

# TeMA

Journal of  
Land Use, Mobility and Environment

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SOCIO-ECONOMIC CHANGES IN ADVANCED SOCIETIES

## SOCIO-ECONOMIC CHANGES IN ADVANCED SOCIETIES

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**Editorial correspondence**

Laboratory of Land Use Mobility and Environment  
DICEA - Department of Civil, Architectural and Environmental Engineering  
University of Naples "Federico II"  
Piazzale Tecchio, 80  
80125 Naples  
web: [www.tema.unina.it](http://www.tema.unina.it)  
e-mail: [redazione.tema@unina.it](mailto:redazione.tema@unina.it)

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## THE DISTRIBUTION OF PUBLIC SERVICES FROM THE PERSPECTIVE OF SPATIAL EQUALITY

NADER ZALI<sup>a</sup>, MOHAMMAD RAHIMPOOR<sup>b</sup>, SAEID SAED BENAB<sup>c</sup>,  
MEHRNAZ MOLAVI<sup>d</sup>, SABER MOHAMMADPOUR<sup>e</sup>

<sup>a, d, e</sup> Department of Urban Planning, University of Guilan  
e-mail: <sup>a</sup>nzali@guilan.ac.ir, <sup>d</sup>molavi@guilan.ac.ir, <sup>e</sup>s.mohammadpour@guilan.ac.ir

<sup>b, c</sup> Payam Noor University of Tabriz  
e-mail: <sup>c</sup>mohammad\_urbanism@yahoo.com, <sup>d</sup>shahrsaz9072@gmail.com

### ABSTRACT

One of the most prominent consequences of rapid urbanization has recently been the disintegrated distribution of municipal services which predisposes inequality in citizens' benefiting from these services. Therefore, the city planners and managers' main goal must be to achieve the ideal of 'equality of opportunities' to help different groups of urban population have access to public services and eliminate conflicts in the provision of opportunities. In the present descriptive-analytical study, after specifying the indicators, ten regions of Tabriz are ranked in terms of the distribution of municipal services using three different methods (per capita land use, accessibility and residents' idea) and action priorities are presented for each region. The results of this study show that Tabriz has an inappropriate spatial distribution of public services and the population is incompatible with the distribution of services. Region 8 is in a good condition compared to the other while region 7 and 9 has a poor distribution of public services.

### KEYWORDS:

Spatial equality; Distribution of services; Accessibility; Per capita land use; Residents' ideas; Tabriz

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## 可持续空间平等角度看待伊朗大不里士市的公共服务分配问题

NADER ZALI<sup>a</sup>, MOHAMMAD RAHIMPOOR<sup>b</sup>, SAEID SAED BENAB<sup>c</sup>,  
MEHRNAZ MOLAVI<sup>d</sup>, SABER MOHAMMADPOUR<sup>e</sup>

<sup>a, d, e</sup> Department of Urban Planning, University of Guilan  
e-mail: <sup>a</sup>nzali@guilan.ac.ir, <sup>d</sup>molavi@guilan.ac.ir, <sup>e</sup>s.mohammadpour@guilan.ac.ir

<sup>b, c</sup> Payam Noor University of Tabriz  
e-mail: <sup>c</sup>mohammad\_urbanism@yahoo.com, <sup>d</sup>shahrsaz9072@gmail.com

### 摘要

近期，快速城市化的突出结果之一就是逐渐分解了容易导致市民享受公共服务利益不平等的市政服务分布。因此，城市规划者和管理者的主要目标应该是实现理想化的“机会平等”，让城市不同群体有机会享受公共服务，消减因机会分配导致的矛盾纠纷。本文采用描述分析方法，首先明确规定指标，然后使用三种不同方法（按人头算、按可达性和居民意见）以十个为单位划分大不里士行政区，并为每个区域指出优先行动。研究结果显示大不里士公共服务空间分布不合理，人口密集度与公共服务的分配并不相配。比较而言，第8区公共服务分配的状况良好而第7区和第9区的状况相对则较差

### 关键词：

空间平等，服务分配，可及性，可持续性，大不里士，伊朗

## 1 INTRODUCTION

According to data of the United States Department of Economic and Social Affairs, in 2007 for the first time in human history, 50% of the entire global population lived in urban areas, while only a century ago this figure stood at 13%, and it is now predicted to reach 69% by 2050 (Barresi and Pultrone, 2013, 62). In other word, World urban areas occupy 4% of the Earth's land area, growing on average twice as fast as their population, and 65% of all land surface will have become urbanized by 2030 (Gargiulo and Zucaro, 2015, 82). Urban growth had a great impact on public service management and compelled managers to be increasingly agile at adopting practical solutions to unforeseen problems, such as Residents' inequality and lack of visual balance in different regions of a city.

This problem is by no means a new phenomenon over the world; while in developing countries, spatial difference of the cities has been intensified due to socioeconomic contrasts, inequality and imbalance in municipal services (Abdi Daneshpoor, 1999, 37). One of the most important issues in the study of spatial equity of urban public facilities allocation is to improve in the quality of the urban environment (Omer, 2006). Specifically, geographic scale is an integral component in the research on spatial equity. As a result, a growing body of work has begun to identify the conflict between the local scale, the level where an environmental problem is experienced and is of grassroots interest, and the broader geographic scale, the level at which the discourse of spatial equity can be politically addressed.

Besides the geographic scale is an important planning issues of spatial equity, another is most studies usually focuses on only one type of public facility allocation and ignores the relationship between other public facilities, it cannot reveal the inter/intra effects of overall public facilities on urban residents (Liao et al, 2009). There has been scant attention paid to the different geographic scale effect of facility service distances and spatial access to facilities opportunities on comprehensive public facilities about spatial equity drawn from previous studies and public facility policies. Consequently, the aim of spatial equity research is to ascertain whether the distribution of public services is equitable and correlates with observed socio-economic spatial patterns (Talen and Anselin, 1998). As any geographical analysis of spatial equity in this context relies on a measure of access to services, it is important to gain an understanding of the sensitivity of the conclusions from conceptualization and measurement of accessibility. Typically, access is loosely defined on the basis of a simple count of facilities or services by some geographical unit, without regard to factors such as spatial externalities, the structure of the transportation network and choice behavior of travellers, the frictional effect of distance, properties of the supply side, and measurement issues related to the large-scale of analysis (Liao et al, 2009). Such lack of attention to the regional facility level and neighborhood facility level are to make different benefit result with the aggregate data.

