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Living on the slum areas in the shadow of drought: a qualitative analysis of lived experience of migrant households facing drought in Southeast of Iran

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Abstract

Background Drought is one of the most destructive and complex natural hazards, with direct and indirect effects, especially economic effects, on society and households. It affects the well-being and life satisfaction of households. It is important to understand the effects of drought at the micro level, such as households, by examining different attitudes, perceptions, and experiences of drought and its impacts.

Methods This research aims to investigate the understanding and experiences of the residents of the poor areas of Kerman city regarding drought and its consequences on their well-being and life satisfaction. To that end, the descriptive phenomenology qualitative method was used, selected samples purposefully, and conducted semi-structured and in-depth interviews with households in August and September 2022. MAXQDA₂₀₂₀ software was used to manage and organize the data.

Results From the analysis of the results of the interviews with the households, it was shown that the drought, with its impact on the economic, social, family, health, and environmental dimensions, has been identified as five main themes, leading to a decrease in the well-being and life satisfaction of the households.

Conclusion The drought has caused the migration of families from the cities and villages around Kerman province to the outskirts of the city. Subsequently, with the increase in the population in the outskirts of the city, the problem of waterlessness has increased. As a result, the welfare and life satisfaction of households have decreased.

Keywords Drought, Slum, Phenomenology, Qualitative research, Kerman

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Background

Drought is one of the most destructive and complex natural hazards, especially in terms of causing economic losses [1, 2]. Its direct and indirect effects span many dimensions of society, such as the environment, economy, social security, agriculture, water, energy, tourism, health, and welfare [3]. However, developing countries are more vulnerable to these consequences than developed countries, and rural households with a livelihood dependent on agriculture are more at risk than urban ones [4, 5].

The annual drought losses in the European Union are estimated at 9 billion euros, in the United States and Mexico at 8 billion dollars, and in China at 2.4 billion dollars in 2011 [6–8]. Iran has also experienced severe and extensive droughts in the past decades. From 1997 to 2001, half of the country's provinces were affected by severe drought, causing more than 10 billion dollars of damage in the agricultural sector. In the years from 2006 to 2008, the losses in Iran's agricultural sector were reported to be 19 billion dollars [9].

Iran, which has faced continuous drought since 1990 and its eastern regions since 1996, has seen migration as one of the main consequences of drought in these areas [10]. Migration is a strategy to cope with climate shocks such as drought, which has drawn attention to the issue of migration due to climate change in recent years. This issue has a complex, dynamic and multifaceted relationship. Drought can cause migration, either directly or through social, demographic, economic and political factors, which can have significant impacts on public health, human security and sustainable development [11].

Kerman is one of the provinces affected by drought. Climate change, population increase, especially urban expansion, agricultural development with traditional irrigation methods, and industrial growth have intensified the risk of drought in this province. Due to the dependence of livelihood on water and land, the economy of this province has suffered from drought and has been a factor for the migration of people from rural areas to the slum areas of Kerman city. The uncontrolled population growth of Kerman city, unplanned migrations, and unmanaged urban development have led to the formation of slums in this city, which have caused many economic, social/cultural and environmental problems [10, 12, 13].

It is important to understand the effects of drought at the micro level, such as households, by examining their different attitudes, perceptions and experiences of drought and its impacts. On the other hand, the first step in dealing with drought and its consequences is to understand drought, including its causes and effects [4, 14]. Therefore, we decided to conduct a study on the households living in the slum areas of Kerman, who migrated

due to drought and settled in the slum areas, where they faced more water scarcity problems.

Methods

Study design

The purpose of this study was to explore the understanding and experiences of people living in the slum areas of Kerman City about drought and its consequences on their well-being, and life satisfaction. Therefore, it was conducted using a qualitative method with a descriptive phenomenological approach. Since this study focused on the interrelated components of drought structure and investigated different dimensions of drought, it had a descriptive design [15].

Statement of reflexivity

This research was conducted by a multidisciplinary team with expertise in social medicine, healthcare management, health economics, and health in disasters and emergencies. These backgrounds likely influenced the research design, data collection, and interpretation of the findings. While our professional expertise provides a strong understanding of public health systems and disaster response, we acknowledge that we do not have direct lived experience of the hardships faced by migrant households in slum areas affected by drought in Southeast Iran.

Throughout the research process, we consciously reflected on our positionality, recognizing the potential biases that stem from our academic backgrounds and the distance from the lived experiences of the communities studied. To ensure authenticity and mitigate these biases, we employed member checking, allowing participants to review and provide feedback on the initial findings. Additionally, peer discussions during the analysis phase helped us to critically assess our perspectives and ensure that the results were firmly grounded in the participants' lived experiences.

