

Typology of Tarmeh in the Historic city of Bushehr

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Abstract

In the Architecture of Iran, the vernacular architecture of Bushehr's historic city is distinctive since it is both introverted and extroverted and has different semi-open interior and exterior spaces. *Tarmeh* is one of these semi-open spaces. Using a qualitative research method, conducting desk and field studies and reviewing the technical documents of the historic buildings of Bushehr, this paper collected the information of historic buildings of this city that has Tarmeh to study their typology. According to the study of 29 buildings, it was revealed that Tarmehs fall into three categories based on their location in the building. These types include exterior, middle, and interior, among which interior is the most widely used. Moreover, Tarmehs are either enclosed on three sides, two sides, or one side. Interior Tarmehs are mostly enclosed on two sides, exterior ones are enclosed on three sides, and all middle Tarmehs are enclosed on two sides. In terms of shape, Tarmehs of Bushehr are of four types, including linear (rectangular, trapezoidal and irregular), L-shaped, U-shaped and four-sided, among which rectangular linear is the most prevailing type. Moreover, it was revealed that most Tarmehs are southward and westward, and at least one Tarmeh is seaward in the buildings that are along the coast. In the end, according to the typology of Tarmehs based on their location in the building, enclosure, type of plan, and whether they are roofed or not, this research provides a modified and complete definition of Bushehr's Tarmehs.

Keywords: Tarmeh, Historic fabric of Bushehr, Semi-open spaces, Vernacular architecture, Architectural typology.

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Introduction

Semi-open spaces are an integral part of Iran's past architecture, and the existence of various forms of these spaces is a manifestation of spatial continuity, dynamism and flexibility in the architecture of this land (Balilan, 2011 quoted by Kiani et al., 2015: 56). In addition to strengthening the relationship between architecture and nature, they have also had various functional, climatic, cultural, physical and psychological functions.

Despite the successful history of using semi-open spaces in the traditional architecture of Iran and the existence of numerous studies on the functions of these spaces in recent years (Zarkesh, 2011; Einifar and Alinia Motlagh, 2014; Nikghadam, 2015; Saadat et al., 2015; Saadat et al., 2017; Momeni, 2018), for various reasons, semi-open spaces are less used in the current architecture of Iran, and the small amount of semi-open spaces that are constructed are often used as a terrace and mainly in apartment housing; and in many cases, semi-open spaces have become a marginal space with no use or limited use.

In the history of constructing semi-open spaces, the historic fabric of Bushehr is one of the most valuable examples of Iranian architecture. The construction of semi-open spaces in this city made its architecture to be both introverted and extroverted –a pattern which is unique in the architecture of Iran (Eshrati et al. 2016, Hedayat and Eshrati 2016). However, despite the rich history of semi-open spaces in Iran, these spaces are rarely used in the modern architecture of Bushehr and other cities alike. This paper attempted to develop a typology of Tarameh, a semi-open space constructed in the historic buildings of Bushehr, to lay the foundation for the recognition of this element. The study of different types as component schemas of physical characteristics would deepen the understanding of architectural spaces and provide the ground for preserving them and also finding new ways in designing methods (Memarian and Dehghani Tafti 2018: 21; Hasanpour Lemer, 2014: 117). Therefore, it is hoped that with the help of Tarameh's typology, designers will have the opportunity to emulate it in new designs of the

contemporary architecture of Bushehr and take a step towards the historical continuity of this element in the contemporary era.

Research Questions

- What is the definition of Bushehri Taramehs?
- What are the types of Tarameh in the architecture of the historic fabric of Bushehr?

Definition of Type and Typology

A type refers to a classification in which a number of different objects are organized based on one or a set of common features (Memarian and Dehghani Tafti, 2018: 22). In architecture, it is a schema that places a number of buildings with similar characteristics in a group. (Memarian and Tabarsa, 2013: 22). According to Rapaport, typology tries to place a set of complicated objects into an organized group to reach a better generality in identification and planning (Rappaport, 1990: 48, quoted by Akbari Ghaderian, 2013: 91). Therefore, it can be claimed that typology is a powerful tool created to study and establish precise recognition of built spaces in the contemporary architecture (Azad and Soltani Mohammadi 2018: 230).

