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Evaluation of Distribution Pattern in Urban Services Using Network Analyze and Nearest Neighborhood Index Based on Distributary Justice Approach: Case of Kabul City

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Abstracts

Presence of urban services are the most basic urban elements to increase the quality of life of urban citizens. Unequal distribution of services has led to the creation of social segregation in cities and would led to inequality and injustice in cities, thus nowadays the urban spaces have become a showground of social conflicts. Competition for extra opportunities and profits has replaced socio-economic segregation with ethnic and racial segregation.

The purpose of this study is to evaluate the spatial distribution of city services and its level of access based on the model of distributive justice in the city of Kabul. This research is geographically descriptive according to the usage and data collection, to analyze the data for examining the level of service and spatial distribution pattern of services the network analyzes and nearest neighborhood index (NNI) has been practiced. Moreover, the required data has been collected through fieldwork surveys, governmental reports and census, websites and Google Spatial Services. According to the outcomes of the research, educational uses in the urban area services are the highest level of access, and drugstores have the lowest access level of access. In terms of spatial distribution pattern, the Mosques, Banks, Gas stations, bus stations, firefighting stations, pharmacy stores and health centers are distributed in clusters, besides only educational centers have a regular distribution pattern.

Keywords: Distribution of Urban Services, Network Anlayse, Nearest Neighborhood Index, Distributary Justice Approach, Kabul City.

Introduction

In Post Industrial Revolution the situations of social and economic developments have harshly affected the human settlement system, an unbridled and unplanned environment resulting from intense and unplanned rural migration, urban management has faced difficulties not only in providing public services, similarly efficient and effective management has become a passive and contingent management. Nowadays, in regarding with solving urban problems the distribution of urban public services, social justice, as well as the welfare of citizens are emphasized. Therefore, spatial balance in the distribution of service centers in the city and accessibility to it, provides the preconditions for sustainable urban development and disorder or inequality in regional and local distribution of facilities increases the distance of regions and neighborhoods from social justice [25].

Therefore, achieving spatial justice in the distribution of urban services, rational allocation of social services and balanced use of environmental sources is one of the important goals of urban planners, who must analyze who, what, where and how to achieve and it should be accomplished [24]. Because their unfair or substandard distribution will lead to social crises and problems of spatial complexity [9]. Spatial injustice is a multidimensional and complex concept but two prominent axes Discussed in all the researches are: examining the quality of life (from both social and physical dimensions) and the distribution of opportunities (access to social, physical and virtual infrastructures) [16]. Although the two basic functions of urban public services are the provision of services to residents and maintaining and increasing the quality of urban living environment [24].

Hence, the city is a place that provides opportunities to residents and the standard of justice can play a decisive role by ensuring the equality of these opportunities and proper distribution of functions, services and proper access to service and activity centers, without differentiation and discrimination between residents of a city. [23]. In most cities of the world, the pattern of scattered (regular) distribution of urban services reflects the planned contexts and is based on social justice.

The random pattern that is more common in Third World cities is due to organic growth and lack of planning, likewise The pattern of clusters is the result of the concentration of services and facilities in one part of the city or the result of the existence of an influential element in the unipolarity of the city [2].

In case of Kabul City numerous factors arise such as rapid population growth, overcrowding of low incomes people, insufficient technical, financial and capacity skills of the municipality and related organizations to cope with the growing needs in access to municipal services.

In addition, the existence of multiple executors in the distribution of municipal services and lack of necessary coordination, the weakness of master plans and other

plans in locating municipal services, not considering the spatial and functional link between municipal services, the low role of the private sector and residents' participation in service distribution, private ownership of urban land and rising land prices are other reasons for the unfair distribution of urban services. However, it is necessary to study the process of such problems in the distribution of urban services and how to optimally distribute urban services which should have the required efficiency, guarantee social and spatial justice and provide solutions for integrated management of the process of equitable distribution of urban services. The purpose of this study is to investigate and analyze the distribution of urban public services from the perspective of spatial justice, which provides an assessment of the integrated spatial justice component in the distribution of urban services.

Theoretical Principles

Justice is one of the most basic concepts in sustainable development and sustainable development will not be possible without justice, in other words, justice is a prerequisite for any action that aims to improve the quality of life [18]. From Aristotle's point of view, justice in the democratic sense means that everyone's share should be equal in terms of numbers and not in terms of merit or excellence [11]. Thus, justice combined with equality in life is the embodiment of sustainability, so that social justice and equality of life is one of the most important aspects of sustainability [14].

Therefore, paying attention to the importance of service distribution in urban areas based on the need for services is an important factor in the sustainability of urban life [12]. Inequality in access to urban services is a situation in which amenities, facilities and urban services are unequally available to members of society, and this differential access to services causes inequality in urban spaces. Hence, the optimal distribution of facilities and services can achieve social and spatial justice in the city [3].

The concept of justice can be considered from different perspectives and concepts such as social justice, spatial justice, geographical justice, and environmental justice are also affected by the multidimensionality of the justice [26]. Social justice from geographically and spatially viewpoint is the distribution of public resources based on social, geographical policies, and the spatial dimension of justice is emphasized by asking who, what and where does it achieve?, nowadays the perception of life without justice is dark, and that is why geographers in recent decades are paying more attention to the impact of social justice and inequality in the morphology and spatial organization of cities [20]. As mentioned, the word justice has different types, of which spatial justice is one of the most important.

It can be said that spatial justice in general includes paying attention to equal rights of human beings or social actors, preserving and protecting their human self-respect or dignity, providing basic necessities of life and social self-esteem [15]. so identifying the dimensions of spatial justice in order to achieve social justice in urban studies is one of the main topics and issues of these studies, which in the past few years has been one of the main subjects for urban theorists in the West, as well as to evaluate the existing spatial distribution and to prepare policies for improvement of justice it can be applied or the spatial justice can be measured by comparing the current allocation or its hypothetical allocation. This method identifies the areas that are farthest from the standards.