Spatial structure of a city is made up of elements interacting with each other and instability of each element will affect the whole structure. The most important factor causing inequality is the lack of access to public services because it affects people's living quality and well-being both directly and indirectly (Lotfi & Koohsari, 2009, 133). The concept of accessibility is a broad concept through various aspects including physical, psychological, economic and financial accessibilities which can be dependent on per capita land use and transport network (Dadashpoor & Rostami, 2011, 7). In fact, accessibility is the ability of residents to have a good access to activities, resources, services and similar cases. Public services should be readily available to the people regardless of their place, limitations and financial resources or physical abilities (Kaphle, 2006, 2). However, the unfair distribution of services among different regions of cities in our country has affected the spatial distribution of population in urban regions. In Tabriz, like most of metropolises in Iran, there are remarkable spatial inequalities in various regions in terms of benefiting from public services. In the past, Tabriz was famous as city of gardens due to its beautiful gardens; but during the land reforms, some of villagers unfortunately sold their farms and gardens and migrated to the outskirts of cities. This issue had a significant



impact on destruction of gardens surrounding Tabriz and formation of slums in the suburbs. Consequently, irregular and rapid urbanization and marginalization caused social, economic, political and cultural problems and created a duality throughout the city in terms of the spatial distribution of municipal services. In the context of this duality, the city was divided into two parts as beneficiary and non-beneficiary of municipal services. Such prospect is inappropriate to achieve the spatial equality as one of the core concepts of sustainable urban development. Therefore, focus on various urban regions in Tabriz in terms of benefiting from municipal services, regarding spatial equality and identification of its strengths and weaknesses, can be very helpful in future urban development plans and policies and elimination of inequalities in access to urban services.

## 2 IMPORTANCE OF RESEARCH

Public service management comprises interdisciplinary knowledge of economics, sociology, organizational theory and law, which should be integrated with characteristic elements of the public sector as motivation, bureaucracy and govern (Juliani and de Oliveira, 2016, 1034). This management must create spatial of equality. Despite the importance and necessity of considering the issue of spatial equality in the distribution of public services in developed countries, unfortunately, few studies have been done on this subject in our country, which mostly focused on its economic aspects and neglected its spatial aspect while inequality may happen economically and spatially. Therefore, it is essential to do a study for eliminating spatial inequalities considering the distribution of public services.

## 3 OBJECTIVES OF RESEARCH

- Studying the distribution of services in different regions of Tabriz;
- ranking different regions of Tabriz in terms of the distribution of public services considering the residents' idea, accessibility and population living in those regions;
- presenting strategies in order to achieve spatial equality in the distribution of public services.

## 4 LITERATURE REVIEW

There have been a few studies on spatial equality of access to urban services and facilities which have mostly focused on the concept of per capita land use. Nevertheless, some studies done in this regard are reviewed in the following.

In a study in America, Talen and Anselin (1998) examined the distribution of services such as neighborhood parks and playgrounds. Their study on spatial equality was demand-oriented and they used the accessibility indicator to analyze the distribution of municipal services.

Tsou et al (2005) tried to offer an integrated indicator of spatial equality through an integrated assessment of the distribution of urban public services within a city in Taiwan.

Martínez (2009) explored urban spatial inequality in an article (Application of GIS indicators for representation of urban inequalities in Rosario, Argentina) and compared them with other similar inequities such as social, income, and gender exclusions. Then, he evaluated living quality in physical and socioeconomic environments and analyzed the distribution of opportunities to access physical, social and virtual infrastructures in his case study using GIS software and identified the benefiting and non-benefiting regions.

Rostaee et al evaluated spatial equality in the distribution of municipal services in Tabriz through a descriptive-analytical study. Determining the indicators, municipal regions of Tabriz were consequently ranked using fuzzy TOPSIS model and planning preferences were then provided regarding each indicator for each region. The results showed that Tabriz has an inappropriate spatial equality in the distribution of these services.

Dadashpoor and Rostami investigated an integrated indicator for measuring spatial equality in the distribution of urban public services in Yasooj through a descriptive-analytical study (Assessment of integrated spatial equality of urban public services based on population distribution, accessibility and efficiency in the city). This indicator was analyzed based on population distribution, accessibility and efficiency of services using Yasooj City spatial data. The inhabitants' access to public services was determined through accessibility network analysis, hierarchical analysis model and local spatial autocorrelation model. Gini coefficient was used to analyze inequality of access to urban services and Moran coefficient was applied to analyze significance of the distribution pattern in the city. The results of Gini coefficient indicated an inequality in the inhabitants' access to urban services and the results of Moran coefficient demonstrated a significant inequality in the distribution of services among urban blocks.

## 5 RESEARCH QUESTIONS AND HYPOTHESES

The research questions in the present study are as follows:

- are public services compatible with resident population in different regions of Tabriz?
- are Public services distributed equally in all regions of Tabriz?
- which public services are mostly demanded according to the people inhabiting in different regions of Tabriz?
- how do different regions of Tabriz benefit from public services compared to each other?

According to the questions above, this study is to prove the following hypotheses:

- first hypothesis: it seems that public services are distributed unequally and unfairly within the city;
- second hypothesis: it seems that public services are incompatible with resident population in different regions of Tabriz.

## 6 METHODOLOGY

In this study, a descriptive-analytical method was used. Geographical scope of the research was Tabriz city and the statistical population included all regions in the city. The required information has been obtained by field and library research. In this study, per capita land use, accessibility of the services and people's ideas were used to evaluate spatial equality of the distribution of public services; finally, the regions were ranked using hierarchical analysis considering whole indicators and compared to each other in terms of their benefiting from services and then, recommendations were made to distribute public services in accordance with spatial equality. Public services examined in this study included education, sports facilities, parks, libraries, banks, health care, firefighting services, mosques, cultural services, urban furniture and facilities, public transport, safety, asphalt quality, street lighting at night, etc.

## 7 THEORETICAL FOUNDATIONS, CONCEPTS AND PERSPECTIVE

### 7.1 URBAN SPACE

Urban space is defined as "a part of public open spaces which is a manifestation of social life; where citizens attend there. An urban space is the scene of communal living or "a place where social boundaries can be broken and unpredicted transactions may happen while people are together in a new social environment" (Lynch, 1972; Pakzad, 2006, 81).

