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Analysis of Earthquake Vulnerability with an Emphasis on Providing Optimal Locating Pattern of Special Land Uses (Health , Medical Services and Educational Centers) Case study: Tabriz Worn Textures

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Abstract

Although at the present, it is not possible for human to prevent earthquake, but the society's preparedness to face with this natural phenomenon, is the most important factors in reducing the damages caused by the earthquake. One of the special measures for reducing the earth quake damages in the cities is the optimal locating of land uses. If the urban land uses are being located precisely, there will be a great save in the costs including health costs and time. According to the estimates, one fifth of the total area of Tabriz city have been occupied by worn out tissues and according to the latest estimates, about 400 to 500 thousand people of Tabriz citizens reside in these areas, and in case of earthquake occurrence in Tabriz, a very destructive disaster will occur in these areas. This study has been performed by using criterion - analytical model and to the aim of presenting optimum locating of special usages for mitigating the damages due to earthquake in part of Tabriz worn out texture by the method of network analysis and AHP model in GIS environment. Studies show that in the under study area, there is no strong buildings, it has lack of proper planning with very narrow and low width passages , which in zoning of Tabriz fault risk in the land uses of this city, it is located in the areas with high vulnerability and risk due to the damages of earth quake . The results indicate that a large part of the study area in spite of high population density, construction, educational, commercial and etc., are outside of the function scope of the existing particular land uses, which have a great vulnerability against the earthquake risks. This situation, itself is the reason of the lack of specific users needed to provide full coverage of the under study space, So that in the conditions of earthquake occurrence, for emergency services and temporary housing in fact half of this area will have no access to a specific land use. In this case, the need to locate and deploy the new land use is being felt more than before. Therefore, for mitigating the damages caused by earthquakes in this area, using the results of network analysis and AHP, locating, new educational, health and treatments uses were proposed.

Keywords: Earthquake vulnerability, Special uses, Locating, AHP, Worn texture of Tabriz city.

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Assessment of the Effectiveness of Decision Tree Classification Method for Extracting Landuses Map by Using Sattellite Data in Cham Gardalan Catchment Area

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Abstract

In order to classify satellite image of the ETM⁺, classes of land uses were classified in six groups as agricultural lands, rangeland, forest, land barren, garden, lake and then training samples were collected from study area using Google Earth satellite image and the field visits. At the next stage, by using the images characteristics, According to results, the tree classification with three splitting methods (gain ratio, entropy, and gini) produced the overall accuracy of 87 and kappa coefficient 0.84, respectively, while, methods of fuzzy Artmap and maximum likelihood were classified with overall accuracies of 84, 81 and Kappa coefficients of 0.81, 0.78, respectively. Thus, the splitting methods of tree classification (average overall accuracy of 3% and Kappa coefficient of 3% in comparing with to methods of fuzzy Artmap artificial neural network, and average overall accuracy 6% and kappa coefficient of 6%) than likelihood maximum classification for the data series used in this study were of higher accuracy. The efficiency of the tree classification with gain ratio splitting to be roughly comparable to the fuzzy Artmap ANN method and this reflects the high efficiency of fuzzy Artmap neural network. Finally, we can say that among three splitting methods used in this study, the gini splitting method with overall accuracies of 6% and 2% and kappa coefficients of 7% and 2% higher than the entropy method respectively has better performance. This study shows tree classification methods have many advantages over the other methods of classification such as fuzzy Artmap artificial neural network and maximum likelihood methods. They are computationally fast (Unlike artificial neural network methods) and make no statistical assumptions regarding the distribution of data (Unlike the maximum likelihood method). As the result, it can be said that, tree classification is a good alternative for other methods of classification.

Keywords: Land cover, Decision tree, Fuzzy artmap, Maximum likelihood classifier, ETM⁺, Cham gardalan catchment, Ilam province.

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An Assessment of Safe Boundary in Urban Area in Relation with Seismic Vulnerability Case Study: Cities of Yazd province

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Abstract

Irregular expansion of cities without considering the faults locations and directions, increases the possibility of placing cities on seismic zones, which in case of earthquake occurrence, creates great financial and human damages. Therefore, specifying the safe boundary in urban areas and its observation can be effective in reducing earthquake damages. Creating the facilities and services including fire station, police station and therapeutic and sanitation centers become more difficult, costly and time consuming by physical spread of the cities. This paper is an applied research which with respect to the cities and faults locations, aimed to determine safe boundary of the cities in relation with seismic vulnerability. The under study area is Yazd cities. Firstly the geology and seismic situation and then the population and urbanization features have been studied.

