



Factors Effecting the Preservation of Indigenous Housing Values and the Regional Texture of Sistan in Line with the Revitalization of Rural Settlements

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Abstract

Purpose- Nowadays, with the disappearance of traditionalism in rural housing design, constructions that deviate from the traditional and indigenous housing patterns are noticeable, and as a result, native values and traditions in rural housing have been disregarded. On the other hand, rural housing is the most humanistic subject of architecture and provides for the diverse needs of local residents. Therefore, this research was conducted with the aim of examining the effective factors in preserving the values of endemic housing and regional texture in Sistan towards revitalizing rural settlements.

Design/ Methodology/ Approach- The qualitative-quantitative research method was used in the present study. The statistical population consisted of two parts: the first part included experts and graduates in architecture who were selected as a sample size of 20 people based on purposive sampling. The second part consisted of the villagers of Qaleh now, Deh Arbab, and Deh now Piran. Background field method, Delphi method, FARAS + FKOPRAS models were used to analyze data in both qualitative and quantitative sections.

Finding- the results of background theory showed that from the perspective of experts, some factors such as preserving rural landscape, principles of protecting native housing values towards development with a focus on indigenous culture, interaction in preservation and revitalization of regional fabric and rural indigenous housing as well as cultural tourism in villages were identified as effective factors in preserving endemic rural housing values. Also, Delphi results showed that Kendall's coefficient for concepts and meaningful units obtained from expert interviews did not differ significantly. In this regard, fuzzy model results showed that developing an ideal pattern for indigenous housing in Sistan with a weight of 70/72; principles of protecting native housing values towards development with a focus on indigenous culture with a weight of 66/72; integrated and cohesive management with a weight of 59/72, received the highest and lowest importance in preserving indigenous rural housing values in Sistan respectively.

Keywords: Indigenous values, Housing, Rural settlements, Traditional and indigenous pattern, Sistan.

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1. Introduction

The indigenous architecture of each region is shaped by the climatic, geographical, and cultural conditions unique to that area. It reflects centuries of accumulated knowledge in effectively utilizing local materials, employing construction methods, and considering climatic factors. It can be seen as a testament to the ingenuity of early builders in adapting to climate challenges and making the most of limited resources to ensure maximum comfort. However, overlooking this aspect can lead to the disappearance of this architectural style and the neglect of the experiences of indigenous architects (Maghuli & Ahmadzadeh, 2018).

Identification and preservation of valuable indigenous architectural heritage (indigenous housing) in general and rural housing in particular, while safeguarding the national historical assets of the country, helps us to discover the secrets, symbols, and signs hidden within them. This enables us to incorporate sustainable principles from the past into modern structures and preserve the identity and the authenticity of rural settlements' architecture. On the other hand, studying the architecture of indigenous rural settlements can help design suitable spaces for different regions and solve some of the problems in rural residential areas, leading to the formation of desirable villages in the country (Sartipipour, 2008). Therefore, today more than ever, there is a need to recognize the values of indigenous housing (Mahdavinejad & Shahri, 2014). Identifying indigenous values in housing can be combined with current needs to achieve more sustainable designs. Local and indigenous patterns, principles, experiences and traditions can be used as design tools (Patidat, 2014). Hence, with renewed attention to traditional values and principles in recent decades and looking at the current situation of rural housing in the country, we are facing a shortage of housing that meets Iranian and indigenous criteria and indicators (Najjarnejad Mashhadi et al., 2020).

In this regard, there is not much information available about housing and its indigenous values in Sistan. Due to the excessive spread and dispersion of settlements and some limitations such as difficult-to-pass roads, lack of security for researchers, and other

problems, the indigenous housing and architecture of Sistan has received very little attention and research. The climatic diversity which leads to diversity in livelihood in itself, has provided the grounds for shaping various types of housing, both in terms of form and structure, in Sistan. Therefore, the rural areas in Sistan, including villages such as Qaleh now, Deh Arbab, and Deh now Piran have their own unique structure that is far from imitating the architecture of other regions. With ingenuity and experience, residents have been able to provide a comfortable living environment for people without high costs.

Valuable solutions and methods have always been proposed in indigenous architecture of Sistan to provide suitable living conditions in rural settlements. The different climatic and geographical conditions of this province across Iran's land have led architects to identify effective strategies to preserve indigenous values of these homes and provide the best and most appropriate ways to adapt to climate conditions. These solutions can now and in the future be combined with new technologies in contemporary architectural structures while maintaining their unique identity to create up-to-date and sustainable architecture. Hence, creating sustainability in Sistan's architecture requires knowledge and awareness of factors that affect preserving indigenous values and can play a decisive role in determining the direction of housing policy-making systems as well as designing and implementing measures in this regard. By recognizing and identifying the effective factors in preserving the indigenous values of rural housing in this region, we can breathe new life into the architectural culture of Sistan, which may be deteriorating before the eyes of every researcher, and in long run, we can witness positive changes in various cultural aspects, revival of human and spiritual values, etc. In this regard, the aim of this research is to identify the factors that are effective in preserving the indigenous values of rural housing in Sistan towards revitalizing rural settlements. The following questions are being investigated: what are the factors effective in preserving the indigenous values of rural housing in Sistan towards revitalizing

the rural settlements? And which one is more important among the mentioned factors?

2. Theoretical literature

Housing is always changing and there seems to be no end to these changes. However, many aspects of what we call housing such as nature, function, application etc., remain unchanged over time. Therefore, some parts of housing always continue and never end (King, 2019). Also, considering that housing is a vital commodity and a basic human need, it can be said that humans have a strong need for it and this necessity does not recognize time and place (King, 2019). Hence, the role of housing in meeting needs is undeniable and it is not just about four walls and a roof. Housing should provide a place for sleeping and resting where people feel safe and secure and are sure about their privacy. Many of these features come together to turn four walls into a home (a place for peace and security) (Zarghamfard, 2017). In this respect, recognition and analysis of housing first requires an understanding of the concept of indigenous housing and providing a definition for it. Based on indigenous approaches, housing is a multifaceted concept that encompasses notions such as comfort, security, lifestyle, culture and identity, the social base of residents, etc. (Zandi, 2014). Therefore, it can be said that indigenous housing is a special model of housing that corresponds to the economic, social and cultural characteristics of residents and the natural and environmental features of the desired location. It improves human quality of life and reduces life costs. Additionally, native housing enhances the skills of primary builders in dealing with climate-related problems and their ability to use minimal resources for maximum comfort. Indigenous housing is a type of architecture that has been built over time in coordination with local people's needs and desires based on their technical and financial capabilities. It also considers the natural conditions and climate requirements while using local materials. Understanding indigenous housing in each region as a valuable asset that has grown over many years is important because it can be informative, citable, and inspiring for future projects. In fact, the active goal of indigenous housing is to create an environment

that best suits the lifestyle of a community (Rapoport, 2013).