Kerman city: a geographical and climatic overview

Kerman Province, located in the southeast of the Iranian plateau, occupies more than 11% of the country's total area. The city of Kerman, situated in the northeast of the province and considered its largest and most important city, accounts for 24.34% of the total area. According to the latest census in 2015, it has a population of approximately 740,000.

Kerman City experiences three distinct climates: hot and dry in the east, cold and dry in the higher regions, and uniformly hot and dry in other areas [16].

Participants

The participants of this study were people living in the slum areas of Kerman affected by drought, who were selected purposefully. The target population of this study

was the native households of Kerman province who lived in the slum areas of Kerman city and had migrated there from Kerman city or other cities of the province for at least one year. To account for the difference of views in terms of gender, both sexes were included in the sample. A total of 21 people with a mean age of 38.9 ± 7.9 participated in the study. The sample size was determined based on data saturation, which was achieved after interviewing 15 participants. Beyond this point, no new information was obtained. This is consistent with the majority of phenomenological studies, where approximately 68% have sample sizes ranging from 5 to 25 people [17]. After explaining the purpose of the study, informed written consent was obtained from all of them. The demographic characteristics of the participants are shown in Table 1.

Data collection

Semi-structured interviews were used to collect data in August and September 2022. The interviews began with a funnel approach, starting with more general questions and then asking more specific and detailed questions [18]. The interview questions were designed to be flexible, neutral, and non-directive. The outline of the interview questions was based on the purpose of the research and the feedback from the research group. The interviewer was the first author of the article, who was a native of the province and, therefore, could communicate well with the participants. Before starting the questions, the participants were informed about the reasons for conducting the research, and their consent was obtained to record the interviews. Each interview lasted between 30 and 40 min. Field notes were taken during the interviews, and participants were encouraged to elaborate further by asking appropriate questions after the initial questions. In addition, new questions were generated based on previous responses. The main questions were as follows: (1) Why did you leave your previous place of residence? (2) Has your life been affected by drought? (3) What aspects of your life have been affected by the drought?

Data analysis

We applied the seven-step Colaizzi method to systematically analyze the qualitative data, with the assistance

of MAXQDA 2020 software for managing and organizing the data. The analysis followed these steps:

1. Familiarization: We began by transcribing each interview verbatim. The research team then read through the transcripts multiple times to become thoroughly familiar with the data. This step allowed us to immerse ourselves in the participants' experiences and gain an in-depth understanding of their narratives. By engaging deeply with the text, subtle insights, emotions, and patterns began to emerge that would later inform the coding and thematic development.
2. Identifying Significant Statements: In this step, we carefully highlighted the most relevant and significant statements from the transcripts—those directly related to the phenomenon of interest, i.e., the lived experiences of migrant households in drought-affected slum areas. These significant statements were identified based on their relevance to key research questions, and through iterative readings, we ensured that no essential statements were overlooked.
3. Formulating Meanings: For each significant statement, we derived its underlying meaning, staying grounded in the data and contextualizing each interpretation within the participants' lived experiences. This was a collaborative process, with researchers comparing and discussing interpretations to ensure that the meanings were aligned with the context and culture of the participants. The meanings were derived inductively, allowing themes to emerge from the data rather than being imposed by pre-existing frameworks.
4. Clustering Themes: The formulated meanings were then grouped into broader themes. This step involved careful deliberation to ensure that the themes represented coherent patterns across the data, capturing the complexity of the participants' experiences. Thematic clustering was guided by recurring patterns and connections within the data, such as how economic hardships intertwined with social and health challenges. MAXQDA software facilitated this process by helping to categorize and organize codes and themes.
5. Developing an Exhaustive Description: Based on the clustered themes, we developed a comprehensive and detailed description of the phenomenon. This description aimed to capture the full scope of the participants' lived experiences, particularly their struggles with migration, economic displacement, and the challenges of drought in slum areas. We paid special attention to the interconnections between themes, such as how drought-related economic

Table 1 The demographic characteristics of the participants

	Variable	Number	Frequency
Gender	Male	10	47.6
	Female	11	52.4
Age	30 years or less	3	14.3
	31–40 years	11	52.4
	40 years or more	7	33.3
Education	Less than a diploma	10	47.6
	Diploma	9	42.9
	Post-diploma degree	2	9.5

hardships exacerbated social tensions and impacted family dynamics.

