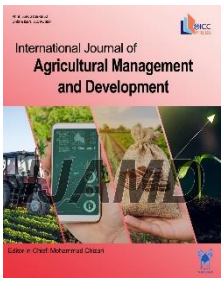

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Pastoral Nomadism and Their Quality of Life: A Case Study from Ilam Province, Iran

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Abstract

Pastoral nomadism is a way of life for more than 200,000 households in Iran. This study examined the quality of life of nomadic households (indigenous and non-indigenous) through a household survey conducted in Ilam Province. Data were collected using documentary review, questionnaires, and observation. A statistical sample of 70 households—comprising 42 indigenous and 28 non-indigenous nomadic households—was determined using Cochran's formula and selected through stratified random sampling. To assess the quality of life of the selected nomadic households, 40 indicators were considered across four main dimensions: economic, social, educational, and hygienic. In addition, several indicators related to environmental dimensions were included to assess the environmental awareness of the sampled households. The collected data were analyzed using descriptive and inferential statistical methods, including frequency, percentage, one-sample t-test, independent t-test, and logistic regression, using SPSS version 16. The results revealed that the economic dimension for both indigenous and non-indigenous nomadic households was at a moderate level, whereas the hygienic and socio-educational dimensions were below average and indicated unfavorable conditions. However, the mean score for environmental awareness was significantly higher than the baseline value of three, indicating a relatively good level of environmental awareness among both indigenous and non-indigenous nomadic households. The results also showed significant differences in all three quality-of-life dimensions between indigenous and non-indigenous nomads at the 99% confidence level. Based on the regression analysis, economic status, hygienic status, socio-educational status, indigenous status, and household size had the greatest influence on household satisfaction or dissatisfaction with the nomadic lifestyle.

Keywords: Nomadic communities; Livelihoods, Quality of life dimensions, Zagros regions, Iran

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INTRODUCTION

Pastoral nomads predominantly inhabit arid and remote regions, where their livelihoods depend on traditional ecological knowledge and the health of their livestock (Rota & Sperandini, 2009). They manage risk through a wide range of strategies, including mobility, livelihood diversification, physical food storage, and exchange

systems (Kocheki & Gliessman, 2005). Mobility is a defining characteristic of pastoralism; the term "nomadic" is applied when movement is both frequent and irregular (Rota & Sperandini, 2009). Nomadic life is shaped by natural patterns and is fundamentally based on adaptation to environmental conditions. The seasonal movement of nomads is one of the most important indicators of their alignment with natural cycles. Through respect for customary rights and strong social trust, nomadic communities have sustainably utilized natural resources for thousands of years, supported by a deep understanding of plant growth dynamics and ecological interactions (Fernandez, 2000).

Today, pastoral nomadism provides a livelihood for more than 20 million households worldwide and contributes approximately 10% of the meat consumed by humans (Blench, 2001). Despite this significant contribution, pastoral communities are often marginalized and receive limited attention in broader socio-political analyses (Rota & Sperandini, 2009). Although their livelihoods are increasingly vulnerable to climate change, population growth, and intensified competition for land and other natural resources, pastoralism remains a viable system of natural resource management. Understanding its rationale, significance, and dynamics is therefore a crucial element in efforts to reduce poverty and support sustainable livelihoods (Rota & Sperandini, 2009).

The origin of nomadic life on the Iranian Plateau can be traced to its physical and geographical conditions, dating back several millennia (Norouzi & Mahmoudian, 2015). In the Zagros Mountains, pastoralism was the dominant economic activity until the introduction of modern agricultural techniques less than a century ago, providing pastoralists with an adaptive strategy to make efficient use of the limited and dispersed resources of the Zagros highlands (Abedi, 2003).

At present, the pastoral nomadic population constitutes about 1.6% of Iran's total population, whereas the first census after the Islamic Revolution in 1987 reported that nomads accounted for approximately 2.3% of the population (Annamoradnejad & Lotfi, 2010). However, in demographic terms, despite the state's gradual settlement policies—which provide basic amenities in rural areas near summer pastures in the plains—the nomadic population has likely remained relatively stable for several decades.About 9.1 percent of the Iranian nomadic population lives in the Ilam province (Annamoradnejad & Lotfi, 2010). So far, more than three thousand nomadic households settled down in Ilam province (on the western border of the country) (General Administration of Nomadic Affairs of Ilam Province, 2010).

Pastoral nomadism can be viewed as a livelihood continuum ranging from fully sedentary agricultural life at one end to purely pastoral nomadism without any farming activities at the other, with several transitional categories in between (Khazanov, 1984, cited in Tahmasebi, 2012). Based on Khazanov's pastoral classification, indigenous nomads in Ilam Province fall into the category of semi-nomadic pastoralism. In this category, pastoralism is the primary livelihood, while agriculture plays a supplementary role. This form of pastoralism involves extensive grazing and periodic changes of pasture throughout the year. Accordingly, some non-indigenous nomads in Ilam Province belong to the first category of Khazanov's (1984) classification. In its purest form, this category involves no agricultural activity; nomads have no permanent residence and are continuously mobile, migrating in response to environmental and resource conditions.

Nomadic communities, as the third major social group in Iran after urban and rural populations, play an important role in the country's economic, social, and cultural development. Nomadic households (approximately 212,000) rear more than 22 million head of livestock—primarily sheep and goats—through seasonal migration and utilize over 28% of the nation's rangelands. They also produce about 160,000 m² of carpets, 330,000 tons of milk, and 13,000 tons of wool annually (SCI, 2012). Despite these substantial contributions, nomads in Iran remain among the lowest-income and most vulnerable groups in society, due to government policies, the inherent nature of nomadic life, and their strong dependence on natural conditions (Salehi-Isfahani, 2009).