Preserving the values of rural homes is a comprehensive and integrated process that analyzes housing problems, and revives and develops all aspects of homes and structures through developing economic, physical, social, and environmental conditions (Roberts, 2003). In this respect, development in valuable villages occurs by creating cultural foundations based on indigenous characteristics. The goal of development is essentially to meet human social needs in the environment, and from this perspective, development is necessary to avoid neglecting the artificial and cultural context as products of interaction with nature, which in fact destroys the identity of place as a prerequisite for social life (Noghsan Mohammadi et al., 2012). Accordingly, considering the concept of development that has been mentioned, reviving the authentic rural fabric can also be considered a step towards development. Of course, this approach also includes concepts such as improvement, renovation, empowerment and revitalization of the fabric (Lichfield, 2000). Thus, preserving and reviving valuable fabrics is one of the most fundamental approaches in protecting values and developments that follows an accurate analysis of the target area and its compatibility with social, economic and environmental structure (Aminzadeh et al., 2021).

In the process of preservation and revitalization, especially in rural areas, indigenous culture approach is a very important developmental strategy from local to global scales (Bird et al., 1993). European settlements have also paid attention to culture as a material capital simultaneously with economic transformations (Bianchini, & Parkinson, 1993). The history of cultural revitalization dates back to 1990s and has been proposed as a successful choice in the field of protection and conservation of historical fabrics (Kearn and Philo, 1993). The advantage of revitalization with a cultural approach is that cultural development compatible with valuable fabrics can be carried out while preserving heritage at the same time and the concept of development and cultural heritage are intertwined (Smith, 2007).

According to what mentioned above, protection, revitalization, and development based on native culture approach emphasize on the process of human life and harmony with nature and their interaction in order to create the least environmental impact. This requires the design to be responsive to native context

in line with strengthening the sense of place, designing with nature and using natural process, paying attention to tangible aspects of nature, and caring about people in the process of designing indigenous housing (Van der rynn, 1994). In this regard, Figure (1) was drawn as a conceptual model.

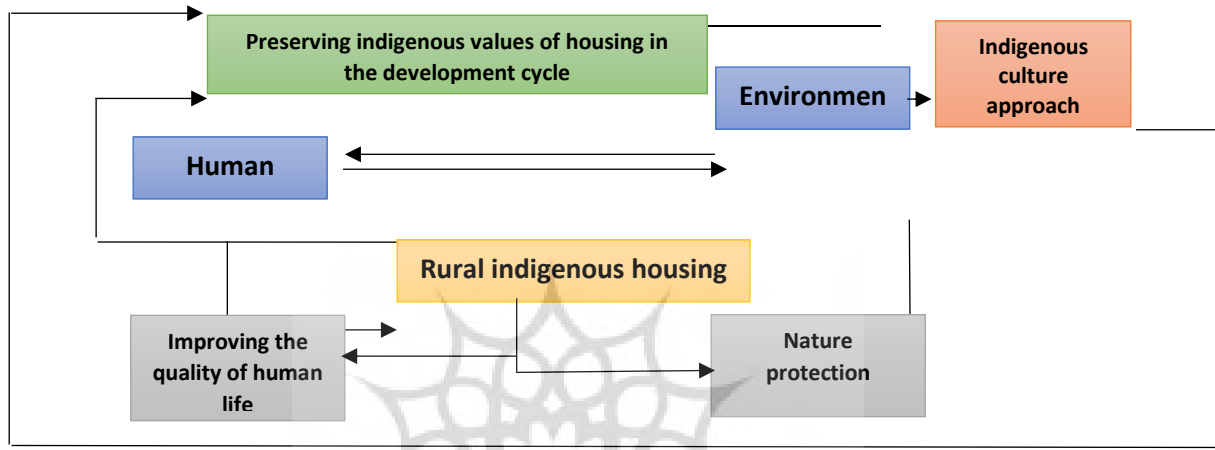


Figure 1: conceptual model of the research

Numerous studies have been conducted on indigenous architecture of housing, but no study has been done towards identifying the factors that affect the preservation of rural housing values. In this part of the research, studies that are relevant to the present topic have been addressed in two sections: domestic and foreign studies.

In examining the spatial analysis pattern of rural housing in dry regions with climatic conditions in Sistan and Balouchestan province, researchers found that indigenous housing in Sarbaz county has the highest compatibility with climate. Saravan, Iranshahr, Nikshahr, Zahedan, and Zabol have average compatibility with the climate and the least compatibility between the indigenous housing and climate belongs to Bampoor region (Esmailnejad & Karimi, (2019). Sistan region has unique climatic conditions and its economic and social structure has led to unique types of housing architecture such as basic type; linear type, L-shaped type, U-shaped type; central courtyard type; and grange type. It seems that recognizing these types can lead to revitalization of rural indigenous housing in Sistan (Oveisi Keikha et al., 2020).

In another study, attention was paid to the role of exploration of cultural choices in shaping indigenous structures, in such a way that based on cultural and environmental backgrounds of examples, choices influenced by environmental factors especially climatic and economic factors had a significant impact on the physical structuring and organization of residential spaces in Ardabil's indigenous houses at macro, meso, and micro scales (Mohammad Hoseini et al., 2020). Additionally, another study showed that different types of housing have multiple capabilities despite their weaknesses and deficiencies, including diversity in material selection, responsiveness to environmental and climatic conditions, respect for elders, hierarchical structure, maintaining privacy in housing units, honoring guests, continuous life cycle and the possibility of accommodating multiple generations in various types of housing. The ability to change and evolve over time according to family needs as well as the possibility of replacing new spaces instead of old dilapidated ones are some capabilities found in housing on the banks of Sarbaz river which are less seen in modern housing (Torshabi et al., 2021).

Regarding the sustainable indicators of Iranian indigenous housing, there is a significant relationship or positive correlation between adapted concepts of traditional and vernacular architecture with some traditional conceptual indicators. Based on this relationship through matching traditional concepts with indigenous concepts and aligning them with traditional indicators led to achieving sustainable vernacular indices (Najjarnejad Mashhadi et al., 2020).

Furthermore, by taking a comprehensive focus on the Islamic architectural organization and the patterns derived from it, the pattern of housing architecture for the future of Iranian Islamic architecture can be achieved (Latifi et al., 2021). This point is also noteworthy that, proposed patterns for developing residential environments in the early twentieth century have moved from a focus solely on meeting basic human needs towards satisfying higher human requirements, especially cognitive and aesthetic needs, and towards sustainable psychological stabilization of residential environments along with environmental protection based on information technology in the direction of creativity and innovation within new paradigms in sustainable development of residential environments (Motallebi, 2022). Additionally, helping to invest in renovating native housing while preserving the authentic features of traditional buildings can protect local communities and promote sustainable development in these areas (Gocer, 2021). Although, prominent rural housing patterns are entirely consistent with Iranian principles and indigenous architecture is evident in all its components (Kharabati et al., 2021). A look at the studies conducted on indigenous housing architecture in Sistan region shows that despite the rich and unique architecture present in the vernacular fabric of Sistan villages, comprehensive studies have not been done to identify factors that preserve indigenous values in rural housing in this area. In the present research, authors attempted to rank and prioritize each factor effective in vernacular housing and regional fabric of Sistan using qualitative method (grounded theory) to revive rural settlements. Thus, what distinguishes this study from others is its use of qualitative method and

identification of factors effective in preserving indigenous values in rural housing in this area.

