

## **Assessment Residential Environmental Quality of Traditional and New Neighborhoods, in a Rapid Grown City, Tehran**

Saleh Kesalkheh, Tarbiat Modares University, Iran  
Hashem Dadashpoor, Tarbiat Modares University, Iran

### **Introduction**

With increasing growth of Iranian cities in the past few decades, traditional and historical structures of them have been affected by new developments over old boundaries. Experiences review in the period indicates that traditional neighborhoods have been faced with physical, social, and environmental changes, changing their role in the structures of cities. In the most cases, these neighborhoods were introduced as the problematic area of urban areas. On the other hand, new large groups settled in the far quarters from downtowns are dissatisfied of environmental qualities and lack of attention to human indicators.

Main problem regarded here is the mismatch of the environment and needs of the human. Residential environments as first places in which every person do understanding; connecting, memory making, etc are spaces in this paper are regarded to assessment their responses to inhabitant's needs from their residential environment. Hence, two different places, one in the historical heart of Tehran and another in developing parts of city were selected. In this paper, efficiency of these areas to make desirable environment to live and settle are analyzed by subjective and objective aspects of the environment.

This paper aims to study recognized factors of residential environment quality and their role in the desirability of environment in the neighborhoods targeted. Main objectives of this paper are to assessment components of the residential environment quality and to recognize of factors influencing in the residential environment quality of traditional and new neighborhoods.

Many researches have been done in field of assessment environmental quality (Adriaanse. C. C. M. 2007. Amerigo. M. & Aragonés, J. M. 1997, Erdogan, N. & el. 2007, Esperanza V. T. & Victoria A, 2008 and James. R. N. 2008). Some of these researches regarded subjective aspects of quality and especially satisfaction of residents and some others studied objective aspects. Also attempts have done to combine objective and subjective aspects of residential environment quality but there was no integrated system to assessment environmental quality in the local areas.

In this paper, sections have been prepared this: first section deals with definitions and understanding key concepts of environmental quality. In the second section, methods of this survey are explained. Next sections contain case studies, results and conclusion.

### **1- Theoretical basis**

#### **1-1- Residential Environmental Quality**

In the survey of existing concepts in the field of “residential environmental quality” based on the origin of this issue, it is necessary to study related concepts to this issue, because most of these concepts are in relation with other concepts as “quality of life”. Concepts as livability, living quality, living environment, quality of place, residential-perception and- satisfaction, the evaluation of the residential and living environment, quality of life and sustainability do overlap, and are often used as synonyms—but every so often are contrasted. The different

concepts find their origin in the various research and policymaking traditions of health, safety, well-being, residential satisfaction and urban physical environment (van Kamp, 2003: 5).

Environmental quality is the specification and feature of the environment which affects human and other organisms in general and the local. Environmental quality is assessment of environment in connection with one or more aspects requirements or for any human need or desire (Johnson et al, 1997: 581-589)

Environmental quality can define as a larger concept of “quality of life”; combining of basis qualities as health, safety with aspects of welfare and grace (Aminsalehi, 2008). Quality of environment is resulted of components of a specific sector. But nonetheless it implicates on general notion more than sum of the components. Each component (nature, open space, infrastructures, build environment, facilities of physical environment and natural reserves) has its especial characteristics and quality.

Based on the Vanpoll's definition, residential environmental quality is a subjective value concept. This value is defined by value of “residential environmental quality” which is contained essential characteristics as individual satisfaction of house, neighborhoods and neighbors. Thus, total subjective value of residential environmental quality equal sum assessments of characteristics and components of environment (Van poll, 1997). A good quality environment gives sense of welfare and satisfaction to inhabitants by physical, social or symbolic characteristics (Marans and couper, 2000). Such an environment is comprising a good quality life and protecting economical, social and cultural activities. So that today improving of environmental quality is become one of the essential objectives of urban policy and planning.

According to use the concept of environmental quality in different disciplines such as architecture, urban design and planning, environmental science, environmental psychology, etc, definitions of this concept contains the especial view of each expressed disciplines. In this paper because of using the concept of environmental quality in the field of urban planning in a local area and regarding to interaction of environment and its inhabitants, the regarded definition of this concept contains both subjective characteristics of inhabitants' perception and objective characteristics existing in the local areas.