Spatial justice is a focal point in urban planning and a branch of social justice. David Harvey, a well-known person in this field, refers to social justice as a basic concept that should be done through geographical analysis methods [7]. Accordingly, urban justice is an ethical and political concept that includes unequal distribution of income and wealth, spatial segregation of housing, unequal distribution of public goods and services, unequal civil rights among classes, race, ethnicity, and gender within communities, cities, and regions. Thus, urban researchers focus on social inequalities, poverty, racism, gender discrimination, etc. in cities [8].

The term spatial justice is not limited to a specific time and is practiced as long as it is used, so that today there is a tendency among geographers and planners to prevent injustice and the search for justice and democracy in contemporary societies. [7]. This concept has been mainly considered in recent literature, which tries to study the concepts and practices of justice from a geographical point of view, and geographical analysis has shown that the spatial structure of the city is interpreted based on a set of diverse experiences [31].

Therefore, in spatial justice, the spatial aspects that affect the situation of justice are the main topic of our discussion [10]. Along with spatial justice, there is also spatial injustice. Spatial injustice can be considered both as an outcome and as a process. For example, we can name the patterns of dispersion that are fairly and equitably distributed [12]. Finally, according to Harvey, social justice in the city should be such that it meets the needs of the urban population and directs the allocation of local resource in such a way that individuals face the least errors and objections to their entitlement [25]. Accordingly, assessing the distribution of population and distribution of services in urban spaces can be useful in measuring the level of social justice and meeting the basic needs of citizens in the context of development, social and economic plans and programs [29].

Landuse of Services:

Bank

Bank branches are one of the most important urban uses that are of considerable importance due to their performance. In recent years, due to the rapid growth of urban population and the lack of comprehensive planning and management in our country's urban system, like other urban services, these spaces also faced many problems and difficulties, which are mostly due to shortage, irregular and disproportionate distribution, absence of optimal positioning and lack of necessary forecasts for these uses in cities. [30].

Firefighting

Among the existing uses and services in the city, the optimal positioning of firefighting stations are of considerable importance due to the increasing status and attention to providing safety services and measures to prevent and deal with fire accidents and crisis management in cities. Undoubtedly, timely service of firefighting stations requires them to be located in appropriate places, likewise, without facing the obstacles and constraints of the urban environment as soon as possible reach the scene. In addition to that with the least negative impact on the lives of city residents cover the area. [4].

Coverage area and range (functional Radius) of different urban areas and the operating radius of fire stations are considered as major factors in planning the establishment of stations. International standards suggest a radius of 5 km for the station, and on the other hand, the time to reach the place of fire is 3-5 minutes. To achieve the standard of 3-5 minutes, the range of the protection zone of the stations must be reduced; As a result, at speeds of 30-40 km/hr, fire truck travel between 500-670 meters per minute, which, taking into account the loss of one minute for the fire-alert message to reach the station and the fire truck to leave the station in the remaining 4 minutes, firefighters cover a length of 2 to 2.7 km distance. The area of such district will be between 12.5 and 23 km^2 [19].

Educational

Educational facilities are also one of the most basic urban services that have not been coordinated with the rapid growth of the student population and the levels allocated to these services are less than the needs of the standard education population in the city. The result of such a shortage is the intensification of the phenomenon of repeated use of educational spaces, excessive overcrowding in the classroom, reduction of per capita educational spaces and finally the decline in the quality of education. On the other hand, unbalanced geographic-spatial distribution of educational centers or in other words, the establishment of educational spaces in

an undesirable way and without paying attention to the need of different parts of the city for these spaces led that justice in access to educational services has been questioned and interrogated [17]. One of the important issues that is nowadays perceived in large cities is the imbalance in the distribution system and the inadequacy of the service system, including educational spaces. Heterogeneous and unplanned development and rapid population growth can be considered as the main reasons for this problem. In order to increase the efficiency of these spaces, it seems necessary to pay attention to proper organization and distribution of services. [2].

Bus Station

The public transportation system as one of the most important systems of urban planning which the uncontrolled increase of population and consequently the expansion of physical and spatial development in metropolitan areas, new chapters have been created in the problems of this public system. Nevertheless, the public transportation system can be considered as one of the most effective urban systems influencing the daily decisions of citizens. Therefore, the public transportation network, both quantitatively and qualitatively, includes a wide range of important indicators of quality of life. The public transportation network can have maximum efficiency and effectiveness in the city when it is planned in line with social justice. One of the greatest important dimensions of social justice in the context of cities is justice in accessing to this public network; Because the judicious distribution of public transportation system between different areas, districts and neighborhoods of a city is one of the most important rights of citizens. [6]. The operating radius of BRT stations is about 800 meters.

Gas Station

Through the increase and development of urbanization and the growing population, the need to use cars and consequently the creation of fuel or gas stations, is felt more than ever. Gas stations as refueling stations for transportation are among the most important and vital service centers in cities that play an important role in the comfort of citizens and the economic development of cities. This makes it necessary to adopt the correct process for locating gas stations. In this study, the operating radius of 2400 meters is considered as the operating radius of gasoline pump station.

Hospital

Access to health services can be studied from two dimensions: lack of health land uses and lack of proper placement. Lack of an activity requires the construction of a landuse in an area, nonetheless, lack of proper placement is a category that does not have a good location activity and leads to waste of time, energy, increased travel costs, reduced access, forced to use more cars… etc. 1 to 1.5 km is measured for the analysis of the hospital coverage area.

