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Recognizing and Determining the Existence Reason and Functional Role of Senasir in the Historical Context of Bushehr

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Abstract

Statement of the Problem: Our past architecture has always fulfilled needs of its users, displaying it in the form of architectural elements with various features. It seems that today, in order to solve many problems, these elements can be used and recreated. It should be said that in order to recreate these elements, we need to have a precise recognition of the role and function of these elements. In previous studies, these roles were not explicitly and accurately described in relation to an element of the vernacular architecture of Bushehr, known as Senasir. **Objectives:** Unlike previous studies, in this research, we try to investigate different dimensions of Senasir in order to find the roots and the reasons for the existence of Senasir to recover it, because the restoration of this kind of elements is necessary to solve many of our problems today, such as excessive energy consumption in order to reduce and adjust the environmental conditions in a warm and humid climate and the problems of equalization in different regions of our country. **Methodology:** For this purpose, the method of library research, field research and stating rational reasons (reciprocating-intuitive arguments) are used to identify the main role of Senasir and express the contradictions in previous researches and implicit functions of Senasir.

Conclusion: In this regard, it should be mentioned that in most of the previous studies, Senasir has been defined as a space for the use of windflow and space for living, but in this research, hypotheses are expressed and proved by rational reasoning indicating that it has not been a place or location to spend time or to do something in which the comfort conditions are of importance, but it has been an element providing the use of maximum airflow in the 6-door and 5-door rooms as well as safety and preservation of privacy. In this research, it has been argued that there are other benefits, such as shading on the wall and the central courtyard, or the interface between the upper floor spaces, etc., but none of them was the main reason for the creation of Senasir, but there were benefits for the inhabitants of the house along with the main performance of Senasir, as stated above.

Keywords

Senasir, Vernacular architecture, Bushehr, Climate, Historical context.

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Introduction and Statement of the Problem

The vernacular architecture of Iran has valuable features and potentials, which today, as such, these features and potentials are not used, one of the reasons is the unknown nature of this architecture and its constructive elements. For this reason, it seems that recognizing and determining their functions will help us reuse these elements and allow them to be created and reused to solve today's problems. In connection with this research, it should be noted that Bushehr is one of the provinces with a certain type of architecture along with unlimited potentials. Bushehr with a special coastal context in southern Iran has a global value, and this historic-cultural value is dependent on the vernacular architecture and naturalistic urbanism of this urban context has made it a work of art. The physical structure of the historical context of Bushehr has been shaped over time with the expansion of the city, and the spaces and elements of the city have been deployed in their proper place (Amiri, Pourmohammad and Karimi, 2017: 1). In fact, we can say that with the advent of Nadir Shah Afshar¹, the new history of Bushehr began. Nader and his maritime policy to increase his authority in the Persian Gulf led the city to once again be considered, which is most likely the movement of the city from the Rishhar area to its current position has taken place at this time (Gholamzadeh, 2014: 12). The subject of this research refers to areas that have been built since this time on the Bushehr peninsula. At the time of Karim Khan Zand², the chaos of the death of Nader Shah in Bushehr ended, and Bushehr was considered again. With the advent of Qajar dynasty, Agha Mohammad Ghajar Khan, not only it did not lose his importance, but it became one of the most important commercial, cultural and political centers. Besides, all the major governments of that time in Bushehr have had offices and important businessmen have been doing business there. In fact, this city was the southern gateway of Iran for trading and interacting political thoughts and cultural relations, and most of the buildings in the historical context of Bushehr can be related to these two

periods (Zand and Qajar) (Gholamzadeh, 2014: 13). The remaining monuments in Bushehr's historical context have very valuable elements that each of these elements seems to be multidimensional and multi-functional and should not be considered from one dimension. One of these elements, which is well known in the Bushehr architecture, and also refers to the subject of this article, is "Senasir", which has various functions. After studying previous studies related to this particular element, we concluded that all its dimensions and functions have not been investigated and the priority of their functional significance has not been accurately identified and expressed. Consequently, in this article, the roots of these contradictions and shortages as innovations of this article are discussed and the hypotheses are expressed based on the root of the contradictions found in previous studies and the existing realities in relation to Bushehr architecture and climate of this area are in other dimensions of architecture, such as culture, religion, etc., which once again proves architecture as an active and fluid phenomenon, and it shows that users of this kind of architecture felt a need anywhere (whether in terms of climate or culturally, etc.), they used different methods of production.