### **1-2- Person-Environment Interaction**

One of the important issues in the residential environmental quality studies is to regard to the interaction and perception of the person to the surrounded environment. How perception of an environment by its inhabitants in a neighborhood affect the relation of them with the environment and the level of their satisfaction. In the Gabriel's studies in 2009, to quality of life and sustainability were regarded of the frame of

Some authors extend the previous conceptualizations of person–environment congruity from individual to community settings, focusing on neighborhoods (Kahana, Lovegreen, Kahana, & Kahana, 2003). The authors consider the applicability of the congruence concept for perception the quality of life of neighborhoods. They argue that the characteristics of the person, those of the environment itself, and those of the person–environment fit (in their terminology) are important factors determining residential satisfaction. In the authors' view, people–environment fit focuses on four physical and two social aspects of neighborhood environments, viz. physical amenities and resources, aesthetics, safety, stimulation vs. peacefulness, homogeneity vs. heterogeneity of the population, and interaction vs. withdrawal. The preferences concerning the latter three bi-polar aspects may vary according to individual and/or collective preferences of the inhabitants of a specific neighborhood. In this latter conceptualization, however, environmental quality (noise, pollution, etc.) is missing (Moser, 2009: 354).

One of the main issues on relations of person and its surrounded environment is the satisfaction of the environment. In past decades, the satisfaction was used in the field of assessment of the environmental quality. Since the urban residential environmental quality is addressed as a hierarchical and multiple concepts and environmental quality is described by essential characteristics, satisfaction also is considered as a concept with multiple specifications (Van poll, 1997). In a farther study in 1969, satisfaction is considered as one of the main indicators of residential environmental assessment and so it was defined: "high quality environment transfer welfare and satisfaction feeling to its population which can be physical, social and or symbolic" (Marans and Couper, 2000: 195-199). Thus, from different researchers' viewpoint, satisfaction is defined as a general indicator to assessment perception of environmental quality.

### 1-3- Theoretical Approach

"Residential environmental quality" is defined from different aspects and is considered from academic specialists different dimensions. Studying approaches of this issue indicates there are three general definitions: person-centered, environment-centered and person-environment interaction approaches.

Most of the existing approaches in the field of residential environment quality emphasize on the subjective and objective characteristics. Each of this dual characteristic is highlighted over the time and in different disciplines. In this paper, survey of these approaches is based on studies of van kamp et al (2003) and Adriaanse (2007).

Human ecology approaches is combined of viewpoints related to anthropology, biology, epidemic, psychology and sociology (Lawrence, 2001 ·vein Camagni et al, 1997 ·Shafer et al, 2000 ·Newman, 1974). The concept quality of life is strongly rooted in the thinking about health. There is no uniform view on causes and effect (van Kamp et al, 2003: 9). In the most viewpoints under this approach, environmental quality was considered a component of health. Urban planner approach is faced strongly by physical elements of environment. Within the social indicator movement a great number of often implicit conceptual models of quality exist. The domain of economics has a core place in these models (van Kamp et al, 2003: 9). Satisfaction approach emphasizes person perception of environment and finally transactional approach focus on both subjective and objective aspect of environment and studies interaction of person and environment. Table 1-1 reviews these approaches.

Theoretical approach	characteristic	models	سال	Model characteristic
Human ecology	Combining subjective-objective approaches and physical, economical and social aspects	vein Camagni et al	1997	approach to sustainability by describing interaction between the physical, social and economical aspects
		Shafer et al	2000	Defining explicitly interaction between the domains
		Newman	1999	extended metabolism model of human settlements
Quality of life	It is rooted in health and welfare	Blam	1974	health is defined as a resultant of genetic factors, the nature and quality of health care, behavior/lifestyle and the quality of the physical and social-cultural environment
		RIVM	2000	examining a combination of measurable spatial, physical and social aspects of the environment and the perception of these
		Cheung	1997	based on four ethical theories: hedonism, dialectical perspective, humanism and formalism

