

Comparative Analysis of Residents' Temperament and Houses of the Historical Fabric of Bushehr Based on the Effects of the Environment on Human and Space Temperament*

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ABSTRACT

Space and human temperament have been analyzed in investigating historical houses of Bushehr City, Iran. In addition to the direct effects of the environment on choosing effective climate solutions in architecture, it also affects the temperament of residents and their living spaces. In this research, statistical society comprised residents and houses located in the historical fabric of Bushehr, and its temperament characteristics are analyzed based on being affected by four elements of the environment. This study has been conducted to find some factors in the architecture of the historical houses of Bushehr influenced by the effects of the environment on its temperament through knowing temperament indicators of each space and studying the attendance rate of four indicators of the environment as the proxies of four main temperaments on the house spaces. These four elements include water, wind, soil, and fire. The main question of this study is how the environment affects the human and space temperament and its effect on the architecture of historical houses of Bushehr, while the effect of these four indicators of the environment of the space temperament is considered as the basic question to achieve the research results. The research method of this study is a descriptive, descriptive-analytical, and content analysis of the references to know research foundations and resources. Data analysis of houses located in the historical fabric of Bushehr is considered within two holistic (deductive) and detailed analysis techniques to reach a general (inferential) result. The most substantial result of this study is the diverse temperaments of house spaces, such as the diverse moods of residents occupying these houses located in the historical fabric of Bushehr. In this case, each space has been shaped based on the residence method and activity of residents in it, so individuals with various temperaments can live in the house spaces based on their physical and mental needs.

Keywords: Historical Houses of Bushehr, Environment Effects, Human and Space Temperament, Comparative Analysis.

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1. INTRODUCTION

Aristotle was the first person who introduced the environment as a factor affecting human mood and temperament (Rabbani and Ramezani 2006, 4). However, most of the available resources by Iranian thinkers are about the effect of living place on the temperament of occupants living in an area. The most precious reference is scripts written by Ibn Sina who assumes that human beings have temperament. He says that four types of effective environments exist (Avicenna 2007), and Farabi introduces differences in moods as the result of weather differences writing that humans living everywhere are affected by geographical factors, weather, land, and climate of that place (Farabi 1992, 38), and Suhrawardi sees the root of people's ethics and mind depending on the temperament (Suhrawardi 2019, 105). Moreover, like Avicenna, Ibn Arabi considers the animal's body a combination of four temperaments soda, blood, phlegm, and bile (Ibn Arabi 2005, 466).

The human that is the creator of architecture is affected by their surrounding environment. Every climate affects the residents' morals shaping almost the same temperament, personality, mood, and behavioral characteristics in each place (Avicenna 2007). Because each environment has also a certain temperament, residents would receive the temperament characteristics from their surrounding environment, so the behavior is shaped based on such temperament and personality traits. Also, the architecture of each area is a part of the behavior of people living in each environment.

The vernacular architecture of each city and climate with its specific features has resulted from temperament indicators of that place. Therefore, temperament or mood of place, temperament of individuals, and behavioral characteristics in each space can balance the temperament of people. Therefore, spaces may have temperaments matched with behavioral characteristics in those spaces balancing the temperament of individuals in the house. Moreover, spaces with diverse temperaments all together can create a whole with a balanced temperament. In the opinion of Avicenna, each organ of the human body has a unique temperament while trying to keep the person's temperament balanced.

This study investigates a layer of how the historical architecture of Bushehr is shaped in dealing with the environment to study the effects of the natural environment on the formation of human and architecture space temperament and indicate its resulting impacts on the historical architecture of this port. This study tends to find what can be applied outside the time frame in architecture by knowing these characteristics. Since houses are the best historical buildings remaining from the Bushehr architecture in the fabric of the residential neighborhood- and since there is a close connection between human life and

houses, the research orientation has been directed towards studying the historical houses of Bushehr.

2. BACKGROUND

Most of the written Persian works about the effect of temperament and architecture of historical buildings of Iran have investigated the effect of temperament of Iranian bath spaces and analysis of historical bath buildings of Iran on the human temperament. One of these papers is titled "The Effect of Bath on Medicine Texts of Islamic Period" (Taheri 2015). Some studies have been done on the connection between mystical ideas and architecture in the field of four elements based on the opinions of some scientists and historians such as Ibn Arabi and Akhavan Al-Safa (Akkach 2005). Moreover, four elements have been investigated in the book of Sacred Architecture and its relevant topics (Kryder 1994).

Noghrekar et al. (2011) have analyzed the environmental impact on ethics and behavior and its results on the design of built environment in which, four climates of Iran are classified into four temperaments, and personality-architectural characteristics of these areas have been grouped based on the mood and temperament properties of residents living there. Yazdanfar et al. (2015) have tested the difference between human temperament and the tendency to architecture indices. In another study, six distinctive architectural features are analyzed in four climates based on temperament characteristics (Hamzehnejad et al. 2015).

Hatmian et al. (2017) also consider the temperament as the creator of ethics introduce ethics as the creator of the behavior, and know the architectural action resulting from the architect's temperament in the building. In the case of temperamental architecture, Abdollahzadeh (2016) addresses the relationship between man and the built environment based on the four elements.

Temperament is a quality created as a result of action and reaction between conflicting qualities of four elements so that when each element continues acting and reacting with its forces (qualities) in another element then a quality that is similar to those elements is created, which the new quality is known temperament (Avicenna 2007, 103). "Temperament" has the same root as "combination," so any combined creature with mixture and combination has temperament. Therefore, all phenomena of the material world with shared qualities have temperament (Avicenna 2007, 219-307).

