Socio-Spatial studies, 3(5): 13-27 / winter 2019
DOI: https://dx.doi.org/10.22034/soc.2019.84448

Evaluating Space Justice in Urban Areas Case study: Quaternary areas of Shahriar

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Abstract

The purpose of this study was to evaluate the spatial justice in different dimensions (physical, social, economic, and environmental) in order to have balance regarding four regions of Shahriyar city. The spatial justice approach in a city is used for controlling and reducing the physical-spatial inequalities as well as a fair distribution of municipal services and facilities in different areas of the city. In this study, the spatial justice of four areas of Shahriyar city was evaluated with 13 criteria and 27 indicators. This study was carried out through exploratory-analytical research method that used two models of the analytic hierarchy and the shortest distance. Eventually, the final map of different access levels was drawn through combining fuzzy logic with these two models. The findings and obtained results through Topsis model indicated that area 1 of Shahriyar city had the highest rank in social, economic, physical, and environmental indicators. However, the area 3 had unfavorable economic and physical conditions, and area 2 had unfavorable environmental conditions. Having integrated Topsis and Fuzzy models, it was shown that areas 1 and 2 were considered as privileged regions and areas 3 and 4 were respectively determined as the semi-privileged and non-privileged regions. Moreover, the Analytic Hierarchy Process (AHP) method indicated that areas 1 and 4 had better conditions and areas 3 and 2 are respectively on the lower levels. Finally, after combining the results of fuzzy and AHP models, the final map was designed. It showed that the areas 1 and 4 were privileged regions; areas 3 and 4 were respectively the semi-privileged and underprivileged regions of the Shahriyar city. Generally, the results of this study indicated that the physical-spatial development of Shahriyar city was unbalanced and did not meet the conditions of equity-based city.

Keywords: Shahriyar city, Spatial justice, Urban areas, Evaluation, Quality of living environment

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Introduction

Geography is the science of spatial studies. From the 1960s, this science considered the spatial school and followed the spatial justice approach in order to determine the spatial inequity of an area (Shokoui, 2003, p. 189). David Harvey, a renowned professor at the University of New York, is a geoscientific theorist that wrote various books and articles on the development of modern geoscience knowledge; he presented the book "social justice and the city" as the important literature in this field. He necessitated the social justice in line with spatial justice, including the balanced distribution of population, activity and physical spaces, and the distribution of income and development opportunities in areas for all segments of the society (Shokouti, 1999, p. 141).

The quality of urban environment is multidimensional consisting of the physical, spatial, economic and social aspects of the urban area. In terms of complexity, it is not yet fully understood in practice, and can be evaluated from different perspectives, such as the city's physical design, infrastructure, economic impacts, governmental policy, public opinion and social considerations. Different components of the urban environment include nature, open spaces, infrastructure, human-made environments, physical environment facilities, and natural resources. In this regard, the main challenge is that there is no easy way to model and predict interactions between all of these aspects, and like most of the geographic phenomena and environmental processes, this concept depends on spatial and temporal levels. Studies conducted on the quality of living environment, have included parameters such as the percentage of built surfaces, open spaces, population density and households, road access, and environmental pollution (Rahman et al., 2011, p. 68).

Spatial justice means the equitable distribution of facilities and services and the existence of equal opportunities in the city and the countryside so that none of the existing areas would have superior condition compared to others in term of spatial advantages and development opportunities. Inequality of natural conditions should not be considered as a justification for the existence of spatial inequality. Rather, it is better to use the "priority" proposed principle in order to focus on nonprivileged/ deprived regions and less developed areas also, on a smaller scale in the urban neighborhoods. Thus, it is recommended to pay more attention to informal settlements and to consider distributive justice. The evaluation of spatial justice is a way to analyze the balanced development and, ultimately, sustainable urban development, which focuses on protecting natural, human, economic, and balanced resources for developing justice and equity. The evaluation of spatial justice is the best way to address these issues and reduce spatial inequalities in urban areas. Accurate and comprehensive knowledge and spatial-space analysis of the regions make it possible to achieve strategies that are appropriate and sustainable urbanization. Assessing spatial justice helps the authorities and planners to have better performance in allocating resources and facilities. According to Hafeznia, spatial is the relative equality of development indicators including economic, social, cultural, political, physical, health, and security of a region or country with corresponding developmental indicators (Hafeznia, 2009).