Urban planning and design	It is conceptual and vary in time- an extensive list of physical form indicators with respect to community	Lang	2005	Essential needs model
		Canter	-	Defining components of designing quality of urban residential environment.
		Appleyard	-	Division designing quality of residential environments based on responsibility to different perception conditions of human.
Social indicators	The domain of economics has a core place in these models. Most approaches within this tradition are data-driven.	Cicerchia	1999	Most approaches work with the principle 'the more the better' combining 'city effects' (positive effects of a concentration of people) with the so called 'overload indicators' (negative effects), e.g.
Satisfaction research	This satisfaction results from a process of appraisal, perception, evaluation and coping (adaptive) behavior. 1- satisfaction as a behavior predictor 2- Satisfaction as a indicator of environmental quality.	Campbell's model	1976	which life satisfaction is viewed as the sum of satisfactions with different environmental domains
		Marans and Couper	2000	a distinction is made between different scale levels: house, neighborhood, city and community
		van Poll	1997	making the hierarchic organization of the development of residential satisfaction explicit
		van Poll and van Kamp	2001	
		RIGO Research and Consultancy	2001	the perception of environmental quality is more influenced by judgments about the environment than by the objective characteristics
Transactional focus	Interaction of person and environment (subjective-objective indicators)	Aitken and Bjorklund	1988	The focus of attention is a change in the total system (person environment) rather than the individual components
		Amérigo and Aragonés	1997	a transactional approach to residential satisfaction by a distinction is made between personal characteristics and objective attributes
		Bonaiuto et al	1999	a structural model aimed at explaining neighborhood attachment

*Table 1-1: Theoretical approaches of residential environmental quality  
References: Van Kamp et al (2003) and Adriaanse (2007)*

Approach review indicates most of them emphasize on subjective and objective characteristic of residential environment quality. But there is not any integrated model which can be able to assessment an environment by using this dual characteristic concept.

In this paper, we are trying to consider perception of inhabitants and physical aspects of environment together. We combined these two aspects by using subjective assessment models and models used in urban planning.

## 2- Methodology

Figure 2-1 shows how subjective and objective evaluation systems combine and what we can expect of this model. We considered two aspects of residential environmental quality as perceptions of people and planners. In practical urban planning, planners evaluate environment by extensive indicators which are based on physical characteristics of environment. What we did is combining these two aspects and using it in two different spatial

environments. We are expected to get the results showed in his model. These results contain an integrated environment assessment, identifying most important indicators in two aspects, comparing subject and object, fitting tools (especially urban planning tools) and improve quality of residential environment.

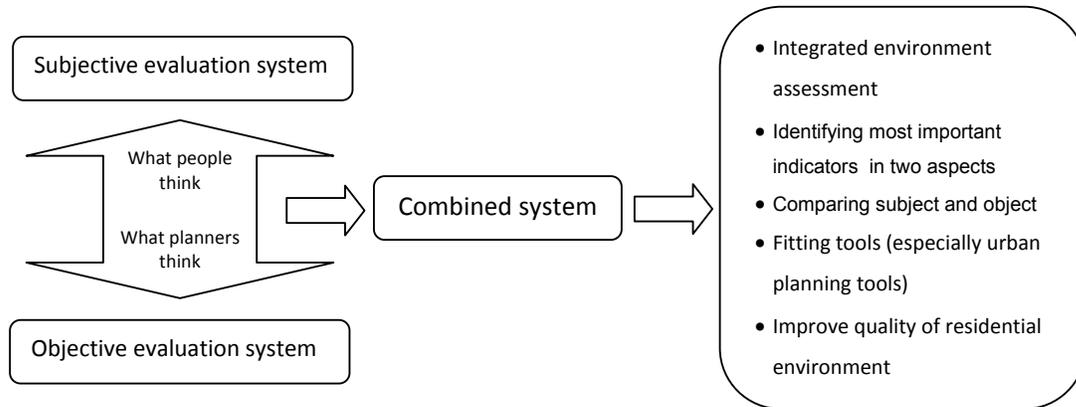


Figure 2-1: conceptual mode of residential environmental quality evaluation

Review of assessment methods in the field of urban planning indicates using of multi-attribute evaluation methods. These methods which mostly support subjective evaluation contain hierarchical multiple regression, multi-attribute utility, conjoint analysis (van poll, 1997), confirmatory factor analysis (Costello and Osborne, 2005; Kline, 2005) and choice experiment (Powe et al, 2005; Hanley and et al, 2001). These methods use similar indicators but how to choose and how to analyze of indicators are different in each method.