Quality of life is a multifaceted concept, which is used to indicate one's satisfaction with life and is a criterion used to determine whether individuals and groups are satisfied with various aspects of life (Azadi et al., 2013). Quality of life depends on age, gender, culture, and other factors like employment, reasonable income, and access to services such as education, health, security, etc. In general, there is still no universally acceptable conceptual framework for measuring the quality of life and a single methodology for determining the domains and indicators of quality of life (Epley & Menon, 2008); Therefore, the selection of dimensions, indicators**,** and methods of measuring the quality of life is based on the objectives of the study, the personal judgments of the researcher, the characteristics of the studied area and the available data. According to these explanations, in the current research, we investigated the different aspects of the quality of life including economic, social-educational, hygienic, and environmental awareness for indigenous and non-indigenous nomads of Ilam

province. Figure 1 shows the conceptual and operational model process of the research. Although quality of life has long been a fundamental human aspiration and has attracted the attention of philosophers, scholars, scientists, planners, and statesmen, it became a more prominent concern following the economic growth of the 1960s (Azadi et al., 2013). Numerous studies have examined quality of life in Iran and elsewhere. Some have focused on urban areas (Rezvani et al., 2009; Mohamadi et al., 2010; Ghalibaf et al., 2011), while others have addressed rural contexts (Pourtaheri et al., 2011; Heidari, 2011; Azadi et al., 2013; Khorasani et al., 2015; Anabestani et al., 2015). Although various aspects of nomadic life in Iran have been explored (Hosseininia et al., 2013; Norouzi & Mahmoudian, 2015; Amini & Rouzfarakh, 2018; Taheri et al., 2020), only a limited number of studies have directly examined indicators of nomads' quality of life. Notably, no research to date has focused on the quality of life of nomadic communities in Ilam Province. Therefore, this study provides valuable insights for development planning aimed at improving the quality of nomadic life in Ilam Province and Iran more broadly.

Given the importance of the concept of quality of life and the above-mentioned issues, the study pursues to answer two main questions that arise in terms of quality of life for nomads in Ilam province:

- Is the quality of life of the nomads in the study parameters desirable?
- Is there a significant difference between the two types of nomadic households (indigenous and non-indigenous) in Ilam province in terms of the study indicators of quality of life?

Answers to these questions can help assess policies, formulate management strategies and nomadic planning, and facilitate the understanding and prioritization of community issues for nomadic planners and managers to improve the quality of nomadic life.

Study area

The province of Ilam, with 20150 square kilometers, accounts for about 1.2 percent of the country's total area (Figure 2). The province governs 10 counties, with a total population of 580,158 in 2016 (Table 1) (Statistical Center of Iran, 2016). Natural resource areas in Ilam province are used by a large population of indigenous and non-indigenous (from neighboring provinces) nomads (Table 1).

The average elevation in the province is 1000 m, the average rainfall is 450 mm and the average temperature is 20.5°C. In terms of climatic conditions, Ilam province is one of the warm and dry regions of Iran. However, due to differences in latitude and longitude and differences in altitudes across the province, the temperature and rainfall in the northern, southern, and western parts of the province vary widely, and three regions of warm, cold, and temperate regions can climatically be observed in the province. The northern and northwestern highlands of the province are relatively cold and have long winters, and the minimum winter temperatures in those areas are well below 15°C. Rainfall amounts to more than 500 mm/year. The western and southwestern regions of the province are tropical, with maximum precipitation of about 200 mm/year (Statistical Center of Iran, 2016).

