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Agricultural land use change in fertile areas (basic agriculture) in Southwestern Iran: lessons learned from a qualitative study

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Abstract
The growing population has led to the conversion of productive agricultural lands into non-agricultural uses. These widespread changes in land use are reducing agricultural production and threatening food security. Therefore, it is essential to preserve agricultural lands; the first step of which is to gain a thorough understanding of the issue. Accordingly, this study aimed to investigate the causes of changing agricultural land use in the fertile areas of southwestern Iran. Utilizing a qualitative grounded theory approach, the statistical population was farmers in Bavi County selected through snowball sampling. Data were collected through in-depth interviews with 34 participants until theoretical saturation was reached. Data were analyzed using three coding stages, namely open, axial, and selective coding. The results of the open coding stage revealed 69 key concepts. During the axial coding stage, these concepts were classified into eight subcategories, including biophysical characteristics of the land, economic factors, legal factors, social factors, improvement and promotion of cultural and welfare issues, the weakness of the monitoring system, physical space development factors, and the change of weather conditions. Ultimately, in the selective coding stage, a paradigm model was developed to depict the causes of land use change in agriculture, including the main phenomenon, contextual conditions, causal conditions, intervening conditions, strategies, and consequences. These findings can smooth the way for a comprehensive understanding of the issue to address it. Accordingly, supporting farmers financially by providing low-cost or subsided inputs and services could make a huge contribution to preventing the conversion of agricultural land use.

Keywords Land conversion · Grounded theory · Paradigm model · Bavi county

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1 Introduction

Land is a vital natural resource, and land use changes represent some of the most profound human-induced transformations of the environment. These changes can have considerable consequences for societies, affecting food accessibility and employment opportunities (Winklera et al., 2018; Savari et al., 2022). The current global population of 7.6 billion people is projected to rise to 11.2 billion by 2100 (United Nations, 2017), with an estimated increase of 83 million people added annually. As the population grows, the demand for agricultural production is expected to surge, potentially rising to 80% by 2100 (Sharma et al., 2017; Delfiyan et al., 2021; Pakmehr et al., 2021; Ataei et al., 2021).

This increasing demand for agricultural products with existing farming practices is likely to stiff competition for access to natural resources, resulting in deforestation and land degradation. Consequently, the pressure to feed a growing population will escalate resource use (Yazdanpanah et al., 2015; FAO, 2017; Savari et al., 2025; Ataei et al., 2022), particularly since most agricultural land is being diverted for non-agricultural purposes.

The increase in agricultural land usage often leads to the transformation, fragmentation, and destruction of productive agricultural land (Niemand, 2011). Furthermore, soil serves as the foundation for all agricultural activities and acts as an intermediary between agriculture and the environment. Serious soil degradation, which threatens the productivity of various soils, is currently evident worldwide (Fanelli, 2019). Additionally, agricultural land is a non-renewable resource that serves as a pillar of agricultural activities. It takes many years for land to become productive under proper agricultural practices. Furthermore, clearing new land is expensive, and rehabilitating land that has been used for non-agricultural activities is both costly and time-consuming, making it challenging to return to the production cycle (Doucet, 2016).

As population and economy grow, productive lands in some countries are being converted into non-agricultural uses. This transformation results in extensive changes in land use and land cover, which exacerbate environmental instability, including degradation, erosion, and contamination of air, water, and soil (Valbuena et al., 2010). Additionally, increasing food production through intensive agricultural systems that rely on high inputs intensifies the pressure on natural resources. This shift contributes to landscape change, land-use change, deforestation, and increased greenhouse gas emissions (Lombardi et al., 2019). Land use change is a significant issue in the field of agriculture, and in the long run, it will disrupt the process and production of agricultural products, threatening food security. Since the human demand for food is constant, the necessity of these lands to meet the growing population's requirements has arisen (Ahmadpour & Alavi, 2014). Agricultural land use change is one of the major challenges related to agricultural production and food security, resulting in soil erosion and endangering food security (Navidi et al., 2023). In addition, changes in land use may lead to a reduction in livestock production (Mahdavian et al., 2024). Therefore, land preservation is a very important element in maintaining food security in society (Jalili, 2019). Land use is a prominent factor in global environmental change. Agricultural activities are key contributors to the management of land use changes and land cover in an area (Ahmed et al., 2016). Furthermore, the pattern of land use reflects a country's socio-economic conditions (Islam & Hassan, 2011). Economic changes are strongly reflected in land use structure, both locally and regionally (Noszczyk, 2018). Concerns surrounding land use change in developing countries are more significant due to poor management and

disruption in political and economic structures (Long et al., 2017). Indeed, the processes of land use change are inevitable, driven by the necessary growth of urbanization, transportation, services, and various types of production, including agricultural production. Rapid changes in agricultural land use reduce land available for agricultural purposes (Noszczyk, 2018). This reduction of agricultural land threatens livelihoods, decreases food supply, and increases poverty. As a result, there are growing concerns about the sustainability of agricultural production, with small-scale farmers bearing the brunt of the adverse effects (Saleh et al., 2014). In addition, profound changes in the agricultural sector are neither simple nor specific processes, but they are often complex and reciprocal. Therefore, in general, on the one hand, the challenge of land use change is inevitable and results in food insecurity and increasing poverty, and in the Long run, will disrupt agricultural production. On the other hand, Khuzestan province, located in the southwest of Iran, ranks first in agricultural production in the country with an annual production of 17.5 million tons of agricultural and horticultural crops (Irna, 2021) and is recognized as an agricultural pole in Iran. Hence, it is essential to take into deep consideration changing the use of agricultural lands in this key agricultural area to achieve sustainable agricultural production. Qualitative research offers the opportunity to seek clarification and in-depth understanding of phenomena under study (Oranga & Matere, 2023). Accordingly, to gain a profound insight into the agricultural land use change, this study aimed to investigate the causes of agricultural land use change in the fertile areas of southwestern Iran using the grounded theory method. Reviewing the literature, a qualitative grounded theory approach is utilized to provide a deeper understanding of the issue. Then the findings are presented, including the participants' characteristics and the results derived from grounded theory. Finally, the paradigm model of changing agricultural land use is illustrated, the result of which can pave the way for addressing this challenge.

2 Literature review

This section offers an overview of the impacts of agricultural land conversion, with a particular focus on the context of Iran.

2.1 Impact of land use and land cover change

Changing agricultural land use means increasing land productivity because of human activities (Dietrich et al., 2012). Land use change arises from the dynamic interaction between humans and their environment. Simultaneously, it impacts both human and natural systems across various time and spatial scales (Valbuena et al., 2010). Furthermore, land use change not only affects human life, but also indirectly influences the elements of the human physical and social environment, such as climate, biodiversity, and food security (Niemand, 2011). The loss of agricultural land results from its conversion to non-agricultural uses (commercial, economic, residential, and industrial) and urban development, which reduces the availability of highly profitable agricultural land. These environmental changes contribute to climate change, biodiversity loss, pollution of air, water, and soil, biodiversity change, biochemistry, and hydrology (Ahmed et al., 2016). Furthermore, the intensification of the predicted droughts, heavy rainfall, and heat waves will further destabilize food production, negatively impacting agricultural production (Sikka et al., 2018). In addition, analyses in

various contexts indicate that climate change has significantly reduced crop yields over the long term (FAO, 2017).