6. Producing the Fundamental Structure: From the exhaustive description, we distilled the essence of the phenomenon into a fundamental structure that represented the core experiences shared by the participants. This structure encapsulated the essential features of their lived experiences, including themes like economic displacement, deteriorating social relations, and health consequences stemming from water scarcity and migration.
7. Seeking Verification: To ensure the accuracy of our findings, we conducted member-checking by returning the results to the participants for confirmation. This step was vital in verifying that our interpretations accurately reflected the participants' experiences. Any discrepancies or additional insights provided by the participants were incorporated into the final analysis [19].

Achieving rigor

To ensure the accuracy of the analysis process, four criteria, credibility, transferability, dependability, and confirmability, were used, based on the suggestions of Lincoln and Guba [20]. With the presence of the researcher in the slum areas of the city as a research environment, spending enough time to conduct interviews, and transcribing the interviews verbatim, we tried to achieve reliability. We conducted in-depth interviews and provided direct quotes to reflect the participants' experiences. We selected appropriate and diverse individuals using

purposive sampling, which demonstrates the transferability of the data. To increase the credibility and confirm the results, we first analyzed the data independently as researchers who were experienced in qualitative work. Then, we finalized the results in a group discussion and presented them to the participants for confirmation or rejection.

Results

Five themes and 18 sub-themes were extracted from the analysis of the results of the interviews with the households that had migrated to the slum areas of Kerman, Iran, due to the drought (see Table 2). The economic, social, family, health, and environmental dimensions were the five main themes that captured the effects of drought on the well-being and life satisfaction of the migrants. The effects of each of these dimensions were complex and interrelated, as drought affected various aspects of their lives such as income, social relations, family cohesion, physical and mental health, and environmental quality. Finally, it was found that the effect of drought on all of these dimensions led to a change in well-being and life satisfaction, which was often negative. A conceptual view of the effects of drought on well-being and life satisfaction has been shown in Fig. 1.

Economic impacts

The results of the interviews revealed effects of drought on households, especially those that depended on agriculture and animal husbandry as their main source of income.

“Because of the drought, we moved from the village to the city, we had no income there, even though we had a lot of agricultural land. We could neither raise livestock nor farm” (P;2).

The decrease in agricultural production due to drought has had harmful effects on the livelihood of households, especially farmers. Participants reported that the drought reduced the area under cultivation and the amount of crops such as wheat, fruits, and vegetables that they used for consumption and sale. This led to a loss of income and food security, as well as a decline in their living standards. For example, one participant said, *“We were in the village, we were farming, we were earning, and we also harvested wheat and other crops once a year, which was enough to cover our living expenses” (P;1).* Another participant shared a similar experience: *“The water was good, we harvested wheat year after year. We had flour, fruit, and everything. We didn't worry about bread. After the drought, we had nothing” (P;8).*

Participants also stated that the drought has reduced job opportunities in the agricultural sector, forcing them to migrate to urban areas or seek alternative jobs in the service sector. However, alternative career options were

Table 2 Experience of migrant households facing drought in slum areas

Main themes	Sub-themes
Economic	Employment status Production status Financial situation
Social	Migration evasion of the law Community Relations Social position social network Social Security
Family	Emotional relationships within the family Being a burden to relatives Changing the role of women in the family
Health and Hygiene	physical injury Mental damage Personal health challenges
Environment	land use change Changing the natural landscape Quantity and quality of water resources