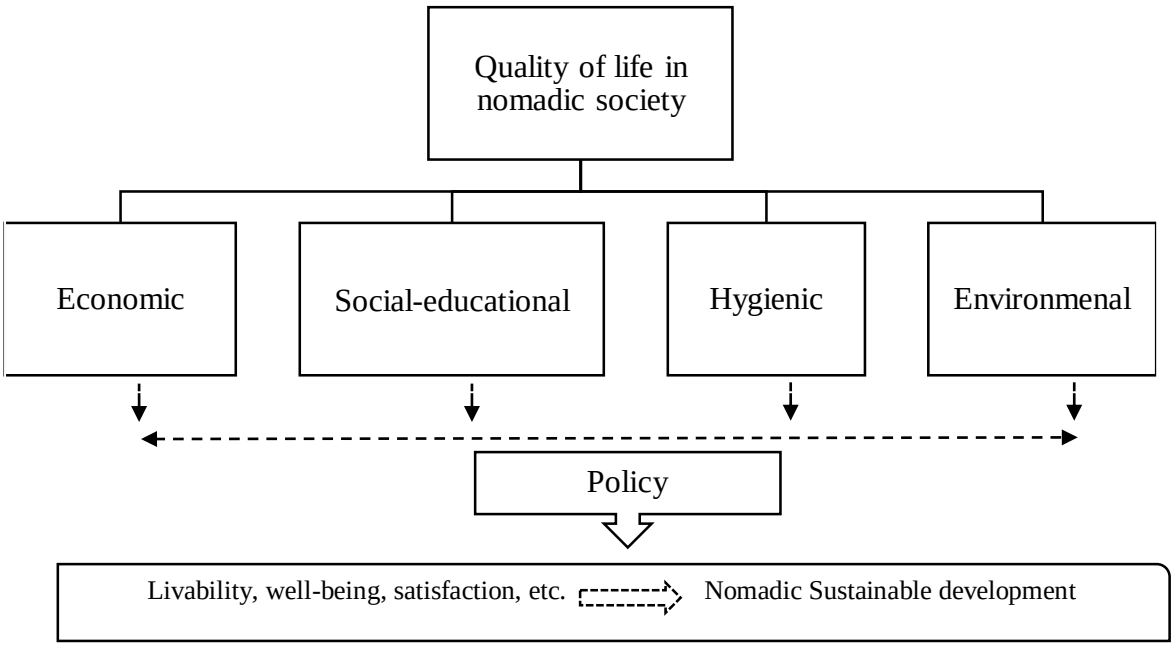

Figure 1. Conceptual Model of Research

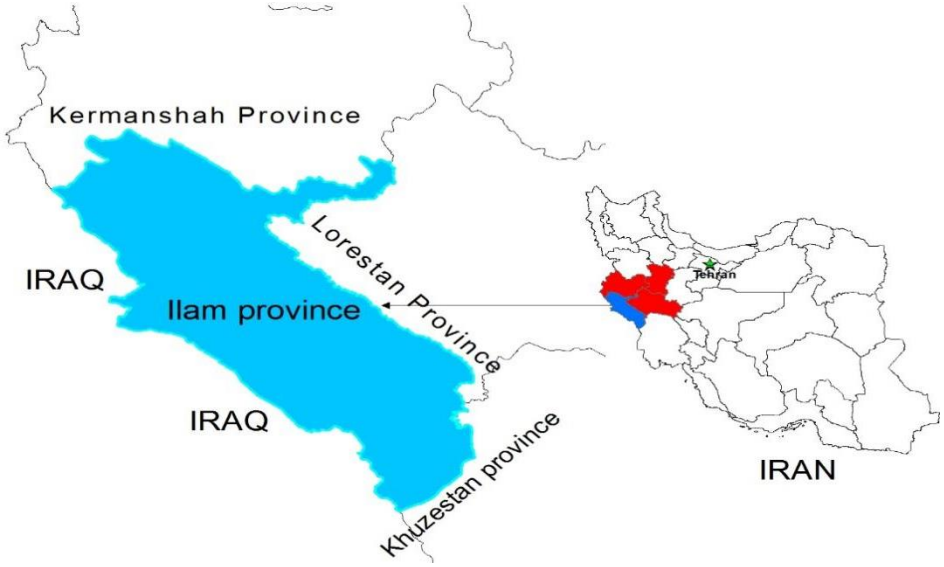

Figure 2. The Location Map of Ilam Province in Iran

Table 1. Total area, Forest Area, Rangeland Area, and Population of the eight counties of Ilam Province (Mahdavi, 2015; Statistical Center of Iran, 2016)

	Total area (ha)	Forest area (ha)	Rangeland area (ha)	Urban population	Rural population	Total population
Abdanan	239,124.37	79,981.14	122,842.56	30,373	17,478	47,851
Ilam	212,804.67	102,724.21	70,484.43	199,861	35,230	235,144
Eyvan	90,374.85	53,453.7	19,327.43	34,265	15,136	49,491
Badreh and Dareh Shahr	146,577.2	82,510.65	43,026.99	27,690	31,632	59,322
Dehloran	678,540.42	96,549.1	290,055.72	41,183	24,396	65,630
Sirvan and Chardavol	220,020.14	98,129.49	79,798.95	27,849	43,929	71,785
Malekshahi	160,046.74	105,022.27	48,480.15	14,856	6,127	21,138
Mehran	255,306.26	23,296.15	110,677.73	19,186	10,516	29,797
Total	2,002,794.6	641,666.71	784,693.96	395,263	184,444	580,158

Vegetation of the study area

To date, over 1,000 plant species have been recorded in Ilam Province, including 50 cultivated species, with the remainder occurring naturally. Based on species composition and ecological characteristics, the province can be divided into two major vegetation zones (Figure 3).

The Gulf and Omani vegetation zone, covering the west, south, and southwest of the province, spans 781,354.75 ha, accounting for 39% of the total area. The dominant species in this zone include *Alhagi camelorum* Fisch., *Vitex agnus-castus*, *Capparis spinosa*, *Ziziphus nummularia*, *Prosopis farcta*, *Prosopis cineraria*, and *Ziziphus spina-christi*.

Arid and semi-arid Zagros forests in the northern part of the province with 1221439.9 ha (61% of the province). The main species of this area are oak with associated species of *Pistacia Atlantica*, *Crataegus aronia*, *Daphne mucronata*, *and Amygdalus sp.* (Mozafarian, 2008).

METHODS

Concept of pastoral nomads in this study

Although pastoralism exhibits wide variation in mobility, reliance on agriculture, livestock numbers and types, political organization, and ecological contexts (Khazanov, 1984, cited in Arbuckle & Hammer, 2019), the term “pastoral nomads” in this study refers to households with the following characteristics:

Focus on livestock rearing through seasonal migration, regardless of herd size or the share of livestock in

household income and consumption. Participation in seasonal migrations, regardless of the proportion of household members involved. Seasonal migrations of local households within Ilam Province (from *yaylaq* to *qishlaq* and vice versa, up to 70 km from settlements) are considered "indigenous" pastoralism. For indigenous nomads, summer pastures are generally near their villages, while winter pastures can be up to 70 km away. Nomads migrating from adjacent provinces (200–500 km) to the warm regions (*qishlaq*) of Ilam during winter are classified as "non-indigenous" nomads.

Figure 4 illustrates the migration routes of both indigenous and non-indigenous nomads in Ilam Province.

According to the latest socioeconomic survey of pastoral nomads in 2018, there are 643 non-indigenous households and 10943 indigenous pastoral nomads in Ilam province. Table 2 shows information on the number of non-indigenous pastoral nomad households in Ilam province, the settlement area, the extent of available rangelands, and the number of livestock in each area, and the capacity of the pasture in each area.