In the case of human temperament, the pillars of the world that form the body of humans and other animals are pure objects and are not divided into different objects. Different kinds of creatures with diverse shapes are created when these elements are combined (Avicenna 2007, 295). These four elements include 1) fire: (this element is hot and dry and has

absolute lightness); 2) air (this element is hot and wet with relative lightness); 3) water (this element is cold and wet with relative heaviness); 4) earth (this element is cold and dry with absolute heaviness). Eight temperaments appear when these four elements are combined: four mixed of combined and four simple temperaments. The combined temperaments include hot and wet, hot and dry, cold and wet, cold and dry. The other four singular temperaments with one dominant quality include cold, hot, wet, and dry. In addition to the mentioned temperaments, moderate temperament is the ninth one. All creatures in the world have one of these temperaments. Therefore, as a soul exists for each body, each body also has a certain temperament. Also, temperament is a relative case, not an absolute one; hence, the coldness and hotness of temperaments are recognizable (Abdullahzadeh 2016). The "moderate" temperament is the best and the human body has the most moderate temperament. Hence, human "moderation" means human "health" (Avicenna 2007, 278-279).

Avicenna assumes a place has temperament. He introduces various temperaments for each place in the book "The Canon of Medicine" including the hot and dry temperament of desert areas, the cold and dry temperament of mountains, cold and wet temperament of coasts with mountains in its south (Abdullahzadeh 2016, 105). In the opinion of Avicenna, southern areas have a dry temperament, while the temperament of southern areas is more humid compared to other areas (Avicenna 2007, 328).

Avicenna classifies the occupants of the Earth into six climates based on closeness to or farness from lands opposite the equator (latitude) (Ibid, 307). He also considers a relative temperament for each place and introduces moderate temperament for each rate of different tribes based on the necessary climate conditions and their lands (Ibid, 305). Therefore, investigation of the temperament of each place and its occupants requires considering their temperaments based on the conditions and moderate temperament in the same place.

In brief, it is concluded that environmental features have a certain temperament shaping an environment altogether, which is matched with a certain temperament of that environment. Therefore, each temperamental environment indicator exists in the Bushehr climate, so the presence or absence of these indicators in the space can affect the temperament of that space. Hence, spaces of the historical houses of Bushehr are studied regarding the manifestation or absence of these indicators to find the temperament of these spaces.

3. METHOD

In terms of research method, this a descriptive-analytical, deductive, and inferential, so the descriptive-analytical method is used to identify the architecture of Bushehr and its environment, while both deductive and inferential methods are used for comparative analysis of space and human temperament in houses located in the historical fabric of Bushehr.

To know the temperament of buildings in the historical fabric of Bushehr, the temperament of occupants living in this fabric is tested. In this research, the Temperament Test 2021 was used to identify individuals' temperaments. To determine this, the temperament of a 30-member statistical society among occupants living in the historical fabric of Bushehr was chosen. This statistical society includes those individuals who have lived their entire lives in this historical fabric. These individuals have been randomly selected considering dispersion in their gender, age, and living place. The results of the temperament test have been presented from scores 1 to 4 in the table and diagram, in which 1 indicates the least while 4 depicts the highest rate of hotness, coldness, dryness, wetness, or moderation. The output has been shown as four temperaments, 9 temperaments, wet or dry temperament, cold or hot temperament, and also the standard deviation index of moderate temperament.

The four elements have been considered in the assessment of the temperament of spaces in houses located in the historical fabric of Bushehr City. In this regard, the quality and presence rate of each element in the space have been investigated, so that how these elements are present in each space led to temperament determination that its details are explained in research findings.

To select some case studies and examine the temperament of houses located in the historical fabric of Bushehr, some houses have been classified into three categories based on several characteristics, including spatial diversity, area, and number of floors. Hence, 16 houses are selected based on Table 1 to identify the house in the historical fabric of Bushehr and determine the temperament of its spaces. After that, each space and its spatial, physical, environmental, and behavioral indicators are introduced to obtain results that are close to the real temperament of each space.

Table 1. Classification of Studies House

Row	Building	Use	Number of Floors	Neighborhood	Approximate Area
1	Haj Rais Edifice	Residential-Commercial	3	Shanbodi	1288m ²
2	Golshan Edifice	Residential	3	Behbahani	1043m ²
3	Dehdashti Edifice	Residential-Business Chamber	4	Koti	1244m ²
4	Haftah Edifice	Residential-Business Chamber	2	Koti	835m ²
5	Habib Shirazi House	Residential	3	Shanbodi	1070m ²
6	Tabib Edifice	Residential	2	Behbahani	905m ²
7	Taheri Edifice	Residential	2	Behbahani	729m ²
8	Azin Edifice	Residential	2	Koti	511m ²
9	Rafiee House	Residential	2	Koti	514m ²
10	Samimi House	Residential	2	Shanbodi	420m ²
11	Sodae Edifice	Residential	2	Koti	416m ²
12	Mobaraki House	Residential	2	Behbahani	475m ²
13	Yahoodian House (Seyyed Al-Shohada Hoseinieh)	Residential	2	Behbahani	216m ²
14	Abasian House	Residential	2	Koti	217m ²
15	Yahooda (Kordestani) House	Residential-Commercial	2	Behbahani	185m ²
16	Khalil Gharibi House	Residential	3	Koti	124m ²

4. FINDINGS

Research findings have been classified into two parts: "temperaments of occupants living in the historical fabric of Bushehr" and "investigation of space temperament of houses located in the historical fabric of Bushehr." Finally, a comparative analysis of the temperaments of occupants and houses located in the historical fabric of Bushehr has been done based on the effects of the environment on the human and space temperament. The first part of the findings analyzed the typology of individuals living in the historical fabric of Bushehr based on the 9 temperaments and occupants' temperament in terms of hotness/coldness and wetness/dryness, while the second part investigated the space temperament in the selected house located in the historical fabric of Bushehr Port and plan pattern and hot-cold and dry-wet temperament cut of spaces' temperament based on the rate and quality of each element.

