Ranking of Urban Areas Based on Quality of Life Indicators Associated with Urban Prosperity Case Study: Tabriz City

Mohsen Ahadnejad Reveshty [a], Safiye Hazeri [b],*

[a] *Department of Geography and Urban Planning, University of Zanjan , Zanjan , Iran.*
[b] *Department of Geography and Urban Planning, University of Zanjan, Zanjan, Iran.*

Abstract

Abstract In 2013, UN-HABITAT provided the City Prosperity Index (CPI) to evaluate policies and guide urban decision-makers. Quality of life is one of the five dimensions of urban prosperity, which is one of the newest theories in the field of urban planning. The concept of urban quality of life has been invigorated in the wake of social welfare and social justice schools. In Iran, from the past, there have been several discussions and attempts to improve the urban quality of life. This paper identifies the indicators and factors affecting urban prosperity in the dimension of quality of life in Tabriz and then the urban areas of Tabriz based on Indicators of the quality of life associated with urban prosperity are ranked using the PROMETHEE model. The Consolidated Approach of AHP and PROMETHEE have been used for this purpose. GIS has been used to prepare the relevant maps, the AHP method has been used to weighing quality of life indicators associated with urban prosperity and, finally, the PROMETHEE model has been used to ranking quality of life in urban areas. The results of the study show that areas 2-3, 2-2 and 3-3 have high quality of life. And areas 7-6, 7-3, and 7-5 are in the last three places in terms of quality of life indicators associated with urban prosperity. It can be said that the findings from the research and ranking the PROMETHEE model are consistent with what is true in the city.

Keywords: Quality of life; Urban prosperity; PROMETHEE model; Tabriz city; Urban areas; AHP method

1. Introduction

Nowadays the quality of life is one of the factors that have special standing in the context of urban planning studies (Ahadnejhad et al, 2016). In recent years, the evaluation of urban quality of life (QOL) different academic backgrounds has increased significantly (Seik,2000; Morais & Camanho, 2011; Higgins & Campanera; 2011) For a long time, Gross Domestic Product (GDP), measuring economic development has been considered as the best predictor of QOL in international comparisons: higher GDP per capita was considered to imply globally a better country to live in. In recent decades, however, researchers have tried to find a better measurement of country QOL (e.g. Human Development Index, Legatum Prosperity Index) (Bonaiuto et al,2014). So searching for to find an alternative quantity to measure prosperity is one of the few attempts to move the boundary of knowledge (Jackson.2011). However, few indexes been suggested to measure urban quality of life at the scale of cities) There is still a lack of this kind of tools at the scale of cities (Bonaiuto et al, 2014).

The City Prosperity Index (CPI) compensates this defect and gap by proposing multidimensional and universal tool for testing prosperity (i.e., a broad concept including wealth, happiness and health) in cities (UN-HABITAT, 2012:59) . The CPI sets out with a strong critique of the 'GDP fetishism' and argues for the need to move towards measuring the broader conception of human and societal well-being (Wong, 2015). A prosperous city integrates six critical dimensions: 1) productivity; 2) infrastructure development; 3) quality of life; 4) equity and social inclusion and; 5) environmental sustainability and 6) Urban good governance. These dimensions could be represented as spokes of a wheel. The hub of the wheel consists of the laws, institutions and urban planning practices that are necessary to maintain the balance across the different dimensions (Sands, 2015). So, balanced development is a crucial feature of prosperity, none of the dimensions must prevail over the others and all must be kept roughly 'equal' – for the sake of a smooth 'ride' on the path of prosperity (UN-HABITAT,2012:15).But among those five dimensions of prosperity, Quality of life is a synthesis of all the dimensions of prosperity(UN-HABITAT, 2012:60). As the quality of life and other dimensions of urban prosperity are increasingly interconnected. Improving and enhancing the status of other dimensions of prosperity improves the QOL. It remains that, as perceived by experts and residents in developing and developed countries alike, the quality of urban life is a broader concept that includes a full range of factors such as economic development, living standards, material progress and individual and collective wellbeing, which all are important dimensions of prosperity (UN-HABITAT, 2012:60).

In our country, the urban population has also grown rapidly in recent decades due to migration, according to the 2016 census, seventy four percent of the population lives in cities. This has faced many challenges for city government agencies and institutions that are responsible for solving problems and meeting their needs, so that our

* Corresponding Author Email: Hazari.safa1991@gmail.com

cities has been faced with variety of urban problems, such as social and economic inequalities, Separation of work place from residence place, inappropriate quality of housing, destruction and shortage of green spaces, inefficient public transportation systems, various types of environmental pollution such as pollution of water resources, noise pollution, air pollution ... and, ultimately, unsustainable development. This has reduced the quality of life and the lack of sustainable development in the cities.

In this regard, the present study has been done with the aim of identify, measure and explain the urban prosperity of the 38th Metropolitan area of Tabriz and their ranking based on QOL indicators related to urban prosperity. Accordingly, the objectives of this paper can be used to extract the indicators and measures of urban prosperity in the dimension of quality of life in Tabriz based on its specific conditions, measuring and explaining urban prosperity from the perspective of 25 indicators of QOL in separation of urban areas of Tabriz for the first time and finally the prioritization of areas based on the PROMETHEE model in Tabriz.

2. Research Background

In the context of urban prosperity, a few studies have been conducted, none of which have been specifically designed to assess the quality of life, and some of which are referred to below:

Bonaiuto et al (2015) in the article of "Perceived Residential Environment Quality Indicators (PREQIs) relevance for UN-HABITAT City Prosperity Index (CPI)" have validated some cross-cultural tools e focusing on the Quality of Life (QOL) spoke of the CPI's wheel of urban prosperity; specifically an abbreviated version of the Perceived Residential Environment Quality Indicators (PREQIs) and the Neighbourhood Attachment Scale (NAS), as well as items for measurement of Residential Satisfaction (RS). They tested a model of the links among the constructs measured by these tools that deal with different features of QOL. Multivariate statistical analyses of the survey results extends the cross-cultural validity of the tools, as well as testing relationship models going from specific to global PREQIs, to NAS, finally predicting RS.They argues for the relevance of PREQIs, NAS and RS constructs and tools in deepening the knowledge on the QOL spoke within the UN-HABITAT CPI (Bonaiuto et al., 2015). Mohtashemi (2014) have done the case study on the city Tehran his thesis with the title of "Formation of Outstanding Architecture Based on City Prosperity Index in Iran Design Case: Darakeh Neighborhood House in Tehran Thesis" by using a descriptive-analytical method, has put the subject of urban prosperity as an architectural translation and, based on it, has proposed a framework for achieving the Outstanding architecture. The major results obtained from the research identify the four general principles of economics, health, socialization and education for creating a Outstanding architecture (Mohtashemi, 2014). Safaee Pour et al (2017) in the article "Evaluate and Measurement of Urban Prosperity Index (CPI) for Ahvaz of Metropolitan" by