Goals and Research Methodology

In this research, the goal is to recognize the existential cause of Senasir so that a step towards identifying the role and function of this element of Iranian architecture can be taken, reconstructed and reused in contemporary buildings. Since scientific research is based on methodology and one of the methods used in scientific research is to provide hypotheses based on previous research, also in relation to snasir many researches have been carried out by researchers related to the phenomenon of Senasir. In the present researches, the hypotheses or propositions about the scientific relationships are discussed first, and then their test is presented (Barati, 2014: 19). Due to the human-environmental relationship, architectural research, especially our traditional and

climatic architecture, is in the category of research based on intuitive-reciprocal methods (Eini far, 2016). In fact, it can be said that at first the act of observation and then the statement of rational reasons are made in the form of statements and theories. That's why there are many contradictions between opinions and votes. In this article, by choosing Senasir as one of the unique and beautiful elements of the vernacular architecture of Bushehr, we examine the contradictions between the stated theories and the facts in relation to this architectural element.

Accordingly, climatic and weather conditions of Bushehr are first introduced. Then, using the library research method and observation method, as one of the methods for collecting information (Barati, 2014: 125), we introduce Senasir and review the previous studies. After expressing previous studies, criticizing these researches and the verification of the authenticity of the existence reason of the Senasir and the prescribed functions are carried out, and then, by expressing the arguments and rational reasons, we attempt to identify and express the main role of Senasir and to prioritize other roles of it as well, because it seems that some of the features proposed for the Senasir were not accurate and the researchers sought to prove the five principles of traditional Iranian architecture. The methodology of this research is based on library studies, observation and Intuitive-reflective arguments based on them. Finally, as the innovation of this article, we respond to the concept of Senasir, and that it is not just a climatic element, and other reasons other than the climate have played a key role in shaping Senasir.

Literature Review

Hamidi (2001: 236) described this term in his "Bushehr Dictionary", Senasir which is shenashil in Arabic, is a shuttered wooden balcony front of the windows of the upper floors of the houses. Senasir is usually a shuttered wooden, overlooking the courtyard or alley.

Gholamzadeh (2014: 20), in the book "Bushehr Architecture in the Zand and Qajar Period",

examined most of the buildings in Bushehr as the case study, and accepted Hamidi's definition, and added that these wooden balconies (Senasir) are built on the front side (courtyard) and the outer (alley) to easily access various spaces of the building and to create shadows, open spaces and air draft, and a beautiful style of the body buildings are protruding. Wooden frames are fixed and movable shutters, for hijab and shading are other features in Bushehr's buildings. One of the important features expressed in connection with the study is the creation of an intimate communication both inside and outside the home with the preservation of privacy (Hedayat and Eshrati, 2017: 49), which in fact links public life to private life, in other words, Senasir has created a connection between extroversion and introversion in the old buildings of Bushehr (Dehdashti and Bashati, 2015: 1). This was the factor that increases the security of urban spaces (Hedayat & Eshrati, 1959: 45). Memarian (1997: 100), in the book "Understanding Iranian Residential Architecture (Introspection Specification)" divided Senasir into two types of roofs and without roofs, and said that Senasirs are usually located in one or two external fronts of the building and on one, two, three or four internal fronts. A Senasir is used to connect the space between two rooms or two sideways to each other and ease of use. The height of the Senasir is the same level of the floor of the upper floor and allows the passage as a corridor.

Therefore, one of the functions of Senasir is the motor communication between the various spaces in the upper classes (Fallah Far, 2008: 16). Ranjbar, Pour Jafar and Khaliji (2010: 29) in a paper titled "Creativity of climate design appropriate to the wind flow in the old context of Bushehr", with the study of wind, these elements suggest that in addition to the awning windows, specific elements such as Senasir and tarme are shaped to better utilize shadows and winds in the body of urban spaces, and the presence of these elements is specific to the use of wind.

