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Investigation the Quality Changes of Zayandehrud River Water Using Fuzzy Logic

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Introduction

Zayandeh River is a vital river stream for Isfahan Province and Central Plateau of Iran. This river is located as the largest Iranian central plateau in the Gavkhoon watershed and plays an important role in the supply of drinking water, industry and agriculture in the central regions of Iran. Today, due to the dramatic reduction of river water due to the construction of several dam and water catchments for water use for agricultural,industrial, recreational and construction of several recreational towns along the river, unauthorized drafting water by motor pumps, lack of rainfall, drainage of various types of Human, industrial, and agricultural sewage in to the river have caused the death of the river and Gavkhoni wetland. . Considering the importance of Zayandehrood river water in its catchment area, especially in the environment, and also considering the importance of aquatic life, maintaining the ecological balance of the river and And knowing more precisely the qualitative state of the river water, conducting a study on the amount of pollution in this river seems to be necessary. Therefore, in order to manage the water to prevent further contamination of the river water, this study attempts to investigate the water quality in terms of water quality changes at different times and locations.

Methods and Material

Zayandehroud River originates from the eastern slopes of Zagros and Zardkooh Bakhtiari mountains and ends in Gavkhoni wetland. In this research, qualitative river water elements were used. Quality elements include (PH), (TDS), (EC), (SAR), (NO3), (HCO3), (CL), (K), (NA), (CO4), (CA) and (MG). The raw data of water qualitative elements were clustered based on fuzzy logic in MATLAB software. In a fuzzy clustering, a sample can belong to more than one cluster, for example, each water quality element can be a member of two or more clusters.

Results and Discussion

The optimal level of water is located at the upstream river stations. So, from 2006 to 2013, from Ghaleh Shahrokh Station in Isfahan Province to Kalleh Bridge Station, the water is at an opilmal level. In the period from 2011 to 2013, from Diziche Station to Varzaneh, the unauthorized limit of water was measured, that due to the establishment of industries and agricultural land around the river, the use of water is unacceptable in the global standard.

Conclusion

The results of water quality assessment of Zayandehrood River showed that alomg Zayandehrud River, water pollution was identified in three parts of the study area: The first part (the beginning of the river from Zayandehrud Regulatory Dam before Baba Shah Ali Alley treatment plant) has a relatively low pollution rate in comparing with other areas and its sources of pollution are mostly from urban and rural pollutions and agricultural drainagea located on the margin of the river . But because of the high river flow in this area, water quality is optimal for drinking, farming and aquaculture in the river. The second part (the continuation of the river starts from the treatment plant and continues up to Chum bridge). In this section, the severity of the industrial and urban pollutants is such that the river water is no longer able to be consumed and only is used for agricultural and industrial uses. The third part (this section is the end of the river from Chum btidge toward Gavkhoni wetland). In this section, river water is heavily polluted because of the decrease in river flow. River water in this area is so infected that it is not suitable for agricultural use**.**

Keywords: Zayandehrud River, Fuzzy logic, Qualitative water changes, Temporal and location variations of Zayandehrood water elements, Water pollution, Isfahan city.

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Assessing Changes of Land use in Tutkabon Catchment Using RS and GIS

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Introduction

Land use change often occurs without respecting environmental principles and constraints, and will have consequences such as urban outbreak, deforestation, occurrence of destructive floods, erosion of agricultural land and the spread of deserts. land changes monitoring is important in future planning and management of natural resources (liu & yang, 2015: 42). The use of new tools such as remote sensing and Geographical Information System has a significant role in identifying and analyzing these changes (Olokeogun et al, 2014: 616). (Olokeogun et al, 2014: 616).

Arekhi et al. (2008) conducted a study to investigate land use changes in Kabir Kouh protected area in Ilam province, they used Landsat satellite imagery from 1988 up to 2002. Comparison of land use maps in 14 years showed, the level of agricultural land has increased from about 8% in 1988 to 11 % in 2002. The evaluation of the accuracy of land use maps derived from satellite imagery in 2002 shows about 82% of the points match the field data (Arekhi et al, 2008: 1-10).