Eduard Soja, a well-known regional development and urban planning geographer, believes that injustice is the result of inappropriate political organizing which is inherently created through distributive inequality, which itself is the result of discriminatory decisions of people or social and economic institutions. According to him, the spatial justice in urban planning is a space that is an institutional and political dimension of human society. Additionally, the social justice in space results from an understanding of the interrelationships between space and social activity (Soja, 2010, p. 9). Due to the implementation of resource allocation and distribution policies in cities by urban planners, they, themselves, and their policies are the main sources of social justice enforcement in cities (Harvey & Talen, 1996, p. 22). Smith considers urban planning as a mechanism through which social justice and urban space are formed

(Hay, 1995: 501). Marion Jung has highlighted, in his social justice theory, the role of equal distribution of urban services and resources in achieving social justice in cities (Young, 1990, p. 37). According to Frosty, social deprivation in space may result in the social isolation and severe insecurity in citizens. He used the "urban insanity" term for spatial deprivation and considered it as a perfect example of spatial inequality (Soja, 2006, p. 2; Bromberg, 2007). John Rawls believed that social justice depends on social development and its constituent institutions. Social institutions can affect how people access the resources, and how the rules for determining the rights and privileges, and access to political power and capital accumulation are included. In many countries, the issue of inequity is considered a major challenge to development, especially for those countries that their territory includes vast geographical areas. These inequalities are seen as a serious threat toward the achievement of a balanced development of different areas, making it difficult to achieve national unity and integrity (Shankar and Shah, 2010). The rapid growth of population has created the beginning of a widespread urban development, and has brought a wide range of local-to-global changes in land usage. This issue has been to the point that the population of cities has increased, but services that could meet their diverse needs were not provided appropriately (Sohe Rana, 2009, p. 321). This has resulted in a shortage of facilities and infrastructures and has led different urban groups to have different accesses to these facilities (Hatami Nejad, 2008, p. 42). The dominance of capitalism on cities is one of the main factors of spatial inequality and inequality of urban facilities (Hilier, 2012, p. 1). Therefore, it can be said that spatial inequity and inequality in the distribution of services and resources in the city are one of the most important factors.

One of the most important challenges that cities of Iran are facing in the last decades is the unfair distribution of urban services that has resulted in citizen's social inequality when accessing these services (Hatami Nejad, 2008, p. 71). Since the formation of the capitalist system and development of capital polarization in cities, realities such as spatial inequity, poverty, and different physical reduction in cities such as diminution of people's access to urban utilities can be mentioned. Justice and equity in urban planning were created to confront these challenges and problems. Therefore, searching for justice or attempting to fight with inequity became one of the main purposes of urban planning (Fainstein, 2014, p. 1). According to Andrew Heywood's trilogy categorization, the equity theories are divided into three groups of "equality, social justice, and prosperity" (Hewood, 2009).

Usually, justice is defined as an exemplary and supernatural phenomenon, which is sometimes understood as a tangible and measurable form (Dadashpour et al., 2016). From pre-seals era to the contemporary era, this philosophical concept was at the center of many scholars attention, which sometimes was interpreted in the form of an exemplary and supernatural phenomenon and sometimes was understood as a tangible and measurable form. In recent years, scholars such as John Rawls and Martha Nussbaum have formulated major theories in the philosophy of justice. Various categories were introduced for justice theories including Andrew Heywood's trilogy, which divided the notions of justice into three groups of "equality, social justice, and prosperity" (Hewood, 2009). In all schools of thought and by all planners and policymakers, it was mentioned that considering spatial and space equity could create a fairer city. By the 1980s, however, some socialists focused on the justice and equity concepts. From the beginning of the 21st century, several important non-socialist theorists also commented on this issue (Rezvani et al., 2014). A city always faces with many challenges, including inequality and injustice. To address these challenges, concepts such as spatial justice was entered into urban planning concepts in order to reduce the existing inequalities (Dadashpoor et al., 2015, p. 182). Cities that are located around the metropolises are faced with many challenges, including inequality and injustice. In order to overcome these challenges,

concepts such as spatial justice were developed to reduce these existing inequalities. In Iran, due to global developments, the country's macro policies, and the slogan of "justice as the central axis of any kind of development," the concept of spatial justice, particularly in recent years, has gained so much attention in urban studies. However, searching for spatial justice requires the creation of coherent frameworks to be able to take action and understand the concepts. Moreover, different paradigms compete to conceive global justice (Marcus et al., 2012, p. 30).

Lack of adequate supervision over the development of urban areas and lack of efficient management, especially in developing societies, has led to the creation of social, economic, service, health inequity in cities (Sheikhi, 2003, p. 107). Shahriyar city is no exception, to the point that disparity and unbalancing can be seen in its distribution of population, as well as urban facilities and utilities. On the other hand, this city is faced with many environmental, health and physical problems including loss of green space, destruction of gardens and increases in residential density. Sustainable development in cities seeks to provide the best living conditions and appropriate relationships between different uses for urban residents. The basic measures of sustainable urban development include reducing poverty and inequality as well as relying on the principle of social justice and geographical equality (Hikmat Nia and Mousavi, 2006, p. 35). As stated above, the evaluation of the amount of spatial justice in the urban areas of Shahriyar was carried out through considering the different given area, based on the equity-oriented approach in order to create regional balance, determine regional differences, and reduce these differences and achieve sustainable urban development. In this study, the following variables were analyzed in order to evaluate the spatial justice of four areas of Shahriyar city: social (demographic, cultural and educational, health-therapeutic), physical (residential), urban facilities (infrastructure), street network (infrastructure), economic (employment status, unemployment status, occupational load), environmental (green space, water, waste disposal system).