Semi-open Space in Architecture

The relationship between the interior and the exterior is one of the most fundamental principles in architecture (Grutter 2005: 168). Semi-open spaces are the most important means that establishes such relationship (Bonyani et. al. 2018: 70). Although a semi-open space is considered as a third space that has the characteristics of both closed and open spaces, it is an integrated whole created in combination of two equal and opposite forces of the interior and the exterior (Mahmoudi 2005: 56; Haeri Mazandarani 2009: 117). Moreover, a semi-open space is not only defined in quantitative terms (half closed and half opened), but is also a qualitative concept encompassing ideas such as introversion, extroversion, transition, connection, semi-public and semi-private feelings and the like (Zarkesh 2011: 99; Bonyani et. al. 2018: 71). This space has established a multi-dimensional relationship with adjacent spaces in terms of shape, meaning, connection and function and is considered as one of the main factors of

continuity, sequence, hierarchy, and spatial zoning (Haeri 1995: 3). It also offers the possibility of performing a variety of activities in an environment with better climatic conditions than the outside in addition to making connection between the outside and the inside (Rezakhani 2013: 96; Qian, 2005: 29; Raheb and Nazari 2017: 40). Therefore, the climate of an area is a very important factor in the emergence and development of semi-open spaces. This is evident in the writings of historians and tourists (Morris, 1983: 45; Williamson, 1810: 38) and in a number of contemporary studies (Nikghadam 2013: 70; Ali-Toudert and Mayer, 2006; Ballantyne and Law, 2011: 308; Goshayeshi et al, 2013: 516). Bushehr is one of the cities that has made good use of the capabilities of semi-open spaces to cope with the climate.

Case Study

Bushehr

Bushehr is a peninsula in the south of the foothills of the Zagros and the northern shore of the Persian Gulf (Boroumand, 2002: 8; Gholamian, 2013: 11). According to the excavations of archaeologists such as Andreas (1872) and Maurice Pezar (1913), this city dates back to the Elamite era in almost two thousand years ago and a part of the first millennium. The current area of the historic fabric of Bushehr was built as ordered by Nader Shah Afshar in the mid-eighteenth century. (Hamidi 2010: 50; Gholamzadeh Jafareh, 2013: 12). In the eras of Qajar and Zand dynasties, this city was the southern gate of Iran for trading and also for political and cultural interactions (Ranjbar et al. 2010: 24; Gholamzadeh Jafareh, 2013; Dashti 2001: 117; Parsaee et al., 2015: 379).

Therefore, in addition to the climatic, geographical, and historic factors, the architecture of the historic fabric of Bushehr was also influenced by the cultural exchange with the neighboring countries and nations that had commercial and political relationships with this city to the extent where it represents unique elements and characteristics among the architecture of other areas in Iran (Morbaghi 2013: 57; Eshrati et. al. 2016: 43). One of these elements is the use of semi-open spaces. In

Bushehr architecture, unlike the architecture of desert and mountainous areas, in addition to being inside the building, these spaces also show themselves in the outer wall and are the main components of the building exterior and the urban landscape of Bushehr, a fact which confirms the extrovert architecture of Bushehr vernacular buildings (Alalhesabi et. al. 2012: 73-72). They have valuable potentials in the exterior walls of traditional houses in Bushehr enabling them to provide better climatic conditions for a variety of activities and also establish a good relationship with natural elements such as the sea. They also improve safety, eligibility and aesthetics of the urban landscape. The main types of semi-open spaces in the architecture of this city are Shanashir¹, Dalan² and Tarameh (Hedayat and Law, 2020), and the main focus of this article is on the typology of Tarameh.

Tarameh

The word 'Tarameh' is derived from the word *Taram*, which means encampment or a wooden fencing (Dehkhoda Dictionary). It refers to a type of rectangular semi-open space with a beam ceiling located across the façade and along the longitudinal axis of the building (Rezaeinia, 2017: 129). Generally, the element that is known as *Tarma* or Tarameh is a type of roofed balcony which is called as Tarameh in the present-day Iraq (Rutter, 2008; quoted by Rezaeinia, 2017: 138). The main function of this space is to provide a living space which is used temporarily during particular seasons of the year (Memarian, 2008). It is found in the historic buildings of Bushehr with a variety of functions, including maximum wind absorption, natural ventilation, provision of accessibility and connection between a number of spaces, improvement of the privacy of interior spaces, increasing the beauty of the facade, and provision of a space for living, resting and sleeping in summer (Mehrinejad Khotbehsara and Eghbal, 2016: 50; Ranjbar et al., 2011: 295; Alalhesabi et al. 2012: 72). Taramehs of Bushehr are mostly wide, roofed spaces that are enclosed on 1 to 3 sides. This element is embedded in the building with an integral structure to the degree that the frame is made of the columns

and the load-bearing walls of the building. Materials used in the construction of Tarameh are Candal beams³, stone, plaster, straw and sarooj. The physical components of this element include floor, body and ceiling which are described below according to the field studies.