3. Research methodology

Sistan is located in the flat and smooth plain in the southeast of the country and in the north of Sistan and Balouchestan province. This region is bordered by Afghanistan to the north and east, Zahedan city to the south, and Lut desert and Birjand county to the west and northwest (Afshar Sistani, 1991, p. 145), and overall it is very similar geographically and climatically to southern Khorasan. The conditions and climate of this region are consistent with desert and semi-desert areas (Malekzadeh, 2011, p. 8). As mentioned in the research methodology section, Qaleh Now, Deh Arbab, and Deh Now Piran villages were selected as sample pilot research areas. Their geographical locations are as follows:

Qaleh Now: This village is one of the 9000 villages in Sistan and Balouchestan region which is located in Jazink district on Zabol road at a distance of 26 kilometers from Jazinak intersection towards Zahak district. It is part of the precious history of Sistan, the cradle of civilization. Qaleh Now is the only village in Sistan where all houses are made of mud bricks with an old style that has been preserved over time. The influence of climatic conditions on its housing architecture is quite evident. Its architecture is such that many refer to it as the Masuleh of Southeast Iran.

Deh Arbab: this village is located 10 kilometers away from Zabol city center and five kilometers away from Bonjaar district center. It is bordered by Aghajan village to the north, Eskel village to the south, Imamieh village to the west and Dahmardeh village to the east. The architecture of Deh Arbab village has been shaped by environmental conditions using mud bricks with a dominant style of villages in this region.

Deh Now Piran: This village is located in Edimi district, the central part of Nimruz of Sistan county. It is situated 5.8 kilometers southwest of Zabol city and 4 kilometers northwest of Aliabad in a plain area. The local materials such as mud, clay, and water are mostly used in the architecture of this village and its architecture is influenced by environmental conditions.

It should be mentioned that due to the dispersion of the studied villages in Zabol, Hamun and Nimruz, attempts were made to draw an extensive and

comprehensive map of Sistan region, which can be seen in [Figure 2](#).

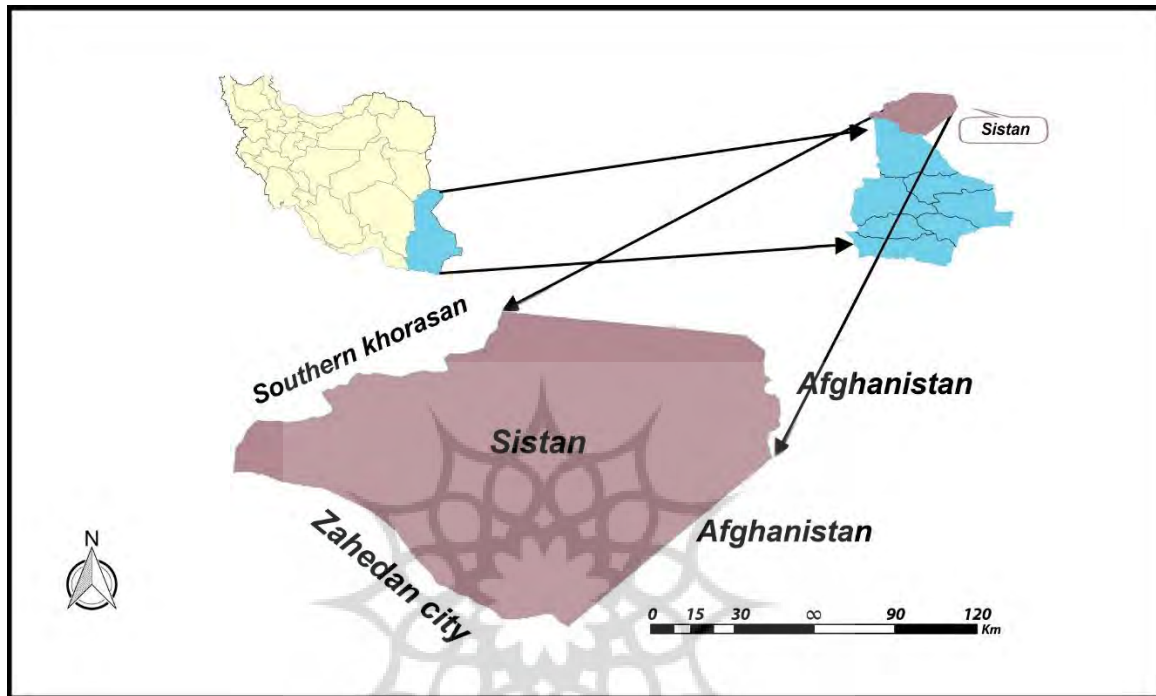


Figure 2: the location of the study area

The present theoretical study has used a qualitative-quantitative research method and its statistical population consisted of two parts: the first part were experts and graduates in architecture, who were purposefully sampled (until saturation of results) and 20 people were determined as the sample population in this section. The second part included Qaleh Now, Deh Arbab, and Deh Now Piran villages, which were selected based on the following criteria:

- Valuable elements and residential architectural features of these three villages have been formed based on indigenous components of the region and considering the needs and priorities of the residents.
- Easy access to villages and common architectural features in these villages. This research is divided into two major sections in terms of methodology; the first section is devoted to extracting concepts of indigenous housing values and is based on a theoretical

or data-based approach that uses qualitative strategic approaches (Groat & Wang, 2012, p. 180), and after identifying concepts and meaningful units using Delphi method, each one was examined in three Delphi rounds. The second part is related to ranking each factor using FARAS + FKOPRAS models.

4. Research findings

Identifying Factors affecting the preservation of the values of native housing and the regional context of Sistan in line with the revitalization of rural settlements

In this section of the research, in order to identify the factors effective in preserving the indigenous values of traditional housing and the fabric of the Sistan region towards the revitalization of rural settlements, necessary information has been extracted from experts. Interviews (between 60 to 90 minutes) were recorded and noted immediately to allow for multiple reviews of conversations and a more detailed

analysis and examination of expert opinions. Initially, in the review stage, which is considered as an introductory step to enter the analysis operation, to prevent personal bias when ordering data, recorded interviews and personal notes taken during the research were collected, reviewed and revised. Furthermore, in the stage of extracting meaningful data through open coding, the aim is to understand hidden concepts in interviewees' statements. Some concepts are taken from prior knowledge while some are invented by the researcher or mentioned by

participants and related to existing data. In this stage, approximately 35 concepts were extracted from interview texts. In the next stage, primary codes were converted into secondary codes due to their frequency (primary codes are placed in similar categories). Several secondary codes were transformed into one conceptual code. In Table (1), results of open coding based on secondary codes, conceptual codes and presented topics were provided.

