-5	Hand-made	Well Fired	-	Red	Red	Red	Sand	Yaz I	VAHDATI 2018, 61. Fig. 9.12
11	Cheshmeh Gilas West Site-(CHS-22)	Rim-7	Hand-made	Well Fired	-	Red	Red	Red	Sand	Yaz I	LHUILIER 2010, 130. o-1/2; REZAEI/ZANGANEH EBRAHIMI/BASAFI 2018. Fig. 4.3
12	Cheshmeh Gilas North Site - (CHS-23)	Rim-2	Wheel-made	Well Fired	-	Red	Red	Red	Sand	Yaz I	VAHDATI 2015, 270. Fig. 8.11
13	Cheshmeh Gilas East Site - (CHS-24)	Rim-1	Wheel-made	Well Fired	-	Red	Red	Buff	Sand	Yaz I	VAHDATI 2018, 59. Fig. 7.17
14	Site (No Name) - (CHS-37)	Rim-3	Hand-made	Over Fired	-	Red	Red	Red	Sand	Yaz I	VAHDATI 2015, 271. Fig. 9.11; VAHDATI 2018, 59. Fig. 7.17
15	Site (No Name) - (CHS-38)	Rim-1	Wheel-made	Over Fired	-	Red	Red	Red	Sand	Yaz I	VAHDATI 2018, 57. Fig. 4.7; VAHDATI 2015, 270. Fig. 8.11
16	Qaleh Kohneh Shirin (CHS-9)	Rim-12	Hand-made	Well Fired	-	Red	Red	Red	Sand	Yaz II-III	VAHDATI 2015, 273. Fig. 11.5
17	Cheshmeh Gilas West Site-(CHS-22)	Bottom-12	Hand-made	Well Fired	-	Red	Red	Red	Sand	Yaz II-III	VAHDATI 2015, 273. Fig. 11.3
18	Cheshmeh Gilas West Site-(CHS-22)	Bottom-15	Wheel-made	Well Fired	-	Red	Red	Red	Sand	Yaz III	VAHDATI 2015, 273. Fig. 11.13; LHUILIER 2010, Fig 7. 8; REZAEI/ZANGANEH EBRAHIMI/BASAFI 2018. Fig 4.19
19	Site (No Name) - (CHS-37)	Rim-2	Wheel-made	Well Fired	-	Red	Buff	Buff	Sand	Yaz III	PILIPKO 2005, 11.6

period is mostly of plain type in red and buff colors, sometimes together with gray pottery.

Analysis of the pottery present at the sites identified in Central Asia suggests that only a few types of pottery could be considered as indicative of Yaz II or Yaz III: jars of different shapes, bowls/basins with developed rims and beakers/vases with very low carination. The distinctive Yaz II pottery is represented by jars with two main rim shapes. The first has a clearly “hook-shaped” appearance and seems to be the most evident among the biconical and cylindrical jars. The second is the flattened rim with the characteristic groove or

pinch present at the lateral surface, as well as a recess below the rim and/or a rib on the shoulders. This type of rim is present in both the basins/bowls with developed rims and jars of different shapes. The characteristics of Yaz III, according to scholars, include the presence of jars with rims in the form of a well-flattened coil, which is usually described as “manchette-shaped”. This shape can be specified as follows: the rim is very flattened and elongated, and its lateral surface is usually convex, occasionally altered by grooving. The most important factor is the lack of a recess below the rim. According to Lyonnet, the upper side of the rim can be either

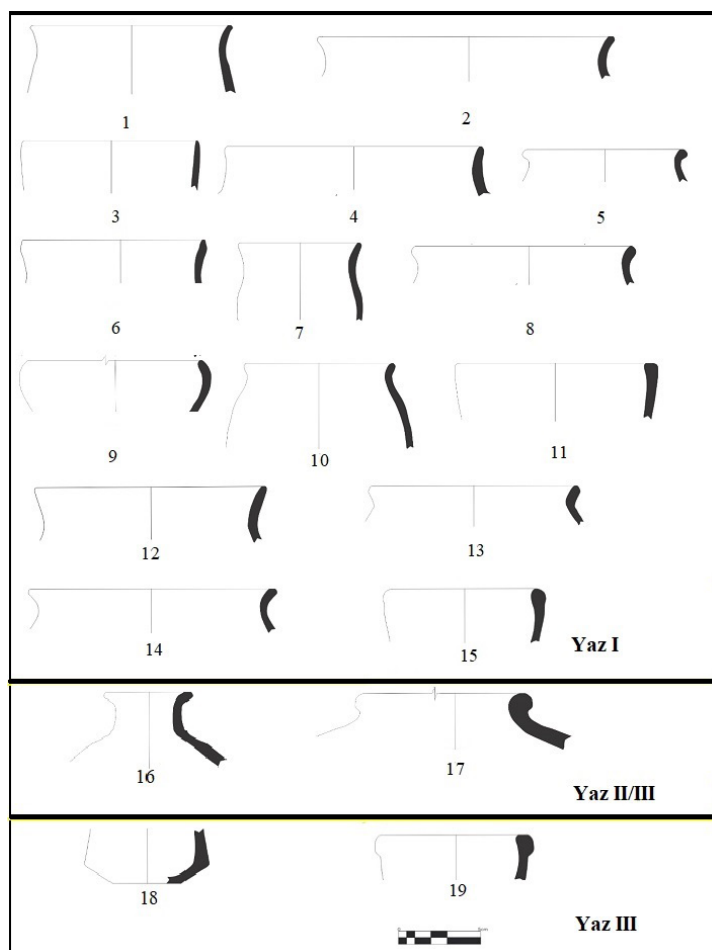


Fig. 6. Pottery sketches of Yaz, I, II, and III periods.