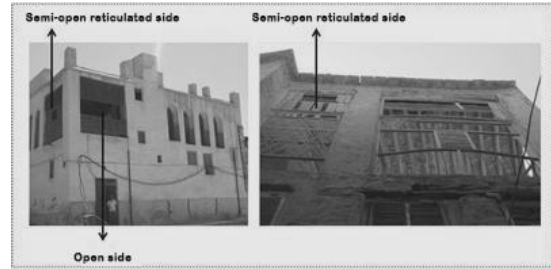
Floor: The floor is mostly rectangular, and its dimensions depend on the needs and the area of the building. The length is often equal with the length of the adjacent room, in some cases, it is equal with the entire length of the facade. The width is almost 2 to 5 meters. The stages of construction are respectively as follows: Laying Candal beams on the main beams, straw covering, using sarooj or sand and plaster mortar, and finally flooring with plaster or stone.

Ceiling: In vernacular buildings, Tarameh is mostly an element with a flat roof. The non-roofed example of this element was less commonly used, but was seen during field visits to the Tabib mansion. Tarameh's roofing method is similar to flooring using multi-beams, and plaster and soil mortar.

Body: The body can be open from one to three sides. The openings of the walls are very important in perceiving the interior space and exterior of this element. The wall between the rooms and Tarameh is a closed wall, which usually has multiple openings. The number of openings affects Tarameh's functions, including the possibility of absorbing wind into space, expanding and flexing the space, and enhancing the visibility. Tarameh semi-open walls have a shelter with a height of about 1 meter, which can be seen with wooden materials in the form of railings, lattice or spheres with an angle of about 45 degrees. Some of the open walls are closed with a wooden lattice wall instead of a shelter. As can be seen in Figure 1, although this type of wall covers Tarameh from floor to ceiling, at the same time, it provides visual communication and air ventilation. In this wall, the privacy of the users of the space is fully observed and a suitable space is provided for sitting, sleeping and resting.

One of the elements used in the body of Tarameh are sunshades that have a height of 100 to 120 centimeters, and their main

function is to prevent intense and dazzling light from entering the space. They are usually made of wood in the form of shutters or plates with rhombic cuts. In field surveys, a special type of sunshade was also seen in the Iranian Trade House with colored glass materials and wooden frames.



F1. (Right) Tarameh with a reticulated semi-open wall, parts of which have been destroyed. (Left) Tarameh with a semi-open wall and an open wall with a shelter and a reticulated beam.

Research Method

The main approach of this research is qualitative, and its strategy is case study. In order to respond to the purpose of the study, which is to present Tarameh typology in the vernacular architecture of Bushehr, field and desk studies and the technical documents of historical monuments of this city were used to collect data on Tarameh buildings. To approach the purpose of the study, the collected information was classified and coded into tables. Photographing, sketching and recording written descriptions were other tools used to collect data.

The main limitation of this study was in the second step, because there is no documentation center in Bushehr that has the visual information and maps of all the historical monuments of this city. The most complete and most reliable documents currently belong to the General Directorate of Cultural Heritage, Tourism and Handicrafts of this province, which has a lot of shortcomings and the documents include a limited number of landmarks that are not complete and organized. In addition to this organization, the Bushehr Architecture Book during the Zand and Qajar eras also provides significant information about the plans of some of the historical monuments of this city that were used in this research. However,

sufficient research documents were not provided through desk studies. Therefore, extensive field studies were started on the buildings located in the historic fabric of the city. Among the buildings in the area, there were a series of buildings that did not have a specific middle or outer Tarameh in the facade, but it was not possible to enter the building due to the opposition of the residents. Therefore, they were removed from the scope of research. In addition, a number of other monuments were abandoned and inaccessible. Moreover, according to the library documents, a number of other buildings had Tarameh based on the available texts or images, but the information of these buildings was incomplete. For example, the location of Tarameh or its internal or external type was unclear. Despite all these

limitations, plans of 24 buildings were extracted from the documents of the General Directorate of Cultural Heritage, Tourism and Handicrafts of Bushehr Province and the visual documents obtained through desk studies. Plans of the four destroyed buildings were also obtained from desk studies. Of these 28 buildings, 22 had Tarameh. Moroder, 7 other buildings that had Tarameh were obtained from field surveys, and their plans were prepared. Thus, out of 35 selected buildings, studies focused on a total of 29 buildings to achieve typology. The information of the selected buildings in terms of the number of floors, status and location is presented in Table 1. It should be noted that library resources and interviews with the area's residents were used to determine the location of the destroyed buildings on the map.