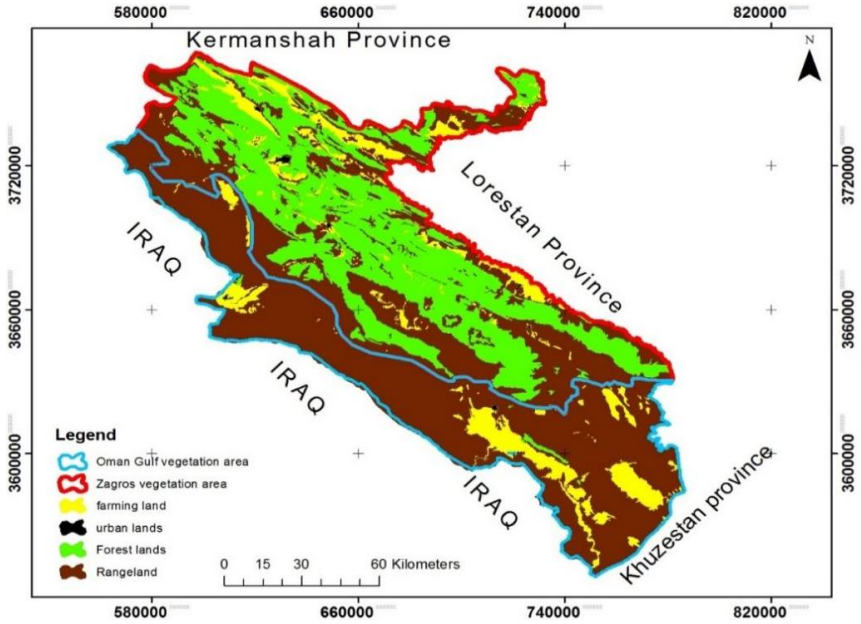

Figure 3. The Map of Vegetation Areas of Ilam Province

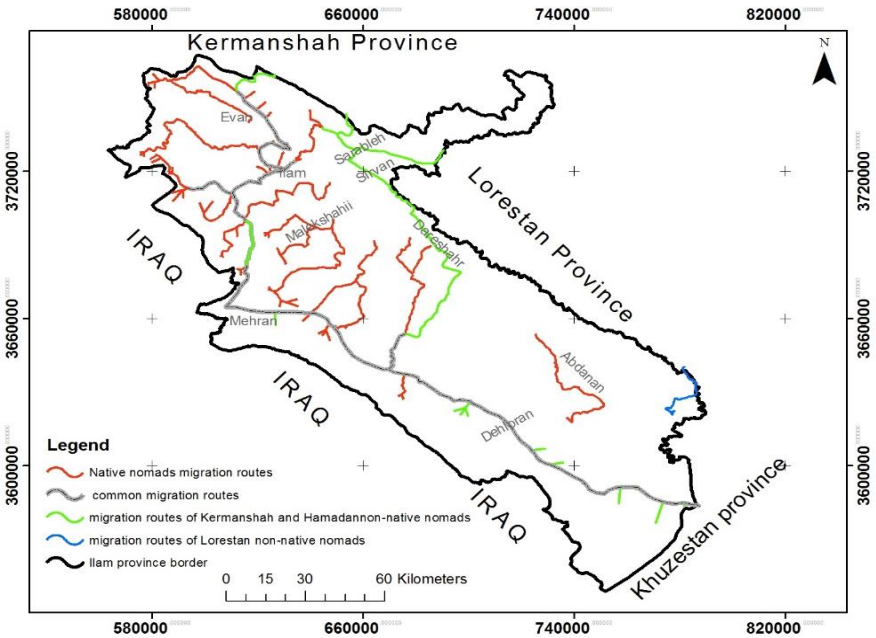

Figure 4. The Migration Routes of Studied Indigenous and Non-indigenous Nomads.

Table 2. The Information on Non-indigenous Nomads in Ilam Province

Name of Pasture (Ilam province)	Origin of nomads	Area (ha)	Nr. Nomad's households	Nr. available livestock	Nr. allowed livestock
Sargarab naser-e-AAli	Kermanshah	2420	28	6904	1963
ChamHendi	Kermanshah	11557	46	16325	4407
Jelizi	Kermanshah	20517	21	5999	1814
Shelesh Aidi	Kermanshah	3044	20	11263	719
Bayat	Kermanshah	11580	48	12741	3242
Septon and BarikAb	Kermanshah	30550	89	31522	9844
Bartash	Kermanshah	59869	126	93957	37813
Dasht-e-Abas	Hamadan-Lorestan	11500	149	20719	1898
AboGharib	Lorestan	12300	33	7885	3315
Gheshlaghi Molab	Lorestan	1700	27	7260	463
Bidhaleh	Lorestan	1000	26	4827	496
Chamshalan	Lorestan	2000	30	6696	987
Total		147475	643	226098	56961

Data collection

This study employed a descriptive–survey design, using documentary review, questionnaires, and observation for data collection. The statistical population consisted of nomads in Ilam province, divided into indigenous and non-indigenous pastoralist groups. Households were selected using a stratified random sampling method, with 42 questionnaires distributed to indigenous nomads and 28 to non-indigenous nomads at their accommodations. Data collection took place during the summer and winter seasons of 2018.

Based on the study's theoretical framework and conceptual model, Likert-scale items were designed to operationalize the variables. The questionnaire items were developed to ensure statistical validity and reliability while incorporating expert opinions. A total of 40 indicators were examined, categorized into four main dimensions: economic, socio-educational, hygienic, and environmental awareness.