4.1. Temperament of Residents Living in the Historical Fabric of Bushehr

The first data analysis was obtained from individuals' temperament tests. Figure 1 and Table 2, that cold and wet temperament has the highest contribution (23%)

of the whole average rate of nine temperaments of residents living in the historical fabric of Bushehr City. This temperament is followed by three hot and dry, hot, and hot and wet temperaments that constitute 17% of the statistical society indicating domination of hot and wet temperaments (51%) among residents. This result is matched with the opinions of some scholars such as Avicenna who considers a direct relationship between residents' temperament and their environment.

Another result of statistical analysis in the table of four temperaments of residents indicates the superiority of two hot and dry and hot and wet temperaments. These two temperaments indicate 60% contribution against 33%, which is almost two times greater than cold temperaments that are contrary to the surrounding environment. However, temperament dispersion among occupants is the most significant point in this table, which shows the balance in the temperamental balance of residents living in the hot and wet environments of Bushehr.

Table 2. Investigating Temperaments of Residents Living in the Historical Fabric of Bushehr

Temperament	Hot		Cold		Wet		Dry		Hot and Wet		Hot and Dry		Cold and Wet		Cold and Dry		Moderate	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
9 Temperaments	5	16.6	1	3.3	2	6.6	1	3.3	5	16.6	5	16.6	7	23.3	3	10	1	3.3
4 Temperaments									7	23.3	11	36.6	7	23.3	3	10	2	6.6
In terms of Hotness	15	50	11	36.6													4	13.3
In Terms of Humidity					14	46.6	9	30									7	23.3

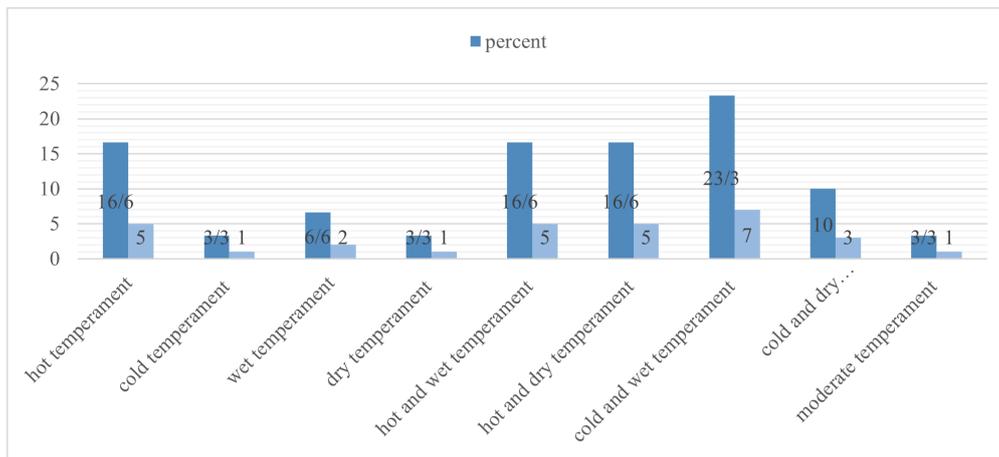


Fig. 1. Typology of the Individual Living in the Historical Fabric of Bushehr Port based on 9 Temperaments

Figure 2 has shown temperament analysis in terms of hotness and wetness indicating that these two temperaments have a considerable superiority over the temperament against the hot and wet temperament in the environment of Bushehr City. The hot temperament is obtained 50% against 37%, while in terms of dryness, the temperament indicates

47% against 30% which is almost matched with the temperament of Bushehr's environment. Although the quantitative aspect of these values gives superiority to the environment temperament-individual alignment, the temperament diversity will be the result of studying these two diagrams.

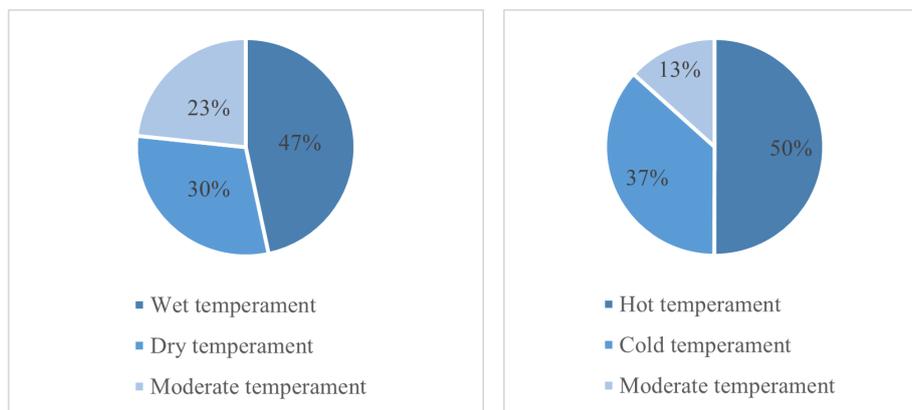


Fig. 2. Temperament of Occupants in Terms of Hotness/Coldness and Wetness/Dryness

Standard deviation is another analyzable index among results obtained from temperament tests for occupants. In this research, the standard deviation

means how much the temperament of occupants gets far from the moderate temperament, and the maximum standard deviation is 25 from 12 meaning

that 21% of hot temperament is far from moderation. Other SD values include 19% that is related to wet temperament, 16% that is related to cold temperament, and dry temperament is only 10% far from the moderate temperament of individuals. SD values have indicated one-fifth (maximum) to one-tenth (minimum) farness from equilibrium, indicating that occupants' temperament is not that far from equilibrium, while the environment has provided the highest deviation in climate indicators compared to heat and humidity balance for this city meaning intensity in hotness and humidity.