Number of floors	Status			Neighborhood				Location on map
	In use	Destroyed	Abandoned	Shanbandi	Behbahani	Koti	Dehdashti	
1	2	0	0	0	1	1	0	
2	20	4	3	1	10	15	1	
3	4	1	1	1	4	1	0	
	26	5	4					
Total	Total buildings: 35 Total buildings with Tarameh: 29			2	15	17	1	

T1. Specifications of the studied buildings.

In the explanation of Table 2, it should be mentioned that the higher area of Behbahani and Koti neighborhoods as well as the greater number of historical monuments remaining in these two neighborhoods is one of the reasons why the number of selected buildings in these neighborhoods is more than Shanbadi and Dehdashti neighborhoods.

Tarameh Typology

Tarameh Typology According to Location

This research divides Tarameh into three general categories based on the location of Tarameh in the building: "exterior", "middle" and "interior".

Exterior Tarameh: The exterior type of Tarameh is located in the outer wall of Bushehr mansions and in the distance between the closed inner spaces and the passage. This type is divided into two general subcategories based on location: a) the type that is located along the whole facade and b) the type that is located in a part of the facade. In the first subcategory, the length of Tarameh is equal to the length of the building

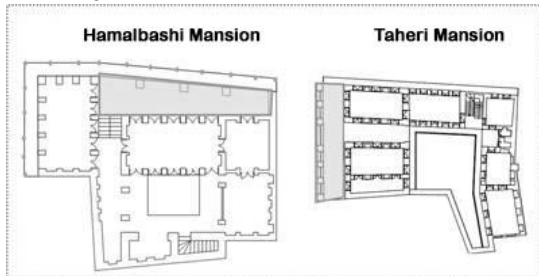
facade, which is connected to the open space on three sides and to the closed space inside. In the second subcategory, Tarameh does not occupy all the length of the facade in that floor, but a part of it. Figure 2 show the position of these two.

Middle Tarameh: In this research, a type of Tarameh that is located among the closed spaces and connects the open space of the passage to the open space of the yard, is named Middle Tarameh. The main function of this Tarameh is to create a connection between closed spaces while helping natural ventilation and establishing airflow. There may be another semi-open space (such as Shenashir, interior Tarameh or exterior Tarameh) between the middle Tarameh and the indoor or outdoor open space.

In addition to this classification, the findings of this study provide another type of middle Tarameh classification based on its degree of elongation along the closed space and outdoor space (presence in the building facade). Based on this, middle Tarameh can

be divided into the following two categories:
 - Middle Tarameh with elongation along the closed space of the building: This Tarameh is located in the heart of the building in such a way that it is adjacent to the closed space from two longitudinal sides and adjacent to the open space of the yard from two transverse sides. An example of such a Tarameh, which is stretched along closed walls, can be seen in Figure 3.

- Middle Tarameh with elongation along the outer open space: In field surveys, a special type of middle Tarameh was seen based on its location in the building. This type of Tarameh has the characteristics of outer and middle Tarameh at the same time. In such a way that in terms of the degree of openness in the facade and also the position of the building, it is similar to the outer Tarameh and in terms of connecting the open space of the passage to the open space of the yard, it has the characteristic of the middle Tarameh. Such Tarameh was seen in Alavi Mansion and Haj Rais Mansion.

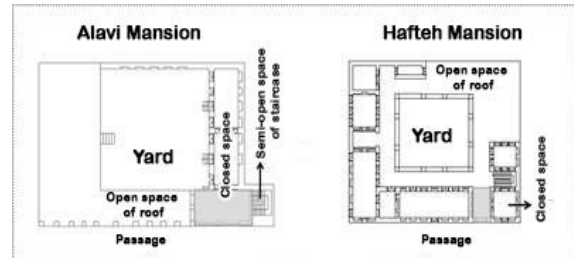


F2. (Left) The location of an exterior Tarameh along the entire western facade of Taheri Mansion; (Right) The location of an exterior Tarameh in a part of the facade of Hamalbashi mansion (Tarameh in this mansion is connected to the outside space through Shanashir); (Source: Authors, based on Gholamzadeh Jafareh, 2013).