The economic dimension includes 16 items on quality of employment, income, utilization, and dependence on natural resource products (income satisfaction, job prospects, job satisfaction, job security, savings, and cost of living). The socio-educational dimension includes 16 items on nomads' satisfaction with educational services, insurance support, adherence to customs, election participation, and so on. The hygienic dimension includes eight items on the nomads' satisfaction with veterinary services, drinking water, personal hygiene, medicine, and treatment. In addition to the main dimensions of the questionnaire, seven questions were asked to assess the environmental awareness and climate change perception of the households of both indigenous and non-indigenous nomadic groups. A group of experts confirmed the questionnaires as valid. Cronbach alpha coefficient (0.89) was used to evaluate the reliability scale of the questionnaires.

Statistical analysis

Data obtained from the questionnaires and field observations were analyzed using descriptive and inferential statistical methods. Descriptive statistics summarized the individual characteristics of the respondents using frequency distribution tables. To assess the quality of life of nomadic households across the four dimensions (economic, socio-educational, hygienic, and environmental awareness), a one-sample t-test was conducted using a base value of three. A mean greater than three indicated a relatively good condition for that dimension, while a mean below three indicated a less favorable situation. An independent t-test was employed to compare the quality of life between indigenous and non-indigenous nomadic households. Finally, logistic regression analysis was applied to identify the factors influencing households' satisfaction with the nomadic lifestyle.

RESULTS

Descriptive findings

Table (3) shows the individual characteristics of the respondents. The average age of study nomad people (head of household) is 46.8 years, the youngest of which is 29 and the oldest is 75**.** The findings in Table (3) indicate that the majority of the household heads are illiterate. The average number of members of the nomadic families was 4.8. Most of them (32.9%) have four family members. The results showed that, in 70 heads of nomadic households (indigenous and non-

indigenous), 40 of them were satisfied with their nomadic lifestyle. However, 30 of them were unhappy with this type of lifestyle.

Livestock and dairy production

The average number of goats and sheep per household is 110 and 100, respectively. Less than 5 percent of their animals are equines (mainly donkeys and horses), which are kept primarily for transportation. The respondents noted that these livestock numbers could vary depending on economic conditions or climatic factors, such as drought. They also reported that in recent years, prolonged droughts have reduced herd productivity and reproductive efficiency. Traditionally, pastoral nomads consume dairy and meat products for personal use, either fresh or processed.

Typically, wives use traditional methods to process milk into butter and yogurt for immediate consumption, and into ghee and dry curds for storage. Table 4 presents the main products of the pastoral nomads studied in Ilam Province.

The results of the one-sample t-test to assess the quality of life of the total nomadic households

As can be seen in Table 5, the mean of the economic situation with the base number three has no significant difference (t = -0.416 and $p >$ 0.05), so the economic status of the study's total indigenous and non-indigenous nomadic households is moderate. The mean of hygienic status (2.132) and socio-educational status (2.436) were significantly different from base number three.

That way the average of these two dimensions is smaller than the base number three. Therefore, the social and hygienic status of the study households is lower than average so they do not have favorable status. On the other hand, the mean of environmental awareness status (3.340) is significantly different from base number three (which is higher than number three) indicating that the study indigenous and non-indigenous nomadic households have a relatively good environmental awareness status.

The results of the one-sample t-test to assess the quality of life of the studied indigenous nomadic households

The results in Table 6 indicate that the mean economic status (2.83), hygienic status (2.45), and socio-educational status (1.85) are all significantly below the base number three. Thus, the economic, socio-educational, and hygienic conditions of indigenous nomadic households are below average and not favorable.

Table 3. Individual Characteristics of Households' Head

Variables	The majority frequency	Mean
Age (years)	-	46.8
Education level	34 illiterate	-
Number of family members	32.9% are 4 people	4.8
Annual migration status	68 households move annually	-
Satisfaction with the nomadic life	40 heads of nomadic households are satisfied and 30 heads of households are not satisfied	-

Table 4. The Average Main Products of Pastoral Nomad Households in Ilam Province

Name of products	Average annual production (Kg/Nr)	Own use of households (Kg/Nr)	Rate of product sales (Kg/Nr)
Lamb	35	4	31
Kid	40	4	36
Ghee	30	10	20
Whey	50	15	35
Wool	100	35	65

Table 5. Results of the t-test to Compare the Quality of Life of the Total Nomadic Households (cut of point = 3)

Dimensions	Mean	Standard division	Standard error	t-value	*p*-value
Economic	2.988	0.233	0.027	-0.416	0.679
Hygienic	2.132	0.501	0.059	-14.484	0.000**
Socio-educational	2.436	0.50	0.059	-9.409	0.000**
Environmental awareness	3.340	0.379	0.045	7.516	0.000**

Note * $p < 0.05$, ** $p < 0.01$

In contrast, the mean environmental awareness status (3.29) is significantly above three, indicating that indigenous nomadic households possess a relatively good level of environmental awareness.

The results of the one-sample t-test to assess the quality of life of the studied non-indigenous nomadic households

Table 7 shows that the mean economic status (2.75), hygienic status (1.58), and socio-educational status (1.96) of non-indigenous nomadic households are all significantly below the base number three. This indicates that the economic, socio-educational, and hygienic conditions of non-indigenous nomadic households are poor and below average. In contrast, the mean environmental awareness status (3.40) is significantly above three, indicating that non-indigenous nomadic households have a relatively good level of environmental awareness.

The results of means comparison using an independent t-test

The results of the independent t-test indicate a significant difference between indigenous and non-indigenous nomads in the economic, socio-educational, and hygienic dimensions at the 99% confidence level (Table 8). However, no significant difference was observed in environmental awareness between the two groups. An independent t-test was also used to compare the quality of life between the two groups of nomadic households (indigenous or non-indigenous) who expressed satisfaction or dissatisfaction with the nomadic lifestyle. The results of this analysis showed that there is a significant difference at 95% level in terms of economic, socio-educational, and hygienic dimensions status between the two groups (Table 9). According to the results obtained from the averages of the studied dimensions, the quality of life dimensions of households that were satisfied with nomadic lifestyles was better. While there is no significant difference in environmental awareness and status between the nomadic households of satisfied and not–satisfied households with nomadic lifestyles (Table 9).