using a questionnaire and a statistical questionnaire prioritized the urban areas of Ahvaz in terms of prosperity dimensions. The results of thise study indicat the 2nd and 1nd regions are very solid prosperity, the 6th, 3rd and 8th regions are solid prosperous, the 7th regions are in the low prosperity region, and finally the 4th area is in the category of urban very weak prosperity (Safaee Pour et al., 2017). Ahangnejad et al (2018) in the article "dentifying the key factors influencing the urban prosperity with future study approach: the case study of Tabriz Metropolis" by uses a cross-impact analysis technique, one of the most common and accepted predictive methods, by using the Mick-Mac software to analyze the urban prosperity components of the metropolitan metropolis of Tabriz. Finally they, of the 78 factors mentioned after checking the amount and the degree of effectiveness the of factors in connection to each other and on the future status of the prosperity metropolis of Tabriz with direct and indirect methods, of the following 15 key factors (Unemployment rate, Literacy rate, Durable housing, Public transport capacity, Poverty, Gini coefficient, Women's Employment, cultural centers, Maternal mortality, air pollution, Infant mortality, Marginalization Youth employment, Public Schools, Industry) that having the greatest role in the future status of prosperity metropolis of Tabriz were selected (Ahangnejad et al., 2018).

Numerous studies have been conducted in the field of quality of life at different local, national and international levels, some of which are mentioned below.

In the article "Analysis of Inequality of Quality of Life Indicators at the Levels of the Babolsar Towns", Shamai, Ali and others (2012), concluded that inequalities in Babol are somewhat high in quality of life. The greatest difference in inequality is observed in the access factor, and the least of it, is the factor of security (Shamai et al., 2012). Bandarabad and Ahmadinezhad (2014), in the article of "Evaluation of Quality of Life Indicators with Emphasis on livability principles in Tehran Area 22", have investigated the livability of Golestan Township in two objective and subjective aspects and identifying important and effective factors in improving the quality of life by using the TOPSIS model and have measured the degree of objective enjoyment and mental satisfaction in different realms. The results of the study indicate the proper enjoyment of housing 0.86 and improper physical enjoyment 0.35 in terms of objective dimensions and the suitability of housing status with a score of 0.58 and environment 0.67 compared to the economic status of 0.44 and social 0.46 in terms of mental dimensions (Bandarabad & Ahmadinezhad, 2014). Faraji Molaei et al (2010), have analyzed the categorization of life quality with the SAW method in the neighborhoods of Babolsar city. Based on the results, although the residents of the urban regions can be having high standard of objective quality of life, they are not satisfied with their lives, it is the contrary for the slums where people may be satisfied with their lives. They have concluded that the qualities related to the constructed environments and other aspects of life quality is impactful on each individual's' feeling of

satisfaction (Faraji Molaei et al, 2010: 21). Moro et al (2008) in the article of "Ranking quality of life using subjective well-being data" have proposed an alternative set of indices based on subjective well-being (SWB) data linked to regional level amenities. SWB indicators provide a direct, self-reported evaluation of life satisfaction and can be used to rank quality of life among different locations in the absence of data on housing prices and wages. Using SWB data in Ireland, their show how to rank quality of life in regions in three different ways: 1) using a simple unconditional average of SWB across locations, 2) conditionally, controlling for personal characteristics of individuals and the environmental amenities in their area and 3) weighting the environmental endowments in each location by the marginal rate of substitution between income and the amenity. Their results show a very high correlation between the three indices and suggest that variation in SWB across locations is not random, but is driven to a large extent by the endowment of location-specific amenities across locations (Moro et al., 2008). Morais and Camanho (2011) in the article of "Evaluation of performance of European cities with the aim to promote quality of life improvements" have explored the possibilities presented by DEA to assess quality of life and evaluate the performance of city managers in what concerns the promotion of urban quality of life. Using the data provided by the Urban Audit program, from the European Union, They defined the city profile regarding quality of life for 206 cities. They two approaches have presented: the construction of a composite indicator of quality of life and the assessment of local management performance, contextualized by the GDP per capita to measure the ability of local authorities to promote quality of life given the economic condition of the country. Their results identify the cities with urban best practices and present a model of intervention for the cities considered inefficient, based on benchmarking principles (Morais & Camanho, 2011)

3. Research Theoretical Bases
3.1. Definition of quality of life

Urban quality of life (QOL) is a complex, interdisciplinary, multidimensional category, and associated with objective and subjective aspects (Schyns & Boelhouwer, 2004: 5). QOL is certainly a multi-faceted concept that is frequently used in the media and by politicians but defies precise definition (Samadi Ahari & Sattarzadeh, 2019). But scientific literature has not yet been stabilized one agreement on the concept of QOL and its definition (Pacione, 2003). Several definitions and concepts have been presented: Quality of life is the interconnected relationship between society, health, economics and environmental conditions that affects human beings and social development (Schyns & Boelhouwer, 2004: 5). Paul defines the urban QOL as the conditions and the status of the lives of families and towns (Paul, 2005: 32). Fo Takan Sik also considers QOL as an overall satisfaction of life (Foo Tuan Seic, 2000: 46). By reviewing the definitions of quality of life, the conceptual

space of quality of life can be described as follows: objective facts, subjective perception, and enjoyment, and well-being, life satisfaction, providing human needs, health, and well-being and so on. Urban QOL is usually measured through the mental indicators derived from surveying and evaluating perceptions and citizens' satisfaction from urban life, or by using objective indicators derived from secondary data and is rarely measured using both types of indicators (Rezvani et al., 87: 2009).