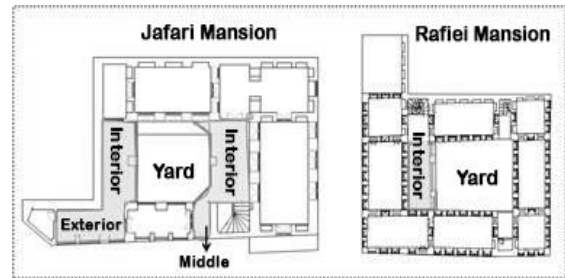
Interior Tarameh: This type of Tarameh is located inside the building and between the closed space and the yard. Interior furnishings in Bushehr mansions are installed with functions such as shading and performing daily activities (sitting, eating, etc.). In the field surveys, a special example of interior Tarameh was seen in Jafari mansion.

This mansion has two interior Taramehs, one of which is adjacent to the exterior

Tarameh and the other is adjacent to the middle Tarameh. Figure 4 shows the dominant example of the interior Tarameh in Rafiei mansion and the special example mentioned in Jafari mansion.



F3. (Right) Plan of the position of the middle Tarameh in Hafteh mansion with elongation in the direction of the closed space; (Left) Plan of the position of the middle Tarameh in Alavi mansion with elongation in the direction of the exterior of the building and is similar to the exterior Tarameh (Source: Authors, based on the archives of the General Directorate of Cultural Heritage, Tourism and Handicrafts of Bushehr Province).



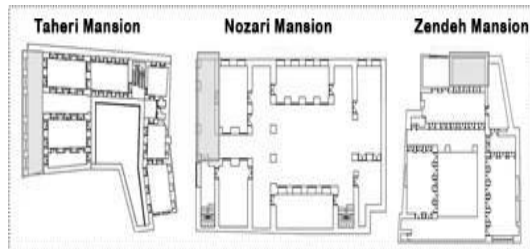
F4. (Right) The predominant type of interior Tarameh in Rafiei mansion which is adjacent to the courtyard and closed space; (Left) a special type of interior Tarameh in Jafari mansion; This mansion has two inner Taramehs on the western and eastern fronts, the Tarameh of the western front is connected to the passage space through the middle Tarameh and the Tarameh of the Eastern front through an exterior Tarameh; (Source: Authors, based on the archives of the General Directorate of Cultural Heritage, Tourism and Handicrafts of Bushehr Province).

Tarameh Typology According to Enclosure

Tarameh enclosure in this study refers to the number of common walls between Tarameh and open and closed spaces. The greater the number of common walls between the closed space and Tarameh, the greater its enclosure.

Therefore, based on the degree of enclosure, Tarameh is divided into three general categories:

- Open on one side and closed on three sides: In this category, three walls of Tarameh are shared with the closed space and it is connected to the open space through a wall.
- Open on both sides and closed on both sides: In this category, Tarameh is closed through two walls with closed space and through two walls with open space. It should be noted that all middle Taramehs fall into the second category. If Tarameh is exterior or interior, the location of such Tarameh is in the outer corner of the building or its inner corner.
- Open on three sides and closed on one side: the least amount of enclosure can be seen in this type of Tarameh, which has a common wall with the closed space only on one side (Figure 5).

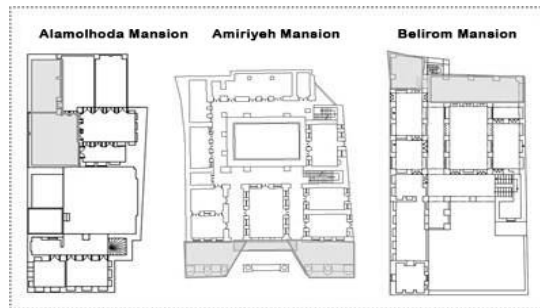


F5. (Right) Zandepay mansion with Tarameh, one side open and three sides closed; (Middle) Nozari mansion with Tarameh open on both sides and closed on both sides; (Left) Taheri mansion with Tarameh open on three sides and closed on one side; (Source: Authors, based on the archives of the General Directorate of Cultural Heritage, Tourism and Handicrafts of Bushehr Province).

