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Urban Environment Quality Improvement Planning
Case Study: Moft Abad Neighborhood, Tehran, Iran

Elham Lashkari, Mehrshad Khalaj

***Abstract*—**Rapid enlargement and physical development of cities have facilitated the emergence of a number of city life crises and decrease of environment quality. Subsequently, the need for noticing the concept of quality and its improvement in urban environments, besides quantitative issues, is obviously recognized. In the domain of urban ideas the importance of taking these issues into consideration is obvious not only in accordance to sustainable development concepts and improvement of public environment quality, but also in the enhancement of social and behavioral models.

The major concern of present article is to study the nature of urban environment quality in urban development plans, which is important not only in the concept and the aim of projects but also in their execution procedure. As a result, this paper is going to utilize planning capacities caused by environmental virtues in the planning procedure of Moft Abad neighborhood. Thus, at the first step, applying the Analytical Hierarchy Process (AHP), it has assessed quantitative environmental issues. The present conditions of Moft Abad state that "the neighborhood is generally suffering from the lack of qualitative parameters, and the previously formed planning procedures could not take the sustainable and developmental paths which are aimed at environment quality virtues." The diminution of economical and environmental virtues has resulted in the diminution of residential and social virtues. Therefore, in order to enhance the environment quality in Moft Abad, the present paper has tried to supply the subject plans in order to make a safe, healthy, and lively neighborhood.

***Keywords*—**Urban Environment Quality, Neighborhood Plan, Urban Development Plan, Analytical Hierarchy Process (AHP)

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I. Introduction

THE basic substance of urban environment quality is to provide both corporeal and incorporeal of the citizens. It causes satisfaction and comfort for them. In real fact, planning for housing, job or transport will be defective without providing sentimental and social needs of citizens as well as safety, comfort, beauty, society dependency, happiness, entertainment and etc.

In general, urban environment quality can be defined as urban planning process with attention to social, economical, cultural, physical and emotional indices in both mental and visible forms [1]-[3].

Elham Lashkari, Member of young researchers club, Islamic Azad University, Central Tehran Branch, Tehran, Iran (Corresponding author to provide phone: +98-915-322-5066; e-mail: elhamlashkari@gmail.com)
Mehrshad Khalaj, Islamic Azad University, Central Tehran Branch, Tehran, Iran (E-mail: mehrshad77@gmail.com)

This article is going to utilize planning capacities caused by environmental virtues in the planning procedure of Moft Abad neighborhood. As a result, this paper is going to study urban environment qualitative virtues indices in Moft Abad neighborhood. Then, it evaluates the neighborhood conditions from the aspect of qualitative virtues. Finally, in order to enhance the environment quality in Moft Abad, the present paper offers subject plans.

II. Case Study: Moft Abad Neighborhood

The region studied in this work is one of the eastern neighborhoods of Tehran. At first, this neighborhood was formed by the spontaneous settlement of poor people in the region. Buildings with low quality and exhaustion of the structure caused to decrease the land and house prices in this region which transmuted it to a neighborhood that attracts the immigrants.

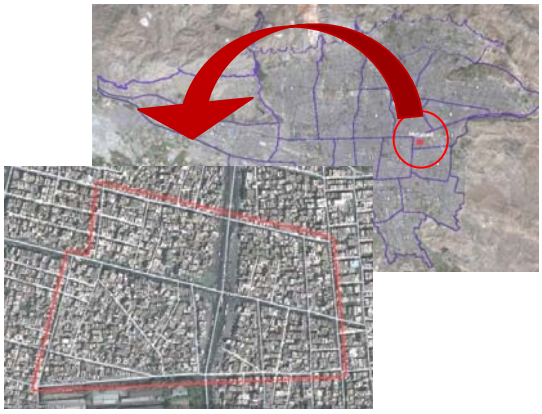


Fig. 1.Position of Moft Abad neighborhood in Tehran

The neighborhood has an overall area of 175000 m2 with 9681 habitants in 2921 families [4]. Specifications of the neighborhood include old and destructible buildings, narrow streets, improper accessibility to main streets especially in the heart of the neighborhood, lack of public services and unsuitable city sight. The present conditions of Moft Abad state that it could not take the sustainable and developmental paths which are aimed at environment quality virtues. The diminution of economical and environmental virtues has resulted in the diminution of residential and social virtues.

III. Indices for Urban Environment Quality Assessments

Urban environment quality is a hierarchy concept from multiple traits, and it should be considered while defining urban environment quality indices. In other words these indices should indicate an obvious meaning of this concept. Therefore, Environmental Quality

Indices may roughly be divided into two categories: Exposure-based and Effect-based indices.