Climate change disrupts the relationship between individuals and the biophysical environment, impacting the severity and distribution of natural hazards such as storms, floods, and droughts. The effects of some of these hazards are often created or exacerbated by inefficient land management practices. Factors contributing to accelerated land use change include rapid economic growth and, consequently, the fast expansion of urban centers, spatial imbalances, political and administrative corruption, lack of transparency, weak citizen participation in decision-making processes, ineffective government policies, and inadequate monitoring (Sayasane et al., 2016).

Changing the use of agricultural lands can lead to several negative consequences, including the gradual decline of agriculture, reduced agricultural production, dependence on foreigners, expansion of deserts and environmental degradation, increased rural migration to cities, etc. (Jamalipour et al., 2015). Land use change has many potential effects on water resources. In areas with limited access to water, land use change exacerbates water scarcity and consequently contributes to deteriorating living conditions (Wagner et al., 2013). Modern society increasingly utilizes rural lands for various purposes, often resulting in the destruction of valuable land that has been productive for centuries within just a few years. In recent decades, changes in land use and management have also contributed to the destruction of many cultural landscapes in rural areas with adverse effects on local populations (Statuto et al., 2016).

2.2 Land use change in Iran

In Iran, approximately 51 million hectares out of Iran's 165 million hectares of land (about 33%) are classified as arable. However, only 6.18 million hectares of this arable land are used for crop production, meaning that roughly 11% of arable land in Iran is in the production cycle. In addition, around 80% of the country's area consists of arid and semi-arid regions. Meanwhile, the per capita agricultural land available for each Iranian is 2400 square meters, which is equivalent to a quarter of a hectare. Protecting this land and preventing it from being converted into residential areas, villas, roads, industrial facilities, etc., is becoming increasingly challenging. Furthermore, land use change, especially around metropolitan areas, is occurring continuously (Sedighi et al., 2018).

An additional challenge facing Iran's agricultural sector is the destruction of the soil base. Capital formation in the agricultural sector is low, and the labor force is generally not sufficiently knowledgeable (Allahyari et al., 2013). Furthermore, there are more than 10,000 hectares of agricultural land used annually. In addition, according to a study conducted by the Soil and Water Research Institute, approximately 200,000 hectares of land around six metropolises in the country have experienced land use change over the past 45 years (Asadi Rahmani, 2023).

Unfortunately, the recent upward trend of this issue is concerning. Despite the approval of the Land Use Preservation Law in 1995, more than 140,000 hectares of land have been removed from production —averaging about 20,000 hectares per year—and have experienced shifts in land use. The continued shift in the use of agricultural land and natural resources is a source of growing concern (Molaei & Aghaei, 2018). Several factors contribute to the difficulty of protecting agricultural lands, including industrial pressures, tour-

ism, water shortage crisis and declining fertility and productivity of the agricultural sector, changing the villagers' lifestyle, the lack of deterrent laws, and corruption (Doroudian & Doroudian, 2018). Additionally, increasing prices and substantial profits from land sales, combined with insufficient income in the agricultural sector, increasing the number of real estate consultants, increasing the number of land and housing brokers in villages (Amini et al., 2017), farmers' dissatisfaction with insurance fund programs, not receiving compensation or prolonging the time of receiving compensation causes farmers to be reluctant to engage in agricultural activities and willing to change the use (Amirnejad, 2013; see also, Yazdanpanah et al., 2013a, b).

Reviewing the literature revealed that the conversion of agricultural land use is not only a worldwide challenge, but also a critical issue in Iran, which has culminated in several complicated problems. However, to the best of the author's knowledge, there remains a lack of in-depth qualitative research on land use change in the fertile regions of southwestern Iran. In other words, a significant knowledge gap exists in fully understanding this issue. Therefore, this study was undertaken to explore agricultural land use change more deeply and to help bridge this gap by addressing the following research question: What are the causes of changing agricultural land use in southwestern Iran? This study can make a considerable contribution to an in-depth, comprehensive understanding of the issue, which can smooth the path for overcoming it.

3 Methods

In this section, the study area is visually illustrated as well, and its features are described. In addition, the study design and data collection are explained. The method for analyzing data, as well as its trustworthiness, is also presented in the following.

3.1 Study area

Bavi County is one of the counties in Khuzestan province, located in the southwest of Iran, at a latitude of 31° 35'6" N and a Longitude of 48° 53'6" E. This county is subdivided into two districts: the Central District and the Veys District. It includes four Rural Districts, including Mollasani, Anaqcheh, Veys, and Zargan (Fig. 1). According to the 2016 census, Bavi County has a population of 96,484. In terms of agriculture, various crops are cultivated in Bavi County. The area under crop cultivation is 42,835 hectares, producing 550252.9 tons of crops. Additionally, the area under horticulture is 645.08 hectares, yielding 4920.65 tons of produce (Agricultural Statistics of Khuzestan Province, 2020). In Bavi County, 45 cases of violation of unauthorized change of agricultural land use have been registered in the management of land affairs of the county, out of which 50 hectares of agricultural land of this county were changed for construction during 2016 to 2018. Furthermore, 294 cases were registered, out of which over 300 hectares of agricultural land use in the county were legally changed in the period 2010–2018. Due to the importance of this county's valuable agricultural resources and their environmental, economic, and social aspects, proper protection and management are essential. The study and analysis of factors affecting land use change can additionally help policymakers to integrate these factors and thus prevent the consequences. Hence, any policymaking, planning, and initiatives related to changing the

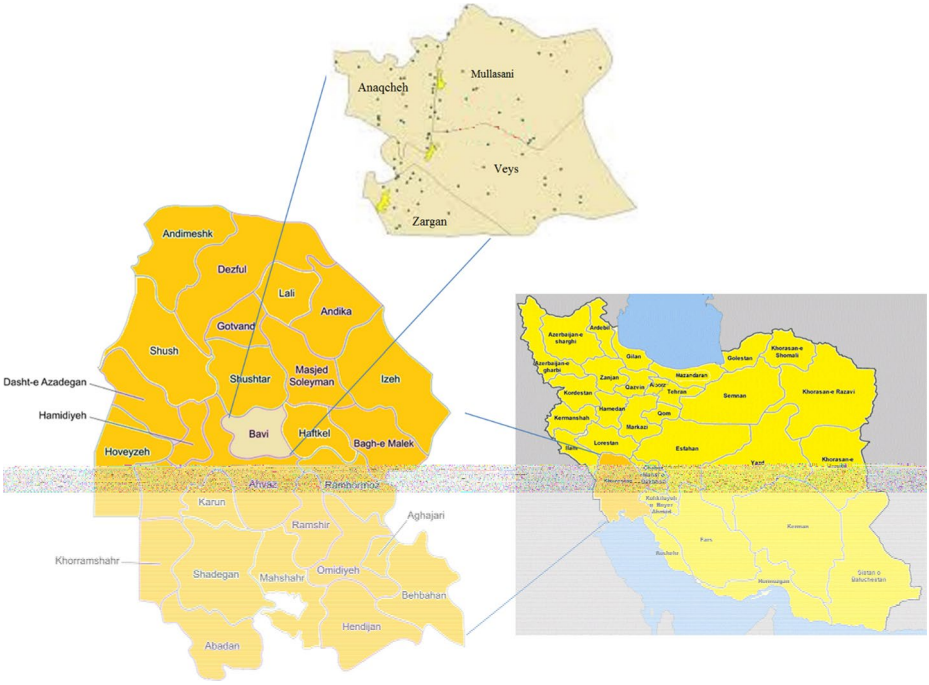

Fig. 1 Location of Bavi County in Khuzestan Province, Iran

use of agricultural lands should be considered technically and in terms of economic, social, environmental, and legal studies.

