

Settlement Pattern of Yanik Culture in Eastern Kurdistan, Iran

Zahra Rajabioun, Rouhollah Shirazi

Department of Archaeology, University of Sistan and Bluchestan, Zahedan, Iran

Email address:

z.rajabioun@yahoo.com (Z. Rajabioun), rouhollah.shirazi@lihu.usb.ac.ir (R. Shirazi)

To cite this article:

Zahra Rajabioun, Rouhollah Shirazi. Settlement Pattern of Yanik Culture in Eastern Kurdistan, Iran. *International Journal of Archaeology*. Vol. 3, No. 1, 2015, pp. 8-16. doi: 10.11648/j.ija.20150301.12

Abstract: The eastern part of Kurdistan Province, the region under Study, includes cities such as Bijar, Qorveh and Dehghan. This region is a high plain which differs from western Kurdistan topographically. Recently, this region has been archaeologically surveyed by the Iranian Center for Archaeological Research (ICAR) successively. As a result, various ancient sites, dated back from prehistoric times to the Islamic period were identified among which 16 are attributed to the "Yanik culture". The main aim of the present study is to analyze the settlement pattern of Yanikian sites in the eastern Kurdistan and their relationship with natural environment. In this study, parameters such as altitude, distance to the river, size of the sites, slope and so on have been taken into account and studied via GIS software. The study shows that Yanikian settlements have been centered in southern part of the region and they are rare in the northern parts.

Keyword: Eastern Kurdistan, Yanik Culture, Settlement Pattern, GIS , Sedentism and Nomadism

1. Introduction

Chronologically, the so called Yanik culture is dated back to the early Bronze Age. It has spread across a vast region including Caucasus (the upper and center part of the Kura-Araxes basin), the coastal corridor of the Caspian Sea (from Dagestan to Azerbaijan) [1], northeastern Anatolia, Syria, northern Mesopotamia, Lebanon, Jordan, Palestine, as well as northwest of Iran, central Zagros and western parts of the Central Iranian Plateau [2]. This Culture has been identified under different names due to its immense geographical extension. In Caucasus, B. Kuftin called it "Kura-Araxes Culture" [3] whereas M. Piotrovsky and Munchaiev mentioned it as "Caucasus Chalcolithic Culture" [4]. In some other works it has been recognized as "Shengavit Culture" [5], "Caucasus Bronze Age" [4] and "eastern Caucasus-Anatolian early Bronze Age" [6]. In northwestern and western Iran, R. Dyson has used the term "Yanik Culture" [4] and C. Young has named it "Godin IV Culture" [4]. The Yanik culture has been also termed as "Amuq I-II Culture" [7], "The Culture Out-of the Fertility Crescent" [8], "Khirbet Kerak Culture" (Levant) [9], "Beth Yerah Culture" (Palestine) [4] and "Burnished Gray ware Culture" (Syria) [10].

According to archaeological studies, in northwestern Iran, Some important Bronze Age Sites such as Yanik Tepe

[11,12,13,14] and Haftavan Tepe [15,16,17,18,19] have been studied. In the valleys of Abbasabad, Kangavar, Nahavand, and Boroujerd in central Zagros, for the first time, C. Young have brought to light the remains of the Yanik Culture [20,21]. Further studies have added 15 more Yanikian sites in the Kangavar valley [22] among them Baba Qasem and Sangolan are noticeable [23]. Far to the west, two other sites related to Yanik culture could be mentioned: Tepe Pisa in Hamedan [24] and Tepe Gurab in Malayer [25]. Also Yanikian remains have been obtained from the lowest layers of Tepe Pari along the Malayer-Arak road [26]. The most prominent Yanikian sites in the Central Iranian Plateau are: Ebrahim Abad [27] and Dauran Abad [28]. In the Abhar Valley, sites such as Algozichay, Khorasanlou and Chechmeh-Qanbar [29], Tepe Aliyuord [30], Ebrahim Abad and Garmouli Qabri [31] are attributed to the Yanik Culture. Recently, A. Motarjem Also reported more than 90 Yanikian sites in the plains around Alvand Mountain near Hamedan [32].

As it has been mentioned earlier, the traces related to Yanik Culture have been reported from eastern Turkey in Amuq region [7], Malatya plain [1], Keban region [33] and in the Konya plain in Southern Turkey [34]. In Levant, the Yanikian Sites are abundant, too [36, 37, 38]. Three Sites related to the early Bronze Age were reported in Southern Caucasus in the plain of Tsakahovit by archaeologists in Armenia [35].

Although there has been few studies in eastern Kurdistan, according to the new archaeological surveys and a chronology proposed by A. Sa'ed Moucheshi, based on excavations at Tepe Kalnan [39], no sites has been found prior to the Chalcolithic period. The results of the carbon 14 dating coming from Tepe Kalnan have revealed a date between 4042 – 3660 B.C [39]. It means that the site was occupied during the middle and early late Chalcolithic.

Based on the new studies in the Talvar basin, several types of Chalcolithic ceramic traditions are found such as Dalma, Dalma-Ubaid, Seh Gabi and Godin VII. The pottery samples, collected from the surface of Yanikian sites identified during the archaeological surveys, at Qorveh and Dehgolan, indicate that two different pottery traditions survived in parallel in the eastern and western Zagros [40]. Also in Bijar, northwestern and western pottery traditions such as Dalma, Pizdeli and

Godin VI, VII and IX can be observed [41]. This paper will analyses the settlement pattern of the Yanikian sites identified during the archaeological investigations in the eastern Iranian Kurdistan [43, 44, 45, 46, 47, 48, 49].