Table 1: the results of open coding based on secondary codes

Row	Meaningful unit	Example witness	row	Meaningful unit	Example witness
1	Special focus on Indigenous Technology	The use of technology suitable with the political foundations of the people of Sistan	5	Economization of cultural attitudes (tourism)	Paying attention to the attractiveness of native houses in the region
		The use of technology suitable with social, economic and cultural foundations of the people of Sistan			Revitalization of traditional houses
		Compatibility of suitable technology with the culture of the people of Sistan			Using the driving force of tourism in the economic use of the local capital of the region, including housing
2	Creativity suitable for native houses of Sistan	Proposing creative strategies related to preserving indigenous values of the region	6	Attention to the driving forces of preservation and development	The use of tourism networks in villages through the link between the cultural attractions of native houses
		Using strategies suitable and compatible with rural settlements of Sistan			Revival and expansion of cultural, historical, and regional tourism features by considering vernacular houses
		Using the opinions of elites and experts about creative strategies in relation with preserving the indigenous values of the region			Attention to the role of people and using villagers' participation in reviving valuable fabrics and houses
3	Preserving indigenous culture of the region	Applying development strategies by responsible institutions	7	Expansion of local communities	Preparing suitable cultural and educational facilities for residents and improving the desired social and economic level of life
		Combining the strategies and policies in the form of a joint statement and adherence of the relevant organizations to their implementation			Reviving buildings by reviewing rural residents' needs
		Attention to the regional fabrics and native houses of Sistan in development plans			Suitable spatial unity through consistency and connection among discrete spaces of the region's texture
			8	Special attention to functional and physical spaces	

Row	Meaningful unit	Example witness	row	Meaningful unit	Example witness
		Establishment of a study center in order to identify issues such as the principles governing the native textures of the Sistan region	9	Lack of desire to change: the temptation of urbanization in the villages	Changing rural residents' view and preventing the tendency to urban life and especially urbanization
		Investigating and identifying how to respond to the values of native houses in new rural constructions			Preventing new aesthetic trends and urban life tastes among people
		Identification and maintaining the significance of the features of indigenous houses of the mentioned villages by relevant institutions in preserving their local values	10	Preventing the collapse of past values	Avoiding foreign values, such as Western culture, consumerism
4	Compatibility of new development plans with the basic principles and criteria in the village	Preservation of surrounding landscape and morphology	11	Typology of rural housing	Comprehensive studies on typology of rural indigenous housing
		Integrity and compatibility with cultural and natural texture			Emphasis on the economic, social, environmental, etc. towards native housing in Sistan
		Strengthening the sense of place and personal respect and credit to the village	12	Optimal and integrated rural management	Coherence and integrity of relevant organizations towards implementation of native development plans
		Simplicity and purity in design			Collaborative management in the village
		Predominance of historical background on new development plans			Preventing parallel work in organizations
		Using bottom-up approach and people's participation in development plans			

Source: research findings, 2022

Central coding is the second stage of data-based theory. The goal of this stage is to establish a relationship between the generated classes (in the open coding stage). This is done based on the paradigm model and helps the processing theory to be easily performed. Essentially, communication in central coding involves expanding and extending one of the classes. In this stage using major perspectives

or statements in the previous stage, main topics and concepts are extracted. Statements are commonly classified into larger information units called meaningful units. Meaningful units represent different dimensions and make it easier to provide textual explanations in the next stage. In this stage, 5 topics or concepts were extracted and their constituent concepts were identified (Table 2).

Table 2: main topics and concepts

Row	concepts	Meaningful unit
1	Preserving rural landscape	Lack of desire to change: tendency towards Urban life in villages
		Preventing collapse of past values
2	Principles of preserving the indigenous housing values towards development with a focus on native culture	Special attention to native technology
		Creativity suitable for native housing of Sistan
		Economizing the cultural attitude (tourism)

Row	concepts	Meaningful unit
		Preserving indigenous culture of the region
3	Interaction in preservation and revival of regional fabric and rural indigenous housing and cultural tourism in villages	Expansion of local communities
		Special attention to functional and physical spaces
		Attention to driving forces of preservation and development
4	Compiling the desired pattern of vernacular housing in the villages of Sistan	Compatibility of new development plans with essential principles and criteria in the villages
		Typology of rural housing
5	Cohesive and integrated management	Optimal and integrated rural management

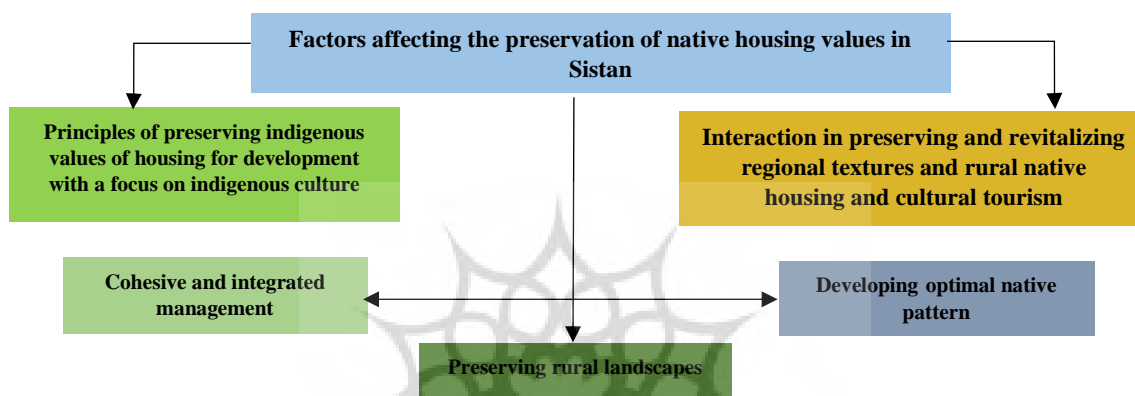


Figure 3: paradigm model of factors affecting the preservation of native values of rural housing in Sistan

According to Table (2), factors such as preserving rural landscapes, principles of preserving indigenous values of housing for development with a focus on native culture, interaction in preserving and revitalizing regional textures and rural indigenous housing, and cultural tourism in villages, developing a desirable model of indigenous housing in Sistan's villages, and finally cohesive and integrated management have been identified by experts.