Azam Hedayat and Seyedeh Marzieh Tabaeeyan (2013: 44) in a table, state Senasir user to create

shadows on awning windows, frames and light refinement, the possibility of double-sided ventilation, use as a communicative gateway and access to the rooms, make the appearance of the room in the courtyard and the sky and vice versa, and that it contains the components of the floor, body, roof and decorations, as well as explanations like the definitions of Gholam Hossein Memarian.

On the other hand, these wooden reticular elements prevent the direct entry of sunlight into the interior of the house (Parsaee, 2015: 375; Aljofi, 2005: 818; Yeomans, 2006: 182; Etman, 2013: 460). Somayeh Dehdashti and Amin Rousayi (2015: 1) also referred to the concept of Senasir as one of the architectural elements of the old buildings of Bushehr, in a paper entitled “Investigating the performance and methods of constructing a Senasir in the old buildings of Bushehr.” In fact, this climatic activity links public life to private life, in other words, it has created a connection between extraversion and introversion in the old buildings of Bushehr. SSenasir is a semi-open space used as a wooden terrace to shade on the exterior awning windows of the western wall of the buildings. In addition to shadowing on awning

windows, these shadows are considered as traditional architectural archetypes of Bushehr. Moreover, due to the warm and humid climate of Bushehr, Senasirs provide wind flow through the wooden lattice walls from the outside into the building, as a result, the effect of the wind flow reduces the heat, moisture and comfort of the inhabitants of the building.

Reducing humidity in a warm and wet climate by controlling the air flow and directing it to the interior spaces are of other climatic functions of Senasir, which Fathi refers to in his book “Natural Energy of Vernacular Architecture” (Fathy quoted from Hedayat, Eshrati, 2017: 43; Masoudinejad, Zarbakhsh and Rezaei Mirahadeh, 2017: 1);(Diagram 1).

Theoretical Foundations

- An investigation of the role of Senasir

Senasir (senasil) is one of the beautiful elements and the vernacular architecture index of Bushehr. First of all, it should be noted that in the traditional architecture of Bushehr there is another element called tarme, whose structure and function are completely different. Tarmes are spaces that were created by

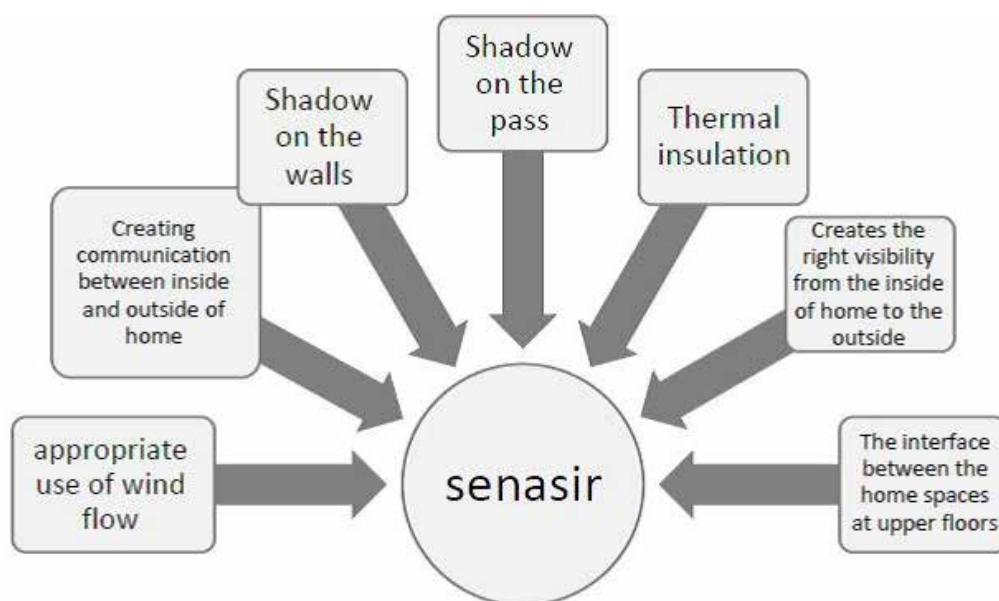


Diagram 1. Types of known roles for Senasir. Source: authors.

retreating in the walls of the houses, and at warmer years, it was a place to rest that the functions of these two elements should not be expressed together.

