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CASE STUDY

Urban landscape and quality of urban environment by means of geographic information system

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ABSTRACT

Quality of urban environment as a subset of quality of life now represents the search for happiness and personal satisfaction in urban environment and is a broad concept which is concerned with the overall well-being in urban environment. The purpose of this study was to investigating the quality of urban environment according to the 5 urban landscape indicators; Land use, Green space, Population and Floor density, Accessibility and physical quality in Noor Town of Tabriz. In order to achieve this goal, the two-step research method has been used. The first step was field observation and conduction an organized interview with the citizens and the next step was the implementation of the results on the map using Geographical Information System analysis. The results of the research showed that the highest quality of urban environment related to green space and people are satisfied with the availability of green space in Noor Town. In contrast, the lowest quality of urban environment was related to the aspects of land use, such as the existence of wastelands in the southern parts of the study area and existence some industrial sites as air pollution sources near to the study area.

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INTRODUCTION

Quality of urban Life (QoUL) is a broad concept which is concerned with the overall well-being in urban Environment. However, there is no an agreed-upon definition of the term in academic, scientific and policy discourses. Rather, the tendency is towards divergence. According to one of the definitions, "well-being reflects not only living, but also the ways in which people respond and feel about their lives in those domains (Fahey *et al.,* 2005). The concept of quality of urban life and Environment has three main characteristics: First, it reflects the individuals' life situations and their perceptions rather than a country's quality of life; secondly, it is a multidimensional concept, covering multiple life domains such as housing conditions, education, employment, work-life balance, access to institutions and public services, and their interplay; and finally, it brings together objective information on living conditions with subjective views and attitudes to provide a picture of overall well-being in society (Shucksmith *et al.*, 2009). It should be noted that Quality of urban Environment is a concept that has inspired much research in the past decades and has established a strong position at the local and national level. Sustainable communities are places where people want to live and work, now and in the future (Turkoglu, 2015). They meet the diverse needs of existing and future residents and are sensitive to

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their environment, and contribute to a high quality of life. Exploring community and neighborhood profiles through quality of life research can enhance decision making processes in relation to community and sustainability. Issues relating to quality of urban life are now high on the political agenda due to an acknowledgement that levels of life quality affects both economic and social wellbeing (Ibid). That is, issues affecting people's lives are more than purely economically driven and that people in developed countries have begun to realize that quality of life is not necessarily a simple function of material wealth (Turkoglu, 2015). Besides, there are some more parameters involved (directly and indirectly) to enhance the scale of QUE such as construction, infrastructure and structures, building materials, urban traffic and transportation, workmanship, continuous supervision, inspection and associated with professional total services (a contributory part of the modification of GDP). Buildings, infrastructure and structures change the nature, characteristics, function and appearance of urban cities and societies, which then modify the QUE of urban and regional dwellers and inhabitants. The construction activities involved with use, repair, refurbishment, maintenance, demolition, consumption of energy, resources, generate waste, increase GHG (Greenhouse gas) emissions and which then contributed to change the nature of total QUE for dwellers and users (Eusuf, 2014). According to Costanza *et al*., (2007), examinations of quality of urban environment often fall under two headings "objective" and "subjective": objective indicators of quality of urban environment include, for example, indices of economic production, literacy rates, life expectancy, and other data that can be gathered without a subjective evaluation being made by the individual being assessed. Objective indicators may be used separately or in combination to form summary indexes. To the extent to which such a measure can be shown to be valid and reliable across assessment contexts (admittedly a difficult task), these relatively objective measures may help gather standardized data that are less vulnerable to social comparison and local adaptation. "Subjective" indicators of Quality of Life (QoL) gain their impetus, in part, from the observation that many objective indicators merely assess the opportunities that individuals have to improve QoL rather than assessing QoL itself. Thus economic production may best be seen as a means to a potentially (but not necessarily) improved QoL rather than an end in itself. In addition, unlike most objective measures of QoL, subjective measures typically rely on survey or interview tools to gather respondents' own assessments of their lived experiences in the form of self-reports of satisfaction, happiness, well-being or some other near-synonym (Turkoglu, 2015). The concept has also had a strong influence on social and political trends being applied to a number of fields, such as urban and regional planning, health promotion, disability, social indicators research and economic and mental health research. The implementation of a credible system of quality of urban life monitoring equates to a greater understanding of both social and economic trends. This empowers decision makers with the knowledge base required to assess livability, environmental quality, quality of life, and sustainability in order to develop national, regional, and local resources. Quality of urban environment and life research can provide the foundations of creating, maintaining, and positively promoting sustainability through implementation of evidence based policy. There is a need to strengthen the scientific basis for sustainable management, and countries need to develop, apply and institute the necessary tools for sustainable development with reference to 'Quality-of-life indicators covering, for example, health, education, social welfare, state of the environment, and the economy (Ibid). So the purpose of this paper is the assessment of quality of urban environment based on urban landscape indicators in Noor Town of Tabriz by using Geographic Information System analyzes.

