



## RESIDENTIAL HOUSING QUALITY ASSESSMENT BASED ON THE CRITERIA OF SUSTAINABLE HOUSING (CASE STUDY: RESIDENTIAL COMPLEX OF 100 UNITS OF REGION 1 CITY OF ZAHEDAN)

Farzaneh Saberi<sup>1†</sup> --- Gholam Reza Miri<sup>2</sup> --- Masume Hafez Reza Zadeh<sup>3</sup>

<sup>1</sup>M.Sc, Department of Geography and Urban Planning, Faculty of Human Science, Islamic Azad University, Zahedan Branch, Zahedan, Iran

<sup>2,3</sup>Ph.D, Department of Geography and Urban Planning, Faculty of Human Science, Islamic Azad University, Zahedan Branch, Zahedan, Iran

### ABSTRACT

*The most basic human needs throughout history, is the need for housing. On the other hand, in recent years one of the topics that were of interest to scholars and experts, is the quality of life and environment. Lack of attention to the physical-spatial standards in the design of residential complexes can cause major problems in the field of housing and living conditions. This study examines the criteria for sustainable housing in the city of Zahedan and in a complex-residential area. The statistical population is 19080 people in the city of Zahedan in a residential area, and the sample was calculated using a sample of 318 people, Library and field is the method of studying and using a questionnaire. And to analyze the data, one sample T-test has been used in SPSS software, and to rank the residential complexes of entropy the hierarchical analysis model is used. The results of the one-sample T-test indicates that housing indicators in terms of physical, social and environmental terms are not in good condition. Considering that the average 3 is calculated from the test T, (67/2, 87/2, 49/2) are lower than the basis of the standards. The mean difference in level is more than 99% and it is statistically significant and reliable (Sig = 0.000).*

**Keywords:** Sustainable housing, Urbanization, Housing complex, A city of Zahedan area.

Received: 21 December 2015/ Revised: 28 January 2016/ Accepted: 8 March 2016/ Published: 1 April 2016

### 1. INTRODUCTION

Until the rapid expansion of urbanization as a result of rapid population growth, only the housing sector has been influenced by the culture and economy issues, over time and uncontrolled physical development of cities and urban population growth, factors affecting the physical planning of residential units also changed. For example, one-story residential units were replaced with high-density housing complexes, and consequently, per capita land and infrastructure found declining. The joy of growing urbanization, especially in developing countries was one of the most important urban challenges. Baqerzadeh and Mohammadi (1392) a glimpse into the process of urbanization in Iran shows that: Regardless of the factors in its origin and how relations between the cities and the villages at different times, Qajar period started establishing a new process of urbanization. Since the end of the first half of the fourteenth century AH 1300 Hijri, Political and economic developments, made changes in urbanization in Iran, until that time was unprecedented. Since urbanization witnessed a period of slow growth. And after the 1962 land reform solar events, development of mechanized capitalist exploitation, concentration facilities in the cities from the countryside to the cities, has resulted in the evacuation of the population and the results was due to increased urbanization. Such rapid growth in urban life caused problems of economic, social and physical. Including

them are imbalance in the urban network and focus on economic opportunities in some cities. And the subsequent we can name city and the metropolis in the country's chain. In the meantime, metropolitan in terms of attracting more facilities attract more people, And also the natural growing population, increasing uncontrolled migration from villages and small towns, While dealing with social and economic issues with particular problems in the name of increased demand for land and housing on the one hand and limited physical space for the development of the other side treated (Hadyly, 1373).

Thus, in the early years of problems, authority's preparation and implementation of comprehensive plans were thinking programming so that the physical environment in terms of facility space and adjust to be solve in this manner. Among the objectives of the program in the field of urban housing was urban housing, that didn't implemented. It should be noted that, Although the guidance of private activities in the production of urban housing using criteria such as how detailed and comprehensive plan land use, creating private streets, residential density, residential quality are the responsibility of municipalities. But in practice, as they should be designed and supervised the implementation of the residential environment in accordance with the criteria set forth in the city has not been approved (Hossein, 1993). So the private investors taking advantage of the vacuum management, Habitat work (especially in large cities) were in possession, However, the lack of a comprehensive design plan and the establishment of relations of land use became more corrupt (Pour-Mohammadi and Mohammad, 1996).