Drugstore

Drugstores or pharmacies are one of the most important service centers in the city, which are accessible quickly, in a timely manner and with less time and cost, in order to achieve the basic goals of development, e.g., social justice and equitable development. Determining the location of health care facilities, including pharmacies, is important not only in terms of how services are provided and the costs and inconveniences of access to users, but also it influences the development of the city and the pattern of spatial distribution of demand for housing in the city. [28].

Religious (Mosques)

In locating religious spaces and neighborhood mosques, the necessary principles and criteria must be observed and distributed in a balanced manner in the neighborhood. Also all residents should have access to it in a balanced way. The functional radius of the mosque in this study is considered to be 200 to 400 meters.

Research Methodology

In each research, according to the subject and the scope of the study and the effective factors in it, various methods are used. In the present study descriptive-analytical and quantitative method is applied which includes the study of library documents and get support from relevant data analysis organizations and institutions. In the theoretical foundations and research literature, library study has been done. Also in later stages to complete the information, OSM sites and Google spatial services were used, and the collected information was entered into Arc GIS, then using network analysis to determine the service range of each service. Moreover, with using the nearest neighborhood index (NNI) the distribution and spatial pattern of services in the city have been determined.

The NNI index is a valuable analytical tool for analyzing the spatial distribution of urban public facilities and their concentration on the specific location, besides measuring their accessibility and determining the focal points and spatial distribution of public facilities in terms of spatial justice. The Kabul city census and

maps have been used to practice the service area algorithm in Network Analyze to form the maps.

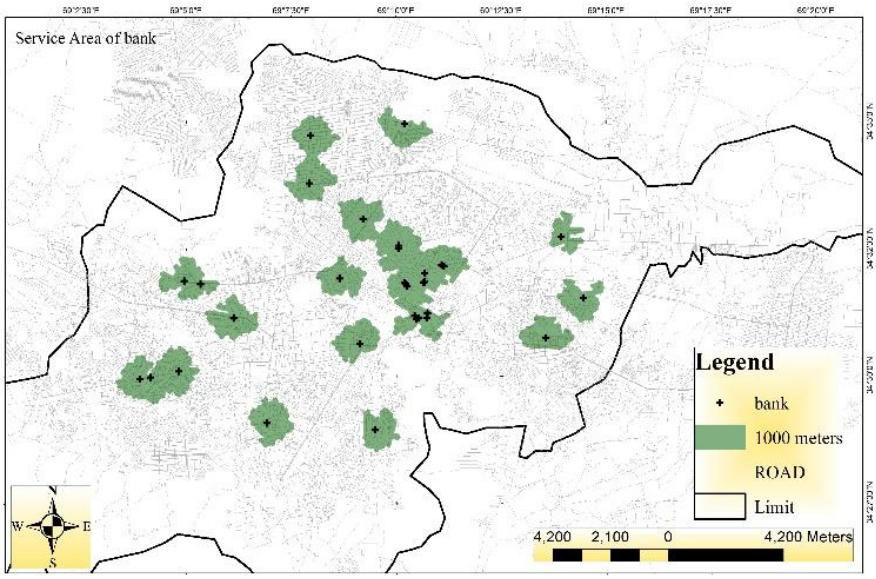
Analysis of services coverage Network

Around 56.8% of the urban area has access to educational centers as standard, which is the highest level of access to educational services among urban services. Afterward the gas stations have the highest level of access, which covers 40% of the city area. The firefighting services, covers about 40% of the city area which ranks third among municipal services in terms of accessibility. Healthcare centers cover approximately 35% of the city areas, followed by religious centers and bus stations, which have only 22% of the coverage level of standard service. Bank branches with a functional radius of 1000 meters, which 9.42% of the city area have access to the bank and about 91% are not covered in this functional radius. Drugstore or pharmacies have the lowest level of access, covering only 6% of the city areas. The following maps show the level of area covereage of each above-mentioned services, which was evaluated using network analysis.

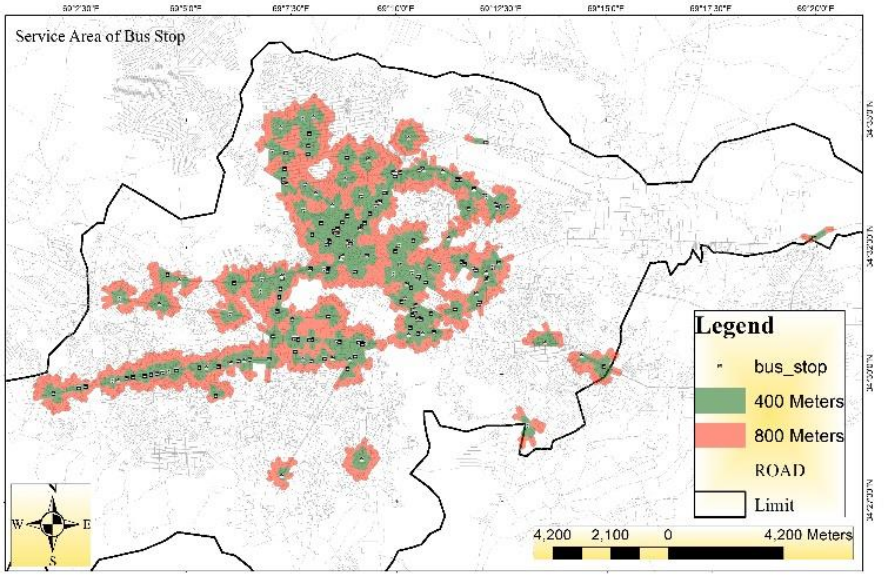
Table 1: Levels and coverd and uncovered urban services in Kabul city.