The understanding, measurement, and improvement of human experience have been the major goals of the individuals, researchers, communities and governments. The overall assessment of human experience has been commonly expressed by term quality of life (QoL) across multiple disciplines including psychology, medicine, economics, environmental science, and sociology (Costanza *et al*., 2007). Quality of Life is often confused with an income-based standard of living. However, QoL is a multidisciplinary and multi-faceted approach (Marans, 2012). It relates to the, well-being and prosperity of individuals (Karim, 2012; Aklanoğlu and Erdoğan, 2012; Hanifah and Hashim, 2012; Mohit, 2013), state of feeling safe (Sham *et al.*, 2013) and overall evaluation of life (Ana-Maria 2015). Other dimensions of QoL include Healthcare (Marans, 2012; Eusuf *et al.*, 2014), Needs satisfaction (Keles, 2012; Mohit,

2013) and material wealth (Constantinescu, 2013). Issues' pertaining to quality of life has increasingly been the area of concern to many governments (Ahmad *et al.*, 2014) and has widely been discussed among researchers (Ludíková and Tomalová, 2013). A comprehensive review of theoretical approaches to research on quality of life and associations with place, environment and, in particular, city life can be found in Ge and Hokao (2006); Insch and Florek (2008) and Smith *et al*., (1997), while a comprehensive review of empirical studies addressing the association between environment, space and well-being can be found in Ballas and Tranmer (2012). Community quality has been accepted as a precondition for typical economic and cultural activities and contribution to quality of life in general (Ge and Hokao, 2006). Furthermore, it has been shown that place or residential satisfaction are prerequisites for commitment to a place (Zenker *et al*., 2013), place or city attachment (Florek, 2011; Insch and Florek, 2008), place identity (Hernández *et al*., 2007) or city loyalty (Florek, 2011). Such affective bonds not only reduce intention to leave a place (Zenker and Rütter 2014) but also encourage investment in neighborhood relations and community life (Jacobs and Appleyard, 1987; Kahrik *et al*., 2015). Macke *et al.,* (2018), stated that according to the academics and urban planners the smart city concept favors technological products and solutions over end users and their quality of life. This perspective calls for an integrated analysis approach that considers the smart city as an organic whole, which encompasses objective and subjective quality of life domains (QoL). According to their results, meeting these criteria of success would improve citizen's quality of life, creating a stronger community within the city. Finally, the study provides relevant information for social researchers and urban planners by identifying factors that influence QoL perceptions and providing elements for political and academic debate. Biagi *et al*., (2018) studied residents' perception of quality of life in cities using the capability approach. The capability approach offers a theoretical framework with which to explain how individual perception of quality of life in cities develops. The main findings were that residents' perception of quality of life in cities is highly dependent on the choices people can actually make. Recent researches on the quality of life that quality of urban environment is a subset of it focused on two basic methodologies of measurement. One method utilizes quantifiable social or economic indicators to reflect the extent to which human needs are met. The other looks to self-reported levels of happiness, pleasure, fulfillment, and the like, and has been termed "subjective well-being" (Easterlin, 2003). The so-called "objective" measurements of QoL generally center on social, economic, and health indicators (Cummins *et al*., 2003), utilizing tools such as the UN's Human Development Index (HDI) and GDP/ capita. In the field of medicine, Health Related QoL (HRQoL) research has resulted in the development of numerous individual instruments, each intended to measure HRQoL for specific subsets of populations based, for example, on age, disease status, and condition (Ibid). While these measurements may provide a snapshot of how well some physical and social needs are met they are narrow, opportunity-biased, and cannot incorporate many issues that contribute to QoL such as identity and psychological security. It is also clear that these so-called "objective" measures are actually proxies for experience identified through "subjective" associations of decision-makers; hence the distinction between objective and subjective indicators is somewhat illusory. More "subjective" measurement tools typically focus on personal reports of life experience that complement social, economic, and health indicators, such as the degree to which a perceived need is being met and the importance of that 'perceived need' to one's overall QoL. Haas (1999) argues that QoL is "primarily a subjective sense of well-being." In the literature, subjective sense of well-being has often been used as a proxy for QoL (Haas, 1999; Easterlin, 2003). However, in addition to some methodological flaws, subjective assessments of well-being have trouble delineating preference adaptation and the fact that people judge their well-being in comparison with peer groups rather than in absolute terms (Costanza *et al.,* 2007). Objective measures, or social indicators, represent in a broad sense the individual's standard of living comprising of verifiable conditions inherent in the given cultural unit and are especially useful at the neighborhood, city, and country levels. Subjective quality of life explores the degree to which the individual's life is perceived to match some implicit or explicit internal standard. The use of subjective indicators is the most contentious aspect of the quality of life approach. Subjective quality of life illustrates quality of life as indicated by the psychological state of life satisfaction rather than by objective conditions and settings (for example