## 7.2 URBAN PUBLIC SERVICES

Urban public services are generally defined as economic activities with communal benefits in terms of initiatives by public institutions. These services are found under supervision of public institutions, although their support and maintenance may also be assigned to the private sector. Public services are distributed widely and affect people's daily life directly; In fact, land uses which people deal with on a daily basis are considered as public services. Various specific authorities are responsible for such services like education, green spaces, sports facilities, health care, cultural and religious services. These services entirely have spatial functions. Location of centers providing services, accessibility, access network, spatial connection with other services, scale of supporting institutions, per capita land uses, etc. are all spatial characteristics of public services (Savas, 1978, 800).

## 7.3 DISTRIBUTION OF PUBLIC SERVICES IN AN URBAN SPACE

A relative urban space is a public good and must be used equally and fairly (Shakooyi, 1994). However, irregular and rapid urbanization have created a duality in spatial distribution of municipal services within urban context of metropolises in Iran as well as social, economic, political and cultural problems. In the context of such duality, the city divides into two regions of benefiting and non-benefiting from municipal services. An inappropriate spatial distribution predisposes social inequality. Cost of access to public services, inappropriate spatial locating, costs of being in the vicinity of pollutant units, etc. lead to socioeconomic and spatial inequality among urban population. Furthermore, economic value of land is influenced by the spatial distribution of services so that in benefiting urban spaces, land price increases remarkably compared to non-benefiting regions and state dealers and land owners thus have to compete in an unfair context. As David Harvey has noted, it is not possible to have a perfect competition market from the perspective of spatial equality (Harvey, 1997); hence locating public services leads to spatial corruption and create advantages for population of benefiting areas.

## 7.4 SPATIAL EQUALITY

The concept of urban equality is considerable from many aspects including social, spatial, geographical, and environmental equalities but it must be noted that any changes in the spatial organization will directly affect economic and social affairs and income distribution in a society; certainly, different mechanisms and programs will have a conflicting impact on establishment or non-establishment of equality. The most important point in the present study is to express spatial aspect of equality. Urban equality must be responsible for the following statements:

- allocating facilities and services appropriately and proportionately;
- using potential and actual capacities in the city;
- filling the gap between the rich and poor people in the city;
- preventing from creation of slums.

One of the most important factors in urban planning is appropriate distribution of spaces and services or in general terms, the spatial equality. Therefore, urban land uses and services are prominent factors that can provide spatial, social and economic equality through meeting the population demands, increasing public benefits and considering individual qualification. Consequently, demographic imbalance, which is rooted in urban inter- or ultra-migrations and excessive concentration of land uses in certain regions, can cause economic and social inequality in urban spaces.

### 7.5. SPATIAL EQUALITY APPROACH IN THE DISTRIBUTION OF URBAN PUBLIC SERVICES

Spatial equality relates social equality and the space. As a result, equality and inequality both emerge in the space. Spatial equality or inequality emphasize on geographical or spatial aspects of equality and include a fair and equitable distribution of resources and opportunities in the social space (Soja, 2009, 2).

Accordingly, two emphasized pillars of spatial equality are living conditions (both social and physical environments) and the distribution of opportunities (access to social, physical and virtual infrastructures) (Martinez, 2009, 390). However, facilities and services inevitably cause unequal access throughout the city since they are located separately while people use them as continuous spaces. In other words, regardless of location of the facilities, there are always people who are closer to them compared to others.

Krapton and Vis suggest three principles regarding fairness of planning for the distribution of services:

- before any distribution of services, all people must have an equal opportunity;
- any deviation will be supported if the most disadvantaged people benefit from it;
- there must be always a minimum level of quality and quantity of the distribution of services and individual accessibility so that the individuals and services should be higher than it (Dadashpoor & Rostami, 2011, 36).

## 8 RESEARCH CONTEXT

Tabriz city is the fifth largest metropolis in the country with a population of one million and five hundred thousand and has an area of approximately 11,811 square kilometers as capital of East Azerbaijan province. This city has ten municipal regions with region 6 as the largest and region 8 as the smallest. Region 4 has the greatest population while region 2 is the least populated. Increasing population growth in Tabriz metropolis especially in marginal regions, which mainly include region 1 and 10, and inhibition of low-income people in region 6 and 7, on the other hand, suggest attention and assessment of the distribution of municipal services from the perspective of social equality in urban regions of Tabriz metropolis.

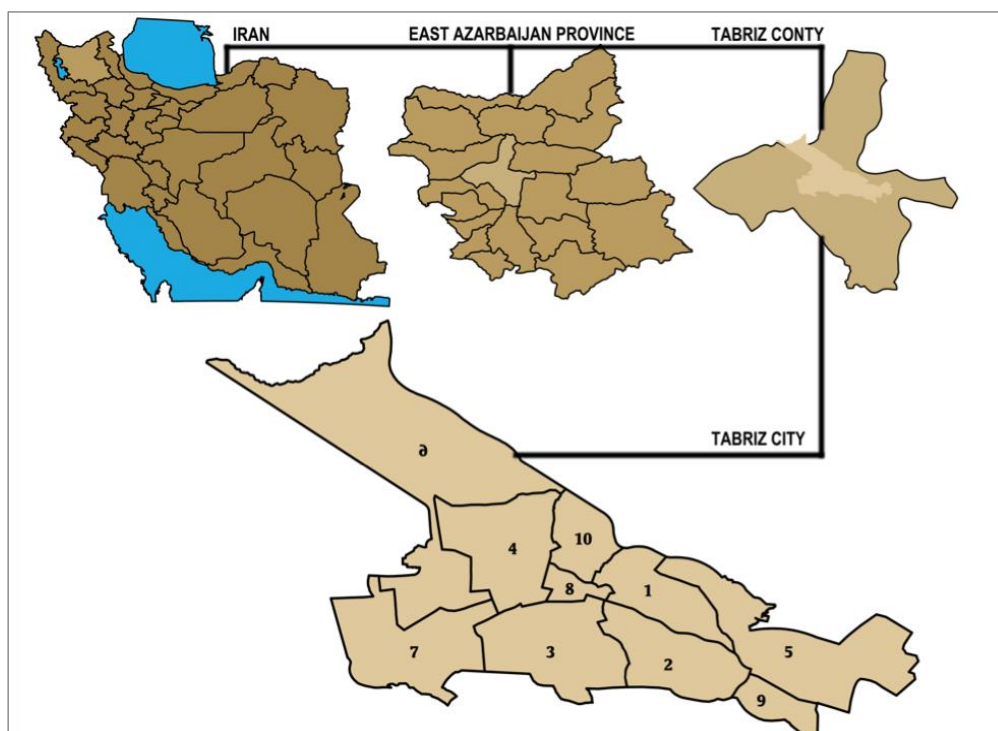


Fig. 1 Geographical position of Tabriz

REGION	AREA (m)	POPULATION
1	14966508	276779
2	17549680	210076
3	13545676	344067
4	17060809	431547
5	22828022	89233
6	5806121	115315
7	12270309	170287
8	3858665	62425
9	6045194	1654
10	9305598	275443

