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Evaluation and Analysis of Space and Activity Nature in Zabol with an Emphasis on Administrative-Governmental Uses

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ABSTRACT

Land and space are the main grounds of all the activities by the citizens and they are considered as instruments required for the actualization of the human wants and wishes; therefore, the use of them as a general, vital and public wealth resource should be planned based on certain principles. The present study aims at the evaluation and analysis of the nature of space and activity (administrative-governmental use) in Zabol. The study uses a descriptive-analytical method and it is based on library and documentary research and field investigations in citywide level in Zabol. In line with this, GIS and Moran Model were used within the format of GeoDa Software to perform spatial analysis and investigate the scattering of administrative-governmental uses of land in Zabol. The calculations carried out using the nearest neighbor mean were indicative of the idea that the urban administrative-governmental land uses are in cluster form and imbalanced in Zabol. The nearest neighbor index was calculated equal to 0.63 and its Z-value, as well, was -10.02. According to the high value obtained for the nearest neighbor and the high value of Z in the analysis, it can be claimed at 99% confidence level that allocation equality and spatial justice have not been observed in administrative-governmental land use scattering in Zabol. Thus, a deep gap is expected to exist between the urban regions in terms of their enjoyment of these uses.

Keywords: *space, Zabol, administrative-governmental land use, GeoDa*

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1. INTRODUCTION

The world we are living in now is an urban world the result of which is unfortunately getting distant from the natural environment and unwanted acceptance of unbalanced conditions stemming from the disproportionate relations between the human beings and urban spaces (Farid, 1996: 8). From the perspective of sustainable development, land and space are not only natural elements for the supply of economic and textural urban needs rather they are the main grounds of all the activities doable by the citizens and the required instruments for the objectification of the human wants and wishes. In this regard, the urban land and space might possibly be recounted as a public wealth playing a more subtle and more extensive role than an economic commodity in the general life of the city and the citizens' lives (Mahdizadeh, 2000: 77).

The present study tries investigating the relationship between space and activity and distribution of the administrative-governmental land uses in Zabol.

Necessity and Importance of Research:

The disorders occurred in the cities have caused variegation of the stability countenance thereof. Due to the same reason, the spatial-textural organization of the cities is deemed inevitable and the optimal establishment of the various urban uses and correct management of them inter alia can play a crucial role in the optimal arrangement of the city (Sadeghzadeh, 2010: 1). Land and space are general life resources and public wealth and general commodities that should be used parallel to the safeguarding of the public interests at present and in future in a rather supervised and managed manner (Yousefi, 2001: 1). It is by the land and ground over which the population is dispersed, agriculture is revitalized, industry is established and the entire activities of the mankind are shaped so creation of a logical and relative balance between the land and its use in respect to the humans' activities and performances is envisaged necessary and required.

Study Background:

Zakeriyan et al (2015) dealt in a study called "an analysis of the population scattering and service distribution in Maibod's urban neighborhoods from the viewpoint of sustainable development" with the spatial analysis of service distribution and population scattering in the city's various neighborhoods and found out that there is no relationship between population scattering and service distribution in Maibod's neighborhoods. Therefore, establishment of a logical and coordinated relationship between population scattering and service distribution in eleven-fold neighborhood in Maibod is envisioned necessary for achieving stability.

Salavati et al (2012) in a study dealt with the investigation of educational land use challenges in Sertogonbus City in the Netherlands and the results of the study showed the inconsistency of the other uses with the educational uses.

Xiaoming Lyu et al (2016) in an article entitled "modeling a process of the urban design: population, land use and road network" created an urban simulation system that produces urban plans with characteristic population, road networks and land use layers and the intended urban space structure is acquired via creating a population map based on population density model.

Niu Fangqu et al (2018) in an article titled "modeling the population and industries' distribution: the policies of urban land use in Pecan" presented an activity-based model of the land use and transportation for the prediction of the effect of urban activities on land use policies so as to specify the urban activity evolution trend in the sub-policies of land use in Pecan during the recent years. The model is an appropriate programming tool for the urban space policy-makers and its first success was demonstrated for Pecan Scenario.

