

Explaining the Concept of Risk and Analysis of Seismic Risk of Urban Areas (Case Study: Najafabad City)

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Extended abstract

Introduction

Iran is one of the most vulnerable countries of the world to the earthquake. According to the seismic hazard map of Iran, almost the whole territory of the country is in relatively medium to high hazard area. Najaf Abad town is located in 30 km of Isfahan with the population more than 221000 people (in the year 2011) and is a middle town. It has the most important service center following Isfahan within the urban set of Isfahan. In terms of geology, Najaf Abad is located within Sanandaj-Sirjan zone regarded as one of the most active zones. Based on the conducted studies, the occurrence of earthquake over this zone is constantly possible. With respect to the seismo-tectonics map of Iran, this county is located within a zone with a relatively medium hazard and the event of historical earthquakes in 20th century. The basic trend of faults and dynamic structures in this zone indicate the relatively high rate of seismicity of this area. Regarding the importance of the issues related to the earthquake, the main objective of this research is to study and analyze the risk of Najaf Abad city exposed to the possible earthquake. Basically, meaningful weights have been dedicated to physical and social attributes for evaluating the seismic vulnerability to provide a local model for practical application of seismic risky analysis.

Methodology

The data gathered in library surveys are including the maps, development plan and urban planning, aerial images, and statistical data related to population census in 2011. The procedure is based on a multiple decision-making approach. In order to analyze the data, Analytical Network Process (ANP) and Super Decision software have been used as maps and informational layers in ArcGIS environment. Hence, we have selected 5 criteria and 18 sub-criteria were considered to prepare the vulnerability map of the town to the seismic risk. The criteria selection is based on

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previous studies and the views of some experts in this regard. The earthquake risk of the study area have been analyzed using theoretical concepts and proposed model.

Results and discussion

Studying tectonic and faults conditions of the zone

Contact of the mountains surrounding the city with an active fault can threaten the city. The super-faults of Qom-Zafreh, Zagros and Rokh are located surrounding this district. The activity of the earthquake will certainly affect this area (Nabavi, 1976). Moreover, according to the studies recently done about the seismic condition of Isfahan, a lot of important active faults, some with a higher than 100 km long, have been detected within a radius of 100 Km of the Isfahan city (Safaei, 2005).

Studying seismic condition of Najafabad area

According to Iranian historical and Iranian earthquakes catalogues, there were several historical earthquakes (with magnitude higher than 5) and 95 earthquakes higher than 2.5 in magnitude in 1962-2014.

Urban vulnerability analysis by ANP model

The vulnerability of the city against the earthquake have been assessed as an integration of the effective factors including environmental, anatomic, social etc. and the coping capacity of community (emergency and management indices) in Najaf Abad city through 5 basic criteria and 18 sub-criteria. Therefore, the maps related to sub-criteria were initially prepared and converted into raster. Then, to weight the above indices, ANP model was used into Super Decision software environment. Finally, obtained weights have been applied to the relevant layers and the maps were overlapped as general vulnerability map of the city.

Evaluation of the earthquake risk to urban areas

The proposed model used in this survey emphasizes that the risk is resulted from two factors of hazard and vulnerability. In this model, the risk is based on the linear relationship between these factors as $\text{Risk} = \text{Hazard} \times \text{Vulnerability}$. Study of the tectonic conditions of the zone showed that there is always the possibly of earthquake event in this area. Entire the area is affected by a possible earthquake. Hence, with respect to the risk map of the town, nearly 33% of undeveloped area of the city is under the high risk. In addition, about 27% of this area has medium risk in the buildings with brick and iron materials and those without proper foundations, often more than 30 years old.

Conclusion

The results of different models have indicated that the risk is the combination of hazard and vulnerability. In this survey, analysis of the zone tectonic conditions showed that the threat of earthquake hazard is inevitable for this city. The results have revealed that about 60% of developed areas of the town were in a medium to high risk level. These areas were located in the central district of the town mainly constructed by masonry buildings. Finally, the combination of the population distribution map and the risk map has also indicated that more than 51000 people are in the high to very high risk zone.

Keywords: risk, vulnerability, hazard, earthquake, Najafabad.

Measurement and Evaluation of Urban Good Governance In Ferdowsieh Neighborhoods, City Shahriyar

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Extended abstract

Introduction

Today, good urban governance is considered as the most efficient and least costly solution for urban management. The rapid development of urbanization in Iran and the wide acceptance of people-oriented urban managements involve public participation and good urban governance. The urban proportion increased from 32 percent to 71 percent in 1956-2011. It is likely that the efficient management of the cities in the coming years is a major concern in the national management system. In general, one of the new phenomena in recent decades and in the twentieth century is the process of urbanization and excessive increase in population and physical development. The urban environment with a complex, dynamic and diverse needs requires substantial management capacity for providing urban governance. A model of good governance is currently the most effective, least costly and most sustainable management solution. The objective of this study is to introduce urban good governance approach to measure and evaluate indicators of urban good governance in Ferdowsieh City. This study is to measure and assess the variables of governance at the local level and offer solutions for the following questions:

What connections made between indicators of urban good governance are related to Ferdowsieh?

Which indicators of urban good governance had the most influence in neighborhoods of Ferdowsieh?

Methodology

Based on the methodology of this research, two common methods have been selected; the library and field survey. We have used the method to develop a theoretical framework to analyze previous studies on the relationship between social capital and social justice. After evaluation, we have reviewed relevant theories and knowledge of the current state of society, indicators and variables. The instruments used in this study, are questionnaire data using the whole five-item Likert. To ensure the validity of the questionnaire, the preliminary questionnaire was prepared to be filled by relevant experts. The reforms necessary to evaluate

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the reliability during a pilot study (pilot test) was assessed by Cronbach's alpha coefficient. In this study, we have applied t-test, correlation, regression and ANOVA.

Results and discussion

According to the one-sample t test in neighborhoods, urban good governance indices are: Level of participation, equality, effectiveness, responsiveness and security at a level lower than the average in urban neighborhoods. According to the analysis of variance compared with the average social capital and social justice in the neighborhood, the results have indicated that the neighborhood of Abbas Abad, Abd Abad, Khave, Ferdous and Mahmoudabad have the highest rate of urban good governance. The Pearson correlation coefficient test results show the indicators of urban good governance. In the Ferdowsieh urban neighborhoods, there is a significant positive relationship ($0/000 = P\text{-Value}$) and the hypothesis is confirmed. According to t-test, the effect of participation, equality, effectiveness, accountability and good governance of urban security on the dependent variables showed the greatest impact on urban good governance and the least citizen participation in neighborhoods Ferdowsieh.

