



Identifying the Mobility Patterns of Human Societies in the Hawraman Cultural Landscape Based on the Ethnoarchaeological Approach

Hassan Ramezani

Department of Archaeology, Tarbiat Modarres University, Tehran, Iran

Abbas Motarjem

Department of Archaeology, University of Bu-Ali Sina, Hamedan, Iran

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Abstract: The lifeways of mobile human societies is a field of study investigated by anthropologists and archaeologists. Mobility is considered as an effective way of foraging and resource production among human societies (for hunter-gatherers, and pastoralists and farmers, respectively). Various classifications regarding the mobility patterns of human societies have been proposed so far. As of today, the majority of archaeologists use Murdock's multi-purpose classification which divided mobile human societies into four groups: (1) Nomadic societies, (2) semi-nomadic societies, (3) semi-sedentary societies, and (4) sedentary societies. But some societies have characteristics that does not allow them to be definitely placed in one of these groups. For identification of these unclearly defined societies, the authors will refer to 5 criteria of demographic dimensions: Mobility, number of movements, movement distance, residential criteria, and lifeway. For instance, it was not until 2003 that archaeologists began to recognize the intermediate trajectory of nomadic pastoralism from early village-based herding to the formation full-fledged pastoralism in the western part of the Central Zagros. Extensive study of pastoralist communities, however, can be used for identification several intermediate stages of the 5 criteria. Current archaeological evidence in most of the early Neolithic sites in Central Zagros such as Qazanchi, Sheikhi Abad, Sarab, Asiab, and Guran, unlike the Levant region which was settled in the Epipaleolithic (Natufian) period, indicates that these sites are seasonal. So how can we explain the mobility of human communities in the proto-Neolithic period of Zagros? As a result, the authors try to use these criteria in order to identify the intermediate stages of the sedentarism in Zagros, from mobile communities in the Epipaleolithic period to sedentary societies in the late Neolithic period. For this purpose, the authors have studied the mobility patterns and residential criteria of human communities in the cultural landscape of Hawraman. The

* Corresponding Author

Email Address: hassan.ramezani.1990@gmail.com (Hassan Ramezani)

research was conducted in two seasons, in the summer of 2016 and the summer of 2018, respectively. At first glance, the patterns of mobility and lifeways of human communities seemed homogeneous and identical in the cultural landscape of Hawraman. But with a deeper analysis, 4 main mobility patterns were identified. The patterns include: (1) single-stage agriculturalist residential mobility in Kuh-e Takht, (2) multi-stage pastoralist residential mobility in Kosalan and Shahu Mountain, (3) logistical mobility (transhumance) in Javeh River, and (4) logistical mobility (based on cultural exchanges) all over the Hawraman. The patterns show that the Neolithic Zagros communities did not become sedentary in a single stage. Therefore, semi-sedentary communities with residential mobility, and sedentary communities with logistical mobility can be placed in the intermediate stages.

Keywords: *Ethno-archaeology, Neolithic, Semi-Sedentary, Hawraman.*

Introduction

Anthropologists and archaeologists have been studying the lifeways of mobile human societies for many years. Mobility is considered as an effective way of foraging and resource production among human societies (for hunter-gatherers, and pastoralists and agriculturalists, respectively). Mobility of human societies is a complex issue that is defined and classified in various forms due to its vast diversity. In an article entitled “Ethnographic atlas: A summary”, Murdock classified mobile societies into four groups: (1) Nomadic societies, (2) semi-nomadic societies, (3) semi-sedentary societies, and (4) sedentary societies (Murdock, 1967). Most archaeologists and anthropologists still use this classification when they want explain the structure of societies. Although some communities have characteristics that does not allow them to be definitely placed in one of Murdock’s groups, relying on such classifications can provide a framework and an intellectual arrangement for researchers who study the lifeways of human societies.

Among other criteria that are helpful in identifying the dimensions of mobility and lifeways of societies, the following can be mentioned:

- (1) Demographic dimensions of mobility of the community¹.
- (2) Number of logistical and residential movements of the community (per annum).
- (3) The average distance covered by the community during their logistical and residential movements (per annum)
- (4) Residential criteria of the community
- (5) Lifeways of the community

These criteria can be helpful in identifying groups that do not fit into Murdock’s classification.

With the emergence of New Archeology and escalation of ethnological studies (especially regarding mobile societies) by the late 1960s, the basis for the formation of ethno-archaeological approach was formulated. The notion of this approach had roots in Binford's scientific ideas and theories, who sought to connect archeology and anthropology (Binford, 1962). On the whole, ethno-archeology is a set of methods for collecting ethnological data. The collected data is then applied for the purpose of interpreting the past and researching the behavior of living societies that lead to the formation of materials and deposits that future archaeologists will identify and

1. In other words, logistical mobility happens when a part of the community leaves the settlement, and when the entire community leaves (and their settlement is abandoned), a residential mobility has occurred.



record them as ancient deposits (Abdi, 2013: 2).

The principle of analogy is the most important factor that caused the Near East to be considered an important region in ethno-archaeological studies. Even when analogy had been just introduced in archeology, however, excessive and naive reliance on ethnological analogies was strongly prohibited (Freeman, 1968; Binford, 1968). Theoretically, two types of analogy were introduced in archaeology; the direct historical and the general comparative (Watson, 1980). A direct historical is an analogy that studies inhabitants of an area where archaeological excavations have been carried out. Such an analogy is possible in parts of the world where the prehistoric period leads directly to the historical period, such as certain rural communities of the Near East (for more information, see Watson, 1966; Hole, 1978, 2009; Alizadeh, 2009). The general comparative analogy, however, applies any apparently suitable source, even when there are huge chronological and geographical gaps between the objectives. For instance, ethnographical data regarding the Bushmen and other African tribes has been used to interpret the lifeways of hunter-gatherer societies in the Near East (Flannery, 1969, 1972), and ethnographical studies on big man cultures in New Guinea were applied in order to explain the domestication of flora in the Near east (Hayden, 1990, 1995). As can be seen, it is obvious that the direct historical analogy is more accurate than general comparative analogy. But if the general comparative analogy is used in a scientific manor, it can be regarded as valuable as the other type. In any case, the Near East is one of the regions where direct historical analogy can be successfully used for the study of chronologically remote societies (Watson, 1980: 57).

Among the research that has been conducted in Iran, we can mention those of Hole in Lorestan (1978, 1979, 2009, 2021), Zagarell in Chaharmahal and Bakhtiari (1975), Mortensen in Lorestan (1972, 1989), Henrickson in Kermanshah (1985), Watson in Kermanshah (1966, 1972), Abdi in Eslamabad-e Gharb, Kermanshah (2002, 2003), and Ghorbani in Lorestan and Khuzestan (2005). Based on these studies, the mobility of human societies in the Near East is directly related to the pastoralist mode of subsistence. In fact, with the domestication of animals (sheep and goats) in the early Neolithic period, pastoralism has played an important and diverse role in the social and economic structure of human societies. As a result, pastoralism is widely considered to be an integral part of the society and economy of the Near East. Considering the environmental capacities of the mountainous regions of the Near East, such as the Zagros and Taurus, pastoralism is considered an efficient subsistence strategy.

Scholars have expressed various contradictory opinions regarding the development of full-fledged nomadic pastoralism. Some attribute the formation of nomadic pastoralism to the Neolithic period (Mortensen, 1972; Zagarell, 1975; Hole, 1978), while others have proposed the Chalcolithic period (Henrickson, 1985; Abdi, 2003). The arrival of Aryan (in the 2nd and 1st millenniums B.C.) and Turkic peoples (in the Islamic period) has also been suggested by certain scholars (Potts, 2014). Prior to Abdi's studies in Eslamabad-e Gharb, archaeologists believed that nomadic pastoralism had developed from early village-based herding to the formation full-fledged pastoralism in a single stage (Lees and Bates, 1974; Hole, 1978; Gilbert, 1983; Henrickson, 1985). But Abdi's studies demonstrated that pastoralism may have undergone through several intermediate stages (Abdi, 2003: 430)².

Since full-fledged pastoralists travel long distances (more than 100 km) and herd many livestock (at least more than 200), they require pack animals as well as leaders who can calculate the time and choose the route of their migration. These two criteria are in line with the aforementioned Chalcolithic proposal. But if this is the case, how can we explain the archaeological evidence that have been obtained from the Neolithic sites of Zagros, which indicate the mobility

2. Abdi then proceeds to confirm Henrickson's view (Henrickson, 1985) and attributes the formation of full-fledged nomadic pastoralism in Central Zagros to the Chalcolithic Age.



of Neolithic Zagros communities? Therefore, it seems that the Neolithic Zagros communities were semi-sedentary. As can be seen in Murdock's classification, nomadic pastoralist communities were not the only mobile group. In Iran, the majority of ethno-archaeological studies have been concentrated on nomadic pastoralist societies such as the Bakhtiari and Qashqai tribes. Ironically, there are many semi-nomadic and semi-sedentary communities in Zagros that migrate over short-distances with a limited number of livestock. For instance, Watson discovered that some of the inhabitants of Hoseynabad and Shirdasht villages in Kermanshah move to the Mount Parâw during the warm seasons (Watson, 1966, 1979). While Watson's studies were limited to these two villages, there are numerous other rural communities in the cultural landscape of Hawrâmân and the plains of Kermanshah, Chamchamal, and Dinavar that use this migration pattern.

Short distance vertical migration is not limited to the aforementioned plains, but can be observed in most of the western plains of Central Zagros. These plains are lower than the eastern plains of central Zagros (below 1500 m). This geological phenomenon is caused by the main fault (thrust) of Zagros. As a result, human communities can access a new ecosystem by traveling a short distance.