2. STUDY METHOD:

The present study is an applied-developmental research conducted based on descriptive-analytical method using basic graphic methods. To collect the information required by the study, reference was made to the library resources in such a way that the maps of land use received from Zabol's municipality were employed to extract the needed data following which they were subjected to further research. In line with advancing the study objectives, ArcGis Software was utilized to prepare the required map layers and GeoDa software was used to evaluate and analyze the relationships between such parameters as the number and density of population in urban districts, their areas and the area of the per capita administrative-governmental land uses in Zabol.

Study Questions and Hypotheses:

- How is the space and activity loading (administrative-governmental land uses) in Zabol?
- Space and activity loading (administrative-governmental land uses) is not appropriate in Zabol.

Study Scope:

Zabol County is situated in the outermost east of Iran and it is located in the northernmost part of Sistan Province. The region is positioned between 30° 7' to 31° 29' northern latitude and 59° and 58' to 61° and 50' eastern longitude. The region reaches to 15197 square kilometers in area. The county possesses six city centers, five districts and 17 villages. The city (Zabol) is amongst the cities featuring their own specific governor offices (comprehensive plan, 2009). A population consisted of 138710 individuals reside the city according to 2016's population and housing census. Zabol has been divided into five districts and 38 neighborhoods according to what has been suggested in the detailed plan of the city.

A considerable surface area of the city's lands (about 0.36 ha) is occupied by administrative performance units accounting for 2.7% of the net area of the city and 1.7% of the whole city's area. Based thereon, the per capita of such a use in the city is 2.5 square meters that is very much. Such a land use inter alia is ranked fourth following the residential, military and educational land uses.

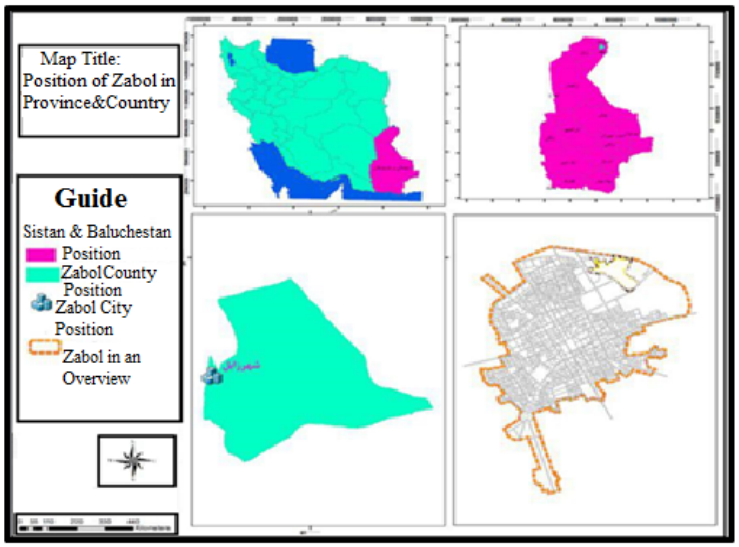


Figure 1. position of Zabol in country, province and county (source: author: 2017)

Study Theoretical Foundations:

In Dehkhoda Dictionary, space has been defined as "arena and field" and, in Mo'ein Dictionary, it is taken as equivalent to "vast place, wide ground and area". It is not long since the term was first taken into account in architectural and urban design terms. In architectural and city design sciences, space refers to the various limited forms featuring specific functions. This space is the ground wherein humans' daily life flows. It is within the urban and architectural space that individual and collective as well as private and general activities, satisfaction of daily needs, behaviors, actions and human relationships are given certain stances. It can be stated that the space and the humans (as space users) are in a bilateral relationship and each influence the other. It cannot be conjectured that the space imposes its principles and functions on the human beings in a decisive manner and that it dominates and guides

their actions in whole rather the humans' creative behaviors in space can lead to the creation of novel meanings in the space and alteration of the spatial realities. One should note that the human actions are not fully independent and free of the space wherein they take place rather there are regulations flowing in the space exert undeniable effects on the human behaviors. The point worthy of being noted here is the necessity of the smallness of the gap between the goals of the constructed spaces and the supervision and users' behaviors. It is only in such a case that the space and its function transcend beyond the circle of humans' satisfaction of their basic needs and result in the development of voluntary activities and daily life blossoming

3. STUDY FINDINGS:

Investigating the Relationship between Administrative-Governmental Land Uses Scattering in Zabol:

Analysis of the Nearest Neighbor Coefficient:

To assess the spatial scattering of the administrative-governmental land uses in Zabol in the present study, the nearest neighbor mean was firstly used as an instrument for investigating the idea that whether spatial distribution of administrative-governmental land uses in Zabol is uniform in the entire city level or not? It was done to eventually assay the scattering rate and concentration of this land use in regional and urban levels so that the neighborhoods' amount of enjoyment of them could be made clear.