In this paper to analyze indicators in the subjective system, hierarchical multiple regression is used. In this method environmental quality indicators using people satisfaction are defined by researcher. In this paper, these indicators form based on combining hierarchical indicators of environmental quality and their proportion with all evaluation model (objective evaluation system and relative equations).

Gathering data in the subjective system is done by using a questionnaire. Multistage cluster sampling helps to cover all parts of neighborhoods in which we can make plans and combine by results of objective evaluation. We used SPSS and GIS to analysis, combine and make results in the spatial scales.

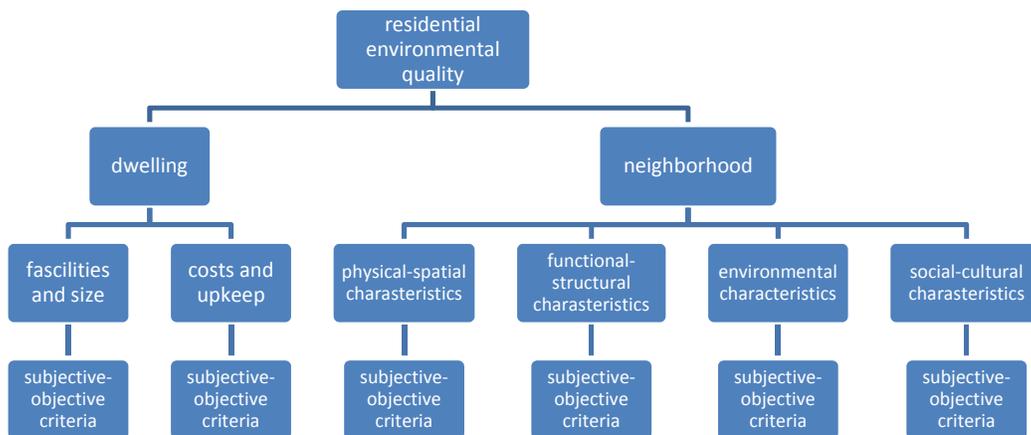


Figure 2-2: Analysis model combining subjective-objective indicators and using urban planning concepts. Based on Van poll's Hierarchical multi-attribute model of urban residential quality  
Analyzing objective indicators are done using spatial analysis of layers. In this method,

objective quality of environment is assessed by physical indicators without people perception. Objective evaluation system database is formed in desktop GIS software, using network and spatial analysis based on place. To combine subjective and objective indicators GIS and SPSS are used together. Results of SPSS are entered in GIS environment which make spatial evaluation plans. And results of combined data come back to SPSS to give results of combined analysis in its format.

### 3- Case Studies

Tehran was selected as the capital of Iran in 1786 when Qajar dynasty formed a new concentrated government. At the time, Tehran was a village in the north of Rey ancient city. Over 200 years population of Tehran has risen from 15 thousand up to 10 million and its area from 4.4 to 750 Square kilometers. Most changes in Tehran happened in last 5 decades. Now, Tehran is a huge metropolis with large cities and villages surrounded it and many different neighborhoods inside the city.

Case studies in this paper are Sanglaj and Naft, two different neighborhoods inside Tehran. Sanglaj is one of the four neighborhoods of primarily old core of Tehran. It is a neighborhood survived from old time with its primarily structures and has to remain alive in a new big metropolis. This neighborhood is facing with many challenges which are emerged because of mismatch of what objectives over them the neighborhood has formed and what needs now people with new lifestyles expect. Now neighborhoods like this in the literature of planning in Iran are recognized as problematic areas. On the other hand, Naft is a new neighborhood formed in two past decades. It was formed by new orientations of planning in Iran which is shown its new buildings, spaces, streets, infrastructures and etc based on approaches trying to make environments for new people. This planning maybe affected by modern styles has willing to make it most far from old parts and old styles.

According to these differences, residential environment quality evaluation in these different districts can be indicator of values and qualities of each environment.