A. Exposure-based indices

Indices based on actual environmental parameters comprise indicators of physical ambient conditions. Examples of these indicators are the sound pressure level expressed in deci-Bells. On the other hand, indices based on the effects of exposure to environmental factors deal with exposure consequences. The main problem with respect to environment quality indices based on physical measurements is the weak relationship between exposure measurements and effects, such as annoyance [5].

B. Effect -based indices

Effect-based environment quality indices pertain to exposure consequences. Consequences can be conceptual and sentimental in perceived environmental quality. The effects that are considered are the level of residential satisfaction in general and the amount of annoyance experienced by residents. Indices based on the effect of environmental factors concentrate solely on the consequences. They circumvent the problem of weak dose-effect relationships. However, quantifying the effects of environmental degradation is not without difficulties [5].

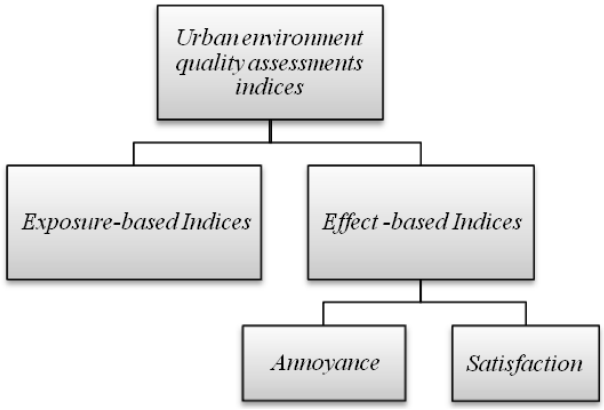


Fig. 1.Urban environment quality assessments indices [5]

In the present article the effect-based environment quality Indices, satisfaction and annoyance experienced by residents, have been employed since they are closer to real conditions. Therefore, hierarchy structure of the urban environment quality in Moft Abad neighborhood will be defined with attention to environment quality concept and specifications of the neighborhood. This structure will be formed on the basis of the Up to Low theory in 3 levels including: goal, indices and sub-indices. (See Fig. 2)

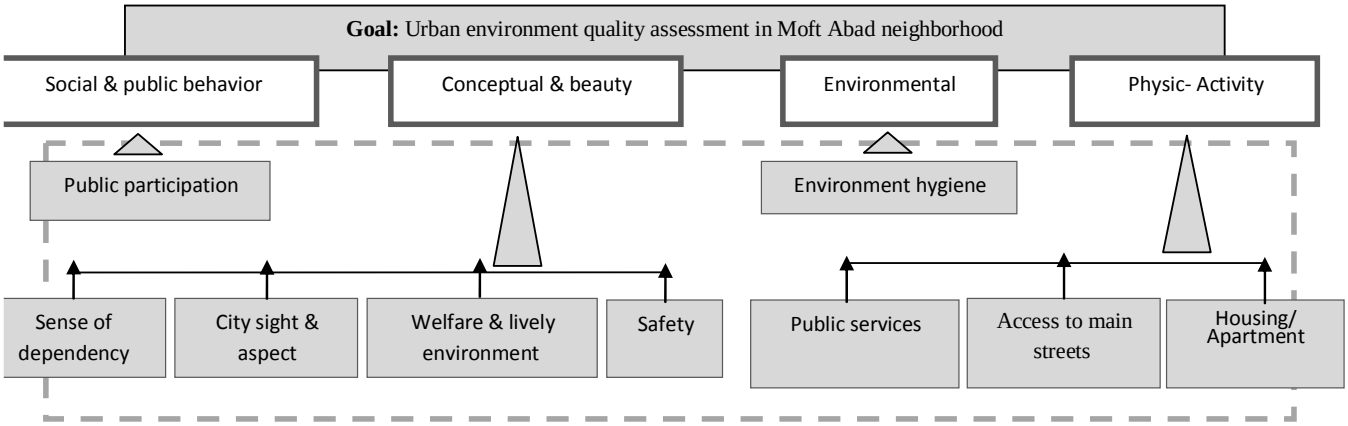


Fig. 2.Hierarchy structure for urban environment quality assessment in Moft Abad neighborhood

Therefore, urban environment quality assessments Indices can be briefly displayed in Fig. 1.

The cognitive and affective reactions are the perceived amounts of satisfaction and annoyance residents experience by the prevailing condition of the environment. Satisfaction is a common measure for perceived environmental quality.

Annoyance may be considered to be the most widespread effect of exposure to environmental factors such as noise, malodor or pollution. Annoyance is a frequently used measure for the negative, affective consequences of exposure to a variety of environmental factors for instance noise, malodor, (social) safety risks and crowding [5].