flattened or rounded.<sup>51</sup> The pottery forms of the Yaz II and III periods are close to typical examples of Achaemenid boat and tulip-shaped pottery.<sup>52</sup> Yaz III (Late Iron Age) corresponds more or less to the period of Achaemenid domination. Insofar as the growth of settlement during the Middle Iron Age is also observed in other areas of Central Asia, Lyonnet's studies in northeastern Afghanistan, which did not show significant changes in the number of sites between phases II and III, rather suggest local changes.<sup>53</sup> The Yaz II complex is said to be characterized by its crooked-rim jars and, at least in Yaz IIB, by tall beakers with a concave wall; it also contains a small percentage of jars with a flat rim that will become especially popular in the Yaz III period.<sup>54</sup> Yaz I pottery in the Golbahar district includes plain red handmade pottery (Fig. 6, 1–15). Yaz I pottery from the Golbahar district was recovered from five sites. Yaz II and III potteries in the Golbahar district are generally buff and red-colored wheel-made pottery (Fig. 6, 16–19), and was found in three sites.

## THE RESULTS OF SPATIAL ANALYSIS

During intensive field surveys conducted in 2017 in the Golbahar district of Chenaran County, more than 58 sites

<sup>51</sup> BUŁAWKA 2017, 148.

<sup>52</sup> ATAEI/ABBASI 2008, 47.

<sup>53</sup> LYONNET 2017, 102–110.

<sup>54</sup> LYONNET/FONTUGNE 2021.

related to different periods (mostly sites and cemeteries of the Islamic period) were identified in the area, of which seven sites presented pottery data from the Bronze Age and Iron Age (Material culture assemblage of Yaz). In five sites, pottery data related to Yaz (mostly belonging to Yaz I) were found, and in two sites, pottery data from the Bronze Age (Namazga IV–V–VI) were recovered. These sites differ in size as well as in the amount of pottery found. Only in CHS–9 and CHS–22 sites, was there evidence of habitation sequence related to Yaz I, II, and III material culture assemblage. The number of sites with material culture assemblage of Yaz could be even higher in this area because we were not able to date some of the sites identified during the survey due to the small amount of pottery and lack of other finds (no typical fragments). Some sites were not discovered perhaps because of the following reasons. First, many sites have been inhabited during different periods, and pottery data from older times (Bronze and Iron Ages) are located beneath the layers of later periods, especially the Islamic period. Secondly, some sites may have been inhabited for a relatively short period and destroyed as a result of cultural processes. Third, the alluvial and river sediments in many parts are several meters deep, which is an obstacle to the discovery of ancient sites. Therefore, special attention should be paid to landscape taphonomy. A few examples in the Central Asian context show that the ignorance of “landscape taphonomy” can lead to erroneous assumptions regarding the distribution of settlements in certain areas.<sup>55</sup> Landscape transformations have played a fundamental role in the preservation or loss of landscape data. Landscapes with the greatest probability of feature survival occur in deserts and high mountains, whereas progressive loss of features is at its maximum in areas of long-term cultivation and less so in marginal zones of settlement.<sup>56</sup> The processes involved in “landscape taphonomy” in the arid environment of Near East and Central Asia fall into two main categories, namely natural processes and human activities, which can lead to the destruction or covering of potential areas. Undoubtedly, most of these processes can also coexist.<sup>57</sup> It can be stated that modern agriculture is the most important factor in the destruction of land in the Middle East because modern machinery can destroy most low-lying sites. There are many examples of the impact of agriculture on the destruction of archaeological sites in Middle Eastern archaeology.<sup>58</sup>

In the following, we will examine the influential factors in the distribution of Bronze and Iron Age settlements in the Golbahar region. By examining and analyzing the prehistoric sites of Golbahar district in terms of altitude, it is clear that the settlements of this region are located at an altitude of 1100–1300 meters and that even today the villages of the study area have been established at such an altitude (Fig. 7). On the other hand, the higher we go, the lower the number of settlements becomes.

<sup>55</sup> MASSON 1959, 90–92; HLOPIN 1964, 137–141; BUŁAWKA/KAIM 2015, 792.

<sup>56</sup> WILKINSON 2003, 41.

<sup>57</sup> BUŁAWKA/KAIM 2015, 792.

<sup>58</sup> ADAMS 1981, 35–47; BANNING 1996, 27; HRITZ 2010, 189; HRITZ 2013, 1978.