Conclusion

Urban governance and urban management can be affected by citizen participation and their trust to urban managers. Citizen participation in decision-making is important for the management of neighborhood to achieve urban governance. In other words, good governance and urban social behavior patterns are affecting citizens. According to the literature reviews, majority of these studies have addressed the role of partnerships in urban good governance. It can be concluded that the participation of the indicators can lead to good governance. According to the results of this study, it seems that urban governance can be viewed as a mediator to improve management performance at the local level.

Keywords: urban good governance, participation, urban management, Ferdowsyeh city.

Evaluation of the Effects of Earth Surface Terrain on Land Suitability of Various Landuses (Case Study: Urmia County)

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Extended abstract

Introduction

In the contemporary era, vital environmental resources such as water and soil have experienced degradation. This is mainly resulted from increasing population, development of environmental harmful activities, inappropriate management and so on. Today, development beyond ecological thresholds and degradation of the main factors of development and human survival has turned into one of the major challenges of human society. If this trend continues, the world society will face with various problems such as food security, environmental conservation and preservation of natural heritage. From the perspective of land use planning, development of economic activities without taking into account the potentials and the degree of production capacity of land resources can lead to various environmental, social and economic problems in a specific region. Therefore, it is essential to understand appropriate management of land resources and its parameters for land sustainability.

Given the physical conditions of land such as topography and landforms in Urmia region, as the limitations for development, it seems that analysis of land characteristics and identifying limitations and potentials of this region can be used as an effective tool for development activities. The present study is aimed at answering this critical question that: how much topographic and landform conditions can affect land suitability for development in Urmia County. The results of this study helps to make a background for further evaluation of the land for determining various land uses in the region.

Methodology

Multi-Criteria Evaluation (MCE) method was used to identify suitable classes for developing activities. MCE is a method for combining data according to their preferences in making a given decision. At a conceptual level, MCE involves qualitative or quantitative weighting, ranking of criteria to reflect their importance to either a single or a multiple set of objectives (Heywood and

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et al., 2006). Since the last decade a number of multi-attribute (or multi-criteria) evaluation methods have been implemented in the GIS environment by WLC and consistency analysis in Analytic Hierarchy Process (AHP). Among these procedures, the WLC and Boolean overlay operations are considered as the most straightforward and the most often employed. WLC is based on the concept of a weighted average. The decision maker directly assigns the weights of 'relative importance' to each attribute map layer. A total score is then obtained for each alternative by multiplying the importance assigned for each attribute by the scaled value given to the alternative on that attribute, and summing the products over all attributes. When the overall scores are calculated for all of the alternatives, the alternative with the highest overall score are chosen.

Results and discussion

Operations of overlaying layers are including:

1. Map A

In order to produce map A, at first stage, slope and elevation parameters were compared. The Statistics of this map show that the highly suitable and suitable classes cover 31.66% and 30.31% of the total area, respectively. The results also show that the combination of the slope and elevation layers has covered approximately 40% of the total areas in limited and not suitable classes.

2. Map B

In order to produce map B, the standardized layer is overlaid with map A. The results of the topographic map indicate that only 21 percent of the total area is highly suitable for developing activities. In the second class, the suitable, covering 22 percent of the total area, the lands are suitable for some special activities.

3. Map C

By overlaying land type and map B to produce map C, more filtering was applied in structural land layers for developing activities. This phase can be regarded as the milestone of the layers overlaying process. In other words, in this step, by adding land type layer, main characteristics of land are combined with the geomorphology map of the region. By producing geomorphology map, the highly suitable area was decreased, significantly. Therefore, the highly suitable area is decreased to 13.02 percent, which indicate the high effectiveness of the land type in filtering of natural parameters for developing activities.

In final map, the drainage layer as an effective parameter was used in the analysis. The drainage map is generated from river density and line density function. The results of this map show that approximately 11 and 21 percent of the total area is attributed to two classes of highly suitable and suitable, respectively. By adding drainage layer to geomorphology map, the areas of the two mentioned classes were significantly decreased. According to final land suitability map, 33 percent of the total area is related to the classes of highly suitable and suitable, 28 percent to the class of marginally suitable and 38 percent to the class of not suitable.

Conclusion

The results of overlaying the parameters represented that topographic elements have played significant role in filtering of land suitability for developing activities. The results of overlaying the land evaluation maps with proposed land suitability have demonstrated that the classes of marginally, very low and not suitable, with slope of 20.18, 28.69 and 42 percent, respectively,

have severe natural limitations. The possibility of developing activities is not practical in approximately 67 percent of the total area. Therefore, topographic and landform characteristics of the region are the main constraints in development of the activities in Urmia County. Based on these results, development in Urmia involves prioritization of environmental issues and sustainable management of natural resources.

Keywords: topography, landform, Urmia county, geographic information system, MCE method.

Trans-regional Market and Landuse Changes in Surrounding Areas (Case Study: Markets of Sofa Yaftabad, Amin al-Mulk Market of Bags and Shoes, and Aluminum Avian Castle)

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Extended abstract

Introduction

Urban expansion in Tehran would initially rely on the market in different stages of development and urban development. Urbanization due to population extreme would not able to respond to the business needs of the population. New consumer products and large-scale services such as transportation and warehousing require major activities in the markets.

Commercial centers were often developed in conjunction with the main axes of movement over time and they are created in the course of its expansion. In essence, the commercial centers in urban areas formed the center of the megalopolis.

Most of the experts such as Jacob Riis believe that the proximity of a market to residential neighborhood provides the backdrop backgrounds for the area.

District 17 of Tehran as a sample in the present study is a disparate business unit. Most of the district is related to the megalopolis regional markets including the Amin al-Mulk special market of bags and shoes, aluminum market, and the Yaftabad furniture market.

Methodology

The goals of cognitive researches are to discover facts and develop the boundaries of human knowledge. This present study as kind of cognitive research seeks to identify physical changes in the communities under the influence of megalopolis markets. The comparative research is to assess the impacts of the extensive market centers on the landuses of the surrounding neighborhoods. The study has investigated the physical changes during the years 1980, 1996 and 2011. Thus, we have used a combination of quantitative-qualitative data through questionnaires and interviews.

The statistical population is the building blocks and urban neighborhoods. We have used SPSS to analyze the research hypotheses through one-sample t-test and make mapping by GIS.

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Results and discussion

In the study area there were landuse changes in residential, industrial workshop, and commercial landuses in Yaftabad neighborhood. Most of residential areas converted into workshops and stores.

In Hasan Shrine neighborhood, most of the landuses are converted into commercial and industrial centers and huge malls.

In 1996, the residential and transportation areas have the highest level of demands. A great majority of farms also converted into industrial and commercial workshops

In Bagh Khazane neighborhood, most of the agricultural, residential and transportation areas are converted into commercial and production centers.