Evaluating spatial justice is a way to study the development and ultimately sustainable urban development through focusing on protecting natural, human, economic, and balanced resources for the development and extension of justice. Evaluating spatial justice is the best way to address these issues and reduce spatial inequalities in urban areas. One of the appropriate methods for the development of a sustainable urban environment is to have accurate, comprehensive knowledge as well as conducting spatial analysis. The assessment of spatial justice is of a great importance to help during the allocation of resources and facilities for officials and planners. Hence, this study, firstly, investigated how the status of the variables and indicators on the assessment of spatial justice in four areas of Shahriar city were addressed, and then the privileged and less privileged regions were analyzed. The purpose of the present study was to evaluate the spatial justice and variables (physical, social, economic, environmental) in Shahriar city, as one of the cities around Tehran.

The main question of this study included "how are the spatial differences of urban services and the possibility of the development in the four areas of Shahriyar based on selected variables and indicators?". The purpose of this study was to achieve balanced urban development and, ultimately, sustainable urban development.

Literature review and theoretical framework

The theoretical approach of this study was the spatial justice that was formed within the framework of the space school in term of distribution of population, activity, and body which was under the influence of institutional activities in the society. According to Dixon and Ramathsindel, the spatial justice represents a fair and equitable treatment of all people in the development, implementation, and application of environmental rules, regardless of their race, skin color, nationality or income (Bass, 1998). Spatial justice implies that citizens should receive equal treatment regardless of where they live (Tsou, 2005, p. 425).

Since the formation of civilization, cities were faced with many challenges that most notable ones included facts such as social inequality, the polarization of poverty, and the physical form of these problems, such as unequal access to growth and development opportunities. The debate of spatial justice was inserted into urban planning to confront these challenges to the point that searching for justice or fighting with injustice became the main goals of urban planning. In this regard, it was possible to decide the history of justice and equity in urban topics through three general periods. The first period included the pre-Plato period to contemporary years. In this period, the justice and equity have always been a major issue among political scientists (Fainstein, 2014, p.1). The following contemporary theorists introduced the prevailing planning traditions in the first world (America, Britain, France), described the relationship between justice, accountability, and the city, and focused on applying these concepts as a city planning system. During the third period including the 1990s onwards, the urban scholars openly began to consider the issue of justice or equity in their works. Also, during this period, the idea of spatial justice was explicitly introduced by urban planners (such as Amin, 2006; Friedmann & Harvey, 1992, 2000; Merrifield & Swyngedouw, 1996). Spatial justice was a multidimensional and complex concept and at the same time it was considered as an emerging and interdisciplinary concept that has been developed and studied in various forms in different science fields, such as urban planning, architecture, sociology, geography. Justice had a spatial dimension and was used to identify injustices in the city (Dadashpour et al., 2015, p. 78). In other words, spatial justice was a fair and democratic distribution of social interests and responsibilities in a variety of scales. Spatial justice acknowledged the fact that space was socially produced and the created space formed the social relations and reinforced the concept of social justice. Spatial justice vould be seen both as a product and a process (Dufaux et al., 2009; Fainstein, 2014).

Development of public participation in the design, implementation, monitoring, and control of urban plans is a way to realize social justice in the city. The most important priority of public-private partnership plans is to ensure that all sectors of society, including poor people and ethnic minorities, have access to basic services. This aspect of social justice should be considered in all stages of designing public-private partnerships, particularly in capital financing period. Although a group of researchers believed that housing is an effective method in achieving social justice and contributes to the achievement of social justice, it should be reminded that it is affected by the extent to which social justice is realized. In a rentier society and economy, unequal distribution of power, wealth and income is a major obstacle to the realization of social justice. The theory of justice-centered and equitable city was mainly fostered by Susan S. Fainstein. She believed that achieving a justice-centered city is an appropriate urban goal (Fainstein 1997, 1999, 2000, 2009). She declared that the recent trend of emphasis on democratic processes both in political philosophy and in planning, was the key concept to achieve justice. She believed that open communication is highly ideal that neglects the content of the discussion [justice].

Conducted research	Theorist	Theoretical principles
The book of "The City and Social Justice" and other articles	David Harvey	(a) The distribution of income must be in such a way that the needs of each region's population are met; (b) the allocation Resources must be in such a way that the inter-regional coefficients become maximized; (c), the allocation of additional resources should be in a way that addresses the specific problems arising from the social and physical environment. Different mechanisms (institutional, organizational, political and economic) should be implanted in a way that can improve the prospects of life in the most deprived areas.

The justice-centered city	Susan Fainstein	Principles of justice-centered cities include democracy and diversity and housing for low-income households. Economic development plans must prioritize the interests of workers and employees and, as far as possible, small businesses. Large projects should have direct benefits for people with lower incomes in terms of job creation, increasing public welfare and providing minimum wages. Fares and payments for public transport should be reduced; zoning rules should not be used for discriminatory purposes, public spaces should be developed, multi-usage of land be available, people's participation should also be developed.