4.2. Analysis of Temperament of Spaces in Houses located in the Historical Fabric of Bushehr

To assess the space temperament of a house and analyze the space of a house located in historical fabric, the presence or absence and rate of presence method of four elements in that space must be examined. The rate and quality of four elements affect

the space temperament, which results in determining its space temperament based on the scoring reported in Tables 3-6.

Fire (sunlight): in the expression of four elements, sunlight is the symbol of fire because it provides all of its characteristics in terms of temperament. Dryness and hotness are specifications that have kinetic and heat in their nature. Heat is the dominant quality of fire and sunlight and dryness is its covert quality. Sunlight (fire) is responsible for creating tenderness and reduction of temperament coldness and creating maturity and lightness in elements. To test this element in houses located in the historical fabric of Bushehr, radiation direction and direct or indirect radiation rate are considered. Because radiation direction has some specifications such as certain temperature and light, Table 3 analyzes radiation direction. After that, each index considers a degree from zero as the minimum rate to four as the maximum presence of that quality in the space, so it analyzes the rate of the sunlight temperament in the house space.

Table 3. Effect Rate of Fire Element on the Space

(Hot and Dry)	Very High (4)	High (3)	Average (2)	Low (1)	Not (0)
Sunlight	South	East	West	North or Indirect	No Light

Air (wind): in four elements, wind indicates the air presence. Since this climate has a hot and humid temperament, heat is its covert quality and humidity is its dominant quality. Fluidity and rapid plasticity are some of the characteristics of air, which create tenderness and lightness in the objects by creating pores and distance between them. Since wind is an inseparable element of the vernacular architecture of Bushehr, investigation of its behavior is one of the most important temperamental indicators of architecture in houses located in Bushehr. Table 4 analyzes the humidity and heat rate in the presence of various winds considering the wind type and possible

presence of wind in the space. Bushehr is a peninsula that can receive coastal breezes from three north, east, and west sides because the historical fabric of Bushehr has been shaped on the coastal edge of this peninsula. Coastal breezes can be simply received through the openings of this house. Also, north-facing wind blows in this city as the dominant wind from north to northwest over the year, which has the highest effect on orientation and natural ventilation gain to get free from building heat and humidity. Another index that affects the wind presence in houses includes walls with some openings, such as Chand Dari (decorated doors), Shenashir, or lattices installed on these walls.

Table 4. Effect Rate of Air Element on the Space

(Wetness and Hotness)	Very High (4)	High (3)	Average (2)	Low (1)	Not (0)
Wind	North wind (from north to northwest)	Coastal breezes (southwest to north)	Bow wind (southeast)	Sea-facing wind (east)	-
	Three-way or more ventilation	Two-way ventilation	One-way ventilation	Limited ventilations	Lack of ventilation

Water (humidity): humidity (humidity in the air) and soil humidity are two elements in the Bushehr climate that highly affect the architecture. Because the temperament of water is cold and wet the dominant quality of water is old and its covert quality is wet, it can affect the temperament and mood of the space where water appears. The effect of water is its plasticity and flexibility in the objects so that those spaces that are in contact with water and humidity would receive the water temperament features.

According to Table 5, lack of constant ventilation and contact with soil humidity are considered indicators that can cause coldness and wetness in the temperament of spaces. The close distance between the historical fabric of Bushehr and the sea has led to a high surface of underground water and humidity in the air over the years creating the highest effect on the architectural spaces of the house through cold and wet temperaments.

Table 5. Effect Rate of Water Element on the Scape

(Coldness and Wetness)	Very High (4)	High (3)	Average (2)	Low (1)	Not (0)
Soil moisture	Underground spaces	Floor spaces	Spaces built on the platform	Middle-floor spaces	-
Humid	Non-ventilation	Limited ventilation	One-way ventilation	Two-way ventilation	Three-way or more ventilation

Soil (Earth): to determine space temperament affected by the Earth, the rate of contact of that space with the Earth and the volume of soil shaping walls of the space must be assessed. The hardness and closeness of the earth have made its temperament dry, which leads to the dominant quality of dryness and heaviness of the earth. Coldness is the covert quality of earth temperament; hence, earth temperament

is cold and dry. In Table 6, when materials in space directly obtained from Earth are used as thick and dense walls then space temperament is considered close to Earth temperament. Another feature that makes space temperament close to earth temperament is the distance between that space and earth (being close or far).