In Bolorsazi Neighborhood, most of the district was occupied by immigrants of different ethnic groups. The trend was continued after the Islamic Revolution. This was responsible for the conversion of agricultural land and orchards into residential land.. In 1996, the residential, industrial plants and transportation have the highest landuse areas in the neighborhood.

Conclusion

The results of the study have indicated that many residential neighborhoods are now converted into markets and shop-commercial stores. These changes were the greatest in Yaftabad neighborhood. It can be concluded that establishment of trans-regional markets of the megalopolis in some districts led to spatial chaos in the urban structure of the neighborhoods and landuse changes.

Keywords: megalopolis markets, urban physical changes, residential neighborhoods, urban buildings, trans-regional markets.

Assessment of the Impacts of Physical Changes on the Urban Spatial Structure in Urmia Historical District by Space Syntax and GIS

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Extended abstract

Introduction

The structure and shape of the historic core in many ancient cities of Iran were mainly disregarded in urban development trends. This has led to some problems of inconsistencies with new physical changes, lack of appropriate link with existing structural network and spatial isolation. The main structure of a city is a set of interrelated and continuous urban spaces encompassing the essential elements and main activities of the city. Understanding this structure requires a thorough analysis of all aspects of the phenomenon. Among the theories dealing with the urban spatial structure, the space Syntax theory has useful capabilities to address the problems. In the past decades, Urmia has experienced major changes in its traditional structure and also the historic core of this city like many other cities. Under the influence of hasty actions, this has undergone numerous difficulties. The objective of this paper is to identify and analyze the growth process of urban development of Urmia and its structure. Thus, we have addressed the effects of contemporary physical changes on the spatial structure of the historical district and the relationship between key elements of the historical structure to investigate the spatial coherence. We have used the Space Syntax theory to analyze the structure and spatial configuration of the city. According to selected parameters for analyzing the urban structure during various periods, the main goal is to study the changes of values and the performance of historical texture through the analysis of the elements of urban spatial structure and the output spatial parameters of this theory.

Methodology

This is a descriptive, quantitative and a comparative research in methodology. In this study, the Urmia city and its historical district is analyzed with the Space Syntax method using AutoCAD, Depth map and ArcGIS. In order to study the spatial structural changes of Urmia city and its impact on the spatial structure of the historic core of the town, based on available documents and maps, four main periods of physical evolution of the city, i.e., the years of 1933, 1976, 1994, 2016, have been considered for analysis of its structure through the space syntax theory.

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After the parameters and analytical maps of the space syntax were analyzed by the comparison of the periods, validity changes have been assessed. These are considered as the most important concepts in this method to study four factors of coherence and coordination of the structure of the historical district, assessment of value and importance of historical orders and its main elements and the manner of distributing activities in the range.

Results and discussion

The results of this research have revealed that the lowest deviation and the highest amount of affiliation and thus urban coherence is related to 1933 following physical changes of the city with reduction of structural integrity. The values of urban affiliation in historical range during the four periods indicate that the average historical context of the city is less than that of the city affiliation. This implies that the internal structure of this area has not been related to these axes. The changes in the values of the inter-connection of the main historical orders have been studied for structural analysis of the main axes.

The spatial physical value of the axis is degraded to inferior position, because both the average value of the interconnection of each axes and also the average difference between the axes are declined compared with previous periods. In the subsequent analysis, public spaces containing historical market and the main fields of the historical core (The Velayat-faqih and Ayalat square) and the central mosque of the city have been considered as the main religious element in the texture. Integration of factors shows that until 2016, the extent of the interconnection of the main historical spaces has been reduced as one of the major city activity centers. The next criterion examines the overlaps of the most integration axes with the active and attractive users of the cities and their relationship.

Conclusion

According to the results of this research, it was revealed that the performance and historical coherence and its relation to the structure of the city have been reduced under the influence of physical changes over the time. The internal structure of this range could not be mingled with the overall structure of city. A large part of identity values and physical texture affected by these changes have been lost. The spatial continuity of main elements and the functional significance of historical orders have been weakened under the influence of the changes. This indicates that the rapid physical changes in the recent years had negative effects on the spatial structure of historical range of Urmia city.

Keywords: structure, urban space, space syntax, Urmia, historical district.

Evaluation of the management Competence of the Organizations Responsible for Rural Coastal Tourism Destinations in Guilan Province

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Extended abstract

Introduction

Although there is no reliable data on coastal tourism as a separate section of tourism industry, it is generally considered as one of the fastest growing forms of tourism in recent decades. Here again, UNWTO statistics show that 12 of the 15 world's top destination countries in 2000 were those with coastlines (UNEP, 2009: 2). Sun, beautiful beaches, and warm ocean waters have become standard vacation requirements for many tourists. Forty-nine percent of those visiting the Caribbean do so for the beaches, while 28 percent are primarily interested in sightseeing, and 17 percent in water sports. Moreover, roughly 25% of the jobs in the Caribbean are directly or indirectly tourism related (Bridges, 2002: 93- 94).

Capacity is defined as the organizational and technical abilities, relationships and values that enable countries, organizations, groups, and individuals at any level of society to carry out functions and achieve their development objectives over time. Capacity refers not only to skills and knowledge but also to relationships, values and attitudes, and many others (Morgan, 1998). Capacity at the organization level will determine how individual capabilities are utilized and strengthened. It refers to anything that will influence an organization's performance (JICA, 2004). Key to the success of any of the processes discussed above is the persons with the necessary capacities to effective participation. According to Innes and Booher (2003) an individual with more capacity to participate in collaborative processes is one with a particular set of skills and a better understanding of problems and opportunities and of others' perspectives. The integrated and coordinated process needed for achievement of the sustainable development will draw on a wide range of skills, some of which might be new to those involved (Innes & Booher, 2003). The aim of this study is to evaluate the management capacity of the organizations responsible for handling coastal tourism destinations.

Methodology

The research has a descriptive-analytic method. In this research, organizations management capacity were evaluated by the questionnaire in 6 dimensions of leadership, human resource management, financial resource management, crisis management, ecological management, economic management and social management. One-sample t test was used for analysis. The

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sample size was 22 people, including managers and experts of the responsible organizations in coastal tourism destinations.

Results and discussion

Organization management capacity was evaluated in 6 dimensions. Results of the dimensions are the following:

Leadership: Creation of harmony between different units for coastal projects (1.95), prioritization of coastal tourism problems (1.72), the rule of law on the implementation of the Coastal Plan (1.27), the registry and archive data for coastal plan (1.27), doing things in the organization for coastal projects (1.09). The distribution of powers are balanced through the leadership of the organization for coastal projects (1), as the basis for control, monitoring and evaluation through the rules and regulations related to coastal tourism (0.9), saving time to decision making about seaside plot (0.81), the existence of regulations, encouraging employees in the organization (0.72), the management system of monitoring and evaluation, based on the structure and functioning of the villages in the project area (0.36), the use of external specialists for coastal tourism (0.18) and thinking room for coastal tourism with the participation of specialists (0.04).