In this research, the authors have examined the small plains of Hawrâmân as separate entities in order to draw a systematic classification of mobility patterns in Hawrâmân's cultural landscape. Further objectives of this research are to investigate the residential criteria of human societies, population density in the villages and Hawârs, the amount of activities of men and women in private and public spaces of Qeshlaghs and Yaylaghs, and the level of social relations. Achieving these goals may be used to clarify the cultural characteristics of the prehistoric societies of Zagros. It must be noted that the authors do not intend to state that the settlement patterns and cultural forms of living nomadic societies are the same as prehistoric ones. In other words, drawing such conclusions in spite of such a long chronological gap would be a huge blunder. Instead, the ethno-archaeological approach can provide interpretative stimuli and provide explanations for difficult issues related to mobile human societies and their settlement patterns in prehistoric times.

As noted, when mobility is considered as a hypothesis for understanding the lifeways of prehistoric groups, scholar usually would not venture beyond the nominal application of the nuances of each form of mobility, such as nomadic, pastoralist, vertical and horizontal migrations. Ethno-archaeological approaches can be valuable for consideration of the great diversity of mobile societies in both habitat forms and types of mobility. On the whole, the classification of different patterns of mobility in the west of central Zagros could be an excellent reference source for those who study the prehistory of the Near East.

The scope of research

Hawrâmân's cultural landscape is known as an integrated cultural unit. With an area of 1,840 km², Hawrâmân covers the south and southwest of Kurdistan Province (Sarvabad, parts of Sanandaj, Kamyaran, and Marivan), the northwest of Kermanshah Province (Paveh) and parts of Iraqi Kurdistan (Map 1). This issue has led to the absence of a complete and unified mentality regarding the geography of Hawrâmân. The area investigated in this research includes the Kurdistan Province, the city of Sarvabad and parts of the cities of Kamyaran and Sanandaj. This area consists of small plains surrounded by Takht, Kosalan, and Shahu mountains, and the heights of the Javeh River. Rivers such as Sirwan, Javeh, Tangi Var, Gav and Avihang pass through these heights (NGEO, 2006: 16). Typically, the Hawrâmân river valleys and their surface roughnesses are situated at an elevation of less than 1000 m and more than 1800 m, respectively. In order

to adapt to this diverse environmental conditions, human communities have maintained their mobility. The short distance between Hawrāmān's highlands and plains has greatly reduced the distances of human migrations³. Therefore, it is possible to migrate between warm and cold regions in less than a day. These communities reside in villages⁴ (located in the vicinity of rivers) during the cold seasons and settle in the highlands during the warm seasons. The inhabitants of Hawrāmān call their summer and winter residences Hawār (i.e. hamlet) and Roostā (i.e. village), respectively. In order to distinguish the winter settlements from the summer ones, we will henceforth use village and hawār.



Map 1. Geographical location of Hawrāmān.

The mobility pattern in the cultural landscape of Hawrāmān

Based on ethnographic studies, four patterns of mobility were identified in the mentioned villages, which include the following:

- (1) Single-stage agriculturalist residential mobility
- (2) Multi-stage pastoralist residential mobility
- (3) Logistical mobility (transhumance)
- (4) Logistical mobility (based on cultural exchanges)

As it is clear from the title of the models, subsistence methods also play a significant role in this classification. After describing each pattern, we will proceed to determine how the residential and logistical mobility patterns are related to the environmental conditions and subsistence strategies.

Single-stage agriculturalist residential mobility

This pattern of movement was observed at the slopes of Kūh-e Takht. In this area, 10 villages were investigated, whose characteristics are shown in Tables 1 and 2. As can be seen in Table 1, the total population of villages has increased since 1966, but the average household population has decreased from 4.6 to 3.4. These 10 villages and the hawārs associated with them are situated at an elevation between 850 and 1600, and 1700 to 1900 m, respectively (Table 1). Based

3. Varying from 1.5 km to 15 km.

4. In contrast to their highland hamlets

on the ethnographic interviews, these communities only possessed a small number of goats and sheep. Typically, a household owned 30 goats and sheep, and a pair of cattle. This is consistent with the population and housing census of 1966 (table 2). The average number of livestock per household is 0.9 cattle and 2.4 goats and sheep. Therefore, agriculture is the most important mode of subsistence in Kūh-e Takht villages. In the past, the hawārs of Kūh-e Takht had rectangular huts⁵, of which only ruins remain today (Fig. 1⁶). Nowadays, architectural structures in the plains of Kūh-e Takht are more stable and their roofs are made of thatch. These single-story structures are comparable to the two-story village houses. The hawār houses, however, are simpler and have additional spaces such as barns and storages. The mobility pattern in Kūh-e Takht is currently single-staged. Although the authors have identified some hawārs used for gathering the preparations for the migration. At any rate, only a few families settled in these hawārs.



Fig. 1: A view of the abandoned huts in Golī (left) and Benan hawārs.

1. Gathering the preparations for migration to the main hawār

At this stage (in early April), a small number of families (4 or 5 families) settle in small hawārs near the village (between 1 and 3 km). After clearing the migration route, they would move to the main hawār along with other families (in early May). These preliminary hawārs, which have small springs, are located between the village and the main hawārs at an elevation of 1100 to 1600 m (Table 3).

2. Towards the main hawār

The main hawār is usually between (1.5 to 10 km) away from the village. The number of families that reside in the main hawārs varies from 30 to 200 depending on the size of the hawār. In the past, all families left the village and moved to the hawār. These human communities settled in the hawārs from early May to early November. The abundance of springs at a height of 1600 to 1900 m in Kūh-e Takht has made agriculture the main mode of subsistence for the main hawārs. Although horticulture is currently the main mode of subsistence in Kūh-e Takht villages, according to the interviews and population and housing census of 1946, wheat and barley cultivation used to play this role. In fact, the environmental conditions of Kūh-e Takht (it's long distance) have made agriculture and harvest available in two different time periods. In this way, wheat and barley were harvested from the village lands in late spring and from hawār lands in late summer. In the main hawārs of Kūh-e Takht, all lands belong to the agriculturalist communities. Stone mortars and crushers comparable to Neolithic ground stone tools were identified

5. An architectural structure, with a roof made of branches and leaves of trees, and fodder. These structures are unstable and require fundamental annual repairs

6. All photographs were taken by Hassan Ramezani.

(cf. Matthews, 2000: 31-43). Usually, these ground stone tools are located in the center of hawār and they are used jointly and for communal activities (Fig. 2).

Based on ethnographic interviews in the villages of Belbar, Selīn, Sarpīr, and Nāv, there are hāwars that belong to the pastoralist communities. In these hāwars, a different mobility pattern can be observed, which will be described in detail in the section dedicated to the mobility pattern of pastoral communities. But for what reason, there are such hāwars in these four villages in addition to the agriculturalist ones? The answer can be found in the location and geographical conditions of the aforementioned villages, as can be seen in Map 1. The location of the mentioned villages between Takht, Kosālān and Shāhū mountains has caused these villages to have hāwars in the heights of Kosālān and Shāhū.



Fig. 2: Some of the stone tools (mills, pounders and crushers) in agriculturalism hawārs. Derawīān (top), Benan (bottom left), and Serājgā.

Multi-stage pastoralist residential mobility

In this pattern, as its title suggests, we are facing a group whose mobility is primarily residential. Secondly, each village has several hawārs, which are settled in a number of stages. As the temperature gradually increases in the warm seasons of the year, the inhabitants leave their hawār and migrate to a hawār that is higher in elevation. Thirdly, the mode of subsistence is based on pastoralism. This pattern was observed in the villages on the slopes of Kosālān and Shāhū (9 villages in each, Tables 4 and 7, respectively). The population demographics of the studied villages in Kosālān and Shāhū (from 1966 to 2016) shows population decline.

Table 1: Population demographics of the investigated villages on the slopes of the Kūh-e Takht in 1966 and 2016

Row	Village	Population		Household		Average household population	
		1966	2016	1966	2016	1966	2016
1	Belbar	573	561	118	165	4/8	3/4
2	Rūvarī	202	327	41	100	4/9	3/2
3	Sarpīr	364	*7	79	*	4/6	?
4	Selīn	503	723	113	206	4/4	3/5
5	Kaljī	335	208	81	62	4/1	3/3
6	Kamāle	366	756	71	199	5/1	3/7
7	Veysiān	187	251	42	75	4/4	3/3
8	Hawrāmān Takht	1040	3176	203	911	5/1	3/4
9	Nāv	520	507	107	164	4/8	3
10	Nevīn	390	697	85	213	4/5	3/2
	Sum	4380	7206	940	2095	4/65	3/4

Table 2: Livestock to population ratio of the villages on the slopes of the Kūh-e Takht in 1966.

Row	Village	Number of households	Number of livestock			Average number of livestock per household		
			Cattle	Goat/Sheep ⁸	Pack animal	Cattle	Goat/Sheep	Pack animal
1	Belbar	118	50	150	35	0/42	1/27	0/29
2	Rūvarī	41	30	200	5	0/73	4/87	0/12
3	Sarpīr	79	150	400	49	1/89	5/06	0/62
4	Selīn	113	70	120	20	0/61	1/06	0/17
5	Kaljī	81	100	200	25	1/23	2/46	0/30
6	Kamāle	71	30	100	10	0/42	1/40	0/14
7	Veysiān	42	40	200	5	0/95	4/76	0/11
8	Hawrāmān Takht	203	180	400	50	0/88	1/97	0/24
9	Nāv	107	?	?	?	?	?	?
10	Nevīn	85	100	200	20	1/17	2/35	0/23
	Sum	833 ⁹	750	1970	219	0/9	2/36	0/26

7. After Hawrāmān Takht became a city, Sarpīr Village was annexed to it. As a result, it is not possible to determine the 1966 population statistics of Sarpīr.

8. The villagers might have understated their number of livestock to the government officials for reasons such as tax evasion. As a consequence, the 1966 statics may not represent the true livestock numbers of that year.

9. Since the authors could not gather the livestock statistics of the Nāv village, their household statistics were also omitted from this table.