2. The Geography of the Eastern Kurdistan

The Eastern Kurdistan has a common border, in the north, with western Azerbaijan, in the northwest with Zanjan, in the southwest with Hamedan, in the south with Kermanshah plains and in the east with Iraqi Kurdistan (Figure 1). In fact, this region acts like a bridge connecting northwestern Iran to the central Zagros and the Central Iranian Plateau.

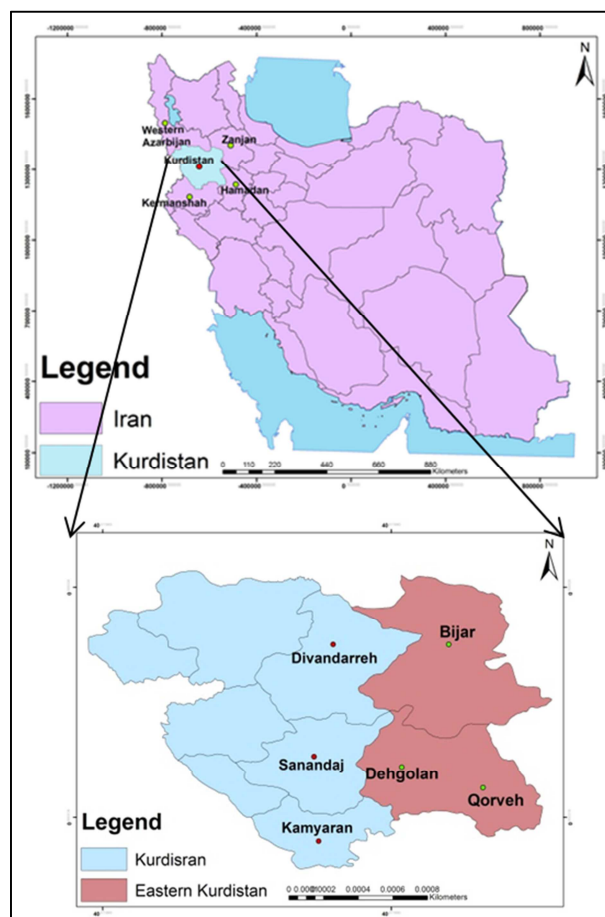


Figure 1. Map of Eastern Kurdistan

Eastern Kurdistan includes also the high mountains between Qorveh, Bijar and Sannandaj, which distinguishes it from the adjacent areas. The most remarkable physiographical features on this geographical unit are the intermontane plains. The mountainous barrage in southern and western edge of Kurdistan belongs to Sanandaj – Sirjan unit and is composed of sedimentary and transformed stones. In the northern part, Shahneshin Mountain (3320 m) and its branches separate Kurdistan from Azerbaijan and in the eastern part, the plains have been surrounded by Zanjan

mountainous walls [50].

This area has two hydrological basins: Qezel Owzan and Talvar. The most important river of the region is Qezel Owzan, a branch of Sefid Rud, into which Talvar River also flows [51]. The source of Qezel Owzan River is Chehel-Cheshmeh Mountains in western Kurdistan, but it receives various branches from both sides [52].

Based on soil analysis, the soils of this area contain Brown calcareous, alluvial and calcareous soils. Among them, the brown calcareous soil composes %70/2 of all soils. This type

of soil has a somehow neutral ph because of its lesser carbonates components. If it is enough deep and sandy, it is suitable for agriculture and vegetation growing [53].

3. The Analysis of the Settlement Pattern

Thanks to the geographical position and its neighborhood to the domain of Yanik culture, the eastern Kurdistan is an ideal region for investigation on the early Bronze Age settlements. Recent archaeological surveys in the region have yielded 16 Yanikian sites [54]. To analyze the settlement pattern of these sites by maps extracted from GIS, 5 characteristics have been taken into consideration which includes:

1. Altitude from sea level
2. Size of the Sites

3. Distance to the river

4. The slope rate

5. The slope direction

Now, the results of GIS analysis will be presented.

3.1. Altitude of the Sites from Sea Level

According to this parameter the sites have been categorized into three groups: The first group includes just one site (%6/25) that is located in an altitude lower than 1700m above sea level (ASL). The second group contains 8 higher sites (%50) situated in an altitude between 1700 to 1900m ASL. Finally, the third group consists of 7 sites (about %44) in an altitude from 1900 to 2000m ASL. Therefore, most of the sites are placed in an altitude higher than 1700m ASL (Figure 2).