Name Of Services	**Percentage Of Area Covered**	**Percentage Of Uncovered Area**
Educational	56.98	43.02
Gas Station	40.21	59.79
Firefighting Station	39.87	60.13
Healthcare Centers	35.33	64.67
Religious Centers	21.99	78.01
Bus Stations	21.70	78.30
Bank Branches	9.42	90.58
Drugstores	5.71	94.29

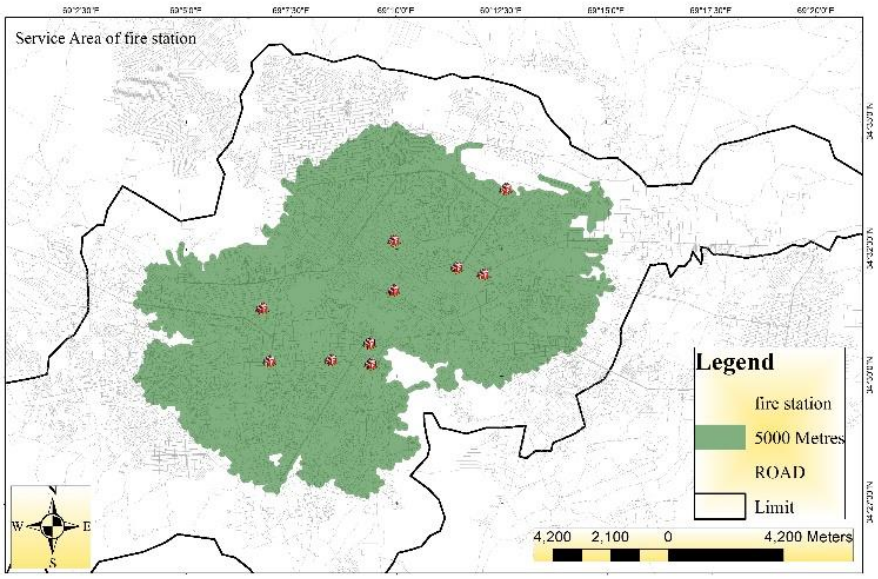
Scource: Authors calculations.



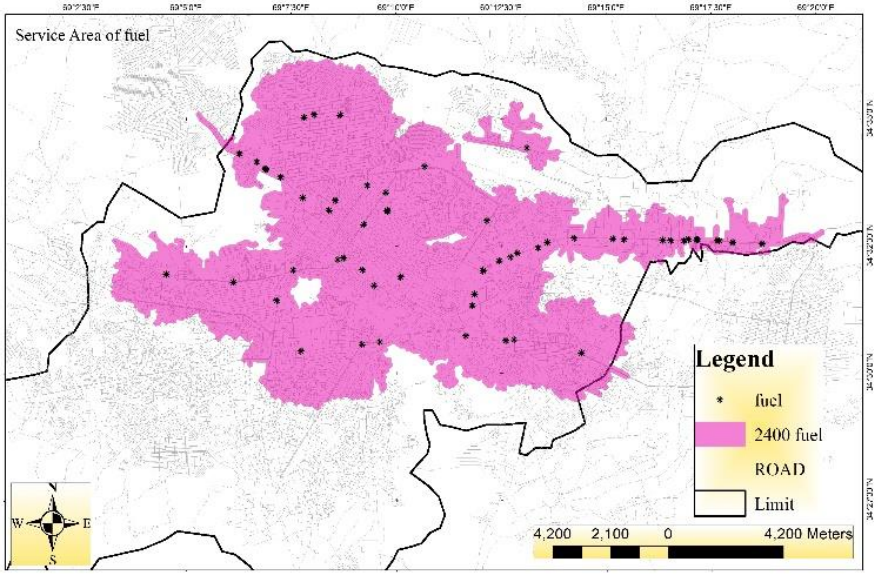
Map No. 1: Level of coverage of Banking services



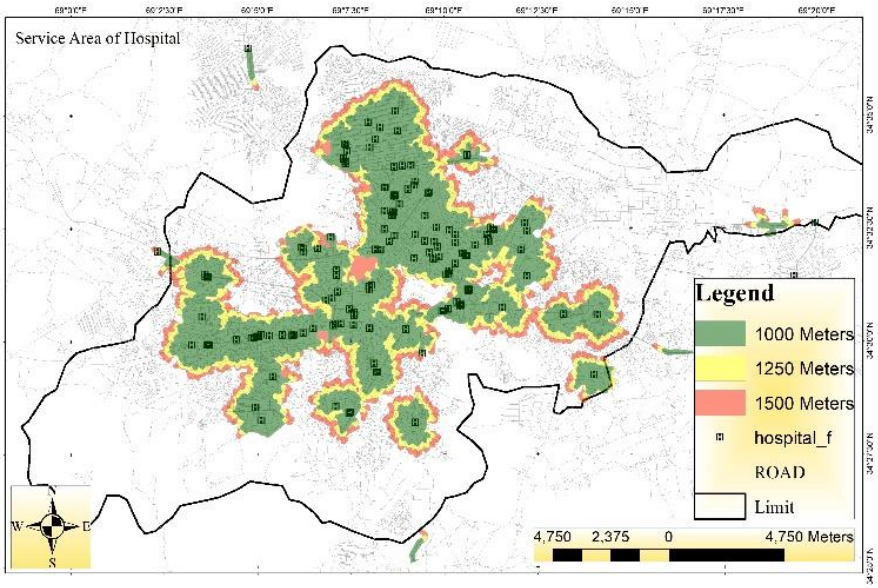
Map No. 2: Level of coverage in regard to bus stations services