Table 6. Effect Rate of Earth Element on the Scape

(Dryness and Coldness)	Very High (4)	High (3)	Average (2)	Low (1)	Not (0)
Soil (connection to the earth)	Spaces inside the earth	Spaces on the earth	Spaces on the platform	Middle-floor spaces	roof
Soil (materials aggregation)	Thick walls without opening	Few openings	Many openings on one surface	Many openings on more surfaces	Completely open spaces

Spaces in the houses located in historical fabric of Bushehr include courtyard, balcony, roof and stairs, vestibule and entrance gate, Shenashir (wooden terrace), Taremeh (fence), corridor and spiral stairs, room (different types with five, four, three doors and one-way opening, rooms with five, four and three doors and two-way opening, and rooms with five, four, three doors and three and four-way opening), hall (sitting room), dining room (Orsi Khaneh), warehouse, kitchen, pond, and restrooms that the temperamental details of spaces are examined in Tables 3-6.

According to Table 7, the temperamental features of all spaces in the historical houses of Bushehr were analyzed. In this analysis, open spaces including courtyards, balconies, and roofs where nightlife occupants occur in the houses located in the historical fabric of Bushehr have a hot temperament. Hence, the hot temperament of these spaces is extra when they are constructed within a distance from the ground floor. Regarding the wet temperament superiority of these spaces- although this temperament is similar to a moderate degree, the closer these spaces are to the earth the higher the temperamental wetness of that space in daily life. The considerable point about open spaces in these houses is the nightlife of these spaces, so the temperament of these spaces such as the balcony and roof at night is different compared to the day due to changes in climate factors of nights compared to days. One difference is the low hotness temperament of these spaces and the high temperamental humidity of them. Analysis of these three spaces indicates that

the courtyard has a moderate temperament, while the balcony and roof have hot and wet temperaments.

The distinctive point of historical architecture in Bushehr compared to other climates of Iran is seen in its semi-open spaces where, corridors, terraces, and fences would connect the open spaces to the closed spaces of the house. Hence, the temperament of these spaces may indicate the certain properties of this architecture. These spaces play a significant role in all circulations of the house so one should pass through these spaces when entering the house to find the rooms on the highest floors. These spaces are deployed in all plans and cuts of the house. The temperament of the corridors is moderate regarding the equal dispersion at all house surfaces. Fences are mainly constructed towards wind or sunlight direction and have hot and wet temperament as same as the environment but terraces that are usually built on the highest floor and are built in connection with the main and dining rooms of the building would reduce the environment humidity making the wetness degree close to moderate and still has hot temperament.

The warehouse has complementary roles for main rooms, such as Panjdari or sitting room, and dining room and is considered a service and secondary house in terms of spatial importance. The temperament of this space is cold and somewhat dry. Other service spaces of these houses include ponds, kitchens, and restrooms. Since these spaces are located on ground floors, they have cold temperaments. In terms of dry temperament, however, the temperament of the kitchen is dryer than the temperament of the pond.

Table 7. Space Temperament in Studied Houses in the Historical Fabric of Bushehr Port

	Space	Rate	Coldness/ Hotness	Rate	Wetness/ Dryness	Tempera- ment	Explanations
	Courtyard	0.4	Hotness	0.4	Wetness	Moderate	With a Little Hotness and Wetness
Open	Roof and Stair	Day	3.75	Hotness	0.1	Wetness	Hot
		Night	1.9	Hotness	2.1	Wetness	Hot and Wet
	Balcony	Day	2.8	Hotness	0.2	Wetness	Hot
		1.3	Hotness	1.7	Wetness	Hot and Wet	
	Corridor, Vestibule, and Entrance Gate	0.7	Coldness	0.05	Wetness	Cold	
	Fence	0.5	Hotness	1	Wetness	Hot and Wet	With little Hotness
Semi- Open	Corridor and Spiral Stairs	0.4	Coldness	0.2	Wetness	Moderate	With Little Coldness and Wetness
	Terrace	2.3	Hotness	0.3	Wetness	Hot	With Little Wetness
	Dining Room	2.15	Hotness	0.15	Dryness	Hot	
	Sitting Room	1.15	Hotness	0.5	Dryness	Hot and Dry	With Little Dryness
	Warehouse	1.25	Coldness	0.25	Dryness	Cold	With Little Dryness
Closed	Room	With Five, Four, Three Doors and Three and Four-Way Openings	2.45	Hotness	0.15	Dryness	Hot
		With Five, Four, Three Doors and Two-Way Openings	0.1	Coldness	0.05	Dryness	Moderate
		With Five, Four, Three Doors and One-Way Openings	2.25	Hotness	0.9	Dryness	Hot and Dry
	Pond and Restrooms	1.3	Coldness	0.3	Dryness	Cold	With Little Dryness
	Kitchen	1.5	Coldness	0.8	Dryness	Cold and Dry	

The rooms are the main living spaces in the historical houses of Bushehr. The rooms are mainly designed and located with a proportion of 1 to 1.5 in size with some uses such as dining room, sitting room for family and formal ceremonies, as well as living and bedrooms. The temperament test of living room occupants is classified into three categories of rooms with openings from one, two, and three or four sides based on the presence rate of four elements through multiple doors and openings. The first category is rooms with one-way openings (mainly central courtyard) their temperament is close to heat and humidity balance. If the number of these walls with the opening is added, the space temperament gets hot in terms of heat, but in terms of dryness, the rooms with two-way openings are hot and dry and if these

openings are installed at three or four directions then their temperament remain hot while become more moderate in terms of wetness. Those rooms that have openings only from two sides have moderate temperament. However, when the number of these walls is added then their temperaments become hotter but remain moderate in terms of humidity. However, the rooms with one-way openings have both hot and dry temperaments.