physical, social, and economic settings), although both are inter-related. The subjective dimension is an important part of quality of life but the measures of that dimension need to be explored and evaluated alongside objective indicators in order to establish their significance (Turkoglu 2015). A crucial key theme for research into quality of life is the exploration of the relationship between people and their everyday urban environments. It is now generally acknowledged that both objective and subjective indicators are required in studying the person environment relationships. Thus, research into quality of life should attempt to measure the combined effect of objective and subjective factors on human well-being. Szalai (1980) echoes these sentiments and merges both objective and subjective indicators (Quoted by Turkoglu, 2015). In this study the focus was on both objective and subjective measurements with emphasis on the quality of environment, since both these measures have been established as positively associated with satisfaction and quality of urban environment.

MATERIALS AND METHODS

Five urban landscape indicators for quality of urban environment used in this study are; Land use, Green space, Population and Floor density, Accessibility and Physical quality. The research method is adjustable according to the research objectives. So the present study aims to examine the quality of urban environment based on interview method and application of Geographic Information Analyzes (GIS). In order to reach this purpose several key research expression are measured in this study: 1) The quality of available land use of urban environment; 2) The quality of green space of urban environment; 3) The quality of population and floor density of urban environment; 4) The quality of accessibility of urban environment; 5) The physical quality of urban environment.

One of the tools that can demonstrate the quality of urban environment is using geographic information system (GIS). In the present research, the first step is field observation and conduction an organized interview as a complementary method with the citizens, and in the next step, implementation of the results on the geographic information system maps. In the interview, 30 samples were selected by Convenience Sampling as type of non-probability sampling that drawn from the part of the population that was close to hand. The questions asked in interview were:

1. What is your opinion about the quality of available land use?
2. What is your opinion about the quality of green space?
3. What is your opinion about the quality of population and floor density?
4. What is your opinion about the quality of accessibility?
5. What is your opinion about the physical quality?