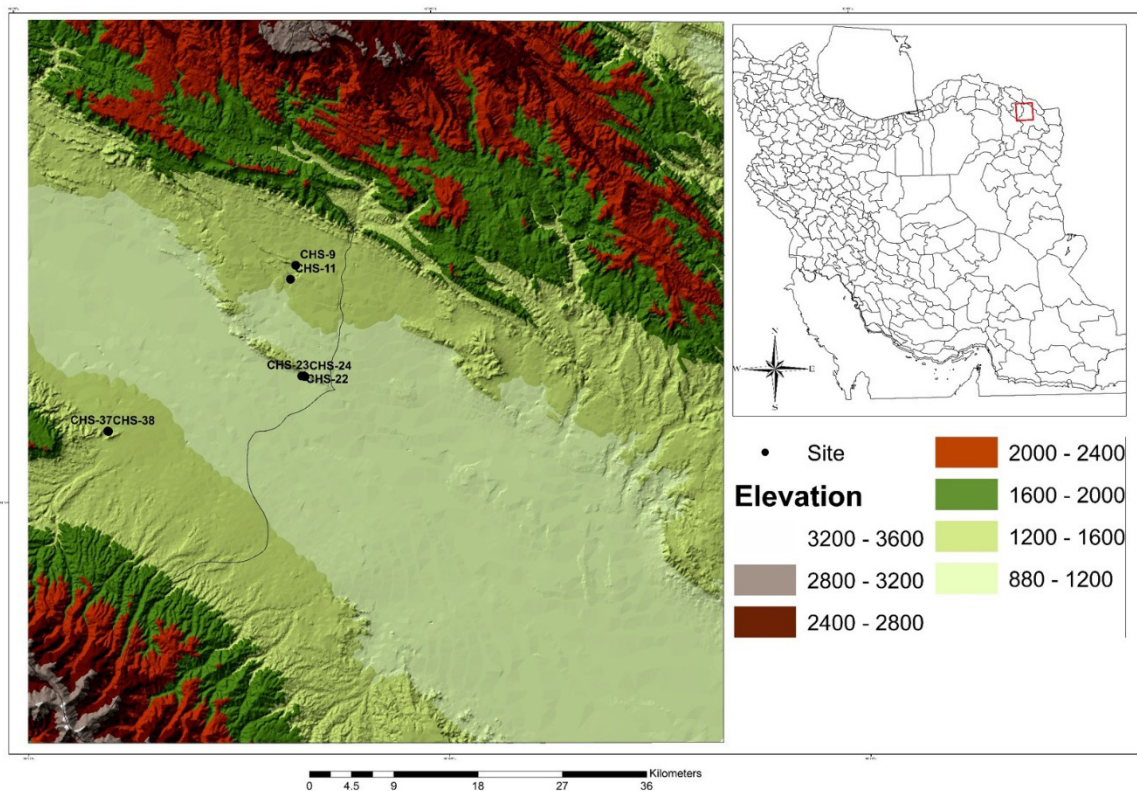


Fig. 7. Distribution of Golbahar Plain sites concerning altitude (Author).

The size of a site is one of the important indicators to determine the population living in an area; it can be inferred that the size of a settlement directly correlates with its population and livelihood characteristics. Specifically, the sites in Golbahar Plain can be categorized into two groups based on their surface area: less than 0.5 hectares (four sites), and 1.5–2 hectares (three sites). Another significant

factor in determining settlement patterns is the proximity to water resources, as water plays a crucial role in the development and growth of villages and settlements. It is generally observed that settlements are established in areas with sufficient water availability.<sup>59</sup> The study area in Golbahar Plain is well-equipped with a network of streams, permanent

<sup>59</sup> BADRI FAR 1998. 91.

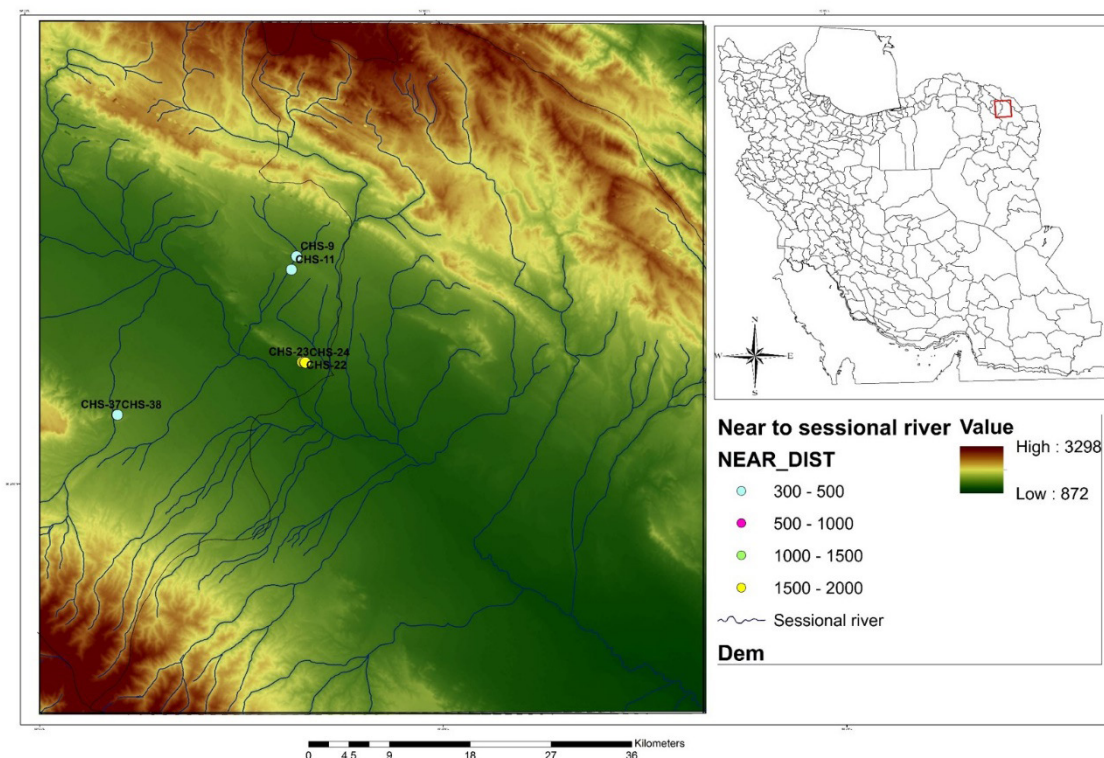


Fig. 8. Distribution of sites in Golbahar Plain relative to the distance from seasonal water sources (Author).

and seasonal rivers, and springs, ensuring easy access to water resources. Therefore, it can be stated that most sites in Golbahar Plain are located within 500 meters of water sources (Fig. 8).

The availability of vegetation, forests, and diverse animal species has traditionally served as a dependable source of sustenance for prehistoric communities. Consequently, these resources play a crucial role in influencing the establishment

of settlements.<sup>60</sup> In the Golbahar Plain, a fertile region in northeastern Iran with abundant pastures, vegetation has been a significant contributing factor in the development, expansion, and distribution of prehistoric sites. Notably, the identified Bronze and Iron Age sites within this plain are located in an area where agriculture is practiced through irrigation methods (Fig. 9).