Furthermore, using the Delphi method, each of the concepts and meaningful units were examined. In this regard, Kendall's coefficient of concordance was used to determine the level of agreement among panel members. Kendall's coefficient of

concordance is a scale for determining the degree of correlation and agreement among several rank categories related to N objects or individuals. In fact, this scale can be used to find the rank correlation among K sets of ranks. The value of this scale is equal to one when there is complete agreement or concordance and zero when there is no agreement. Schmidt provides a statistical measure for deciding whether to continue or stop Delphi rounds, which determines the level of agreement among panel members based on the value of Kendall's coefficient of concordance. Table (3) shows how various values of this coefficient are interpreted.

Table 3: interpretation of various values of Kendall's coefficient of concordance

W value	Interpretation	Confidence in ratio with factor order
0-0.19	No significant agreement	Very weak
0.2-0.39	Weak agreement	Low
0.4-0.59	Moderate agreement	Moderate
0.6-0.79	Strong agreement	High
0.8-1	Very strong agreement	Very high

Mere statistical significance of W coefficient is not enough to stop the Delphi process. A significant increase in this coefficient in two consecutive rounds indicates that the Delphi method should continue. The constancy or slight growth of this coefficient in

two rounds indicates that there has been no increase in member consensus and the polling process should be stopped. The numerical value of Kendall's coefficient in three stages of Delphi in this part of the research is presented in [Table \(4\)](#).

Table 4: the numerical value of the Kendall's coefficient of Delphi steps

Questionnaire		Preserving rural landscapes	Principles of preserving values of indigenous housing towards development with focus on native culture	Interaction in preserving and revitalizing regional textures and native housing and cultural tourism in villages	developing desirable pattern of rural native housing in Sistan's villages	Cohesive and integrated management
Questionnaire 1	Delphi steps	0.710	0.730	0.698	0.700	0.711
	Kendall's coefficient value	0.733	0.741	0.700	0.711	0.731
Questionnaire 2	Delphi steps	0.741	0.741	0.721	0.731	0.744
	Kendall's coefficient value	0.721	0.732	0.733	0.756	0.751
Questionnaire 3	Delphi steps	0.749	0.758	0.760	0.777	0.754
	Kendall's coefficient value	0.689	0.760	0.751	0.781	0.760

With the close proximity of the results of the second and third rounds and the slight difference in Kendall's coefficient, the Delphi test ended.

4.1. Delphi rounds of raised topics and meaningful units

In accordance with [Table \(5\)](#), in the first round of Delphi, questionnaires consisting of 5 topics were presented to experts. At the end of the first round, no new meaningful unit or topic was added to the questionnaire, and no topic or meaningful unit was removed. In the second round of Delphi, based on the results obtained from the first round, a questionnaire with 5 topics was designed for the second round. This

questionnaire was provided to experts along with the results of the first round. At the end of the second round, no new topic or meaningful unit was added and no topic or meaningful unit was removed. In the third round of Delphi: based on the results obtained from rounds one and two, a questionnaire with 5 topics was designed for round three, and at the end of this round, no new topic or meaningful unit was added. Finally, using Kendall's coefficient, consensus on all factors was observed. Due to consensus and no addition of new topics or meaningful units, the survey was completed.

Table 5: the results of triple rounds of Delphi for presented topics and meaningful units

Row	Topic	Meanful unit	Mean	First round agreement percentage	Mean	Second round agreement percentage	Mean	Third round agreement percentage
1	Preserving rural landscape	Lack of desire to change: tendency for urban life in villages	3.11	0.66	3.16	0.76	3.18	0.80
		Preventing the collapse of past values	3.16	0.76	3.19	0.82	3.21	0.85
2	Principles of preserving	Special focus on native technology	3.13	0.68	3.19	0.82	3.23	0.87

Row	Topic	Meaningful unit	Mean	First round agreement percentage	Mean	Second round agreement percentage	Mean	Third round agreement percentage
	indigenous housing values towards development with a focus on native culture	Creativity suitable for indigenous housing in Sistan	3.14	0.79	3.17	0.77	3.20	0.84
		Economizing cultural attitude (tourism)	3.03	0.62	3.11	0.65	3.15	0.70
		Preserving regional native culture	3.12	0.77	3.15	0.81	3.17	0.82
3	Interaction in preserving and revitalizing regional texture and rural native housing and cultural tourism in villages	Expansion of local communities	3.11	0.66	3.16	0.76	3.12	0.77
		Special attention to functional and physical spaces	3.10	0.72	3.13	0.79	3.14	0.80
		Attention to driving forces of protection and development	3.17	0.77	3.19	0.78	3.20	0.88
4	Developing desirable indigenous pattern of housing in Sistan's villages	Compatibility of new development plans with essential principles and criteria in the villages	3.17	0.72	3.20	0.82	3.23	0.91
		Typology of rural housing	3.16	0.71	3.21	0.86	3.25	0.88
5	Cohesive and integrated management	Optimal and integrated rural management	3.05	0.61	3.10	0.63	3.16	0.71

In the following, (FARAS + FKOPRAS) models were used to rank the level of importance of each of

the factors. The final results can be observed in [Table \(6\)](#).

Table 6. the results of ranking factors affecting the preservation of indigenous rural housing values towards revitalization of rural settlements

Factors	(Q_L)	(Q^{MAX})	(Q^{MIN})	Difference between (Q^{MAX}) and (Q^{MIN})	Score out of 100
Preserving rural landscapes	13.321	14.334	12.453	1.881	72.23
Principles of preserving native housing values towards development with a focus on native culture	14.445	15.686	13.334	2.352	72.66
Interaction in preservation and revitalization of regional texture and rural native housing and cultural tourism in villages	14.334	15.554	13.145	2.409	72.70
Developing optimal native housing pattern in Sistan's villages	14.556	15.765	13.453	2.197	72.76
Cohesive and integrated management	14.223	15.334	13.098	2.236	72.59

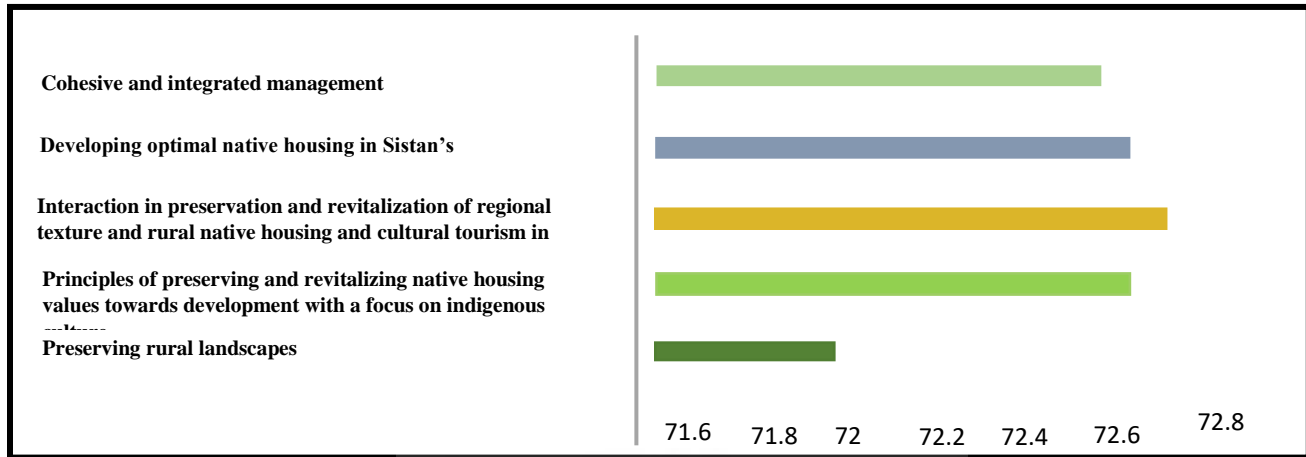


Figure 4: the degree of importance of each of the factors affecting the preservation of rural native housing values