3.2 Study design and data collection approaches

The current study employed a qualitative approach. Qualitative method addresses socio-technical aspects with approaches associated with designing and participatory research. It also makes it possible for researchers to identify both explicit and implicit processes within their data (Charmaz & Thornberg, 2021; Chenani et al., 2021). One of the methods applied in these studies is grounded theory, which was developed by Glaser and Strauss (1967). This method is centered on the development of theories related to social phenomena, making it particularly suitable when there is limited knowledge about a subject (Yazdanpanah et al., 2025; Zobeidi et al., 2022).

The grounded theory method focuses on understanding complicated phenomena and helps researchers to synthesize data. In addition, by constructing new concepts, researchers can move beyond mere description to provide explanations of what is happening (Charmaz & Thornberg, 2021). This method offers both systematic and flexible guidance for researchers, promoting and facilitating the development of theory. It is frequently employed in situations where a theory is not available to understand or explain the processes that unfold over time (Groen et al., 2017; Rahimi-Feyzabad et al., 2021).

Grounded theory is an effective method, particularly when researchers aim to develop a comprehensive theory or explanation of a natural phenomenon. This approach benefits from

its strong foundation in empirical evidence, as it relies on real data (Chong & Yeo, 2015). This method is employed especially for research on topics on which limited research has been carried out and to build the required theory, as well as to study technological changes and social and technical behaviors in the field of research (Wiesche et al., 2017). Mohajan (2018) noted that grounded theory is an appropriate method for studying human behavior on a particular issue. The main goal of the researcher is to discover the main concerns of the participants and to determine how they continually strive to address these issues (Glaser & Strauss, 1967). The grounded theory method explores and develops the theory surrounding a phenomenon through collecting and analyzing systematic data. It is mainly applied to discover logic rather than merely confirming logic (Li et al., 2017). In this method, the researcher attempts to derive a general and abstract theory regarding a process, action, or interaction based on the participants' perspectives. According to Creswell (2012), conducting grounded theory research involves a systematic process consisting of eight essential steps. The first step requires researchers to evaluate the suitability of grounded theory for addressing the specific research problem. Following this, a practical and feasible plan for the study must be developed. Given the nature of grounded theory methodology, the third step involves establishing mechanisms to verify research activities and obtain necessary permissions from stakeholders and interview participants to ensure the validity and ethical integrity of data collection. The fourth step focuses on theoretical sampling, which guides data collection based on emerging concepts. Subsequently, data coding is conducted to organize and interpret the collected information. Selective coding then allows for the refinement and development of a coherent theory grounded in the data. The seventh step involves validating the emerging theory to confirm its credibility and relevance. Finally, the process concludes with the preparation of a comprehensive report detailing the grounded theory and the research findings. This structured approach ensures rigor and depth in grounded theory studies.

One significant advantage of grounded theory is that the analysis begins as soon as the data is collected in the first interview, provided the researcher identifies relevant concepts during the interview. The data must be analyzed systematically and accurately to uncover the concepts that lead to the formation of categories. Corbin and Strauss (1990) emphasized that data for grounded theory research can be gathered from a wide range of sources, such as interviews, observations, official documents, video recordings, newspapers, letters, and books—all of which can be analyzed using a consistent coding process. In general, grounded theory is preferred over other qualitative approaches as it serves as a prominent framework for investigating social phenomena and conducting social research. It provides a systematic method to build useful theories and helps to mitigate researcher bias (Rahimi-Feyzabad et al., 2021). As there is currently no complete theory explaining the causes and drivers of land use change, grounded theory is an appropriate method for studying and understanding the factors influencing changes in land use (Li et al., 2017). In addition, this method allows for a better understanding of farmers' perceptions regarding agricultural land issues (Rogge & Dessein, 2015). Hence, grounded theory is used in this study to develop a model of the causes of agricultural land use change based on the participants' perspectives.

This study was conducted in 2020, and the statistical population of the study was the farmers in Bavi County who had legally or illegally changed their agricultural land use. The participants were selected using a chain referral method. The sampling method was snowball sampling (Hayati et al., 2010; Yazdanpanah et al., 2013a, b). Initially, a list of agri-

cultural lands that were changed in the past decade was extracted from the land use office in the Agricultural Service Center of Bavi County. However, the list was Long, and it was not possible to have access to all. In addition, some of them had sold the land and moved to another city. Also, their registered telephone was out of order or transferred to another person. Hence, the interview started with the landowners in the List who were in access, and then they were asked to refer other owners who had also changed their land use. After conductingF 23 interviews, the data were completely repetitive, indicating that theoretical saturation, the point where the concepts were well defined and explained, had been reached. An additional 11 interviews were conducted to confirm that saturation had been reached, and a total of 34 interviews were conducted.

3.3 Data analysis

In grounded theory, data is analyzed through a systematic process that includes open, axial, and selective coding (Creswell, 2012). The process begins with open coding, where the researcher classifies the collected data into basic categories related to the information on the studied subject. To accomplish this, the researcher identifies significant words or concepts and assigns appropriate labels to them (Birks & Mills, 2011). All collected data is subsequently organized into relevant categories. The next phase, known as axial coding, involves selecting a central category from the open coding stage and systematically linking it to other categories. These connections reflect key elements such as the causal conditions underlying the phenomenon, the strategies employed to address it, contextual and intervening factors, the implementation of strategies, and the resulting outcomes. During this stage, the researcher develops hypothetical relationships between the core category and its subcategories, providing a more integrated and structured understanding of the data. The third stage is selective coding, in which the researcher develops a theory by interpreting the interrelationships established during the axial coding stage. Through this process, theory is developed by linking related categories, allowing the researcher to explore how various factors influence the phenomenon and how specific strategies contribute to particular outcomes (Creswell, 2012). In this study, the causes of agricultural land use change were identified and categorized into primary codes, secondary codes (concepts), categories, and finally, a framework of causes was obtained.

3.4 Trustworthiness

Lincoln and Guba (cited in Stahl & King, 2020) suggested that their approach to establishing trustworthiness is based on four key criteria: credibility, transferability, dependability, and confirmability. In this study, investigator triangulation—involving multiple researchers conducting comparative analyses of individual findings—was employed to enhance credibility. To ensure transferability, detailed descriptions were provided regarding the data collection methods, timelines used in the original study, and the overall duration of the fieldwork. Lastly, the use of another researcher to read and react to field notes has been applied to confirm dependability. Activities were recorded over time to be followed by other researchers to ensure confirmability.

4 Results and discussion

The results are represented in the following, including socioeconomic characteristics of the participants as well as the grounded theory results (open, axial, and selective coding).

4.1 Socioeconomic characteristics of the participants

The results of descriptive statistics showed that all respondents were male. The frequency distribution of respondents by age revealed that over half of the respondents were aged 41–50 (Fig. 2). The average age of the respondents in the study sample was 49.24 years with a standard deviation of 10.12, a minimum age of 30 years, and a maximum of 73 years. The frequency distribution based on the level of education indicated that most respondents had a diploma (Fig. 2). The main occupation of most respondents was farming (Fig. 3). Regarding land use change, the results showed that approximately half of the farmers have changed the use of less than one hectare (Fig. 3). The in-depth interviews began with questions about the necessity and motivation behind changing land use, with subsequent questions tailored according to the interviewee's responses.