Tab.1 Area and population of ten municipal regions in Tabriz

## 9 RESEARCH FINDINGS

A few studies have been carried out on spatial equality in the distribution of urban services so far, mainly focused on one of the concepts and criteria of per capita land use, accessibility and residents' demands and neglected two other criteria. Therefore, the present study was aimed to consider all three criteria to investigate the spatial distribution of public services from the perspective of spatial equality so that it could achieve more accurate and realistic results.

### 9.1 PER CAPITA LAN USE

In this method, research indicators (education, health care, sports facilities, religious services, and green space) were investigated in ten regions of Tabriz; so that per capita value of the indicators was calculated in each region and a hierarchical analysis model was finally presented (binary comparison) to rank the regions in terms of per capita land use.

USE	STANDARD CAPITATION (m <sup>2</sup> )
Educational services	$2 \leq \text{capitation} \leq 5$
Medical services	$1 \leq \text{capitation} \leq 2.5$
Sports facilities	$1.2 \leq \text{capitation} \leq 2$
Landscape	$\text{capitation} \geq 8$
Religious services	$0.5 \leq \text{capitation} \leq 0.75$

Tab.2 Standard per capita land use (approved by Supreme Council for Planning and Architecture)

Use capitation	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10
Educational services	0.87	1.27	0.9	1.02	3.04	3.09	0.85	2.76	8.24	0.63
Medical services	0.3	1.22	0.6	0.15	0.01	0.3	0.03	0.39	0.27	0.37
Sports	0.36	0.73	0.34	0.6	0.9	1.64	0.62	0.17	0.55	0.19
Landscape	2.87	9.33	1.32	1.37	9.64	14.09	5.05	9.9	0	0.89
Religious services	0.15	0.05	0.08	0.09	0.01	0.13	0.02	1.69	0.12	0.83