According to [Table \(6\)](#) and [Figure \(4\)](#) among the mentioned factors, developing the optimal native housing pattern in Sistan's villages with a value of 72.76, interaction in preserving and revitalizing regional texture and rural native housing and cultural tourism in villages with a value of 72.70, principles of preserving indigenous housing values towards development with a focus on native culture with a value of 72.66, cohesive and integrated management with a value of 72.59, and preserving rural landscapes, had the most and the least degree of importance in preservation of rural indigenous housing values in Sistan region, respectively. In the following, based on storytelling, each of the factors was explained in accordance with their importance from the point of view of experts.

4.2. Developing the optimal indigenous housing pattern in Sistan's villages

Same as all parts of our country, indigenous housing in Sistan has been built according to climatic conditions and facilities provided to architects by environment. Maximum use of natural energy and minimum use of fossil energy can be mentioned as one of the principles of indigenous architecture, which is evident in Sistan region. Native architects of Sistan have used the dominant climatic phenomenon of the region, that is, the 120-day winds of Sistan, in the best possible way. The direction of these winds is from northwest to southeast. The impact of these winds on moderating the heat conditions in the region is to such an extent that it has affected the physical orientation of the native settlements in the region and the wind flow can be directed into the residential houses through special wind deflectors called kolak ([Fazelnia et al., 2016, p. 7](#)). Therefore, one of the important factors in preserving the indigenous values of rural housing in Sistan is the typology of indigenous housing in this region.



Figure 5: orientation towards southeast, i.e., against the wind direction



Figure 6: An example of indigenous housing in studied villages

In this regard, some experts stated that, given that recent construction in rural areas of Sistan has been shaped by emulating urban housing, and this trend continues, recognizing rural housing types can lead to designing rural indigenous housing in contemporary architecture of Sistan. Additionally, according to experts' opinion, compatibility with basic principles and criteria in Sistan's villages is another effective factor in preserving indigenous values of Sistan's housing. Thus, it is necessary to preserve the perspective and morphology of the region's fabric and create coherence and compatibility between cultural and natural texture. Furthermore, historical aspects of these houses should be given more attention in rural guide plans and by using a bottom-up approach and people's participation, strengthen the sense of place among rural residents.

According to other experts, the management plans implemented in villages, such as rural development projects, have been carried out with a superficial view of urban structures without considering the environmental, climatic, cultural, and identity features of the villages and with the slogan of better

and easier living. The use of new materials and building regulations with an urban perspective has brought about significant changes in the organic structure of villages, including regional fabric and indigenous architecture. By changing the mindsets of rural residents about their place of life, rural landscapes have been pushed towards becoming indistinguishable from urban areas, which has paved the way for the elimination of identity and cultural components of villages. In this respect, to preserve the indigenous values of Sistan housing, it is necessary to put aside plans for standardizing rural housing in Sistan region.

4.3. Interaction in preserving and revitalizing indigenous rural housing fabric and cultural tourism

This factor was identified with the following meaningful units: development of local communities, special attention to functional and physical spaces, attention to driving forces of protection and development. Several experts have acknowledged that:

Without considering culture and society, it is impossible to achieve preservation and revitalization

of Sistan's indigenous habitats. Also from the other expert's perspectives, we can only expect to preserve indigenous values in rural areas when people are considered as key components in revitalizing regional texture. Additionally, suitable cultural and educational facilities should be provided for rural residents to preserve Sistan's endemic housing values and alongside that create desirable economic conditions and quality of life for people. According to another expert's opinion, detailed study should be conducted towards local residents' needs to preserve Sistan's indigenous housing values.

4.4. Principles of preserving indigenous housing values for development with a focus on native culture

Cultural conditions and values are considered the dominant factor in shaping spaces. Culture dominates all areas, and economy has a lower position. Development based on indigenous culture, by giving importance to local and national values, should be able to respond to the spiritual and material needs of its society through cultural and social planning, so that, ideas, thoughts, and native customs can be presented in the form of symbolic cultural communications and native symbols (Azad & MirHashemi Roteh, 2016). Some experts suggested that appropriate technology is one of the essential requirements for developing indigenous housing based on endemic culture. From their point of view, the more technology is compatible with the social system of Sistan's rural community, the more indigenous culture is strengthened. This also leads to a reduction in culture disintegration in rural society. It also provides living conditions for residents' welfare. Another expert also acknowledges that evaluating rural guide plans in terms of their impact on valuable rural fabric in economic and social dimensions is very important to preserve indigenous housing values. Therefore, Sistan's regional texture and its indigenous housing should never be considered as a conflicting system with changes and transformations in the entire Sistan rural system, while it should act oppositely.

4.5. Cohesive and integrated management

From the experts' point of view, developing a cohesive and integrated management is another significant factor in preserving the indigenous

housing values of Sistan. Lack of organizational coherence is observed during implementation of many development plans in villages including the villages of Sistan region. This occurs in a way that, organizations follow their goals and procedures without considering other organizations. Lack of organizational coherence causes the majority of development plans to encounter serious challenges. Development plans related to preserving local values, including rural renovation and improvement, are not without these challenges.

4.6. Preserving rural landscapes

This factor was identified with the following meaningful units: lack of desire to change, orientation to urban life in villages, preventing the collapse of past values. In this regard several experts acknowledged that:

One of the most important factors that causes the change in rural identity characteristics, is the change of view of rural residents and their orientation to urban life, especially urbanism. The desire to change the village to the city, has transformed the structure of Sistan's housing. As a result, we can talk about preserving the native values of Sistan's houses in the direction of revitalizing rural settlements, if the people of Sistan's villages do not turn to new aesthetics by looking at the natural elements and without considering urban life. Also, rural development plans, including the rural guide plans, should be effective in this change of perspective.