<sup>60</sup> NASERI SOOMEH/NIKNAMI 2017. 550; REZAEI 2017. 11.

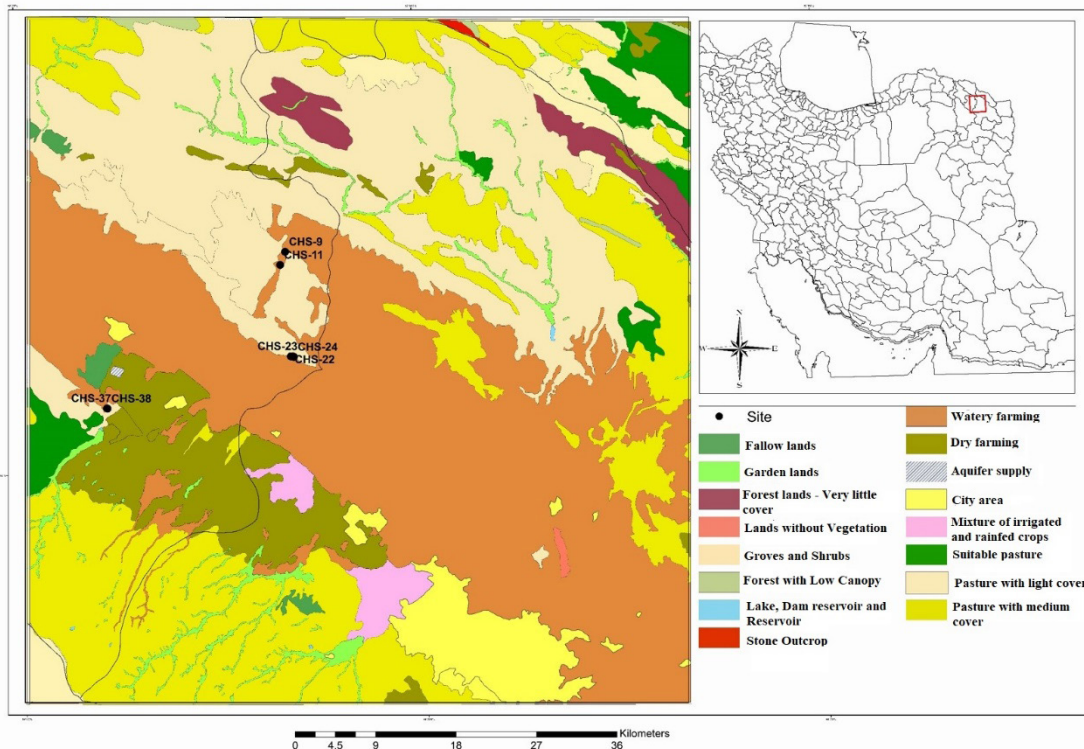


Fig. 9. Distribution of Golbahar Plain sites concerning Vegetation (Author).

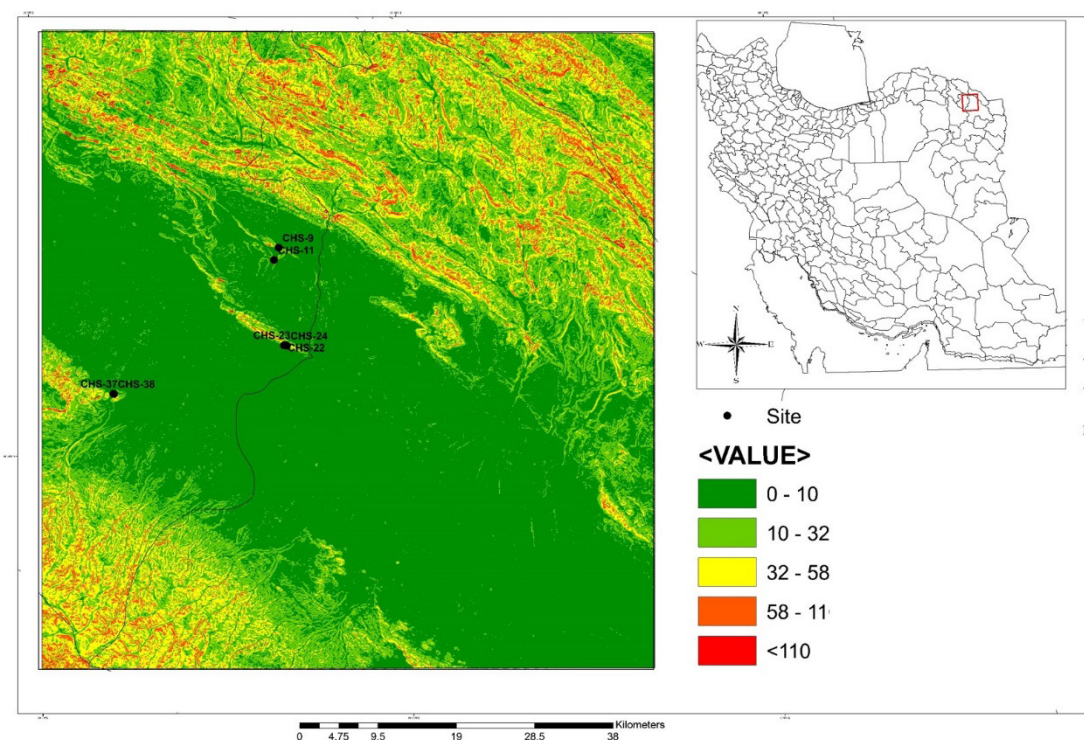


Fig. 10. Distribution of Golbahar Plain sites concerning the land slope (Author).