In the absence of a comprehensive government program and lack of production patterns, did not have any significant impact on housing department (Ahari and Amini, 1996). Later, the main custodians of housing department (private sector) accompany and support the public sector, selected the most effective way of housing for different groups of people in the apartment complexes. But because in the seating plan and designing social, cultural, economic, environmental, and not met issues didn't considerate, And on the terms and privacy by integrating residential, office and commercial complexes have imposed in a same way. So high density have limited the Outdoor, and the also having inefficient distribution functions, An unreasonable bond and discrete environment, away from the demands of urban development has been achieved. Then eventually the result of the major economic and reliance on the work, gradually made various problems of social, economic, physical and swiped the building and its residents. Zahedan, like other major cities in recent decades due to population growth faced with the problem of housing, The city authorities have arranged several programs for the resettlement of this population, One of these programs is that mass housing is in the form of residential complexes, Unfortunately because of the emphasis on construction and population resettlement, Much less has been paid to the criteria for sustainable housing Or did not care, Which causes problems such as socio-cultural problems, such as : the nobility, the low per capita income and standards of service areas and the economic, environmental and physical. The aim of this research is to check good housing and sustainable criteria in urban residential complexes of 100 units in Region 1 Zahedan, Using "AHP", Practical and scientific solutions, taking into account local conditions and regional presented.

### 1.1. Background and History Research

Maliene and Mayls (2009) in his study entitled "The quality of housing is key to achieving sustainable communities." The characteristics of quality housing and housing societies have on the attractiveness and health. In this study, stable housing is a key tool in building sustainable communities (Maliene and Mayls, 2009).

Negahdar (2011) in his dissertation explores the urban standards in the construction of residential complexes (of socio-cultural, economic, physical, safety, environmental and operational management) case study of Tabriz. The results show that compliance with the aspects and factors defined in the urban population vary from complex to complex and generally defined on the basis of considerations of a loss, and degradation can be seen. Baqerzadeh and Ahmadi, 2013, in a paper examines the optimal housing standards in the design of residential complexes Residential Garden Design Tabriz. The results of this study show that low density residential and open spaces and green environment provides better-quality residential environment makes it and its effects on it.

**1.2. Housing Index**

Qualitative and quantitative analysis of the issues of housing is done using a tool that has been housing variables Index, And represent various aspects of economic, social, cultural and physical housing (Azizi, 2004). Indicators of housing are useful tool to measure the standards of housing policies. Housing indices as the basis of a comprehensive program and essential tool for explaining the various aspects of economic, social, cultural, environmental and physical accommodation have special importance in the planning of housing (Bahrami, 2010). The housing index providing appropriate action as reflecting different aspects of the issue and develop relevant policies can be used to identify the dimensions. Index funds simply quantitative and qualitative housing shortage and housing aspects of the status quo. Using these indicators, we can assess housing conditions and housing conditions to obtain the real image (Habibi, 1991). Using these indicators, we can assess the situation in the housing system and the scale of the facts and events that exist in this area objectively review, Physical, social and environmental indicators are studied in this research.

**2. GEOGRAPHICAL LOCATION OF ZAHEDAN**

Zahedan, is the capital of Sistan-Baluchistan province in Iran's East. Near the border with Afghanistan and Pakistan. It is limited from North of the city to Zabol, from the North East to Afghanistan, from North West to South Khorasan, from West to Kerman, from the South West to Iranshahr, from East to Pakistan and from South East to Khash. Zahedan area is 36,581 square kilometers, in The math position it is at longitude 60 degrees 51 minutes 25 seconds east and latitude 29 degrees 30 minutes 45 seconds north .its Height is 1385 meters above sea level and has a 4 section 3 of the 8 districts and 2102 villages (Varesi, 2008).