The geographical coordinates of these land uses were inserted into GeoDa software to investigate the spatial balance of administrative-governmental land uses in Zabol within the framework of its fivefold district. Calculations based on nearest neighbor mean were expressive of the idea that the administrative-governmental land uses' loading in Zabol is in cluster form and unbalanced. The nearest neighbor index was computed equal to 0.63 and its Z-value was -10.02. According to the high values obtained for the nearest neighbor coefficient and Z score, it can be claimed in a 99% confidence level that the apportionment equality and spatial justice have not been observed in the administrative-governmental land uses scattering in Zabol. Thus, a deep gap is expected to exist between the urban districts in terms of their enjoyment of these land uses. The results of nearest neighbor index calculations have been illustrated within the format of figures (1-4).

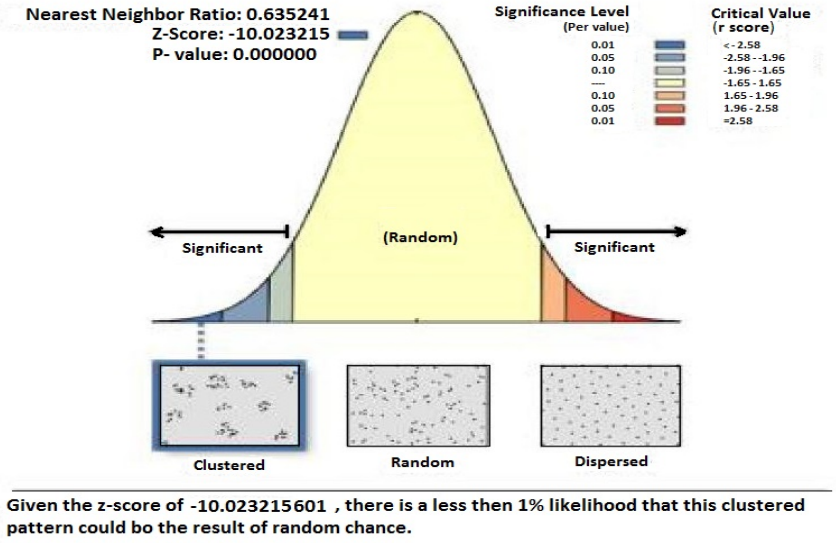


Figure 2. calculating the nearest neighbor coefficient analysis function for administrative-governmental land uses in Zabol (Source: author, 2018)

Current Status Analysis:

Based on the results obtained from the spatial distribution of administrative-governmental land uses and knowing their misappropriation in Zabol, it becomes twice as much necessary to perform an analysis of the current status of land use in Zabol. So, the present study firstly specifies the area of land allocated to administrative-governmental uses in each district in such a way that the gravity points of the administrative-governmental land uses are seminally determined and Intersect Tool is applied to blend the map of the administrative-governmental land use with the map of the urban districts so as to finally calculate the area of administrative-governmental land uses in each district of Zabol and 2016's population-related and statistical information received from Iran's center of statistics is applied in the end to determine the per capita administrative-governmental land uses in each district. According to figure (3) displaying the map resulting from per capita administrative-governmental land uses in each district of Zabol, it can be discerned that the majority of the districts in Zabol cannot supply the minimum standard per capita needs in terms of per capita administrative-governmental land uses and that they are generally in a very low level of enjoyment as compared to District Two.

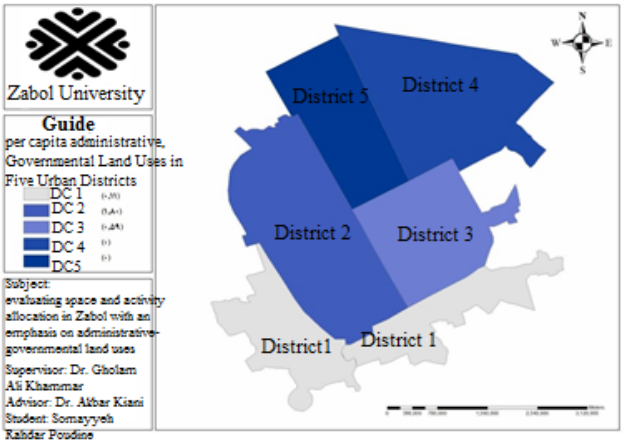


Figure 3. per capita administrative-governmental land uses in each district of Zabol (Source: author's calculation, 2018)