4.2 The grounded theory results

In this section, the findings of the grounded theory based on the causes of agricultural land use change in Bavi County are presented. After collecting data from the study population, interviews and manuscripts were reviewed. Analysis of the interview data was conducted using open, axial, and selective coding, each of which is explained below.

First stage: open coding It is the first step in data analysis and encoding. In the open coding stage, the interview transcripts were regularly reviewed and carefully scrutinized, and data

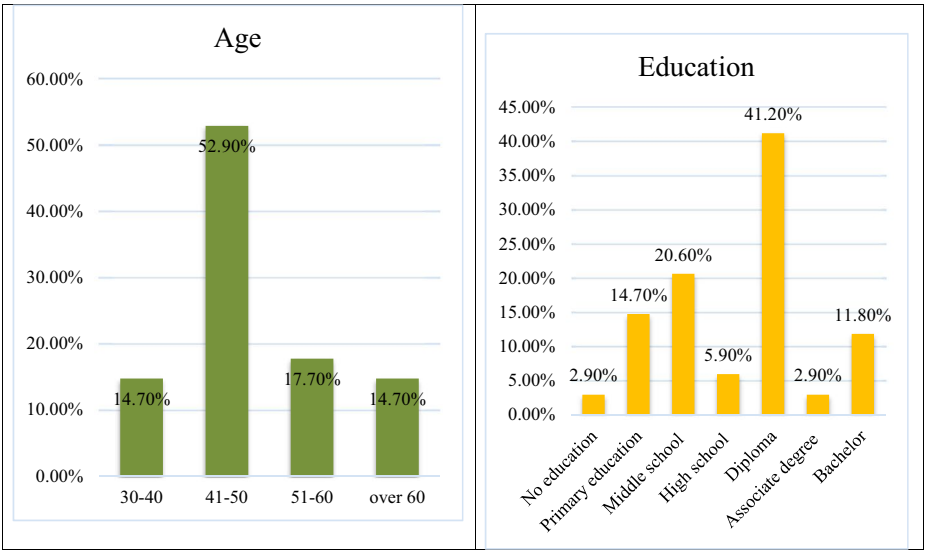

Fig. 2 The frequency distribution of respondents by age and education

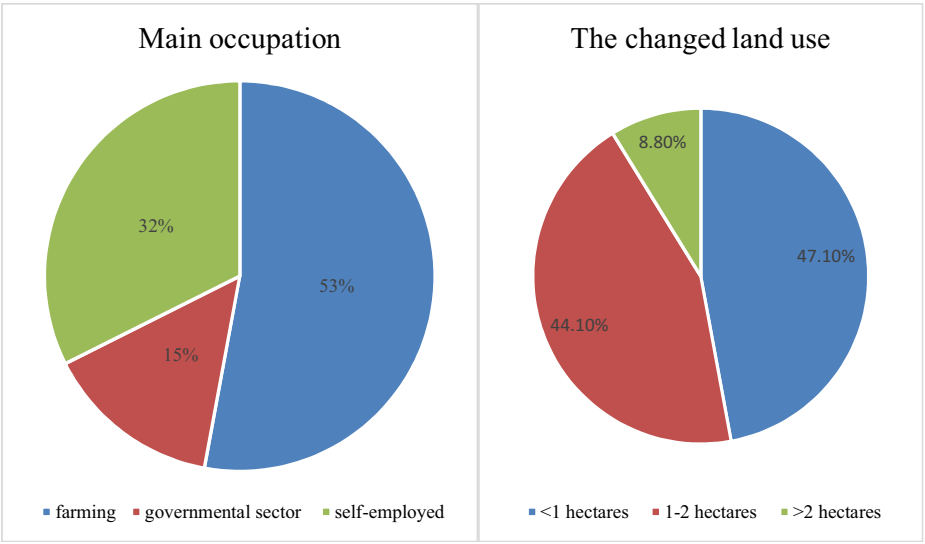

Fig. 3 The frequency distribution of respondents by main occupation and the changed land use

were broken down to the smallest un, named concepts. In other words, at this stage of the coding process, content analysis and line-by-line study of the collected information were undertaken to extract the concepts.

Representative interview quotes follow: "My agricultural land is 3 hectares, and the texture of the soil is sandy. It was a rain-fed farm, and we did not have water for irrigation. We also did not have output due to the lack of water. We had to change the use and make the farm residential". "My children are unemployed. That's why I decided to build a poultry farm. I fenced all around the land without a permit. But now, due to legal issues, I can neither cultivate nor complete the change of use. The ground is currently suspended. "Due to the increase in population and the inability of the villagers to live in the city, we requested the development of rural areas from the Road and Urban Development Organization, the Agricultural Jihad, and the Natural Resources and Watershed Management Organization. The main problem for the development of the village was passing two gas and oil pipelines around the village, which prevented us from increasing the area of the village on non-agricultural lands. Following up through the relevant departments, a request was made to change the agricultural land use to a residential one, which was partially agreed upon, but not finally approved. Some locals changed their use by themselves". Reviewing the transcripts, a total of 69 key concepts were identified in the study population (Table 1).

Second stage, axial coding In the axial coding stage, reassembling and linking the data fractured during open coding, subcategories are extracted. Accordingly, during axial coding in this study, eight subcategories were identified including the biophysical characteristics of the land (8 open codes), economic factors (16 open codes), legal factors (11 open codes), social factors (6 open codes), improvement and promotion of cultural welfare issues (10

Table 1 Conceptualization of research data (open coding)

1. The small size of agricultural lands	36. Generating new income and employment through poultry farming
2. Sandy soil texture	37. Construction of a garage to keep personal belongings and property
3. Violation and destruction of the protected area	38. Receiving loans and facilities to create jobs
4. Inheritance and lack of documents for some agricultural lands	39. Fencing around the land without permission
5. Highland unevenness and unsuitability for agricultural work	40. Fallow land for several consecutive years due to the lack of water
6. Not enough time for agricultural work due to having a self-employed job	41. Inefficient cultivation of rain-fed agricultural land
7. Not allowing the Water Department to build wells due to the lack of water	42. Rehabilitation or reinvestment of agricultural lands
8. Not using loans and facilities for agricultural work	43. Construction of irrigation canals in rain-fed lands
9. Lack or absence of housing and consequent renting	44. Low product yield per unit area and reduced profits
10. The need for rural development	45. Fallow farming land
11. Increase in population and number of households living in the village	46. Suffer from sanctions and increased inflation
12. Rocky parts of the land	47. The need for urban development
13. Confiscation of undocumented arable land by the Natural Resources and Watershed Management Organization	48. Unemployment and not having a job and enough income
14. Lack of recreational and sports space in the village	49. High interest in horse breeding and the construction of stables
15. Salinity of farm soil	50. Division of land between the heirs, and as a result, becoming small
16. Abuse of personal position and land acquisition	51. Construction of a cattle farm and bankruptcy sometime after its activity
17. Paying attention to the welfare and tranquility of those around by constructing a garage for a heavy vehicle	52. The abuse of some municipal managers to change the use
18. Land donation for the construction of a health house	53. Municipal compulsion to convert agricultural land to urban land
19. Not being allowed to withdraw from the well for irrigation by the Water Department	54. Prohibition of agricultural activities by the Oil Company
20. Good location of the land and being located next to the main road	55. Lack of interest in work and agricultural activities
21. Lack of sufficient capital to restart the cattle farm	56. Lack of financial ability to level the farming land
22. Proximity of land to residential houses and infrastructure	57. No need for agricultural income due to employment in the public sector
23. Adoption and amendment of new laws for the protection of agricultural lands	58. Reducing the tendency to change the use if different conditions improve
24. The lack of financial ability of some villagers to live in the city	59. Owner's migration and construction of a villa garden on agricultural land for weekend recreation
25. Voluntary construction of a football pitch in the village for the leisure of the youth	60. Purchase of some lands by non-native people and construction of villa garden, slaughterhouse, tomato paste factory, and …
26. Lack of insurance and pensions	61. Land donation to build a school due to the lack of school space for children to continue their education