Finally using two different methods namely, A) using available standards (faults safe boundary with minimum and maximum standard range 300-1000 m) B) Using data of the last 100 years regarding the location of cities and radius distance from probable earthquakes, the safe urban boundary has been determined.

Research findings show that: the main part of Yazd province is located in areas that are at low and medium risk of earthquake. The southern, eastern and north-eastern cities are at high risk of earthquake. In Nedoshan, Harat, Marvast, Taft, Bahabad, Deyhouk and Eshghabad, appointment of urban safe boundary should be taken into more consideration. According to urbanization study 21.74 percent of cities and 7.63 percent of population in Yazd province are located at areas with high risk of earthquake. Population forecast show that urban centralization in Yazd province is increasing. Therefore vulnerable population will increase. With regard to distance radius from faults and probable earthquakes and with respect to historical earthquakes, the whole of Yazd cities are located at proper radius, but this does not mean that the province cities are secure against earthquake, because the first method (available standards), proved its contrary. Also this study showed that relying only on the earthquake historical data (seismic data of the last 100 years) does not surely secure the safety of cities against earthquake.

Keyword: Safe Boundary in Urban Area, Seismic Vulnerability, GIS, Yazd Cities.

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The Application of Analytic Hierarchy Process (AHP) and Weighted Linear Combination (WLC) methods for landfill of Urban Solid Waste materials Case Study: Marand County

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Abstract

Finding an appropriate place for burying landfill site is one of the most important parts of urban solid waste management system. Marand city with a population of 203,000 is one of the largest cities of East Azerbaijan Province. As a result of population growth, over-consumption nutrition habits, the increasing of consumption of packaging materials in recent decades, the solid waste volume has increased in this city. Despite this problem, still an appropriate method for waste disposal does not exist in Marand County. The main purpose of this study is to apply different spatial analysis operations, through GIS in order to locate suitable municipal solid waste disposal site. Therefore, factors affecting the positioning of Marand city landfill were extracted, digitized and weighted on the basis of 12 standard layers including slope, erosion, faults, surface water, groundwater, wells, regional conservation, vegetation, communication lines, power lines, distance from population centers in the county of Marand and then entering the layers to the ArcGIS and Idrisi software environment. Multiple criteria decision and analytic hierarchy process and linear weighted combination of the existing layers were also applied. Preliminary results suggest that the model resulting from the AHP method selected landfill sites in the region was accepted. But with the implementation of WLC model range in the northwestern city of Marand was extracted with little difference, which is based on the field evidence and the comparison of results matching the existing realities. Finally, these models were overlapped and shared at the final place in the ArcGIS environment. Marand city proposed landfill area has an area of 299 ha and 130 tons of waste can be accepted for 20 years for each day.

Keywords: Analytic Hierarchy Process (AHP), weighted linear combination (WLC), Location, Marand city.

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Measurement of life Quality in old habitat and its visualization Case Study: the hashemi district in 10 zone of Tehran metropol

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Abstract

Rapid growth of cities during the recent decades may contribute to the formation of improper and irregular textures. In addition, old textures in the cities are wearing and the quality of life has been greatly declined in these areas. Therefore, planning for promotion of life quality is an inevitable issue in these textures. Quality of life is a multidimensional concept which impact greatly on life of the habitantants of a residential area. The most important of these effects is the satisfaction of residing in these areas. Therefore, as it is clear, identification of the effective criteria on the satisfaction of habitants and how to impact is a top priority, which the aim of this study is to clarify this matter.

The technique used in this study is Hierarchical Regression Analysis (HMR) method, the criteria will be selected based on the study objectives relevant with the life quality in residential areas by the review of other studies' models and criteria. The manner of organizing such criteria in this study is as up to down. Based on the results obtained from data analysis, the subjective quality of life (satisfaction) is 2.77.

Based on the results obtained for objective quality of life, in the area of subjective life is equal to 2.82. Quality of life (subjective-objective) in the study area is equal to 2.80 and the obtained results by GIS and its analytical functions have been presented in the form of drawing, which shows that the situation of life quality in the study area is placed at a low level.

Keywords: quality of life, subjective quality of life, objective quality of life.

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Review the factors affecting on membership and participation of villagers in rural cooperatives, Case study: Khorasan Razavi province

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Abstract

Rural cooperatives, as a foundation for gathering and concentrating small capitals and supplying manufacturing and service requirements can take important steps for solving rural problems. But, often these companies do not exploit their real capacity, due to the lack of great participation of villagers. Then, the Main question of this study is: what factors and features influence on the presence of villagers in this trend. To this aim, this assumption proposed that personal, family, social and geographical factors are effective on increasing the partnership of these people in the rural cooperatives. In order to determine such factors and their relevant features, the analytical – descriptive method was used. For this purpose 961 people of villagers who were selected by cluster sampling method, were asked.