Ecological management: creation of green spaces in the beach (0.63) proportional to the number of tourists and the area of the site and the potential of the site to reduce congestion and pollution (0.54).

Economic management: creation of a legal framework to facilitate investment community on the beach (0.18), creation of a legal framework for community investment tax breaks on the beach (0.36), creation of job opportunities for the local community on the beach (0.81), creation of sale opportunities for local production at the beach (1.45) and reduction of the cost of job creation by the local community on the beach (0.18).

Social management: attention to social illnesses (crime, theft, drug addiction, etc.) in the village (0.18), upholding the faith of rural people in coastal plan (0.13), maintaining villagers in traditional coastal design (0.18), keeping rural family integrity in coastal plan (0.13), and maintaining public safety in the seaside villages (0.22).

Human resource management: financial experts for encouragement (1), encourage of experts to promotion (0.13), proper screening of knowledge (0.18), a decent choice based on experience (0.18), deserve choice based on the knowledge and experience (0.27) and build skills in coastal staff (0.36).

Conclusion

Coastal areas have long been of interest to tourists. The areas have the potential capabilities (beautiful combination of sea and beach, serenity of environment, etc.) for tourism development and the ability to attract tourists from near and far. Management organizations play important role in the effective and efficient use resources in planning, organizing, and mobilizing resources, guidance and control in order to achieve the organization's objectives in the development of coastal tourism. In the study area, these organizations are resulted from poor management of coastal development purposes. In order to improve management capacity in coastal development purposes, we can consider the following actions:

Promotion of the necessary management capacity is an intellectual leadership. Academic experts can bring together in conjunction with the development of tourism to synergy. Human resources management as another factor plays an important role in development of coastal

tourism. In the majority of enterprises, human resource management is not properly and thereby allocating the tasks to tourism experts. It has the ability to do these tasks necessary for admission. It is necessary in the assignment of tasks, based on criteria for switching a decent education, knowledge and experience to motivate the financial incentives in the form of experts and occupational promotion, especially as conditions of competition among the experts.

Keywords: organization, management capacity, coastal tourism, tourism destination, Guilan.

Spatial Evaluation of Urban Environment with Green City Approach (Case Study: Tehran Metropolis)

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Extended abstract

Introduction

With rapid growth of the urban population of the world and increasing concern about the environmental issues, the challenge of making urban societies more sustainable have attracted the attention of many designers, academics and government officials.

The 3E approach examine urban development within the context of economy (the competitive city), equity (the inclusive city), and environment (the green city). Each initiative has the key components for achieving such a city to support the other, providing the basis for sustainable urban development.

There are many approaches of sustainability including green city, eco city and livable city. Each approach is focusing on specific issues of sustainability. Green cities are defined as the cities striving to lessen their environmental impacts by reducing waste, expanding recycling, lowering emissions, increasing housing density while expanding open space, and encouraging the development of sustainable local businesses.

Green city concept in the late twentieth century was outlined as one solution to reduce urban environmental problems in the cities to achieve sustainable urban development. Given that Tehran is faced with critical air pollution, urban density, rapid population growth and the ever increasing uncontrolled sources of pollution, it seems necessary to study the status of Tehran based on the indicators of Green City. This can be a suitable approach for planning and achieving environmental sustainability and sustainable urban development in the future.

Methodology

The aim of this study was to assess the environmental status of Tehran using Green City Index.

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The method used in this study has been designed and developed in two main steps. The first step is to determine and identify the emergence of Tehran, as discussed among Asian cities. To identify Green City Index, we have used fuzzy multi-criteria decision-making models to assess the effects (weight) of each index. We attempted to prioritize and determine the position of Tehran among Asian cities. In the second step, after the recognition of green in the city of Tehran, we have assigned specific weights to each of the indices of Green City in the first stage using VIKOR ranking. We also attempted to rank and prioritize each of the 22 districts of Tehran based on the areas identified in the current situation in Tehran.

Results and discussion

Today, cities play a considerable role in environmental degradation that has led to an unstable ecosystem. Planning and urban management approaches of green city are based on ecological management with the implementation of environmental indicators of ecological sustainability and sustainable urban development.

The results showed that the weight of carbon dioxide is 0.1836, transportation 0.1585, and air quality 0.1494 among the most important indicators. We have used VIKOR Technique and Fuzzy Analytical Network Process (FANP) for weighting in the index. This showed that Tehran is ranked fifteenth among selected Asian cities as a relatively unfavorable position. Tehran is faced with negative factors such as the release of CO₂ (8.7 tons / person), population density (12,411 people / km²) and water loss (percent) higher than the average, as well as positive measures such as energy share of GDP (3 / 4) and per capita green area (6/15 m). It has access to sewerage, and sewage treatment rate has been lower than average. The city in indices of per capita waste generation, water consumption and particulate matter is relatively well compared to the average Asian cities. Among the 22 districts of Tehran, the districts of 10, 11 and 12 has the lowest ranking of the environmental status of the green. In other words, the eastern areas of Tehran relative to central and western regions of the urban landscape are better in green indices. In contrast, the central areas due to population density, increased traffic, increased air pollution, and more carbon dioxide emissions are worse among other parts of Tehran.

Conclusion

The major strategies to achieve and reach the green in Tehran, it is possible to reduce municipal solid waste, energy efficiency, conservation of urban ecosystems, the development of sustainable transport, air pollution control, sustainable urbanism and green building and plan for quality improvement environmental issues. We can move toward sustainability principles to achieve green city using public participation, public transport, green and efficient energy saving, waste management, use of renewable energy, reconstruction of buildings, and use of efficient technologies, development of more pedestrian and cycling routes, local policy, and a council to protect the environment, environmental education of citizens (from primary schools to parents and citizens), a collaboration of institutions and organizations and implementing preventive laws.

Keywords: green city, urban environment, Fuzzy Analytical Network Process (FANP), VIKOR, Tehran.

Ranking of Rural Area Based on Livability Indices (Case Study: Nezamabad Rural District, Iran)

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Extended abstract

Introduction

The rural settlements throughout the world are faced with many problems such as unemployment, migration, poverty and environmental degradation. Because of existing deficiencies in services and facilities, this situation decreased the general inhabitability of rural settlements especially in developing countries. Therefore, understanding the needs of rural people and making these spaces livable could improve the quality of life in rural area to provide the appropriate condition for achieving sustainable development goals. Getting to this purpose involves promotion of the livability level and inhabitability of rural environments as a main place of rural living and employment. Because nowadays, in most cases rural environments haven't enough standards of living due to many reasons such as faults in private living facilities. These could, consequently, increase spatial un-sustainability for inhabitants. This condition observed in rural areas is farther from urban environments. In order to make a planning for the rural areas, we need livable and inhabitable spaces as a living and employing place. It is needed to identify the effective indicators and also make a ranking of the rural points based on these indicators for recognizing the spatial livability differences among them.