Tarameh Topology According to Plan

The field search that was conducted to find the shape pattern of Tarameh in Bushehr architecture shows that the exterior and interior Taramehs can be divided into four categories based on the shape of the plan: Linear (exterior example in Taheri mansion and interior example in Rafiei mansion), L-shaped (exterior example in Alamolhoda mansion and interior example in doctor's office), U-shaped (exterior example in the

Iranian mansion and exterior example in Zandepay mansion) and four-sided (exterior example in Kazeruni mansion and interior example in Tabib mansion). It should be noted that the middle Tarameh was seen only in linear shape in the studied buildings. A study of Tarameh with a linear plan shows that this category included a rectangular plan (in Taheri mansion), a trapezoid (in Amiriyeh mansion) and an irregular plan (in Beliom⁴ mansion). Figure 6 shows the types of Tarameh with a linear shape.



F6. Right) Beliom mansion with an irregular linear exterior; (Middle) Amiriyeh mansion with trapezoidal linear exterior; (Left) Alamolhoda mansion with L-shaped exterior; (Source: Authors, based on the archives of the General Directorate of Cultural Heritage, Tourism and Handicrafts of Bushehr Province).

Tarameh Typology According to Direction

The results of field observations and review of library documents in the field of Tarameh direction in Bushehr mansions show that among the Taramehs of the 29 selected buildings, the number of sides facing the south was 30, facing the west was 23, facing the north was 17 and facing the east was 10. Table 2 shows the number of sides of the exterior, middle and interior Taramehs in each direction. It should be noted that there was a total of 47 Taramehs in the surveyed buildings, but due to the fact that some Taramehs were L-shaped, U-shaped or four-sided, in counting the number of Tarameh sides in each direction, all sides were considered. In other words, for an L-shaped Tarameh, two sides, for a U-shaped Tarameh, three sides, and for a four-sided Tarameh, four sides were calculated.

Direction	Open sides of exterior Tarameh	Open sides of middle Tarameh	Open sides of interior Tarameh	Total number of open sides
North	5	3	9	17
South	12	5	13	30
West	11	1	11	23
East	3	0	7	10

T2. Types of Taramehs according to direction.

Summary

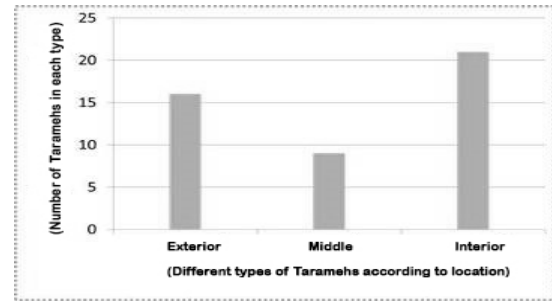
In some sources, Tarameh is defined as a semi-open, rectangular space, which is roofed and located in the longitudinal axis of the building (Rezaeinia, 2017: 129). However, based on the typology done in this article:

1. Tarameh is not necessarily a roofed space because its non-roofed type was seen in Tabib mansion;
2. Taramehs are not only located in the longitudinal axis of the building; according to the typology of this research, middle Taramehs are located in the transverse axis of the building, and only the exterior and interior types are located in the longitudinal axis.
3. The shape of Tarameh is not necessarily a rectangle; it is also seen in linear shapes (rectangular, trapezoidal, irregular), L-shaped, U-shaped and four-sided.

As a result, the current definition of Tarameh needs to be revised.

Summary of Typology according to Location

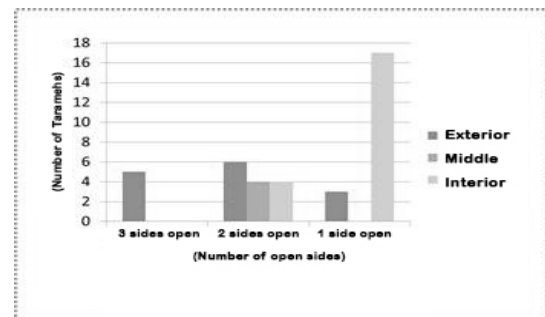
Based on the location of Tarameh in the building, there are three types of Tarameh: the exterior (in the longitudinal axis of the building, adjacent to the closed indoor and outdoor space and located along the facade of the building), the middle (located in the transverse axis of the building connecting the open space to the space of the yard) and the interior (embedded in the building adjacent to the open space of the yard and the closed space). In 29 buildings studied in this study, a total of 16 exterior Taramehs, 9 middle Taramehs and 22 interior Taramehs were observed. Accordingly, the most widely used type of Tarameh in the vernacular architecture of Bushehr is the interior followed by the exterior. It should be noted that some buildings have two or all three types of Taramehs, and there is a total of 43 Taramehs in 29 buildings (Figure 7).