Thus, the present study aims to examine the quality of urban environment based on interview method and application of Geographic Information System Analyzes that from this point of view is a subjective study in the field of quality of urban environment. But since a field survey in the preparation of maps and the observation method, have been used, the present study can be considered as objective study too. Eastern Azerbaijan is one of the 31 Provinces of Iran with centrality of Tabriz (Heydari and Shojaeivand, 2017). Tabriz is one of metropolises in northwest of Iran and has been a trading center from ancient times and one of the most popular tourism destinations in Iran for both of domestic and international tourists due to various historical tourism attractions (Ghanbari and Shojaeivand, 2015). Tabriz has always been the center of economic activities in Iran northwest for its geographic, communicative, political, and economic position (Abizadeh and Zali, 2013). The current study has been carried out in Noor Town in Tabriz 2018. Tabriz is the sixth major city of Iran by population over 1,790,000 (Statistical Center of Iran, 2014). Noor Town as the study area is one of the towns of Tabriz metropolis that has emerged in the past decades and located in the southwestern part of Tabriz (Fig. 1).

RESULTS AND DISSCUSION

Land Use and Green Space

Land use involves the management and modification of environment into built environment. Cities are broken up into 6 major functions and land-use groups; residential, transportation, institutional and public buildings, open space and recreational land, industrial, and commercial. Plan for a compatible and harmonious arrangement of land uses in urban areas by providing a type and mix of functionally well-integrated land uses which meets general social and economic needs, is urban land use planning. If urban land use be without proper planning, will reduce the quality of the urban environment. So, it is necessary that the urban land use be in a way that improves the

quality of the urban environment. According to the interview with people and the GIS analysis in Fig. 2, the land use quality is acceptable generally in Noor Town and most residents have the proper access to the most land use. Since green spaces is one of the most important public spaces and play a direct role in quality of urban environment, interviewees have considered it necessary and have emphasized it and they have stated that they have access to the closest green space within fifteen minutes. Fig. 2, confirms the distribution of green space.

But the factors that has been considered in interview as a decline of the quality of urban environment in relation with the land use, is the existence of wastelands in the southern parts of the study area and existence of some industrial sites as air pollution sources near the study area (Fig. 3).

Population and Floor Density

Population density is a measurement of population per unit area or unit volume and it is frequently applied to living organisms, and most of the time to humans in urban environment. Floor density is a density measure expressing the ratio between a building's total floor area and its site coverage. They are quantity of type number density and are one of the key geographical term (Wikipedia, 2019). Existence of a population density can be an economic advantage and may results in the provision of facilities in the city.

Based on the results of the interview and according to the Fig. 4, the two factors led to the heterogeneous of population density are the existence of modulation residential complexes without lifts and the existence of wastelands in the west and south of the study area. Floor Density and Floor Area Ratio (FAR) a common zoning technique is for a district to have a relatively low density or FAR standard, but allow a landowner to build more floor area or more units per area of land area than would otherwise be allowed under the zoning provided that the landowner provides some public benefit or amenity to the community (Wikipedia, 2019).