The purpose of this paper is to study the concept of rural livability in academic literature and codify the rural livability indicators by sustainability dimensions using multiple criteria attention. We are to make a ranking of the rural points using multi-criteria decision making techniques in Nezam abad Dehestan, Azadshahr Township, Iran. This research attempts to address rural point livability based on the determined criteria by VICORE technique.

Methodology

This is an applied study by analysis – explanatory methodology. The main goal is to make a ranking of the rural points based on livability criteria. For gathering the needed information, we

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have used documentary and field study observations through questionnaire. For the rural points, finally, 4 dimensions and 16 criteria have been selected as a livability indicator mentioned in theatrical literature. Validity and reliability of the indicators have been tested for the 34 questionnaires through Cronbach's alpha ranged from 0.62 to 0.81. The statistical community of this study contains 17 villages selected from 22 recorded rural points in 2011. The sample size determined by Cochran formula is 94 households among 3874 households. To analyze the data, we have used statistical tests compare mean T-test, MCDM techniques, and VICORE.

Results and discussion

The results of T-Test statistical examination of respondent attitude show that 8 criteria of livability indicators were meaningful in the study area. This has indicated that there are meaningful differences among the means of livability indicators in rural points of the study area. Thus, the obtained significant differences of the results in the alpha level of 0.05 have documented that from 16 indicators to measure viability; only 8 criteria have been meaningful at alpha less than 0.05 and accepted as a livable area. The ranking of the rural points based on MCDM techniques confirmed that Ghurchay and Hajinabi is in lowest level of livability.

Conclusion

The results of data analysis have also been confirmed by real observations through field study. Therefore, it is possible that these criteria can be introduced as a proved pattern for other rural areas to measure the level of livability. These criteria could be helpful for rural development planners to revise policies and plans for improving the rural spaces. The planners and managers must focus on promotion of the livability criteria in rural points to improve the rural spaces for inhabitants. Therefore, the managers should allocate the development credits and loans to focus on improvement of the rural livability especially in less livable villages.

Keywords: livability, quality of life, rural area, VICORE, rating.

Making Smart; an Approach for Attaining Sustainable Urban Development (Case Study: District 6 Tehran)

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Extended abstract

Introduction

The concept of the smart city over the past two decades has found great popularity in the realm of science and politics. The term of development focuses on improvement of the level and quality of life for individuals and enhancement of the general welfare of society. Its sustainability refers to the continuity of this process throughout the human generations. As a result, the sustainable development will encompass all the aspects and dimensions of human life. Sustainable development focuses on the qualitative and quantitative aspects. Since 1990, the term of Smart City has been expanded with the liberation of telecommunications and the development of services provided through the internet.

What drives a city into intelligence is not merely the application of electronic device and communication system of that city. The Smart City is a city administering all the affairs of its citizens online including public and private services. Thus, one of the main differences between the smart city and other urban concepts (virtual city, electronic city, digital city, etc.) is the ability of the smart city to answer and solve the urban problems of citizens in a hierarchy. The citizens of Smart city have a high responsibility for their settlement because they are more aware of their own city and can participate in its administration. They will provide service at their level of participation. Thus, the major roles the smart city can play are including smart environment, smart mobility, smart economy, smart governance, smart life and smart people. This study attempts to examine sustainable urban development in Tehran 6th metropolitan area with 14 neighborhoods. One of the main physical features is its location in the city center of Tehran in one hand and the establishment of the most important administrative-service utilities with a transnational, urban and even national scale of service-oriented utilization on the other hand. This kind of application is faced with many challenges and problems such as blending of resources, population overflow in the region, concentration of ministries and important national organizations. These factors can cause instability in the neighborhoods of this region.

Methodology

The current study was conducted using a survey method and a questionnaire tool to collect data.

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Measurement tools (questionnaires) have formal validity. Cronbach's Alpha coefficient was used to obtain validity of the tool. The statistical population of this study is all the residents in the district 6 of Tehran, by cluster sampling method.

The district 6 may be considered as one of the central areas of Tehran. This neighborhood is geographically limited to the Enghelab Islami Street from the south, to the Hemmat highway from the north, to the Modarres highway from the east and to the Shahid Chamran highway from the west. The district of the municipality is divided into 14 neighborhoods.

Results and discussion

The results of this study indicate that there is a solid correlation between smart environment, smart governance, smart mobility, smart people, smart living, and smart economy. Each of the smart urban components will increase the stability of the district. This finding is confirmed by the research findings of Su, Li and Fu (2011), Awosusi and Jegede (2013), Lee and Hu (2013). The results of regression analysis have indicated that three factors of smart mobility, smart people and their smart life affect their significant sustainability as the most important factors. The proportions of the smart mobility, smart people and smart lives are 26%, 16%, and 28%, respectively. Thus, among these factors, smart life is the most influential factor in explaining sustainability. The results of this research are consistent with the research by Ni and Liu (2014).

Conclusion

The term of development focuses on improving the level and quality of life of individuals and improving the general welfare of the community, and its sustainability refers to the continuation of this process in future. In this way, sustainable development embraces all aspects and dimensions of human life. Paying attention to the purposes, principles and philosophy of sustainable development explain that sustainability of development depends on the participation of the people of a country in the planning, implementation and evaluation of projects. Since sustainable development has a quantitative and qualitative dimension, it is necessary to change the attitudes, skills, and perspectives of individuals. The development proceeds more quickly and this is not possible without the cooperation of all people. In sustainable development, people constitute the true wealth of every nation, and the purpose of development is to create conditions to enable people to enjoy a long healthy life.

Over the past decades, cities have become increasingly important in economic, environmental, social, and development trends. These agents, in turn, depend on the real and focal point of political and economic strategies. The smart city is about how citizens can shape the city and how it can contribute to urban development. The smart cities join to each other by strategic planning initiatives from a bottom-up perspective. The planning approaches from top to bottom and from bottom to top must be complementary. The areas, neighborhoods, and urban spaces are key elements of smart city strategies. Therefore, the current paper argued that the use of new methods such as urban intelligence with intelligent economy, smart people, smart environment, intelligent mobility, and intelligent governance can realize purposes of urban sustainability. The main goals are including supply of basic needs, improvement of living standards, better management of ecosystems and a secure future in several economic, social, cultural, environmental, and physical aspects.

Keywords: smart city, sustainable urban development, sustainability, communications and information, district 6 of Tehran.