3.2. Quality of Life and CPI

The UN-HABITAT report believe that "Quality of life is based on the functionality of cities: quality of life is a concept at the intersection of all policies and actions, and a synthesis of all dimensions of prosperity" (UN-HABITAT, 2012: 59).
In the same document, it also states that When a city generates employment and economic growth, quality of life improves. The quality of life improves when a city designs buildings and better public spaces that offers attractive, secure, clean and durable surroundings. When a city provides more green spaces, quality of life improves. When a city increases social justice, quality of life improves. When a city increases its education level and provides good health care, quality of life is guaranteed for the foreseeable future .According to the UN-HABITAT survey (2011), value security for living and working freely, quality of education, adequate housing with basic services, and meaningful employment and decent and reasonable income as the most important factors in promoting quality of life and prosperity in cities (UN-HABITAT, 2012 :60)
Also UN-HABITAT report suggests that QOL may be improved by many sorts of interventions.
Indeed, different actions are needed for cities of different degrees of prosperity. And according to the degrees of prosperity some interventions can be more important than others, suggesting a kind of hierarchy of needs to achieve prosperity. Infrastructure and safety are important indicators for QOL in less prosperous cities, economic growth and GDP are good predictors for low and medium prosperity cities, but less so for fully economically developed ones; sustainability, green areas, availability of culture and sport facilities become very important in improving QOL in already prosperous cities (UN-HABITAT, 2012; Bonaiuto et al,2014).

4. Research Methodology

This research is applied in terms of purpose and is descriptive-analytical in terms of method. 38-th areas of Tabriz are the statistical population. In this research, library and field methods have been used in accordance with different situations and fields. Firstly, with library studies, quality of life indicators related to urban prosperity were determined in four categories: socioeconomic, physical, health, safety and security. Then, the data of these indicators were extracted from different organizations as well as statistical blocks of the

population and housing census in 2011. In this research first at all, determined the weight and importance of each of the 25 indicators used in the research, according to experts from the urban planning area, using the AHP model to analyze the data. Then, the PROMETHEE model was used to rank the 38-th districts of Tabriz. Finally, ARC/GIS software has been used to process the material produced from the mentioned model.

4.1. Introduction of research model

Multi criteria decision making methods are powerful tools for analyzing decision-making issues with different and conflicting criteria. Meta-ranking methods as a branch of multi criteria decision making models make a more accurate and realistic modeling of decision-making problems by defining meta-ranking relationships and, based on pairwise comparisons between options. Meta-ranking relationships include strict preference, strong preference, weak preference, and no preference or indifference relationships. Which are defined by determining the thresholds for preference (P), minor difference (q) and veto (v) (Figueira, et al: 2005).

 Among the various methods presented in the form of meta-ranking methods, the PROMETHEE method has been widely used in recent years (Banias, et al: 2010). This method, as one of the decision support methods without the need for too much and confusing information makes it easy to achieve sustainable and understandable results. The most important strengths of this method are compared to other decision-making methods, ease of use for the user, the possibility of interpreting the parameters (categorization of indicators and options), the stability of the results in comparison with most other methods, the possibility of sensitivity analysis in a simple and fast way, the possibility of using graphical modeling and considering different constraints in decision optimization (Asgharizadeh and Nasrollahi, 2009).

One of the advantages of the PROMETHEE model is that it supports six types of pre-defined preference functions, which could cover the within-criterion relationships for most of the QOL attributes. In a way, it could save user's effort of defining utility functions for each attribute, and it is also better than the simple maximizing or minimizing relationship. Another advantage is that it does not have a fixed weighting scheme, and thus allows for the inclusion of any good method. It is also a model which is simple on its concept and easy for users to understand and apply to solve the real problems.

Since PROMETHEE model does not have a pre-defined weighting function, we first need to find a good weighting scheme to go with it. In many service selection algorithms, different QOL attributes are assumed to be independent of each other. However, the dependency normally exists a more abstract attribute may rely on a more primitive attribute, a subjective attribute may be decided by some objective attributes, two attributes may be dependent on each other, etc.To account for the QOL interdependency, we decide to use the Analytical Hierarchy process (AHP) model in the weighting step.

This method is used to evaluate and prioritize discrete options and select the best one based on several criteria (with different measurement scales). There are limitations in using the PROMETHEE technique to compensate for the weakness of one criterion or the strength of another criterion, and therefore an ideal option should obtain the least of all criteria.

In addition, PROMETHEE method is easily able to apply criteria with different scales of measurement (without the need to harmonize the criteria scale) and defines it according to the information and criterion scale of six separate functions, thus in multi-criteria decision making. Usually the criteria have different scales of measurement is a strength for decision making (Karim et al., 2011).

Like all meta-ranking methods, the PROMETHEE method is also used in the pairwise comparisons of decision making options are used to determine the partial relationships that indicate a strong preference for **a** to **b**. The evaluation table is the starting point for the PROMETHEE method. In this table, options are evaluated according to different criteria. These evaluations contain quantity information.

	f1(.)	f2(.)	…	fj(.)	…	fk(.)
a1	f1(a1)	f2(a1)	…	fj(a1)	…	fk(a1)
a2	f1(a2)	f2(a2)	…	fj(a2)	…	fk(a2)
ai	f1(ai)	f2(ai)	…	fj(ai)	…	fk(ai)
an	f1(an)	f2(an)	…	fj(an)	…	fk(an)

Here (a1, a2, ... an) = A is a finite set of options and {¬f1 (.), F2 (.), Fg (.)} Is the set of evaluation criteria for the set of options A.

The implementation of PROMETHEE requires two additional types of information, namely:

Information on the relative importance (i.e. the weights) of the criteria considered

Information on the decision-makers preference function, which he/she uses when comparing the contribution of the alternatives in terms of each separate criterion.

The preference function (Pj) translates the difference between the evaluations (i.e., scores) obtained by two alternatives (a and b) in terms of a particular criterion, into a preference degree ranging from 0 to 1.

$$P_{j(a,b)} = G_j[f_j(a) - f_j(b)]$$
$$0 \leq P_{j(a,b)} \leq 1$$

Let be the preference function associated to the criterion, $f_i(i)$ where G_i is a non decreasing function of the observed deviation (d) between $f_i(a)$ and $f_i(b)$. In order to facilitate the selection of a specific preference function, six basic types have been proposed, usual function, U-shape function, V-shape function, level function, linear function and Gaussian function (Table 1).

Table 1
Preference functions of Promethee

function	Shape	Threshold
Usual		No threshold
U-shape		Q threshold
V-shape		P threshold
Level		Q ad P threshold
Linear		Q ad P threshold
Gaussian		S threshold

(Source: Deshmukh, 2013:30)

PROMETHEE allows the computation of the following quantities for each alternative **a** and **b**.

$$\Pi r\,(a.b) = P_j(a.b)wr.j$$
$$\Phi + (\alpha) = \Sigma_{x \in A}\pi r(x.a)$$
$$\Phi - (\alpha) = \Sigma_{x \in A}\pi r(a.x)$$
$$\Phi\,(\alpha) = \varphi + (\alpha) - \varphi - (\alpha)$$

For each alternative a, belonging to the set A of alternatives, π(a,b) is an overall preference index of **a** over **b**, taking into account all the criteria, $\varphi^+(\alpha)$ and $\varphi^-(\alpha)$. $\varphi(\alpha)$ represents a value function, whereby a higher value reflects a higher attractiveness of alternative **a** and is called net flow (Deshmukh,2013:30).