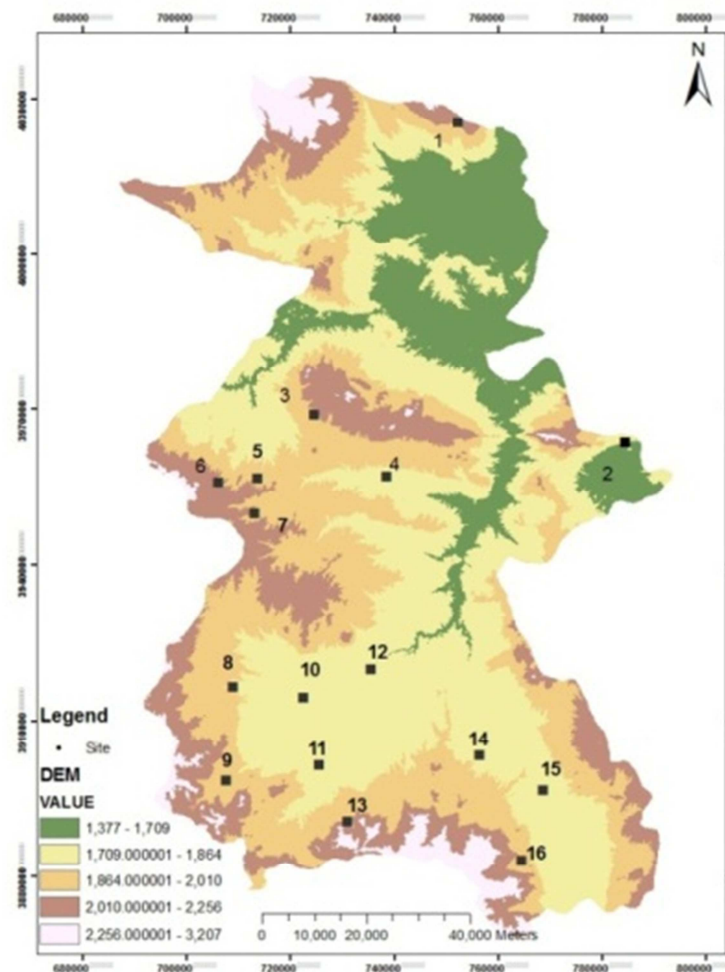


Figure 2. Altitude of the sites above sea level

3.2. Distance to river

Based on the distance of the sites to the river, sites are divided into four groups. The first group includes 9 sites (%56) that their distances to the river are less than 100m. The second group contains those sites with a distance from 100 to 200m to the river (4 sites, about %25). The third group consists of one site (%6) that is far from the river about 200 to 300m. The fourth group are the sites (2 sites, %12/5) with a distance more than 1000m to the river. The results show clearly that most of the sites (%87/5) are located in a distance between 100m to 300m of the river (Figure 3).

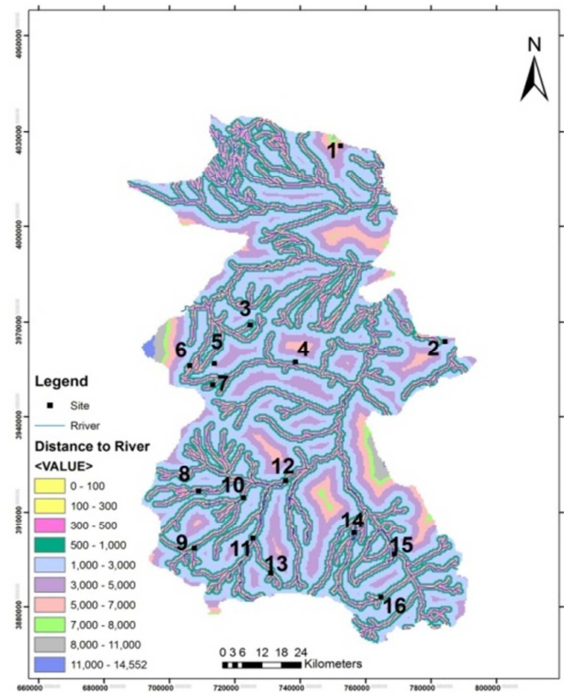


Figure 3. Distance of sites to the rivers

3.3. The size of the sites

This parameter is one of the most important characteristics for determination of the settlement pattern. Among the sites under the study, 9 have an area less than 1 ha (about %56), 5 have an area of about 1 to 2 ha (about %31), and 2 sites have an area of about 3 to 5 ha (%12/5). Overall, most of the sites have an area of 1 ha or lesser (Figure 4).

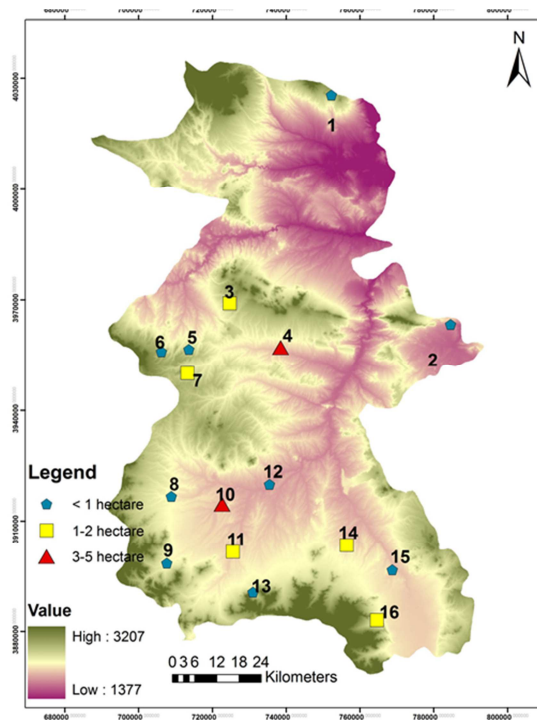


Figure 4. The size of sites

3.4. The Slope Rate

With respect to the slope rate, 7 of the 16 sites (about %44) are placed in a slope between 0° to 3° , 6 sites (%37/5) are positioned in a slope between 3° to 8° , and 3 sites (about %19) are located in a slope between 8° to 13° . According to the obtained data, it is concluded that most of the sites are located in a slope rate ranging from 8° to 13° (Figure 5).