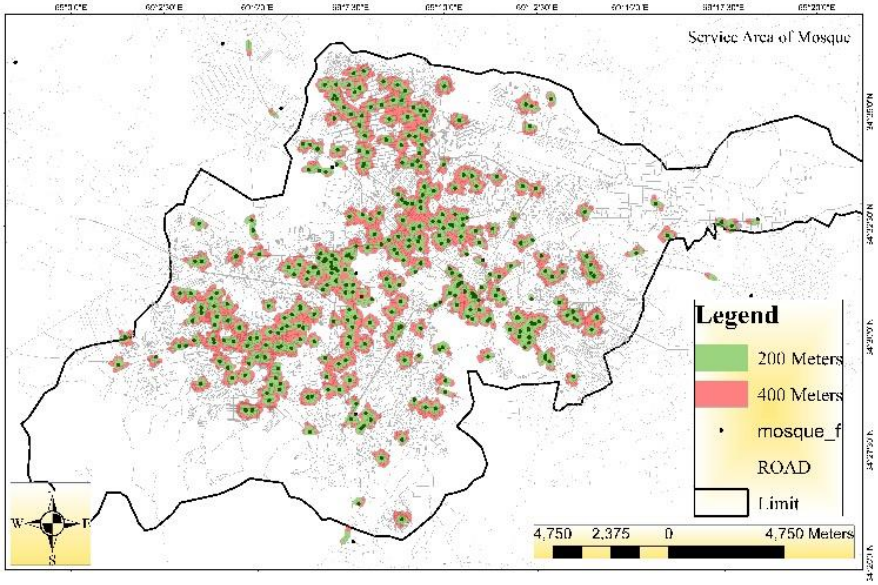
Map No. 3: Level of coverage of firefighting stations



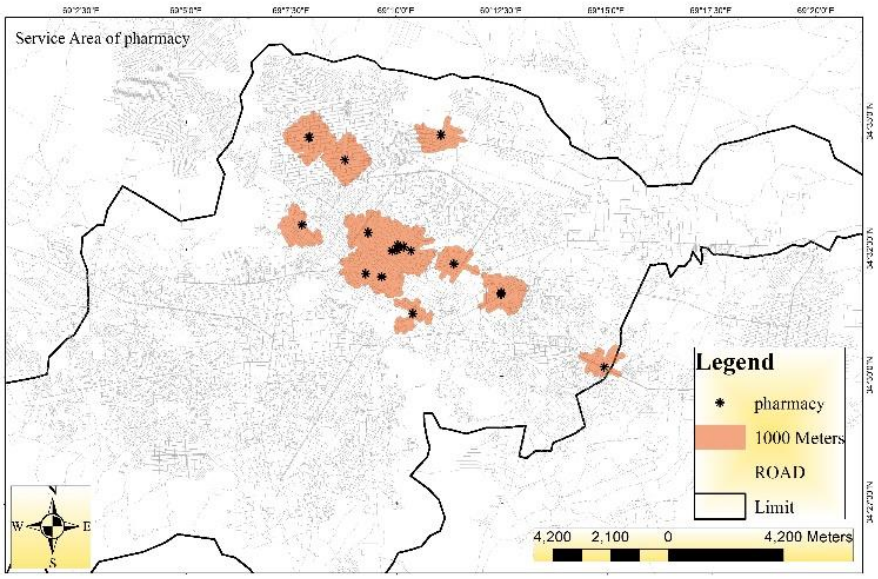
Map No. 4: Service coverage of gas stations



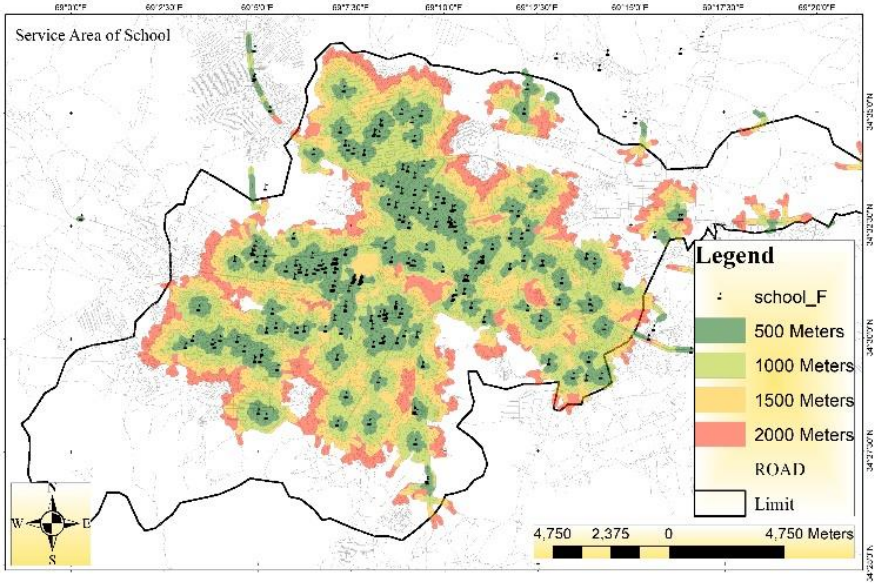
Map No. 5: Service coverage of healthcare centers



Map No. 6: Service coverage of mosques



Map No. 7: Service coverage of drugstores



Map No. 8: Level of coverage of educational services

Analysis Of Spatial Distribution Pattern

Among the 8 services under evaluation which are: mosques, banks, gas stations, bus stations, firefighting stations, drugstores, and healthcare centers have a cluster distribution pattern, and only educational land uses have a regular distribution pattern, and so-that perceived from the value of the nearest neighbor ratio, if it is higher than one, it indicates a regular distribution pattern, which is equal to 1.27 in educational services. Then, mosques with the value of 0.809 have the second highest ratio of the nearest neighbors, and in banking services this value is equal to 0.72, in gas stations it is equal to 0.67, in bus stations 0.65, in firefighting stations about 0.59, in drugstores its 0.58, and it is the lowest in healthcare centers and is equal to 0.497. In terms of the average distance index, which is calculated in meters, firefighting stations have the longest distance and equal to 1758 meters, pharmacies or drugstores equal to 1218 meters, banks 1162 meters, fuel tanks 837 meters, educational centers equal to 710 meters, healthcare centers have 425 meters distance, distance between bus stations It is equal to 421 meters and mosques have the lowest observed distance and is equal to 363 meters.