Structural Adjustment Policies and Transformation of Rural Economy in Rezvanshahr, Iran

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Introduction

The rural settlements of Rezvanshahr are faced with shortage of capital, lack of suitable economic infrastructure. These conditions resulted in improper use of productive and active rural labor forces in three economic sectors. This can lead to hidden and seasonal unemployment and consequently reduction of economic power and living standards of rural residents in the study area. The rural people are dependent upon agriculture and agricultural income without any industrial potential, such as agricultural conversion industries. This led to the lowest value-added agriculture products for the villagers. Therefore, severe economic vulnerability, rural income instability and employment constraints and the lack of job opportunities are the important structural features of rural economy in Rezvanshahr. These have been aggravated by disregarding of government. Therefore, the study attempts to examine the impact of subsidies, as one of the structural adjustment policies, on rural economy in study area. The villagers as the most vulnerable sectors of society are faced with economic and social problems. The important reasons are low income in the rural areas and even the productivity of the agricultural sector. It is obvious that the study of the impacts and the consequences of implementing this project, especially in the rural households affected by their economic conditions, can be helpful for decision-makers and policy-makers. Accordingly, the present study attempts to investigate the reflection of subsidy payments in rural settlements in Rezvanshahr area.

Methodology

This research with a qualitative approach as a methodological framework mainly focuses on grounded theory approach. To examine the reflection of targeted subsidy plan, collaborative observations and semi-structured interviews are based on exploratory approach. Statistical population is all the villagers and local people including council members, governors of rural districts and other villagers. The villages have been classified into three categories in terms of receiving subsidy. About 20% of the villages were selected as samples. Snowball sampling was used for selection of the villages under study. The sample size was 53 based on theoretical

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saturation. According to grounded theory, data from interviews were analyzed in three steps: open, axial and selective coding. The research validity was examined via members control and self-monitoring.

Results and discussion

Investigating the views of local community have revealed that in the villages of Rezvanshahr area, similar to other regions of Iran, the liberalization of energy carrier price both in non-manufacturing and manufacturing sector has led to increased costs in moving different goods and rural travels. Income growth among rural households due to receiving subsidy improved the savings for some households with previous financial ability. Some rural dwellers with no financial ability, on the other hand, said that the subsidy as second sources of income has partly influenced the trust among villagers, especially in lending and borrowing money among relatives. The urban relatives could more easily borrow money to the people because they believe that if agricultural revenues were not sufficient they could pay off by the subsidies. According to the views of the villagers in the Rezvanshahr area, after implementation of the Targeting Subsidy Act, the owners with more agronomic background gained more advantages from production subsidies in form of receiving fertilizers and poisons. Accordingly, it can be said that economic inequality has been fueled by subsidies in the villages. In the rural area of Rezvanshahr, as the dominant pattern of most rural areas in Iran, the households can be divided into two economic situations in relation to subsidies. Based on a six-year experience from targeted subsidies plan and its cash payment, the villagers become dependent on the determined "supplementary income" (subsidies). As cash subsidy payments, in one hand, depends on the ruling government and on the other hand, is a function of the country's oil revenues, rural income system has always been exposed to political and economic (mainly psychological) shocks especially during the elections.

Conclusion

The targeted subsidy plan as one of the implemented structural adjustment policies in Iran has caused reflections in the rural economy of Rezvanshahr. Based on selective coding, it can be said that there were three core categories as the result of implementing this policy. The categories are including change in the cost and income of villagers, changes in the system of production and consumption of wealth in the rural economy, and risk-taking growth in rural economy. Given that the subsidies are usually spent shortly after payment (up to 5 days), it creates a significant momentum in the flow of capital between rural and urban economy and then a depression appears in the market and trading sector. This situation is a reflection of growing dependence of the economic cycle (on the trading side) on subsidy payments in rural areas. The system and the source of subsidies, along with more and more dependence of villagers upon the subsidies have led to a drastic increase in the process of globalization and politicization of rural economy. Finally, it can be said that despite that rehabilitation has not happened in the rural economy in relation to its constituent elements (villagers) and the compensation for losses of stagnation does not happen very quickly, the targeted subsidies and its current support pattern (cash payments only to households) does not result in strengthening of the foundations of this economy.

Keywords: structural adjustment policy, rural economy, rural settlements, targeted subsidies, Rezvanshahr area.

Informal Life and Relationship between the Seizure Security and the Quality of Life, Boomhen, Iran

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Extended abstract

Introduction

Urban issues cannot be solved simply by technical and engineering methods. The urban issues are very complex and require a multi-facet and equally complex approach. Social exclusion and space issues such as marginalization, informal economics, informal settlements, slumming, problematic textures, worn-out texture, and etc. are the urban issues well understood by the common sense of the concepts of city and space collapse.

Despite the existing laws, plans, and studies carried out over the past decades, we are witnessing the expansion and intensification of social and spatial exclusion. Urban fringes are no longer physically marginalized, but they can also be seen in urban centers. Capital accumulation at one point is necessarily accompanied by impoverishment at another point. These are interconnected internally. Consequently, poverty and urban inequality are not the phenomena like what we usually know. Poverty and spatial inequality are the inevitable phase of the capitalist mode of production.

Today, urban issues resulted from the powerful process of capital, have a decisive role in everyday life of humans. The global urbanization process, as its global trait is no longer limited to some cities in some countries. Now all countries and cities are involved in this process.

The growth of urbanization and the fear of its maladaptive phenomena in different areas, especially in large cities in metropolises, have forced urban planners to embrace new social orientations and trends to strengthen social considerations in urban studies. One of these tendencies with a tremendous impact on the evolution of the views and methods of urban planning in the second half of the 20th century was social theory and attention to the quality aspect of development. These elements today consolidated its position in terms of quality of life and social welfare. One of the main goals of addressing the quality of life is to achieve human security in its general sense.

Methodology

This research has a descriptive-analytic approach. This research has been conducted by library and field method. In order to formulate theoretical basis of the researches, we have used available statistics and documents including statistics in urban plans related to the Ouzoon

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Tapeh neighborhood and population census statistics. In order to collect data from the field study area, we have used a questionnaire. The questionnaire was developed in the research process based on the goals and theoretical framework. For data analysis, we have employed statistical analyses including factor analysis (for statistical structuring and determination of superior factors), scaling (for questionnaire items), and Pearson correlation and regression statistical techniques for relationships among the variables.

Results and discussion

While private-sector is the key provider of housing for most people, government action is needed to support the activities such as providing roads, sewage, water, regionalization controls, public transportation, and environmental standards. Government action also regulates what makes housing including construction standards, health and safety regulations, height restrictions, and planning controls. However, the government also intervenes cautiously in regulating the profitable private financing.