Based on map no.3 and table (1) given below, in terms of the per capita administrative-governmental land uses allocated to the five districts in Zabol, except District 2 featuring a per capita value equal to 1.80 square meters of administrative-governmental spaces, the rest of the districts have per capita rates a lot lower than their minimum per capita. As an example, districts 4&5 in Zabol have a population equal to 30 thousand people but they both possess very trivial quotient of the administrative-governmental space.

Table 1. per capita and area of the administrative-governmental land uses in each district of Zabol

District	Population	Administrative-governmental space area (m^2)	Per capita Administrative-governmental space area (m^2)	Differential of Per capita Administrative-governmental space area and standard 1.5 m^2 mean of Housing Ministry
1	36971	4297	0.11	-1.39
2	41619	75101	1.80	0.3
3	35546	21130	0.59	-0.91
4	7391	750	0.1	-1.4
5	22732	1500	0.06	-1.44
Source: the author				

It was made clear via calculating the per capita values for all of the five districts in Zabol that, except district 2, all the districts have a very low per capita. The last column of table (1-4) gives the differential of Per capita Administrative-governmental space area and standard 1.5 m^2 mean declared by Housing and Urban Design Ministry; amongst the fivefold district of Zabol, four districts have negative differentials and only district 2 has a positive differential. Using scrutiny over the computed per capita indicates that not only the standard mean has been observed in allocation of the administrative-governmental spaces' per capita in the fivefold district in Zabol but also the per capita values of four districts (1, 3, 4 and 5) are reflective of their inadequacies in offering the minimum existing standards (1.5 m^2).

1.1. Analyzing the Spatial Autocorrelation of the Administrative-Governmental Land Uses Scattering and Loading:

Spatial autocorrelation deals with the analysis of the issue that, assuming a regional system, how would a variable in a region influence the same variable in its adjacent regions? If the effect is found positive, it means that the presence of that variable in a region causes an increase in the value of the same variable in the neighboring regions in which case it is described as positive spatial autocorrelation; conversely, if the existence of a variable in a region negatively influences the same variable in the adjacent regions meaning that if it causes itself to be reduced in the neighboring regions, it is to be described as negative spatial autocorrelation and it would be recounted as absence of spatial autocorrelation in case that no special effect is recorded for the variable (Rahnama, 2008: 122 cited in Dadashpour and Rostami, 2011: 16).

To assess the spatial autocorrelation between the variables, bi-variable analysis proposed by Moran was utilized in GeoDa Software environment. Moran Index is defined as shown in the relation below:

$$\frac{\boldsymbol{n}\ \sum_{i=1}^{n}\sum_{i=1}^{n}\boldsymbol{w_{ij}}(\boldsymbol{x_i}-\bar{\boldsymbol{x}})(\boldsymbol{x_i}-\bar{\boldsymbol{x}})}{\left(\sum_{i=1}^{n}\sum_{i=1}^{n}\boldsymbol{w_{ij}}\right)\sum_{i=1}^{n}(\boldsymbol{x_i}-\bar{\boldsymbol{x}})^2}$$

Where, n denotes the number of specimens, xi is the amount of variable in region I, xj is the amount of variable in region j, x is the variable mean in the entire regions and wij is the weight used for the comparison of regions i and j (ESRI, 2015). It is worth mentioning that weight matrix has been computed from the area of land devoted to administrative-governmental uses and the population and the area of the whole district in the present study.

According to the fact that Moran Coefficient ranges between 1 and -1, if it is found equal to unity, it implies the fair spatial distribution and the more this value approaches zero the more it is reduced of its justness and -1 implies completely unjust spatial distribution (Rahnama and Aftab, 2015: 30).

To assess the relationship between the per capita administrative-governmental land uses in urban districts considering the population density, Moran's bivariate test was utilized that gave a value equal to -0.107. The obtained Moran coefficient confirms the lack of spatial justice observation in spatial distribution and scattering and loading of the urban administrative-governmental land uses and it indicates the unbalanced distribution of this type of land uses in the district level of Zabol; it means that the enjoyment of a special district of the city is accompanied by the lack of enjoyment in the other districts. Figure (2-4) exhibits the autocorrelation between the per capita administrative-governmental land uses and population density and figure (), as well, depicts the per capita of administrative-governmental spaces (a) and population density (b) in districts of Zabol.