Tab.3 Per capita land use in each region

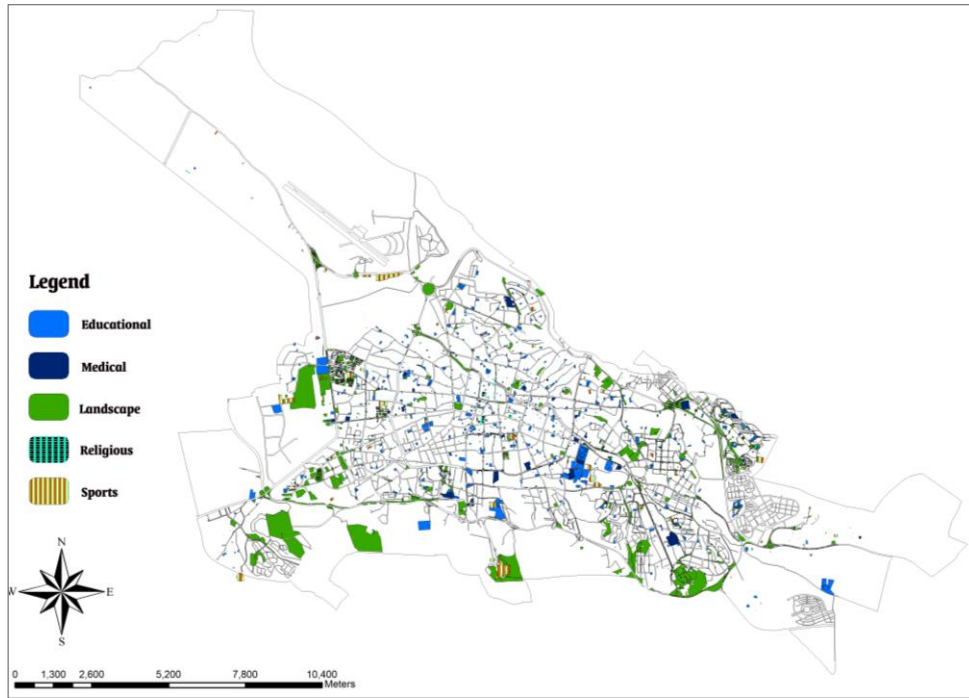


Fig.2 The hierarchical model based on per capita land use

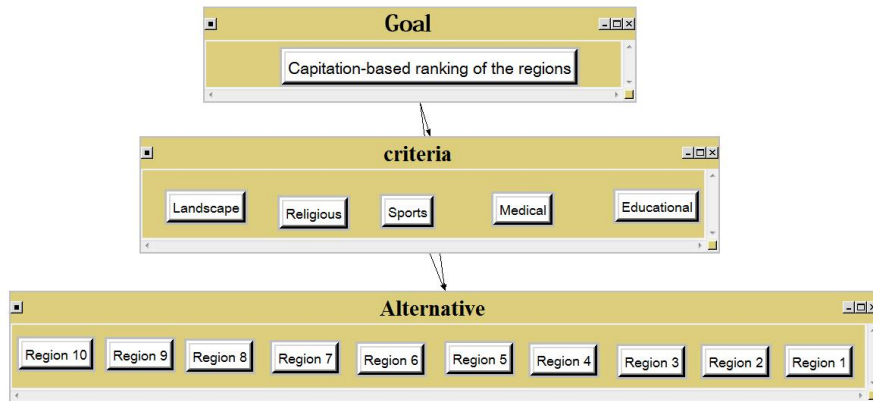


Fig.3 The hierarchical model based on per capita land use

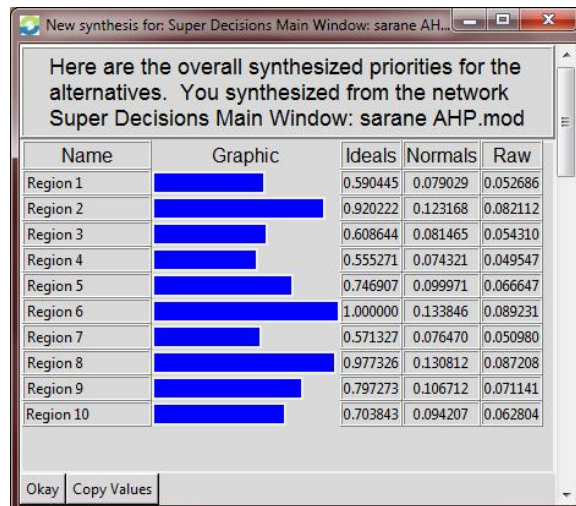


Fig. 4 Ranking of the regions based on per capita values

In the hierarchical model mentioned above, ten regions of Tabriz were ranked based on a binary comparison of per capita value of the indicators by Super Decision Software. To lessen the percentage of errors, the regions were rated through direct data entry by introducing per capita percentages. According to the software output, the regions are ranked as follows:

Rank	1	2	3	4	5	6	7	8	9	10
Region	6	8	2	9	5	10	3	1	7	4

Tab. 4 Ranking of the regions based on per capita values

## 9.2 ACCESSIBILITY

In this method, three indicators have been considered to evaluate access to the services (education, health care, sports facilities, religious services and green space): benefiting, relatively-benefiting and non-benefiting indicators. To evaluate accessibility, Multiple Ring Buffer function was used by ARC GIS Software and range of the distribution of services was calculated in ten regions based on standard accessibility. Standard accessibility for studied services was presented in the following.

Use	Accessibility		
	Benefiting		Benefiting
Primary school	400	800	1200
Guidance school	800	1200	6000
High school	1200	2000	8000
Clinic	1000	2500	15000
Hospital	750	1500	11000
Sports	800	1000	4000
Landscape	700	900	3000
Religious services	600	800	2500

Tab. 5 Accessibility standards (Resource: Tabriz detailed plan, per capita urban land uses by Dr. Habibi)

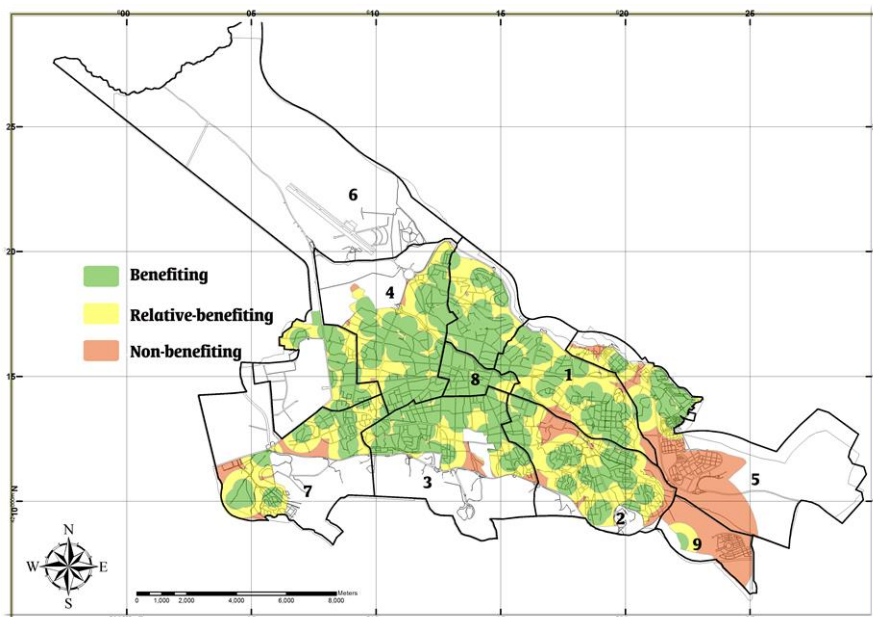


Fig. 5 An example of accessibility standard: Primary school

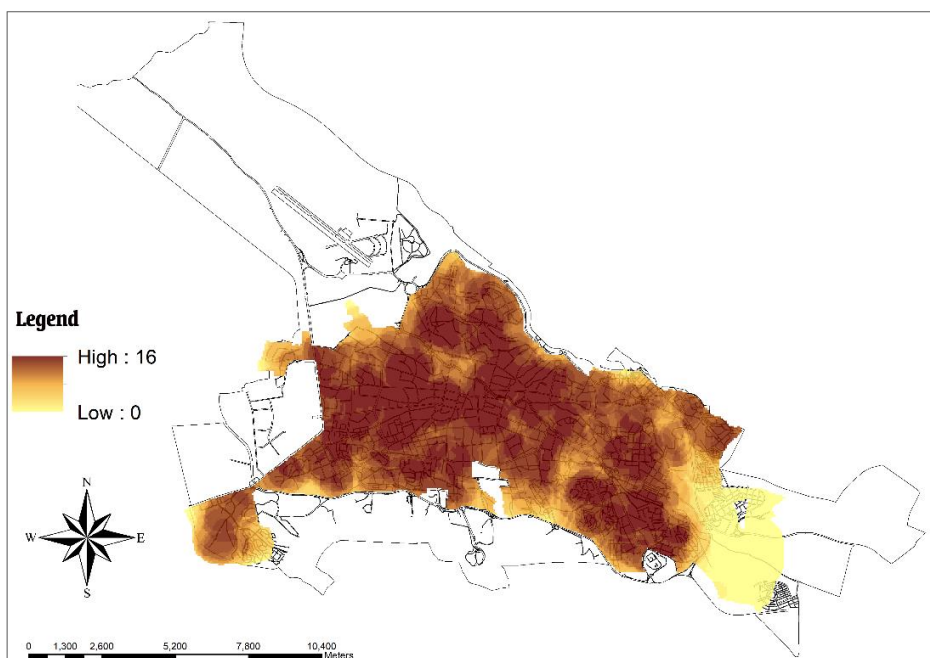


Fig. 6 An integrated model of spatial equality based on accessibility

Use/ Accessibility percentage	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10
Primary school	58.1	44.57	67.7	69.06	21.56	61.49	38.43	90.77	3.73	69.58
Guidance school	77.85	74.8	89.2	98.4	27.55	72.46	77.29	100	24.29	99.81
High school	98.7	89.33	97.17	85.6	32.23	98	92.52	100	46.74	91.15
Hospital	46.5	50.9	36.14	62.33	0	46.11	1.67	76.56	0	36.75
Clinic	60.23	69.12	60.4	73.26	19.8	74.35	65.05	93.17	1.78	55.62
Sports	88.97	70.42	66.15	77.35	35.75	79.33	74.98	87.91	0	83.67
Landscape	82.85	77.25	52.22	50.49	33.16	66.61	74.51	64.61	14.4	60.38
Religious services	89.35	67.83	94.73	98.68	26.49	94.4	72.36	100	11.09	98.35