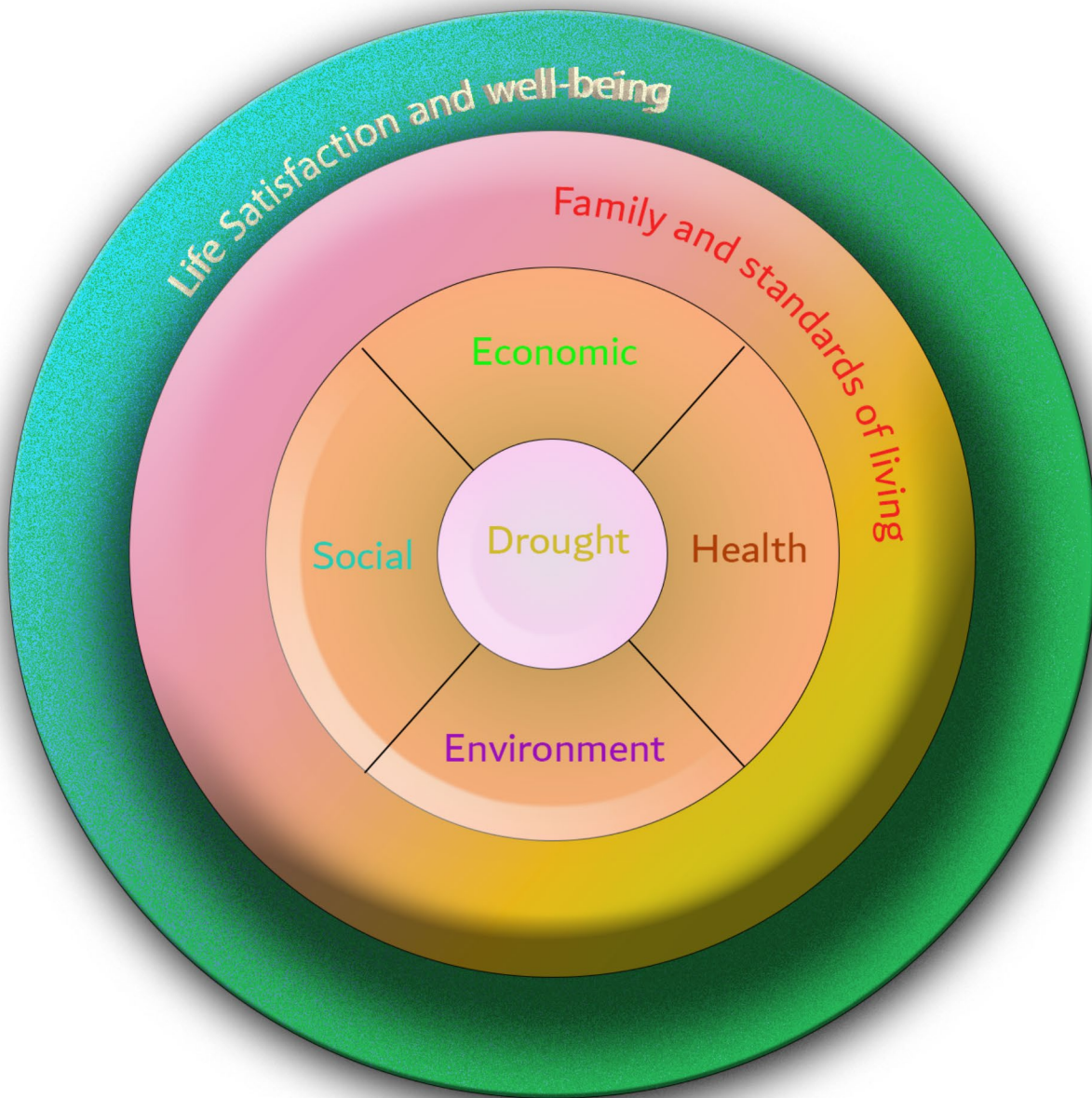


Fig. 1 A conceptual view of the effects of drought on well-being and life satisfaction

often limited and uncertain and did not provide enough income to meet their basic needs. As a result, participants reported experiencing a decrease in their purchasing power, savings, and assets, as well as an increase in their debt and vulnerability. For example, one participant explained: *“My husband used to farm, but due to the drought, their fields dried up. The water motor did not work. They needed an electric water motor, but they could not install it because they did not have enough income to do so”* (P;1).

Social impacts

The analysis of the interviews showed that the drought, with its impact on migration, social security, evasion of the law, social relations, social network, and social position, had caused social harm to the households, and part of this harm were caused by the disruption in the household economy. One of the most obvious social effects caused by the drought was the migration of farmers and agricultural workers, which forced many of them to leave their land and livelihood. For example, one participant stated: *“I was a farmer, and I had land, but due to*

the drought, access to enough water was a bad situation, and there was not enough water in our aqueduct. I had no choice but to migrate to Kerman to find a job" (P;14). Another participant shared a similar experience: *"I was farming in our village, but we faced a long drought that destroyed our crops. I migrated to the city of Kerman, but I was young and inexperienced. I got involved with a bad person in the city of Kerman and had to sell everything I had. I ended up settling in a neighborhood on the outskirts of the city"* (P2). The phenomenon of migration, as a direct consequence of drought, emerged as a pivotal theme. It encompasses not only the physical act of relocating but also the resulting disruption of social networks and community cohesion. These quotes demonstrate that the impact of drought extends far beyond environmental degradation. It serves as a catalyst for social harm, affecting not only the physical landscape but also the very fabric of community life. The drought precipitated a change in social roles, with landowners becoming laborers, as described by one of the participants: *"My husband had agricultural land for his own. He had income. He didn't have to work as a laborer"* (P;1). This shift is not merely a change in occupation and economics; it is a profound transformation in social identity and status, affecting one's position within the societal hierarchy.