In previous studies, in relation to the existential nature of Senasir, each researcher has studied it only from one dimension, which are mostly climates that in order to express them first we have to know the climatic conditions of the Peninsula of Bushehr. It lies within the warm and humid climate of Iran and ,according to the different regions, can be divided into: a) internal regions with high heat and low relative humidity; b) coastal areas with high temperature and high relative humidity.

Coastal areas: The features of this area include moderate weather and short winter rainfall and long periods of drought and severe hot weather

in summer. In the coastal areas like Bushehr, the temperature difference between the night and day and seasons is low due to the proximity to the sea, because the moisture from the Persian Gulf prevents decreasing the temperature in winter and excessive increase in summer. As a result it creates a sultry, which together with a relatively high temperature makes difficult conditions for the inhabitants of Bushehr (Kushok, 2006: 27). In the annual table of the Meteorology Organization, it can be seen that in the warmest months of the year, the temperature of the peninsula of Bushehr is not higher than 34 degrees, which, in terms of temperature, compared to the central regions of the plateau of Iran are closer to the index of comfort temperatures. In fact, it can be said that the factor



Fig. 1. Senasir (Archives of Documentation Center of the Directorate General of Heritage, Handicrafts and Tourism of Bushehr Province).
Source: authors.

that makes living conditions in this region difficult is sultry and over-humidity. This moisture prevents the evaporation process on the surface of the skin and thus prevents the cooling of the body and makes it very difficult to tolerate the heat of the area. In previous studies, the existential reasons for this architectural element (Senasir) are important in the following order (this is a functional division of the writers of this paper): 1. Use of the Senasir to take advantage of the wind stream (Fathy quoted from Hedayat and Eshrati, 2017: 47; Masoudinejad, 1959: 5; Azham Hedayat and Saydeh Marzieh Tabaeyan, 2013: 1). 2. Establishing the relationship between the interior and exterior of the houses (semi-interiors of the Bushehr houses) with preservation of privacy (Hedayat & Eshrati, 2017: 49). 3. Use of Senasir to shade on the exterior and interior walls of the center yard with light purification (Parsae, 2015: 375; Aljofi, 2005: 818; Yeomans, 2006: 182; Etman, 2013: 460; Gholamzadeh, 2014: 20; Mohammadi, 2013: 53). 4. The operation of Senasir as a thermal insulation (Zangoei & Turkman, 2014: 3). 5. Creating an appropriate vision for residents and inhabitants of the house toward the sea (Dehdyshti & Rosae, 2014: 1). 6. Shadowing on the passage in the warm summer days. 7. The interface between the spaces of the house in the upper floors (Memarian, 1997: 100; Hedayat, 2013: 35; Fallah Far, 2008: 16).

According to the matters discussed in relation to the climate of Bushehr peninsula, previous researchers should have the right to know that the most important reason for the existence of a Senasir is the use of wind and air conditioning in this space, and to say that Senasir provides a suitable environment for living. In order to investigate this hypothesis, we should first of all know about the characteristics of the local winds of Bushehr, because the most important factor of the climate that affects the condition of the ventilation is regional wind.

The regional wind is due to the difference in atmospheric air pressure, the heterogeneous distribution of solar radiation energy and its temperature, and the differences in air density.