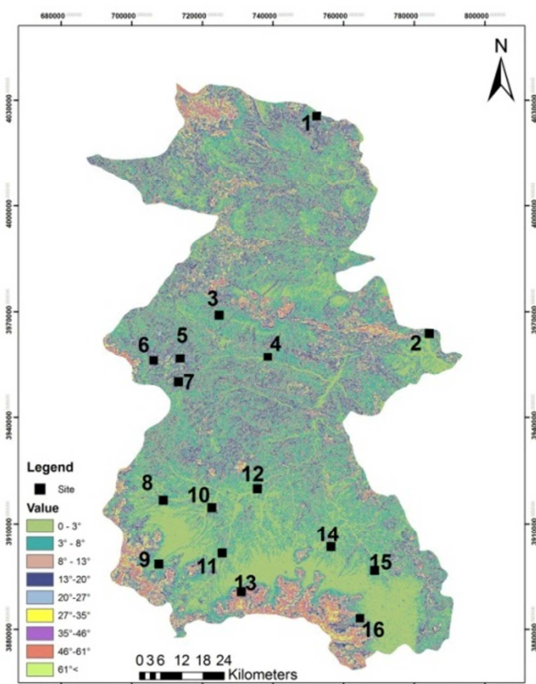


Figure 5. slope rate of the sites

3.5. The Slope Direction

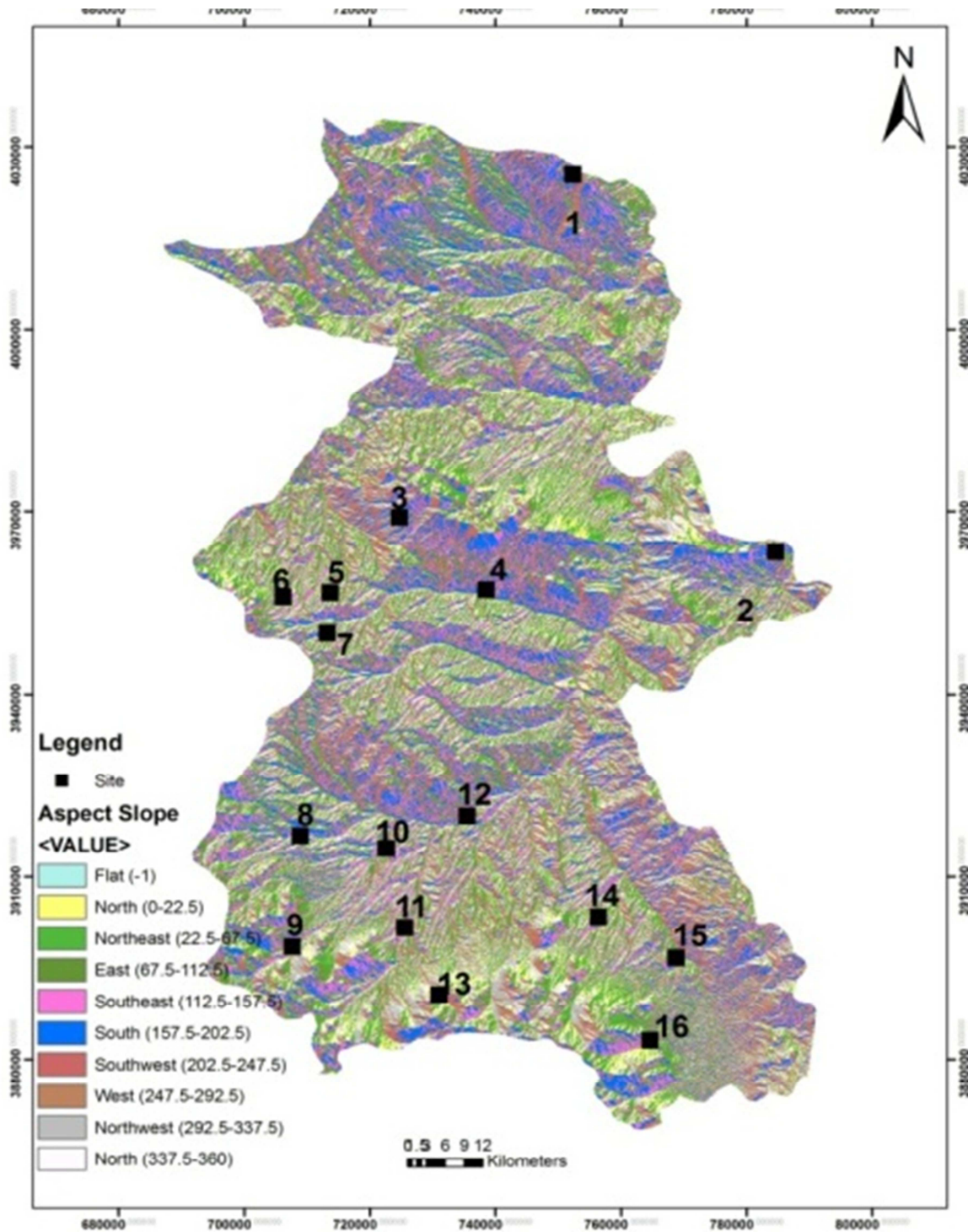


Figure 6. The slope direction of sites

With regard to the slope direction, sites are observed in all directions. In a general classification, 8 of the 16 sites (50%) are positioned in southern, south-eastern, and south-western slopes directions. 5 sites (31.25%) are situated in north and north-eastern slopes, 2 sites (12.5%) are located in eastern slope and 1 site (6.25%) is positioned in western slopes (Figure 6).