Displacement from the main place of life due to lack of water disrupted their sense of belonging, identity, and social network. They felt homesick and sad to leave their hometown and childhood friends. For example, one participant said, *"Drought is not good at all because we come from a place where we grew up and our childhood friends were there"* (P;8). Households were forced to reduce their social interactions and hospitality due to water shortages and enormous hassles in collecting water. They felt embarrassed and isolated because they could not invite guests or visit their relatives and friends as before because they had to ration their water for drinking, cooking, washing, and cleaning. For example, another participant said: *"We can't invite guests because the water tank is empty immediately, even to go to the toilet... it makes us avoid everyone"* (P;13).

Their food security was in danger because of economic problems caused by migration and damage to the livelihood of farmers and livestock families. Malnutrition was observed, especially among children in areas further away from the city center, and the families also mentioned this. One of the participants said: *"You look at our children and see how thin they are. It is obvious that they are malnourished"* (P;1). These sentences show how drought can disrupt the economic and social well-being of households.

Some households in areas with severe water stress to supply drinking and consumption water, especially in the summer season with increasing water scarcity, sometimes

had tension with their neighbors and the water organization. But the point to consider was that more than creating tension with the neighbors, depending on them for water supply indicated good interaction and cooperation between the neighbors. One of the participants said: *"We don't have a source to collect water from other areas, and we don't have a car, but we get a source and a car from a neighbor and friend once and sometimes twice a week"* (P;7). On the other hand, this cooperation with the neighbors had led them to evade the law by illegally piping water, and they considered it their right. One of the participants said: *"The neighbors have pooled money for several months, and we have drawn a water pipe from the main water pipe"* (P;16).

Living in an area outside the city limits and often in the form of construction without permission with illegal water and electricity infrastructures, with the problem of the water crisis, also led to major social consequences, including disruption of social security (increase in addiction, theft, and sexual assault). One of the participants said: *"There are many drug addicts on our streets. We don't dare to send our children out of the house alone for a moment"* (P;6). Another participant said: *"The area is not safe at all because there are many drug addicts"* (P;14). Another participant said: *"We avoid leaving the house even for a few hours of sightseeing"* (P;16). On the other hand, some of the interviewees reported an increase in drug abuse caused by water scarcity. *"My husband has increased his smoking due to nervousness caused by water scarcity"* (P;17). Another said: *"My husband was addicted to glass for a year, and he quit. He needed to take a bath with cold water on hot days, but the lack of water made him nervous, and he started using drugs again and finally decided to get divorced"* (P;3).

Family impacts

Lack of water and economic problems caused by drought can have negative effects on the family by affecting the emotional relationships within the family, burdening relatives, and changing the role of women in the family, which can affect the structure, dynamics, and relationships of the family. Among the effects of drought on emotional relationships in the family, we can mention increased tension, reduced marital relations, lowered the age of marriage, and decreased recreational activities.

Households had to cope with the lack of water for drinking, cooking, washing, bathing, and praying, and they were often worried about the lack of water to meet their needs, especially in the summer season. These factors led to conflicts, arguments, and violence, and some even decided to divorce and leave home. One of the participants said: *"Sometimes I argued with my husband because of water scarcity. He came home after work and said, 'I was tired, I can't go get water'. Sometimes I wanted*

to give up my life" (P;7). Another participant said: "My wife is a driver for an agency. She comes home at noon in the summer to rest. There is no water to turn on the air conditioner. The fan does not cool enough. This causes quarrels and nervousness, and she often leaves the house angry" (P;10). The third participant said: "My husband is a construction worker. Because of his job, he needed to take a bath after work, and the weather was hot. There was no water to go to the bathhouse. That's why we had fights, temper tantrums and bad moods" (P; 3).

On the other hand, due to the religious practices and beliefs of some families, marital relations had decreased because of the need for water for bathing before prayer. According to the results of this study, it seems that women were more bound to their beliefs than their husbands, and as a result, the reduction of relationships caused tension between men and women in the family. They felt that without water, they could not perform their religious duties, and without a bath, they could not have sex with their spouses. This would reduce communication, intimacy, and satisfaction in their marriage. One of the participants said: "Finally, we pray. How can we bathe if there is no water? But my husband says that God is not strict." (P;11).

Drought can affect marriage decisions and patterns, and families may force their children, especially girls, to marry at a young age to cope with economic problems or reduce the number of dependents. As one of the participants said: "Because of the drought, we came from the village to the city, where there was no water, and we had no income. I had to marry off my 14-year-old daughter" (P;1).

Some of them had to rely on their relatives or friends for water supply or financial support due to the effects of the drought. They considered themselves indebted to their friends and relatives, and they felt ashamed. They felt that they had lost their dignity and independence as a family. One participant said, "We have to go to my mother's or sister's house to take a bath" (P;9).