IV. Study method: urban environment quality assessment in Moft Abad neighborhood by Analytical Hierarchy Process (AHP)

The First step in Analytical Hierarchy Process (AHP) is, is to constitute the hierarchy structure [6]. Hierarchy structure of urban environment quality in Moft Abad neighborhood is indicated in Fig. 2.

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TABLE I
ANALYTICAL HIERARCHY PROCESS RANGE [7]

1/9	1/7	1/5	1/3	1	3	5	7	9
extremely preferred	very strongly preferred	strongly preferred	moderately preferred	equally preferred	moderately preferred	strongly preferred	very strongly preferred	extremely preferred

AHP is a decision-making theory that compares indices and sub-indices two by two quantitatively on the basis of a relative weight constant. These quantitative constants are shown in table 1[7]. In this section, tow by tow comparisons have been done in the 3 rd level of the hierarchy structure for urban environment quality assessment (chart 2) and its results are listed in table 2.

After that, "Criteria Weight" and "Consistency Ratio" (CR) have been calculated for each index and sub-index. "Criteria Weights" and CRs are demonstrated in table 3:

V. QUALITY VIRTUES ASSESSMENT CONCLUSIONS IN MOFT ABAD NEIGHBORHOOD

Combination of Quality virtues in assessment process and their analyses in Moft Abad neighborhood demonstrates that any virtue has different importance and weight. Urban environment quality Analytical Hierarchy Process (AHP) in Moft Abad neighborhood represents that: "Criteria weight for sense of dependency is 0.565 and it has the effect on environment quality in Moft Abad."

TABLE II
TOW BY TOW URBAN ENVIRONMENT QUALITY SUB-INDICES COMPARISON IN MOFT ABAD NEIGHBORHOOD

	Housing/ Apartment	Access to main streets	Public services	Environment hygiene	Safety	Welfare & lively environment	City sight & aspect	Sense of dependency	Public participation
Housing/ Apartment	1	3	5	5	1/3	5	5	5	7
Access to main streets	1/3	1	3	3	1/3	5	3	3	5
Public services	1/5	1/3	1	3	1/3	5	3	3	5
Environment hygiene	1/5	1/3	1/3	1	1/3	5	5	5	7
Safety	3	3	3	3	1	5	5	3	7
Welfare & lively environment	1/5	1/5	1/5	1/5	1/5	1	3	1/3	3
City sight & aspect	1/5	1/3	1/3	1/5	1/5	1/3	1	1/3	3
Sense of dependency	1/5	1/3	1/3	1/5	1/3	3	3	1	5
Public participation	1/7	1/5	1/5	1/7	1/7	1/3	1/3	1/5	1

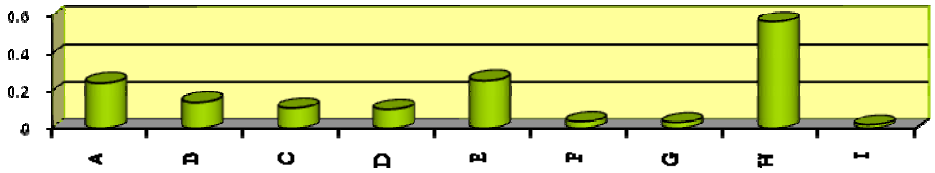
After finding the urban environment quality assessment conclusions in Moft Abad neighborhood, due to the criterions and the parameters affecting them different areas with different environment qualities ranging very good ,good ,normal ,bad or very bad are defined in order to investigate and analyze them. This classification is based on the marks gained by the areas in one class and the existence of a significant difference between any class with the upper and lower classes.

Moft Abad neighborhood is exactly poor from the point of urban environment quality. 88.96 percent of the area has quite undesirable condition and only 11.04 percent is close to the normal condition.

After that, safety and housing/apartment quality greatly affect neighborhood environment quality. At last public participation, city sight quality, welfare and lively appropriate the lowest level of environment quality in Moft Abad. Chart 3 portrays these topics.

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TABLE III
CRITERIA WEIGHTS FOR URBAN ENVIRONMENT QUALITY SUB-INDICES IN MOFT ABAD NEIGHBORHOOD

Housing/ Apartment (A)	Access to main streets (B)	Public services (C)	Environment hygiene (D)	Safety (E)	Welfare & lively environment (F)	City sight & aspect (G)	Sense of dependency (H)	Public participation (I)	Urban environment quality sub indices in Moft Abad neighborhood.
0.2264	0.1421	0.1089	0.1025	0.2587	0.0359	0.0309	0.565	0.0182	criteria weights
									Criteria weights [CR]< 0.1 CR=0 Consistent

VI. SUBJECT PLANS

Improving the urban environment quality depends on the improvement of the quality of the indices and sub-indices that formed it. As discussed before, the environment quality in Moft Abad neighborhood is assessed to be quite undesirable and according to the results, any sub-index has different importance and weight. In order to, the present paper supply the subject plans in neighborhood development plan process. These plans are in attention to "Criteria Weight" for each index and they are advised for improving the urban environment quality, see table 4.