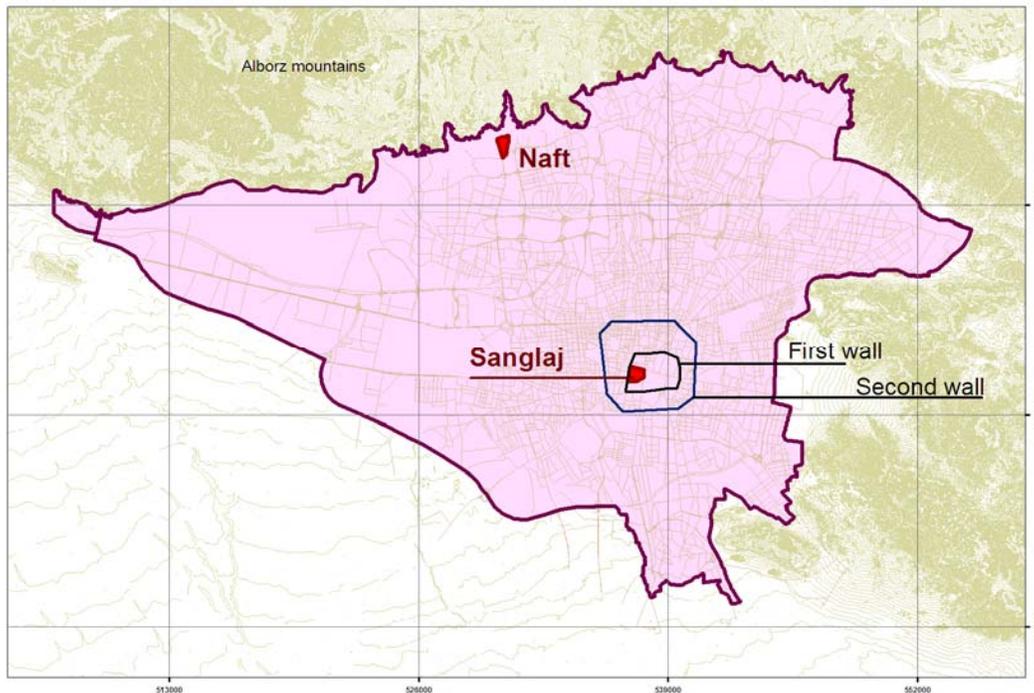


Figure 3-1: Spatial position of case studies in Tehran metropolis

### 4-Results

#### **4-1- Research questions and hypothesis'**

We would answer two essential questions in this paper:

- 1- How are satisfaction and environmental qualities in two case studies, traditional and modern neighborhoods in comparison?
- 2- What factors have most effects on raising residential environmental quality in traditional neighborhoods?
- 3- What factors have most effect on raising residential environmental quality in new neighborhoods?

Our hypothesis s to respond the questions are:

First hypothesis: *residential environmental quality in new neighborhoods is higher than traditional neighborhoods.*

Second hypothesis: *physical components have most effects in residential environmental quality of traditional neighborhoods.*

Third hypothesis: *physical components have most effects in residential environmental quality of traditional neighborhoods.*

We hope our research have more responds to questions as "how are differences in evaluated residential environmental quality between subjective and objective aspects in two neighborhoods".

#### **4-2- Empirical results**

##### **4-2-1- Subjective quality results**

Results of evaluated subjective environmental quality indicate that it is lower than theoretical median (3) in two neighborhoods. Subjective environmental quality is 2.84 in Sanglaj (traditional) and 2.89 in Naft (new). T-tests show meaningful differences between qualities and median and between two neighborhoods. In the second level of indicators (satisfaction of dwelling and neighborhoods), subjective qualities of dwelling are higher than theoretical median in both neighborhoods. Subjective quality of dwelling in Sanglaj does not have meaningful difference with theoretical median but difference between two neighborhoods is meaningful. In this level, satisfaction of neighborhood environment in Naft (2.72) is higher than Sanglaj.

In the third level where quality components of dwelling and neighborhoods are separated, results indicate higher values for indicators of new neighborhoods except dwelling upkeep and functional- structural indicators of neighborhoods. In the next level, subjective quality analysis model display meaningful differences in indicators of two neighborhoods. Here from 16 indicators of the level, satisfaction of these indicators are better positions in traditional neighborhoods: dwelling upkeep, green and open spaces, social welfare, recreation, business area and public transportation services (6 indicators).