Table 3: Characteristics of the hawārs of the slopes of Kūh-e Takht

Row	Village	Elevation	Hawār	Elevation	Village distance to the hawār	Number of households	Residence time
1	Belbar	900	Kalwā Pīrah	1350	5/2	4	Preparations
			Derawīān	1700	7	40	Early May to Late October
			Shera Dera	1720	5/9	70	Early May to Late October
			Sollāwī	1000	5/1	8	
			Zemī Hālah	1800	6/4	8	
			Awdālān	2400	10	8	
			Hānī Sardī	2100	16	8	
2	Sarpīr	1580	Hasārīe	1790	3/1	60	Early May to Late October
			Mar Cham	1900	5/1	10	Early May to Mid-September (pastoralism)
			Kāw	2100	5/2	10	Early May to Mid-September (pastoralism)
3	Selīn	850	Dela Hor	1100	2	5	Preliminary hawār
			Derawīān	1800	9	106	Early May to Mid-September
			Zarda Hāl	1200	2	7	
			Hasha Dol	2200	9	7	
4	Kaljī	1370	Golī	1950	5/9	81	Early May to Mid-September
5	Hawrāmān Takht	1450	Harīnah	1450	1	4	Preliminary hawār
			Benan	1700	5	170	Early May to Mid-September
6	Nāv	1000	Pīrsafa	1200	5/1	12	Preliminary hawār
			Serājgā	1650	5/3	107	Early May to Mid-November
			Fīrsānah	1950	5/5	15	Late June to Mid-September
7	Nevīn	1270	Gūshepol ¹⁰	800	5/3	85	Late February to Early May
			Kerāwiadol	1883	6	57	Early May to Mid-November
			Qorkhānah	1770	5/8	28	Early May to Mid-November
8	Kamāle	1600	Dew	1600	2	*	Preliminary hawār
			Gechānī, Ganāw	1900	4	* ¹¹	Early May to Mid-November
9	Rūvarī	1500	Dew	1600	3	*	Preliminary hawār
			Gechānī, Ganāw	1900	5	*	Early May to Mid-November
10	Veysiān	1500	Dew	1600	2	*	Preliminary hawār

10. Gūshepol is situated at a lower elevation than its village. The inhabitants deserted this hawār due to wheat harvesting.
 11. Since Gachānī and Ganāw are shared between the villages of Kamāle, Rūvarī, and Veysiān, the number of households that settled in these hawārs could not be determined.

Kosālān

Although the population of Kosālān has increased since 1966, but the average household population has decreased from 4.98 to 3.43. The villages of Kūh-e Takht and Kosālān have relatively similar population demographics. According to population and housing census of 1966, the number of livestock in the villages of the slopes of Kosālān is on average 5.26 sheep and goats and 1.74 cattle per household. Razāb and Degāgā villages had the highest number of livestock among the villages of Kosālān with an average of 13.6 and 8 goats and sheep per household, respectively (Table 5). According to ethnographical interviews, the maximum number of livestock of a household in the villages of Kosālān is 90 goats and sheep, while during the interviews with the residents of Razāb and Degāgā villages, the maximum number of livestock of a household is more than 7 taghārs¹² of goats and sheep.

The mobility pattern in Kosālān can be divided into two groups: 1. Villages of the Sīrwān watershed (Western Kosālān) 2. Villages of the Jāve River watershed (Eastern Kosālān). The vil-

12. Each taghār contains 30 goats, sheep or a mix of both animals.

Table 4. Population demographics of Kosālān villages in 1966 and 2016.

Row	Village	Population		Household		Average household population	
		1966	2016	1966	2016	1966	2016
1	Del	930	705	202	223	4/6	3/16
2	Dorūd	274	395	56	113	4/89	3/49
3	Degāgā	740	829	150	265	4/93	3/12
4	Razāb	593	669	125	201	4/74	3/32
5	Rūvār	538	183	114	50	4/71	3/66
6	Zhīvār	712	1282	125	328	5/69	3/9
7	Abbās Ābād	79	58	16	16	4/93	3/62
8	Kūlij	436	30	76	11	5/73	2/72
9	Varga Vīr	20	17	3	5	6/66	3/4
Sum		4322	4168	867	1212	4/98	3/43

Table 5. The number of livestock to the village population ratio on the slopes of Kosālān in 1966.

Row	Village	Number of households	Number of livestock			Average number of livestock per household		
			Cattle	Goat/Sheep	Pack animal	Cattle	Goat/Sheep	Pack animal
1	Del	202	300	500	50	1/48	2/47	0/24
2	Dorūd	56	136	120	60	2/42	2/14	0/50
3	Degāgā	150	210	1200	50	1/40	8	0/33
4	Razāb	125	240	1700	100	1/92	13/60	0/8
5	Rūvār	114	170	200	40	1/49	1/75	0/35
6	Zhīvār	125	110	500	50	0/88	4	0/40
7	Abbās Ābād	16	35	15	8	2/18	0/93	0/50
8	Kūlij	76	300	300	34	3/94	3/94	0/44
9	Varga Vīr	3	8	30	2	2/33	10	0/66
Sum		867	1508	4565	394	1/73	5/26	0/45



lages of Zhīvār, Varga Vīr, Abbās Ābād, Rūvār, Del, and Kūlij are located on the western slope of Kosālān and the villages of Razāb, Degāgā, and Dorūd are situated on its eastern slope. These two areas have extensive connections and interactions. In the past, Khans of Razāb considered Kosālān as part of their territory and took tribute (in the form of livestock and their related products) from every villager that settled in its highlands during the warm seasons.

Except for the villages of Abbās Ābād and Varga Vīr¹³ in Western Kosālān and Razāb and Degāgā in Eastern Kosālān, the rest of the villages follow a multi-stage mobility pattern. In this pattern, one or two hawārs are for the spring season and one hawār is for the summer. The starting time of the migration in the villages of Kosālān varies from early March to early May according to the elevation of the village and the hawārs, but without exception, all villagers return from the hawārs by mid-September. In most of the villages of Western Kosālān (820 to 1280 m), migration starts from the early or mid-March. The villagers of Eastern Kosālān (1250 to 1500 m) begin their migration from the early May (Table 6). As a result, it can be concluded that the migration period commencement in Kosālān villages with an elevation of less than 1200 m is from early March to late April (according to the environmental conditions of each village) and in villages with an elevation between 1200 and 1500 m is from early May.

The hawārs of the spring season, which generally lack sufficient water resources, are situated between 1070 to 2100 m. Due to the abandonment of all hawārs in the spring season, remnants of numerous huts can be found. The summer hawārs have springs and other sufficient water sources. Nowadays, most of the summer hawārs located at an elevation of 1650 to 2400 m are regularly settled (Table 6). With the desertion of the spring hawārs, their habitation starts from the early May and continues until the end of September. Therefore, hut architecture was replaced with thatched roofs houses that are more stable.

Del

Del was the most populated village of the Western Kosālān in 1966. The authors identified two hawārs for Del; Bāne Del, and Hashūr. In the past, Bāne Del and Hashūr were settled from early May to mid-June and from early to late summer, respectively. Since the abandonment of Bāne Del, the inhabitants of Del Village settle in Hashūr from the early May to the beginning of autumn. In Del Village, according to ethnological interviews, the maximum number of sheep and goats reached 60 per household. This statistic is in line with the 1966 census.

Zhīvār

Zhīvār was the second most populous village of the Western Kosālān in 1966¹⁴. The authors identified three hawārs for Zhīvār; Hamro Dol, Dolāw, and Hāna Lār. In order to recognize the movement pattern of the inhabitants of Zhīvār village, the authors will describe the currently abandoned Hamro Dol and Dolāw as well. As the temperature gradually increased at mid-March, Zhīvār villagers moved to Hamro Dol in the eastern heights of Kosālān. This hawār has a small spring. In the second stage, after 45 to 60 days, the inhabitants moved to Dolāw in early or mid-May (based on the weather conditions). They continued to live in this hawār for 30 days, which has very little water. With the beginning of summer, they settled in Hāna Lār (their main hawār), and continued to reside in it until mid-September, and then returned to their village. As two other hawārs are also abandoned, the residents of Zhīvār continue to live in the Hāna Lār from early May to the end of summer. Although all three hawārs of Zhīvār have springs, the

13. Vargā Vīr and Abbās Ābād are new villages. Following the reduction of their environmental capacities, some residents of Selīn migrated to Varga Vīr and some residents of Nāv migrated to Abbas Abad.

14. It has more population than Del village as of today.



springs of Hamro Dol and Dolāw are small and cannot be relied upon as a main source of water¹⁵. According to the ethnographical interview, the maximum number of goats and sheep per household reached in Zhīvār.

Rūvār

Three hawārs were identified in Rūvār; Darbānd, Zhūnī, and Be Āwah. All three hawārs are abandoned, but Zhūnī was settled in the last years. All villagers settled in Darbānd in late April, and with the beginning of the summer, most of the families (more than 100) moved to Zhūnī. Less than 8 families went to Be Āwah, which has suitable pastures. These communities stayed in Be Āwah and Zhūnī until mid-September. The maximum number of goats and sheep per household reached 60.

Kūlij

Three hawārs were identified in Kūlij; Mesārān, Sardasht, and Pashtan (Sar Darband). Two hawārs of his village have been abandoned and only Sardasht remains. Nowadays, the residents of the village live in a single-stage mobility pattern and reside in in Sardasht from early May to late summer. According to the ethnographical interview, the residents of Kūlij moved towards Mesārān (at an elevation of 1500 m) in early May. Although Mesārān has enough water resources, but due to the lack of pastures and low elevation, the migration towards Sardasht starts at the same time as the temperature rises in early June. These 76 families were settled in this hawār from early June to early September and at the same time as its pastures were severely reduced, they moved to Sar Darband. They stayed in Sar Darband for 15 to 30 days and then returned to their village. Since the route from the village to the hawār is short and smooth, the number of cattle is equal to the number of goats and sheep in Kūlij.