Table 2: Indicators of the distribution pattern of service uses

Indicators / Services	Distribution Pattern	Average Observed Distance (m)	Average Optimal Distance (m)	Average Nearest Neighbor Distance (R)	Standardized Index (Z)	p-value
Educational Centers	Regular	710.8237	559.7041	1.269999	8.673968	0
Mosques	Claustral	363.045	448.5912	0.8093	-7.643866	0
Banks	Claustral	1162.3732	1611.9204	0.721111	-3.111015	0.001864
Gas Stations	Claustral	837.1286	1244.932	0.672429	-4.731224	0.000002
Bus Stations	Claustral	421.1614	646.5692	0.651379	-9.549084	0
Firefighting Stations	Claustral	1757.947	2972.2343	0.591456	-2.471549	0.013453
Drugstores	Claustral	1218.333	2101.687	0.579693	-3.595942	0.000323
Healthcare Centers	Claustral	425.526	855.5583	0.497366	-12.864972	0

Scource: Authors calculations.

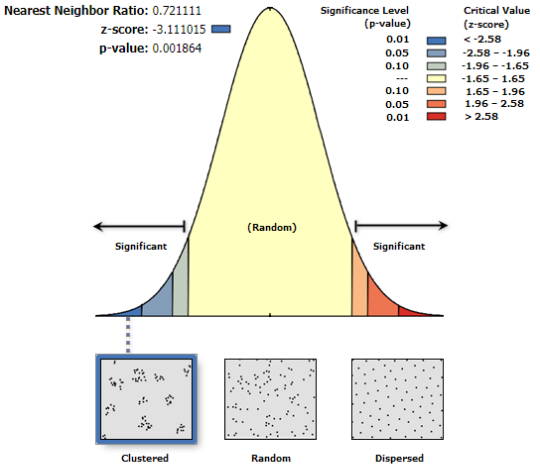


Figure 1: Spatial distribution pattern of banking services

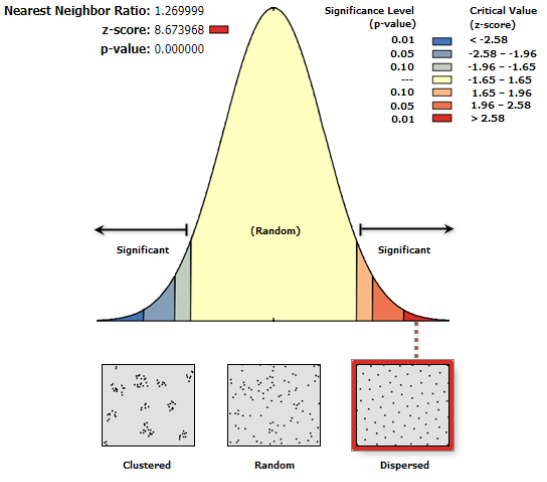


Figure 2: Spatial distribution pattern of educational services

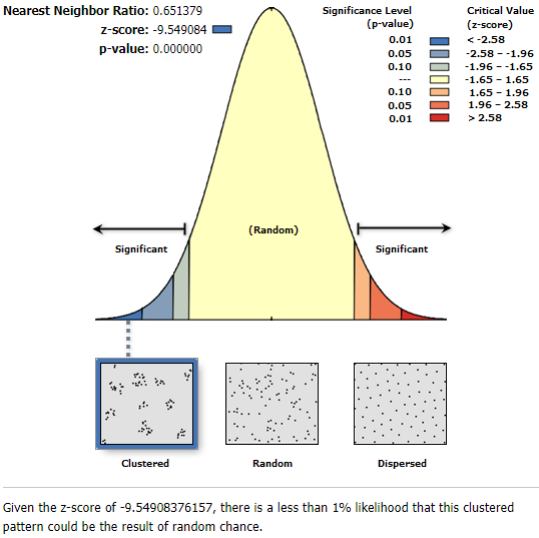


Figure 3: Spatial distribution pattern of bus stations

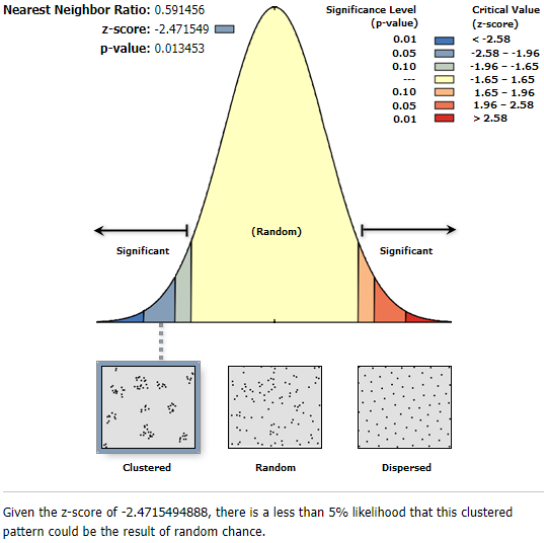


Figure 4: Spatial distribution pattern of firefighting station services

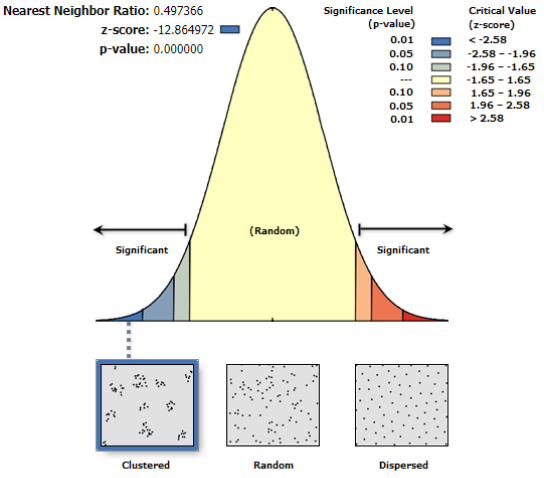


Figure 5: Spatial distribution pattern of healthcare centers services

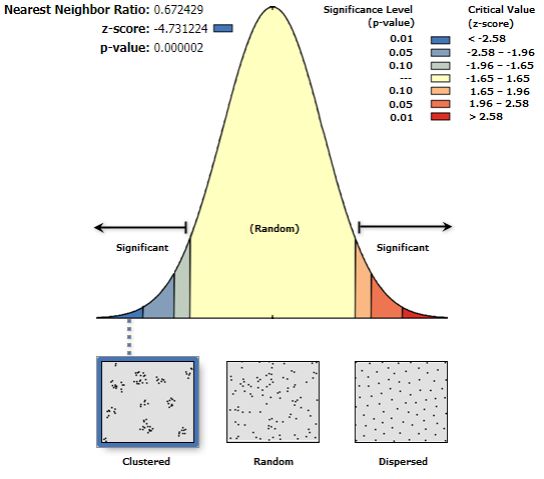


Figure 6: Spatial distribution pattern of mosques

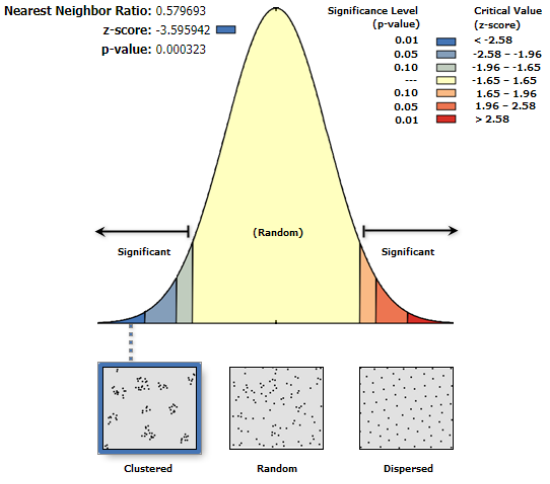


Figure 7: Spatial distribution pattern of drugstores services

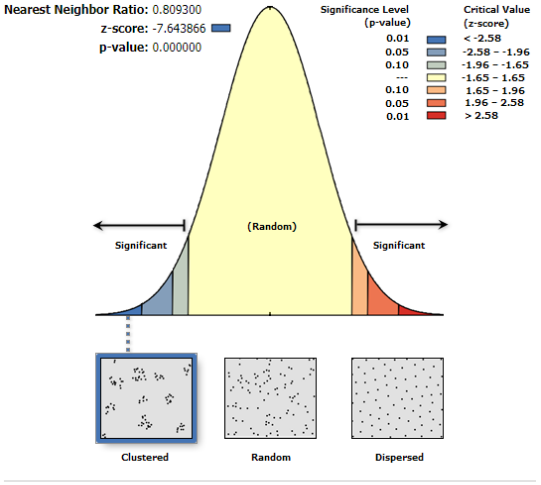


Figure 8: Spatial distribution pattern of gas stations services

Discussion and Conclusion

Urban sustainability has different dimensions, the citizens' judicious access to urban service uses can also be one of the principles of measuring urban sustainability, especially when these uses are equally distributed in different urban areas, it can be said that the city is at least physically stable. Moreover, in most residential areas of Kabul service uses are disproportionately distributed, depriving a large part of the population of access to these services.