Flowing air from a high pressure point to a low-pressure point, known as the torsional effect or the effect of Coriolis, results from the exploration of the earth, the topography of the earth, and the distribution of water and land. These winds are hundreds of meters above the Earth's surface, so that wind speed increases slowly with increasing altitude and low temperature variations. Near the surface of the earth, even flat lands due to the collision with the earth and the presence of friction with vegetation, the wind speed has decreased and the wind movement is high (Ranjbar. 2011: 20). This variety of winds due to the disputed position of the Bushehr peninsula has provided for clever use to reduce the effects of humidity and heat in urban and residential spaces. By studying the plans of the Bushehr Houses, we find that the Senasirs are in most cases in a direction in front of the wind and air flow. 48% of the outer Senasirs are westward and sea, 26% north, 22% southward and only 4% eastward (Hedayat & Eshrati, 2017: 56);(Fig. 2).

Now, if we look closely at the Senasirs, we conclude that there are contradictions that may be dismissed by the hypothesis that the Senasir due to the proper ventilation is a good environment for spending time in the hot summer period, the reasons for which are stated below.

Senasir is a cultural and identity element, not just a climatic one:

The first reason: when we look at the dimensions of

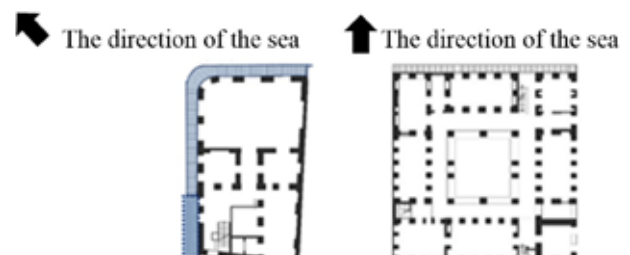


Fig. 2. Location of the Senasir in the house plan and its orientation towards the sea (pictured on the right) the plan of the Tabib mansion, (left photo) The Tabib hospital plan. Source: authors.

the Senasir in Bushehr houses, we find that rarely the width of these spaces exceeds one meter, and in most of the remaining buildings such as Taheri mansion, Golshan mansion, Tabib Mansion, etc. the Senasir is as wide as the shoulder so that it is simply not possible to cross or sit, while the length of the Senasir sometimes reaches even twenty meters, which these proportions seem unusual and irrational for the environment in which a lot of time is spent (Fig. 3).

Second reason: Another interesting point that can be said is that the Senasirs are located on a side of the building where we see a lot of awnings (windows) in that front. On the other hand, the presence of Senasir itself prevents the entrance of the wind into the house at its full power, and the construction of a Senasir with movable blades that when blown they

become horizontal is itself evidence of this claim and an appropriate response to solve the problem, that we repeatedly found local residents in their field surveys that these blades also had a special sound that was heard by the north wind blowing. The more interesting point is that the windows without Senasir in front of them have shutter-shaped shields that cover the lower part of the tall windows of the Bushehr houses (picture 4, left side) that can be said that these similarities are not accidental, and this type of shutter structure provides the possibility of high-level awning windows, along with the preservation of privacy and safety, which seems to be the most important factor (Fig. 4).

Third reason: another reason is the removal of the architecture element of the Senasir in new neighborhoods of Bushehr (four new places) such



Fig. 3. Large length of the Senasir in relation to their width. Photo: Bahrani. 2016.

as Bahmani and Sabzabad. In these neighborhoods, houses have one floor and have a lower height than the four old ones. Urban context is scattered in these neighborhoods, and it can be stated that in these areas where houses are built with great distances, there is no Senasir.

The rational expression of the presence of this vernacular architecture element (Senasir): We first examined the climatic conditions of the peninsula of Bushehr. It was argued that the vernacular architecture of Bushehr sought a solution that would reduce the effect of this sultry and very high humidity and provide better conditions for the people of the home, and when there is no equipment and the only possible way is to use the local wind flow. In order to use the wind and its flow inside the house, it requires a large amount of awning windows, which is due to the creation of spaces with a large number of awning

windows, such as the 5-Doors and 6-Doors in Bushehr houses. These awning windows which have a height from ceilings to floor, are open all day long in hot months of the year, so that they can bring the flow of wind to the house and reduce sultry effects. These open tall windows make a lot of danger for the inhabitants, especially children, which cover them to the height of the windows to provide them with safety, but these shutters can stop the wind and reduces the intensity of the flow (Fig. 5).