Also, Farajzadeh and Fallah (2008) used TM and ETM + images of 1992 up to 2001 to study the vegetation changes in Tajan River Basin. They stated that runoff has reduced the forest and pasture land in the region (Farajzadeh and Fallah, 2008: 89-104). Barati et al. (2009) examined the land use map derived from satellite images in 1975, 1980 and 2002 to identify land use change in Ghaleh Shahrokh watershed. In 1975 to 2002, the area of semi-arid lands has decreased and the area of arable land and dry farm has been increased (Barati et al., 2009: 349-365). The present study was conducted on Tutkabon to define land use change, using GIS and RS, during four periods.

Methods and Materials

Tutkabon Catchment is located at the north part of Iran and t the southeast of Guilan province. Land use maps were prepared in Arc GIS software based on visual interpretation and digitalization of aerial photographs with scale of 1:55000, in 1955, the land use map of 1998 with a scale of 1:50,000, satellite images of Landsat ETM+ in 2002 and IRS-Liss-PAN 2008. The land uses of Tutkabon catchment observed in visit the area included: 1-forest, 2-rangeland in two good and poor conditions, 3-aquatic agriculture and garden, 4-drought and 5-stony deforestation.

Results and Discussion

The results show, the total area of forest land in 1955 was declined from 66.04 % to 34.73 % in 2008, Olokeogun et al (2014) stated, destroying forests for farming activities is one of the most important causes of deforestation in the world, that it will lead to serious environmental problems such as landslides, floods and so on (Reis, 2008: 6189). Also Farajzadeh and Fallah (2010) reported the decline of forest lands as the cause of runoff production.

Rangeland has increased from 1955 to 2002, and there is a decrease of 2938.33 hectares in 2008, the reason is the change of rangeland to dry farming, increasing grazing will also lead to the conversion of forest lands into rangelands in the upper position.

Also, investigating the changes in garden and irrigation farming shows that these lands increased from 0.77 % to 9.60% during the period 1955 to 2008 in Tutkabon, which is similar to in Areki et al. (2008) and Barati et al. (2009). Changes of bare soil shows an increase of 13.2 %, increasing of livestock grazing and uncontrolled exploitation of vegetation, especially in rangeland, has led to an increase in the bare soil that this happened due to weak implementation of soil conservation practices and grazed the rangeland. Due to land cover changes in this period, the probability of environmental accidents will increase.

Conclusion

New tools used over time to identify and understand the status and type of changes, the natural and artificial phenomena depicted the surface of the earth diligently, and can also be a response to many of the past ambiguities. The findings of the research indicate that most of the destruction and change land use has occurred in forest. Forest lands are located along Rangeland and farmland rural, when it is often people's livelihood, agriculture and animal husbandry, the most important factor to be considered deforestation.

Access to the national lands of forests and rangeland and on the other hand, the proximity to the Sepidrud River, has led to the development of non-productive agriculture and, subsequently, with the reduction of production capacity in these lands, bare soil of the land will increase over the years. Such changes is often the result of human intervention, in addition to the negative effects on the environment, will increase the damage to natural disasters. Hence, the researchers emphasize the need for the planning and implementation of land regeneration plans and protection of the ecosystem of the region.

Keywords: Change land use, Geographical Information System, Remote Sensing, Satellite Images.

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Analysis of Land Use Changes Using Object Oriented and Markov Chain Methods in Zailbirchay Basin in the Eastern and Western Azerbaijan