Tab. 6 Accessibility percentage in each region

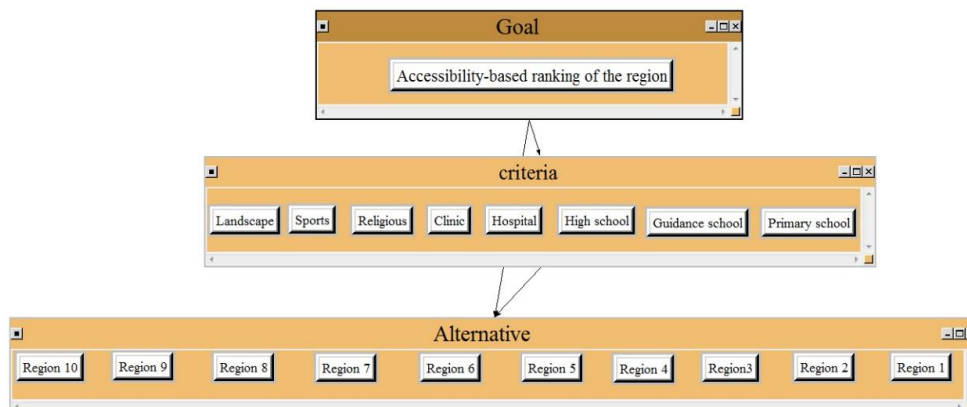


Fig. 7 The hierarchical model based on Accessibility



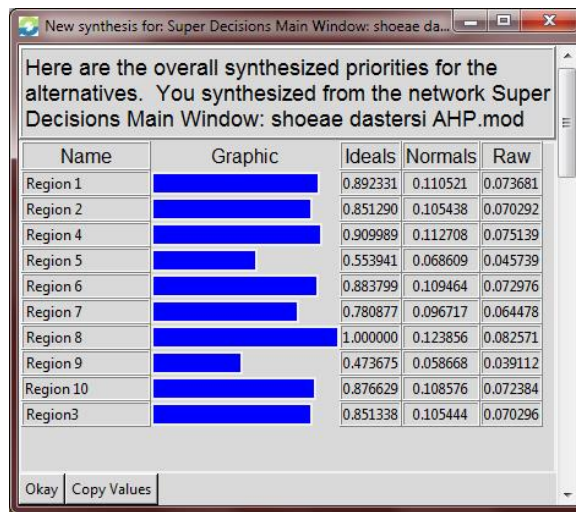


Fig. 8 Ranking of the region based on Accessibility

Rank	1	2	3	4	5	6	7	8	9	10
Region	8	4	1	6	10	3	2	7	5	9

Tab. 7 Ranking of the region based on accessibility

In the hierarchical model mentioned above, a binary comparison of ten regions was done based on accessibility. To lessen the percentage of errors, regions were rated through direct weighting or entering per capita percentages.

An important point was that comparison of the results obtained from hierarchical models based on per capita land uses and accessibility showed a significant change in ranking of most regions. For example, region 4 was ranked as last place per capita land use hierarchical model while it got second place based on accessibility hierarchical model; it was due to high concentration of population in region 4 where despite a relatively fair distribution of the services, it got last place in hierarchical model based on per capita land use. Therefore, similar to the present study which has considered all factors, more than one criteria and methods must be considered in studying the distribution of public services from the perspective of spatial equality.

### 9.3 RESIDENTS' IDEAS

Public services must meet the residents' demands. The residents may require various services such as transport, offices, education, and green space; thus, residents' needs and type of services should be concerned more accurately. As discussed through main context of the paper, three criteria (the residents' idea, accessibility, per capita land use) are first used simultaneously to assess spatial equality in the distribution of public services in this paper. Given that bottom-up or demand-based and neighborhood-based planning has been noticed in recent urban planning, the article highly emphasizes on people's ideas and needs to implement plans and investigates it as an indicator of spatial equality assessment.

In this method, spatial equality in the distribution of services was evaluated relied on the residents' ideas and demands and benefiting from services (education, sports facilities, parks, banks, health care, firefighting services, mosques, cultural services, urban furniture, public transport, safety, asphalt quality, street lighting at night) and their distribution were assessed in five levels (excellent, good, moderate, bad and very bad) in regional scale. Following that, benefiting percentage of each region was calculated and regions were ranked by SPSS Software.

Use/ Satisfaction percentage	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10
Primary school	63.9	71.26	82.84	76.3	78.18	75.46	79.92	70.9	75.99	74.74
Guidance school	56.52	66.24	74.02	67.94	76.44	70.48	69.56	67.24	75.99	67.36
High school	58.22	68.36	70.14	67.94	76.44	73.92	65.86	72.32	75.99	67.9
Medical services	68.62	76.32	83.84	80.5	78.26	80.08	74	76.88	75.99	72.24
Sports	47.42	54.18	65.48	57.54	60.06	53.9	65.86	47.8	67.98	54.18
Landscape	59.48	79.57	64.22	70	87.26	77	74	60.02	60	57.82
Religious services	88.24	78.76	87.28	80.82	69.16	81.62	82.22	85.16	87.99	84.68
Asphalt quality	56.08	63.4	63	64.1	76.44	64.68	67.08	58.06	51.99	52.72
Firefighting	64.42	60.04	65.12	60.44	63.7	50.82	54.52	69.08	54.33	64.16
Primary school	63.9	71.26	82.84	76.3	78.18	75.46	79.92	70.9	75.99	74.74
Guidance school	56.52	66.24	74.02	67.94	76.44	70.48	69.56	67.24	75.99	67.36
High school	58.22	68.36	70.14	67.94	76.44	73.92	65.86	72.32	75.99	67.9
Medical services	68.62	76.32	83.84	80.5	78.26	80.08	74	76.88	75.99	72.24
Sports	47.42	54.18	65.48	57.54	60.06	53.9	65.86	47.8	67.98	54.18

Tab. 8 Residents' satisfaction percentage of accessibility to services in each region

In the following, a hierarchical model was used similar to analyses based on per capita land use and accessibility, and a binary comparison of the regions was done; and according to the residents' ideas, ten regions of Tabriz were ranked based on benefiting from public services.