Two rooms are usually used as sitting rooms in the studied houses, and receive greater attention from family members compared to other rooms in terms of location, decorations, dimensions, and number of openings. The sitting room is one of these rooms located on the ground floor and close to the entrance gate of the house to host formal and business guests

in this space. The temperature of this space is hot and a little dry according to its physical specifications. However, living rooms are designed on upper floors with more openings rather than other rooms. The temperature of this space is hot based on the mentioned

indicators, so it is suitable for warm and vibrant family parties and is close to moderate in terms of humidity. Figure 3 depicts the temperament and degree of each space in terms of hotness, humidity, and distance on the diagram relative to temperament moderation.

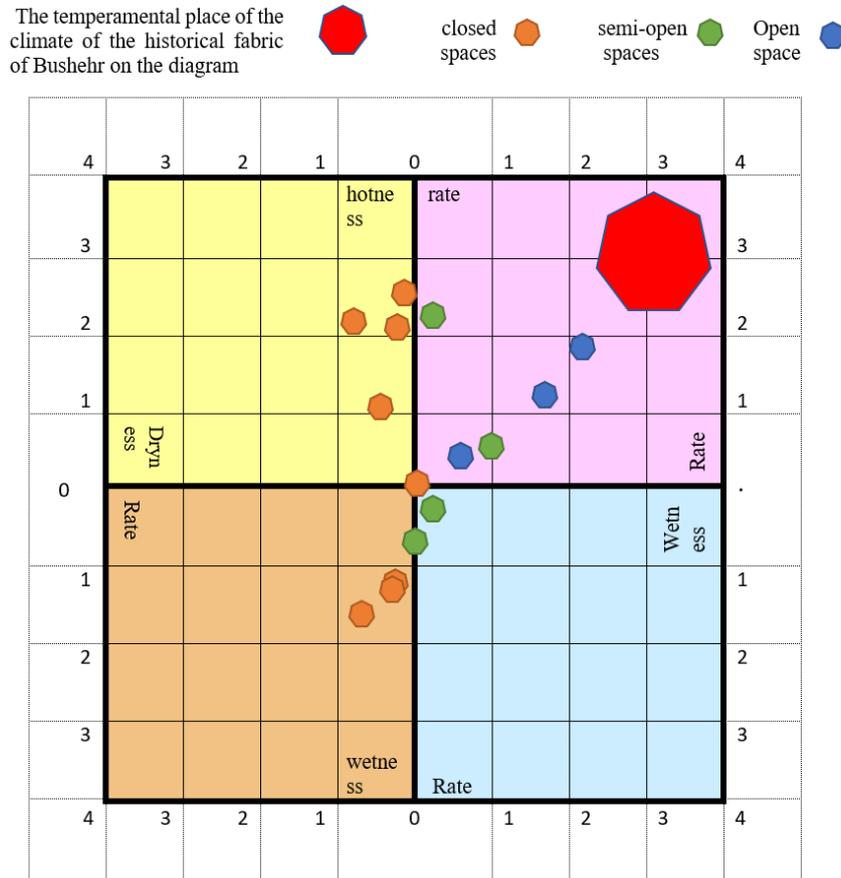


Fig. 3. Temperamental Location of Spaces of Historical Houses in Bushehr

5. DISCUSSION AND CONCLUSION

The first step to assessment and analysis of the relationship between space and occupants' temperament in houses located in the historical fabric of Bushehr port is the separate analysis of heat and humidity of temperament of spaces and occupants living in the fabric. In the next step, the house is considered as a whole the house temperament is mixed with human temperament the temperament of occupants living in those houses was considered and tested. Temperament results of spaces and houses are plotted in Figures 4-7 in the plan and cut.

According to the analytical results in terms of 8 temperaments of occupants living in the historical fabric of Bushehr, 23% have the cold and humid temperament that was considered the dominant and superior temperament. However, Figure 1 indicates three hot, hot dry, and hot and humid temperaments that each make up 17% of occupants' temperament introducing more than half of occupants living in the

fabric with hot temperament, which more than 37% of cold temperaments are among these 9 temperaments. Analysis of the temperament of house spaces indicates that main daily living spaces that are mainly rooms with several doors have almost moderate or hot temperaments. The result of this study indicates that the temperament of main architectural spaces with dining, sitting, and daily living uses is matched with the dominant hot temperament of occupants and environment. Since movement is a specification of heat, the temperament of these spaces is matched regarding the vibrant life and use for its occupants. Unlike the heat alignment of rooms with several doors in houses located in historical fabric, they have a dry temperament in terms of humidity to make the humidity of occupants and environment in this residence moderate. Since the humidity temperament of occupants is superior to its dryness, this index can consciously indicate the design, location, and construction of these spaces and their relationship

with the environment.

The most important result of this study may be the activity, movement, and residence in spaces of studied houses. When entering from the corridor to the vestibule of the house, the person enters from an environment with a high level of heat and humidity enters the corridor or entrance vestibule. The temperament of this space is a little cold with moderate humidity. Then, the person enters the spaces of the central courtyard of the house with a moderate temperament, which all service spaces, including the pond and kitchen, are designed with a cold temperament on the ground floor regarding the need for individual activity and domination of hotness, movement, and kinetics considering the temperamental hotness of occupants' temperamental hotness. The person then passes through some spaces, such as corridors and stairs that have moderate temperament to enter the short-term residence spaces

(dining room and sitting room), which are rooms with warm and vibrant temperaments. These spaces are both introverted and extroverted with some specifications, including some ornaments such as colorful glasses, lattices, and Shenashir which is the most important decoration that is mainly designed around one of these spaces. These two spaces and Shenashir have hot and dry temperaments. Taremeb or fence is another middle space that has a hot and humid temperament. This space is responsible for creating a balance between the temperament of the outside environment and transferring its indicators, including light, wind, and air to reduce the hotness and wetness rate of these indicators. As Avicenna considers drowsiness one of the specifications of hotness and wetness, the balcony roof and stairs have a hot and humid temperament so occupants can have comfort and peace at night in line with the nightlife in these spaces.