The morphology and slope of a basin are key factors in hydrogeomorphological studies, as they not only affect the rate of water flow but also impact other physical characteristics of the basin. Additionally, the slope of a hill has a direct relationship with soil erosion, with steeper slopes resulting in higher erosion rates. Moreover, erosion can occur in different directions. The amount of sunlight radiation and geographical directions are significant factors influencing moisture levels, soil transformation, vegetation patterns, slope erosion, and the extent of damage. The direction and slope of a hill also play a crucial role in altering the morphogenesis setting. The topography and slope of an area not only activate geomorphological factors depending on the region's climate regime, but they are also influenced and transformed.<sup>61</sup> Throughout history, humans have sought to choose settlement locations based on favorable slope directions. Geographically, slopes of  $\leq 10\%$  have been considered suitable for establishing settlements, and this has been an important consideration in the past. In the Golbahar district, archaeological sites dating back to the Bronze and Iron Ages are all situated in areas with  $\leq 10\%$  slope, which is appropriate for agricultural-related activities (Fig. 10).

## CONCLUSION

The Golbahar Plain is one of the widest intermountain plains in the northeastern region of Iran. Considering the few archaeological studies conducted in the Khorasan area and the presence of prehistoric settlements in this area, the present research can open a window for conducting systematic archaeological studies in the future of this region. In addition, before this research, there was no archaeological investigation in the Golbahar Plain, therefore, this research is important to prepare the chronological table of the region. Due to the presence of fertile soil, abundance of water resources, and river flow, Golbahar Plain has had a special position for the formation of settlements during different periods. It seems that, in this environmental context, variables such as access to the river and altitude have played a decisive role in the development of settlements on this plain. The findings of the present study showed a relatively clear picture of Golbahar Plain. Two sites from the Bronze Age found in Golbahar Plain (CHS-9, CHS-11) are situated in the northern part of the plain close to water resources. However, the Iron Age settlements are divided into three groups in terms of distribution and location. The first group of sites from this period is located in the northern part of the plain and includes CHS-9 and CHS-11, the two largest sites in the region, both of which contain remains of the Bronze Age. Qaleh Kohneh Shirin, being the largest, was occupied since the Middle Bronze Age. The analysis suggests that LBA material was present there, but so far the FBA material was not identified. The second group lies in the center of the plain near Cheshmeh Gilas, namely CHS-22, CHS-23, and CHS-24. The third group is positioned in the south of Golbahar Plain near the seasonal stream and includes CHS-37 and CHS-38 sites. The sites of Golbahar Plain are located at a distance of 500 to 2000 meters from each other in terms

of density and distance. However, CHS-9 and CHS-11 sites, and CHS-37 and CHS-38 sites are located less than 500 meters from each other, while CHS-22, CHS-23, and CHS-24 sites are located at a distance of 1500–2000 meters from each other. Besides, according to the relative chronology of the sites, it can be stated that most sites of Golbahar Plain have been inhabited from the beginning of Yaz I, and only in CHS-9 and CHS-22 sites, did habitation continue until Yaz III. Yaz III (Late Iron Age) roughly coincides with the rule of the Achaemenid Empire. During this period, settlements in Central Asia expanded, and their number increased. However, in some areas in northeastern Iran, no significant changes are observed between the settlements of Yaz II and III. It should be noted that, as previously mentioned, taphonomic processes not only disturb the recognition of Iron Age settlement patterns but are a major obstacle to the study of earlier periods, and the scarcity or absence of Iron Age or earlier sites in the region is thus justified.

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## REFERENCES

- ADAMS 1981  
Adams, R.M., *Heartland of Cities. Surveys of ancient settlement and land use on the central floodplain of the Euphrates* (Chicago and London: The University of Chicago Press).
- ANANI/IRAVANI GHADIM 2020  
Anani, B./Irvani Ghadim, F., An Investigation of Chalcolithic and Bronze Age Settlement Pattern in Sarayan Region, South Khorasan, *Iranian Journal of Archaeological Research* 24/10, 27–45.
- ASHLEY/JONES 2001  
Ashley, C./Jones, S., *The management of cultural world heritage sites: The role of ICOMOS* (London: Routledge).
- ASKAROV 1976  
Askarov, A.A., Raspisnaâ keramika Džar-Kutana. In: Masson, V.M. (ed.), *Baktrijskie Drevnosti. Predvaritel'nye soobšeniâ ob arheologičeskikh rabotah na ũge Uzbekistana* (Leningrad: Izdatel'stvo "NAUKA", Leningradskoe otdelenie), 17–19.
- ASKAROV 1992  
Askarov, A.A., The beginning of the Iron Age in Tranoxiana. Dani, A.H., Masson, V.M. (eds.) *History of Civilizations of Central Asia, Volume 1: The Dawn of Civilization: Earliest Times to 700 B.C.* (Paris: UNESCO), 441–458.
- ATAEI/ABBASI 2008  
Ataei, M.T./Abbasi, G.A., Narges tepe and signs from Median and Achaemenid periods in Gorgan, *Iranian Journal of Archaeology and History* 22/44, 42–55. DOI: 10.4000/abstractairanica.40175

<sup>61</sup> RAJAEI 1999, 72; ANANI/IRAVANI GHADIM 2020, 40.