**3. RESEARCH METHODOLOGY**

The type and purpose of the present study used a cross-sectional nature of the survey strategy. Field data gathered through appropriate tools such as questionnaires. Its validity is confirmed by some of the professors of geography and reliability using Cronbach's alpha is approved. The total index of Cronbach's alpha is 0.82. Since this amount is more than 0.7 Therefore, we conclude this study is of sufficient reliability. The statistical population is, 19080 people (the population of the city of Zahedan residential complex of 100 units of Region 1). And the sample population is 318 adults living in the residential complex. The method of analysis in this study is the use of one-sample t-test.

**4. RESEARCH FINDINGS**

**4.1. Descriptive Findings the Sample Population**

Summary Results Descriptive statistics are presented in Table 4-1.

Table-4.1. summarizes the results of descriptive statisti

Type search	Group	Results
Sex		female and 61.9% are male %38.1
Age	less than 20 years, 84.9% between 20 and 45 years, 6.6% between 45 and 65 years and 0.9% over 65 years.	%7.5
Employment status	26.1% were unemployed, 33.3% of employees, 15.4% and market traders, 7.2 percent and 17.9 percent of other students	
Education	Education high school diploma (22.6%), 43.1% of diploma, associate degree, 11.6 percent, 20.8 percent of undergraduate and graduate level is 6 to 1.9%	

Source: Research findings

**4.1.1. Analysis of Physical Parameters Using T-Test**

For analyzing the physical parameters of the 13 items on the physical parameters used, The results indicate that only items (3 and 13) with the calculated value (0126/3 and 1321/3) located at a medium level, But the rest of

the items related to the physical parameters are lower than medium (3). The mean difference was statistically significant at the 95% level ( $05 / 0sig \leq$ ) and is reliable. The results of the physical index items in the table (4-2 and 4-3).

Table-4.2. Results of single-sample t-test items related to the physical index

One-Sample Statistics					
Row	Items	Number	Average	Deviation	Mean
1	Satisfaction, appearance and facade work in the residential complex	318	2.6698	1.11532	.06254
2	The satisfaction of interior design houses	318	2.7107	1.08820	.06102
4	The satisfaction of the materials used in residential complex	318	3.0126	.99518	.05581
4	The satisfaction of access on foot to green space	318	2.5818	1.23229	.06910
5	The satisfaction of access by foot to the recreational facilities	318	2.4308	1.20197	.06740
6	The satisfaction of access by foot to the sports facilities	318	2.7201	1.12063	.06284
7	The satisfaction of access by foot to shopping centers	318	2.6824	1.06998	.06000
8	The access to public transport	318	2.7358	1.09171	.06122
9	Access to training centers	318	2.5881	.86107	.04829
10	Access to health centers	318	2.5503	.95761	.05370
11	The access to cultural and religious centers (mosques, libraries, etc.)	318	2.8145	1.16745	.06547
12	The main arteries of communication and access to the main street	318	3.1321	.99914	.05603
13	Proximity to incompatible land (land producing smoke, sound, and ...)	318	2.3113	1.01437	.05688

Source: Research findings

Table-4.3. Results of single-sample t-test items related to the physical index

One-Sample Test							
Row	Items	Test Value = 3					
		t	df	Significance level	Average	Upper and lower limit	
						lower limit	upper limit
1	Satisfaction of appearance and facade work in the residential complex	-5.279	317	.000	-.33019	-4.532	-.2071
2	The satisfaction of interior design houses	-4.741	317	.000	-.28931	-.4094	-.1692
3	The satisfaction of the materials used in residential complex	.225	317	.822	.01258	-.0972	.1224
4	The satisfaction of access by foot to green space	-6.052	317	.000	-.41824	-.5542	-.2823
5	The satisfaction of access by foot to the recreational facilities	-8.444	317	.000	-.56918	-.7018	-.4366
6	The satisfaction of access by foot to the sports facilities	-4.454	317	.000	-.27987	-.4035	-.1562
7	The satisfaction of access by foot to shopping centers	-5.293	317	.000	-.31761	-.4357	-.1996
8	The access to public transport	-4.315	317	.000	-.26415	-.3846	-.1437
9	Access to training centers	-8.531	317	.000	-.41195	-.5070	-.3169
10	Access to health centers	-8.374	317	.000	-.44969	-.5553	-.3440
11	The access to cultural and religious centers (mosques, libraries, etc.)	-2.834	317	.005	-.18553	-.3143	-.0567
12	The main arteries of communication and access to the main street	2.357	317	.019	.13208	.0218	.2423
13	Proximity to incompatible applications (land producing smoke, sound, and ...)	-12.107	317	.000	-.68868	-.8006	-.5768