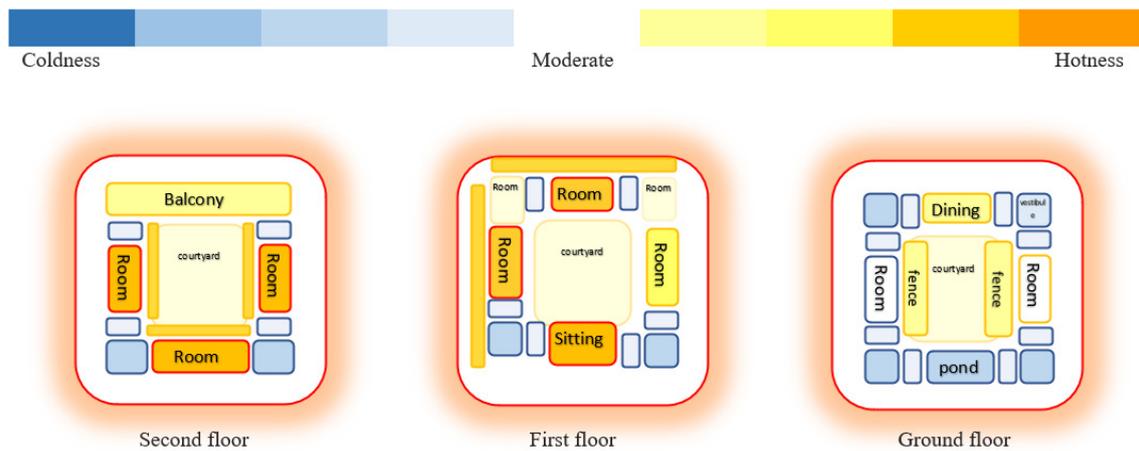


Fig. 4. Hotness-Coldness Plan of Spaces' Temperament in Historical Houses of Bushehr

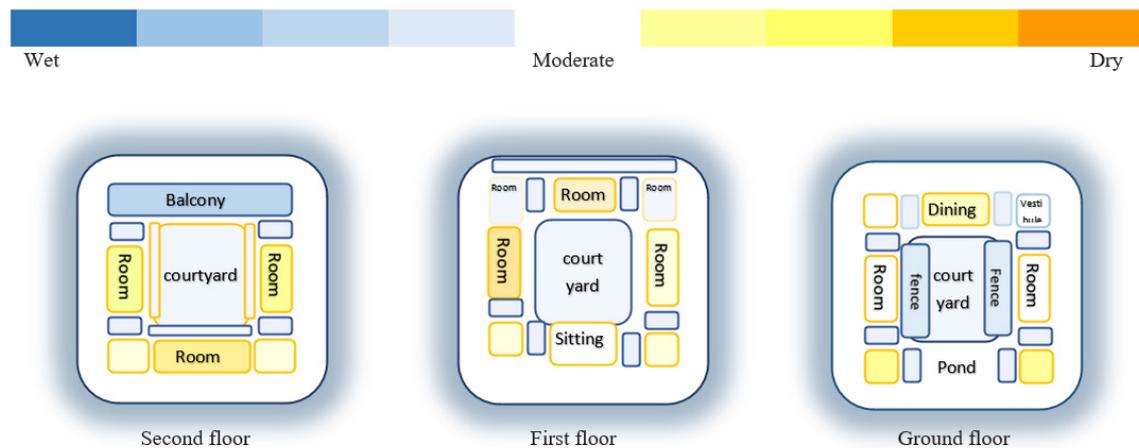


Fig. 5. Dryness-Wetness Plan of Spaces' Temperament in Historical Houses of Bushehr