Logistic regression

In this study, the dependent variable—satisfaction or dissatisfaction with the nomadic lifestyle—is nominal, while the independent variables are measured on categorical and quantitative scales. To identify the factors affecting nomadic households' satisfaction, a stepwise logistic regression analysis was performed. The variables included in the model were hygienic status, economic status, socio-educational status, environmental awareness, age of the household head, number of household members, indigenous status, migration, and education level of the household head. The results from Step 4 of the regression analysis are presented in Table 10.

As shown in Table 11, the chi-square value (log-likelihood) decreased from 81.71 in the first stage to 48.45 in the fourth stage, indicating an improvement in model fit. Additionally, the Cox and Snell and Nagelkerke coefficients, representing the model's explained variance and adjusted explained variance, show that the independent variables can predict between 0.574 and 0.750 (57–75%) of the variation in the dependent variable, satisfaction with the nomadic lifestyle (Table 11).

After confirming the significant effects of the variables and evaluating the overall characteristics of the model, the results indicate that the model is appropriate. Table 10 shows that hygienic status (B = 8.441) is significant at the 99% level, while socio-educational status (B = 3.21), being indigenous (B = 3.10), number of household members (B = 3.17), and economic status (B = 2.43) are significant at the 95% level. These variables have the greatest impact on satisfaction and dissatisfaction with the nomadic lifestyle.

Exp(B), also known as the odds ratio, represents the ratio of the probability of an event occurring to the probability of it not occurring. It indicates the predicted change in odds for a one-unit increase in the independent variable. This statistic is analogous to standardized regression coefficients (Beta) in linear regression and is used to interpret the effect of independent variables. An odds ratio less than one indicates that as the independent variable increases, the probability of the event occurring decreases (positive effect). Conversely, an odds ratio greater than one indicates that the probability of the event occurring increases as the independent variable increases (negative effect).

In logistic regression analysis, the negative effect of an independent variable can be identified in two ways: first, by the negative sign of the B coefficient, and second, when Exp(B) is less than one, as shown in Table 10. To determine which variables significantly affect the dependent variable, the Wald statistic is used, whereas Exp(B) indicates the magnitude and direction of each variable's effect.

Table 12 presents the overall model evaluation for classification. The results show that approximately 96% of respondents are correctly classified. Among the 40 respondents satisfied with the nomadic lifestyle, 38 were correctly classified and 2 misclassified. Of the 30 respondents not satisfied with the nomadic lifestyle, 26 were correctly classified and 4 misclassified.

Table 6. Results of the t-test to Compare the Quality of Life of the Indigenous Nomadic Households (cut of point = 3)

Dimensions	Mean	Standard division	Standard error	t-value	*p*-value
Economic	2.83	0.364	0.056	-2.94	0.005**
Hygienic	2.45	0.504	0.077	-14.68	0.000**
Socio-educational	1.85	0.465	0.077	-7.61	0.000**
Environmental awareness	3.29	0.431	0.066	4.49	0.000**

Note * $p< 0.05$, ** $p <0.01$

Table 7. Results of t-test to Compare the Quality of Life the Non-indigenous Nomadic Households (cut of point = 3)

Dimensions	Mean	Standard division	Standard error	t-value	*p*-value
Economic	2.75	0.23	0.043	-5.53	0.000**
Hygienic	1.58	0.407	0.076	-18.45	0.000**
Socio-educational	1.96	0.58	0.111	-9.25	0.000**
Environmental awareness	3.40	0.28	0.053	7.603	0.000**

Note * $p< 0.05$, ** $p <0.01$

Table 8. Independent t-test for Comparing the Average Quality of Life of Indigenous and Non-Indigenous Nomadic Households

Dependent variable	Independent variable	n	Mean	Standard division	t-value	*p*-value
Economic	Indigenous	42	3.11	0.224	1.36	0.017**
	Nonindigenous	28	2.84	0.242		
Hygienic	Indigenous	42	2.32	0.455	4.34	0.000**
	Nonindigenous	28	1.84	0.433		
Socio-educational	Indigenous	42	2.62	0.359	4.18	0.000**
	Nonindigenous	28	2.16	0.56		
Environmental awareness	Indigenous	42	3.29	0.433	-1.12	0.26
	Nonindigenous	28	3.4	0.28		

Note * $p< 0.05$, ** $p <0.01$

Table 9. Independent t-test for Comparing the Average Quality of Life Conditions of Total Nomadic Households Based on Their Satisfaction with the Nomadic Lifestyle

Dependent variable	Independent variable	n	Mean	Standard division	t-value	*p*-value
Economic	Satisfied	40	2.98	0.232	1.22	0.039*
	Not satisfied	30	2.49	0.237		
Hygienic	Satisfy	40	2.32	0.546	1.81	0.043*
	Not satisfied	30	2.00	0.411		
Socio-educational	Satisfy	40	2.53	0.576	1.95	0.045*
	Not satisfied	30	2.20	0.344		
Environmental awareness	Satisfy	40	3.32	0.419	1.52	0.058*
	Not satisfied	30	3.16	0.323		

Note * $p< 0.05$, ** $p <0.01$

Table 10. Logistic Regression Analysis on Investigating Factors Affecting Nomadic Households' Satisfaction with the Nomadic Lifestyle of Pastoral Nomadism in Ilam Province, Iran, 2019 (N=70)