Conclusion

As the political focus on housing is in highest level and housing and economic conditions are deteriorating, there is an opportunity to cultivate a progressive housing movement that can bring low-income and middle-income tenants and landowners around their shared interest in desirable housing. What we need is a plan that can change the current state of the debate on housing. An efficient plan for housing should challenge the nature of housing markets and their role in our economic and social system to meet the needs of people's legitimate housing through an alternative approach.

The purpose of such an alternative program can be stated as follows: providing affordable housing with appropriate proportions and desirable quality, with security, located in a supportive neighborhood for all individuals, and for all groups of community. A second strategy for the commoditization of housing can be an attempt to limit the role of profit in decisions affecting housing, instead of replacing the fundamental principle of social need. Another point is that the ideological core of the discourse of the new housing policy is that all income groups have their own segments in the housing market.

Keywords: informal life, seizure security, quality of life, human geography, Ouzoon Tapeh.

Explaining the Factors Affecting Differentiation of Economic Activities among the Villagers (Case Study: Villages in Saqez, Iran)

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Extended abstract

Introduction

Today, many villages in Iran are vacated and many dwellers left their home villages mainly due to weaknesses and inefficiency of rural economy. Diversification of economic activities in rural areas is considered as a strategy for rural households to increase their income sources through which they can have an appropriate response and ability to deal with economic shocks. The stability of a settlement reflects the equilibrium and dynamism of rural settlements in relation to natural-ecological, socio-cultural, economic and spatial-physical structures. Thus, it ensures the stability of a settlement during spatial trends. Hence, special attention is paid to rural development, and adopting monetary and credit policies for the governments of the Third World Societies. This can play a major role in facilitating and directing development, and investment. Injection of financial resources can play a very important role in fostering rural livelihoods and achieving sustainable rural development goals.

Methodology

This research has a general quantitative approach using librarian-documentary and field survey techniques for collecting data. Firstly, for identifying the indices and indicators of diversification of economic activities with special emphasis on rural areas, we used the related studies. The components and items of sustainable livelihoods were identified based on a questionnaire designed as the main tool of the research in field studies. To increase the validity of the method, we also used the content and formality of the method. In this regard, the validity of the research tool was confirmed by a number of experts in the field using the Cronbach's alpha technique. The Cronbach's alpha value for this tool obtained 0.905 which indicated the appropriate reliability of this research tool. To identify the villages, they first were divided into 5 groups of 20-50 households, 10-51 households, 150-101 households, 152-150 households, 250-95 households and 525-500 households. After selection of sample villages, based on the

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Cochran formula, 300 families were selected as the sample size determined in proportion to the population of the villages.

Results and discussion

To investigate the relationship between educational variables and number of activities, as well as income and activity variables, we used Lameda, v Kramer, Goodman and Kruskal tests. The results of these tests show that since sig is less than 0.05, then there is a significant relationship between education and the number of activities. As the level of education increases, the number of household activities and number of income sources also increases. Field analysis showed that among the 123 out of 136 uneducated families with primary education, 123 cases had one activity and only 12 cases had two activities. The results of Lameda, V Kramer, Goodman and Kruskal tests confirmed that there is a significant relationship between the number of activities and income increase in the study villages. This means that the households with more economic diversity have higher income. Among the total households surveyed, 204 people have an annual income of 5 million or fewer. All these households have one type of economic activity. The research findings also revealed that among the 71 households with income levels between 5 and 10 million, 45 cases have dual activity and 6 cases have 3 types of economic activities. One of the weaknesses of rural households is that they do not have diverse economic activities and only rely on agricultural activities. This showed vulnerability of their income and livelihood to shocks (human and natural). For this purpose, Lameda, V Kramer, Goodman and Kruskal tests were used to investigate the relationship between livelihood vulnerability of rural households against shocks and number of activities. The results of these tests show that in the studied villages there is a significant relationship between the number of activities and their livelihood vulnerability to shocks. Therefore, the households have side activities with their agricultural activities are less vulnerable than those only with one activity. There are a number of economic activities in which there is an increase in income. This means that households with more economic diversity have more income. Among the total studied households (68.18%) who had only one kind of activity, their income and livelihoods were affected by climate shocks such as drought, floods and pests. Friedman test (rank average) was used to prioritize the key factors affecting the diversification of economic activities from the viewpoint of villagers. The statistical results of the test show that there is a significant difference between the factors at alpha level of 0.05. The average results of the Friedman test also indicate that the government support factor is ranked first for diversifying the activities.

Conclusion

The diversification of economic activities in rural environments can be seen as a consistent and dynamic process in response to threats and opportunities through which farmers can manage risk and can also increase their income and livelihoods, maintain their livelihoods and ultimately improve their living standards. Descriptive findings showed that from the perspective of the sample society, the government's financial support can have the greatest impact on the diversification of economic activities. The government supports are including enhancement of appropriate facilities to farmers, the availability of savings and financial resources for farmers, the purchasing guaranteed crops, promotion of horticultural and livestock, entrepreneurship development and intermediary removals in selling products, and raising the level of knowledge of the people about the affiliated businesses. In confirmation of the descriptive findings, Friedman's test also shows that addition to the factor of government support for diversification

of jobs, the second factor that influences the diversification of economic activities from the perspective of the sample population is the financial resources and household savings.

Keywords: diversification, rural areas, economic activities, viewpoints of villagers, Saqez County.

Urban Land Policies and their Effects on the Physical Development of Isfahan City, Iran

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Extended abstract

Introduction

Isfahan is one of the ancient cities of Iran and its history dates back to thousands years ago. Before 1921 (1300 SH) the growth and development of the city was very slow and it had still a proportional and organic relationship with its neighboring villages. After 1921, however, the urban growth of the city was relatively slow and the first urban planning projects as construction of streets were conducted and the traditional form of the city was changed.

In recent decades, the population of Isfahan, like many other cities of Iran, is quickly increased. According to Statistical Center of Iran, the population increased from 254708 in 1956 to 1908968 in 2011, i.e., more than seven times the value during the half century of 1956-2011. The undesirable consequences of population growth destructed gardens and countryside's farms. This led also to formation of suburb settlements.

The purpose of this present research is to examine urban land policies and its effects on Isfahan urban physical development. The main issue is the study and analysis of imbalance between urban land policies and development goals of urban comprehensive plan of Isfahan, especially after Islamic revolution. Therefore, the failures and problems are the methods of performing comprehensive plans that influence urban land policies on the city's physical development.

Methodology

This study is a basic-applied research performed using a descriptive-analytical method. The Isfahan's city as the study area was examined by the methods. The data were collected through studying available texts and documents and internet sites. Other sources of information were interviews with the experts of urban development and urban practitioners and workshops professionals. The urban development map was prepared using aerial photos of Isfahan city and urban maps. The data were analyzed quantitatively using SPSS, Excel and ArcGIS.