4. Discussion

Because of differences in geographical characteristics in eastern Kurdistan, the sites in the Qezel Owzan and Talvar basins, will be discussed separately (Figure 7).

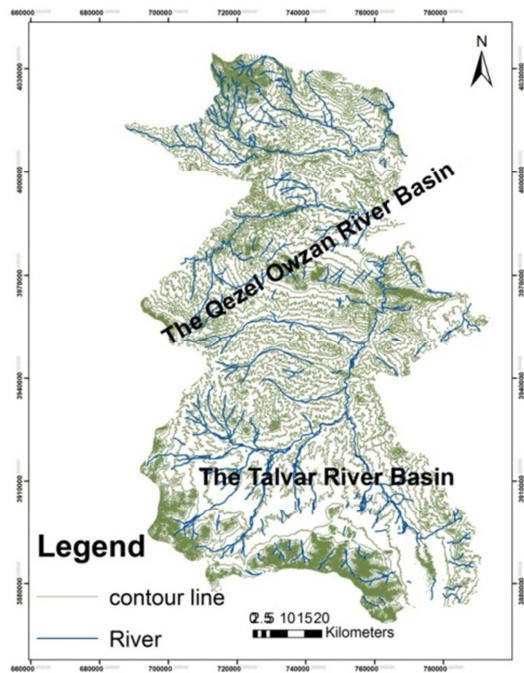


Figure 7. The Qezel Owzan and Talvar basin

Qezel Owzan River basin: In Qezel Owzan basin, there is a direct relation between the slope rate and the size of the settlements. It means that in the sharp slopes the size of settlements reduce and it increase in lower slopes. Regarding the location of the sites in the slope direction, as mentioned earlier, %86 of sites are located in the southern, southeastern and southwestern slopes. The reason why the majority of sites are located in these directions is that it allows more shining of the sun in higher altitudes during winter.

In this basin, regarding the size, the settlements are classified into three groups. In the first group, among 4 sites having an area of less than 1 ha, two are located in an altitude above 1950m ASL and in a slope rate of more than 8°. These conditions are ideal for formation of a pastoral settlement in a vertical transhumance model. The other two sites have different conditions. While they are located far from a permanent water source, one of them has a mostly sharp slope in a low altitude and the other has a lower slope in a high altitude. Both of them show a great degree of suitability for pastoralism and stockbreeding. In the second group, there are 2 sites which are located in a high altitude (above 1950m ASL) with a slope rate between 3° to 8° but their size is larger than 1 ha. They are suitable for farming but not for stockbreeding and grazing. So it can be said that these sites have been small agrarian habitats. In the third group, there is only one site called Tepe Darkin Sirlan with an area of about 5 ha. It is placed in a low altitude with a lower slope, close to the river. It seems that it is a permanent agrarian site that its habitants practiced somewhat of stockbreeding, too. Ethnological evidence confirms also this model as A. Sa'ed Mucheshi has observed it in the villages near the site [55].

Talvar River basin: The settlement pattern in Talvar basin is fairly different. Mostly, because the sites are located in the plains and on the piedmonts. In this basin, sites have been

positioned in different directions. Generally, the sites are located in lower slopes in comparison to the Qezel Owzan basin (about %78 of sites are located in 0° to 3° and the others between 3° to 8°). Like Qezel Owzan basin, here again, the relation between the slope rate and the size of settlements are evident. For instance, regarding the size of the sites, three groups are distinguished: in the first group (sites with less than 1 ha), 5 sites are registered that 3 of them have some agricultural potentiality. But the other two sites are located in an altitude about 1900 m ASL and their distance to the river is more than 100 meters. So they are not agrarian sites but small settlements for stockbreeding. According to his studies in the region, A. Motarjem suggests a model which is based on a center-periphery paradigm. In this model the sites close to the main settlement are normally small-sized sites but farther sites are bigger [32]. In other words, the large size of the seasonal nomadic settlement could be justified by more autonomy in terms of space, equipment, storage, technology and artisanal workshops [32]. The Yanikian sites in eastern Kurdistan can be considered in a similar pattern as it is proposed by A. Motarjem.

The second group, includes 3 sites (with an area of 1 to 2 ha). They are located in low altitudes and slopes. In fact, they could be considered as small agro-pastoral villages. As A. Motarjem refers also to a pastoral nomadic system moving between plains and piedmonts in the central Zagros [32].

The questions which are arisen here are: why the number of Yanikian sites is limited in the eastern part of Kurdistan? And why, despite the similarity between eastern central Zagros and eastern Kurdistan [55], Yanikian peoples have left this area and settled in the eastern part of central Zagros where their settlement could be traced in the Kangavar Valley abundantly [56]? Here, three possibilities are considered: the first goes back to the nature of previous studies. Perhaps further archaeological surveys in the eastern Kurdistan may change the present situation. But we cannot emphasize on this possibility because the earlier settlements are also rare in this region [55]. The second possibility is the high altitude of the region that cause a reduction of the temperature considerably and provide a harsh environmental conditions. But this possibility is weak, too, because earlier sites (Chalcolithic), even rare, are present [54]. In addition, there is not considerable changes in the climatological conditions from 5500 years ago up to now [57]. The third possibility is based on the understanding of migration paradigm in the region. As K. Alizadeh has correctly pointed out, it seems that, before the arrival of Yanikian peoples, this region had been settled by native peoples or those who had already come to this part of Zagros [10]. Also any trace of Urukian expansion could be traced in the region [41]. The northern part of the studied region is bare of Yanikian sites (Figure. 8). A. Motarjem thinks that movement direction of Yanikian peoples was from southern Azerbaijan toward the valleys of Mahabad, Bukan, Shahin Dejh, Zarrineh-Obato plain, Bijar, Qorveh and Hamadan, where the conditions are enough suitable for a prosperous pastoralism. Moreover, the presence of pastoral communities in the fertile plains of