Variable	Unstandardized coefficients (B)	Standard error	Wald	df	p-value	Exp (B) odds ratio
Economic	2.43	0.81	7.19	1	0.05*	0.4
Socio-educational	3.21	1.17	6.69	1	0.03*	0.625
Hygienic	8.44	3.13	8.64	1	0.001**	0.82
Environmental awareness	1.08	0.29	3.12	1	0.07	0.23
Being an indigenous	3.10	0.84	9.25	1	0.01*	0.44
Age of household head	1.04	0.32	2.23	1	0.06	0.21
Education level of household head	1.21	0.38	4.42	1	0.06	0.018
Number of household members	3.17	1.13	13.06	1	0.04*	0.26
Migration every year	1.35	0.49	5.53	1	0.09	0.21
Constant	53.20	17.42	12.10	1	0.000**	-

Note * $p< 0.05$, ** $p <0.01$

Table 11. Model Fit Indices Obtained from Logistic Regression

Steps	Chi-square improvement rate	Cox and Snell coefficient of determination	Nagelkerke coefficient of determination
1	81.71[c]	0.437	0.574
2	65.62[d]	0.546	0.628
3	58.65[d]	0.584	0.729
4	48.45[e]	0.613	0.750

Table 12. Classification of Individuals According to the Results of Logistic Regression

	Satisfaction	Dissatisfaction	Percentage of correct prediction
Satisfaction	38	2	97.9
dissatisfaction	4	26	94.8

DISCUSSION

Nomadic society in Iran, the third societal group after urban and rural communities, plays a key role in livestock and agricultural production, providing food and raw materials for various industries (Norouzi & Mahmoudian, 2015). Therefore, organizing their economic and social structures, ensuring access to basic welfare facilities, and improving their quality of life through the expansion of productive, social, and infrastructure services are essential. Comprehensive knowledge of the quality of life of nomadic communities is necessary to achieve this goal. This study aimed to assess both the current quality of life and the satisfaction of indigenous and non-indigenous nomadic households with pastoral lifestyles.

The results showed that more than 34 percent of the sampled households were illiterate (Table 3). Beyond literacy, cultural barriers remain the greatest challenge to nomadic students' academic success. Although most children of non-indigenous nomads have access to primary schools in their winter settlements, they often have to share classes and teachers with students from other grades. Consequently, teaching hours are divided among multiple classes, and instruction occurs in intervals. Final examinations for nomadic students are held one month earlier than for other schoolchildren to accommodate the spring migration. As a result, the low quality of instruction and poor academic performance contribute to high dropout rates among non-indigenous nomadic students before completing primary school.

This issue is less severe for indigenous nomadic children, who typically have access to schools and educational facilities in the villages where they reside. The low quality of education among nomadic communities has been highlighted in previous studies (Norouzi & Mahmoudian, 2015; Norouzi & Mohamadizadeh, 2020), which also reported significant differences between settled and non-settled nomads in terms of educational outcomes.

According to the study findings, the overall economic situation of the sampled nomadic households is average (Table 5). However, when indigenous and non-indigenous households are analyzed separately using a one-sample t-test, both groups fall below the average in economic conditions (Tables 6 and 7). Most sampled nomadic households reported dissatisfaction with their work and little hope for future career advancement due to low income from traditional livestock, low production efficiency, and the various challenges they face throughout the year.

Additionally, the results indicate that the socio-educational and hygienic dimensions of quality of life are low for both indigenous and non-indigenous nomadic groups (Tables 5, 6, and 7). These findings are consistent with and support the results of Dehghani et al. (2013), Anabestani et al. (2015), Norouzi and Mahmoudian (2015), and Norouzi and Mohamadizadeh (2020). The results of the independent t-test comparing indigenous and non-indigenous nomadic households indicate a significant difference in three dimensions of quality of life: economic, socio-educational, and hygienic. On average, indigenous nomadic households fare slightly better than non-indigenous households in these dimensions (Table 8).

Environmental awareness of pastoral nomads

Nomadism in general, and pastoralism in particular, have always been highly vulnerable to natural hazards as well as changing political and socio-economic conditions (Chuluundorj, 2006). Numerous pressures threaten the nomadic lifestyle and the viability of their animal husbandry. One major pressure is the decline of rangelands, which, combined with increasing human and livestock populations, has intensified competition for available grazing areas (Tahmasebi, 2012). According to the 2018 census and data from the Ilam Nomads Affairs Organization, there were 11,729 indigenous and non-indigenous nomadic households in Ilam province. Table

2 further shows a 47% increase in livestock numbers—40% over the last five years—exceeding the carrying capacity of the rangelands. In 2018, there were 1,544,259 sheep and goats in the winter rangelands of Ilam province, yielding an average of 131 animals per nomadic household.

As livestock numbers increase, the spatially limited rangelands are under greater pressure and at risk of overgrazing. Moreover, overgrazing has reduced rangeland quality, forcing nomads to increasingly rely on supplementary forage, particularly in winter campsites. This dependence raises production costs and exposes households to greater vulnerability from price fluctuations, especially under current economic inflation in Iran.

Based on the questionnaire results and expert opinions from Natural Resource Offices, Environmental Offices, and the Nomads Affairs Organization in each city, the following major inconsistencies in natural resource use in Ilam province were identified: increasing livestock numbers, rising herder populations, premature grazing, overgrazing (especially by goats), grazing competition among herders, and cutting shrubs and tree branches for firewood.