Belbar and Selīn

As can be seen in Table 3, most of the population of Belbar and Selīn move to the heights of Kūh-e Takht, but 8 households from Belbar and 7 households from Selīn move to pastoral hawārs in the heights of Kosālān. Hawārs of Selīn in Kosālān include Zarda Hāl, and Hasha Dol and hawārs of Belbar in Kosālān include Sollāwī, Zemī Hālah, Awdālān, and Hānī Sardī. In this pattern, the preliminary stage begins in early March and ends at the end of September when the inhabitants return to their village. According to the ethnographical interviews, each family has between 90 and 150 goats and sheep in Belbar and Selīn. Zemī Hālah and Hānī Sardī are abandoned as of now. The inhabitants of Belbar and Selīn migrate in two stages. In the first stage, the Selīn pastoralists move to Zarda Hāl in the east of the Sīrwān River (at an elevation of 1200 m) in early March and stay there until early May. The houses of Zarda Hāl are roofed with timber and thatch. Sollāwī is obviously similar to this hawār in terms of geographical location, elevation, and architectural style (Fig. 3). Belbar pastoralists are also currently using Sollāwī.

In the second stage, as the temperature increases and the rainfall dwindles in early May, the Selīn pastoralists settle in Hasha Dol. Hasha Dol is the main hawār of Selīn pastoralists and they stay in there until mid-September. This hawār has a very small spring that cannot meet the needs of pastoralists. The main source of water for these human communities is supplied through zahūras¹⁶, Chālāws¹⁷ and natural glaciers. Awdālān is similar to Hasha Dol in all respects.

15. In the Hawrami dialect, Dūl and Hānī mean spring: Springs with limited water are called Dūl and springs with enough water are called Hānī.

16. In the Hawrami dialect, masses of snow are called zahūra.

17. In the Hawrami dialect, waterholes are called chālāb.



Fig. 3: The location of Sollāwī on the slopes of Kosālān (left), and the architecture of Sollāwī.

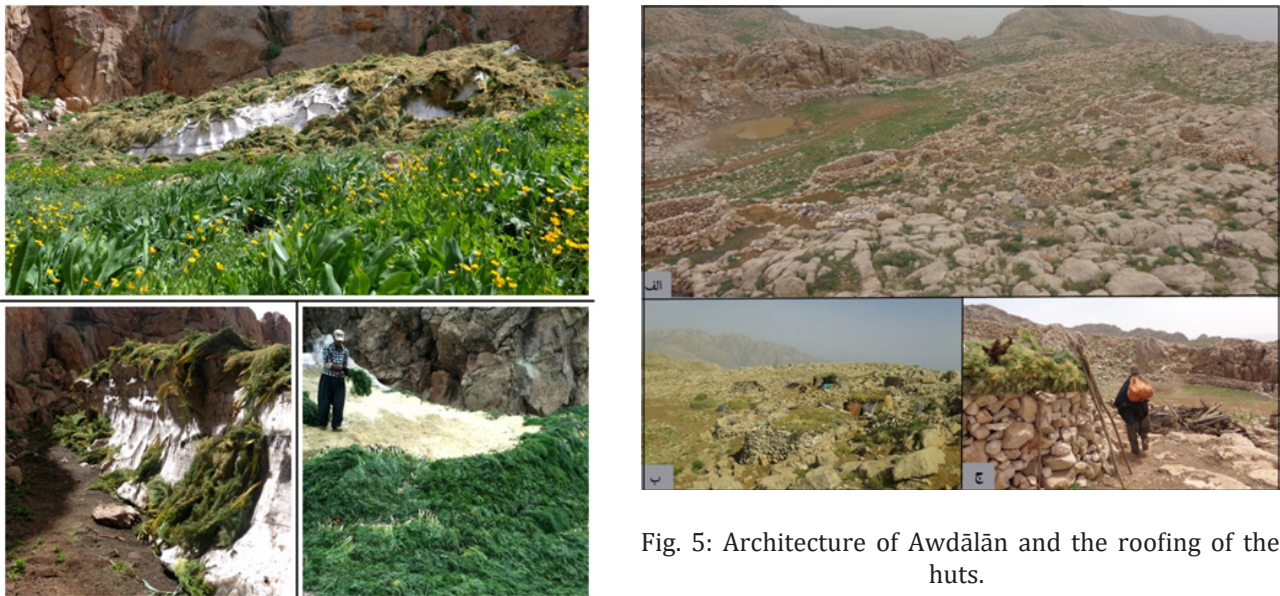


Fig. 5: Architecture of Awdālān and the roofing of the huts.

Fig. 4: Awdālān - Placing fodder on huge snow masses in order to prevent melting.

The pastoralists of these two hawārs cover snow masses with fodder in order to prevent their rapid melting (Fig. 4). Their non-angular rounded huts are drystack structures roofed with tree branches and fodder (Fig. 5). In each hawār, there is a free-standing architectural space where all households keep their livestock.

In order to determine the mobility pattern of Belbar pastoralists, the author had to investigate their abandoned hawārs as well. The Belbar pastoralists only stayed in Zemī Hālah for less than a month. In this hawār, there is a small spring with limited water supply. As a consequence, each household was allowed to draw five gallons in 24 hours. This hawār used to be settled from late April to mid-May. The inhabitants would then move to Awdālān. As the snow masses began to melt in late July or early August, they moved to Hānī Sardī and stayed there until mid-September. The architecture of Zemī Hālah and Hānī Sardī can be compared to Awdālān; non-angular huts roofed with tree branches and vegetation. Therefore, it can be concluded that the mobility pattern among pastoralists of Belbar and Selīn bears a striking resemblance to those observed in the villages of Kosālān.

Degāgā

In 1966, more than 150 households lived in Degāgā village, which is located in Eastern Kosālān. The authors have identified two hawārs of this village; Mārānī and Būk. According to the ethnographical interviews, the villagers were divided into two groups, agriculturalists and pastoralists. The two hawārs of this village are still in use. The architecture of this hawārs have undergone some changes and their huts have been replaced by more stable houses. Approximately, 95 agriculturalist households (the first group) settled in Mārānī. This hawār is 2 km away from the village and situated at an elevation of 1750 m. Mārānī has a spring. These agriculturalists also have up to 10 sheep and a pair of cattle. This hawār is settled from early May to early November, when wheat sowing season approaches. From early May to mid-September, approximately 60 pastoralist households (the first group) settled in Būk. This hawār also has a spring. According to the ethnographical interviews, these 60 households had 60 to 210 sheep and goats. As can be seen, the mobility pattern in Degāgā differs from those observed in Western Kosālān villages. In this village, both modes of subsistence (agriculturalism and pastoralism) can be observed, as it is situated between the Javeh (Zhāve) River and the heights of Kosālān. There are no signs of a multi-stage (stepped) migration pattern in Degāgā.



Fig. 6: One of the so-called Khan huts in Būk.

Razāb

Historically, numerous khans had their headquarters in Razāb. Among these khans, we can mention Hassan Khan, Muzaffar Khan, Assad Khan, Kay Kaboos Khan, Abbas Khan and Mohammad Khan. Their territory included the heights of Kosālān, some areas in the vicinity of Javeh River and even the slopes of Shāhū Mountain. Unlike the Khans of other regions, these Khans received oil, wool, goat and sheep as tribute from their vassal villages. According to ethnographic interviews, Būk used to be the hawār of Razāb, which was confirmed by identifying the ruins of large huts that belonged to khans of Razāb (Fig. 6).

Dorūd

Dorūd is the only village in the Eastern Kosālān which has a mobility pattern comparable to the western villages of Kosālān. The authors have identified two hawārs of this village; Bahārānah and Sarna Hāl. The hawārs of this village are located in the vicinity of the hawārs of Zhīvar. As a

Table 6: Hawārs of the slopes of Kosālān

Row	Village	Elevation	Hawār	Elevation	Traveled distance (km)	Distance to the village	Spring	Number of resident households	Residence time
1	Del	1280	Bāne Del	2100	5/2	5/2	N	202	Early May to Mid-June
			Hashūr	2140	5/2	5	Y	202	Late June to Mid-September
2	Rūvār	820	Darbānd	1070	5/2	5/2	Y	114	Late April to Early June
			Zhūnī	1650	5/2	5	Y	106	Early June to Mid-September
			Be Āwah	1820	2	7	N	8	Early June to Mid-September
3	Zhīvār	1030	Hamro Dol	1860	5/7	5/7	Y	125	Mid-March to Early May to
			Dolāw	2100	6/1	6	Y	125	Early May to Mid-June
			Hāna Lār	2300	2/5	5	Y	125	Late June to Mid-September
4	Abbās Ābād	1050	Sepūnah	2400	4	4	N	16	Late April to Mid-September
5	Kūlij	1250	Mesārān	1500	2	2	Y	76	Early May to Mid-June
			Sardasht	1800	10	8	Y	76	Late June to Mid-September
			Pashtan	1700	5/6	5/1	N	76	Late September to Early October
6	Varga Vīr	860	Rāsebān	2400	4	4	N	3	Late April to Mid-September
7	Dorūd	1500	Bahārānah	2050	2	2	Y	56	Early May to Mid-June
			Sarna Hāl	2400	5/3	5/5	Y	56	Late June to Mid-September
8	Razāb	1240	Mārānī	1750	2	2	Y	90	Early May to Late October
			Būk	1830	4	4	Y	60	Early May to Mid-September
9	Degāgā	1430	Būk	1830	5/5	5/5	Y	50	Early May to Mid-September



Table 7: The population demographics of the investigated villages in the slopes Shāhū Mountain in 1966 and 2016

Row	Village	Population		Household		Population to household ratio	
		1966	2016	1966	2016	1966	2016
1	Espah Rīz	609	-	121	-	5/03	-
2	Pālangān	1191	809	241	215	4/94	3/76
3	Tangī Var	151	120	33	36	4/57	3/33
4	Jūlāndī	192	131	32	33	6	3/96
5	Dele Marz	396	271	71	76	5/57	3/56
6	Dewaznāv	704	453	109	131	6/45	3/45
7	Zūm	431	78	80	19	5/38	4/1
8	Kāshtar	456	320	90	91	5/6	3/51
9	Yūzīdar	332	581	75	167	4/42	3/47
Sum		4462	2763	852	768	5/23	3/59

Table 8: The livestock to population ratio of villages in the slopes Shāhū Mountain in 1966.