5. Discussion and Conclusion

The present study was conducted to investigate the following questions: what are the factors affecting the preservation of indigenous values of rural housing in Sistan in regard with revitalizing rural settlements? Which of the mentioned factors is the most important? According to the obtained results, the effective factors in preservation of indigenous values of rural housing of Sistan in regard with revitalizing rural settlements include: *principles of preserving indigenous housing values towards development with a focus on native culture, interaction in preservation and revitalization of regional fabric and rural indigenous housing and cultural tourism in villages, developing optimal native housing pattern in Sistan's villages and finally the cohesive and integrated management.*

In order to revitalize rural settlements with an emphasis on preserving indigenous values, both rural settlements' requirements and historical texture of these houses should receive special attention by native housing architecture. Driving force of cultural tourism is one of the most important tools to revitalize the housing in Sistan region. This factor is consistent with the present study (Azad & Mirhashemi Roteh, 2016).

This approach pays attention to revitalization and improvement of the quality of life in villages through betterment and development of special features of historical values and cultural attractions of houses. On the other hand, fundraising improves the economic growth and creates changes in management that dynamizes and revitalizes the regional fabric and native housing. The use of this culture-based approach requires to identify the characteristics of native houses of Sistan. This approach leads to interaction between revitalization and tourism and it also provides grounds for the development of these areas. The results also indicated that, the values of rural housing in Sistan can be preserved when the regional fabric and indigenous architecture of the area are kept away from any improper management policies, external factors, and neglect of internal development. Special attention should be paid to the cultural and identity components of the village and their connection to rural livelihoods and economic levels as identity symbols. This process continues until the landscape of villages such as Qaleh Now, Deh Arbab, and Deh Now Piran presents a sign of their own identity in the form of rural development plans. The result of implementing these factors, including cohesive management and changing the mindsets, is a landscape of villages that has a connection with old structures and regional fabric in all housing components, presenting a rural landscape to viewers. Finally, according to conducted studies, one of the most significant strategies of recognizing the native values of Sistan is to identify the effective factors in preserving the native housing values in the villages of the region, which still preserves a significant part of traditional structure despite the passage of time and the general domination of modernism. Accordingly, the results obtained from this research

are different from other studies. Firstly, the effective factors in preserving the indigenous housing values of Sistan were presented towards revitalizing rural settlements based on experts' experiences in this field. They can help preserve native values by considering the importance of each factor according to FUZZY COPRAS and FUZZY SWARA models. Therefore, the factors obtained in this study can be used as general principles and foundations for planning, designing, constructing and implementing rural housing of the villages of Qaleh Now, Deh Arbab, and Deh Now Piran, based on lifestyle, local residents' needs, regional texture and ultimately traditional architecture. Additionally, by examining each topic and meaningful unit based on Delphi method in three rounds, it is possible to develop a desirable model for effective factors in presenting indigenous housing values in Sistan towards revitalizing rural settlements.

Also, according to the obtained data, it can be said that, despite the occasional efforts to implement traditional and endemic patterns in some rural houses of Sistan, due to the lack of indigenous written and conceptual criteria, houses are observed that are lacking standard criteria and required conditions and merely follow the physical and shape patterns that do not have much depth and durability. Hence, one of the most important solutions for recognizing the indigenous values of Sistan is to identify the effective factors in preserving the traditional housing values in rural areas of this region, which despite the passage of time and the general influence of modernism, still preserves a significant part of its traditional structure and transfers it to new generations. And finally, in line with the obtained results in qualitative and quantitative parts, the following solutions were suggested in order to preserve the indigenous rural housing values of Sistan:

- To achieve the best way of preserving the cultural identity and indigenous housing of this region, basic studies and practical design must be carried out to promote the development of the studied villages, maintain the continuity of Sistan's indigenous architecture on a large scale, and protect it.

- Conducting scientific studies to prevent the destruction of indigenous habitats and establishing a desirable indigenous housing pattern in Sistan is considered the main strategy.

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Authors' contributions

The authors equally contributed to the preparation of this article.

Conflict of interest

The author declares no conflict of interest.

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مجموعه عوامل مؤثر در حفظ ارزش‌های مسکن بومی و بافت منطقه‌ای سیستان در راستای احیاء سکونتگاه‌های روستایی

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چکیده مبسوط

۱. مقدمه

می‌پذیرد. هدف از توسعه در واقع تأمین نیازهای اجتماعی انسان در محیط است، و از این منظر توسعه ضروری است که بی‌توجهی به بستر مصنوع و فرهنگ به‌عنوان محمولات تعامل با طبیعت، در واقع هویت مکان به‌عنوان پیش‌نیاز زندگی اجتماعی را از بین برده است. لذا با توجه به مفهوم توسعه که بیان شد، می‌توان احیای بافت اصیل روستایی را گامی در جهت توسعه نیز دانست. البته این رویکرد مفاهیمی مانند بهسازی، نوسازی، توانمندسازی و روان‌بخشی بافت را نیز در بر می‌گیرد. بنابراین حفظ و احیای بافت با ارزش، به‌عنوان یکی از اصلی‌ترین رویکردها در حفاظت ارزش‌ها و توسعه، تحلیل دقیق منطقه هدف، و تطابق آن با ساختارهای اجتماعی، اقتصادی و زیست‌محیطی را دنبال می‌کند.

۳. روش‌شناسی تحقیق

روش تحقیق در پژوهش حاضر از نوع کیفی-کمی بوده و جامعه آماری در این پژوهش شامل دو بخش است: بخش اول: متخصصین و دانش‌آموختگان رشته معماری تشکیل داده‌اند که نمونه‌گیری از میان آن‌ها به‌صورت هدفمند (تا زمان به اشباع رسیدن نتایج) انجام شده است، که تعداد ۲۰ نفر به‌عنوان جامعه نمونه در این بخش تعیین شدند. بخش دوم نیز شامل: روستاهای قلعه‌نو، ده ارباب، ده نو پیران می‌باشد. دلایل انتخاب این سه روستا به دلیل معیارهای ذیل بود:

- عناصر با ارزش و مطرح معماری مسکونی این سه روستا بر اساس مؤلفه‌های بومی منطقه و با در نظر گرفتن نیازها و اولویت‌های ساکنان شکل گرفته‌اند.

معماری بومی هر منطقه تحت تأثیر شرایط اقلیمی، جغرافیایی و فرهنگی آن منطقه به وجود آمده و بیانگر قرن‌ها تجربه در استفاده بهینه از مصالح، روش‌های ساخت و ملاحظات اقلیمی می‌باشد و به‌نوعی مهارت سازندگان ابتدایی در مواجهه با مشکلات اقلیمی و توانایی آن‌ها در استفاده از حداقل منابع برای آسایش حداکثری است. در این بین، بی‌توجهی به این مسئله می‌تواند باعث از بین رفتن این نوع معماری و همچنین فراموشی تجربه‌های معماران بومی شود، در معماری بومی سیستان همواره راهکارها و شیوه‌های ارزشمندی در جهت فراهم کردن شرایط زندگی مناسب در مسکن روستایی مطرح شده است. با بازشناسی و شناسایی عوامل مؤثر در حفظ ارزش‌های بومی مسکن بومی در این منطقه، می‌توان روحی تازه به فرهنگ معماری امروز (منطقه سیستان) که شاید به شکل یک جسم در حال فرسایش پیش روی چشم هر پژوهشگر است دمید، و در درازمدت شاهد تغییرات مثبت در جنبه‌های مختلف فرهنگی، احیای ارزش‌های انسانی و معنوی و ... باشیم.