Miandoab toward Qazvin, Abhar and Takastan avoided the proliferation of Yanikian peoples to reach these regions [56].

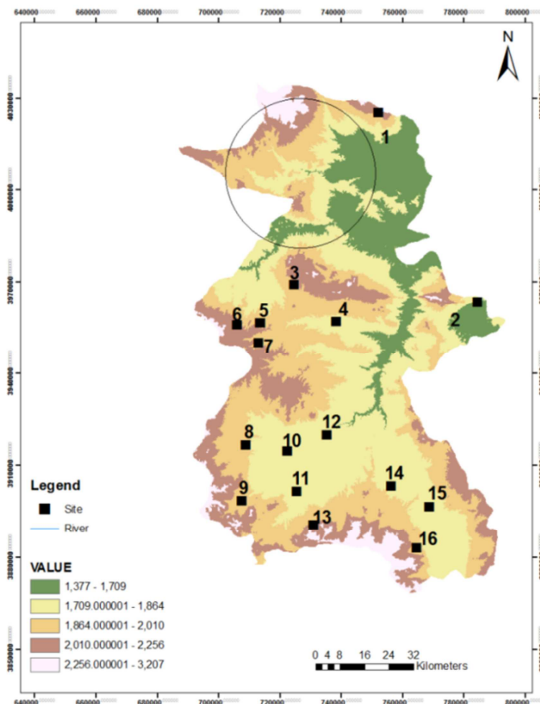


Figure 8. Distribution of sites under study

5. Conclusion

Based on data analysis, we come to the conclusion that, Sites have been positioned in various parts including plains, highlands and piedmonts. Among them, those located in high altitudes and piedmonts enjoys suitable conditions for stockbreeding and nomadism. The existence of pastoral nomadism in the Zagros have been attested from Neolithic [58]. K. Abdi considers that the emergence of nomadic pastoralism between 6500 and 5500 B.C. is a reflection of dependence on herding. It necessitates increasing movements to achieve new pastures [59].

At the same time, this region has suitable conditions for development of agriculture thanks to the existence of convenient soil and water sources. Generally, regarding these bio-environmental features, different settlement patterns could be distinguished in eastern Kurdistan.

Acknowledgments

Appreciation is offered to Dr. Abbas Motarjem for his suggestions and Mr. Alireza Azarshab, cultural heritage deputy of Cultural Heritage, Handicrafts and Tourism Organization of Kurdistan for his useful helps.

Table 1. Yanikan sites in eastern Kurdistan

Location	Altitude Sites from sea level	Dimention	Distance to river	Rate slope	Direction slope	Latitude and longitude
Tepe Milar Azad veys	2000	60 × 85	5300 m	3°-8°	South west	East longitude 47°48'40.56" North latitude 36°20'29.34"
Chal Tepe PirTaj	1677	80 × 40	1800m	8°-13°	South	E 48°06'06.51" N 35°45'3.60"
Cham Daregan Sed-Abad	1983	220 × 85	2m	3°-8°	South	E 47°29'17.5" N 35°50'22.46"
Tepe Darkin Sieralan	1800	235 × 212	74m	3°-8°	South west	E 47°38'13.88" N 35°43'44.67"
Ban-Tash Ali-Abad	1957	80 × 70	75m	8°-13°	South east	E 47°21'6.29" N 35°43'6.76"
Sargaleh(Darkin) Khorasan	1970	120 × 65	60m	8°-13°	South east	E 47°16'47.52" N 35°43'33.93"
Kulah-zar-khanom Upper Shirkoush	1951	170 × 70	200m	8°-13°	north	E 47°21'20.88" N 35°40'15.8"
Emart Ghoro-Chay	1881	70 × 50(?)	100m	0°-3°	north	E 47°17'58.9" N 35°22'23.5"
Tepe kohne Sis	1900	118 × 78(?)	300m	0°-3°	north	E 47°16'51.80" N 35°12'26.86"
Tepe Bozorg Talvar	1775	200 × 175	18m	0°-3°	west	E 47°26'59.87 " N 35°20'59.49"
Ghala-Kohne Tubrah Rize	1792	125 × 120	300m	0°-3°	South east	E 47°28'36.58" N 35°13'52.68"
Tepe Shakhs Gache Gard	1766	85 × 45(?)	7m	0°-3°	South west	E 47°35'35.8" N 35°23'42.20"
Ghala-Kohne-Kungareh	1988	110 × 70	46m	3°-8°	North east	E 47°32'7.15" N 35°7'53.99"
Tepe Ghaslan	1807	115 × 110	120m	0°-3°	north	E 47°49'3.68" N 35°14'26.83"
Tepe Majin	1835	95 × 60	100m seasonal river and 900m	3°-8°	east	E 47°57'05.26" N 35°10'36.16"