The results showed that the drought had a negative effect on the role of women in the family in different ways. Female participants reported that the drought had increased their burden and responsibility in providing water for the family. They had to spend more time, energy, and money to fetch water from distant sources or from tankers. One of the participants said: "I have to wake up early in the morning to fetch water from a tanker that is about 50 meters away from our house. I put 3–4 20-liter bottles in the van, and how many times do I have to travel this route to be able to collect enough water. Sometimes, we have to wait for hours for our turn. Sometimes, we have to fight with other women or men who have come to fetch water. It is very difficult and exhausting" (P;6).

The role of women in economic activities has become weaker due to the effects of drought, as they had to reduce or stop their participation in agricultural or livestock production due to migration and job change caused by crop failure, loss of livestock, or reduced income. Another participant said: "When we were in the village, and my husband was a farmer, at least my children and we could help him, but since the drought dried up our land, he had to find another work, and I could not help him with his living expenses." (P;1).

Health and hygiene impacts

The drought and the water crisis have challenged the health and personal hygiene of households, such as washing, bathing, and using the toilet. These things can affect physical and mental health. Some participants attributed their skin problems to the impossibility of regular washing. Some people believed that source or tank water pollution caused urinary tract infections and digestive disorders. Not having enough water to carry out their daily activities caused them to worry and suffer from mental stress and high blood pressure. The drought also affected physical health by forcing people to change jobs due to hard work and carrying containers for collecting water. "Carrying 20 liters of water with a wheelbarrow from the collection point to the house also caused me to have prolapsed uterus, in addition to hand pain and back pain" (p;6). Another participant said, "I had lumbar disc surgery because of working and carrying heavy loads" (P;14). Finally, these cases led to psychological problems, such as depression, blaming spouses for living in an area with a lack of water, being ashamed in front of their children, worry, and anger. Most of the participants mentioned that drought and lack of water destroyed their soul and spirit. "More than anything else, lack of water is a psychological issue. Well, it made people very nervous. When you came home, you would see that there was no water because you need water to do all the work, you want to cook, use the toilet, and thousands of other programs. I could see that my wife was also upset and nervous about this" (P;15).

Environmental impacts

Drought has changed the environment by affecting land use, the natural landscape, and the quantity and quality of water resources. Due to a lack of water and reduced income from agricultural products, many people were often forced to convert their dry lands into residential areas or sell them to developers. "My father-in-law had agricultural land. There was no water. It was dry for several years. They gave us the land, and we built a house" (P;9).

They witnessed the destruction of greenery and vegetation, so they felt sorry and angry about their lost

environment. The increase of insects and vermin was mentioned as one of the major problems caused by lack of water. *“Scorpions and these things are found here a lot, especially in summer when the weather is hotter”* (P;20). Other reported problems were the reduction of water supply from aqueducts and wells, water salinity in some areas, and water contamination caused by water stored in tanks or tankers. *“Sometimes after the water is cut off, the water pressure increases due to the use of the pump, and the water is muddy... I think that’s why I got kidney stones”* (P;18). *“The bottom of our tank is always full of sand”* (P;9).

Discussion

This study shows that drought has a significant impact on the economic, social, family, health, and environmental aspects of households, which ultimately causes a decrease in their satisfaction with their personal and social lives. Most of the findings are consistent with previous studies that have documented the negative effects of drought in different regions of the world [14, 21–30].

The drought, which affected agricultural production, income, food security, and livelihoods of households, led to food insecurity and reduced job opportunities and sources of income. This forced households to migrate to urban areas or engage in low-income and informal jobs, borrow money, sell assets, and cut costs to cope with the economic consequences of the drought. Therefore, the economic factors prepared the ground for a series of social harms, such as the disruption of the social network, increased exposure to poverty and urban violence, and reduced access to basic services due to migration to the slum areas of the city. Edward et al. argued that the primary mechanism of drought impact on social outcomes is economic factors. Consequently, one of the adaptation strategies to the decline in income caused by the agricultural drought was the migration of farmers and other affected people to other regions in search of employment opportunities. In contrast to our study, Edward et al. found that drought does not adversely affect farmers’ access to local services. They suggested that this could be due to the responsiveness of policymakers to farmers’ service needs during drought or the divergence of farmers’ service needs from those of the studied population [21].

As the results of our study reveal, the economic and social impacts of drought, such as the displacement of households to the slum areas of the city, increased their vulnerability. Vulnerability, which contrasts with the resilience of communities and groups, is influenced by economic and social conditions. Javadinejad et al. mentioned stability and sustainability, especially in livelihood, as one of the aspects of social resilience [22]. Paumgarten et al. argued that dependence on nature and livelihood

strategies can create a “poverty trap” that enhances vulnerability to natural hazards such as drought [23]. Such crises compel people to liquidate their assets and intensify the exploitation of natural resources to cover their living costs, which in turn affects the ecosystem and the environment adversely [24]. Our study demonstrates that drought has adversely affected the productivity of agricultural land and has induced farmers to change their land use from agricultural to residential in order to cope with the economic challenges.