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Introduction

One of the most effective tools in the field of environmental studies and geosciences is the use of remote sensing technology and satellite data. Remote sensing is very important in the assessment of natural resources, in order to provide up-to-date information, duplicate coatings, measurement in different spectral range, low cost, diversity of data forms, quantitative and digital measurements of ground-level phenomena and is the best tool for providing land use and land cover maps. Various methods have been developed to analyze the changes in land use and land cover that with a wide view is divided in two ways, post classification and pre-classification methods. In the present study, object-oriented method was used based on knowledge base method. This method acts more robustly than pixel base methods due to the use of basic knowledge algorithms, geometric information and texture of phenomena. Although the scale determination, the compression and shape coefficients in the object-oriented method for segmentation depend on the spatial resolution of the used images and through trial and error is obtained. In the present study, the object-oriented method was used to categorize Landsat satellite imagery in the periods 1987 and 2015. Considering the topographic conditions of the area and the excessive use of groundwater for irrigation of orchard and irrigation farming, the need to predict the changes and develop these applications in the future is quite obvious using the Markov chain model. Also, the use of parameters such as elevation, slope, vegetation index and images at different times according to the crop pattern can be solved for further research by object-oriented method and provide more accurate categorization.

Methods and Material

The Zilbirchay an area of 2527 km2 basin is located at 70 km north of Tabriz city. The vast area of this basin is located in East Azarbaijan and a small area is located in West Azarbaijan.

In this study have been used satellite images of Landsat 5 (TM) and Landsat 8 (OLI). Garmin's GPS tool and the Google Earth system for the acquisition of training and testing points and digital elevation images of the Aster to produce the elevation and gradient of the study area, eCognition8.7 specialized software for classification of images, ENVI5.1 to calculate vegetation indices and residential and calculation of accuracy classification also, disclosure of post-classification changes, IDRISI17 was used for prediction and future study.

Segmentation of images: After the image processing step in object-oriented methods, images are segmented according to the shape, color and selected scale by the user that these objects can be from a pixel to several pixels. The selected algorithm is one of the other factors affecting them and the classification accuracy. Objects are the basis of object-oriented classification and including features of terrestrial phenomena. Therefore, the quality of object-oriented classification depends on the precision of segmentation. In this study, Multi-resolution Segmentation algorithm which has been embedded in eCognition software was used.

Object-oriented classification: In the object-oriented classification each of segment, according to the user's definition, used parameters and the numerical range assigned to each application in the region is allocated. This process primarily depends on the user's knowledge of the study area. In the classification of small areas such as wheat (Irrigated farming and dry farming), alfalfa, etc., due to their different growth times, in the present study, different images were used to extract the land use of the years 1987 and 2015. The mean and standard deviation of NDVI vegetation indices were considered in each of the segments. Classification was carried out using the nearest neighbor's algorithm and training samples and in that object, the assigned algorithm (multi-resolution) was assigned to classification classes.

Markov chain analysis: In this method, studying land use and land cover changes, there is a basic assumption that any land use can switch to another land use which is in the form of St and is considered to be St + 1 in moving towards time.

Results and Discussion

The overall accuracy of both images (1987 and 2015) is above 85%, however, due to the quality and resolution of OLI images, the overall accuracy and kappa coefficient are higher in numerical order than other Landsat images. Rangelands have largest area in basin which it is divided into two sections of good and poor rangeland. The poor Range has the highest percentage of area during the two years of study (84% and 66% respectively). To analyze the changes that occurred in land uses and the impact of human factors on these changes, using the correspondence approach, each pixel was investigated for its corresponding pixel discovery. In the study area irrigated wheat and irrigated farming classes were allocated 10 and 17 percent respectively to the orchard class. The water requirement of apple and apricot trees (orchard class) is 522 & 421 mm, respectively (Meteorological

Organization). This is while the wheat needs 293 mm of water and for irrigated farming, which includes tomatoes and sunflower crops (irrigated farming), water require are 455 and 400 mm, respectively. With this comment, the water consumption in the area has increased sharply with an increase of almost 50% in the area of the orchards. Also, an increase of almost 40 percent of irrigated farming will have an impact on water consumption and the increase of high-consumption water products has led to a large extraction of water from surface and underground resources, causing irreparable consequences such as subsidence and this is in conflict with sustainable development. However, data of groundwater level indicate a significant reduction in the level of 99% and the decline in groundwater levels may aggravate the possibility of subsidence in the plain of the basin. The probability of a land use changes was forecast for 2030 with a proportional error of 0.0122. The prediction of land use changes in the study area indicates an increase in orchards up to 27 km^2, an increase in irrigated farming to 7 km^2 and an increase of 8 km^2 in the residential area. Reducing the wheat cropping and high ranges will probably increase orchards. Also, with the reduction of green space, there is an increase in residential areas. The increase in residential areas that it seeks to increase population and this increase leads to a decrease in natural resources, including surface water and underground water resources.