F7. Number of exterior, middle, and interior types.

Summary of Typology according to Enclosure

According to the number of enclosed sides, in this study, three types of Tarameh were identified: 1) open from three sides and closed from one side, 2) open from two sides and closed from two sides, and 3) open from three sides and closed from one side. Figure 8 shows the extent of the predominant enclosure in the exterior, middle, and interior Taramehs. The predominant type of Tarameh is "two sides open and two sides closed" in the exterior Taramehs and "one side open and three sides closed" in the interior Taramehs. It should be noted that all the middle Taramehs in the buildings studied in this research were "open two sides and closed two sides".



F8. Different types of Tarameh according to the number of open sides in the exterior, middle and interior types.

Summary of Typology according to Plan

According to the results of the shape typology of Tarameh, in all three types (interior, middle and exterior), the dominant shape is linear (Figure 9). The linear type is divided into three subcategories: rectangular, trapezoidal and irregular. Among the linear Taramehs studied in this article, the interior

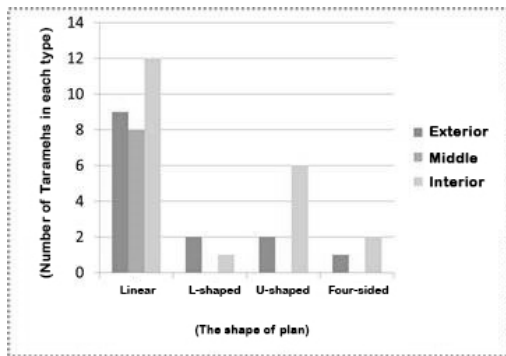
and middle Taramehs were all rectangular. In the exterior type, however, in addition to rectangular plans, trapezoidal and irregular linear plans were also evident.

Summary of Typology according to Direction

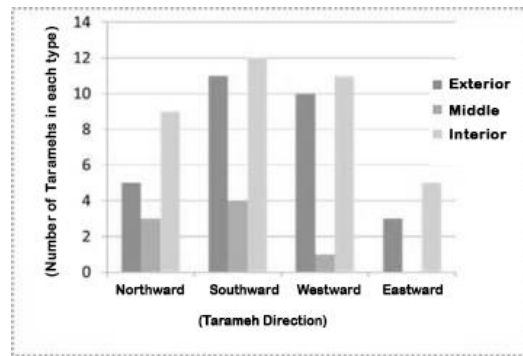
The results obtained from the typology of Bushehri Taramehs according to their direction show that the highest number of Taramehs in all three types are respectively southward, westward, northward and eastward. According to Table 2, the fact that most Taramehs are southward and westward reinforces the hypothesis that the most important reason for the emergence of

Taramehs was to cast shadow on the inner spaces and adjust the temperature. The relationship between the location of Tarameh and its direction in buildings that were seaward was also taken into consideration in field studies. Since in all the buildings that are located along the coast, at least one Tarameh is seaward, it can be said that the sea view and the onshore breeze are two effective factors in the direction of Taramehs along the coast (Figure 10).

Table 3 shows the typology of Tarameh in the vernacular architecture of Bushehr according to the location, the shape of plan, direction and the number of enclosed sides.



F9. The dominant shape in the exterior, middle and interior Taramehs.



F10. The dominant direction in the exterior, middle and interior Taramehs.