These people have been studied in view of knowledge and attitude with respect to their age, sex, educational level, residence area, occupation and livelihood situation. In addition to descriptive statistical methods the other methods were used for data analysis (t test, ANOVA and Chi2).

Results showed that people's awareness of the benefits and interests of rural cooperatives and their attitudes about this foundation greatly depends on their residence place, age, educational level, employment status and their livelihood ($P < 0.05$).

Unlike awareness, the attitude was appropriate and positive in most of the studied cases in most cases. The highest attitude toward encouraging factors to join this foundation was 79 percent and highest inappropriate attitudes which leads to non participation was 62 percent. Accordingly, if the negative attitude be promoted through increasing the awareness in different fields and considering other influential factors including personal or social characteristics, the rate of people joining to these companies will increase dramatically.

Key words: Rural cooperatives, membership, participation meaningful, Khorasan Razavi.

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Investigation of the Spatial Pattern of Crime in Regional Levels Case study: Drug-Related Crimes in Southern Khorasan Province

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Abstract

A brief look at the phenomenon of crime and violence generally in the world and particularly in Iran, suggests that crime occurrence especially drug-related crime can cause negative and unbearable physically, mentally and financially effects on human, social and economic development. The present research , with the aim of identifying and analyzing the spatial patterns of crime in zonal levels, and study of spatial patterns of committing the crimes of drug dealing and drug abusing crimes in Southern Khorasan province has tried to study the relation between the residential place and the activity of wrongdoers with the crime occurrence place, ratio of crimes to population of each district and township of the province and rural and urban habitats of the province. The research method used for the patterns of crime occurrence place in Southern Khorasan province was a combination of the two methods of spatial and ecological analysis. Based on finding of this paper, drug dealing and drug abusing crimes have occurred more in Birjand and Nehbandan parish in comparing with other towns of Southern Khorasan province . The crime rate was about 501-800 crimes and this rate was less in Darmian and Sarayan parish (less than 60 crimes in each parish). The general evaluation of spatial patterns of crime distribution in Khorasan area shows that the strategic and important road between Nehbandan and Ferdous which links the important cities of this region and the flows of narcotic from east to west in this line has a significant role in this pattern. It seems that for improving the security and reducing crime especially drug-related crimes in Southern Khorasan province, these suggestions should be considered as a priority for people in charge to control crime in this province, including: giving priority to the prevention strategies, remarking cultural and educational solutions with the aim of crime prevention, encouraging the public participation and using modern technologies such as Geographical Information Systems (GIS) on policing are the most effective policies for controlling crime in southern Khorasan province.

Keywords: Drug-related crimes, Geographic information system (GIS), Spatial pattern of crime, Southern khorasan province.

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Analysis of Spatial Expansion in Tabriz City and Demolition of Agriculture Area and Urban Green Spaces

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Abstract

Urbanization and besides it, the urbanization requirements are the basic reason of environmental changes. This approach is the result of historical-geographical complexity and it has caused the uncontrolled urban expansion and demolition of green spaces and agriculture lands and caused the removal of urban beauty and nature and has expanded the city and indicate clearly the social- economical, cultural and ecological problems which not only has made regional changes, but also has caused the environmental changes and disturbance of ecological balance in the world. The objective of this research is reviewing, analyzing and study of urban green space demolition in Tabriz city and sprawl development of Tabriz in time series of 16 years (1989-2005) and study of different effective factors on them which Satellite images of these periods are the main tools for this research. Inappropriate expansion of construction in Tabriz city has caused the destruction of green spaces and agricultural lands in the recent decades. This expansion has caused the reduction and limitation of access to green spaces from two aspects. On one hand, the change of agricultural lands and gardens around the city has minimized the ecological power of the urban environment, and on the other hand, changing the usages of green spaces inside the cities and changing the lands allocated to green spaces in to profitable land uses, has increasingly limited the mental - social power of urban spaces. The results indicate that the satellite images are the appropriate tools for evaluating the amount of development changes and land demolition changes, and it is possible to determine the urban land use changes by satellite images for different periods. By using Helder model, it is possible to determine the Physical growth of city based on population, uncontrolled, unbalanced and sprawl growth, which the results obtained for Tabriz city shows the unbalanced and horizontal growth of the city. Based on ratification of Commission article 5 of Tabriz city for years 2006 and 2007, more than 65 hectares of Tabriz green spaces have been changed to other land uses. The continuation of this situation and the lack of appropriate management systems for protecting the green spaces, the sustainable development will face with a serious risk in Tabriz city.

Keywords: Urban green spaces, Satellite images, Urban expansion, Eestruction of environmental resources.