considering the importance of land use changes, optimal planning and attention to sustainable development due to its impact on the consumption of more water resources, futurology can influence the future planning of managers and lead them to an effective planning. In the study area, over the course of 28 years, 15 km2 has been added to the residential area, this indicates an increase in the population, especially in Marand city. Also, the doubling of orchard and irrigated farming land uses has affected the excessive consumption of water and caused a sharp reduction in the water resources of the area, especially groundwater. According to the pattern of 28 years ago, it can be said that by 2030, if water resources are contributed, the increase and development will continue. Although it seems to with the additional pressures on surface water and especially groundwater, it is possible to regain more and more of these resources. Because the natural environment primarily is affected by human and anthropogenic factors. Then it acts as feedback and be influenced human factors (Subsidence, a sharp decrease in flow and, consequently, a decrease in greenness and vegetation cover). For continuity and maintain developed resources (vegetation), the need to plan and prevent traditional irrigation as well as investment in the studied area is inevitable.

Conclusion

Remote sensing technique is a powerful and cost effective tool for discovering vegetation density, type of land uses in the area (based on previous knowledge), detecting changes, and predicting them. For this purpose, various models are available for optimal use of the features of this tool, that including an object-oriented model, and researchers emphasize the performance of this model. In this study, using of Landsat satellite images type and the area of land uses of the region in 1987 (TM Sensor) and 2015 (OLI Sensor) were extracted from the object-oriented model with multi-resolution Segmentation algorithm. Total accuracy and Kappa coefficient, which are indicators for validating

image categorization, for TM 87%, 0.83% and for OLI 89%, 0.86% were calculated which shows the good reputation of the model. Given that the growth season for some land uses is different, therefore, the use of satellite images of different months is recommended, So that the area of the product can be well estimated. The result of classification on the images indicates increase 42 km^2 in the orchard, in other words, doubling its area, increasing the area of 50 km^2 in irrigated farming, and increasing of 15 km^2 in the residential area. Discovering Changes indicated that crops with less water consumption turned into crops with more water consumption. That this issue without optimal and efficient management, not have and will not have other outcome than the reduction of water resources. And predictions also indicate an ever-increasing rise in consumer products and the growth of residential land use. Therefore, in order to prevent the loss of development, it is recommended to achieve sustainable development, the need for planning by senior managers, and the use of investment to get out of traditional irrigation and mechanization of irrigation.

Keyword: Land use, Object orientation, Forecasting, Forecasting, Zilbirchay.

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Analysis of Dorud Fault (Southwest of Iran) by Using Morphotectonic and Geomorphologic Fans

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Introduction

Zagros mountain belt is approximately 1,500 km long, 250-400 km wide, and extends from eastern Turkey, where it connects to the North and East Anatolian faults, to oman Gulf, where it is in progress at Makran subduction zone. This active fold and thrust belt is composed of deformed sediments of the Arabian margin and has grown since Early-Middle Eocene in response to convergence and ongoing collision between Arabia and Eurasia plates. Crustal shortening in Zagros is expressed by active folding and thrusting associated with a widely distributed shallow seismicity (depth < 20 km). The Main Recent Fault (MRF) is an active right-lateral strike-slip fault, which follows closely the suture zone between Arabia and Eurasia and separates the Central Iranian to the northeast from Zagros fold-and-thrust belt to the southwest. The right-lateral strikeslip MRF fault is divided into several major segments including Doroud, Qale-Hatam,Nahavand, Sahneh,and Morvarid segments Dorud fault, as one of the most important seismic in segments of Zagros Main Recent fault, near Arjng area it has northwest- southeast trend and continuity extended in Boroujerd area. In this study we use morphotectonical evidences to show that seismic behavior of this fault in the past has a clustering model in some time intervals. Geomorphic indicators as a tool for identifying new structures and activated by the movement of tectonic used.