Row	Village	Number of households	Number of livestock			Average number of livestock per household		
			Cattle	Goat/Sheep	Pack animal	Cattle	Goat/Sheep	Pack animal
1	Espah Rīz	121	340	900	51	2/80	7/43	0/42
2	Pālangān	241	800	2500	115	3/31	10/37	0/47
3	Tangī Var	33	146	450	26	4/42	13/63	0/78
4	Jūlāndī	32	105	835	40	3/28	26/09	1/25
5	Dele Marz	71	-	1500	60	-	21/12	0/84
6	Dewaznāv	109	470	1800	58	4/31	16/51	0/53
7	Zūm	80	180	800	40	2/25	10	0/50
8	Kāshtar	90	328	1200	45	3/64	13/33	0/50
9	Yūzīdar	75	135	800	67	1/8	10/66	0/89
Sum		852	2504	10785	502	2/93	12/65	0/58

result, there were interactions and conflicts between these two villages. From early May, these communities began moving to Bahārānah and lived in this hawār until mid-June. In the next stage, at the beginning of the summer, they moved to Sarna Hāl and stayed there until the end of the summer.

Mobility pattern in the Shāhū Mountain

9 villages were studied in the area of Shahu Mountain (Table 7). The population of these villages has been greatly reduce since 1966. Consequently, the villages of Espah Rīz and Zūm have been depopulated. According to ethnographic interviews, goat and sheep herding is the main mode of subsistence for these communities. The population and housing statistics of 1966 also confirm this, as the average number of goats and sheep per family was 12.61 (Table 8). The mobility pattern of the studied villages on the slopes of Shāhū was observed in form of frequent relocations in the Shāhū highlands. As of today, most of their hawārs are abandoned, as they lack springs and sufficient water sources. The most important sources of water in these hawārs used to be the zahūras and Chālāws.



Pālangān

Pālangān is situated on the slopes of the Shāhū Mountain at an elevation of 1000 m. The authors have identified eight hawārs of this village, including Gwezībān, Hānīyah, Shekhazīz, Bolīn-e Kūchak, Bolīn-e Bozorg, Shliwān, Golī, and Barda Charmek. Only two hawārs, Gwezībān and Hānīyah, are still in use and the others are abandoned. According to ethnographic interviews, the maximum number of goats and sheep per household reached 120 in Pālangān. The mobility pattern in Pālangān (in the past) can be explained as follows. In the first stage, all inhabitants of the village (241 households) migrated to Gwezībān (which has a spring) in early April, and engaged in agricultural activities. They lived in this hawār for 30 days, which is situated an elevation of 1650 m. The architectural structures of Gwezībān are stable and have thatched roofs like those of Zarda Hāl and Sollāwī. In the second stage, as the temperature increased and precipitation decreased in the early May, all households moved to Hānīyah, which has sufficient water resources. Situated at an elevation of 2100 m, Hānīyah is still the main hawār of Pālangān. The drystack structures of this hawār are roofed with tree branches and fodder. In the third stage, 120 households that had more livestock moved to the highlands that has more pastures, and the rest stayed in Hānīyah. These 120 households, which had 100 to 200 goats and sheep, were di-

Table 9: Characteristics of Pālangān's hawārs

Row	Village	Elevation	Traveled distance (km)	Distance to the village	Spring	Number of resident households	Residence time
1	Gwezībān	1680	Y	241	N	202	Early April to Early May
2	Hānīyah	2120	Y	241	Y	202	Early May to Mid-September
3	Shekhazīz	2200	N	90	Y	114	Late June to Mid-July
4	Bolīn-e Kūchak	2250	N	90	Y	106	Late July to Mid-August
5	Bolīn-e Bozorg	2300	N	90	N	8	Late August to Mid-September
6	Shliwān	2200	N	30	Y	125	Late June to Mid-July
7	Golī	2200	N	30	Y	125	Late July to Mid-August
8	Barda Charmek	2250	N	30	Y	125	Late August to Mid-September

vided into two groups, and the hawārs of each group are as follows. 90 households constituted the first group, who migrated to Shekhazīz, Bolīn-e Kūchak, and Bolīn-e Bozorg hawārs respectively. The second group was composed of 30 households who migrated to Shliwān, Golī, and Barda Charmek fields, respectively. From late June to mid-September, these households stayed for 15 to 30 days in each hawār. None of these hawārs have springs. Their main source of water was provided by snow masses, natural glaciers, and Chālāws. As a consequence, migration and residence in these hawārs depended on the melting rate of snow masses and glaciers. At the end of the summer, these 120 households left their last hawārs (Bolīn-e Bozorg and Barda Charmek) and returned to the Hānīyah. In the fourth stage, as the temperature decreased and the raining season began at mid-October, all 241 households left Haniyeh and returned to Hwar Gwezībān. They stayed in Gwezībān until early November and finally returned to their village after sowing the crops. As can be seen, the mobility pattern in Pālangān is manifested by frequent relocations. These communities are divided into 3 groups in the summer season due to the fact that



Table 10: Characteristics of Yūzīdar's hawārs

Row	Village	Elevation	Traveled distance (km)	Distance to the village	Spring	Number of resident households	Residence time
1	Ton Pelwān	1700	5	5	N	75	Early April to Early May
2	Nalwān	1860	1	6	N	75	Early May to Mid-September
3	Shliwān	2200	5/2	8/5	N	75	Late June to Mid-July
4	Bolīn	2250	3	11/5	N	75	Late July to Mid-August

they have small settlements with very limited environmental capacity in the Shāhū highlands that cannot meet the needs of 241 households.

Yūzīdar

Yūzīdar is 6 km away from the Pālangān village and situated at an elevation of 1350 m. Following the ethnographic interviews, four hawārs of this village were identified. These hawārs include Ton Pelwān, Nalwān, Shliwān, and Bolīn, all of which are completely abandoned. As can be seen, two of these names were also used in the hawārs of Pālangān village. This demonstrated that the hawārs of the two villages are in the vicinity of each other. In the first stage, in early April, the inhabitants of Yūzīdar moved to the Ton Pelwān which is situated an elevation of 1700 m. They lived in this hawār until the precipitation decreased and the temperature increased. The architectural structures of Ton Pelwān are also roofed with timber and thatch, just like Gwezībān. In the second stage, in early May, these 75 households moved to Nalwān (near Hānīyah, at an elevation of 1860 m), and stayed there until mid-June. In the third stage, with the beginning of the summer, they started moving to Shliwān (at an elevation of 2200 m). Finally, in the fourth stage, they migrated to Bolīn (at an elevation of 2250 m) in the middle of summer.

Tangī Var and Kāshtar

These two villages are located on the slopes of Shāhū Mountain, at a distance of 4 km from each other. Following the ethnographic interviews, we found out that many hawārs belonged to these villages, which have been abandoned since the Iran-Iraq war (in 1980s). None of these hawārs had springs and their water supply was provided by zahūras and Chālāws. 11 hawārs of the Kāshtar Village and 7 hawārs of Tangī Var Village were identified. The hawārs of Kāshtar include Yak Shawa, Dūhelān, Zardī Shekh, Berālokān, Takht, Kānī, Mīr Āwāra, Hasārgah, Kalāho, Bandgol, and Pol-e Ahmād, respectively. The hawārs of Tangī Var include Sar Darband, Chālāw, Dashtah, Hasārgah, Kalgāh, Brīm, and Sūtiāg, respectively.

All of these hawārs are dedicated to pastoralism and agriculture was not reported in any of them. Residence time in each hawār depended on the amount of available water sources, varying between 20 and 30 days. According to ethnographic interviews, the maximum number of goats and sheep per household reached 150 in both villages. The non-angular drystack structures in these hawārs were roofed with tree branches and fodder. The mobility pattern in these hawārs can be summarized in 5 steps (Tables 11 and 12). In the first stage (early March to early April), the inhabitants of Tangī Var moved to the highlands and settled in Sar Darband. In the meanwhile, the Kāshtar villagers moved to Yak Shawa¹⁸ and Dūhelān. In the second stage (early April to mid-May), Tangī Var villagers moved to Chālāw at an elevation of 1420 m, and the inhab-

18. Yek Shabe (Yak Shawa in Hawrami) means one/a single night in Persian. As its name suggests, residence time in Yak Shawa was only one night, and the main hawār of the inhabitants of Kashtār was Dūhelān at this stage.



Table 11: Characteristics of Kāshtar's hawārs

Row	Village	Elevation	Traveled distance (km)	Distance to the village	Spring	Number of resident households	Residence time
1	Yak Shawa	1350	4	4	N	90	Approx. 24 hrs. in Early March
2	Dūhelān	1350	2	6	N	90	Early March to Late April
3	Zardī Shekh	1500	1	7	N	90	Late April to Mid-May
4	Berālokān	1650	5/1	5/8	N	90	Late May to Mid-June
5	Takht	1680	3	5/11	N	90	Late June to Early August
6	Kānī	1750	5/1	13	N	30	Early August to Mid-September
7	Mīr Āwāra	1800	2	5/13	N	45	Early August to Mid-September
8	Hasārgah	200	3	5/16	N	15	Early August to Mid-August
9	Kalāho	2200	5/1	18	N	15	Mid-August to Early September
10	Bandgol	2140	1	19	N	15	Early September to Mid-September
11	Pol-e Ahmād	1250	19	3	N	90	Late September to Late October

Table 12: Characteristics of Tangī Var's hawārs

Row	Village	Elevation	Traveled distance (km)	Distance to the village	Spring	Number of resident households	Residence time
1	Sar Darband	1350	2	2	N	33	Early March to Late April
2	Chālāw	1450	5/1	5/3	N	33	Late April to Mid-May
3	Dashtah	1531	2	5/5	N	33	Mid-May to Mid-June
4	Hasārgah	1750	5/2	8	N	33	Late June to Early August
5	Kalgāh	2200	5/1	5/9	N	18	Early August to Mid-September
6	Brīm	1956	5/1	5/9	N	15	Early August to Mid-September
7	Sūtiāg	1200	5/11	2	N	33	Late September to Late October

itants of Kāshtar settled in Zardī Shekh at an elevation of 1500 m. In the third stage (mid-May to mid-June), the inhabitants of Tangī Var and Kāshtar moved to Dashtah and Berālokān (at an elevation of 1700 m), respectively. In the fourth stage (late June to early August), the residents of Tangī Var used to take two measures based on the environmental conditions throughout the year. If there were enough snow masses in Hasārgah (at an elevation of 1870 m), all households settled in this hawār until early August. Then, they were divided into two groups and stayed in Brīm and Kalgāh (at an elevation of 2000 m) until mid-September. If the snow masses in Hasārgah were insufficient, all households left this hawār into two groups and stayed in Brīm and Kalgāh until mid-September.