The preference flows are computed to consolidate the results of the pairwise comparisons of the actions and to rank all the actions form the best to the worst one. Three different preference flows are computed: Phi+ (f+): the positive (or leaving) flow Phi- (f-): the negative (or entering) flow· Phi (f): the net flow

The positive preference flow Phi+ (a) measures how much an action a is preferred to the other n-1 ones. It is a global measurement of the strengths of action a. The larger Phi+ (a) the better the action.

$$\phi^+(a) = \frac{1}{n-1}\sum_{x \in A}\pi(a,x),$$

The negative preference flow Phi- (a) measures how much the other n-1 actions are preferred to action a. It is a global measurement of the weaknesses of action a. The smaller Phi- (a) the better the action.

$$\phi^-(a) = \frac{1}{n-1}\sum_{x \in A}\pi(x,a)$$

The net preference flow Phi (a) is the balance between the positive and negative preference flows:

$$\emptyset(a) = \emptyset^+(a) - \emptyset^-(a)$$

It thus takes into account and aggregates both the strengths and the weaknesses of the action into a single score. Phi (a) can be positive or negative. The larger Phi (a) the better the action.

4.2. Indicator Selection

Indicators used in this research are determined using the CPI Methodology guide and based on local conditions and availability of data. Table 2 shows the indicators used in this study.

Table 2
Quality of life Indicators of urban prosperity

Categories	indicator
Socioeconomic	1- Literacy rate 2- Net enrollment rate in higher education 3- Unemployment rate 4- Old age dependency ratio 5- Number of mosques 6- Number of public libraries
physical	7- Capacity public transport network 8- Number of parking 9- Suitable public passageways for disabilities 10- Improved shelter
health	11- Number of under- one month infants mortality 12-Vaccination coverage 13- Number of maternal mortality 14- Disability rates 15- Number of medical laboratories 16- Number of government hospitals 17- The number of radiology centers 18- Green space per capita 19- Air pollution 20- Dispersion of industries 21- Access to improved sanitation (Connection to sewage network to percent)
safety and security	22- Number of police stations 23- Number of fire stations 24- Divorce rate 25- Number of deaths from in-city accidents

5. Research Area

Th study area is the total area of Tabriz city. Tabriz is located in the northwest of Iran and is the center of East Azerbaijan province. Tabriz is the largest metropolitan city in the northwest of Iran with an area of 24498 hectares located at 46 degrees and 25 minutes east longitude 38 degrees and 2 minutes north latitude from Greenwich Meridian. The average height of this city is 1340 meters inside Tabriz plain. Tabriz has 10 districts and 38 urban areas.

6. Findings of the Research

In this research, to evaluate the urban areas of Tabriz in terms of quality of life spoke urban prosperity, has been used from 25 indicators in four categories: socioeconomic, physical, health, safety and security. The status of these indicators in urban areas is seen in Figures 1 to 25.

6.1. Indicators and Criteria of urban prosperity in the dimension of quality of life

Socio-economic indicators of quality of life: Socio-economic indicators of quality of life greatly dominate other indicators of urban quality of life. In this research, the components of Literacy rate, Net enrollment rate in higher education, unemployment rate, Old age dependency ratio, Number of mosques, and Number of public libraries has been considered as Socio-economic indicators of the quality of life.
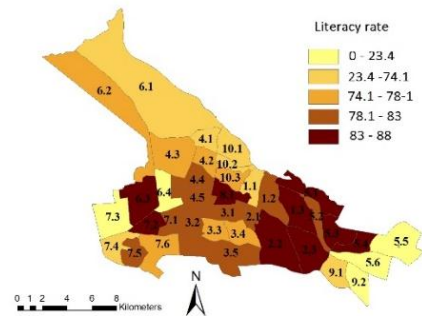
Fig. 1. Literacy rate in Urban Areas
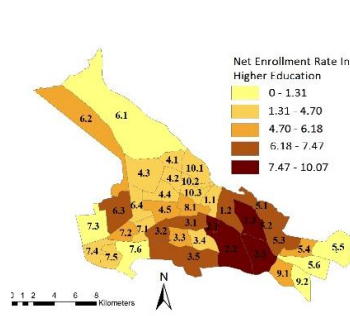
Fig. 2. Enrollment rate in Higher Education
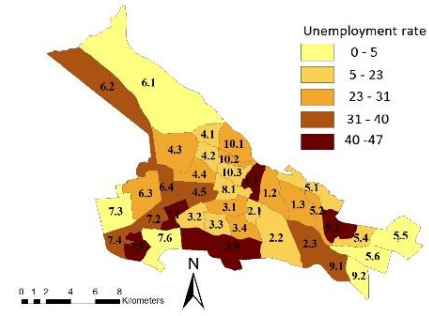
Fig. 3. Unemployment rate in urban areas
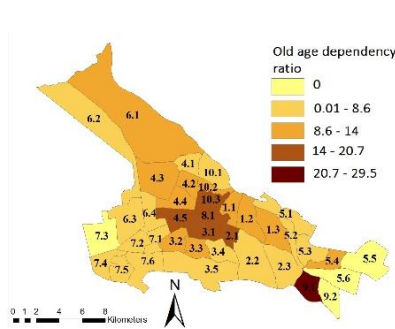
Fig. 4. Old Age dependency ratio
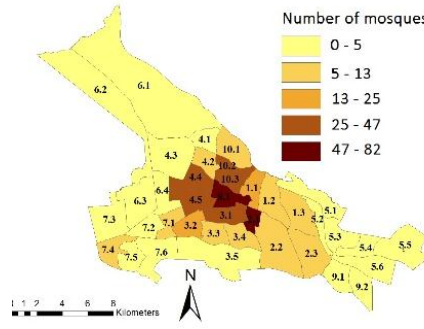
Fig. 5. Number of public libraries
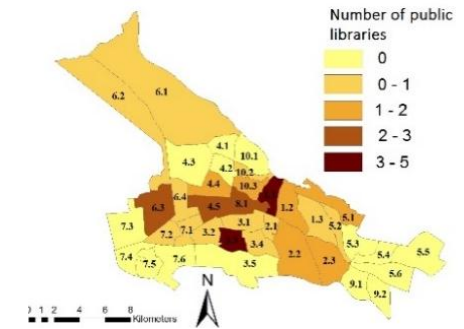
Fig. 6. Number of mosques