Methods and Material

The tectonic morphology of the displacement of the waterways is also used to determine the horizontal and vertical displacements, as well as the pure slip of the fault. Geomorphic indicators are used as a tool for identifying new and active structures affected by tectonic movements. In this regard, by calculating geomorphic indices, the active tectonic level has been measured. In this research, topographic maps, geology, satellite imagery and digital elevation model (DEM) and IRS sensor images were used as the main data of the research.

Results and Discussion

Therefore, morphometric evidence has been used to determine the tectonic activity rate. In this regard, the morphometric indices derived from the fault activity were measured and evaluated. Llovil fns are one of the most prominent phenomena in river geomorphology, which are found mostly in the foothills of the mountains and in the foothills of arid and semi-arid regions. These forms are influenced by climate change and surface-level changes, and are very sensitive to tectonic variations, and their effects are recorded. The evidences of the morphological construction indicate that the fault along itself, by passing through the units with different ages shows different behavior and the values of the angular rick obtained during the fault are different. Accordingly, the fault, according to the results, can be divided into three segments with different lengths, So that the angles of rick of segments 1 and 2 are 16.60, 22.81, respectively, and the length of the segments are 18 and 49 kilometers respectively. Due to the high rick values (more than 10), the Slope slip component has more dominant effect than the lateral axis on these two parts However, the value of the angle of Rick 74.2 in segment 3 shows the performance of the slopeslip component in alluvial units of Silakhor Plain This piece is over 44 kilometers index associated with alluvial fans, including fan of bending β, fanning coefficient and longitudinal profile was calculated. The results of topographic analysis, geomorphological evidences obtained from field observations and values obtained from geomorphic indices are all evidence of the neoconal activity of the region, and the study area is classified according to the classification of LAT in class 1, which indicates intense tectonic activity And the northern part of Dorood fault is more active than the section.

Conclusion

Structural investigations carried out in the northern part show a tensile basin derived from the staircase arrangement of Drood and Nahavand fault components Evidence of this is the tensile strength of the left-stacked parts and the compressive structure resulting from the arrangement of the fault shoots of Dorud fault, which works in Kalanganeh and Zaranah.The northern part (Silakhor plain) is covered by alluvial deposits on its entire surface and is related to the southern part, which includes Upper Paleozoic Mesozoic and Senozoic agglomeration units. It has been more active, as well as seismic data, high earthquake density and seismic migration occurred in this part can prove this, of course, in this section, we will also see a difference in the tectonic activity rate of this fault of course, in the northern part, even at the level of the plain, the alluvial units is different, and evidence of folding growth in some places is due to the operation of Droud fault.

Keywords: Morphotectonic, Droud fault, Fan, Neotectonic, Zagros Main Recent Fault, Silakhor.

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Prioritization of Flooding of Hydrologic Units

Case Study: Pole Shah Catchment

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Introduction

In most regions of Iran, the effect of precipitation and distribution on climatic characteristics has caused seasonal floods and irreparable damages. Because of the large extent of catchment areas and economic and administrative constraints, the recovery of watersheds from the perspective of water management in not possible by single project. Selection of priorities for the implementation of such projects is a management decision that must be made by studying the physical and socioeconomic conditions of the region. The physical conditions governing the basin, as well as socioeconomic issues and technical constraints forces us to carry out watershed management operations in a small section of the basin in each basin. Therefore, the most important concern of related engineers and executive experts is the selection of sub-basins for the operation of watershed management. Prioritization is generally based on selective criteria or only on the basis of a target in watershed management such as flooding, soil erosion and so on. Many researchers have prioritized hydrologic units in the watersheds. Therefore, the purpose of this study is to prioritize sub-basins using the HEC-HMS hydrologic model in the Pole shah basin. Achieving this goal can be the basis for prioritizing the watersheds in order to implement related projects and preventing high costs in unnecessary areas.