Table 1: Spatial justice theories

Despite high attention given to the issue of spatial justice of urban area in developed countries, in Iran, few studies have been conducted in this field, and most of these existing studies have considered the economic aspect of this concept (Tsou et al., 2005, p. 424). The analysis of the interaction between space and society can help to understand social inequalities and how to regulate planning policies to reduce or solve inappropriate distribution (Dufaux, 2008, p. 2). From the 1980s, as a distributive justice, social justice was able to attract the attention of some scholars (Corubolo, 1998, p.18; Tsou, 2005, p.450; Talen,2002, p.168). Payeri believed that spatial justice has emerged from the combination of social justice and distributive justice (Prange, 2009, p. 22). Spatial justice depends on other forms of social, economic, and environmental justice. Additionally, since space is a common element in all forms of justices that connect them together, it can act as the center of various concepts of justice (Cardoso, 2007, p. 384). Roberts emphasized that spatial justice is a triple set of economic, social, and environmental concepts that attribute to sustainable development (Greer, 2003). Travell believes that spatial justice is social justice. He has mentioned that environmental justice is an inseparable element of social justice (Cardoso, 2007, p. 390; Brown and et al., 2007, p. 27). In general, the spatial justice provides a capacity for justice movements through emphasizing on the social, economic, and environmental aspects of the community. Thus, policymakers and planners should follow these concepts to create fair and sustainable societies (Dadashpour et al., 2012, p. 26). The thought of a just and righteous city has emerged from the combination of different philosophical debates on justice, the historical thoughts of utopia, and the ideal city (Dataspour et al., 2012, p. 45).

Tsu et al. (2005), in his study in a city of Taiwan, attempted to provide an integrated index of spatial justice. They considered three characteristics for distribution of services: 1) the rate of provided services and the amount facilities` negative impact; 2) the different impact of various services on citizens; and 3) the different quality of similar facilities. The findings of their study indicated that the distribution of urban public services in that city was not fair.

Rafian et al. (2012) in a study entitled "Spatial Analysis of Tehran regarding its divided urban areas" used a descriptive-analytical method. They found out that Tehran metropolis had no physical-social unity. Moreover, spatial heterogeneity between its northern and southern regions was still the main spatial structure of the Tehran metropolis.

Rezvani et al. (2014) in their study with the title of "justice-centered urban planning" provided a leading urban planning approach that aimed to identify the evolution of the justice concept in urban planning theories (with emphasis on the theories presented in the twenty-first century). The results of this study indicated that justice-centered urban planning had the highest commonality with spatial justice, economic justice, and cultural justice. The impact of justice and judicial justice on justice-centered urban planning was achieved through these three areas.

Hafezia Nia et al. (2015) in their research with the title of "designing a model for evaluating spatial jus-

tice, case study: Iran" used an applied-development approach to design an operational model for evaluation of spatial justice in Iran. The results of their study indicated that it was possible to measure and evaluate the spatial justice through considering the positive and negative role of the eight factors and their related indicators through a computer software called spatial justice.

Research methodology

The method of this study was exploratory-analytical, following a functional purpose. The data was collected through documentary and library sources. The required information was collected from municipal department of Shahriar Municipality, Statistics Center of Iran, population and housing census that was carried out in 2011, using the information of the comprehensive and detailed plan of Shahriyar. According to the economic, social, environmental and physical dimensions of sustainable development, 27 indicators have been selected in the form of 13 main criteria. Two models of AHP and Topsis have been used for analyzing the information. First, the entropy method was used in Topsis model for weighing and standardizing the weights and integrating the scales. Afterward, the best option was determined as an optimal solution. Then the AHP method was used for extracting the weight of each criterion, sub-criteria and options. Accordingly, the final score was obtained for each area, and then the inconsistency coefficient was obtained which should be less than 0.1. Next, the Fuzzy logic model was used for verifying the validity of the models and determining the privilege level of Shahriyar city. Then, by integrating this model with the AHP and Topsis models, the different areas and areas of Shahriyar city were ranked according to their level of development. Having used Arc Gis, the final map of privilege level, including privileged, semi-privileged and non-privileged, was designed.

Introducing research variables and indicators

Dimensions	Criteria	Indicator	Dimensions	Criteria	Indicators
Social	Demographic	Pure Density (Residential) Family size Area growth rate	Economic	Employment status	The percentage of overall activity rates The percentage of men's activity rate The percentage of women's activity rate
	Cultural and educational	Total literacy rate Educational per capita Cultural and religious per capita Women's Literacy Rates		Unemployment status	The percentage of total unemployment The percentage of men's unemployment rate The percentage of women's unemployment rate
	Health & treatment	The user's health- treatment per capita		Dependency ratio	Dependency ratio rate

Physical	Residential use	urban services per capita Percentage of urban infrastructure facilities and equipment	Environmental	Water	water consumption per capita
	Municipal facilities and equipment			Sewage disposal system	Percentage of sewage disposal system usage through absorbent well
	Street network			Garbage	Waste production per capita