Physical indicators of quality of life: These indicators are strongly influenced by the environmental factors of the location of human beings. Leisure facilities and optimal leisure time, the efficiency of the public transportation system and the quality of housing are among the most important physical factors affecting the quality of life of individuals. In this study, the components of public transport capacity, Access to parking, Suitable public passageways for people with disabilities, and Improved Shelter have been considered as physical indicators of the quality of life.
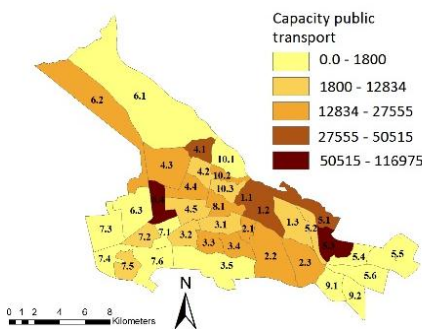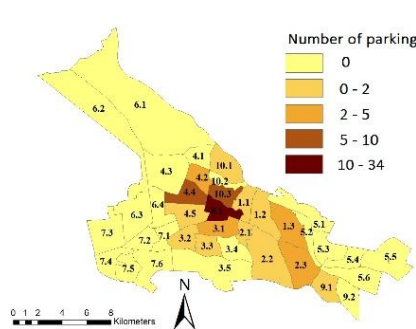

Fig. 7. Public transport capacity

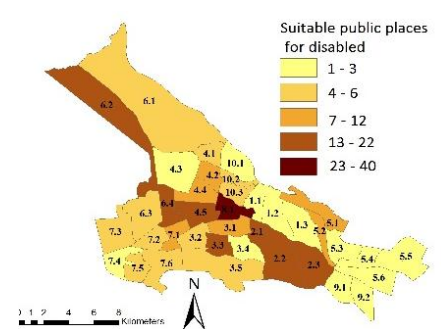Fig. 8. Suitable public passageways for people with disabilities
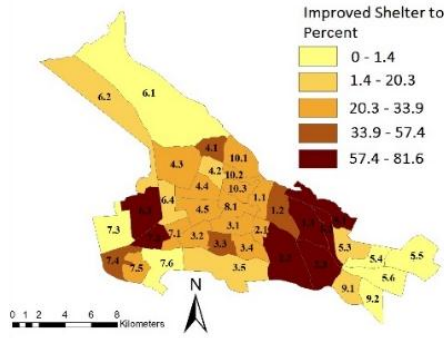

Fig. 9. Number of parking

Fig. 10. Improved shelter

Health and environmental indicators of quality of life: These indicators are the starting point for the study the concept of the quality of life in sanitary, environmental and psychological areas. The quality of life in the health and environmental areas is the result of planning and performance in other socio-economic, physical, and ... fields. In this study, Infant Mortality, vaccination coverage, maternal mortality, disability rates, medical laboratories, government hospitals, radiology centers, green space per capita, air pollution, industries, Access to improved sanitation (Connection to sewage network to percent) has been considered as health and environmental indicators of quality of life.
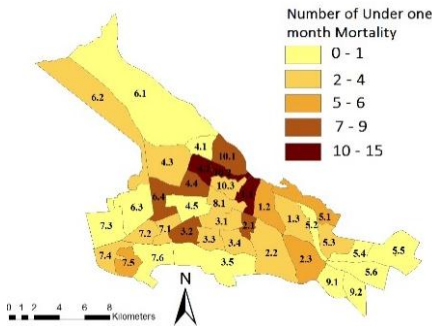

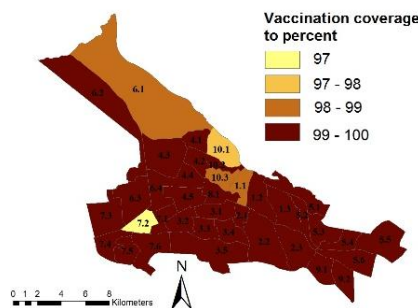Fig. 11. Number of under one month infant mortality
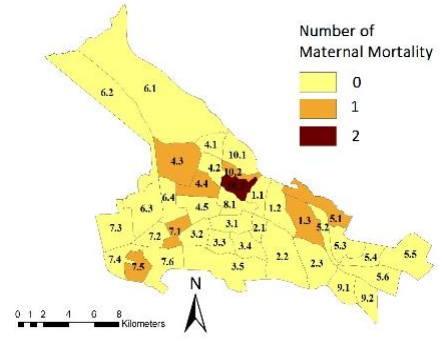

Fig.12. Vaccination coverage

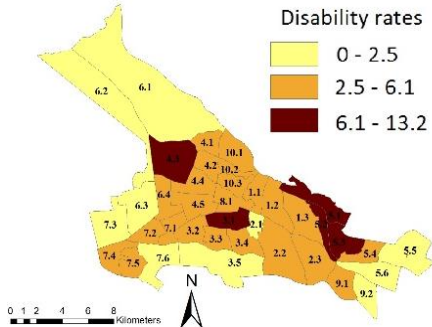Fig. 13. Number of maternal mortality
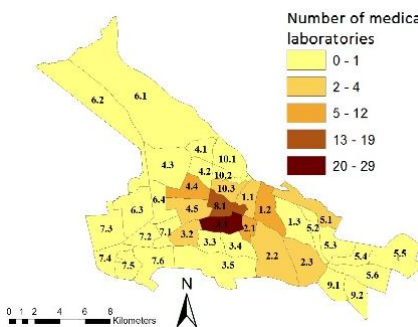