Source: Research findings

And the statements of the physical indicators are combined and interpreted by one sample t-test analysis, the results indicate that the physical parameters of the residents of housing complexes are not in a good condition.

Considering that the average is 3, the calculated value of the test T, is 2.68, which is lower than the reference standard. The mean difference in level is more than 99 percent which is statistically significant and reliable (Sig = 0.000). Table (4-4 and 4-5).

Table-4.4. Results of one-sample t-test description of the relevant physical parameters

One-Sample Statistics				
Index	Number	Average	Deviation	The mean difference
Skeletal	318	2.6877	.62037	.03479

Source: Research findings

Table-4.5. Analysis of single-sample t-test of physical parameters

One-Sample Test						
Test Value = 3						
Index	t	Df	Significance level	Average	Upper and lower limit	
					lower limit	upper limit
Skeletal	-8.977	317	.000	-.31229	-.3807	-.2438

Source: Research findings

4.1.2. Analysis of Social Indicators Using T-Test

To analyze the social indicator 8 items have been used, the results indicate that items (1, 2, 3 and 6) with the calculated value (3.4088 and 3.5755 and 3.0912 and 3.0283), are at a medium level. But the rest of the items related to social indicators are lower than the average (3). The mean difference of items (1, 2, 4 and 7) are at 95% statistically significant ( $05 / 0sig \leq$ ) and is trusted. The items (3, 5, 6, and 8) are not statistically significant. Tables (4-6 and 4-7).

Table-4.6. Descriptive results of the one-sample t-test items related to social indicators

One-Sample Statistics					
Row	Items	Number	Average	Deviation	The mean difference
1	The rate of water in the residential complex	318	3.4088	1.02162	.05729
2	The rate of electricity in the residential complex	318	3.5755	1.02906	.05771
3	Having the phone, in the residential complex	318	3.0912	1.21031	.06787
4	The rate of urban gas in the residential complex	318	1.2673	.68853	.03861
5	Satisfaction kitchen, bathroom, toilet in their unit	318	2.9119	1.03188	.05786
6	The satisfaction of their housing	318	3.0283	1.05188	.05899
7	Satisfaction level of security against theft in the residential complex	318	2.7799	1.16547	.06536
8	Satisfaction level of security against natural hazards (floods, earthquakes, etc.) in Complex	318	2.9497	.98441	.05520

Source: Research findings

Finally, items related to social indicators are combined and interpreted by the t-test one sample, The results indicate that social indicators for residents of housing complexes is not in good condition, Considering that the average is 3 , the calculated from the test T, is 2.87, Which is lower than the reference standard. The mean difference in level is more than 99%, statistically significant and reliable (Sig = 0.000).

Table-4.7. Results of single-sample t-test items related to social indicators

One-Sample Test							
Row	Items	Test Value = 3					
		t	Df	Significance level	Average	Upper and lower limit	
						lower limit	upper limit
1	The rate of water in the residential complex	7.136	317	.000	.40881	.2961	.5215
2	The rate of electricity in the residential complex	9.972	317	.000	.57547	.4619	.6890
3	The phone is in the possession of the residential complex	1.344	317	.180	.09119	-.0423	.2247
4	The rate of urban gas in the residential complex	-44.876	317	.000	-1.73270	-1.8087	-1.6567
5	Satisfaction kitchen, bathroom, toilet in their unit	-1.522	317	.129	-.08805	-.2019	.0258
6	The satisfaction of their housing	.480	317	.632	.02830	-.0878	.1444
7	Satisfaction level of security against theft in the residential complex	-3.368	317	.001	-.22013	-.3487	-.0915
8	Satisfaction level of security against natural hazards (floods, earthquakes, etc.) in Complex.	-.911	317	.363	-.05031	-1.1589	.0583