Table 1 (continued)

27. Maintaining the use of agricultural lands under different conditions improves	62. Not allowing some families to continue their girls' education outside the village
28. Lack of permission to develop the village space in non-agricultural lands due to the passing of gas and oil pipelines	63. The selling of undocumented land by the Department of Natural Resources to indigenous and non-indigenous people
29. Managing and monitoring of the city land affairs organization on construction in agricultural lands	64. The extension of agricultural operations and teaching methods for the protection of water and soil resources
30. Coordination of organizations and institutions in charge of planning and civil affairs, such as municipalities and the Environmental Protection Organization etc.	65. Not allowing neighbors for irrigated farming due to the proximity of the land to residential houses
31. Implementation of land consolidation projects to improve the facilitation of agricultural production	66. Inclusion of land in urban development plan and lack of legal permission for agricultural activities
32. The lack of water for irrigation (drought)	67. Establishing deterrent laws and amending existing laws, and dealing severely with unauthorized land use changes
33. Land donation for the construction of a library in the village	68. Trespassing by a farmers' neighbor on to land and abuse of the owner's absence
34. Increasing the age of the farmer and the inability and mood for farming	69. Conversion of agricultural land to urban land to increase the price and value of land
35. Lack of legal permission for cultivation	

Table 2 – Biophysical characteristics of the land

Axial codes (subcategories)	Open codes (concepts)
Biophysical characteristics of the land	The small size of agricultural lands
	Sandy soil texture
	Highland unevenness and unsuitability for agricultural work
	Rocky parts of the land
	Being fallow land of farming land
	Salinity of farm soil
	Good location of the land, and being located next to the main road

open codes), the weakness of monitoring system (4 open codes); physical space development factor (3 open codes) and the change of weather conditions (2 open codes).

The findings indicate that biophysical land characteristics are among the key factors driving agricultural land use change in Bavi County. It includes "the small size of agricultural lands", "sandy soil texture", "high land unevenness and unsuitability for agricultural work", "salinity of farm soil", etc. (Table 2). In this regard, Amini et al. (2017) believed that the suitability of land for investment and selection of land use is defined by a wide range of different factors. Land is considered a special type of economic wealth because its supply is different in constant time and place in terms of quality, concerning the land shape, slope, soil, and its value and type of use are strongly dependent on relative geographical location and the neighborhood. Briassoulis (2020) identified several biophysical drivers of land

use change, including variations in weather and climate, landforms, topography, geomorphic processes, soil types and functions, drainage systems, and the availability of natural resources. The results of Journeaux et al. (2017) also showed that biophysical factors such as soil type, land topography, weather, and access to water have changed land use. Also, Piquer-Rodríguez et al. (2018) found woodland conversions were chiefly determined by environmental factors, including aridity, slope, soil, and may continue in the forthcoming event due to small profitability. Msofe et al. (2019) also identified biophysical factors as major drivers of land use changes.

According to the results, the economic factor is the main reason for changing the use of agricultural lands in Bavi County that includes the items of "inefficient cultivation of rain fed agricultural land", "conversion of agricultural land to urban land to increase the price and value of land", "purchase of some lands by non-native people and construction of villa garden, slaughterhouse, tomato paste factory and…", "receiving loans and facilities to create jobs", "lack of financial ability to level the farming land", "suffer from sanctions and increase inflation", "low product yield per unit area and reduced profits", "lack of financial ability of some villagers to live in the city", "division of land between the heirs and as a result becoming small", "lack of insurance and pensions", "no need for agricultural income due to employment in the public sector", "unemployment and not having jobs and enough income" (Table 3). The challenge among the low-income generation to achieve agricultural profitability cannot be denied in many cases, and this has encouraged people to work in non-agricultural areas.

Costs of farm, total income, land ownership, and labor distribution (Arunyawat & Shrestha, 2016); profit, capital, infrastructure, land ownership, market, access to information, access to skilled workers (Journeaux et al., 2017), migration (Dadashpoor et al., 2019) have been identified as the most influential economic factors driving land use change. Paudel et al. (2019) determined socioeconomic factors as significant drivers of land use changes. Munthali et al. (2019) identified poverty as the key driver of the observed land use and land cover changes in their study area. Stehfest et al. (2019) also found that agricultural efficiency is one of the most effective determinants for future cropland and pasture extent. Msofe et al. (2019) Market influence has been identified as one of the key drivers of land use change. As agricultural lands are converted and withdrawn from productive economic use, former landowners often shift to alternative economic sectors to sustain their livelihoods. Consequently, this transition alters the traditional functions of rural villages.

It is worth noting that biophysical characteristics of the land may interact with economic factors. For example, "high land unevenness and unsuitability for agricultural work", "salinity of farm soil" may lead to "low product yield per unit area and reduced profits" and all of which contribute to land use change.

Legal factors are also among the causes of agricultural land use change which include: "undocumented arable land and its confiscation by Natural Resources and Watershed Management Organization", "fencing around the land without permission", "lack of permission to develop the village space in non-agricultural lands due to passing gas and oil pipelines", "not allowing the Water Department to build wells due to the lack of water", "not being allowed to withdraw from the well for irrigation by the Water Department", "inheritance and lack of documents of some agricultural lands", "lack of legal permission for cultivation", "prohibition of agricultural activities by the Oil Company", "municipal compulsion to convert agricultural land to urban land", "inclusion of land in urban development plan and

Table 3 Economic factors

Axial codes (subcategories)	Open codes (concepts)
Economic factors	Generating new income and employment through poultry farming
	Inefficient cultivation of rain-fed agricultural land
	Conversion of agricultural land to urban land increases the price and value of land.
	Lack of sufficient capital to restart the cattle farm
	Purchase of some lands by non-native people and construction of a villa garden, a slaughterhouse, a tomato paste factory
	Receiving loans and facilities to create jobs
	Lack of financial ability to level the farming land
	Suffer from sanctions and increased inflation.
	Low product yield per unit area and reduced profits
	The lack of financial ability of some villagers to live in the city
	Division of land between the heirs and in a result becoming a smaller area
	Lack of insurance and pensions
	Construction of a garage to keep personal belongings and property
	No need for agricultural income due to employment in the public sector
	Construction of a cattle farm and bankruptcy sometime after its activity
	Unemployment and not having a job and enough income

lack of legal permission for agricultural activities", "the selling of undocumented land by the Department of Natural Resources to indigenous and non-indigenous people" (Table 4). Chamling and Bera (2020) found that illegal infiltrations, along with the execution of different developmental projects, have resulted in the transformation of agricultural and forest lands into urban or built-up areas.