- BADRI FAR 1988  
Badri Far, M., *Human Geography of Iran (Geography major)* (Tehran: Payame Noor University Press).
- BANNING 1996  
Banning, E.B., Highlands and Lowlands: Problems and Survey Frameworks for Rural Archaeology in the Near East, *Bulletin of the American Schools of Oriental Research* 301. DOI: 10.2307/1357294
- BASAFI/RAHMATI 2011  
Basafi, H./Rahmati, M., Preliminary Report of Archaeological Excavations of Shahrake Firouzeh Site, Neyshabur County, *Mazdak Nameh* 5, 624–613.
- BASAFI/REZAEI 2014  
Basafi, H./Rezaei, Mh., Evidence of Cheshmeh Ali Culture in Chenaran Plain (Northeastern Iran), *Archaeology* 3/1, 10–15. DOI: 10.5923/j.archaeology.20140301.02
- BENDEZU-SARMIENTO/LHUILLIER 2016  
Bendezu-Sarmiento, J./Lhuillier, J., *Some more exceptional discoveries at Ulug-Depe*. In: Dubova, N.A., Antonova, E.V., Kozhin, P.M., Kosarev, M.F., Muradov, R.G., Sataev, R.M., Tishkin A.A. (eds.), *Transactions of Margiana Archaeological Expedition. To the Memory of Professor Victor Sarianidi* 6 (Moscow: Saryi sad), 522–528.
- BISCIONE/VAHDATI 2012  
Biscione, R./Vahdati, A.A., The Iranian-Italian archaeological mission: Season 2012: The identification of cultural areas, *Studi Micenei Ed Egeo-Anatolici* 54, 355–360.
- BISCIONE/VAHDATI 2021  
Biscione, R./Vahdati, A.A., The BMAC presence in Eastern Iran: state of affairs in March 2018-Towards the Greater Khorasan Civilization? In: Lyonnet, B., Dubova, N. (eds.), *The World of the Oxus Civilization* (Oxford–New York: Routledge), 527–550.
- BUŁAWKA 2011  
Buławka, N., Decorative motifs of the Early Iron Age (Yaz I) pottery in southern Turkmenistan, *Światowit. Annual of the Institute of Archaeology of the University of Warsaw* 7/49/A, 121–131.
- BUŁAWKA 2017  
Buławka, N., The Yaz I–III Settlement Pattern in the Serakhs Oasis, Southern Turkmenistan, *Iran* 55/2, 143–170. DOI: 10.1080/05786967.2017.1355526
- BUŁAWKA/KAİM 2015  
Buławka, N./Kaim, B., The Iron Age in Serakhs Oasis (Turkmenistan). The Preliminary Results of the Application of Geographic Information System in the Study of the Settlement Pattern of the Earliest Confirmed Occupation of the Oasis. In: Campana, S., Scopigno, R., Carpentiero, G., Cirillo, M. (eds.), *CAA2015. Keep The Revolution Going. Proceedings of the 43rd Annual Conference on Computer Applications and Quantitative Methods in Archaeology*, Vol. 2, (Oxford: Archaeopress), 791–801.
- BUŁAWKA/KAİM/RZEPLIŃSKA 2021  
Buławka, N./Kaim, B./Rzeplińska, M., Berdysy´cran-depe: A bronze age site in the lower Tedjen river valley, Turkmenistan, *Archaeological Research in Asia* 28. DOI:10.1016/j.ara.2021.100326
- BUTTON 2009  
Button, M., Multiple Ways of Seeing One Place: Archaeological and Cultural Landscapes of the Sutter Buttes (MA thesis at California State University, Chico).
- CATTANI 1998  
Cattani, M., Excavations at Takhirbai-depe (thr-1) (1992–1993). Preliminary Notes. In: Gubaev, A., Koshelenko, G., Tosi, M. (eds.), *The Archaeological Map of the Murghab Delta. Preliminary Reports 1990–95*. Centro Scavie Ricerche Archeologiche, Reports, and Memoirs, Series Minor 3 (Rome: Istituto Italiano per l’Africa e l’Oriente), 97–104.
- CHANG 2010  
Chang, B., *The Power of Geographical Boundaries: Cultural, Political and Economic Border Effects in Unitary Nation* (MA thesis at Iowa State University, Ames, Iowa).
- COOPER ET ALII 1995  
Cooper, M.A./Firth, A./Carman, J./Wheatley, D., *Managing Archaeology* (London: Routledge).
- DANA/HOZHABRI 2019  
Dana, M./Hozhabri, A., The Role of Cultural Factors in Locating of Archaeological Sites: the Settlement Patterns of Prehistoric Sites in Jajarm, Khorasan, Iran, *Iran: Journal of the British Institute of Persian Studies* 57/2, 123–141.
- DANA/MIRZAEI 2022  
Dana, M./Mirzaei, A., The Early Iron Age in Upper Atrak Basin: Connection Ring of Northern Steppes and the Interior of the Iranian Plateau, *Parseh Journal of Archaeological Study (MBP)* 6/21, 41–70.
- FRANCFORT ET ALII 2014  
Francfort, H. P./Vahdati, A.A./Bendezu-Sarmiento, J./Lhuillier, J./Fouache, E./Tenberg, M./Mashkour, M./Shirazi, Z., Preliminary Report on the Soundings at Tepe Damghani Sabzevar, Spring 2008, *Iranica Antiqua* 49, 111–158. DOI: 10.2143/IA.49.0.3009240
- GHANBARI 2002  
Ghanbari, A., *Geography of Chenaran County*. First Edition (Jame: Apadana Publications).
- HASHEMI TABAR 2009  
Hashemi Tabar, Z., *Chenaran. Eleventh annual conference of History head of departments in Khorasan Razavi*.
- HIEBERT/DYSON 2002  
Hiebert, T./Dyson, R.H., Prehistoric Nishapur and the Frontier Between Central Asia and Iran, *Iranica Antiqua* 37, 113–149. DOI: 10.2143/IA.37.0.120
- HEJEBRI NOBARI/BISCIONE/JUDY 2021  
Hejebri Nobari, A./Biscione, R./Judy, N., Settlement Patterns of the Bronze Age Sites of the Upper and Middle Atrak Basin in the Northeast of Iran, *Journal of Archaeological Studies* 13/2, 293–317.
- HEYDARI DASTENAEI/DANA 2022  
Heydari Dastenaeei, M./Dana, M., Settlement Patterns and Distribution of Iron Age Sites in the Middle Atrak Basin, *Journal of Research on Archaeometry* 8/1, 45–65. DOI: 10.52547/jra.8.1.45
- HLOPIN 1964  
Hlopin, I. N., *Geok’srskaa` gruppa poselenij` e`pohi` e`neolita* (Leningrad: Izdatel’stvo «Nauka»).
- HLOPINA 1972  
Hlopina, L., Southern Turkmenia in the late Bronze Age, *East and West*, 22, 204–217.
- HRTIZ 2010  
Hritz, C., Tracing Settlement Patterns and Channel Systems in Southern Mesopotamia Using Remote Sensing, *Journal of Field Archaeology* 35/2, 184–203. DOI: 10.1179/009346910X12707321520477
- HRTIZ 2013  
Hritz, C.A., Malarial-ridden swamp: using Google Earth Pro and Corona to access the southern Balikh valley, Syria, *Journal of Archaeological Science* 40/4, 1975–1987. DOI: 10.1016/j.jas.2012.11.017
- KHLOPINA 1981  
Khlopina, L.I., Namazga-depe and the Late Bronze Age of Southern Turkmenia. In: Kohl, Ph. (ed.), *The Bronze Age*