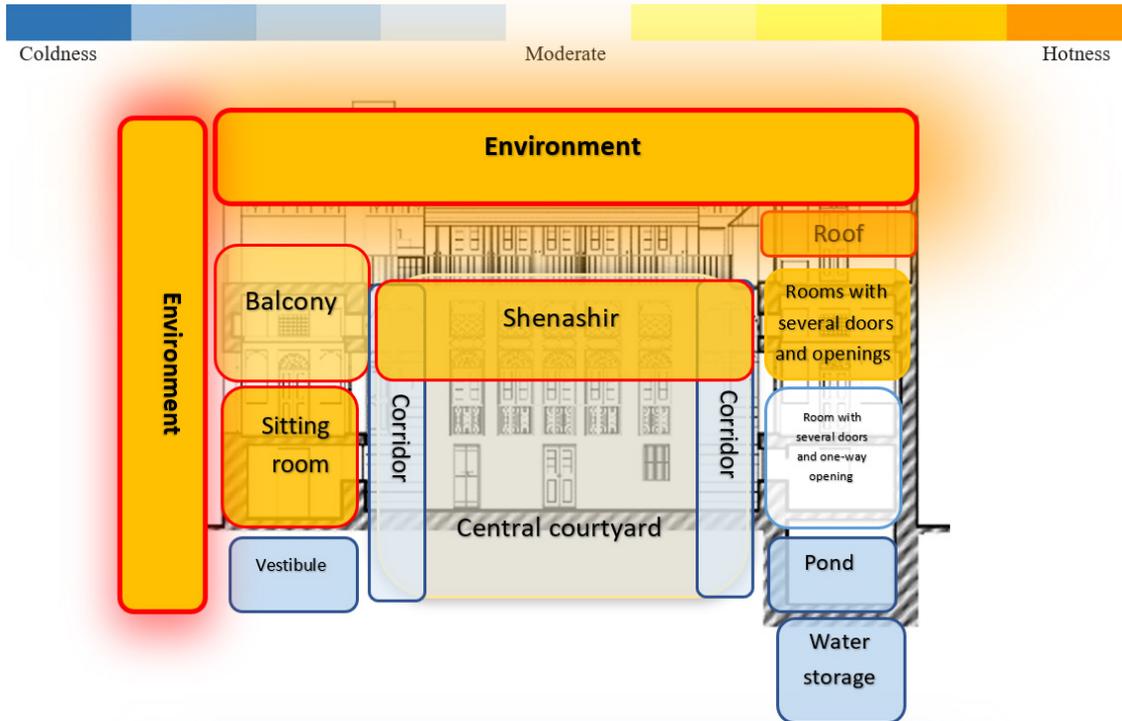


Fig. 6. Hotness-Coldness Cut Plan of Spaces' Temperament in Historical Three-Story Houses of Bushehr

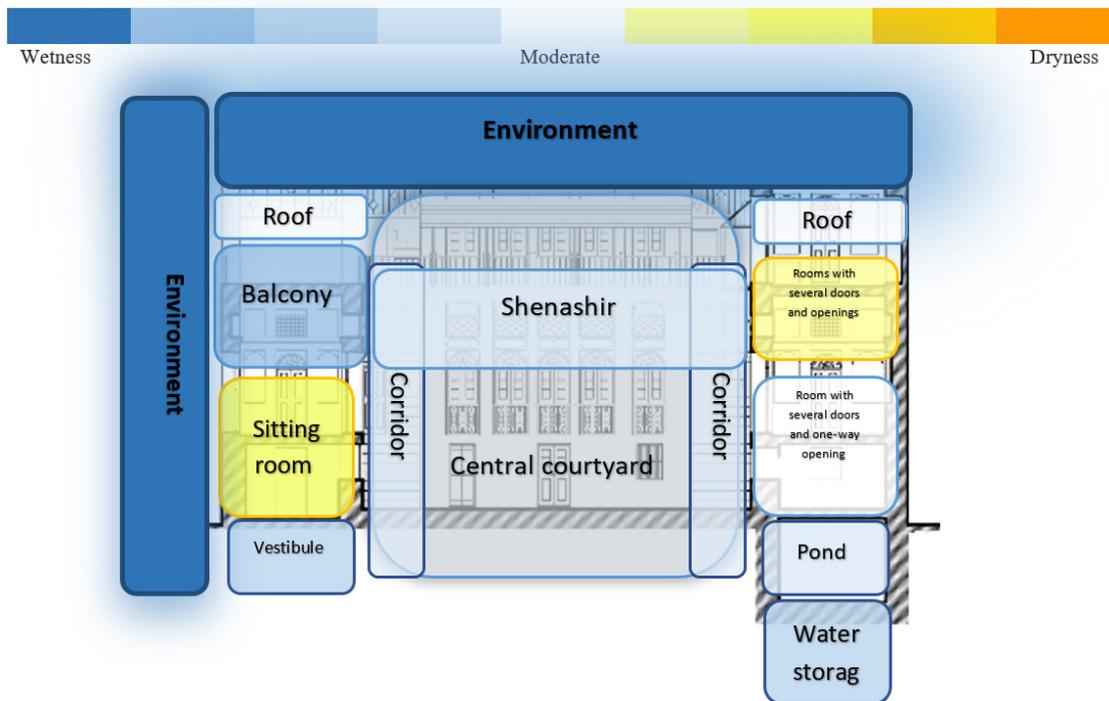


Fig. 7. Dryness-Wetness Cut Plan of Spaces' Temperament in Historical Three-Story Houses of Bushehr

Finally, Figures 4-7 indicate the analysis of the temperament and behavior of individuals and their characteristics and temperament test of occupants living in the historical fabric of Bushehr and its environment. Accordingly, the following results are obtained. These results can be useful in identifying

historical houses and their relationship with the environment and knowing the behavior based on the temperament of space and occupants of these spaces. Results of occupants' temperament test living in the fabric:

- Diversity in the temperament of occupants living in

the historical fabric of Bushehr

- The temperament of the environment and occupants living in this fabric are highly matched, and both have hot and humid temperaments.

In this research, each element and organ of houses located in the historical fabric of Bushehr has a unique temperament. As human has the most moderate temperament among universe creatures and each organ of human has its certain temperament, the space and elements of these houses are built to create temperamental balance as a detail of whole next to each other. Also, the temperament of each space is more moderate compared to the environment and affects the temperament of occupants living in a

house in three ways:

- Temperament house spaces are more moderate compared to the environment.

- Regarding to the diverse temperament of spaces in the house, occupants can live in spaces matched with their temperaments and use this feature in line with their temperamental balance.

In a hot and humid climate, the structure of house spaces is in line with the collective hot and humid temperament regarding the behavioral needs of each space that temperament. Hence, houses located in this fabric have been constructed in the extroverted-introverted form to meet the physical and mental needs of occupants.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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The authors commit to observe all the ethical principles of the publication of the scientific work based on the ethical principles of COPE. In case of any violation of the ethical principles, even after the publication of the article, they give the journal the right to delete the article and follow up on the matter.

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The authors state that they have directly participated in the stages of conducting research and writing the article.

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