

**Performance measurement of visual comfort components to improve quality of urban environment, using VIKOR technique  
(Case study: Mashhad Metropolitan)**

**Tahereh Sadeghloo\***

Assistant Professor, Department of Geography and Rural Planning, Ferdowsi University of Mashhad, Mashhad, Iran

**Leila Johari**

M.Sc. in Urban Management, Ferdowsi University of Mashhad, Mashhad, Iran

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**Extended Abstract**

**Introduction**

Urban quality of life is not a simple term that has a clear or an agreed definition but it is a complex concept which might be defined by various theories. The term urban quality of life is not used to describe some physical features but to describe all the relationship, the dynamics, and the reticular relationship that exist between those physical features. Therefore, the definition of urban quality of life is network and complex rather than linear and very elementary. This special keyword is resulted from urban environment quality. Thus, the aim of this research is to analyze the relation between urban environment quality and visual comfort. The importance of urban environment issues has never been as serious as today. One of the most important subjects in urban planning is quality of environment and the satisfaction of citizens. Urban environment quality is a measurement of residential environment in which for urban life we have the minimum desirability. The circumstances of the relation between human and environment are a special condition in which it makes a role to evaluate the urban environment quality. On the other hand, to improve and then evaluate urban environment and experience good urban quality of life, visual components should be considered. Today visual comfort is a major component of urban life, especially in man-made environments. In recent decades, urban environment quality has become a specialized issue in the society. Increase in the quality of urban environment is a long step toward improving citizen's satisfaction. One of the most rewarding aspects in order to increase environmental quality is to upgrade visual comfort. Visual comfort is a reflection of quality of life and welfare of citizens. Visual comfort in a city offers architectural and portable lightening, how to play with colors and apply them according to the physical environment and the way symbols are employed or how visual form of a city can be seen. Visual comfort can be used to describe places that have more social and formal monitoring. The other aim of this research is to investigate performance of visual comfort components to improve quality of the urban environment in Mashhad metropolitan. This is to

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\* Corresponding Author: Tel: +98 9196261569 Email: tsadeghloo@yahoo.com

evaluate 14 indicators in environmental quality, and 4 visual comfort factors and the relation between these two categories in 13 regions of Mashhad municipality.

### **Methodology**

The research method is descriptive survey. Population of the study is consisted of whole citizens in 13 regions of Mashhad municipality. According to Cochran formula 383 questionnaires are distributed among the population. The questionnaire is researcher made and consisted of 40 questions about visual comfort and 40 questions about quality of urban environment. Formal validity of the questionnaire is approved by the experts and to examine the content validity, factor analysis is applied and to test reliability, Cronbach's alpha coefficient is used. To analyze the data, SPSS software is used and in addition, VIKOR rating technique is used i to rank the regions. This technique is one of the multi-criteria decision making methods to select the best option or to prioritize the options. VIKOR technique is able to give assistance to decision maker to make the final decision and often is used when the decision makers cannot submit their preferences in decision making process because of contradictory indicators.

### **Results and Discussion**

The results show that there is significant difference between the components of environmental quality and visual comfort in 13 regions of Mashhad municipality. Results of ranking the regions show that some regions (13, 4, and 5) were in the worse condition of visual comfort and also have experienced less quality of urban environment and less urban welfare. The regions of 1, 8 and 9 with high overlapping are in the best condition in terms of quality of urban environment and visual comfort. The most remarkable part is that often the areas with lower ranking level in terms of quality of urban environment (13, 5, and 4) were also lower in terms of visual comfort components. Thus, it could be said that visual comfort not only have relation with environmental quality, but also lies at the heart of it. On the other hand, weighted technique results show that lightening has had the most weight between the visual comfort components and the most remarkable part in the city is often good lightening. It should be equally fashionable and functional, great lightening is more than a physical object. It is beyond what the product looks like or how well it is made.

### **Conclusion**

According to the results, there is a large gap between the 13 regions of Mashhad municipality, while some regions as 1, 9, and 8 are in the best situation in terms of visual comfort and environmental quality of life. Some other regions are very poor, like 4, 5, 13, and 6. It could be concluded that the regions which have had a poor condition in terms of environmental quality of life have experienced a worse situation in availability, economic dynamism, network quality, green spaces, quality of buildings, aesthetics of buildings, architecture, management services and etc. Those regions which have had poor condition in terms of visual comfort elements (light, color, sight, symbol contamination) have experienced less quality of life, because these two components (visual comfort and environmental quality) are significantly related to each other. Significant gap in the environmental quality of life of the citizens should not be neglected. Good urban environment is an environment in which civil justice is considered. Therefore, urban environment cannot be built for citizens without knowledge of their opinions and also urban realities.

**Keywords:** environmental quality, Mashhad Metropolitan, MCDM techniques, VIKOR technique, visual comfort.