Regarding the category of social factors, it can be noted that from the respondents' point of view, "not enough time for agricultural work due to having a self-employed job", "not allowing of neighbors for irrigated farming due to the proximity of land to residential houses", "lack or absence of housing and consequent renting", "increase in population and number of households living in the village", "trespassing farmers' neighbor to land and abuse of the owner's absence", "increasing the age of the farmer and the inability and mood for farming" are causing agricultural land use change (Table 5). It appears farmers do not consider agricultural activity to be respectable in terms of social prestige and are not willing to work in agriculture, and therefore, they change their land use. It seems that social perception of farmers of their job is a societal reality, in such a way that outsiders' attitude towards agricultural work affects farmers' views and encourages them to change jobs. In this regard, the results of a study by Journeaux et al. (2017) showed that socio-organizational factors

Table 4 Legal factors

Axial codes (subcategories)	Open codes (concepts)
Legal factors	Confiscation of undocumented arable land by the Natural Resources and Watershed Management Organization
	Fencing around the land without permission
	Lack of permission to develop the village space in non-agricultural lands due to the passing of gas and oil pipelines
	Not allowing the Water Department to build wells due to the lack of water.
	Not being allowed to withdraw from the well for irrigation by the Water Department.
	Inheritance and lack of documents for some agricultural lands
	Lack of legal permission for cultivation
	Prohibition of agricultural activities by the Oil Company
	Municipal compulsion to convert agricultural land to urban land
	Inclusion of land in the urban development plan and lack of legal permission for agricultural activities
	The selling of undocumented land by the Department of Natural Resources to indigenous and non-indigenous people

Table 5 Social factors

Axial codes (subcategories)	Open codes (concepts)
Social factors	Not enough time for agricultural work due to having a self-employed job
	Not allowing neighbors for irrigated farming due to the proximity of the land to residential houses.
	Lack or absence of housing and consequent renting
	Increase in population and number of households living in the village
	Trespassing by farmers on the neighbor to land and abuse of the owner's absence
	Increasing the age of the farmer and the inability and mood for farming

and individual factors have changed land use. Moreover, Dadashpoor et al. (2019) recognized the increase in population as a major factor that resulted in land use change.

Improvement and promotion of cultural and welfare issues of villagers are other reasons for changing the agricultural land use in the study area which include "lack of recreational and sports space in the village", "land donation to build a school due to the lack of school space for children to continue their education", "land donation for the construction of a library in the village", "land donation for the construction of a health house", "paying attention to the welfare and tranquility of those around by constructing a garage for a heavy

vehicle", "high interest in horse breeding and construction of stables", "voluntary construction of a football patch in the village for the leisure of the youth", "owner's migration and construction of a villa garden on agricultural land for weekend recreation", "not allowing some families to continue their girls' education outside the village", "lack of interest in work and agricultural activities" (Table 6). Darban-e-Astaneh et al. (2016) believed that the main cause of these types of changes is the increase in literacy and the expansion of mass media, which has resulted in a different experience of socialization and has caused changes in people's habits and practices. As a result of changing standards and, particularly, lifestyles, the willingness to engage in agricultural work has decreased, which is the first step in changing the use of agricultural land.

It is noteworthy to mention that social factors and the improvement and promotion of cultural welfare issues could interact, as well. For instance, "increase in population and number of households living in the village" as a social factor on the one hand and "lack of interest in work and agricultural activities" as an improvement and promotion of cultural welfare issues factor on the other hand could culminate in land use change.

The weakness of the monitoring system factors is another reason for the change of agricultural land use in Bavi County. The respondents noted items including "not using loans and facilities for agricultural work", "violation and destruction of the protected area", "abuse of personal position and land acquisition", "the abuse of some municipal managers to change the use" (Table 7). Doroudian and Doroudian (2018) argued that the primary political and structural drivers of land use change include a lack of legal transparency, the presence of numerous ambiguous clauses and interpretations regarding land use regulations, as well as insufficient oversight and the discretionary decision-making power of local councils. Similarly, Harris (2010) conducted a study on socio-economic factors affecting

Table 6 Improvement and promotion of cultural welfare issues factors

Axial codes (subcategories)	Open codes (concepts)
Improvement and promotion of cultural welfare issues factors	Lack of recreational and sports space in the village
	Land donation to build a school due to the lack of school space for children to continue their education
	Land donation for the construction of a library in the village
	Land donation for the construction of a health house
	Paying attention to the welfare and tranquility of those around by constructing a garage for a heavy vehicle
	High interest in horse breeding and the construction of stables
	Voluntary construction of a football pitch in the village for the leisure of the youth
	Owner's migration and construction of a villa garden on agricultural land for weekend recreation
	Not allowing some families to continue their girls' education outside the village.
	Lack of interest in work and agricultural activities

Table 7 The weakness of the monitoring system factors

Axial codes (subcategories)	Open codes (concepts)
The weakness of the monitoring system factors	Not using loans and facilities for agricultural work
	Violation and destruction of the protected area
	Abuse of personal position and land acquisition
	The abuse of some municipal managers to change the use

Table 8 Physical space development factors

Axial codes (subcategories)	Open codes (concepts)
Physical space development factors	The need for rural development
	Proximity of land to residential houses and infrastructure
	The need for urban development

the degradation of Tibetan plateau pastures in China and concluded that poor monitoring, incorrect policies, and incorrect social and environmental systems were among the causes of this type of degradation. It is worth noting that the interaction between the weakness of monitoring system factors, such as "not using loans and facilities for agricultural work," and economic factors, such as "lack of financial ability to level the farming land," may intensify the land use change.

The need to develop the physical space of cities and villages is another reason for changing the agricultural land use in the study area. Respondents considered items such as "the need to develop urban and rural areas", as well as "the proximity of land to residential houses and infrastructure" (Table 8). Khorasanian and Nazarian (2016) investigated the changes in Tehran city and its impacts on land use change in suburbs and found that the pattern of physical development of Tehran, especially during the last thirty years, has had a great impact on land use change in Islamshahr. In addition, changes to land use in the last decade have not had a positive effect on residents' satisfaction with their quality of life. Amini et al. (2017) stated that Iran has witnessed a change of rural agricultural land use to residential, commercial-service, and industrial use over the past few decades, which has been affected by a combination of various factors, including rural population migration to cities and the need to expand and develop cities. Sedighi et al. (2018) offered that the most important physical factors are changing the tourist use of the region, the pressure of city development, the increasing construction of rental villas, and the expansion of transportation and communications. The results of the Islam & Hassn (2011) in Bangladesh revealed that every year the country loses 1% of arable land due to population growth and infrastructure development. Furthermore, the pattern of land use in the Rajshahi region is changing, particularly as agricultural land is significantly reduced and is now more vulnerable. The agricultural land of the study area is decreasing by 0.46% per year, and the area of infrastructure is increasing by 5.86% per year. If this rate continues, Rajshahi agricultural lands will be eliminated in the next 217 years. Sali (2012) believed that influences such as high levels of gross domestic product (GDP) (and increasing urban size and transportation networks can be considered factors in reducing agricultural land and turning it into forest sites in developed countries.