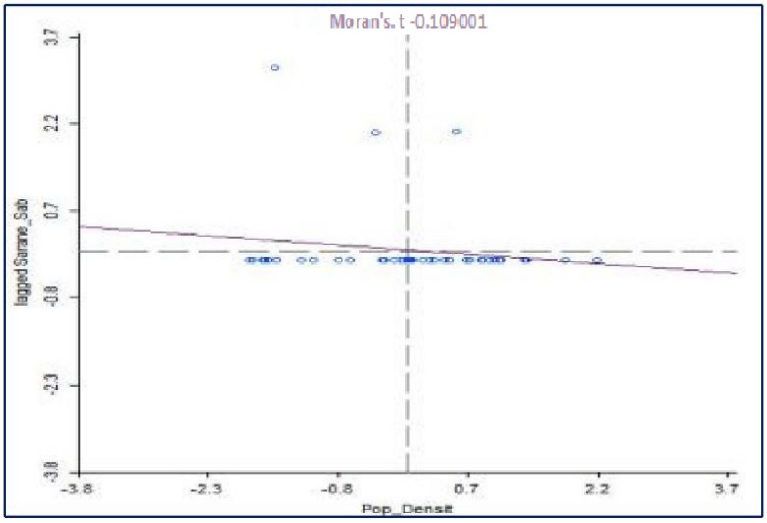
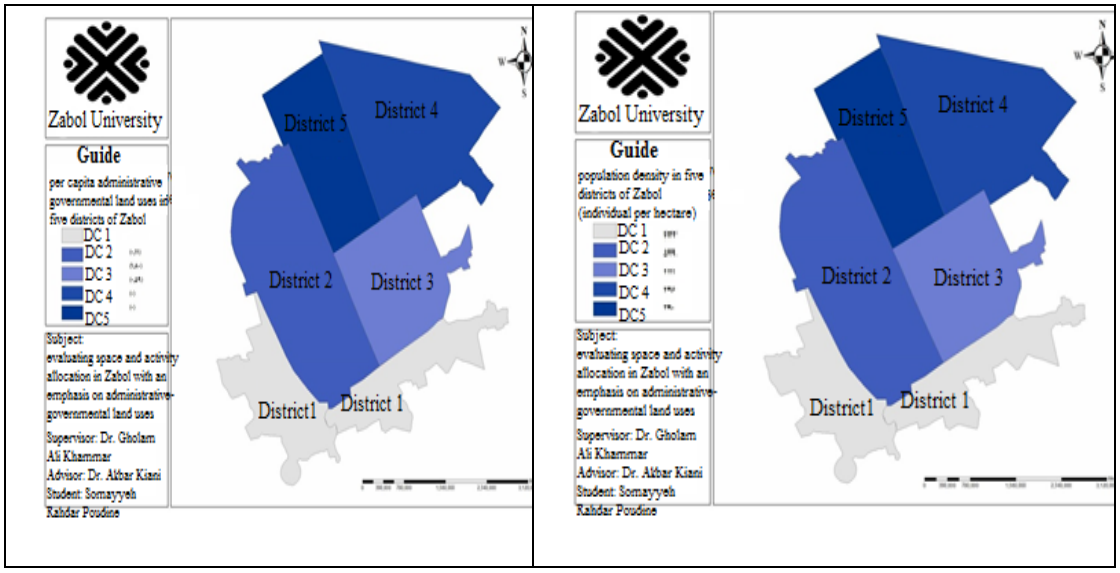


Figure 4. spatial autocorrelation between per capita administrative-governmental land uses and population density in districts of Zabol



Source: author, 2018

Figure 5. per capita administrative-governmental land uses and population density in districts of Zabol

Also, to investigate the statistical relationship and correlation between the per capita allocated to the administrative-governmental land uses in the five districts of Zabol in consideration of population density, the parallel coordinates map existent in GeoDa Software was applied. The result of this analysis has been demonstrated in figure (5). In this analysis, the concentration of the lines on the left side means the low value of the variable and the lines' inclination towards the right side indicates the high numerical value allocated too that variable in that district. It has to be pointed out that each of the

lines existing in the analysis represents a neighborhood in Zabol. Based on the results obtained from the analysis, it can be discerned that there is a negative correlation between the administrative-governmental land use per capita and population density meaning that the districts featuring high population density have not be apportioned with sufficient per capita of administrative-governmental land uses.