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Results and discussion

The comparison of Gross Urban land per capita of Isfahan city and gross density of population during 1956-2011 shows that except for 1956 the gross urban land per capita was higher than population density of the city. However, this does not mean that all citizens enjoyed urban utilities the same way, instead, it means the excessive supply of land, especially in 1996 the urban gross per capita was at the highest point.

The process of Isfahan urban expansion and physical development (1921-2011) revealed that the extent of the city during the last 90 years has increased by 12 times. If it is calculated by its extent in 2006, before Khorasgan being merged with legal limits of Isfahan, it will be found that the city has expanded by 11 times. The slow development of the city during 1923-1956 can be observed in figure 2. Since 1965, especially following land reforms and the implementation of development plans, the development trend has been increased. Thus, the city was extended around 4.5 times by 1956. Following Islamic revolution of 1979, until 1996, the the extent of the city increased considerably. This was the result of the urban policies made after revolution and the lands assigned. After 1997 and due to the policies adopted by the seventh administration, i.e. the policy of adjustment of land assignment, the trend experienced a decrease.

According to the aerial photos and urban maps, it can be found that during the mentioned period, the city has developed in all directions. Indeed, the development is much significant in the North, Northwest, West and Southwest parts of the city (Eastern development of Isfahan in 2013 was occurred as Khorasgan merged with Isfahan). This kind of development transformed many of the gardens and farm lands around the cities into urban and residential areas. Therefore, regarding the fast development of Isfahan during the last decades, a definite border for Isfahan cannot be explicitly defined; instead it should be called urban region or metropolis of Isfahan as merged with surrounding suburbs.

Conclusion

Following development of cities, the policies of urban land and the way they were implemented has gained importance. It is because the land is the basis for urban development and the main factor in the formation and development of cities. It should, however, be considered that growth and development of cities without control and a comprehensive plan will result in undesirable economic, social and cultural consequences. But this doesn't mean the negligence of inadequacies observed in comprehensive plans (whether in study or performance phases). Instead, it is necessary to overcome weaknesses of comprehensive plans. In this way the development and expansion of cities will be controllable, schedulable, as well as predictable. By presenting a model, a comprehensive plan should predict future conditions, especially the physical development of the city. On the other hand, the urban land policies should be so accurately designed that achieve the development goals of comprehensive plans and prevent the excessive growth of the cities. Therefore, this present research wants to evaluate and analyze comprehensive plans and how they influence the physical development of Isfahan.

The results of the studies performed in Isfahan show that in one hand the weaknesses of performing comprehensive plans (especially organic comprehensive plan) and inconsistency in urban land policies with development goals of these plans (especially after Islamic revolution) to examine the excessive growth of the Isfahan city.

Keywords: urban land policies; physical development; comprehensive plan; Isfahan City.

Spatio-Temporal Modelling of the Urban Environment Quality

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Extended abstract

Introduction

Fast growth of urban population and increasing demands for high living standards have intensified the pressure on natural resources and made it more difficult to answer every need. Regardless of the fact that environmental capacity, population and economy would affect the fundamental functions of the environment. Thus, analysis of the environmental quality can help us to understand the exact need for natural resources in any urban areas along with its economy and social development. The quality of urban environment is recognized as an indicator for assessing and measuring the degree of suitability in urban settlements. It is also a rate for meeting the needs of individuals and society which can be affected by several factors such as air, noise and etc. All these factors would vary by any changes in time and space. Previous studies mainly focused on spatial changes, but in this research we seek to consider seasonal changes in addition to spatial ones. We have also tried to use more complete set of indicators. Therefore, the main purpose of this study is to make a modeling of the quality of urban environment based on a set of spatio-temporal factors.

Methodology

We have used satellite imagery and some geospatial data including NDVI maps, land surface temperature, land surface moisture, land surface albedo, solar radiation, air pollution, urban heat island, building height, population density, enhanced built-up and bareness index and also noise

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pollution. Landsat 8 (OLI) is used to calculate NDVI indices, land surface temperature, land surface moisture, land surface albedo, urban heat island, and enhanced built-up and bareness index. A Digital Elevation Model (DEM) has been used to extract solar radiation. Finally, we have used location based field data to enhance air pollution, building height, population density and noise pollution. Because of the uncertain nature of quality measurements, we have used Fuzzy logical approach to model the quality of urban environments. One of the most important fuzzy operators for overlaying the indices is the GAMMA. Gamma operator is the general mode of multiplication and addition. In other words, the gamma fuzzy function is the product of the algebraic multiplication of two functions of collect and multiply fuzzy. This function is the result of the compatibility between the incremental effect of the fuzzy sum function and the reduction effect of the fuzzy multiplication function. Therefore, districts of 3, 6 and 11 of Tehran municipality have been selected to be measured for the quality of urban environment in Tehran along a northern-southern line.

Results and discussion

The results of this research have indicated that a northern-southern trend in the quality of urban environment which is reducing from north to south. The environmental quality conditions of the three defined urban areas are categorized into five classes of moderate, very good, good, very low and low. According to the results, region number three has a better environmental condition than the regions six and eleven. We can also realize that most of the selected indicators have represented seasonal changes within a year in the study area. This is due to the existence of more parks and less air pollution in the northern regions. The time intervals also show a better quality in spring and summer than in autumn and winter. To investigate seasonal changes, the total area of each class was compared in different seasons and the urban environmental qualities were devised into five categories: very good, good, medium, low and very low. In the spring, a large partial of the region has a modest and good quality, and a small part of it has a very good situation. In the summer, most of the areas have a middle class situation and a small part with a very low level. This indicates the region's good status on this season. In the fall, most of the area has the lowest quality and the minimum of it has a very good level that indicates the worst condition for the urban environmental quality. In the winter, the situation is a little better. Most parts of the area are in middle level and small parts of is the area are in the lowest class. Therefore, the quality of urban environments changes dramatically within a year. At the next step, we have studied the Pearson correlation coefficient of indicators. The results of the correlations showed that the greenness is the most effective indicator of quality in urban environments. One-At-A-Time (OAT) Sensitivity Analysis was used to analyse the sensitivity of the model. Given the fact that all the changes in model outcome are less than the total percentage of input change (30% increase) for all the variables, it can be concluded that the results of the gamma fuzzy model are reliable and not affected by one or more specific variables.

Conclusion

According to an extensive review of the literature, this study has introduced a wide array of factors in both natural and artificial environments to assess the urban environmental quality (UEQ) of Tehran. It is hopeful that this study provides a useful basis for more researches in the field of UEQ by combining both natural and built-up parts of urban areas. Further work can focus on validation and verification of the UEQ indices in the future.

Keywords: modelling, urban environmental quality, fuzzy logic, Pearson correlation coefficient, sensitivity analysis.