As the political and economic capital of Afghanistan (Kabul) has grown in population over the past few decades due to rapid population growth. thus, there has not been a good opportunity for proper planning, and most urban areas have been immersed in residential construction, regardless of the distribution of service uses.

Based on the results of this study, it can be said that among the service uses, educational uses with 56.8 % coverage level of the urban service have the highest access level, and gas stations that cover 40 % of the city area and firefighting services with about 40 %, respectively ranks second and third. It should also be noted that drugstores have the lowest level of access, covering only 6 % of the city. In terms of spatial distribution pattern, mosques, banks, gas stations, bus stations, firefighting stations, drugstores and healthcare centers are distributed in clusters, and only educational centers have a regular distribution pattern.

Educational services with the ratio of the nearest neighbor index equal to 1.27 and then mosques with the value of 0.809 have the highest ratio of the nearest neighbor index and healthcare centers have the lowest and equal to 0.497.

According of the average observed distance index, which is calculated in meters, firefighting stations have the longest distance and equal to1757 meters, healthcare centers have 425 meters, bus stations equal to 421 meters and mosques have the lowest observed distance and equal to 363 meters.

References:

[1.] Ahad Nejad Roshani, Mohsen, Mohammadi Hamidi, Somayeh, Mousavi, Mir Najaf. (2016). Access to urban public services with emphasis on social justice approach in the city using GIS (Case study: Miandoab city secondary education services). Journal of Spatial Planning, 6 (21), 125-140.

[2.] Ahad Nejad Roshani, Mohsen, Molaei Qelichi, Mohammad, Javadzadeh Aghdam, Hadi, Hatami, Afshar. (2012). Analysis of the spatial distribution pattern of educational centers and its proper physical organization using GIS (Case study: District 8 of Tabriz). Journal of Urban Research and Planning, 3 (8), 1-18.

[3.] Ahmad Touzeh, Branch (2013), A Study of Spatial Justice in Saqez, Master Thesis in Geography and Urban Planning, Faculty of Geography, University of Tehran.