Shiferaw et al. examined the influence of economic factors, such as access to banking facilities and non-agricultural income, land area, crop insurance, and social factors, such as religious beliefs and social status, on the vulnerability of farmers to drought crisis [25]. In another study by Kachergis et al., it was mentioned that factors such as ethnicity, race, social class, gender, age, and the level of resources and power affect drought resilience [26].

As mentioned in the present study, due to the drought and lack of water, the families left their houses and land in the hope of finding a job and a better place to live for themselves and their children and moved to the center of the province. Exposure to environmental stress, such as drought, has also been mentioned as a factor for migration in various studies conducted in the world [27, 28]. As in the study of Etongo et al. in country Burkina Faso, where 70% of the rural population depends on agriculture and animal husbandry, the population living in the central and northern regions has migrated to the southern region due to frequent droughts [29]. Rigby et al.’s study also reported that as the drought continued, more working-age people moved to regional centers or larger cities, and people such as the elderly, very young, or unable to migrate due to poor health stayed in the village. This kind of migration disturbs the balance of the population [30]. However, in our study, the migration of families occurred in groups and among relatives, which may have been influenced by the interdependence of families. As several families reported, they had to move to reduce the distance from their children who had married and settled in the center of the province.

Studies in India have shown that the decisions to migrate or not during droughts are greatly influenced by the different social and economic backgrounds of Indian people. As in the study of Sarkar B et al., of all temporary migrants in rural India, 67.12% had migrated from the village to cities and showed a strong relationship between the occurrence of drought and the probability of having at least one member of a temporary migrant in a family. The probability of temporary migration due to drought was higher in marginalized rural households with poor socio-economic status, and the reason for migration was the result of lack of adaptation in the place and as a

technique to reduce poverty [31]. In our study, as a result of insufficient income and savings of households due to drought, they were forced to live on the outskirts of the city, which exposed them to new challenges and risks.

In the study of Mayhew et al. in Somalia, the migration and mobility of people affected by floods and droughts from the villages were prominent themes in the interviews, and as a result, they often moved to the cities of Jowhar and Mogadishu in search of better opportunities. Men reportedly worked in construction and charcoal production, while women found employment as domestic workers [32]. In our study, men often worked as construction workers on the outskirts of the city, while women transitioned from roles in agriculture and animal husbandry to domestic duties. Notably, their responsibilities, especially in securing water, intensified. The study reveals that drought significantly alters gender roles and dynamics, directly impacting the objectives of the fifth Sustainable Development Goal. The decline in marital relations and the trend towards younger marriages among girls underscore the broader implications of environmental challenges on gender equality. Goals 5.6 and 5.3 of the Sustainable Development Agenda, which advocate for health, sexual, and reproductive rights, and the prevention of early and forced marriages, respectively, are hindered by the ramifications of drought [33].

Living in an area outside the city limits, with the lack of proper urban planning, disproportionate and often unlicensed development, and illegal use of water and electricity infrastructures, has doubled the problems of households. Many of these problems are rooted in the lack of water and related crises. Limited access and quality of water for drinking, cooking, washing, and cleaning have reduced social interactions and the hospitality of households. On the other hand, they tried to cope with the problem of water scarcity by cooperating with neighbors and friends to share water resources and transportation. This strategy shows the importance of social capital and solidarity in times of crisis. Edwards et al. pointed out in their study that rural communities are flexible in terms of social cohesion due to the high level of participation in social organizations, which enables residents to gather together in times of crisis [21]. In the study of Imesha Dharmasena et al., communication, social relations, and networking are mentioned as unrealized assets for disaster management organizations. This study also confirms that building resilient communities is a collaborative process that involves communication between networks of communities and organizations. Sri Lanka's developing economy, collective and religious culture, and moderate risk tolerance, as well as strong bonds of family and society, are among the socio-cultural values that affect community resilience and adaptation to extreme events such as natural disasters [34]. In Gunn et al.'s

study, maintaining social connection is stated as a key factor in strengthening resilience and mental well-being among rural communities, and female farmers were more likely to seek emotional social support [35]. However, Döring and Hall's study of Syrian and Iraqi refugees showed that exposure to drought was associated with reduced altruism [27].

In our study, conflicts with neighbors or water agencies over water allocation and distribution indicated the potential for violence and unrest due to water scarcity and competition. In the study of Döring and Hall, they stated that exposure to drought did not directly increase violence, but it was expected to increase competition for scarce resources such as water, which itself was the background for conflicts [27].