The annual environmental conditions also have had an impact on whether the Kāshtar villagers settled in Kānī, Mīr Āwāra, Hasārgah, Kalāho and Bandgol or not. On the whole, human societies were divided into three groups if there were sufficient snow masses. The three groups consisted of 45, 30, and households, respectively. The first and the second groups proceeded to settle in Mīr Āwāra (at an elevation of 1800 m), Kānī (an elevation of 1750 m), respectively. The third group, which had more goats and sheep (90 to 150), settled in Hasārgah, Kalāho, and Bandgol (an elevation of 1900 to 2000 m).

In the fifth stage, at the end of the summer, the Tangī Var an Kāshtar villagers settled in Sūtiāg (at an elevation of 1100 m), and in Pol-e Ahmād near the Tangī Var River (at an elevation of 1150 m), respectively. These communities lived in Sūtiāg and Pol-e Ahmād until mid-November. According

Table 13. Characteristics of the hawārs of Dewaznāv, Zūm, Dele Marz, and Espah Rīz

Row	Village	Number of households	Elevation	Hawār	Traveled distance (km)	Distance to the village	Number of resident households	Residence time
1	Dewaznāv	109	940	Kāw	3	3	44	Early May to Mid-June
				Darenah	5/2	5/5	44	Late June to Mid-September
				Wargīr	4	4	65	Early May to Early June
				Sardah	1	5	65	Early June to Mid-July
				Barzah	4	9	65	Mid-July to Mid-September
2	Zūm	80	860	Kerkellā	1	1	80	Late April to Early June
				Sar Kamar	5/2	5/3	80	Early June to Late June
				Gardamiān	4	5/7	80	Late June to late August
				Hānī Woz	4	5/2	80	Late August to Early November
3	Dele Marz	71	860	Dol	3	3	71	Early May to Mid-June
				Rangnāv	4	7	40	Late June to Early August
				Dar Dawalah	5	8	31	Late June to Early August
				Kāzhah	1	9	12	Early August to Mid-September
				Kānī Zhārzhā	1	10	18	Early August to Mid-September
4	Espah Rīz	121	1260	Hānatā	3	3	121	Early May to Mid-June
				Gardlī	2	5	121	Late June to Mid-September

to the ethnographic interviews, the main reason for the establishment of these hawārs, located at a lower elevation than the village, was due to the presence of ticks in their village houses.

Dewaznāv, Zūm, Jūlāndī, Dele Marz, and Espah Rīz

These five villages are situated by the Sīrwān River and slopes of the Shāhū Mountain at an elevation of 850 to 1250 m. Except Jūlāndī, which is a new village, numerous hawārs were identified in four other villages. The majority of these hawārs, however, have been abandoned. Only in Dele Marz and Dewaznāv, in-use hawārs were identified. The inhabitants of Zūm and Espah Rīz, all households moved to the aforementioned hawārs in one group. In Dewaznāv and Dele Marz, however, the villagers were divided into two groups due to the small size of the hawārs and the lack of environmental capacities.

Dewaznāv

Dewaznāv is situated at an elevation of 940 m. Dewaznāv villagers were divided into two groups from the onset of the migration. As a result, 44 households moved to Kāw, and Darenah and 65 households moved to Wargīr, Sardah, and Barzah, respectively (Table 7). Only Kāw has a small spring. Kāw and Wargīr (at an elevation of less than 1700 m), are the spring hawārs of Dewaznāv residents, and Darenah and Barzah (at an elevation of more than 2100 m), are the summer hawārs of the village. The unstable architectural structures of all hawārs of Dewaznāv are roofed with branches and leaves of trees. The maximum number of goats and sheep per household reached 120 in this village. This is consistent with livestock statistics of 1966 (Table 8).

Dele Marz

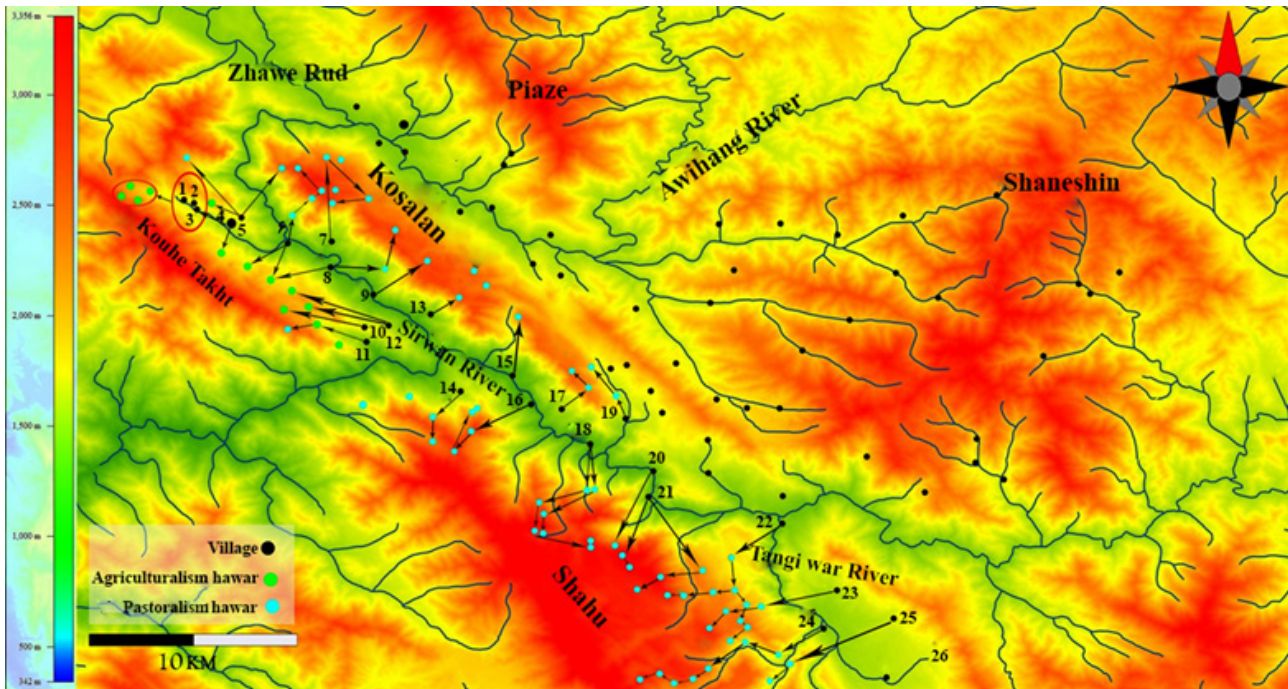
Dewaznāv is situated at an elevation of 860 m. The maximum number of goats and sheep per household reached 120 in this village. This is also consistent with livestock statistics of 1966 (Table 8). The mobility pattern in this village is divided into three stages. In the first stage, in early May, all 71 households moved to Dol¹⁹ (at an elevation of 1650 m). This hawār has a small spring. The unstable huts are also roofed with branches and leaves of trees. In the second stage, as the temperature increases and summer begins, these 71 households are divided into two groups. In mid-June, the first group (40 households) settled in Rangnāv, and the second group (30 households) settled in Dar Dawalah. In the third stage, as the water supplies dwindled in early August, 38 households from Rangnāv (two households moved to Kāzhah) returned to Dol. The 30 households that resided in Dar Dawalah divided into two groups and settled in Kāzhah (12 households) and Kānī Zhārzhā (18 households), located at higher elevations.

Logistical mobility pattern (transhumance)

This mobility pattern was identified in the heights of the Javeh River's drainage basin. During our ethnographic studies, 20 villages were investigated in this drainage basin. The 20 villages are situated at an elevation of 1600 to 2000. These villages are more populated than other regions of Hawrāmān, since there are many springs and high-quality agricultural lands scattered around the villages. As of today, most of these lands have been converted into gardens. Based on the land area, between 3 and 10 households settled in these gardens from early May to early November. During the warm seasons of the year, the residents of a village are divided into more than 20 to 50 groups (depending on the population of the village). Settling in these gardens cannot be considered as a type of nomadism. Because these lands are not far away from the villages (1 to 2 km) and do not differ in elevation, a farmer can easily engage in agricultural activities in these lands with a logistical mobility. It seems that after the conversion of these lands, the