Methods and Material

Pole shah is a sub basin of Alvand Basin. The rainfall and runoff events of the rain-gauge and hydrometric stations in the watershed were studied. Simulation of watersheds in HEC-HMS was carried out by four basic components such as basin model, meteorological model, control characteristics and time series. The calculation of the casualties in the basin, the conversion of excess precipitation to runoff, baseline flow, and simulation of flow in the canal and reservoirs and their reconfiguration in the basin model was performed and the basin model was divided into 9 sub-basins.

The SCS was used to calculate the baseline casualties' parameter, which in the preset state is equal to 0.2 of specific storage (S). Hydro graph analysis and special methods were used as a meteorological model to isolate the base water from flood discharges. Rainfall- runoff time series consists of two components. The first component is related to the time series of rainfall data, which in the element related to it, the rainfall data of the Pole Shah's rain-gauge station were determined. The second component is related to the observed hydrograph of the flood. In this element, the recorded flood hydrograph data for the Pole shah hydrometric station on the Deira River at the basin outlet was entered into the model at one hour intervals.

Results and Discussion

Initially, 9 sub-basins were defined, using 4 intervals and 5 interconnections. Then, CN values were calculated based on the landuse and the soil hydrologic group layers in the GIS environment. The HEC-HMS software was calibrated to correct the initial loss rates and curve number related to the basin model, the events of 2012.11.12 and 2012.11.26. Observed and simulated hydrographs of these events were prepared before and after calibration. Before the calibration, the percentage of peak dismemberment of the simulation against the observed value for the first event (2012.12.11) was 153%. Also, the peak time difference has fallen by one hour. On the other hand, the performance factor of the model before calibration is -2.871, which after calibration reached to 0.872. For the second event (2012.11.26), before the calibration, the percentage difference in peak discharge simulation against the observed value was 52%. However, after calibration, this value has reached to zero. This is while the peak time difference has not been changed. On the other hand, the efficiency of the model before calibration is 6.05, which after calibration reached to 0.173. As mentioned above, for the purpose of checking the validity of the optimal values of the curve number and initial loss parameters, the optimal values obtained from the calibration step in the HEC-HMS software were validated by the 2014.03.11 event data. Initially, the values of the optimized parameters (curve number and initial mortality) of the two calibration step events were taken to introduce the model validation stage. Also, the coefficient of 0.2 for specific storage (S) has changed and in most sub-basins it decreased to 0.19. According to the results, the flood peak is 200 m^3/s at the outlet of the basin, which lead to 9.2 million cubic meters of its annual flood volume. It was observed that the highest peak discharge occurred in sub-basin 2 with a value of 90.1 m^3/s and the lowest in sub-basins 6 with a value of 2.5 m^3/s. However, in terms of peak discharge, the highest value was for sub-basin 9 and the lowest was for sub basins 2 and 4. The relatively small basins, such as the sub basins 9 and 6, have a high flood density, so the flooding is not affected by the sub-basin area, but the physiographic and the geological conditions as well as precipitation are more effective in flooding.

Conclusion

With the initial simulation, it was found that the model estimates the peak discharge value higher than the recorded value for both events. Therefore, applying the calibration process and the percentage error function, the initial losses and the curve number were optimized. According to the

results, it was found that the selected target function (percent of peak discharge error) was able to perfectly match the peak sum of simulation and observation values in both calibration events to zero. The results indicated that the rainfall-runoff model, in addition to the peak discharge parameter, was also well-proven in predicting peak runoff time. Comparing the peak discharge time, it was found that the difference between the peak discharge time and the hydrograph peak is approximately 4 hours. This error is relatively low. Therefore, the rainfall-runoff model in the validation step has been able to predict the peak discharge time in addition to the peak discharge parameter with acceptable accuracy. According to the results obtained, it was found that the model can predict the peak flood peak accurately with the correction of the parameters of the curve number and initial losses. Considering the complexity of the variables that affect the runoff simulation process, it seems that the preparation and development of related models based on the deduction and extraction of precipitation data and factors within the basin requires more precision. On the other hand, optimal parameters of the watershed model must be well calibrated and validated for more events. In the case of the preparation of the rainfall-runoff model, SCS, it was found that this method has been well-proven in estimating peak discharge and time parameters. Given that flood damage is directly related to peak runoff, determining the contribution of sub-basin participation to flood potential can help provide management and conservation programs.