In the southern areas of Ilam province (Dehloran County), home to non-indigenous pastoral nomads, rangelands suffer severe degradation and soil erosion due to overgrazing, poor pasture conditions, and adverse climates. In contrast, the northern rangelands, inhabited by indigenous pastoral nomads, experience less soil erosion. This is attributed to better climate, richer vegetation, greater community participation in conservation, stronger support from experts, improved economic conditions, and a higher quality of life for indigenous nomads.

To assess environmental awareness in more detail, the study examined nomads' perceptions of climate change. The results indicated that both indigenous and non-indigenous nomads in Ilam province have acceptable levels of environmental awareness (Tables 5, 6, 7). Most respondents reported that their environment is becoming warmer and drier, altering ecosystem behaviors. Because the natural vegetation of rangelands is highly sensitive to rainfall variations, nomads are often the first to perceive the effects of drought as forage shortages (Tahmasbi, 2012). Households reported that late-winter and spring droughts in Qishlaq pastures are particularly challenging, as winter forage reserves are depleted and spring grazing is critical. Many households emphasized returning earlier than usual from Qishlaq to Yeylaq due to drought and warmer temperatures.

The impacts of drought on the studied nomads varied considerably depending on their access to assets, particularly forage and fodder resources during winter. Indigenous nomads with farmland in their summer settlements, who can produce adequate forage or store leftover straw from agricultural fields, cope more easily with drought than non-indigenous nomads in Ilam province. Non-indigenous nomads, with more limited resources, often rely on coping strategies such as selling part of their herds at relatively low prices to purchase fodder or paying high prices for fodder during the winter.

The adaptation strategies of indigenous and non-indigenous nomads in response to socioeconomic and climate pressures can be categorized into two types: their own strategies and state-led adaptation policies. Following the 1979 Islamic Revolution, the Iranian government implemented measures to support pastoral nomads, including improving rangeland conditions, providing basic services and infrastructure, and mitigating drought impacts. The Forest, Range, and Watershed Organization (FRWO) was tasked with examining traditional property rights and developing sustainable land use practices that account for both ecological conditions and nomadic needs. These measures included identifying traditional rights holders, securing pasture rights through grazing licenses, and creating range management plans (RMPs). The RMPs also set limits on herd and human populations, grazing periods, and pasture exploitation based on plant physiology.

In contrast, nomads adjust herd sizes and grazing periods according to changing climate conditions and rangeland vegetation. Overgrazing remains a major challenge for sustainable rangeland management; in Ilam province, livestock numbers exceed the rangelands' carrying capacity by approximately 1.9 times. Observations and interviews indicate that FRWO policies have failed to gain compliance because RMPs restrict nomads' flexibility in herd management and grazing practices. Consequently, FRWO's efforts to improve rangeland conditions have been largely ineffective. These findings align with Tahmasbi's study on the vulnerability of Shahsavand pastoral nomads in northwest Iran.

CONCLUSIONS

The current conditions for indigenous, and particularly non-indigenous, nomads in Ilam province are undeniably harsh. Their vulnerability is increasing, and their quality of life is declining; however, the degree of impact varies between indigenous and non-indigenous communities due to differences in socioeconomic conditions. Research findings and field observations indicate that the quality of life of nomadic communities under the tribal system has been constrained, losing

much of its potential for development and improvement. These communities face multiple obstacles, including ecological, demographic, economic, political, social, cultural, and intellectual challenges. Under such circumstances, efforts to preserve livelihoods often perpetuate hardship, imposing increasing material and spiritual costs on nomads, especially women and children.

Although further efforts are needed to motivate the younger generation in the pastoral production system, incentives such as improving livestock income, providing easier access to essential services (social welfare, health facilities, water, and electricity through solar panels), and similar support could encourage participation. The government has made significant strides in providing these services over past decades, achieving notable results. However, most of these efforts focus on sedentarizing pastoral nomads, even in Ilam province, rather than supporting the continuation and development of their traditional pastoral economy.

As a result, the settlement of nomads may be necessary for their development and for improving various dimensions of their quality of life (Abdollahi, 2007; Dehghani et al., 2013). Some studies (Norouzi & Mahmoudian, 2015; Norouzi & Mohamadizadeh, 2020) have shown significant differences between settled and non-settled nomadic communities, with settled nomads generally enjoying better quality of life across multiple dimensions. However, other studies in Iran indicate that settlement projects have not always significantly improved the productivity or economy of nomadic livelihoods (Amini & Rouzfarakh, 2018) and, in some cases, have had undesirable outcomes due to insufficient consideration of the multiple aspects of nomadic life (Young & Ismail, 2019).

Balanced and comprehensive development of nomadic communities depends on voluntary, planned settlement and participatory strategies that enable a transition from traditional migratory animal husbandry to a combination of modern animal husbandry, agriculture, and related industrial and service activities. Taheri et al. (2020) suggest that the government develop a scientific, systematic, locally adapted strategy to organize and settle Zagros nomads. Thus, voluntary and planned settlement, while maintaining sustainable livelihoods and respecting local conditions, should be prioritized. Finally, it is recommended to conduct further qualitative and quantitative studies to assess the dependence of nomadic and rural communities on natural resources in other regions, to identify sustainable alternatives to traditional resource use.

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List of abbreviations:

FRWO (Forest Range and Watershed Organization); RMP (Range Management Plans) (RMP); GNRO (General Natural Resources Office); SCI (Statistical Center of Iran).

Authors Contribution

Ali Mahdavi: Conceptualization, Methodology, Data curation, Resources, Formal analysis, Visualization, Supervision, Writing -original draft, Writing -review & editing;
Babak Alimirzaei: Data curation, Investigation, Writing-original draft,
Mohamad Salavarzi: Advisor, Formal analysis, Software, Visualization,
Samireh Saymohamadi: Formal analysis, Software, Visualization.

Availability of data and materials

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

Conflict of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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