It is noteworthy to mention that "proximity of land to residential houses and infrastructure" as a physical space development factor could interact with "lack or absence of housing and consequent renting" as a social factor, and "municipal compulsion to convert agricultural land to urban land" as a legal factor. As a result, land use change would occur.

In the subcategory of the change of weather conditions, respondents noted that "the lack of water for irrigation (drought)" and "fallow land for several consecutive years due to the lack of water" are among the reasons that cause agricultural land use change (Table 9). Kalali Moghaddam (2015) found that climatic conditions and excessive 24-hour rainfall, steep terrain, as well as devastating floods, not only cause human and financial losses, but also soil erosion and reduced agricultural soil fertility, and consequently lead to land use change. Motavaselie et al. (2016) stated that the land use in rural areas, two basic factors, including natural factors (agricultural land capability) and human factors (population) have a significant role in the different uses. The results of Amini et al. (2017) showed that the proximity of villages to the city, climatic and natural conditions of the region, drought and depletion of the Zayandeh Rood River, and migration from village to city were effective in changing the land use of villages. Sylvester et al. (2013) also pointed out that follow landslides have influenced the coverage of the Great Plains of the United States in the second half of the twentieth century. The interaction between "inefficient cultivation of rainfed agricultural land" as an economic factor and "the lack of water for irrigation (drought)" as a change of weather conditions factor could make a contribution to land use change.

From the respondents' point of view, several factors play an important role in preventing this phenomenon. These include the "implementation of land consolidation projects to improve facilitation of agricultural production", "the extension of agricultural operations and teaching methods for the protection of water and soil resources", "adoption and amendment of new laws for the protection of agricultural lands", "rehabilitation of rain fed agricultural lands", "construction of irrigation canals in rain fed lands", "managing and monitoring of the city land affairs organization on construction in agricultural lands", "coordination of organizations and institutions in charge of planning and civil affairs, such as municipalities and the environmental protection organization, etc.", "establishing deterrent laws and amending existing laws and dealing severely with unauthorized land use changes". (Table 10).

One of the key legal frameworks for preventing the conversion of agricultural land and regulating construction activities in the country is the Law on the Preservation of Agricultural Land Use, which the Cabinet approved in its meeting dated 5/23/2007 as an amendment to the Preservation Law of Agricultural and Horticultural Land Use. According to the Amended Land Use Preservation Law of 2006, collecting tolls from applicants for "agricultural exploiters' licenses", the necessity for service organizations to obtain Licenses from the Note 1 Article 1 Commission and natural and legal persons, and impose fines, demolition of the construction, imprisonment for one to six months in case of recurrence of the crime, permanent dismissal from government services, revocation of the issued license, seizure of operations by Agriculture Jihad officers and law enforcement are among the executive guar-

Table 9 The change of weather conditions

Axial codes (subcategories)	Open codes (concepts)
The change of weather conditions	The lack of water for irrigation (drought)
	Fallow land for several consecutive years due to the lack of water

Table 10 Strategies to prevent land use change

Axial codes (subcategories)	Open codes (concepts)
Strategies	Implementation of land consolidation projects to improve the facilitation of agricultural production
	The extension of agricultural operations and teaching methods for the protection of water and soil resources
	Adoption and amendment of new laws for the protection of agricultural lands
	Rehabilitation of rain-fed agricultural lands
	Construction of irrigation canals in rain-fed lands
	Managing and monitoring of the city land affairs organization on construction in agricultural lands
	Coordination of organizations and institutions in charge of planning and civil affairs, such as municipalities and the Environmental Protection Organization, etc.
	Establishing deterrent laws and amending existing laws, and dealing severely with unauthorized land use changes

Table 11 Consequences

Axial codes (subcategories)	Open codes (concepts)
Consequences	Reducing the tendency to change the agricultural land use
	Tendency to preserve agricultural land use

antees of this law (Oni & Sharifi, 2018, Namjouian et al., 2018). Therefore, in recent years, a large amount of agricultural land in the country has been subjected to destruction and change of authorized and unauthorized uses, and this issue seriously threatens food security, community health, and basic resources of the country. Thus, preserving agricultural lands as the national capital of the country is vital and is considered one of the important priorities for independence, self-sufficiency, and food production. Table 11 presents the consequences of employing the mentioned strategies.

Third stage: selective coding Selective coding aims to establish connections among the identified subcategories by developing a coherent storyline that explains and supports these relationships, ultimately producing a visual paradigm model of the central research theme. During the selective coding phase of this study, the identified subcategories were systematically organized into broader categories such as contextual conditions, causal conditions, intervening conditions, strategies, and outcomes. Accordingly, a paradigm model of the causes of changing agricultural land use was presented in Fig. 4 based on the paradigm model of Corbin and Strauss (1990). In this presented paradigm model, the research phenomenon is changing agricultural land use that some context has led to the occurrence of the phenomenon and some conditions have affected the occurrence of this phenomenon. Based on selective coding, it can be pointed out that the occurrence of this phenomenon was due

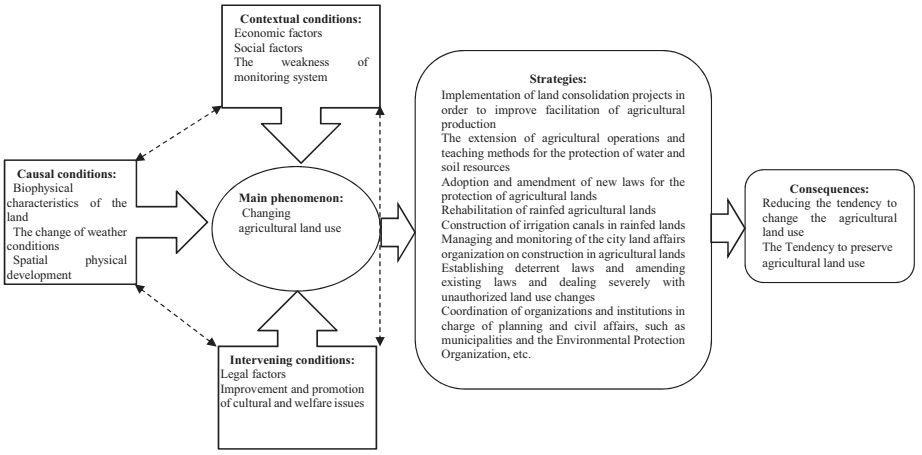

Fig. 4 Paradigm model of changing agricultural land use

to causal conditions such as biophysical characteristics of the land (including "the small size of agricultural lands", "sandy soil texture", "high land unevenness and unsuitability for agricultural work", "salinity of farm soil", etc.), the change of weather conditions (such as "the lack of water for irrigation (drought)" and "fallow land for several consecutive years due to the lack of water") along with spatial physical development (including "the need to develop urban and rural areas", as well as "the proximity of land to residential houses and infrastructure"). In addition, economic factors (such as "low product yield per unit area and reduced profits", "lack of financial ability of some villagers to live in the city", "lack of insurance and pensions", "unemployment and not having jobs and enough income", "lack of financial ability to level the farming land", "suffer from sanctions and increase inflation", etc. provide the appropriate context for the occurrence of the phenomenon of changing land use in agriculture. Moreover, social factors (including "not allowing of neighbors for irrigated farming due to the proximity of land to residential houses", "lack or absence of housing and consequent renting", "increase in population and number of households living in the village", "trespassing farmers' neighbor to land and abuse of the owner's absence", "increasing the age of the farmer and the inability and mood for farming", etc.) as well as the weakness of the regulatory system (such as "not using loans and facilities for agricultural work", "violation and destruction of the protected area", "abuse of personal position and land acquisition", "the abuse of some municipal managers to change the use") provide the context for the phenomenon of land use change in agriculture. Furthermore, legal factors (including "lack of permission to develop the village space in non-agricultural lands due to passing gas and oil pipelines", "not being allowed to withdraw from the well for irrigation by the Water Department", "lack of legal permission for cultivation", etc.) and improvement and promotion of cultural and welfare issues (such as "lack of recreational and sports space in the village", "land donation to build a school due to the lack of school space for children to continue their education", "land donation for the construction of a library in the village", "owner's migration and construction of a villa garden on agricultural land for weekend recreation", etc.) have played an intervening role in exacerbating land use changes.