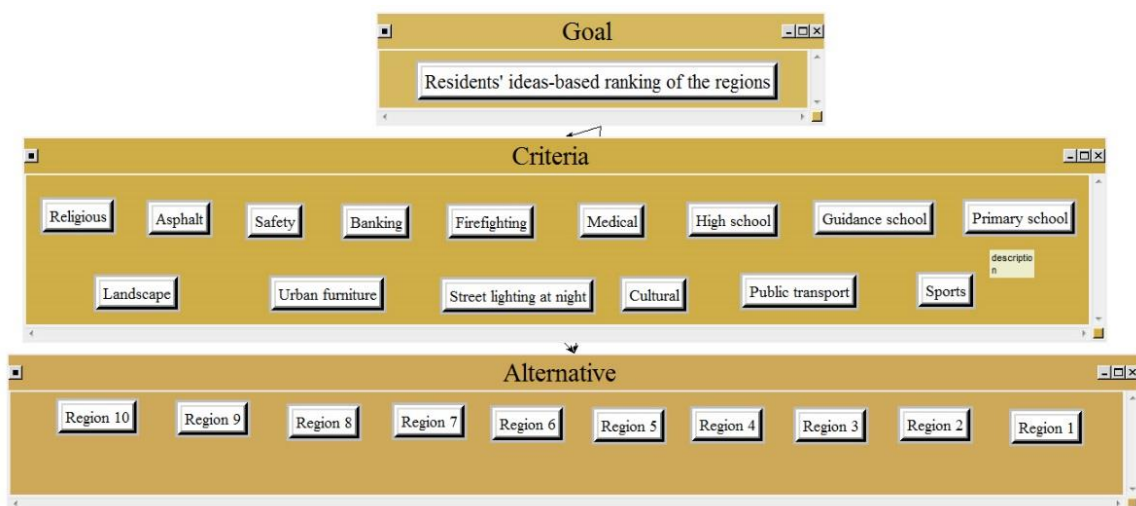


Fig 9. The hierarchical model based on the residents' ideas

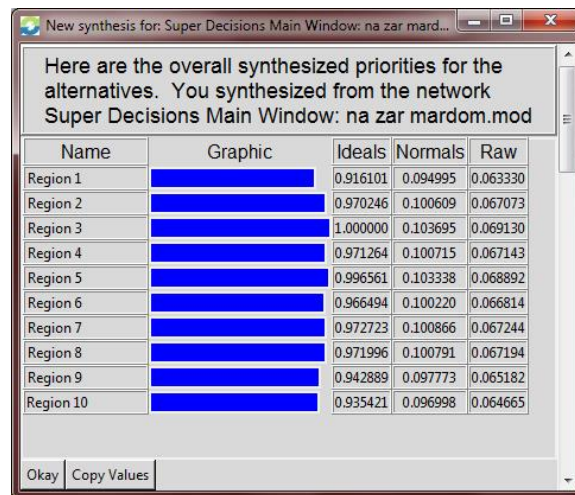


Fig. 10 ranking of the regions based on the residents' ideas

Rank	1	2	3	4	5	6	7	8	9	10
Region	3	5	7	8	4	2	6	9	10	1

Tab. 9 Ranking of the regions based on the residents' ideas

#### 9.4 GENERAL ANALYSIS

According to what mentioned, relying on just one method does not lead to realistic results. It was observed that some regions were in the last place in terms of per capita land use while they were in the first place in terms of accessibility and the residents' ideas. Thus, to achieve accurate and realistic results affected by whole criteria, all aspects must be considered in a research study. Therefore, in the present study, three methods mentioned above were integrated by a hierarchical analysis model to rank ten regions of Tabriz through an accurate comparison.

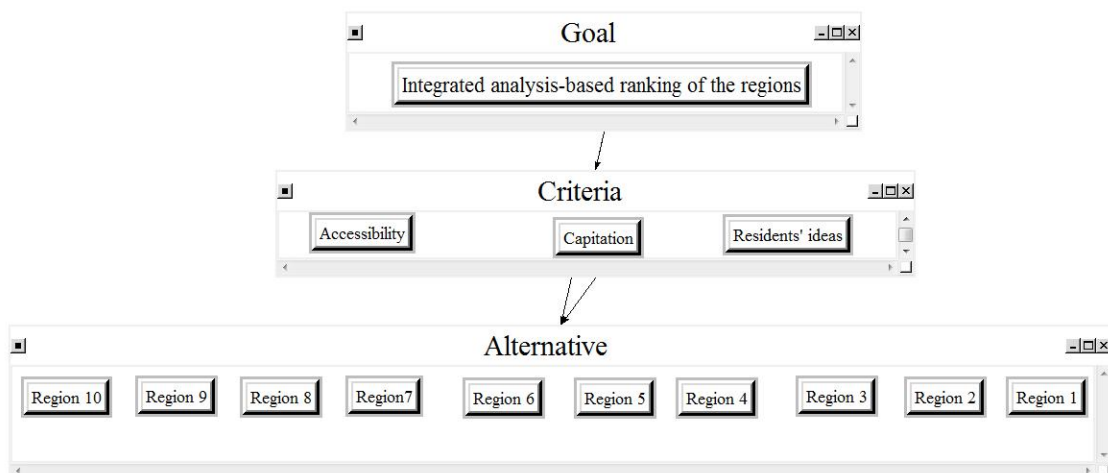


Fig. 11 The hierarchical model based on an integrated analysis

In general analysis, the same weight was considered for the criteria (residents' ideas, per capita land use, accessibility) and the options were weighted in respect of each criterion based on their ratings in hierarchical analyses.