In the study of Mayhew et al., the effects of severe drought included the evacuation of grazing areas, the conversion of small agricultural lands into places for cattle grazing or the non-cultivation of crops in these fields, the increase in the cost of food such as rice and wheat flour, the dependence on the support of relatives, the reduction of disputes, the increase in expenses as a result of debt, the reduction in food consumption, and the closure of small traders' shops to sell vegetables and food products due to the lack of products. It has also been reported that households had to pay for access to water trucks, and they sometimes had to borrow money from family members. On the other hand, such access to water caused tension due to waiting in line for water [32].

Rigby et al., in their study, examined the impact of prolonged drought on the social and emotional well-being of Indigenous communities in rural New South Wales. They showed that drought affected well-being by weakening livelihoods and participation, aggravating socio-economic damages, and creating a context for shameful behavior according to the society's culture. As in the aforementioned study, the increase in alcohol consumption and suicide were mentioned as long-term effects of drought [30]. Although none of these cases were reported in our study, only two cases mentioned increased drug use. Perhaps these cases are associated with social stigma in our society, and the participants have avoided mentioning them. In Gunn et al.'s study on the stress and coping methods of the Australian farming community during the drought, the use of alcohol/drugs in men was not confirmed as a way to cope with the stress caused by the consequences of the drought. However, the age differences were significant, as the age group of 25 to 44 years used alcohol/drugs more than farmers in other age groups [35].

In Gunn et al.'s study and the findings of Killkinen et al., women did not have higher levels of mental distress than men [35, 36]. In our study, most of the participants of both genders complained about the effects

of water scarcity on physical and mental health. Vins et al. examined the different ways that drought affects health and found that the economic effects, especially on rural farmers and migration, played a more significant role than environmental degradation [37]. As Dean et al. have pointed out, living in small towns is associated with a strong attachment to place, and one of the reasons for the emotional distress of older teenagers was being away from their friends due to drought [38], which was consistent with the results of our study. In the study by Bryan et al. (2021), the potential primary recipients of health and welfare effects were farmers and other people such as businesses, water resource providers, and outdoor recreation users whose livelihoods, lifestyles, and recreation were impacted by the drought [14]. Freund showed that drought had an impact on mental and physical health, and its effects on mental health were mediated by increasing food insecurity, household subjective poverty, and inflation [39]. Berry et al. (2019) and Vins et al. (2020) have stated in their studies that drought affects mental health by contributing to poverty [37, 40].

Finally, the drought, with its effects on various aspects of life, reduced the mental well-being of our study participants, both at the level of personal and social life, and affected their life satisfaction. In the studies by Berlemann and Eurich, people living in areas with higher drought risk reported lower satisfaction with their expected future life, which was more pronounced in people with worse economic status [41]. Previous studies have associated drought with a decrease in life satisfaction [42–44].

Limitations

Some families were unwilling to participate in the interview, some of whom may not have fully and honestly recounted their experience. Of course, the first author who conducted the interviews was a native of the province and was able to communicate well with them due to their common accent. This study only covers the slums; it would be useful to understand the residents in both formal and informal settlements. However, household interviews provide useful insights into the understanding and experience of drought consequences among the residents of slum areas.

Conclusion

In order to get rid of the drought and hope for a better life, the households have migrated from the cities and villages around Kerman province to the outskirts of the city, and with the increase in the population in this area, the problem of waterlessness has increased. It seems that the well-being and satisfaction with life have decreased significantly, especially in the households of farmers and ranchers. Migration had also affected their lives as a

result of not meeting their expectations of life in the city, in addition to the effects of drought. To address this issue, it is necessary to make the authorities aware of these conditions and propose different solutions to improve the working conditions, especially in agriculture and animal husbandry. After that, the families, especially in the villages, should be given the necessary training and education to understand that migration to a larger area is not always beneficial.

Supplementary Information

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Supplementary Material 1

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Author contributions

M.M. and N.N. and M.N.M. designed the study and made substantial contributions to data collection, data analysis, data interpretation, and manuscript writing. R.G. and M.A. contributed to data analysis and interpretation. M.M. and N.N. and M.N.M. and R.G. prepared the first draft of the manuscript. All authors read and approved the final version of the manuscript.

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Data availability

The data analyzed during the current study is available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

This study received ethical approval from the ethics committee of Kerman University of Medical Sciences [Ethics Code: IR.KMU.REC.1401.264]. Written informed consent was obtained from all participants. Confidentiality of information, voluntary entry and freedom to withdraw from the study at any time were assured to all participants.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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