Fig. 14. Disability rates
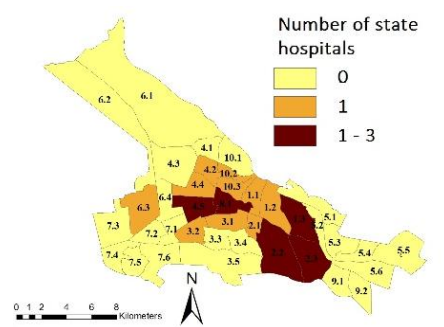

Fig. 15. Number of medical laboratories

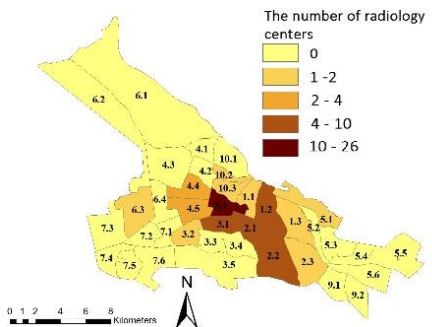Fig. 16. Number of government hospitals

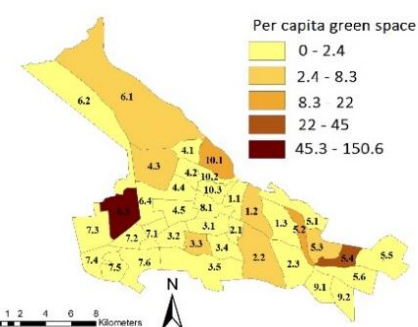Fig. 17. Number radiology centers
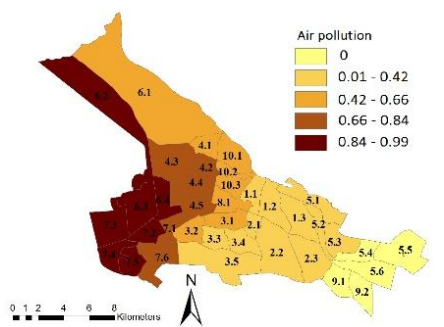

Fig. 18. Air pollution

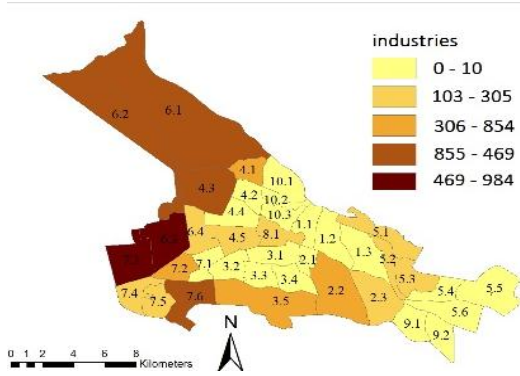

Fig. 19. Green space per capita
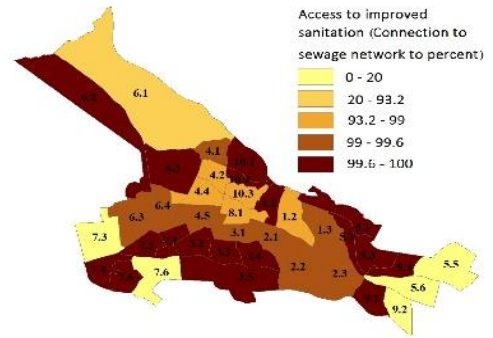
41

Fig. 20.: Dispersion of industries

Fig. 21. Improved sanitati

Safety and security Indicators of Quality of Life: Safety and security indicators are one of the indicators that are used globally for ranking the quality of life of cities. Several indicators are involved in urban security. In this research, based on the availability of statistics and

information, the components of the number of police stations, fire stations, divorce rates, and deaths from in-city accidents have been considered as indicators of safety and security of quality of life.
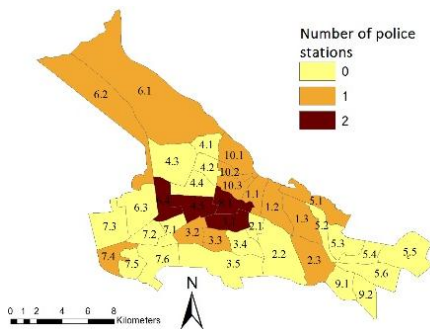
Fig. 22. Number of police stations
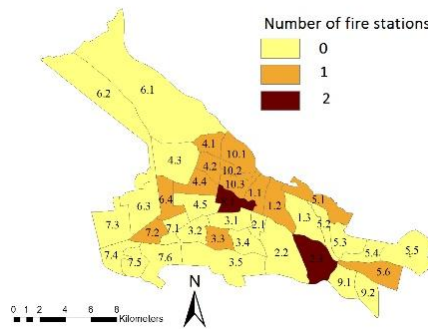
Fig. 23. Number of fire stations
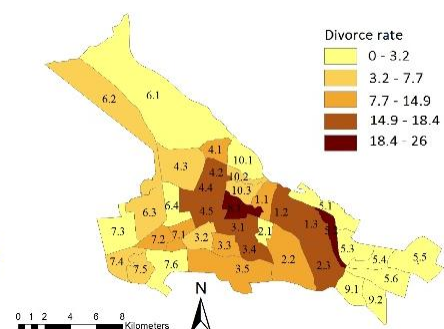
Fig. 24. Divorce rates
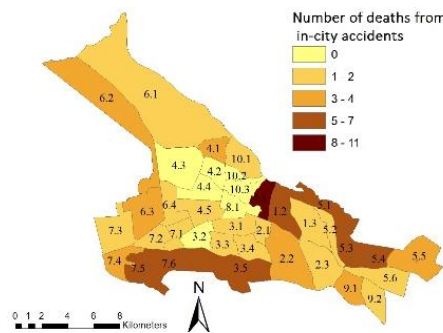
Fig. 25. Number of deaths from in-city accidents

6.2. Ranking of urban areas based on quality of life indicators associated with urban prosperity

In the ranking of quality of life in the urban areas of Tabriz Metropolis, 25 indicators were divided into four categories: socioeconomic, physical, health and

environmental, safety and security. The weight obtained from the AHP model for these criteria, the negativity or positivity criteria for calculation in the PROMETHEE model, has been given in Table 3.

Table 3
Problem structure, weight of Indicator, type of Indicator

Indicator		Sub - Indicator	Indicator Type	Indicator Weight
quality of life	Socioeconomic	Literacy rate	Positive	0/0381
		Net enrollment rate in higher education	Positive	0/0229
		Unemployment rate	Negative	0/0534
		Old age dependency ratio	Negative	0/0229
		Number of mosques	Positive	0/0229
		Number of public libraries	Positive	0/0381
	physical	Capacity public transport network	Positive	0/0687
		Number of parking	Positive	0/0381
		Suitable public passageways for disabilities	Positive	0/0534
		Improved shelter	Positive	0/0381
	health	Number of under- one month infants mortality	Negative	0/0534
		Vaccination coverage	Positive	0/0381
		Number of maternal mortality	Negative	0/0534
		Disability rates	Negative	0/0381
		Number of medical laboratories	Positive	0/0305
		Number of government hospitals	Positive	0/0534
		The number of radiology centers	Positive	0/0229
		Green space per capita	Positive	0/0610
		Air pollution	Negative	0/0534
		Dispersion of industries	Negative	0/0381
		Access to improved sanitation (Connection to sewage network to percent)	Positive	0/0381
	safety and security	Number of police stations	Positive	0/0229
		Number of fire stations	Positive	0/0381
		Divorce rate	Negative	0/0229
		Number of deaths from in-city accidents	Positive	0/0381

In the next step, for implementing the PROMETHEE model after creating the decision-making matrix and presenting the model based on equations from 3 to 6 and with the General function (as shown in Table. 2), the results of Table 4 were obtained.