Source: Research findings

Table-4.8. Descriptive results from one sample t-test related to social indicators

Index	The number of respondents	Average	Deviation	The mean difference
Social	318	2.8766	.67420	.03781

Source: Research findings

Table-4.9. Results of one-sample t-test analysis of social indicators

Index	THRESHOLD = 3					
	Number	Average	Significance level	The mean difference	Upper and lower limit	
					lower limit	upper limit
Social	318	2.8766	.001	-1.12343	-1.1978	-.0490

Source: Research findings

#### 4.1.3. Analysis of Environmental Indicators Using T-Test

Indicators for environmental analysis has been used 6 items, the results indicate that the items in good condition is not related to the environmental index And are lower than the average (3). The mean difference was statistically significant at the 95% level ( $0.05 / 0.05 \leq$ ) and is reliable. Table (4-10 and 4-11).

Table-4.10. Descriptive results of the one-sample t-test items related to environmental index

One-Sample Statistics						
Row	Items	Number	Average	Deviation	The mean difference	
1	Satisfaction of sewage disposal methods, in the residential complex	318	2.5189	1.09974	.06167	
2	The appropriate methods of waste disposal (non-release and waste incineration in residential complexes)	318	2.2044	1.01676	.05702	
3	The satisfaction of using clean energy and natural light (sunlight)	318	2.5629	1.03296	.05793	
4	The national building regulations concerning energy (use of thermal insulation and double glazed windows)	318	2.5818	1.02857	.05768	
5	The consent of the orientation of the building (opposite wind direction, exposure, etc.) in the residential complex	318	2.6258	1.13792	.06381	
65	The consent of the dimensions of the window (the best position: transverse and short to prevent the entry of dust and sunlight, etc.) in residential complexes	318	2.4497	1.23142	.06905	

Source: Research findings

Table-4.11. Results of one-sample t-test items related to environmental index

One-Sample Test							
Row	Items	Test Value = 3					
		T	Df	Significance level	Average	Upper and lower limit	
						lower limit	upper limit
1	The satisfaction of methods of wastewater disposal in residential complex	-7.802	317	.000	-.48113	-.6025	-.3598
2	The appropriate methods of waste disposal (non-release and waste incineration in residential complex	-13.954	317	.000	-.79560	-.9078	-.6834
3	The satisfaction of using clean energy and natural light (sunlight	-7.546	317	.000	-.43711	-.5511	-.3231
4	The national building regulations concerning energy (use of thermal insulation and double glazed windows	-7.251	317	.000	-.41824	-.5317	-.3048
5	The consent of the orientation of the building (opposite wind direction, exposure, etc.) in the residential complex	-5.864	317	.000	-.37421	-.4998	-.2487
6	The consent of the dimensions of the window (the best position: transverse and short to prevent the entry of dust and sunlight, etc.) in residential complexes	-7.969	317	.000	-.55031	-.6862	-.4145

Source: Research findings

Finally, items related to environmental indicators are combined and interpreted by one-sample t-test analysis, The results indicate that the environmental indicators for the residents of housing complexes is not in good condition. Considering that the average is 3, the calculated value of the test T, is 2.47, which is lower than the reference standard. The mean difference in level is more than 99 percent on statistically significant and it is reliable (Sig = 0.000) tables (4-12 and 4-13).

Table-4.12. Results descriptions of the environmental index

Index	The number of respondents	Average	Deviation	Mean
environmental	318	2.4906	.72128	.04045

Source: Research findings

Table-4.13. Results of one-sample t-test for environmental index

Index	THRESHOLD = 3					
	Number	Average	Significance level	Mean	Upper and lower limit	
					lower limit	upper limit
environmental	318	2.4906	.000	-.50943	-.5890	-.4299

Source: research findings

## 5. CONCLUSION

In this study, the evaluation and ranking of the top hundred families in the residential complex "area of a" city of Zahedan has been studied. Zahedan as the metropolitan area of South-East in Iran, with a population of over 560,000 in 1390, like the other Metropolises in Iran has tremendous growth in recent decades, and is faced with the problem of housing. One way to provide housing for residents, is creating a large residential complex in the city.