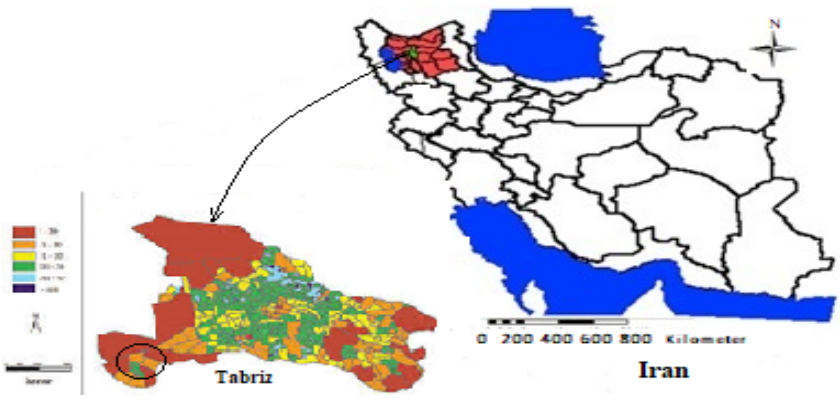

Fig.1: Geographic location of the study area in Tabriz urban environment in Iran

Fig. 2: Land use and distribution of green space in the study area

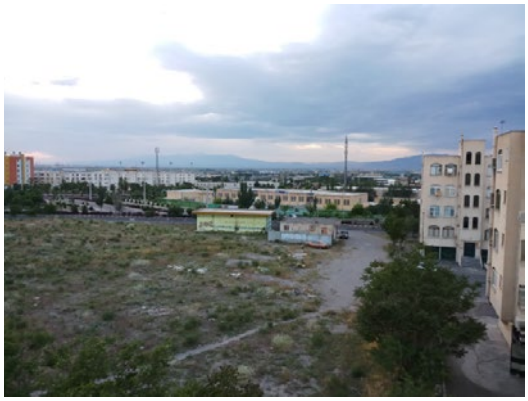

Fig. 3: Wastelands and perspective of industrial land use

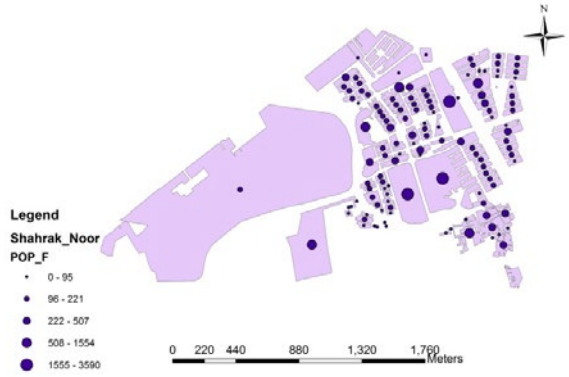

Fig. 4: Population Density in study area

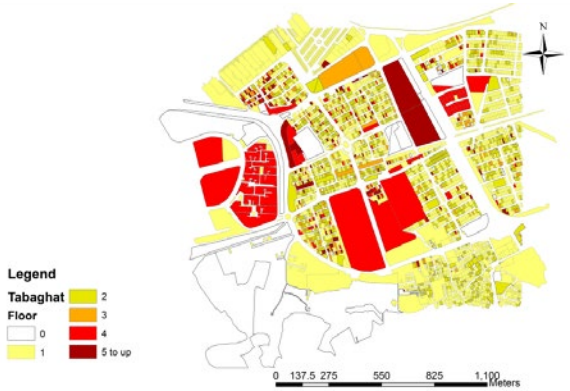

Fig. 5: Floor Density in study area

Fig. 6: Accessibility and Physical Quality in study area

The amount of excess density or FAR allowed as a zoning bonus depends on how valuable the amenity is deemed by the community. According to research results and the Fig. 5, environmental quality in terms of Floor density can be acceptable. Because, there is notable open space and green space in places where the density is high. The physical quality in this research is an indicator that is estimated by the age of the buildings. Although this factor cannot be the only indicator of the quality of life but it can be an important indicator in assessing the quality of urban environment. Physical quality is a visible and obvious indicator through which at first glance, the quality of the environment, the economic situation, the social infrastructure, and ultimately the quality of life in the area can be found. The advantage of this type of quality is that if there are some research orientations, the researcher achieves actual results with active participation in the research process.

According to the Fig. 6, the accessibility and physical quality of the study area except the small parts in the south is appropriate and people have expressed their satisfaction with it. But what people have been dissatisfied about is the existence of uniformity and lack of diversity in some of the cases.

CONCLUSION

Quality of Urban Environment is a concept that has inspired much research in the past decades and has established a strong position in local and national. Sustainable communities are places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. Exploring community and neighborhood profiles through quality of life research can enhance decision making processes in relation to community and sustainability.