Table 4
Ranking of urban areas based on the PROMETHEE model

| Ranking	Alternative	F	F+	F-	Ranking	Alternative	F	F+	F-
1	8.1	0.41630	0.65812	0.24182	20	5.4	-0.01966	0.36473	0.38439
2	2.3	0.38394	0.63318	0.24924	21	3.4	-0.02106	0.37631	0.39738
3	2.2	0.27380	0.55396	0.28016	22	10.1	-0.04518	0.38971	0.43490
4	3.3	0.25979	0.54118	0.28139	23	5.5	-0.05194	0.33633	0.38826
5	5.1	0.18269	0.52225	0.33956	24	10.2	-0.07943	0.39922	0.47865
6	1.2	0.17542	0.51478	0.33936	25	6.3	-0.08213	0.34020	0.42232
7	4.5	0.16517	0.50646	0.34128	26	7.2	-0.08811	0.34558	0.43369
8	2.1	0.15083	0.50588	0.35505	27	5.6	-0.09403	0.31321	0.40724
9	10.3	0.13415	0.51261	0.37846	28	6.1	-0.10037	0.33078	0.43115
10	3.1	0.10739	0.48168	0.37429	29	9.1	-0.11954	0.30364	0.42318
11	1.3	0.10487	0.48332	0.37845	30	9.2	-0.12150	0.28761	0.40911
12	4.4	0.10013	0.49117	0.39104	31	7.4	-0.13356	0.31933	0.45289
13	3.2	0.09525	0.47324	0.37799	32	7.1	-0.18367	0.32059	0.50426
14	5.2	0.05420	0.41611	0.36191	33	6.2	-0.18737	0.29368	0.48105
15	6.4	0.04659	0.45893	0.41234	34	4.3	-0.21503	0.29398	0.50902
16	1.1	0.03696	0.46256	0.42560	35	3.5	-0.22752	0.25708	0.48460
17	4.2	0.02922	0.45405	0.42483	36	7.6	-0.27243	0.22761	0.50005
18	5.3	0.00273	0.39264	0.38991	37	7.3	-0.30379	0.20203	0.50582
19	4.1	-0.00461	0.38774	0.39235	38	7.5	-0.36849	0.22076	0.58925
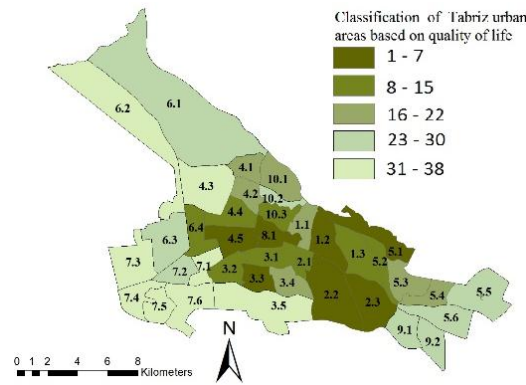
Fig. 26. Classification of Tabriz urban areas based
on quality of life indicators related to urban prosperity

Based on Figure 26, areas of 2-3, 2-2 and 3-3, by considering all the indicators of quality of life associated with urban prosperity, which were mentioned in this article, respectively, have been ranked from first to third among the 38-th areas of Tabriz city. Area of 2-3 in accordance with the Southern Valiasr, Golshahr, Parvaz, Eagle Goli neighborhoods; area of 2-2, in accordance with the Za'faraniyeh, Mirdamad, Raja'i Shahr, Eagle Goli, Sahand, Sari Zamin and area of 3-3, are also in accordance with neighborhoods of Taleghani and Imamieh. And areas of 7-6, 7-3, and 7-5 are in the last three ranks in terms of quality of life indicators associated with urban prosperity. These areas have been located in the southwest corner of the city. Area of 7-6 has a population of 30 people and the area of 7-3 has a population of 70 people, and industrial applications and factories such as Tracktorsazi, Motorsazan... are located in these areas. Obviously, these three areas have not been able to provide the necessary infrastructure for urban development and have low quality of life due to their lack of significant residential land ues and having industrial land ues and environmental issues. Area of 7-5 is also in accordance with the Andishe Township; due to its being located between two industrial areas and its adjacent to the cemetery and the absence of an urban sewage system ... Being in the last rank of quality of life is not beyond expectation.

7. Conclusions

The starting point of the human communities is to have a correct realization of human needs and to monitor the accomplishments of the development. Measurement of the quality of life offers a suitable implement for such realization because studying the quality of life is a pathway between the local officers and citizens as a constructive interaction that leads to the interpretation and discussion about the key impacting subjects on the lives of people.

From the obtained results of this study can be deduced that the neighborhoods of (Valiasr, Golshahr, Parvaz, Eagle Goli, Za'faraniyeh, Mirdamad, Raja'i Shahr, Eagle Goli, Sahand, Sarizamin, Taleghani and Imamieh) are among the regular chess texture which are generally related to external development (contemporary), and their

expansion has been accomplished through predetermined planning and designs. In these neighborhoods, a desirable system of relations between mass and space can be seen in new developments. And as seen in figures from 4 to 28, they are in a good position in terms of literacy ratio, urban infrastructure and access to public transportation.

But the areas that were in the last ranks in terms of quality of life are often on the outskirts of the city and include lands, but due to the extension of the legal area of the city are considered as part of it, but urban development has not yet spread and their blocking has no specific structure and are included the most industrial applications and are in inappropriate condition in terms of access to urban services and infrastructures.