		Permanent rivers				
Tepe Mire Miham	1912	150 × 80	160m	0°-3°	east	E 47°54'5.56" N 35°3'19.99"

References

- [1] Batiuk, S and M. Rothman. 2007. Early Trans-Caucasian cultures and their neighbors: unraveling migration, trade, and assimilation. *Expedition* 49 (1): 7-17.
- [2] Kohl, Ph. L. 2009. Origins homelands and migrations: situating the Kura-Araxes early Trans-Caucasian Culture within the history of Bronze Age Eurasia. *Tel Aviv* 36: 241-265.
- [3] Kuftin, B. 1940. K voprosu O rannykh stadiyakh Bronzovoy kultury na territorii Kavkaza. *Kratkiye Soobshcheniya o Dokladakh i Polevykh Issledovaniyakh Instituta Istorii*. 8: 5-35.
- [4] Burney, C. and D. Lang. 1971. *The Peoples of the Hills*. London: Weidenfeld and Nicholson.
- [5] Baiburtyan, E. 1938. Kul'tovyy ochag iz raskopok Shengavitskogo Poseleniya v 1936-1937. *Vestnik Drennej Istorii*. 4: 255-259.
- [6] Burney, C. 1958. Eastern Anatolia in the Chalcolithic and early Bronze Age. *Anatolian Studies* 8: 157-209.
- [7] Braidwood, R and L. Braidwood. 1960. *Excavations in the plain of Antioch, Volume 1: the earliest assemblages, phases A-J*. Oriental Institute Publications 61. Chicago: The University of Chicago Press.
- [8] Kelly-Buccellati, M. 1980. The outer Fertile Crescent culture, north eastern connections of Syria and Palestine in the third millennium B.C. *Ugarit-Forschungen*, 11, 413-430.
- [9] Amiran, R. 1965. Yanik Tepe, Shengavit, and the Khirbet Kerak Ware. *Anatolian Studies* 15: 165-167.
- [10] Alizadeh, K. 2012. A study on the migration theory in archaeology and to extend Kura- Araxes culture in ancient near east, *Archaeology and History*. 25: 48-65.
- [11] Burney, C. 1961a. Excavation at Yanik tepe north-west Iran. *Iraq* 23.
- [12] Burney, C. 1961b. Circular buildings found at Yanik Tepe, in north - west Iran. *Antiquity* 35: 237-40.
- [13] Burney, C. 1962. Excavation at Yanik Tepe Azarbaidjan 1961. *Iraq* 24: 134-152.
- [14] Burney, C. 1964. Excavations at Yanik Tepe, Azerbaijan, 1962 : third preliminary Report . *Iraq* 26: 54-61.
- [15] Burney, C. 1972. Excavation at Haftvan Tepe 1969: Second preliminary Report. *Iran* 10: 127-42.
- [16] Burney, C. 1973. Excavation at Haftvan Tepe 1971: Third preliminary report". *Iran* 11:153-72.
- [17] Burney, C. 1974. Report on the 1973 season of excavation at Haftvan Tepeh. In: F. Bagherzadeh (ed.), *Proceedings of the first Annual Symposium on Archaeological Research in Iran, 1973*. 102-111. Tehran: Iranian Center for Archaeological Research.
- [18] Burney, C. 1975. Excavation at Haftvan Tepe 1973: fourth preliminary report. *Iran* 13: 149-64.
- [19] Burney, C. 1976. Haftvan Tappeh: *Iran* 14: 157-58.
- [20] Young, T. 1966. Survey in western Iran 1961. *Journal of Near Eastern Studies*, 25: 228-239.
- [21] Henrickson, R. 1986. A regional perspective on Godin III Cultural Development in Central Western Iran. *Iran* 24: 1-43
- [22] Young, T. 1975. Kangavar Valley survey . *Iran* 13: 191-193
- [23] Mason, R and L. Copper. 1999. Grog, petrology and early Trans-Caucasian at Godin Tepe. *Iran* 37: pp.25-31.
- [24] Mohammadifar, Y., A. Motarjem and H. Torabzadeh Khorasani. 2009. Tepe Pissa: new investigations at a Kura-Araxes site in central western Iran. *Antiquity* 83/320.
- [25] Khaksar, A. 2006. The report of exploration in order to determine bounds of Gurab Tepe (Malayer). Hamadan's cultural Heritage Records, Unpublished.
- [26] Baba Piri, J. 2005. The Report of stratigraphy of Tepe pari in Malayer. Hamadan cultural Heritage Records. Unpublished.
- [27] Tala'i, H. 2008, *Bornze Age of Iran*. Tehran: SAMT Press.
- [28] Fazeli Nashli, H. 2006. *Archaeology of Qazvin plain from 6 to 2 millennia B.C*. Tehran: Tehran University Press.
- [29] A'lai, A. 2006. A descriptive report of archaeological survey and identification on Abhar Rud basin. *Payam-e Bastanshenas*. 3/6: 17-42.
- [30] Naqshineh, A. S. 2011. A preliminary report on the first season of excavations on Aliyout Tepe, Saeen Galeh- Zanjan province. *Payam-e Bastanshenas*, 8/15: 91-110.
- [31] Zare'i, M. A, S. M. Sayed Mohammad, 2010, Studying and identifying Khodabandeh city (Qidar). second season 1388 - 89, Zanjan's cultural Heritage Records, Unpublished.
- [32] Motarjem, A. 2007. A study and analyze of the settlement pattern of early Bronze Age in the plains around Alvand mountain Hamedan. Ph.D. Dissertation, University of Tehran , Unpublished.
- [33] Whallon, R and S. Kantman. 1969. Early Bronze Age development in the Keban Reservoir, east-central Turkey. *Current Anthropology* 10/1: 128-133.
- [34] Mellaart, J. 1963. Early cultures of the south Anatolian Plateau, II: The late Chalcolithic and early Bronze Ages in the Konya Plain. *Anatolian Studies* 13: 199-236.
- [35] Smith, A., R. Badalyan., P. Avetisyan, and M. Zardaryan. 2004. Early complex societies in southern Caucasia: a preliminary report on the 2002. Investigations by Project ArAGATS on the Tsakahovit Plain, Republic of Armenia. *American Journal of Archaeology* 108: 1-41.
- [36] Zuckerman, S., A. Esudrib and A. Weinbergerb. 2009. Production centers and distribution patterns of Khirbet Kerak Ware in the Southern Levant: A Typological and Petrographic Perspective. *Tel Aviv* 36: 135-180.