Ranking and weighting of levels indicators based on multiple hierarchical regressions in Sanglaj indicate higher rank for dwelling quality in second level. In the third level, dwelling upkeep has first rank and facilitations second rank. In the neighborhood sub-indicators rankings are social-cultural, environmental functional-structural and physical characteristics. Results in Naft are similar to Sanglaj but the rankings of environmental indicators and social-cultural characteristics are in verse.

##### **4-2-2- Objective quality results**

Evaluation objective indicators indicate higher residential environmental quality in Naft (new neighborhood). Objective residential environmental quality is 3.15 in Sanglaj and 3.78 in Naft and both of results have meaningful differences with theoretical median. In the second level of the model, objective evaluation of environment reveals higher results for dwelling quality in Naft (3.85) in comparison with Sanglaj (3.71). Reviewing third level of indicators indicates physical characteristics indicator are higher in Naft and functional-structural characteristics in

Sanglaj. Differences between indicator numbers in third level are high. Amounts of three evaluated indicators for neighborhood environmental quality, physical, functional and environmental health are 2.75, 4.39 and 2.97 in Sanglaj and 3.97, 2.62 and 4.56 in Naft.

#### 4-2-3- Combined quality

Combining subjective and objective residential environment quality shows higher amount of residential environmental quality indicator in Naft. This result was repeated in the second level of indicators, but in the sub-indicators results are variable.

#### 4-2-4- Mapping of results

Mapping of subjective, objective and combined residential environmental quality indicates spatial quality of environments in the neighborhoods. Decreasing and increasing of environmental quality are shown by these maps. In Sanglaj spatial arrangement of subjective and objective results are different but in Naft the arrangements have more similarity. In Sanglaj generally by getting far from bazaar and business district in the east part of neighborhoods, environmental quality is increased. This increasing shows itself more in moving from south-east to north-west. In Naft, There are also meaningful differences between parts of neighborhood. In the south edge of Naft and near highway, environmental quality is lower; in the middle part of neighborhood it increase and finally by going to north (near boundary of Tehran) it decrease again.

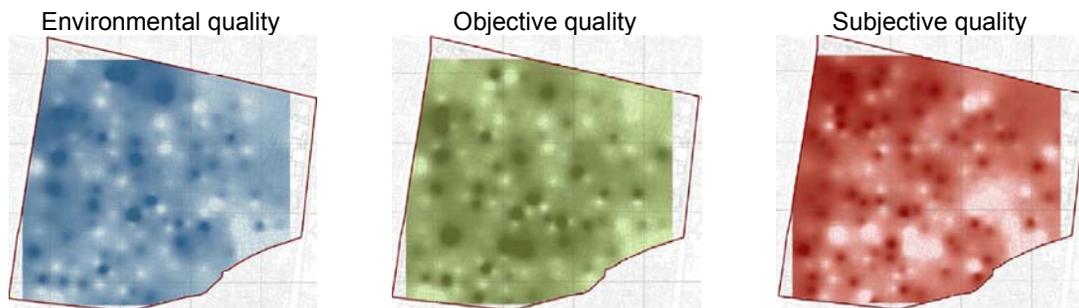


Figure 4-2- residential environmental quality in Naft (new neighborhood)