By marking the areas of the city which have the higher rank and lower measures of living quality indexes, we can pay to the issues and shortcomings of those urban regions - by recognizing the indexes that are being used and the shortcomings of such indexes in different areas of Tabriz city - to eliminate such shortcomings with the use of specific programs. In the end, according to the findings of the research and in order to elevate the quality of life on the surveyed area of the research, the following recommendations can be helpful:

1. Development of facilities in a balanced way across the urban areas , especially in area of 7-5 in which the facilities and accommodations related to parking and public transport are not ideal.
2. Elevating the green spaces in areas of 7-6, 7-3, and 7-5. According to the low capitation of green spaces especially in areas of 7-6, 7-3 where there are industries and factories the expansion of urban green spaces and development of parks in the mentioned district seems mandatory.
3. Investment in order to construction of cultural centers in areas 7-5, which has a culturally significant gap with other urban areas.
4. Investment in order to enhance the health services in areas with low quality of life by constructionmedical laboratories of government hospitals to develop equitable access.

Finally, it should be noted that in order to avoid deepening the gap between areas, with appropriate

policies and planning between the level of prosperity of areas and access to services and resources, a reverse process should be adopted over time and gradually the spatial balance between areas and areas.

References

1) Ahadnejad, M. and Hazeri, S. and Meshkini, A. and Piri, I. (2018) 'dentifying the key factors influencing the urban prosperity with future study approach: the case study of Tabriz Metropolis', Urban Planning and Research, Year 9, Serial No. 32, Pages 41-56. (In Persian)

2) Ahadnejhad, M. and Yarigholi, V. and Norozi, M. (2016) 'Spatial Analysis of The Indexes of Life Quality Using a Multi-Criteria Decision Making Approach (A Case Study of Abhar Municipal Regions)', Space Ontology International Journal, 5 Issue 2 Spring 2016, 11 – 21 .

3) Asgharizadeh, E. and Nasrollahi, M. (2009). 'Ranking the Firms Based on Excellency Model Criteria – PROMETHEE Method', The Modares Journal of Management Research in Iran, 11(Issue 3 (Tome 52)), 59-84. (In Persian)

4) Bandarabad, A. and Ahmadinezhad, F. (2014) 'Assessment of quality of life with emphasis on the principles of habitable cities in the region 22 of Tehran', Journal of Research and Urban Planning, 5(16), 55-74. (In Persian)

5) Bonaiuto, M. and Fornara, F. and Ariccio, S., and Cancellieri, U. and Rahimi, L. (2015) 'Perceived Residential Environment Quality Indicators (PREQIs) relevance for UN-HABITAT City Prosperity Index (CPI)', Journal of Habitat International, pp:1-11.

6) Banias, G.and Achillas, C. and Vlachokostas, C. and Moussiopoulos, N. and Tarsenis, S. (2010) 'Assessing multiple criteria for the optimal location of a construction and demolition waste management facility', Building and Environment, 45(10), 2317-2326.

7) Deshmukh, S. C. (2013) 'Preference ranking organization method of enrichment evaluation (Promethee)', International Summit on Waste Water Technology for Green Economy May 6-7, 2013, 55.

8) Foo, T. (2000) 'Subjective assessment of urban quality of life in Singapore (1997-1998)', Habitat International, 24(1): 31-49.

9) Figueira, J. and Greco, S. and Ehrgott, M. (2005)' Multiple Criteria Decision Analysis: State of the art surveys', Springer eBook, ISBN: 0-387-23081-5. 1045 p.

10) Higgins, P. and Campanera, J. M. (2011) '(Sustainable) quality of life in English city locations', Cities, 28(4), 290-299.

11) Jackson, T. and Senker, P. (2011) 'Prosperity without growth: Economics for a finite planet', Energy & Environment, 22(7), 1013-1016.

12) Karim, R. and Ding, C. and Chi, C. H. (2011) 'An enhanced PROMETHEE model for QoS-based web service selection', In 2011 IEEE International Conference on Services Computing (pp. 536-543). IEEE.

13) Mohtashemi, N (2014) 'Formation of Outstanding Architecture Based on City Prosperity Index in Iran, Master's Thesis', Tarbiat Modares University, Faculty of Arts and Architecture, p. 47. (In Persian)

14) Morais, P. and Camanho, A. S. (2011) 'Evaluation of performance of European cities with the aim to promote quality of life improvements', Omega, 39(4), 398-409.

15) Moro, M. and Brereton, F. and Ferreira, S. and Clinch, J. P. (2008) 'Ranking quality of life using subjective well-being data. Ecological Economics', 65(3), 448-460.

16) Morais, P. and Camanho, A. S. (2011) 'Evaluation of performance of European cities with the aim to promote quality of life improvements', Omega, 39(4), 398-409.

17) Pal, A. K. and Kumar, U. C. (2005) 'Quality of Life concept for the evaluation of societal development of rural community in West Bangal', India. Asia-Pacific Journal of Rural Development, 15(2), 83-93.

18) Pacione, M. (2003) 'Introduction on urban environmental quality and human wellbeing.

19) Schyns, P. and Jeroen, B. (2004) 'Measuring quality of life in Amsredam from the viewpoint - of participation', The Amsterdam bureau for Research an statistics/ Social and Cultural Planning Office, pp 1-20.

20) Rezvani, M. R. and Mansourian, H. and Metcan, A. A. and Sattari. M. H. (2009) 'Development and Assessment of indicator of Urban Life Quality', Journal of Urban - Regional Studies and Research, 1(2), 87-110. (In Persian

21) Samadi Ahari, A. and Sattarzadeh, D. (2019). Evaluating Quality of Life in a Different Social Setting (Case Study: Magsudiyeh District, MollaZeynal District, and Roshdiyeh District in Tabriz, Iran), Space Ontology International Journal, Vol. 8, Issue 3, Summer2019, 41-51.

22) Sands, G. (2015) 'Measuring the prosperity of cities', Habitat International 45. 1-2

23) Saayyipour, M. and Maleki, S. and Hatami Nejad, H. and ModanlJouibari, M. (2017) 'Evaluation and Measurement of Urban Flourishing Components in Ahwaz Metropolis, Geography and Environmental Sustainability', No. 22. (In Persian)

24) Shamaei, A. and Azimi, A. and Farajimollaei, A. (2012) 'Analysis of differences in the quality of life indicators in Babolsar city neighborhoods geography Summer 2012, Volume 10 , Number 33;Page(s) 253 To 280. (In Persian)

25) Seik, F. T. (2000) 'Subjective assessment of urban quality of life in Singapore (1997–1998)', quality of life -49.

26) UN-HABITAT. (2012). State of the world's cities 2012/2013: Prosperity of cities.

27) Wong, C. (2015) 'A framework for 'City Prosperity Index': Linking indicators, analysis and policy', Habitat International, 45, 3-9.