Table 2: The research variables and indicators

The area of the study

Shahriyar city has a total area of 320 km2, which its capital is Shahriyar. This city is located in an alluvial plain, at the west of Tehran, with 16 km distance from Tehran and 18 km distance from the south of Karaj. The north and west of this city are limited to Karaj city, from the east is limited to Tehran and Islamshahr cities, from the south is limited to the Robert Karim and Zarand Saveh cities, and from the southwest is limited to the Mallard city. The current total population of this city is 641,000 consisting of cities (including 6 phases), Shahriar, Baghestan, Ferdowsi, Vahidieh, Saba Shahr, Shahed Shahr, along with six rural areas and 36 villages (Shahriar Master Plan, 2011, p. 14). Shahriyar is the center of Shahriyar province, which has four areas including Shahriar, Andisheh, Amiriyah, and Vaayein. In the master plan, the total area of this city was documented around 3131 hectares, and its population is 256730 people (Population and Housing Census, 2011).

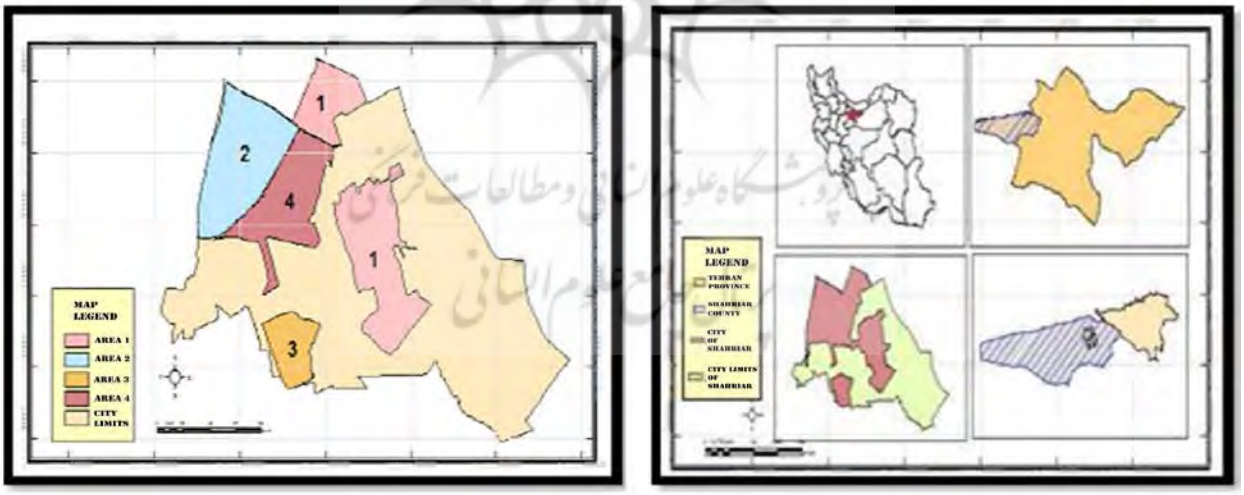

Figure 1: Political situation, political divisions, and zoning of Shahriar city

Results

Introduction of multi-criteria decision-making methods` (MCDM[1]) model: MCDM contain a set of techniques that allow a range of criteria related to a topic to be weighted and then ranked by experts. Multi-criteria decision making is selecting the best option through considering various criteria. It should be noted that during the selection of the best option, more than one criterion is involved. Furthermore, these criteria can be quantitative or qualitative, and positive or

1.Multi Objective Criteria Decision Making

negative (Mozayeni & Abdoos, 2005, p. 743). These models have high potential in reducing the cost and time as well as increasing the accuracy of the decision-making process, but these techniques do not have a spatial dimension. Hence, a GIS-based analytic framework is essential in this process, which enables researchers to use the GIS capabilities in data acquisition, storage, retrieval, processing and analysis along with multi-criteria decision-making models` based technical capabilities. Generally, MCDM and GIS methods can use each other's advantages and capabilities (Malchovsky, 2006, p. 153).

Findings and calculating variables using Topsis method: In this model, first, selected economic, social, physical and environmental indicators were determined according to divided regions and then, entropy method was used for standardization and weighing. Afterward, the MCDM Engine software was used for achieving the ideal solution and ranking the city areas in terms of the degree of development. All the calculations were carried out through entering the data into this software. After investigating the four areas of Shahriar city, and by considering the city's situation and features, and the amount of access to the available information, eight social indicators were selected, which are presented in Table 3 based on their regions.

Social indicators								
Indicator / Areas	Net residential density (per hectare)	Household size (n)	Population growth rate (In percent)	Total literacy rate (In percent)	Educational per capita (m²)	cultural-religious per capita (m²)	Health-treatment usage per capita (m²)	Women's Literacy Rates (Percentage)
area 1	350	3.2	3.1	93	3.6	3	2.5	90.8
area 2	346	3.5	3.2	96.1	1	1.3	1.1	93.7
area 3	509	3.6	3.1	81.8	0.5	0.5	0.8	76.5
area 4	341	3.3	3.1	93	0.8	0.2	1.1	89.5
Source: Population and Housing Census, 2011								

Table 3: Investigating the four areas in Shahriar city

According to Table 3 and the calculations performed in Topsis software, it is clear that area 1 having the score of 0.99% was more developed than other areas of the city in term of social indicators and area 4 having the score of 0.63% had more unfavorable conditions compared to other areas.