VII. CONCLUSION

This paper is going to utilize planning capacities caused by environmental virtues in the planning procedure of Moft Abad neighborhood. Thus, at the first step, it has assessed quantitative environmental issues. Urban environment Quality assessments on the basis of quadruplet indices (Physic- Activity, Environmental, Conceptual & beauty, Social & Public Behavior) in Moft Abad neighborhood shows that the neighborhood has a low quality in physical environment as well as serious problems in infrastructures, environment hygiene, conceptual quality and public behavior. Weak access, lack of happiness and local government cause to decrease the urban environment quality in Moft Abad neighborhood.

Therefore, in order to enhance the environment quality in Moft Abad, the present paper provides the subject plans in order to make a safe, healthy, and lively neighborhood.

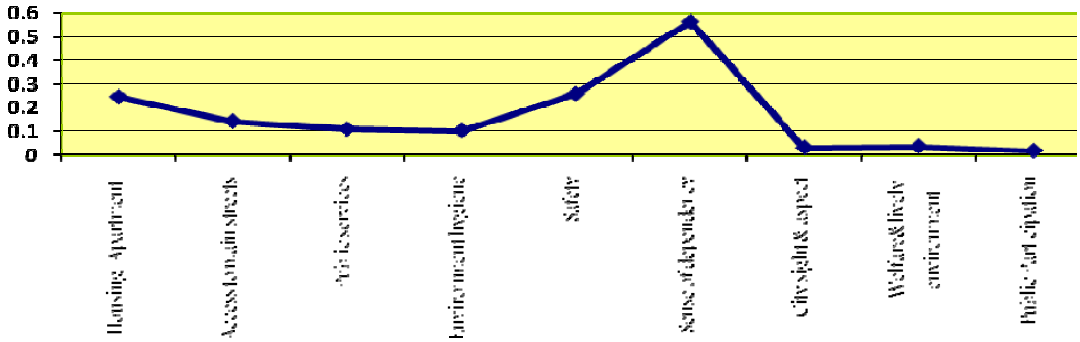


Fig. 3. Level of quality virtues effects on urban environment quality in Moft Abad neighborhood

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TABLE IV
SUBJECT PLANS FOR URBAN ENVIRONMENT QUALITY IMPROVEMENT IN MOFT ABAD NEIGHBORHOOD

Fields	Plans
Inspiration of the sense of dependency	- Correction of the mental image - Utilizing souvenirs in public spaces and increasing the sense of dependency in the neighborhood.
Increasing the safety	- Improving the defenseless and vulnerable spaces in neighborhood - Improving the ray condition in pathways.
Improving the housing /apartments quality	- Clustering the small blocks and supplying the building right in order to development models. - Improving the building visage and deleting them surplus elements. - Improving residential- commercial land use in streets sides
Improving the access to main streets	- Correction of the structure and hierarchy accesses. - Developing the public transportation specially buses.
Improving the public service in the neighborhood	- Increasing the non- residential land uses (educational, green space, cultural, entertainment and etc) in neighborhood.
Improving the environment hygiene	- Constructing infrastructure canals. - Cleaning the pathways in the neighborhood.
Providing welfare and lively environment	- Creating safe, happy and lively spaces and making them proper for all people (women, men, children, youth, the elderly and etc) - Creating attractive spaces for all of age and cultural groups in neighborhood.
Improving the city sight and neighborhood aspect	- Improving the city sight and building surfaces - Providing the rights for buildings heights in order to achieve orderly sky line.
Increasing the public participation	- Attending to local government and creating the necessary fields for public participation

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AUTHORS



Elham Lashkari
Born: Mashhad, Iran, 14 July, 1983.
B.A. Urban Planning Yazd University, Iran.
M.A. Urban and Regional Design and Planning, Islamic Azad University, Central Tehran Branch, Tehran, Iran.
Member of young researchers club, Islamic Azad University, Central Tehran Branch, Tehran, Iran.



Mehrshad Khalaj
Born: Tehran, Iran, 8 June, 1977.
B.S. Surveying Engineering, Islamic Azad University, South Tehran Branch, Tehran, Iran
M.A. Urban and Regional Design and Planning, Islamic Azad University, Central Tehran Branch, Tehran, Iran