The best way to create safety in the upper floors, while having the highest airflow, is to build narrow wooden balconies in front of the side of the building, with the high windows of the house on that side, these balconies are Senasirs. In fact, it is a security guard (in terms of danger and visibility) that, by passing from the windows, increases the inflow of air into the spaces behind the Senasir, that is, the five and six



Fig. 4. Similarity of the structure of Senasirs and awning windows without Senasir in front of them. Photo: Bahrani. 2016.



Fig. 5. Structure for creating security and confidentiality. Source: The documents of center of the cultural heritage of Bushehr province.

door rooms where residents inhabit. The existence of a space called *tarme* (a space where a number of walls or shutters are facing the sea) is a proof of this claim, because wherever there is a need for semi-open ***spaces to spend time, they built *tarmes*. On the other hand, the removal of *Senasir* in four new locations in which most of the houses have lower height than those of the four former hometowns and have one floor indicates that *Senasir* because *Senasir* has been the security supplier for the inhabitants of the house, it was so important. It should also be noted that the inhabitants of the Bushehr houses constructed *Senasir* as far as possible so that they could have more open surfaces.

Senasir's implicit usages

Iranians have invented something whenever they needed and provided an innovative response to their needs. These responses were indicated in architecture in the form of architectural elements, and users tried to improve these elements over time in order to have various usages and benefits from various aspects of it. By pointing this out, we look at other features of *Senasir* element, but these attributes are by no means the reason for the existence of this architecture element. But the inhabitants of Bushehr's houses, along with the main reason stated above, enjoyed them.

A. Use as an interface (creating a connection between

spaces of the house): spaces in Bushehr houses are located around the central courtyard and are linear, and Senasir is the cause of connection between these spaces in the upper floors (Memariyan, 1996: 100; Hedayat, 2013: 35; Fallah Far, 2008: 16). However, this feature was not expressed as the main factor of the existence of a Senasir, because some buildings in Bushehr have been retreated in the upper floors and there has been a connection between spaces without Senasir, but has created problems for the residents: 1) The retreat in the upper floors will cause more sunlight penetration into the house and the central courtyard. 2) Due to the porous walls in the old buildings of Bushehr, the retreat of the upper walls towards the lower walls will cost a lot to traditional users of Bushehr (Fig. 6).

In addition to the above, use of a Senasir as an

interface between home spaces creates shading on the central courtyard and the exterior walls of the house. This shadow creates various temperatures on the surface of the wall, and the result is a draft around the building, which brings a better air movement. On the other hand, Senasir exacerbates these drafts by creating ubiquity on the surface of the outer wall (Fig. 7).

B) Creating privacy: One of the important features of Iranian architecture is the attention to the home and its inhabitants, and that the unholy should not have a way home. The traditional architecture of Bushehr is not excluded from this principle, and the inhabitants of the old houses of Bushehr have added this feature to the pavilion by placing the shutters instead of Senasir leg (However, it should be noted that many of the Senasirs do not have a shuttered



Fig. 6. Retreat in the upper floors of the house to create interfaces. Photo: Bahrani. 2016.



Fig. 7. The Advent of the Senasirs in the Central Yard. Photo: Bahrani. 2016.

body (Figure 8)), which this element prevents people from seeing through the high windows and at the same time allowing them to pass the air in the best possible way. From the inhabitants' words, we found that these shutters were changed from a steady state to a horizontal one during a blast (Fig. 8).

C) Creating a proper view: Senasir in various locations of the old context of Bushehr is seen, but in the coastal area, Senasir for residents of the homes provides the opportunity to enjoy the beautiful views of the beach and the sea. But the Senasir of the houses far from the beach do not have these functions.

D) Shading on passages: In addition to shading on the central courtyard that is made by the inner Senasirs, shading on the passages is also done by the outer Senasir. Bushehr's old context has very narrow passages and very tall walls to create a better shade for inhabitants, which Senasir exacerbates it.