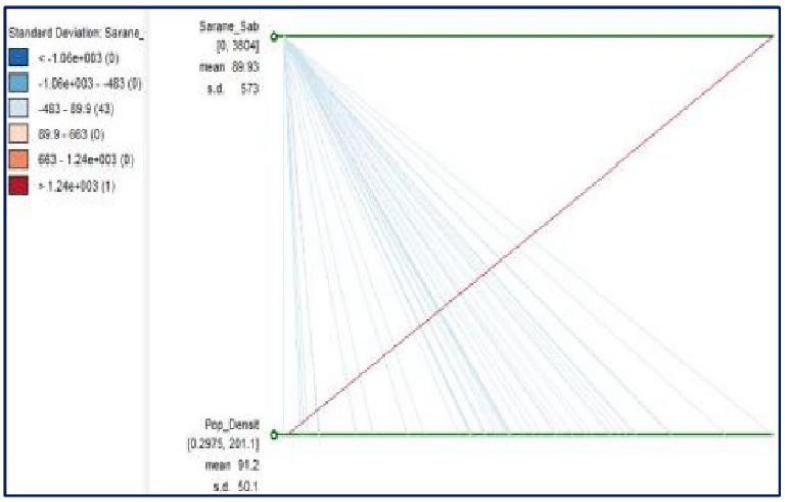


Figure 6. the relationship between the administrative-governmental land use per capita and population density

After the unfair distribution of governmental-administrative and uses was verified in respect to the population density, the relationship between the area of the administrative-governmental land uses and the area of each district was assessed so that the likelihood of direct relationship between the different enjoyment of each of the five districts in Zabol and the different areas could be evaluated; it means that the area of the districts was considered as the concentration factor considered in the allocation of the administrative-governmental land uses but the calculation of Moran Index for the two abovementioned variables gave a different result. The Moran index obtained from the analysis was equal to -0.275 that is reflective of unfair spatial distribution of the administrative-governmental land uses in respect to the areas of the districts in Zabol. It can be understood from the minus sign of the obtained value that the areas of the majority of the district have no effect on their enjoyment of high administrative-governmental land uses' loading. For example, district five of Zabol, with a population of 22732, possesses the least administrative-governmental land use.

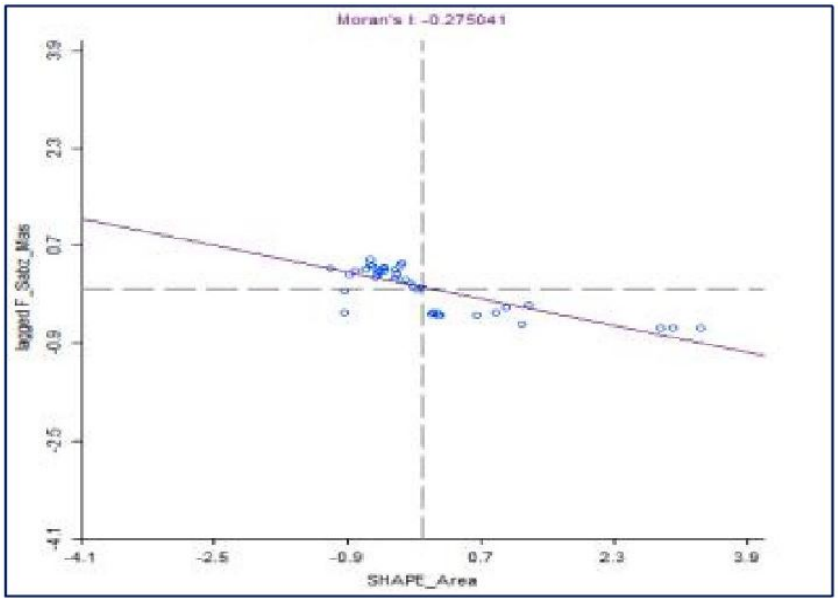


Figure 7. spatial autocorrelation between the administrative-governmental land area and the areas of Zabol's districts

The result of analyzing the relationship between the areas of the administrative-governmental land and the areas of the five districts is indicative of the idea that there is no direct relationship between these two indices meaning that the large areas of the districts has not spontaneously provided for a greater allocation of administrative-governmental land uses for these districts. In the meantime, there is one exception and that is district two in Zabol with a total area of 529 ha out of which 7510 square meters have been allocated to administrative-governmental uses.