Investigation of social indicators in four areas of Shahriar city: According to the economic indicators that were explored in this study (Table 4), the area 1 having the score of 0.99% was the most developed area in terms of economic indicators, and the area 3 having the score of 0.001% had very unfavorable conditions compared to other areas.

economic indicators							
Indicator / region	Total activity rate	Total unemployment rate	Dependency ratio	Men's activity rate	Women's activity rate	Men's unemployment rate	Women's unemployment rate
Area1	39.9	8.1	3.2	67.5	11	7.1	14.4
Area2	39.9	8.7	3.3	68.9	9.2	8	13.8
Area3	37.9	8	3.4	69.1	3.9	7.4	19.6
Area4	-	-	-	-	-	-	-
Source: Detailed Plan of Shahriar City, 2013							

Table 4: Investigation of economic indicators in four areas of Shahriar city

Investigation of physical indicators in four areas of Shahriyar city: According to Table 5, the seven physical-infrastructural indicators were calculated in the software using the topics method (Table 5). According to the results, the area 1 having a score of 0.66% had the best condition and area 3 having a score of 0.007% had the most unfavorable condition.

physical indicators							
Indicator region	residential usage per capita (m²)	Percentage of durable housing (concrete and metal)	The percentage of worn and old houses 2006-2016	The percentage of the loan paid for housing renewal	urban services per capita (m²)	equipment and facilities per capita (m²)	Street network (percentage)
Area1	28.9	71	75.5	35.4	29	2.7	34.4
Area2	28.9	100	95	41.7	18.5	1.8	21.5
Area3	19.6	65	55	2.9	22	0.4	22.7
Area4	29.3	100	100	20.6	19.4	1.4	26.9

Table 5: Investigation of physical indicators in four areas of Shahriyar city

Investigation of the environmental indicators in the four areas of Shahriyar city: As it was shown in table 6, the five environmental indicators were investigated based on given urban regions. The results of measurement conducted based on Topsis method indicated that area 1 having the score of 0.63% was in the first place and had the best condition in term of environmental indicators, and the area 2 having the score of 0.14 was in the last place and had the most disadvantageous conditions, and particularly faced with the lack of green area.

environmental indicators					
Indicator region	Green space per capita (m²)	The amount of consumed water	waste production per capita (kg)	Percentage of sewage disposal system (absorbent well)	The Number of parks
Area1	1.7	9029570	2.2	97	33
Area2	0.76	8140110	2.4	100	7
Area3	2.75	3058076	0.65	53	6
Area4	1.4	2900890	0.53	100	2

Table 6: Investigation of the environmental indicators in the four areas of Shahriyar city

Results and calculations of Fuzzy-Topsis integrated model: Based on the calculations and scores obtained by MCDM Engine software in the Topsis method, and according to the final score of each indicator in each area that was obtained separately based on Fuzzy Overlay in the Arc Gis software, it was possible to design the privilege level map of different areas. According to the findings, the area 1 and 2 were considered privileged areas; area 4 was semi-privileged area and area 3 was identified as the non-privileged area, which was shown in Figure 2.
Results and calculation of variables with AHP

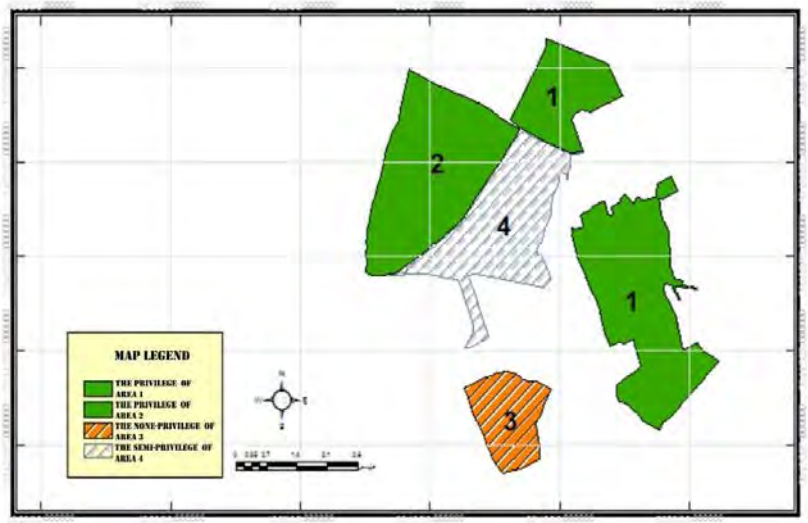

Figure 2: The privilege level of different areas of the city based on an integrated model (Fuzzy-Topsis)

Model: In the first step, the paired comparison matrix was created in the Expert Choice software in order to determine the importance and priority of sub-criteria and criteria of this concept. Next, the final weight of each criterion and sub-criteria was obtained. Afterward, the pairwise comparison was conducted for the options, and the final weight of each option was calculated. Finally, the incompatibility coefficient of 0.07 was obtained for the final score of the options and the incompatibility coefficient of 0.04 was obtained for criteria (Table 7).