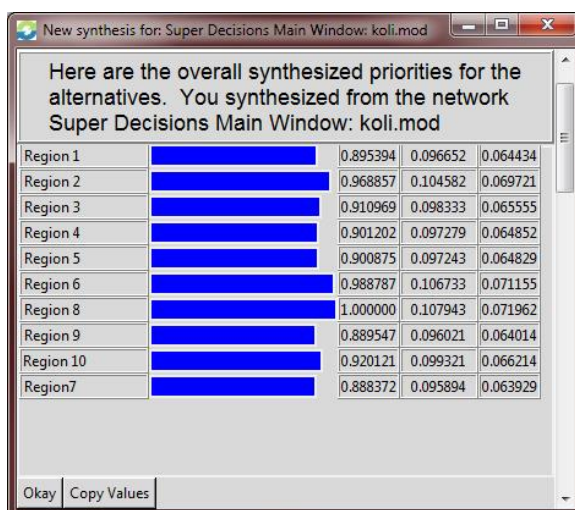


Fig. 12 Ranking of the regions based on an integrated analysis

The overall rating of whole regions taking into account all the criteria is as follows:

Rank	1	2	3	4	5	6	7	8	9	10
Region	8	6	2	10	3	4	5	1	9	7

Tab. 10 Ranking of the regions based on an integrated analysis

## 10 CONCLUSIONS AND RECOMMENDATIONS

Main objective of this study is to investigate the distribution of services in ten regions of Tabriz and rank them based on accessibility to public services. This study analyzed and evaluated spatial equality in the distribution of public services using various data and sources of Tabriz and three methods of per capita land use, accessibility and the residents' ideas. The proportion of the distribution of public services to the urban population and equality and fairness of the distribution of services based on accessibility, people's satisfaction as well as spatial distribution pattern in Tabriz has led to two main hypotheses: public services were distributed inappropriately within the city and public services were incompatible with the resident population in different regions of Tabriz. The results indicated an inequality in the distribution of public services compared to the population (per capita land use) and the residents' accessibility and demands. The data on public services in Tabriz were incompatible with standard per capita land use and accessibility to the services. Moreover, inequality was evident in various regions of Tabriz in terms of per capita land uses, accessibility and residents' satisfaction.

Given that most of the regions were ranked differently through various analysis methods, e. g. region 4 which was in the last place in terms of per capita land use and in the second place in terms of accessibility, the three criteria were integrated in the hierarchical model in which the gap between the regions was lessened due to overlap of the criteria. However, this did not mean equality in these regions since the data and diagrams of three methods implied an inequality and lack of service distribution based on spatial equality in the regions. Region 4 has gained the least benefit in terms of per capita land use; region 9 has gained the least benefit in terms of accessibility; and region 1 has gained the least benefit in terms of the residents' ideas. In integrated hierarchical method, region 7 has gained the least benefit.

According to the research findings, following recommendations are proposed to benefit citizens by a fair distribution of municipal services.

### 10.1 TYPICAL RECOMMENDATIONS

- Considering the success of participatory approach in planning, it was proposed to include citizen's ideas in whole steps of implementing municipal service projects;
- providing participation requirements by municipalities and related organizations;
- involving people before, during and after implementing public service projects and urban plans;
- investigating and responding to urban services requirements based on their priorities by the municipality and other organizations related to municipal services;
- creating a local council in each region to involve people and meet their needs.

### 10.2 TOPICAL RECOMMENDATIONS

- Increasing per capita share of education in region 1,2,3,4,7 and 10;
- increasing per capita share of health care in all regions except region 2;
- increasing per capita share of sports facilities in all regions except region 6;
- increasing per capita share of religion services in all regions except region 8 and 10;
- increasing per capita share of parks and green space in region 1, 3, 4, 7, 8, 9 and 10.

An important point is that fair distribution, level of requirement and the current and future population of the city must be considered in locating and budgeting public services so that the resident's accessibility to the services would be appropriate to their demands and needs.

### 10.3 PRIORITIZING THE REGIONS IN TERMS OF THEIR NEED TO PUBLIC SERVICES ACCORDING TO THE RESIDENT'S IDEAS

Region 1: Increasing per capita share of banks and widening paths.

Region 2: Increasing per capita share of sports facilities.

Region 3: Increasing per capita share of parks and green space.

Region 4: Increasing per capita share of sports facilities and improving quality of asphalt pavement.

Region 5: Increasing per capita share of sports facilities.

Region 6: Increasing per capita share of cultural services and improving quality of asphalt pavement.

Region 7: Increasing urban furniture.

Region 8: Improving safety (speed bumps, overpasses and crosswalks).

Region 9: Increasing per capita share of offices and green space.

Region 10: Increasing per capita share of offices and green space.

Priority	1	2	3	4	5	6	7	8	9	10
Region	7	9	1	5	4	3	10	2	6	8

Tab. 11 Prioritizing of the regions based on an integrated analysis

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## IMAGE SOURCES

Images, tables and schemes have been elaborated by the author

## AUTHOR'S PROFILE

Nader Zali

Associate professor of Urban Planning at the University of Guilan. He was Dean of Research and Technology in the Faculty of Art and Architecture from 2009 to 2014. From 2014 he was Head of Department of Urban Planning at University of Guilan to now. He is representative of Guilan University in the organization of Roads and Urban Development at Guilan Province. His educational background are as follows: BS: Social Planning, University of Shiraz, 1994-1998; MSc: Urban and regional Planning, University of Shiraz, 1998-2000; PhD: Geography and Urban Planning, University of Tabriz, 2005- 2009; Research Fellow in Regional Development Foresight, University of UTM, Malaysia, 2009.

Mohammad Rahimpour

Rahimpour received B.A in urban planning from, Payam Noor University of Tabriz, october, 2015. He is Urban planning and development advisor, member of Iranian society of urban planer (ISUP), Design Tabriz tourism map in 2015.

Saeid Saed Benab

Benab received B.A in urban planning from, Payam Noor University of Tabriz, october, 2015. He is Urban planning and development advisor, member of Iranian society of urban planer (ISUP), Design Tabriz tourism map in 2015.

Mehrnaz Molavi

Assistant professor of Urban Planning at the University of Guilan. His educational background are as follows: BS: Architecture, University of Shahid Beheshti University, 1992; MSc: Urban Design, University of Tehran, 1996; PhD: Urban Planning, University of Tehran, 2001.

Saber Mohammadpour

Assistant professor of Urban Planning at the University of Guilan. He was Dean of Research and Technology in the Faculty of Art and Architecture from 2016 to now. His educational background are as follows: BS: Urban Geography, University of Shahid Beheshti University, 2003-2007; MSc: Geography and Urban Planning, University of Tehran, 2008-2011; PhD: Geography and Urban Planning, University of Shahid Beheshti, 2011- 2015.