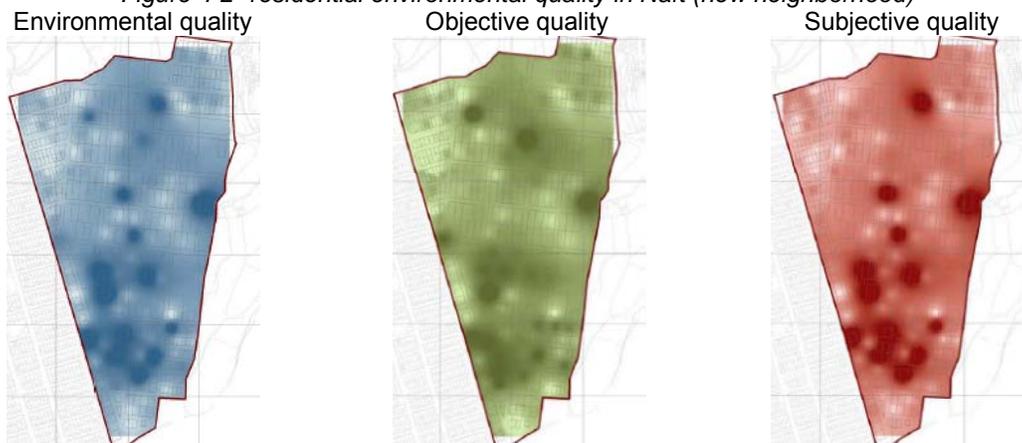


Figure 4-1- residential environmental quality in Sanglaj (traditional neighborhood)

### 4-3- Testing of Hypothesis

To test the first hypothesis in three aspects (subjective, objective and combined) of residential environmental quality, paired-sample and independent-sample T Test are used. The results of test indicate that there are meaningful differences between environmental quality indicator and theoretical median. It also showed by independent T Test there are

meaningful differences between residential environmental qualities of two case studies. In three evaluated aspect of residential environmental quality, Naft as a new neighborhood had higher amounts in indicators in comparison with Sanglaj as an old neighborhood.

indicator	neighborhoods		T Test	
	Sanglaj	Naft	t	Meaningful level
Subjective environmental quality	2.84	2.8968	-2.135	0.034
Objective environmental quality	3.15	3.785279	-14.536	0
Residential environmental quality (combined)	3.09	3.3496	-11.659	0

*Table 4-1: results of evaluating subjective, objective and combined residential environmental quality*

To test second hypothesis, Pearson Correlation Coefficient and hierarchical multiple regression are used. In the first step, results of Pearson correlation coefficient shows there are more coefficients in physical characteristics indicator (physical quality of dwelling, roads and accessibility, public services, etc.) with overall residential environmental quality indicator in comparison with other indicators. This could help to confirm our second hypothesis but in the second step results of hierarchical multiple regression testing indicate  $\beta$  coefficient of two other indicators, socioeconomics and environmental health, in third level (where physical characteristics is regarded) are higher than physical indicator. Thus the second hypothesis is rejected.

Methods used to test second hypothesis is utilized in the third hypothesis. In the first step, results of Pearson correlation coefficient of socioeconomics characteristics indicator do not have higher amount in comparison with other indicators. In the second step, rankings of indicators by  $\beta$  are environmental health, socioeconomics, and functional and physical characteristics indicators. Thus the third hypothesis is rejected.

To describe second and third hypothesis and according to the gained results of sub indicators, in general, we could not emphasize on absolute affects of some indicators in the definition of residential environmental quality. The results of this study indicate that according to the specific characteristics of the neighborhoods, effectiveness of each indicator in defining overall residential environmental quality is different. On the other hand, reviewing of results in lower levels (third and fourth levels of the model) indicate treatments of sub indicators are variable. Thus second and third hypothesis are rejected.

#### **4- Conclusion**

On the one hand, this study indicated satisfaction (evaluated subjective indicators) of residential environmental quality in Naft, a new neighborhood, is higher than Sanglaj, a traditional neighborhood. On the other hand, evaluating residential environmental quality by objective indicators of environment (based of urban planning measures) and without perception of people confirm results of subjective evaluation, however, in both aspects, sub indicators do not follow the general trend and have variable treatments in the two neighborhoods. Therefore, it can be concluded that due to more desired conditions of objective indicators and higher satisfaction in Naft in this study, residential environmental quality of the new neighborhood is more than the old neighborhood.

The study of sub indicators showed that each of the neighborhoods has more desired situations in comparison with other one. Despite the lower amount of the overall residential environmental quality indicator, Sanglaj has better situation in

functional-structural attributes. Thus, we should emphasize in each neighborhood on the specific strengths and cover weaknesses by appropriate proposals. Reviewing and comparing of results in studied aspects indicate both environments have higher amount in objective quality in comparison with subjective quality. And another important result is that difference between amount of subjective and objective evaluated quality in Naft is more than it in Sanglaj. According to same indicators in the both neighborhoods, it may show a higher level of expectations of people who live in the new neighborhood, compared to Sanglaj.