- [37] Iserlis, M. 2009. Khirbet Kerak Ware at Bet Yerah : Segregation and Integration through Technology. Tel Aviv 36: 181-195.
- [38] Amiran, R. 1968. Chronological problems of the early Bronze Age early Bronze I-II: The city of Arad Early Bronze III: The Khirbet Kerak Ware. *American Journal of Archaeology* 72/4: 316-318.
- [39] Sa'ed Mucheshi, A., K. Niknami, M. Mashkor, H. Fazli-Nashli, B. Firouzmandi. 2011. Relative and absolute chronology of the Kalanan Tepe Bijar: Site of the middle Chalcolithic period In Western Iran, *Namehy-e Bastansheansi* 1: 31-56.
- [40] Sa'ed Mucheshi, A., K. Niknami, Z. Karimi, E. Azizi, A. Behnia, 2011. The settlement pattern of the sites related to middle Chalcolithic period of the edges of Talwar's rivers (Dehgolan and Qorveh cities). *Payam-e Bastanshenas* 8 /16: 17 – 34.
- [41] Sa'ed Mucheshi, A. 2013. The Talvar and Qezel Owzan River's basin in Chalcolithic: According to archaeological studies on Bijar. *Namehy-e Bastansheansi* 5: 25-50.
- [42] Swiny, S. 1975. Survey in Northwest Iran, 1971. *East and West* 25/1-2: 77-96.
- [43] Azizi, E. 1999. The report of survey and identification of ancient traces of eastern and western Chahardoli district of Qorveh. *Kurdistan's cultural Heritage Records*, Unpublished.
- [44] Azizi, E. 2002. The report of archaeological survey on Bijar. *Kurdistan's cultural Heritage Records*, Unpublished.
- [45] Elyasvand, E. 2006. An Archaeological survey on Siltan and Khorkhoreh districts in Bijar in 1385. *Kurdistan's Cultural Heritage Records*, Unpublished.
- [46] Elyasvand, E. 2007. An Archaeological survey on Toqamin and Siah Mansoor districts in Bijar in 1386. *Kurdistan's Cultural Heritage Records*, Unpublished.
- [47] Elyasvand, E. 2008. An archaeological survey on Korani and Gorgin districts in Bijar in 1387. *Kurdistan's cultural Heritage Records*, Unpublished.
- [48] Karimi, Z. 2007. The report of the archaeological study on southern Eaylan village, Dehgolan district, Qorveh city (Dehgolan), in 1386. *Kurdistan's cultural Heritage Records*, Unpublished.
- [49] Behnia, A. 2009. An archaeological survey on Qorveh city (Sirish Abad district). *Kurdistan's cultural Heritage Records*, Unpublished.
- [50] A'layi Taleqani, M. 2004. Iran's geomorphology. Tehran: Qoumes Press.
- [51] Najafi, S. Y. 1990. The General geography of Kurdistan province. Tehran: Amir Kabir Press.
- [52] Mahmoodi, F. 1973. Regional geography of Qorveh-Bijar-Divandareh. *Geographical Reports* 9. The Geographical Institution of University of Tehran , Unpublished.
- [53] Dechaufeur, P. 1978. Pedology generalities (Sand application and categorization). Tehran: Tehran University Press (Persian translation).
- [54] Rajabioun, Z. 2014. A study on the settlement patterns of Yanik culture in Eastern Kurdistan. M.A dissertation in Archaeology, sistan and Baluchestan University.
- [55] Sa'ed Moucheshi, A. 2011. A study of the settlement pattern of sites related to Chalcolithic in eastern Kurdistan (Qezel Owzan and Talvar basin). Ph.D. thesis, Tehran University, Unpublished.
- [56] Motarjem, A. 2011, Early Bronze Age in eastern central Zagros-Iran. *Archaeological Studies*, 2/4: 33-52.
- [57] Van Zeist, W. 1967. Late quaternary vegetation history of western Iran. *Rev. Paleobot. Palynol.* 2: 301-311.
- [58] Mortensen, P. 1963 Early village occupation: excavation at Tepe Guran, Luristsn. *Acta Archaeologica* 34: 110-21.
- [59] Abdi, K. 2003. The Early development of pastoralism in the central Zagros Mountains. *Journal of World Prehistory*, Vol. 17, No. 4.