AHP measurement indicated that area 1 having the final score of 0.298 was the most privileged region of the city and the area 4 having the final score of

Regions / Indicators	Area 1	Area 2	Area 3	Area 4	The whole Shahriyar city
Economic indicators	0.273	0.205	0.222	0.300	0.337
Total activity rate	0.286	0.143	0.286	0.286	0.048
Total unemployment rate	0.286	0.286	0.143	0.286	0.169
Dependency ratio	0.326	0.124	0.194	0.356	0.031
Men's activity rate	0.245	0.245	0.334	0.167	0.068
Women's activity rate	0.364	0.052	0.208	0.377	0.039
Men's unemployment rate	0.281	0.239	0.140	0.340	0.471
Women's unemployment rate	0.212	0.087	0.467	0.234	0.174
Social indicators	0.222	0.099	0.284	0.395	0.263
residential density	0.508	0.041	0.263	0.183	0.094
Household size	0.277	0.095	0.160	0.467	0.022
Population growth rate	0.286	0.286	0.143	0.286	0.093
Total literacy rate	0.209	0.067	0.514	0.209	0.156
Educational per capita	0.081	0.110	0.175	0.634	0.139
cultural per capita	0.088	0.093	0.265	0.553	0.087
Health per capita	0.227	0.80	0.207	0.486	0.300
Women's Literacy Rates	0.263	0.104	0.288	0.238	0.109
physical indicators	0.263	0.104	0.288	0.345	0.126
residential usage per capita	0.436	0.052	0.256	0.256	0.087

Percentage of durable housing	0.411	0.067	0.411	0.113	0.197
The percentage of worn and old houses	0.429	0.049	0.429	0.093	0.082
The percentage of loan payment	0.160	0.044	0.509	0.187	0.069
Urban services per capita	0.136	0.232	0.136	0.495	0.244
equipment and facilities per capita	0.183	0.053	0.283	0.482	0.252
Street network	0.263	0.141	0.141	0.455	0.068
environmental indicators	0.185	0.319	0.166	0.180	0.273
Green space per capita	0.207	0.415	0.107	0.293	0.247
The amount of consumed water	0.406	0.406	0.115	0.073	0.264
Waste production per capita	0.400	0.400	0.100	0.100	0.241
Percentage of sewage disposal system	0.370	0.047	0.370	0.214	0.222
The Number of parks	0.109	0.093	0.133	0.665	0.025

Table 7: The weight of criteria and sub-criteria based on the given regions

0.275 and area 2 having the final score of 0.232 respectively were ranked after the area 1. The last one was area 3 having the final score of 0.196, which was in the lowest level of development and was considered the most deprived area of the city. Also, the level of accessibility (privileged level) of four areas of Shahriyar city was investigated separately in AHP method in term of economic, social, environmental and physical indicators, the obtained results of which are shown in table 8.

Results and calculation of variables with Fuzzy-AHP integrated method: Based on the selected indicators in the ArcGIS software environment, the final score in AHP method, and usage of Fuzzy technique at three levels, the final map of the development of Shahriar city areas was designed in three levels of privileged, semi-privileged, and non-privileged. Thus, the areas 1 and 4 were more privileged regions, area 2 was a semi-privileged region, and area 3 was a non-privileged region. This final map indicates the existing unbalancement between these four areas.

Indicator / Region	economic		social		physical		environmental	
	Final score	rank	Final score	rank	Final score	rank	Final score	rank
Area1	0.300	1	0.395	1	0.345	1	0.180	3
Area2	0.222	3	0.284	2	0.288	2	0.166	4
Area3	0.205	4	0.099	4	0.104	4	0.319	1
Area4	0.273	2	0.222	3	0.263	3	0.185	2

Table 8: Ranking the city areas according to the final score of the indicators

Conclusion and Suggestions

According to the main question and objectives of this research, the levels of urban space development of Shahriyar city and the level of development of the four areas of Shahriyar city were identified based on 27 selected indicators in term of social, economic, physical and environmental criteria. The least developed region of the city was the area 3 (Amiriyah) and area 1, most developed urban region. As a result, according to the methods used for leveling the areas of Shahriyar, it was determined that areas 1 and 4 were privileged areas and had a more favorable situation in term of the development