۲. مبانی نظری تحقیق

حفظ معماری مسکن روستایی فرایندی جامع و یکپارچه است که به تحلیل مشکلات مسکن پرداخته و از طریق پیشرفت وضع اقتصادی، کالبدی، اجتماعی، و زیست‌محیطی، سبب احیاء و توسعه همه‌جانبه مسکن و بافتها می‌شود. در این راستا، توسعه در روستاهای واجد ارزش با ایجاد بستر فرهنگی و برگرفته از ویژگی‌های بوم صورت

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ارزش‌های مسکن بومی در روستاهای این منطقه است که علیرغم گذشت زمان و استیلای عمومی نوگرایی (مدرنیسم)، همچنان بخش اعظمی از ساختار سنتی خود را حفظ نموده است. بر این اساس، نتایج حاصل از این پژوهش با سایر پژوهش‌های دیگر متفاوت است، در درجه اول عوامل مؤثر بر حفظ ارزش‌های بومی مسکن سیستان در راستای احیاء سکونتگاه‌های ارائه شد که به نمایه تجربه متخصصان در این حوزه بوده و می‌توانند با توجه به ارزش و اهمیت هر یک از عوامل با توجه به نتایج مدل‌های (کوپراس فازی و سوارا فازی)، در حفظ ارزش‌های بومی کمک شایانی کنند. بنابراین عوامل به‌دست‌آمده در این پژوهش می‌توانند با توجه به سبک زندگی، نیازهای ساکنین محلی سیستان، بافت منطقه‌ای و درنهایت معماری بومی مسکن روستایی به‌عنوان مبانی کلی و پایه‌ای در برنامه‌ریزی، طراحی، ساخت و اجرای مسکن روستاهای (قلعه‌نو، ده ارباب، ده نویران) مورد استفاده قرار گیرد. همچنین می‌توان با توجه به بررسی هر یک از مقولات و واحدهای معنایی بر اساس روش دلفی در سه راند، به تدوین الگوی مطلوب عوامل مؤثر در حفظ ارزش‌های مسکن بومی در سیستان در راستای احیاء سکونتگاه‌های روستایی دست‌یافت.

درنهایت در راستای نتایج به‌دست‌آمده در بخش کیفی و کمی، راهکارهای ذیل به‌منظور حفظ ارزش‌های بومی مسکن روستایی سیستان پیشنهاد شد تا:

- برای رسیدن به بهترین شیوه و حفظ هویت فرهنگی و مسکن بومی این منطقه بایستی مطالعات پایه و طراحی کاربردی انجام گردد تا ضمن آبدانی توسعه روستاهای مور مطالعه و تداوم تاریخ معماری بومی سیستان به‌صورت گسترده شکل گرفته، و حفاظت شود.

- انجام مطالعات علمی برای پیشگیری از انهدام مسکن بومی و برقراری الگوی مطلوب بومی مسکن سیستان به‌عنوان عمده‌ترین استراتژی مورد توجه قرار گیرد.

کلیدواژه‌ها: ارزش‌های بومی، مسکن، سکونتگاه‌های روستایی، الگوی سنتی و بومی، سیستان.

تشکر و قدردانی: مقاله برگرفته از رساله دکتری نگارنده اول به راهنمایی و مشاوره نگارندگان دوم و سوم با عنوان «بازشناسی مفاهیم بومی معماری مسکونی در شکل‌دهی مدل مداخله روستایی (منطقه سیستان)» است.

- دسترسی آسان به روستاها و ویژگی‌های مشترک معماری در این روستاها.

پژوهش حاضر از نظر روش‌شناسی، به دو بخش عمده تقسیم شده است؛ در بخش اول اختصاص به استخراج مفاهیم ارزش‌های بومی مسکن بومی دارد و از رویکرد نظریه زمینه‌ای یا داده بنیاد، که از رویکردهای راهبرد کیفی می‌باشد. استفاده شده است، و پس از شناسایی مقولات و واحدهای معنایی با استفاده از روش دلفی به بررسی هر یک از آن‌ها در سه راند دلفی پرداخته شد. در بخش دوم اختصاص به رتبه‌بندی هر یک عوامل با استفاده از مدل‌های (FARAS + FKOPRAS) می‌باشد.

۴. یافته‌های تحقیق

در این قسمت از پژوهش به‌منظور شناسایی مجموعه عوامل مؤثر در حفظ ارزش‌های بومی مسکن بومی و بافت منطقه‌ای سیستان در راستای احیاء سکونتگاه‌های روستایی اطلاعات مورد نیاز از نظر خبرگان استخراج شده است. مصاحبه‌ها (بین ۶۰ تا ۹۰ دقیقه) ضبط و یادداشت و بلافاصله پیاده می‌شد تا با مرور چندباره گفتگوها، تحلیل و بررسی دقیق‌تری نسبت به دیدگاه‌های خبرگان انجام شود. در ابتدا، در مرحله مرور بازنگری که در حکم مقدمه‌ای برای ورود به عملیات تحلیل محسوب می‌گردد، برای جلوگیری از داوری شخصی در هنگام ترتیب داده‌ها، مصاحبه‌های ضبط‌شده، یادداشت‌های شخصی که در طی تحقیق توسط پژوهشگر انجام می‌شد، جمع‌آوری و مورد بازنگری و اصلاح قرار داده شد. در ادامه نیز در مرحله استخراج داده‌های معنایی کدگذاری باز: هدف درک مفاهیم مستتر در گفته‌های مصاحبه‌شونده است. نام برخی از مفاهیم از دانش پیشین گرفته شده و نام برخی مفاهیم ابداع شده توسط پژوهشگر و یا ذکر شده توسط مشارکت‌کنندگان و معطوف به داده‌های موجود است. در این مرحله به‌طور کلی حدود (۳۵) مفهوم از متون مصاحبه استخراج گردید. در مرحله بعد، کدهای اولیه به علت فراوانی آن‌ها به کدهای ثانویه تبدیل شد (کدهای اولیه در قالب طبقه‌های مشابه قرار می‌گیرند). چند کد ثانویه تبدیل به یک کد مفهومی می‌شود. نتایج کدگذاری باز بر اساس کد ثانویه، کدهای مفهومی و مقولات ارائه شده است.

۵. بحث و نتیجه‌گیری

بر اساس مطالعات صورت گرفته یکی از مهم‌ترین راهکارهای بازساخت ارزش‌های بومی سیستان رجوع به شناسایی عوامل مؤثر در حفظ

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