Location	Typology according to plan			Typology according to direction		Example	
	General shape	Qty.	Direction	Qty.			
Exterior	Linear	Rectangular	7	S	3	Iranian Trade House, Belirom, Amiriyeh, Nozari, Hamalbashi, Malek	
		Trapezoidal	2	W	2		
		Irregular	2	S & W	6		
				N & W	1		Alamolhoda, Haj Raeis
			N & E	1			
	L-shaped	2	N, W & S	1	Iranian, Consulate Office		
	U-shaped	2	E, N & S	1			
	Four-sided	1	All four directions	1	Kazeruni		
	Typology according to enclosure						
	Plan	Linear		L-shaped	U-shaped	Four-sided	
Enclosure	1 side open, 3 sides closed	2 sides open, 2 sides closed	3 sides open, 1 side closed	2 sides open, 2 sides closed	3 sides open, 1 side closed	3 sides open, 1 side closed	
Qty.	3	4	2	2	2	1	
Diagram							
Middle	Typology according to plan			Typology according to direction		Example	
	General shape	Qty.	Direction	Qty.			
	Linear-rectangular	9	South	5	Alavi, Hafteh, Rafiei, Haj Raeis, Jafari		
			North	3			
			West	1			
	Typology according to enclosure						
Enclosure	Two sides open, two sides closed						
Qty.	9						

T3. Typology of Tarameh in the vernacular architecture of Bushehr according to the location, the shape of plan, direction and the number of enclosed sides

Diagram	Typology according to plan				Typology according to direction		Example
	General shape	Qty.	Direction	Qty.			
Interior	Linear-rectangular	13	S	6	Alavi, Rafiei, Azin, Jafari, Nozari		
			W	3			
			E	2			
			N	2			
	L-shaped	1	N / W	1	Tabib		
			N / S / W	3			
	U-shaped	6	N / S / E	1	Amiriyeh, Rostami, Hamalbashi, Zendehtpay		
			S / W / E	1			
			N / W / E	1			
	Four-sided	2	4 directions	2	Tabib, Haj Raeis		
Typology according to enclosure							
Plan	Linear		L-shaped	U-shaped		Four-sided	
Enclosure	1 side open, 3 sides closed	2 sides open, 2 sides closed	2 sides open, 2 sides closed	1 side open, 3 sides closed	2 sides open, 2 sides closed	1 side open, 3 sides closed	
Qty.	11	1	1	4	2	2	
Diagram							

T3. Typology of Tarameh in the vernacular architecture of Bushehr according to the location, the shape of plan, direction and the number of enclosed sides

Conclusion

The result of the present study, which was conducted to develop a typology of Tarameh as a semi-open space in the vernacular architecture of the historic fabric of Bushehr, reveals that there are three types of Tarameh according to its location in the building: "exterior", "middle" and "interior", among which the interior is the most widely used. Moreover, in terms of the enclosed sides, the dominant type in exterior Taramehs is "two sides open and two sides closed", and the dominant type in interior Taramehs is "one side open and three sides closed". Examining the shape of Taramehs, it was concluded that the predominant type among the identified shapes, including "linear" (rectangular, trapezoidal, irregular), "L-shaped", "U-shaped" and "four-sided", is the rectangular linear plan. It was also revealed that the direction of most Taramehs is southward and westward, and in the buildings that are along the coast, at least one Tarameh is seaward.

Based on the typology developed in this study, the definition of Bushehr's Taramehs is modified and completed as follows: "Tarameh is a semi-open space, often with a roof, which is built on the longitudinal axis (exterior and interior Tarameh) and the transverse axis (middle Tarameh) of the

building with a linear shape (rectangular, trapezoidal, irregular), L-shaped, U-shaped and four-sided". Since identification is the precondition for the success of conservation measures, the results of this study can be considered as a step in protecting the architecture of Bushehr by providing the architects with the knowledge of vernacular architecture of Bushehr and also a basis for using Taramehs in the contemporary designs of this city.

Endnotes

1. A special type of semi-open spaces that is added to the building with wood structure and juttied towards the public passage and the private yard. Bushehr is the only city in Iran that has such spaces (Hedayat and Eshtrati 2016).
2. A roofed corridor that is linear or L-shaped found in most of the historic buildings of Bushehr as a connection between the entrance and the yard in the ground floor or between different rooms in the upper floor (Gholamzadeh Jafareh 2013: 21).
3. Wooden beams imported from India and Africa used for ceiling. These beams were very strong and resilient lasting for almost 100 years. In the Persian language, it is also called "Sandal" or "Chanden" meaning an aromatic stick (Gholamzadeh Jafareh 2013: 19).
4. Blairom stands for "Roman billiards". During the period when the British had a consulate in Bushehr, the consular staff played billiards in this building and hence it is known as Balarom among the people

of The historic fabric of the city. The current name of this building is Ghand o Shekar Mansion (interview of the authors with the old residents of the historic context of Bushehr, April 2017).

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