[4.] Alavi, Seyed Ali, Salarvand, Ismail, Ahmadabadi, Ali, Farrokhi Sis, Saeedeh, Ishaq, Mohammad Reza. (2012). Geo-spatial analysis of firefighting stations performance based on crisis management using the combined method of MCDM and network analysis. Journal of Crisis Management, 1 (2), 57-65.

[5.] Ashton Shortridge, Practical limits of Moran's autocorrelation index for raster class maps. Computers, Environment and Urban Systems, 31 (2007) 362–371.

[6.] Delaei Milan, Ebrahim, Khairuddin, Reza. (2017). Assessing spatial justice in the context of public transportation system with network analysis model (Case study: 2, 3, 4 and 5 Phases of Tehran). Journal of New Attitudes in Human Geography, 9 (3), 1-39.

[7.] Ebrahimabadi, M. S (2008), Accessibility and Street Layout. Master Thesis in Urban Planning and Design. Stockholm: Sweden.

[8.] Fujita, K (2009).Urban justice and Sustainability. Local Environment, VOL. 14. NO. 5 .

[9.] Hatami Nejad, Hossein, Farhoudi, Rahmatollah and Morteza Mohammadpour Jaberi (2008) Analysis of Social Inequality in the Use of Urban Services Case Study: City of Esfarayen, Human Geography Research Publications, No. 65, pp. 85-71, Fall 2008, Tehran .

[10.] Hellegers, S (۲۰۰۰). Justice and Mobilities in the Netherlands. Master Thesis Human Geography.

[11.] Hojjati, Vahideh, Mozaffarzadeh, Hamed (2008). "The concept of justice and its relationship with the city", Journal of Urban Studies, No. 24-25, pp. 40-47.

[12.] Iveson, K (2011). Social or Spatial justice?. Marcuse and Soja. On the right to the city. City VOL. 15, NO 2.

[13.] Jacek Malczewski. Exploring spatial autocorrelation of life expectancy in Poland with global and local statistics. GeoJournal (2010) 75:79–92.

[14.] Jamali, Firooz, Ghanbari, Abolfazl, Pourmohammadi, Mohammad Reza (2010). "An Attitude Towards the Concept of Inequality and Related Concepts in Socio-Economic Studies", Quarterly Journal of Tutor of Humanities - Planning and Spatial Planning, No. 2, Volume 14, pp. 121-141.

[15.] Jawan, Jafar, Abdullah, Abdullah. (2008). Spatial justice in dual urban spaces (geopolitical explanation of inequality patterns on the outskirts of Mashhad metropolis). International Journal of Geopolitics, 4 (12), 131-156.

[16.] Martenz, Javier (2009) The use of GIS and Indicatirs to Monitor IintraUrban Inequalities, A case Study in Rosario, Argentina, Habitate International, Vol33,No1, PP:387-396

[17.] Mikaeli, Reza, (2004, (Determining the model of location of educational spaces in Sari city using capabilities (GIS), Master Thesis, Tarbiyat Malim (Teacher's Training) University.

[18.] Mohammadi, Maryam (2008). "Women and Gender Justice Approach in Sustainable Development", Journal of Urban Studies, No. 25-25, pp. 56-63.

[19.] Parhizkar, Akbar (2004) Presenting the model and criteria for locating firefighting stations, urban and rural research center.

[20.] Rostami, Muslim, Shaali, Jafar. (2009). Analysis of spatial distribution of urban services in Kermanshah City. Planning Studies for Human Settlements, 4 (9), 27-52.

[21.] Salvo,G.;Simona S.;a GIS approach to evaluate bus stop accessibility, Transport Department_ Via Delle_ Palermo, 2006.

[22.] Shekohi, Mohammad, Rastegar, Mohsen, Mirjafari, Razieh Sadat. (2015). Spatial analysis of sports centers and study of its service radius in Zanjan. Geography and Regional Development, 13 (1).

[23.] Tabibian, Manouchehr (2007) A Comparative Comparison of the Urban Perspectives of John Rawls and David Harvey in the Philosophy of Justice, Shahrnegar Magazine, No. 48.

[24.] Tsou, Ko-Wan,Yu-Ting Hung , and Yao-Lin Chang.(2005), An accessibility-based integrated measure of relative spatial equity in urban public facilities, Cities, Vol.22, No. 6,pp.424–435.

[25.] Waresi, Hamid Reza, Zangi Abadi, Ali, Yaghfori, Hossein. (2008). A comparative study of the distribution of urban public services from the perspective of social justice; Zahedan. Journal of Geography and Development, 6 (11), 139-156.

[26.] Warsi, Hamid Reza, Ghaed Rahmati, Safdar and Iman Bastanifar (2007) Investigating the effects of urban services distribution on spatial imbalance of population, a case study; Areas of Isfahan City, Journal of Geography and Development, Spring and Summer of 2007.

[27.] Wisser. G(2003). Spatialities of Social Justice and Local Government Transition: Notes on and For South African Social Justice Discourse. South African Geographical Journal. VOL. 85(2).

[28.] Yaghfori, Hossein, Fotouhi, Samad, Beheshtifar, Jasem. (2013). Application of GIS in the analysis of spatial distribution and location of pharmacies (Case study: Drugstores in the city of Jahrom). Journal of Urban Research and Planning, 4 (14), 1-20.

[29.] Zakarian, Maliha, Mousavi, Mir Najaf, Bagheri Kashkouli, Ali. (2010). An analysis of population distribution and service distribution in Meybod urban areas from the perspective of sustainable development. Journal of Urban Research and Planning, 1 (2), 61-84.

[30.] Zangi Abadi, Ali, Saeedpour, Sharareh. (2018). Spatial analysis of "bank" distribution and their optimal location (Case study: Saqez city). Environmental Planning, 11 (40), 21-43.

[31.] Zhang& et al(2012), Using GIS and Multi-criteria Decision Analysis For Conflict Resolution In Land.

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