Using subjective-objective combined system in both neighborhoods can have more integrated approach to evaluation residential environments. On the other hand, we can understand dual aspects and problems of environment by evaluation subjective and objective indicators. This understanding can be used in the urban planning process and related proposals what can study in the feature researches.

### References

1. Adriaanse. C. C. M. (2007). Measuring residential satisfaction: a residential environmental satisfaction scale (RESS). *J Housing Built Environ* 22: 287-304.
2. Amerigo, M., & Aragonés, J. M. (1997). A theoretical and methodological approach to the study of residential satisfaction. *Journal of Environmental Psychology* 17: 47-57.
3. Aminsalehi, F., (2008). Appropriate solutions for residential quality improvement of high-rise complexes, case study: Ekbatan Town. Thesis for the degree of master of art (M.A) in urban and regional planning, Tarbiat Modares University, Tehran.
4. Erdogan. N. & el. (2007). Comparison of Urban Housing Satisfaction in Modern and Traditional Neighborhoods in Edirne, Turkey. *Social Indicators Research* 81: 127-148.
5. Esperanza V. T. & Victoria A. (2008). The relevance of social interactions on housing satisfaction. *Soc Indic Res* 86: 257-274.
6. Ghobadian, V. (1999). Residential environments psychology, *Journal of architecture and culture*, 2, 3.
7. Hur et al. (2010). Neighborhood satisfaction, physical and perceived naturalness and openness, *Journal of Environmental Psychology*: 52-59
8. James. R. N. (2008). Residential Satisfaction of Elderly Tenants in Apartment Housing. *Soc Indic Res* 89: 421-437. Azarakhsh, Tehran.
9. Johnson et al. (1997). Meanings of environmental terms. *Journal of Environmental Quality* 26: 581-589.
10. Kahana, E., Lovegreen, L., Kahana, B., & Kahana, M. (2003). Person, environment, and person-environment fit as influences on residential satisfaction of elders. *Environment & Behavior*, 35, 434-453.
11. Marans, R.W., Couper, M., (2000). Measuring the quality of community life: a program for longitudinal and comparative international research. In: *Proceedings of the Second International Conference on Quality of Life in Cities*, vol. 2. Singapore.
12. Mohit M.A. & Ibrahim. M. & Rashid. Y. R. (2009). Assessment of residential satisfaction in newly designed public low-cost housing in Kuala Lumpur, Malaysia. *Habitat International* 34: 18-27.
13. Moser, Gabriel (2009). Quality of life and sustainability: Toward person-environment congruity. *Journal of Environmental Psychology* 29: 351-357
14. Newman, P.W.G., (1999). Sustainability and cities: extending the metabolism model. *Landscape Urban Plann.* 33: 219-226.
15. Rafiean, M. & Molodi, J. (2011). Approaches and methods of urban residential environmental quality assessment, Tehran, Azarakhsh.
16. Rafiean, M. & Askari, A. & Askariasnezhad, Z. (2009). Assessment satisfaction of residential environmental quality in Navvab neighborhood. *Human Geography researches*. 67: 53-68.
17. RIVM, (2000). De Hollander A.E.M., et al. 5e Nationale Milieu Verkenningen. RIVM. National Outlook, Summary in English.

18. Szalai, A., (1980). The meaning of comparative research on the quality of life. In: Szalai, A., Andrews, F. (Eds.). *The Quality of Life*. Sage Beverly Hills, CA: 7–24.
19. Sirgy, M. J & Gao, T & Young, R. F (2008). How Does Residents' Satisfaction with Community Services Influence Quality of Life (QOL) Outcomes? *Applied Research Quality Life* 3: 81-105.
20. Taghizadeh, M., (2002). Planning to improve the standard of living to quality of life, urban queries, and 1:17-26.
21. Van Kamp, Irene et al. (2003). Urban environmental quality and human well-being towards a conceptual framework and demarcation of concepts; a literature study, *Journal of Landscape and Urban Planning*, Vol 65: 5-18
22. Van Poll, R., (1997). *The perceived quality of the urban residential Environment, a multi-attribute evaluation*. Rijks universiteit Groningen, Groningen.