19. As of today, Dol is the only in-use hawār.





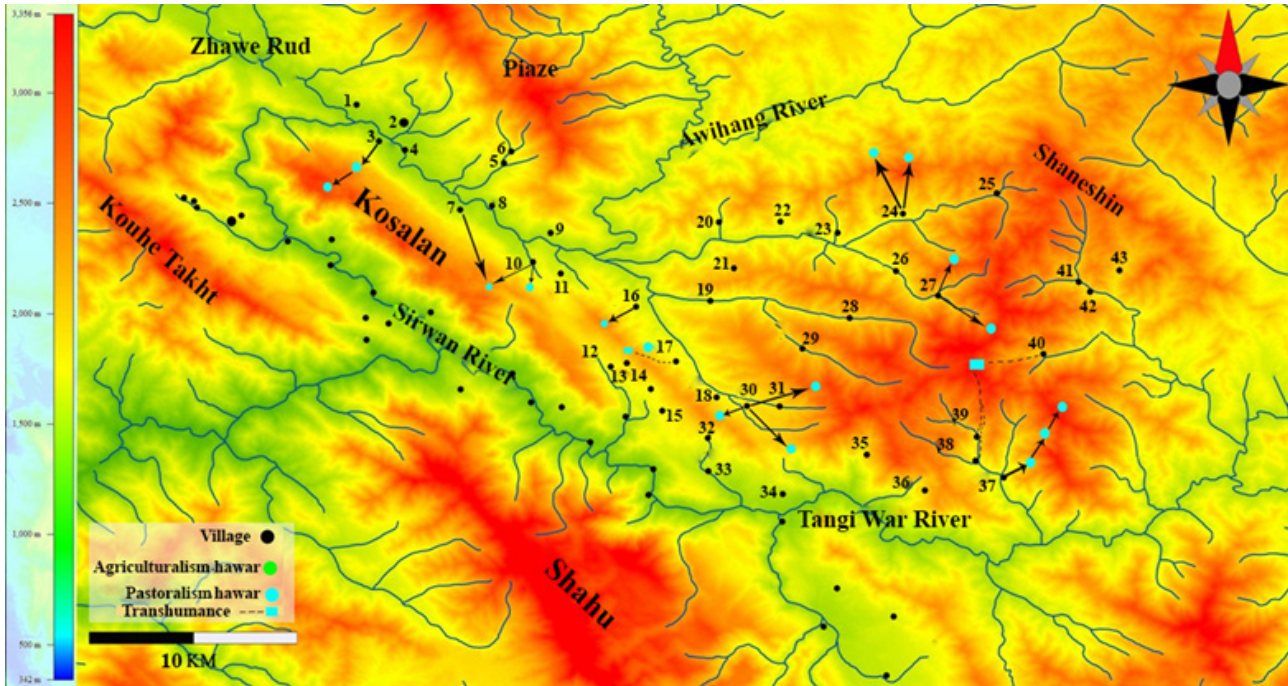
Map 2. Mobility pattern in Sīrwān's drainage basin: (1) Kamāle (2) Rūvarī, (3), Veysiān, (4) Hawrāmān Takht, (5) Sarpīr, (6) Belbar (7) Zhīvār, (8) Selīn, (9) Varga Vīr, (10) Kaljī (11), Nevīn, (12) Nāv, (13) Abbās Ābād, (14) Espah Rīz, (15) Rūvār, (16) Zūm, (17) Del, (18) Dele Marz, (19) Kūlij, (20) Jūlāndī, (21) Dewaznāv, (22) Pālangān, (23) Yūzīdar, (24) Tangī Var (25) Kashtār, and (26) Gāzerkhānī.

villagers were encouraged to stay for a part of the year:

According to the ethnographic interviews conducted in the Javeh River drainage basin, some of these villages used to have hawārs that were used for transhumance activities. In late June, a number of men (3 to 5) took goats and sheep to the heights of Shāneshin, Pīāze, Kochak Sūr, and Kānī Sūr and stayed in there for 3 months. They never returned to their village during this time. In the meanwhile, women went to the highlands and returned to their village after milking their goats and sheep (every day at a certain time). This can clearly be defined as a logistical mobility. Such a pattern, however, was not identified in all the villages of this drainage basin. Some villages also use a daily grazing trip.

Logistical mobility (based on cultural exchanges)

Economic and cultural interactions and exchanges are important features of a cultural environment. logistical mobility plays a significant role in increasing these interactions and exchanges. Ethnographic studies in Hawrāmān's cultural landscape showed that each of the studied areas have different modes of subsistence. The different modes of subsistence and the surplus of various products in the heights of Kūh-e Takht, Shāhū, Kōsālān, and Javeh River has led to the formation of extensive interactions and exchanges among Hawrāmān villages. Without logistical mobility, this amount of cultural exchanges and specialization among the communities of Hawrāmān would be virtually impossible. Among the industries identified in Hawrāmān, we can mention pottery, blacksmithing, carpentry, and felting. Due to the different distribution pattern of each of the industries, their logistical mobility pattern is also different. In addition to the aforementioned specialists, brokers who exchange products between villages and cities of Hawrāmān (Sanandaj, Dehgolān, Kermānshāh, and Iraqi Sharezūr) also benefit from a long-distance (extra-regional) logistical mobility pattern. Most of the villages in Hawrāmān's cultural landscape used oak wood as fuel and sold some of the charcoals in nearby cities (before the Iranian Land Reform).



Map 3. Map 2. Mobility pattern in Javeh River basin: (1) Ahmad Ābād, (2) Sarv Ābād, (3) Dorūd, (4) Mahmūd Ābād, (5) Nesel, (6) Gūshkhānī, (7) Razāb, (8) Kar Ābād, (9) Ney Ābād, (10) Degāgā, (11) Māziben, (12) Seromāl, (13) Kaklīk Ābād, (14) Zherīzhe, (15) Kānī Hoseynbayg, (16) Būrīdar, (17) Cheshmīdar, (18) Ārīān, (19) Harsīn, (20) Sefīd Ben, (21) Khāsht, (22) Nejī, (23) Sālīān, (24) Āvīhang, (25) Vīsar, (26) Hūye, (27) Sarhūye, (28) Beysārān, (29) Zhān, (30) Zhenīn, (31) Pāigelān, (32) Dezvand, (33) Sorkhe Tūt, (34) Tefīn, (35) Goāz, 36. Sarrīz, (37) Mehrāb (38) Nīyar, (39) Tangīsar, (40) Shīyān, (41) Hashamīz, (42) Tori Var, and (43) Takhte.

Pottery

As a result of our ethnographic studies, expert potter families were identified in 7 villages of Ārīān, Āvīhang, Beysārān, Zhān, Hashamīz, Tangīsar and Galīn in the drainage basin of Javeh River, which have suitable soil. All potters in the cultural landscape of Hawrāmān used to be women who were in this profession until 30 years ago. Today, only in Hashamīz village, a woman is still engaged in pottery. In each village, 1 to 4 women were involved in pottery according to the market demand. The pottery production technique in all these villages were similar. In the first stage, they prepare the soil, which is mostly comprised of red soil²⁰ mixed with a small amount of white soil. Then, in the second stage, they produce the clay with their feet or hands. In the third stage, goat wool is added to the clay as a temper to prevent cracking, and then the clay is kneaded until the wool spreads all over the clay. In the third stage, they use the coiling method to work the vessel into their desired shape (Fig. 7). In the fifth (final) stage, they place the prepared pottery in a specific area and put cow dung on them. In fact, these dung have two uses. The first use is to supply fuel and gradual heat for baking the pottery, and the second use is to form a closed furnace to prevent weathering (Fig. 8). According to the ethnographic interviews, the villages of the Sīrwān drainage basin supplied their pottery by traveling a long distance to²¹ Ārīān and Āvīhang villages²². Since Ārīān is the closest pottery manufacture center for the villages of the Sīrwān drainage basin, it used to supply most of their demands. It seems that the location of this village en route to Dehgolān and Sanandaj cities was the main factor for this

20. Called "Gelī Sūr" in the Hawrami dialect.

21. 35 to 50 km.

22. The villages of Zhān, Beysārān, Hashamīz, Tangīsar and Galīn supplied their own pottery demands as well as their neighboring villages.

act of Sirwān drainage basin's residents. According to an interview with Abdul Rahim Dehghan, son of an Āriān potter, villages that bought pottery from Āriān can be divided into four groups.

The first group consisted of the villages located in the west of the Javeh River's drainage basin (3 to 15 km away), such as Zherīzhe, Dezvand-e Oliā, Dezvand-e Soflā, Kānī Hoseynbayg, Tefīn, Seromāl, Māzīben, Būrīdar, and Cheshmīdar. The residents of these villages exchanged wheat with pottery. The second group was comprised of villages located in Kūh-e Takht (30 to 40 km away), such as Selīn, Belbar, Kaljī, Nevīn, and Nāv. They exchanged pomegranate, fig, and pomegranate paste with pottery. Villages situated in Shāhū heights such as Espah Rīz, Zūm, Dele Marz, Dewaznāv, Jūlāndī, and villages located in the heights of Kosālān (10 to 30 km away) such as Zhīvār, Del, Kūlij, Rūvār, Dorūd, Degāgā, and Rāzab constituted the third group. Their villagers exchanged dairy with pottery. The fourth group included the two villages of Pāigelān and Zhenīn, which were the closest villages to Āriān. They gathered the soil from around their village, kneaded and added goat wool (as a temper), and prepared the clay. They would then proceed to invite a potter from Āriān to shape the desired pottery. Such a method has also been reported in the two pottery centers of Galīn and Tangīsar (up to 3 km).

As can be seen, the pattern of pottery distribution in Āriān shows a bartering system where pottery was exchanged with a specific product based on the surplus of each village. Two mobility patterns are also evident in this pottery distribution method. Movement of the buyer to the pottery center in order to get pottery (long-distance logistical mobility), and movement of the potter to the village that demands pottery (short-distance logistical mobility).



Fig. 7: Making pottery by the coiling method in Hashamīz.



Fig. 8: The stages of pottery production. Placing the pottery and the cow dung (right), and burning cow dung as fuel and the wall of the furnace.

Blacksmithing

Based on the ethnographic interviews conducted in the study area, blacksmith workshops were identified in 10 villages, which include: (1) Sarpīr, Nevīn, and Nāv in Kūh-e Takht, (2) Dewaznāv and Pālangān in Shāhū, (3) Del in Kosālān, and (4) Būrīdar, Hūye, Cheshmīdar, and

Beysārān in Javeh River. Blacksmithing has been a full-time activity, and there were blacksmith workshops in a village and its hawārs. There were several blacksmith workshops in each region. In this way, these communities traveled a distance of 2 to 15 km in order to buy or repair their iron tools.

Brokers

Throughout the cultural landscape of Hawrāmān, there are people who make a living by buying surplus products from the villages and selling them in the cities. These people bought livestock and dairy from the villages of Shāhū and Kosālān, felt from the industrial village of Kamāle, and carpentry products from the industrial village of Weysiān. They would then sell these things in the city and bought tea, rice, tobacco, sugar, wheat and other demands of the villagers. At the end, they sold the merchandise (that they bought in the city) to the villagers who required them. Thus, they have a trans-regional logistical mobility (50 to 100 km).