- Civilization of Central Asia. Recent Soviet Discoveries* (New York: Armonk), 35–62.
- KOHL/HESKEL 1980  
Kohl, Ph./Heskel, D., Archaeological Reconnaissance in the Darreh Gaz Plain: A Short Report”, *Iran* 18, 160–169.
- LABAF KHANIKI 2006  
Labaf Khaniki, M., Landscape archaeology, *Journal of Archaeological Studies* 4, 113–126.
- LHUILIER 2010  
Lhuillier, J., *Le phénomène des “cultures à céramique modelée peinte” en Asie centrale dans l’évolution et la transformation des sociétés de la fin de l’âge du Bronze et du début de l’âge du Fer (IIe-Ier millénaire avant n.è.). Une synthèse comparative et régionale de la culture matérielle.* (unpublished Ph.D. Dissertation, Université Paris 1 Panthéon Sorbonne, Paris).
- LHUILIER ET ALII 2013  
Lhuillier, J./Dupont-Delaleuf, A./Lecomte, O./Bendezu-Sarmiento, J., *The Middle Iron Age in Ulug depe: A Preliminary typo-chronological and technological study of the Yaz II ceramic complex.* In: Wagner, M. (ed.), *Pottery, and chronology of the Early Iron Age in Central Asia* (Wądszala: The Kazimierz Michałowski Foundation), 9–29.
- LHUILIER 2016  
Lhuillier, J., Ulug-depe and the transition period from Bronze Age to Iron Age in Central Asia. A tribute to V.I. Sarianidi. In: Dubova, N.A., Antonova, E.V., Kozhin, P.M., Kosarev, M.F., Muradov, R.G., Sataev, R.M., Tishkin A.A. (eds.), *Transactions of Margiana Archaeological Expedition. To the Memory of Professor Victor Sarianidi* 6 (Moscow: Saryi sad), 509–521.
- LYONNET/DUBOVA 2021  
Lyonnet, B./Dubova, N.A., Questioning the Oxus Civilization or Bactria Margiana Archaeological Culture (BMAC). An overview. In: Lyonnet, B., Dubova, N. (eds.), *The World of the Oxus Civilization* (Oxford–New York: Routledge), 7–65.
- LYONNET/FONTUGNE 2021  
Lyonnet, B./Fontugne, M., Back to the Iron Age chronology in southern central Asia: From Yaz II to the Hellenistic period, *Ancient Civilizations from Scythia to Siberia* 27/2, 337–377. DOI: 10.1163/15700577-12341397
- MAJIDI/ALIZADEH/GHORBANI 2011  
Majidi, N./Alizadeh, A./Ghorbani, M., Determining the optimal cultivation pattern in line with water resources management of Mashhad-Chenaran Plain, *Water and Soil* 25/4, 776–785. DOI: 10.22067/jsw.v0i0.10208
- MARKOFISKY 2010  
Markofsky, S., *Illuminating the Black Sands: survey and settlement in the Bronze Age Murghab Delta, Turkmenistan* (Doctoral thesis, University College London).
- MASIMOV 1981  
Masimov, I.S., The Study of the Bronze Age sites in the Lower Murghab. In: Kohl, Ph. (ed.), *The Bronze Age Civilization of Central Asia. Recent Soviet Discoveries* (New York: Armonk), 194–220.
- MASSON 1959  
Masson, V.M., *Drevnezemledel’cheskaâ Kul’tura Margiany. Materialy i Issledovaniâ po Arheologii SSSR* 73 (Moscow: Izdatel’stvo Akademii Nauk SSR).
- MIRZAEI/DANA 2016  
Mirzaei, A./Dana, M., Bronze Age Review in Upper Atrak Valley: New Archaeological Surveys in North Khorasan. In: *Celebration of Mir Abedin Kaboli. Honors of Iranian Cultural Heritage* 2, 215–236.
- NASERI SOOMEH/NIKNAMI 2017  
Naseri Soomeh, H./Niknami, K.A., The role of natural factors in the spatial distribution of chalcolithic settlements in Bostan Abad County, East Azarbarbaijan, *Journal of Natural Geography Research* 48/4, 533–556. DOI: 10.22059/JPHGR.2016.60824
- PILIPKO 2005  
Pilipko, V.N., Raskopky Khyrly-depe, *Problemy Istorii, Filologii, Kul’tury* 15, 57–80.
- PYANKOVA 1989  
Pyankova, L., Pottery Complexes of Bronze-Age Margiana (Gonur and Togolok 21), *International Association for the Study of the Cultures of Central Asia Information Bulletin* 16, 27–54.
- RAJAEI 1999  
Rajaei, A.H., *Geomorphology in planning* (Tehran: Samat Publications).
- REZAEI 2017  
Rezaei, M.H., The role of environmental factors on the formation of Bakun settlements in Kazeroun Plain, Southern Iran, *Iranian Journal of Archaeological Research* 14/2, 7–24. DOI: 10.22084/NBSH.2017.11288.1485
- REZAEI/ZANGANEH EBRAHIMI/BASAFA 2018  
Rezaei, M.H./Zanganeh Ebrahimi, J./Basafa, H., The Settlement Patterns in Roshtkhar Plain, Northeastern of Iran, *Iran* 57, 1–14.
- ROBIN/ROTHSCHILD 2002  
Robin, C./Rothschild, N.A., Archaeological ethnographies: Social dynamics of outdoor space, *Journal of Social Archaeology* 2/2, 159–172. DOI: 10.1177/1469605302002002965.
- ROUSE/CERASETTI 2017  
Rouse L. M./Cerasetti, B., Micro-dynamics and macro-patterns: Exploring new archaeological data for the late Holocene human-water relationship in the Murghab alluvial fan, Turkmenistan, *Quaternary International* 437, 20–34. DOI: 10.1016/j.quaint.2015.12.021
- RUBEL/KOTTEK 2010  
Rubel, F./Kottek, M., Observed and projected climate shifts 1901–2100 depicted by world maps of the Köppen-Geiger climate classification, *Meteorologische Zeitschrift* 19/2, 135–141.
- ŠAJDULLAEV 2000  
Šajdullaev, Š. B., *Severnaâ Baktriâ v epohy rannego železnogo veka.* Turon-Movarounnahr civilizaciâsi. Civilizations of Turan-Mavarannahr. Civilizaciâ Turana-Maverannahra IV (Tashkent: Izdatel’stvo narodnogo nasledia imeni Abdully Kodyri).
- SALVATORI 2002  
Salvatori, S., Project Archaeological Map of the Murgab Delta (Turkmenistan): Test Trenches at the Bronze Age Sites of Adzhi Kui 1 and 9, *Ancient Civilizations from Scythia to Siberia*, 8/1–2), 107–178.
- SARIANIDI 1989  
Sarianidi, V. I., *Hram i Nekropol’ Tillâtepe* [Le temple et la nécropole de Tillja tépé] (Moscou: Nauka).
- SARIANIDI 1998  
Sarianidi, V.I., *Margiana and Protozoroastrism* (Athens: Kapon Editions).
- SARIANIDI 2007  
Sarianidi, V.I., *Necropolis of Gonur* (Athens: Kapon Editions).
- SEYED SAJJADI 2010  
Seyed Sajjadi, S.M., *The first cities of the Iranian Plateau.* Volume 2 (Tehran: Samat Publications).
- SOROUGH/YOUSEFI 2013  
Soroush, M.R./Yousefi, Sh., Reza area, a witness of settlements from the 3rd millennium to the historical period in South Khorasan. In: *Short articles of the 20th Annual Meeting of Iranian Archaeology* (Tehran: Cultural Heritage, Handicrafts and Tourism Organization, Cultural Heritage and Tourism Research Institute), 273–271.
- TEUFER/VINOGRADOVA/KUTIMOV 2014  
Teufer, M./Vinogradova N.M./Kutimov, Ju., Der Übergang von