So the purpose of this study was to investigate the quality of urban environment according to the five urban landscape indicators; Land use, Green space, Population and Floor density, Accessibility and Physical quality in Noor Town of Tabriz. In order to achieve this goal, the two-step research method has been used. The first step is field observation and conduction an organized interview with the citizens and the next step is the implementation of the results on the map by geographical information system (GIS) analysis. According to the findings, on the five indicators of urban landscape as quality of urban environments; In connection with the land use, the land use quality is acceptable generally in Noor Town and most residents have the ability to access the most land uses. Since green spaces is one of the most important in land use and plays a direct role in quality of urban environment, interviewees have considered it necessary and have emphasized it and they have stated that they have access to the closest green space within fifteen minutes. But the factor that has been considered as a decline of the quality of urban environment in relation to the land use is the existence of wastelands in the southern parts of the study area and existence some industrial land uses as air pollution sources near the study area. Also associated with the population and floor density; the two factors led to the heterogeneous of population density, one the existence of modulation residential complexes without lifts and the existence of wastelands in the west and south of study area. Also the environmental quality in terms of Floor density can be acceptable. Because, there is notable open space and green space in places where the density is high. The accessibility and physical quality of the study area except the small parts in the south is appropriate and people have expressed their satisfaction with it. But what people have been dissatisfied about is the existence of uniformity and lack of diversity in some of the cases. In general the highest quality of urban environment related to green space and contrary to the inappropriate situation of green space in the mega polis of Tabriz, people are satisfied with the availability of green space in Noor Town. In contrast, the lowest quality of urban environment is related to the aspects of land use, such as the existence of wastelands in the southern parts of the study area and existence some industrial land uses as air pollution sources near to the study area.

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CONFLICT OF INTREST

The author declares that there are no conflicts of interest regarding the publication of this manuscript. In addition, the ethical issues; including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy have been completely observed by the author.

REFERENCES

Ahmad, Y.; Hamid, S.; Afgani, E.Y.; Yusof, N., (2014). Quality of life amongst agropolitan participant project: A Malaysian experience. Proc. Soc. Behav. Sci., 153 (16): 479 – 490 (**12 pages**).

Aklanoğlu, F.; Erdoğan, E., (2012). Improvement quality of life for an Anatolian traditional settlement: Konya-Sille Case. Proc. Soc. Behav. Sci., 35: 420–430 (**11 pages**).

Ana-Maria, V., (2015). Study on promoting quality of life through physical exercise. Proc. Soc. Behav. Sci., 180, 1439–1443 (**5 pages**).

Ballas, D.; Tranmer, M., (2012). Happy people or happy places? A multilevel modeling approach to the analysis of happiness and well-being. Int. Region. Sci. Rev., 35(1): 70–102 (**33 pages**).

Biagi, B.; Ladu, M. G.; Meleddu, M., (2014). Urban Quality of Life and Capabilities: An Experimental Study; Ecol. Econ., 150: 137-152 (**16 pages**).

Constantinescu, M., (2013). Educating young people for quality of life improvement. Proc. Soc. Behav. Sci., 93: 395–399 (**5 pages**).

Costanza, R.; Fisher, B.; Ali, S.; Beer, C.; Bond, L.; Boumans,; Gayer, D. E., (2007). Quality of life: An approach integrating opportunities, human needs, and subjective well-being. Ecol. Econ., 61(2-3): 267-276 (**10 pages**).

Cummins, R. A.; Eckersley, R.; Pallant, J.; Van Vugt, J.; Misajon, R., (2003). Developing a national index of subjective wellbeing: The Australian Unity Wellbeing Index. Soc. Indic. Res., 64(2): 159-190 **(32 pages).**

Easterlin, R.A.; (2003). Explaining happiness. P. NATL Acad. Sci.: 11176–11183 (7 pages).

Eusuf, M.A.; Mohit, M.A.; Eusuf, M.R.; Ibrahim, M., (2014). Impact of outdoor environment to the quality of life. Proc. Soc. Behav. Sci., 153: 639–654 (16 pages).

Florek, M., (2011). No place like home: Perspectives on place attachment and impacts on city management. J. of Town City Manage., 1(4): 346–354 (**8 pages**).

Ge, J.; Hokao, K., (2006). Research on residential lifestyles in Japanese cities from the viewpoints of residential preference, residential choice and residential satisfaction. Landsc. Urban Plan., 78(3): 165–178 (**14 pages**).