Furthermore, as noted previously, the derived factors could interact with one another, which is demonstrated with a double-headed dotted arrow in Fig. 4.

The phenomenon prompted stakeholders to use targeted strategies to adapt. In this regard, activities such as the "implementation of land consolidation projects to improve facilitation of agricultural production", "the extension of agricultural operations and teaching methods for the protection of water and soil resources", "adoption and amendment of new laws for the protection of agricultural lands", "rehabilitation of rainfed agricultural lands", "construction of irrigation canals in rainfed lands", "managing and monitoring of the city land affairs organization on construction in agricultural lands", "establishing deterrent laws and amending existing laws and dealing severely with unauthorized land use changes", "coordination of organizations and institutions in charge of planning and civil affairs, such as municipalities and the Environmental Protection Organization, etc." have been developed. The implementation of strategies has had consequences such as "reducing the tendency to change the agricultural land use" and "the tendency to preserve agricultural land use".

5 Policy implications

The results of the research imply several policy suggestions presented in the following:

The findings revealed economic factors with the largest number of extracted codes. Some economic factors, such as "low product yield per unit area and reduced profits," were cited as the farmers' reasons to change the use of agricultural land. Therefore, it is suggested that the government provide farmers with low-interest financial support and Long-term return periods to reduce production costs. Furthermore, providing low-cost or subsided inputs and services such as fertilizers, seeds, etc. can support farmers financially to prevent the conversion and destruction of such lands. In addition, recruiting agricultural experts to provide free consultation to farmers during 3 stages, including cultivation, protection, and harvest for their crops, could lead to enhancing crop productivity.

Legal factors were also with a considerable number of extracted codes. Some items, such as "not allowing the Water Department to build wells due to the lack of water, lack of legal permission for cultivation, prohibition of agricultural activities by the Oil Company, etc.) were legal factors. Hence, planning, supporting, and cooperating with responsible and involved institutions such as Agriculture Jihad, Water Department, etc. is suggested to implement projects that not only solve existing problems (such as lack of access to water resources, etc.), but also provide the necessary conditions for agricultural activities. Furthermore, based on the findings, in some villages, farmers' agricultural land had been inherited and was undocumented. Therefore, documenting such arable lands can be a very effective action in preventing their destruction and fragmentation as well as maintaining the existing condition of the lands.

Population growth and housing needs were acquired social factors in land use change that led to problematic conversion of a large part of the land to residential use, especially around the villages. Therefore, proper and principled management of rural space is essential to effectively prevent land use change in this area.

Improvement and promotion of cultural welfare issues factors were recognized as reasons for the conversion of agricultural land use. Therefore, in order not to change land use due to cultural welfare issues, these issues in rural areas should be given specific attention by the Culture and Guidance Department.

The change of weather conditions, such as "the lack of water for irrigation (drought)", was another reason for changing land use. Thus, water management through providing modern irrigation methods, such as drip irrigation, for farmers is highly suggested.

The weakness of the monitoring system factors and physical space development factors were acquired as other reasons of converting agricultural land use. Strengthening the monitoring system as well as following a specific plan in terms of rural development should be taken into consideration by authorities, including the Agriculture Jihad, Housing Foundation, etc.

6 Conclusion

Currently, the change of agricultural land use after water shortages is the second major problem of agriculture in Iran and exemplifies a significant human influence on the environment. Risk-taking in agricultural work, potential risks, and unforeseen events that actually hinder agricultural activity on the land lead people to activities that have relatively fewer risks. Research results indicate that land use change is not only an important issue, but also has become a big challenge. On the one hand, this phenomenon causes the destruction of a large share of agricultural land, which has very important consequences in terms of food security, self-sufficiency, and sustainable employment in rural communities. On the other hand, the pressure of industry, tourism, water shortage crisis, reduced fertility of the agricultural sector, changing the villagers' lifestyle, etc., make the protection of agricultural lands more challenging. Accordingly, due to the great significance of preserving agricultural lands and preventing their destruction and use change, identifying the factors that accelerate land use change is crucial. Accordingly, this study employs a qualitative grounded theory approach to explore the causes of agricultural land use change in Bavi County, Khuzestan Province. The results of this study showed that subcategories, including biophysical characteristics of the land, economic factors, legal factors, social factors, improvement and promotion of cultural and welfare issues, the weakness of the monitoring system, physical space development factor, and the change of weather conditions, are the causes of changing agricultural land use in Bavi County. Because these findings align with previous studies, they can be used nationally and internationally; to prevent the change of agricultural land use, all the mentioned factors should be taken into consideration by authorities, including legislators, Agriculture Jihad experts, the Land Affairs Organization, and other entities. It should be noted that most of the extracted codes were related to economic and legal factors, which indicates these were the most significant causes of changing agricultural land use in the study area. For instance, high effort and low profitability in the agricultural sector and profits make farmers willing to work in other sectors. In addition, organizations, and institutions in charge of planning and development affairs, such as municipalities and the Environmental Protection organization, do not act in a coordinated manner, and each makes decisions based on its interests. Also, in this study, a paradigm model of changing agricultural land use was presented, which included the main phenomenon, contextual conditions, causal conditions,

intervening conditions, strategies, and consequences. Accordingly, effective strategies to prevent changing agricultural land use should include implementation of land consolidation projects, the extension of agricultural operations and teaching methods for the protection of water and soil resources, rehabilitation of rain fed agricultural lands, construction of irrigation canals in rainfed lands, establishing deterrent laws and amending existing laws and dealing severely with unauthorized land use changes, etc.

Although the results of this study could make a contribution to a comprehensive perception of the causes of land use change in southwestern Iran, it has some limitations that could be taken into consideration in future research. First, since the data collection method in this study was interviews, the data collection process was time-consuming as well as costly. Second, conducting the interview required the consent and willingness of the respondents, and the patience and perseverance of the interviewer. Finally, due to the limited number of interviews with farmers in Bavi County who have changed their agricultural land use, there was no generalization of results to other regions or larger groups. Therefore, as a future research direction, it is suggested that studies with mixed-method approaches (integrating both qualitative and quantitative methods) be conducted on a large scale with more samples to be generalizable to the country. In addition, investigating the causes of land use change not only from the farmers' perspective, but also from the authorities' and Agriculture Jihad staff's viewpoint, could shed more light on this issue.

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