- der Spätbronze zur Früheisenzeit in Mittelasien, *Das Altertum* 59/2, 109–148.
- VAHDATI 2014  
Vahdati, A.A., A BMAC Grave from Bojnord, North-Eastern Iran, *Iran* 52, 19–27.
- VAHDATI 2015  
Vahdati, A.A., Preliminary report on the Archaeological Survey in Esfarāyen county, Northeastern, Iran, *Archaeologische Mitteilungen aus Iran und Turan* 47, 261–287.
- VAHDATI 2018  
Vahdati, A.A., The Early Iron Age in Northern Khorasan. In: Lhuillier, J., Boroffka, N. (eds.), *A Millennium of History, The Iron Age in Southern Central Asia (2nd and 1st Millennia B.C.). Proceedings of the conference held in Berlin (June 23–25, 2014). Dedicated to the memory of Viktor Ivanovich Sarianidi* (Berlin: Deutsches Archäologisches Institut), 51–66.
- VAHDATI/MEIER 2020  
Vahdati, A.A./Meier, D.M.P., Objects of the «Oxus-Civilization» and the «Jiroft Culture» from the Mofakham Museum, Bojnord, North Khorasan Province. In: Usai, D., Tuzzato, S., Vidale, M. (eds.), *Tales of Three Worlds:: Archaeology and Beyond – Asia, Italy, Africa. A Tribute to Sandro Salvasori* (Oxford: Archaeopress), 98–112. DOI: 10.2307/j.ctv10cldr5.13
- VAHDATI/BISCIONE 2012  
Vahdati, A.A./Biscione, R., New evidence from the Bactria-Margiana Archaeological Complex in Jajarm plain, North Khorasan. In: *Abstract of the articles of the 11th Annual Meeting of Iranian Archaeology* (Tehran: Research Institute of Cultural Heritage, Handicrafts and Tourism).
- VENCO RICCIARDI 1980  
Venco Ricciardi, R., Archaeological Survey in the Upper Atrak Valley (Khorassan, Iran): Preliminary Report, *Mesopotamia* 15, 51–71.
- WILKINSON 2003  
Wilkinson, T.J., *Archaeological landscapes of the Near East* (Tucson: University of Arizona Press).
- YOUSEFI ZOSHK/BAGHIZADEH 2012  
Yousefi Zoshk, R./Baghizadeh, S., The use of geographic information systems (GIS) in the analysis of the settlement pattern: a case study of Dargaz plain sites from the Neolithic period to the end of Iron Age IV, *Archaeological Researches of Iran* 2/2, 7–24.