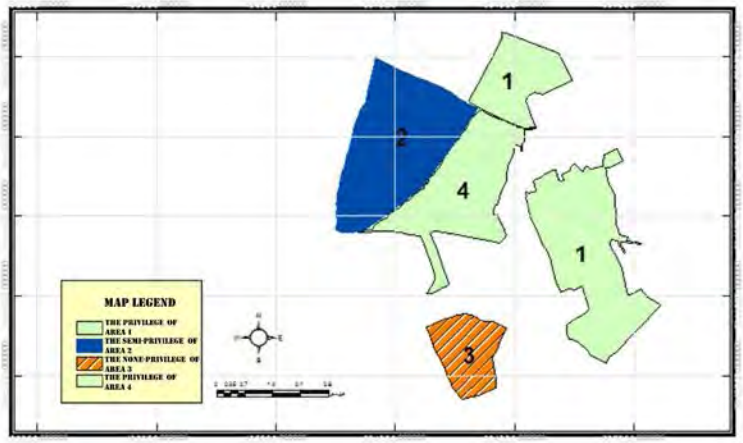

Figure 3: Accessibility or privilege level of different areas of Shahriar city in term of development indicators based on the AHP model

level. The area 2 was semi-privileged and area 3 was more deprived than other areas of the Shahriyar city. Area 1, containing the main core and the central part of the city, was in better condition in comparison to other areas. However, this area had some problems regarding some of the indicators; for example, in terms of the environmental indicator, this area faced with the lack of urban green space. Compared to area 2, the areas 3 and 4 had a better condition in term of the environment indicator, such as agricultural land. The area 3 was the most deprived and non- privileged region in term of economic, social and physical indicators. Area 2 had the poor condition in term of environmental indicator, particularly in terms of water consumption per capita and green space per capita, but had better conditions in terms of physical and social indicators. Area 4 had better conditions in term of environmental, physical, and economic indicators, but had a poor condition in term of social indicator. According to the investigation, the Shahriar city had a low level of required standards and developmental indicators. Therefore, in the future urban planning and management, much more attention should be dedicated to the improvement of social, physical and environmental indicators. Moreover, the existence of the appropriate level of development in some areas of the city did not indicate the desired situation. Rather, it only distinguished the location of these areas in relation to other areas of the same city. According to the approach of spatial justice and sustainable development, the urban managers and other city managers should consider the integrated management strategies as a proper approach for urban development of city areas, in order to reduce the social and spatial inequalities and improve the performance of urban areas of Shahriyar city. This development should be accompanied by reducing the inequalities and contradictions, supporting urban identity and creating employment and self-sufficiency of deprived communities, and protecting the urban environment and extending urban service spaces. In order to create the economical balancing of the city, it is recommended that areas 3 and 2 gain the highest priority in economic, industrial and agricultural programs and investments, especially in the field of downstream industries and the conversion of agricultural products. Area 1 of Shahriyar city had a favorable condition in term of cultural and educational indicators. However, areas 3 and 4 were marginal and deprived regions and did not have desirable educational facilities. Therefore, they had a lower level of cultural development. Since area 4 was considered a newly constructed area, it did not have a proper condition in term of cultural and educational indicators. Therefore, during investment and development of educational and cultural centers, such as the development and renovation of schools and the establishment of cultural centers and libraries, this area should have the priority over other areas. According to the necessity of physical development

and its expansion in the city and the right of all people to access these indicators, especially their right toward o durable housing, facilities, and services, results showed that area 3 was a marginal region that did not have a favorable condition. Therefore, during investment and development of infrastructure and residential needs, this area should have the highest priority. Furthermore, area 4 had the second highest development priority. Other areas had almost identical conditions. The central part of the city having an old context in terms of physical and infrastructure indicators should be considered. Moreover, required investments should be carried out in this area in order to modernize and renovate this part of the city. To do this, it is possible to use people's contributions and local people's partnership. Area 2 had a poor status due to its population density and according to the obtained rank in the analyzes in terms of environmental indicators, including the waste production per capita. Thus, it should be prioritized when investing for development and the expansion of the park, urban green spaces, and promenade. Area 3 had many problems due to the lack of a sanitary waste disposal system and inadequate facilities such as absorption wells. Therefore, the development of the sewage network should be considered for this area.

In applied geographic and urban planning studies, spatial justice seeks the appropriate distribution of population, activity and physical spaces formed in geographical environments. Spatial justice in the scale of Iran's urban areas and districts has caused disorientation in the level of residents` social welfare of urban neighborhoods. This research has been conducted in the field of spatial justice to evaluate urban planning and urban development in the four areas of Shahriar city. Avoiding inappropriate and non-indigenous urban policies was essential for realizing spatial justice and sustainable development in cities. Spatial justice is realized through comprehensive laws and policies governing the urban system as well as the participation of citizens in each district and urban area. Most of the urban planning theories in Iran have focused on the planning processes and neglected spatial and social structures of cities. Such views have led to the abandonment and emptiness of the urban spaces in Iran. Therefore, attention to content planning, with emphasis on spatial justice, is very important.

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HOW TO CITE THIS ARTICLE

Shamaei,A. & Hajilou,M. & Darvish,AP .(2019). Evaluating Space Justice in Urban Areas, Case study: Quaternary areas of Shahriar. Socio-Spatial studies, 3(5): 13-27

DOI: https://dx.doi.org/10.22034/soc.2019.84448

URL: http://soc.gpmsh.ac.ir/article_84448.html