Discussion

In the following, the authors will review the early Neolithic period in the Zagros highlands. The purpose of this review is not to establish a mechanical analogy between the settlement patterns of modern communities in the Hawraman cultural landscape with those of the Neolithic period. Instead that sort of simplifications, we intend to provide interpretive stimuli with the help of the ethno-archaeological approach.

Hole criticized the lack of emphasis on the impact of climate and landscape during the “Nomads, Tribes, and the State in the Ancient Near East” seminar held in 2009 at the University of Chicago. He points out that although political and social factors play an important role in the formation and nature of nomad communities, the roles of landscape and climate in the adaptation and subsistence strategies of human societies should not be ignored. Hole also reminded that the mobile pastoralists could adapt to climate changes more quickly than sedentary societies that depend on agriculture. According to Hole, although there have been changes since the Younger Dryas Period (c. 12,000 years ago), these changes have been limited and the main factors such as climate, terrain, species of livestock, and vegetation have not changed much (Hole, 2009: 261). After examining the faunal remains of Ganj Dareh and nearby sites, Hesse proposed that before the domestication of goat, human communities developed a preference to use goat dung as a fuel. From Hesse’s point of view, this led to the deliberate keeping of wild goats inside the settlement, and in turn led to their domestication. In conclusion, Hesse argues that early Holocene climate changes provided a direct stimulus for the intensification of goat management towards complete domestication, through the need to secure the supply of dung fuel alongside their other products (Hesse, 1984: 260-261). This is an interesting point of view as it provides a new reason for the management of wild herds and domestication of animals. On the other hand, it is in contrast with the adaptation of mobile pastoralists to climate changes point of view. In this regard, massive ash and charcoal deposits have been discovered in the lower layers of Sheikh-e Abad and Jani, with no evidence of goat dung. While in the upper layers, which date to after c. 8000 B.C., the dung of ungulates becomes abundant and charcoal remains decreases. This issue has been confirmed in other sites of the early Neolithic in Central Zagros (Matthews et al., 2013: 27). As the authors pointed out, in most villages of Hawraman charcoal was prepared and sold in the cities by brokers before the land reforms. Although the lower layers of the Neolithic sites of Zagros (10,000 to 8,000 B.C.)²³ are considered as separate clusters, they have the

23. Among these sites, we can mention Shanidar Cave level B1 (Solecki, 2004), Zawi Chemi and Shanidar (Solecki, 1981), Karim Shahir (Howe, 1983), Ganj Dareh (Smith, 1976, 1990), Asiyab (Braidwood, 1960), Sarab (Hole, 1987), Guran (Mortensen, 2014), Abdul Hosein (Pullar, 1990), Ali Kosh (Hole et al., 1969), East Chia Sabz (Darabi et



following commonalities. (1) Occurrence in the lowermost levels of massive stratified deposits of ash, (2) pits with firecracked stones, (3) cooking/eating debris accumulating over centuries of episodic activity at specific locales in the landscape, (4) the absence of evidence for significant investment in permanent architecture, and (5) small amounts of obsidian and charcoal (Matthews et al., 2013: 25-27). As a result, it can be concluded that the main subsistence strategy of the foraging inhabitants of Zagros during the early Neolithic period was hunting-gathering alongside with seasonal movements. Due to the lack of architectural structure and the use of charcoal in the lower layers, it can be inferred that the inhabitants of Zagros in the early Neolithic period frequently relocated and only temporarily resided in their settlements. Since c. 8000 B.C., the discovered evidence demonstrates some changes. Charcoal was replaced with goat dung, sustainable architecture appeared, cultivation (Riehl et al., 2012), and the application of obsidian increased. Matthews believes that these new interactions was the main drive towards fauna and flora management, sedentarism, and complete domestication (Matthews et al., 2013: 29-30). The evidence obtained from sites such as Sarab and Tula'i in this period, however, shows that certain human communities of the Central Zagros continued to pursue the traditional highland Zagros lifestyle of mixed hunting and pastoralism with seasonal movements across rich and diverse ecozones (Matthews et al., 2013: 27). On the whole, it can be concluded that the interaction of humans with flora and fauna was an entanglement or coexistence that occurred in this period and resulted in the decrease of relocations and movements of human communities.

Conclusion

Despite the similarities of climate and landscape in Hawraman, the authors have observed diverse and interesting mobility patterns in this region. This is an important issue, since it shows the possibility of the coexistence of various settlement patterns and subsistence strategies in a cultural landscape. Such studies can serve as an excellent reference for highland prehistory researchers. According to this study, human communities in each of Takht, Shahu, Kosalan and Javeh River highlands have different mobility patterns and subsistence strategies. The landscape, climatic conditions and available resources in each of these highlands have changed the subsistence strategies and the mobility patterns of these communities. It must be noted, however, that the authors are not referring to the current situation of the aforementioned communities. In other words, the pre-Iranian Land Reform era is being discussed here.

Prior to the land reforms, residential mobility was used in the highlands of Takht, Shahu, and Kosalan. In addition to the agriculturalist and pastoralist households, colonizers and artisans also left their villages. Consequently, their villages were completely deserted during the 6 warm months of the year. Ironically, the average distance from the villages to the hawārs is less than 10 km, and it took only a few men and a few of hours to exploit the rich environmental capacities of the highlands. So why all the villagers moved to the hawārs?

It seems that the difference in elevation of villages and hawārs (Tables 3 and 6) was the main reason for the residential mobility of these communities during the warm seasons. By traveling a short distance, in addition to exploiting the diverse ecozones of the region, these communities evaded the intense heat of their villages (located at an elevation of 850 to 1500 m in the river valleys), and settled in their hawārs (situated at an elevation of 1700 to 2500 m). This issue is also confirmed by observing the villages of Javeh River plains, which have an elevation of 1600 to 2000 m. Due to the high elevation of the mid-mountain plains of Javeh River, the mobility pattern in most of the villages of this region is transhumance.

al., 2011), Chogha Golan (Riehl et al., 2015), Ghazanchi (Mashkour et al., 2021), Sheikh-e Abad and Jani (Matthews et al., 2013), and Bestansur and Shimshara (Matthews et al., 2013, 2016, 2019).



The communities that reside in the Shahu highlands have the largest number of multi-staged relocations. Due to the lack of snow resources, some of these communities abandoned some of their hawārs for several years. In these situations, they would stay longer in their remaining hawārs (refer to the mobility pattern of Kāshtar and Tangī War villagers). In other words, as the number of movements increases, the occupation time of a hawār becomes shorter. Unlike Shahu, communities of Kuh-e Takht had much less instances of relocations. It seems that the main reason for the difference in the mobility pattern in Shahu and Takht is the difference in subsistence strategies of these communities. Grain cultivation is the main source of subsistence in the hawārs of Kuh-e Takht. As Kuh-e Takht communities depend on agriculture, their mobility frequency is much lower than those who live in Shahu and Kosalan. Pastoralist communities do not depend on agriculture fields and they only search for suitable pastures. In Kosalan, pastoralists move in two stages. The first is the spring hawār and the second, which is their main one and has a higher elevation, is the summer hawār. To sum up, the main residential criteria of Hawraman communities include elevation, water resources, and pastures.

These communities hunt wild goats, birds and fish and collect acorn, wild pistachio and oak wood. As these activities are one of their main subsistence strategies, these communities can also be considered as foragers. Therefore, we should not apply a single residential pattern for the Zagros region in the Neolithic period as well as other prehistorical periods. By studying each of the components of a landscape separately and identifying patches, subsistence strategies and residential patterns of human communities can be determined. Based on the existing archaeological evidence from the Neolithic period of Zagros, it can be concluded that in the early Neolithic period (10,000 - 8,000 B.C.), these communities had seasonal settlements. Their residential duration depended on the availability of resources, and elevation. During this period, these communities have not domesticated any fauna or flora, but interacted and coexisted with them. By observing wild goat herds, the Zagros inhabitants had recognized their territory, hierarchy, sex, and seasonal mobility pattern, and adjusted their hunting strategies accordingly. Considering that the human bands were relatively small in the early Neolithic, it is unlikely that the average distance traveled by these people for residential movements exceeded 10 km. Due to the abundance of resources in various adjacent ecozones, these communities had a high number of migrations in order to achieve a broad spectrum of food sources. This is comparable to the mobility pattern in Shahu Heights, that is also manifested by frequent relocations.

During the Neolithic period of Zagros (8000 - 6500 B.C.), the structure of some human communities changed fundamentally. These changes included the domestication of flora and fauna, and the permanent residence of all members (or at least some members) of a group in one settlement for a whole year (sedentarism). This evidence has been traced in the upper layers of Ganj Dareh, Chogha Golan, Sheikhi Abad, and Jani. Although in some other sites of this period, such as Sarab, Tula'i, Asiyab, and Abdul Hosein, there are no evidence of sedentarism despite the domestication of flora and fauna. The coexistence of nomadic and sedentary communities in this period of Zagros is not a controversial matter. As diverse mobility patterns were identified in Hawraman's cultural landscape (in Takht, Shahu, Kosalan, Shaneshin and Piaze mountains), we may expect such diversity in the settlement patterns of Neolithic communities.

On the whole, it can be concluded that the early Neolithic communities of Zagros were foragers, just like the Epipaleolithic period. As a result of their diverse landscape and geographical ecozones, their subsistence depended on a broad spectrum of fauna and flora. But with the stability of the climatic condition of Zagros in 8000 B.C., the mobility of these human groups decreased. Consequently, the human communities were divided into two groups:



(1) Sedentary with logistical mobility; Logistical mobility in the Neolithic period, included hunting-gathering, early pastoralism, and even transhumance. These communities had well-watered and rich ecozones that could be inhabited year-round.

(2) Semi-sedentary with residential mobility; These communities had rather fragile ecozones that had seasonal critical resources (such as water).

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