4. CONCLUSION:

Administrative-governmental land use is one of the most important indicators influencing the citizens' lives and it demands special attentions in urban planning because such types of land use play multifaceted roles in the urban life: on the one hand, it is via appropriate siting of these places that a large deal of traffic and urban pollution could be dismissed and, on the other hand, it is rendered possible to set the ground for the increase in the citizens' participation and satisfaction. Also, according to the fact that administrative-governmental land uses are reminded as one index of sustainable urban development and a scale for a city to be recounted as healthy and clean, the shortages of such land uses is intensely felt in the city that is contradictory to the standards of healthy city and sustainable development.

It can be asserted according to the aforementioned materials that proper siting of administrative-governmental land uses in cities and their appropriate and fair distribution can be enumerated as an important scale in the stability of the cities and establishment of spatial fairness. Thus, the present study tried performing a spatial distribution analysis on the administrative-governmental land uses in Zabol to assess their relationships with the population density and area of the urban districts in Zabol. The analysis of the spatial distribution of the administrative-governmental land uses indicated that the foresaid use is distributed in an unbalanced and cluster manner in the entire levels of all five districts in Zabol and no importance has been given to the standards as well as the citizens' needs and wants in the siting and placement of these land uses in such a way that districts two and three account nearly for one third of the Zabol population and they have been allocated with the highest per capita and area of the administrative-governmental land uses and the rest of the city districts accounting for a considerable volume of Zabol's population have been given a trivial share of the administrative-governmental land uses.

The assessment of the relationship between the administrative-governmental land use per capita and population density that was carried out using Moran's bivariate index in GeoDa Software environment indicated that there is a negative autocorrelation between the spatial scattering of administrative-governmental land use in all districts of Zabol and population density meaning that the higher population density has not been necessarily accompanied by the high administrative-governmental per capita and that the distribution of the administrative-governmental spaces has been conducted with no consideration of population density. The evaluation of the relationship between the area of the districts and the amounts of administrative-governmental land uses gave a result similar to what was mentioned above meaning that there is a negative autocorrelation between the area of administrative-governmental land use and the area of districts and, except for districts two and tree, the larger areas of the other districts do not indicate their enjoyment of a greater number of administrative-governmental land uses.

It can be stated according to the study results that the spatial distribution and scattering of the administrative-governmental land uses in Zabol has been unbalanced and in a cluster form. This is reflective of the idea that our urban managers have not paid attention to the spatial justice in siting and allocation of these land uses to the urban districts and the spatial distribution of the aforementioned uses in the current status of the city signifies the lack of attentions that would have to be otherwise paid by the officials to the allocation of administrative-governmental spaces based on the needs and wants of the people living in various city districts. Considering the idea that unfair and unbalanced distribution of the land uses, including administrative-governmental land use, can lead to the higher enjoyment of certain districts versus the deprivation of others and cause the citizen to feel injustice which, eventually, instigates social conflicts and reduction of people's participation and this is per se always unbeneficial for both the city and the citizens, the urban managers are expected to direct their attentions towards balanced distribution of these land uses, especially administrative-governmental land uses more than ever before so that measures can be taken and plans could be made in future to perform siting, distribution and allocation of administrative-governmental land uses in each of the districts in a balanced manner and with the preservation of practical coherence of these uses in line with providing the urban districts with fair enjoyment of the administrative-governmental land uses thereby to pave the way for environment stability and the occurrence of unfavorable outcomes like pollution, vandalism and social conflicts could be eventually prevented.

SUGGESTIONS:

- Concomitant paying of attention to populations and areas of all five districts in Zabol in regard of optimal distribution of administrative land uses
- Essential revision of the positions of the existent administrative land uses and increasing their distances from inconsistent land uses
- Expansion of the idea of administrative estate and considering a unit zone for the establishment of administrative land uses in Zabol
- Translocation of administrative-military land uses, such as military bases, to outside the city
- Paying attention to the treatments, interactions and communications in urban spaces and providing an appropriate ground for the administrative land uses to see and be seen

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