Ghanbri, A.; Shojaeivand, B., (2015). People's Attitudes towards Participation, Place Attachment and Urban Tourism Development in Tabriz, Iran. Online international. Interdi. Res. J., 5(1): 68- 81 (**14 pages**).

Haas, B.K., (1999). A multidisciplinary concept analysis of quality of life. West. J. Nurs. Res., 21: 728–742 (**15 pages**).

Hanifah, N. A.; Hashim, R., (2012). The Madrid Protocol 1991 and its environmental impacts towards the quality of life. Proc. Soc. Behav. Sci., 35: 398–403 (**6 pages**).

Hernández, B.; Carmen Hidalgo, M.; Salazar-Laplace, M.E. Hess, S., (2007). Place attachment and place identity in natives and non-natives. J. Environ. Psycho. 27(4): 310–319 (**10 pages**).

Heydari, R.; Shojaeivand, B., (2017). New urbanism approach and urban space in mega cities. Int. J. Hum. Capital Urban Manage., 2 (4): 303-308 (**6 pages**).

Insch, A.; Florek, M., (2008). A great place to live, work and play: Conceptualizing place satisfaction in the case of a city's residents. J. of Place Manage. Dev., 1(2): 138–149 (**12 pages**).

Karim, H.A., (2012). Low cost housing environment: compromising quality of life? Procedia. Soc. Behav., 35: 44-53 (**10 pages**).

Keles, R., (2012). The quality of life and the environment. Proc. Soc. Behav. Sci., 35: 23– 32 (**10 pages**).

Ludíková, L..; Tomalová, P., (2013). Research on quality of life of workers in school counseling centers for the visually and hearing impaired in the Czech Republic. Proc. Soc. Behav. Sci., 106: 2269–2274 (**6 pages**).

Ludíková, L.; Tomalová, P., (2013). Research on quality of life of workers in school counseling centers for the visually and hearing impaired in the Czech Republic. Proc. Soc. Behav. Sci., 106: 2269-2274 (**6 pages**).

Macke, J.; Casagrande, R.M.; Sarate, J.A.R.; Silva, K.A., (2018). Smart city and quality of life: Citizens' perception in a Brazilian case study. J. Cleaner Prod., 182: 717-726 (**10 pages**).

Marans, R.W., (2012). Quality of urban life studies: an overview and implications for environment-behaviour research. Proc. Soc. Behav. Sci, 35: 9–22 (**14 pages**).

Mohit, M. A., (2013). Quality of life in natural and built environment – an introductory analysis. Proc. Soc. Behav. Sci., 101: 33–43 (**11 pages**).

Sham, R.; Hussein, M. Z.S.; Ismail, H. N., (2013). A review of social structure, crime and quality of life as women travelers in Malaysian Cities. Proc. Soc. Behav. Sci., 101: 307–317 (**11 pages**).

Shucksmith, M.; Cameron, S.; Merridew, T.; Pichler, F., (2009). Urban-Rural Differences in Quality of Life Across the European Union. Reg. Stud., 43, 10: 1275-1289 (**15 pages**).

Smith, T.; Nelischer, M.; Perkins, N., (1997). Quality of an urban community: A framework for understanding the relationship between quality and physical form. Landsc. Urban Plan., 39(2): 229–241 (**13 pages**).

Turkoglu, H., (2015). Sustainable development and quality of urban life. Proc. Soc. Behav. Sci., 202: 10 – 14 (**5 pages**).

Zenker, S.; Rütter, N., (2014). Is satisfaction the key? The role of citizen satisfaction, place attachment and place brand attitude on positive citizenship behavior. Cities, 38: 11–17 (**7 pages**).

Zenker, S.; Petersen, S.; Aholt, A., (2013). The citizen satisfaction index (CSI): Evidence for a four basic factor model in a German sample. Cities, 31: 156–164 (**8 pages**).

Wikipedia, (2019). Urban density and Floor area ratio.

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