This study examines housing complexes in the city of Zahedan in area of one, the overall findings can be concluded that, Indicators of physical, social and environmental calculated the amount of 2.68, 2.87 and 2.47, Considering that the average has been 3, The calculated value of the test T, for all three indices is lower than the reference standard, So for the residents of residential complexes in terms of three indicators of sustainable housing are in good condition.

## 6. PROPOSALS

Overseeing the construction of residential complexes in the entire process, the study sample with negative effects, lack of adequate oversight and rigor, only in the initial phase of construction license have been met. And then take control of the Custodian of the residential complex, which in the end will cause negative effects and discontent residents, Negative cases can be allocated on non-emergency staircase, covered concrete instead of brick facade and so on.

Having a population thresholds necessary to attract and deploy municipal services needed to be developed due to limitations in land area and elevation.

According to need for people to spaces and elements of services such as parking, green space, children's playground, mosque, and library and ... to build a residential complex, parking in the series is calculated as the base population estimates. For children also proportional to the number of children should exist land and recreational facilities and the absence of facilities for sport and increased traffic vehicles.

Precision positioning and creating integrated security and management considering the factors to increase the security of residential complexes and increase resident satisfaction.

Considering the issues of the elderly, children and people with disabilities in the design inputs and walking paths through the courtyard of the complex-building.

Compliance with environmental standards in the planning and designing of residential complexes such as having clean air and avoid sound and environmental pollution.

Funding: This study received no specific financial support.

Competing Interests: The authors declare that they have no competing interests.

Contributors/Acknowledgement: All authors contributed equally to the conception and design of the study.

## REFERENCES

- Ahari, Z. and J.S. Amini, 1996. The experiences of different countries in the provision of housing, printing. Tehran: Department of Housing and Urban Development National Agency for Land and Housing.
- Azizi, M.M., 2004. The position indicator housing in the housing planning process. *Fine arts*, No. 17: 42-31.
- Bahrani, R., 2010. Analysis of rural housing and approaches for retrofitting Kermanshah province. *Geography and Regional Planning*, 2(2): 63-77.
- Baqerzadeh, A. and S. Mohammadi, 1392. Article reviews the optimal housing standards in residential designing. *The Design of the Residential Complex Gulshan-e Tabriz Tabriz International Conference*.
- Habibi, M., 1991. *Minimum housing*. 2nd Edn., Tehran: The Ministry of Housing and Urban Development, Building and Housing Research Center.
- Hadyly, B., 1373. *Urban planning, physical development*, faculty of humanities. Tehran: Publishers University of Tabriz.
- Hossein, D.K., 1993. *Techniques and principles of urban planning*. Faculty of Humanities and Social Sciences, University of Tabriz.
- Maliene, V. and N. Mayls, 2009. High-quality housing – a key issue in delivering sustainable communities. *Building and Environment*, 44(2): 426–430.



- Negahdar, H., 2011. Review the criteria for urban development social-cultural dimensions, economic, physical, safety, environmental and operational management in the construction of residential complexes, of Tabriz. Master's Degree Thesis, Department of Geography and Environmental Planning, University of Sistan and Baluchestan.
- Pour-Mohammadi and R. Mohammad, 1996. Some considerations in the context of physical planning and design of residential complexes. *Journal of Literature and Human Sciences*(161-160): 127-142.
- Varesi, H., 2008. A comparative study of the distribution of public services from the perspective of social justice, case ascetics. *Journal of Geography and Development*, 6(11): 139-156.

*Views and opinions expressed in this article are the views and opinions of the author(s), International Journal of Geography and Geology shall not be responsible or answerable for any loss, damage or liability etc. caused in relation to/arising out of the use of the content.*