Discussions

As it has been said, the Bushehr peninsula is located near the Persian Gulf with special water conditions, such as the moderate weather of winter and the short period of severe rainfall and summer heat. The temperature between the night and the day and the seasons is low due to the proximity to the sea because the moisture content prevents it from decreasing or increasing too much in winter and summer, but this excess moisture (humidity) makes living in this region hard. The best solution, when there is no type of equipment (cold), seems to be the use of wind that can be improved by providing better airflow in the living environment.

In this case, the architecture is also trying to improve the situation, which in one of the previous researches have described Senasir as one of the architectural responses. It is said that Senasir is a good place



Fig. 8. Body without Senasir Shutters, Senasir of the Taheri Mansion. Photo: Bahrani. 2016.

to live because of its physical structure, good ventilation and air flow, and residents spent some of their time in the summer there. When we look at this hypothesis from the rational dimension and the view that architecture is a multidimensional phenomenon, we find that with these unreasonable dimensions, Senasir has never been a place to spend time because even for one person it is difficult to pass, and it was also argued that if the Senasir was only a climatic

element, in the following periods, and in four new neighborhoods of Bushehr, it was not removed from the vernacular architecture of Bushehr. On the other hand, the existence of the tarme element completely dismisses the hypothesis that the local Senasir has been a place for living, because whenever there is a need for a space to rest and reduce the effect of sultry, tarme is used.

Conclusion

In this article, previous statements about Senasir were mentioned including: 1. using a Senasir in order to take advantage of the wind flow. 2. Interface between the spaces of the house in the upper floors. 3. Making connection between the interior and exterior of the houses (semi-internalization of Bushehr houses) with preservation of privacy. 4. Using a Senasir to shade on the outer walls and inside the central courtyard with

light purification. 5. Functioning Senasir as a kind of thermal insulation. 6. Providing visibility for people and residents of the house towards the sea. 7. Shading on the passage on hot summer days.

Then, as a hypothesis of this article, the reasons for the existence of a Senasir in the previous studies were not correct, adequate and accurate, and there are contradictions between the existing facts and these investigations that as the innovation of this paper, these contradictions are mentioned with logical arguments which are as follows: 1) Senasir with an irrational dimension and low width has not been an environment for spending time for the people of the home. 2- Because of the retreat in many homes in the upper floors, the main function of Senasir was not connecting the spaces of the house 3. The existence of Senasirs without shutters indicated that the main function was not to create confidentiality, but one of its implicit functions. 4. On the very narrow and high passage of Bushehr's historic context, there is no need for Senasir shadowing. 5. The distance from the sea and the high density of the context showed that the Senasir only made the sea look good for the seaside houses, not all the houses. In the end, by identifying these contradictions we found that the existential causes of Senasir are other things. It was also argued that the Senasir is a wooden balcony built on the side of the building with a lot of awning windows. In this study, we used rational arguments (first argument: long length of Senasir versus its width, which has such dimensions in order to cover a large number of awning windows.) Second argument: The similarity between the constructive components of Senasir and the protections in front of the windows with no Senasir in front of them. The third argument: the removal of Senasir in periods where houses are less high), which, contrary to what was said earlier, the essence of the existence and the main function of the Senasir is in a way which allows residents to open up their high windows of their 5-door and 6-door rooms with security to provide them with the most amount of the air flow in hot seasons of the year, to reduce the effects of ambient humidity, which in former articles were not noticed. In fact, the wooden protective Senasir (in terms of danger and visibility), which bypasses the windows increases the inflow of air into the spaces behind the Senasir. That is, the rooms of the 5 and 6 doors that inhabitants reside in them, meaning that Senasir has changed from a functional element to a semantic element, which today represents the architecture of that climate.

Endnote

1. Nadir Shah Afshar: Nadir Shah Afshar who ruled from 1736 to 1747, was one of the most powerful Iranian rulers.
2. Karim Khan Zand: Mohammad Karim Khan Zand who was the founder of Zand dynasty, ruled from 1751 to 1779.

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