Keywords: Flooding risk, HEC-HMS, Initial losses, Curves Number, Pole-Shah Catchment.

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Evaluation and Prediction of Changes in Vegetation Using Landscape Metrics and Markov Model

Case Study: Hamadan

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Introduction

Among the various vegetation indices, NDVI index and EVI index are global vegetation indices used to prepare spatial and temporal vegetation information (Piao et al,2006: 674;2011: 3229; Zhang et al, 2014: 549). The NDVI index is the most well-known and most used indicator in vegetation studies (Blaes et al, 2016: 531; Lanorte et al, 2014: 443; Wang et al, 2011: 2568) It is obtained using multi-spectral remote sensing data based on spectral reflection measurements of red and infrared bands (James et al, 2015: 132). Plant cover has changed due to various causes and over time due to natural or human factors that affect the conditions and performance of the ecosystem (Pettorelli et al, 2005: 504). The development of concepts and tools for describing and determining the amount of vegetation or landscape patterns is essential for studying changes in vegetation patterns (Ivits et al, 2005: 2981; Zhang et al, 2013: 51). From the study of land-surface metrics, the ecosystem vulnerability can be directly quantified as well as the changes made in it. These quantitative numbers, which express the variations in land surface markers, the condition of repair, or the vulnerability of the terrain, can be interpreted in various ways (Farina, 1998: 112). Given the negative effects and adverse consequences caused by the exploitation and unsustainable use of the land, Investigating and analyzing landform changes and their trend over time can be effective in quantitative evaluation of developmental effects as a useful tool.

Methods and Material

The present research is applied in a descriptive-analytical manner. Arc GIS 10.3, Fragstats 4, IDRISI Tiga and ENVI 4.8 have been used in this research. Landsat satellite images were also used. The geometric correction, atmospheric correction and initial preprocessing were performed on the images used in this study in ENVI 4.8 software. Then, in the IDRISI Tiga software environment, a NDVI map or vegetation index was prepared and 4 classes covered areas excellent, very good coverage, good coverage and poor coverage were classified. then analysis of the changes in the landform was carried out. To this end, five measures at the level of the class and six measurements at the level of the landform were calculated and investigated.

Results and Discussion

The change of coverage classes in Hamadan city indicates the dynamics of the process of change and the significant speed of this process. Between the changed areas, very good coverage (garden and forest) and poorly covered areas (Bayer lands) had the largest increase and decrease in the area in the city, respectively. Also, excellent cover (agricultural lands) and good cover (rangelands) are changing over the same period with a gradual rate, As expected, the status of these two classes of coverage of the area is being alerted. as the results show, the highest probability of destruction to the horizon of 1410 is observed in the high cover area (0.8329). also, degradation of lands with good cover to low-lying lands has the highest probability (0.3581) in the future. the results of the study of landform changes in the city of Hamedan at the level of the class indicate that Class Classes (CA) for lands with excellent coverage and lands with a very good surface area have significantly increased between 2000 and 2015 . In contrast to class classes (CA), good cover lands (rangelands), which are considered as natural vegetation, and areas with poor coverage (Bayer's use) have decreased in the same period. the average surface area (MPA) for all classes has increased over a period of 15 years. The metric of the nearest neighbor (MENN) suggests an increase in this metric in good and poor coverage categories and a decrease in the floors with excellent coverage and is very good. Comparing this metric over a period of 15 years indicates that the values of poor coverage (Bayer lands) are the highest. the Shape Indicator Measurement (SHI) shows that the average spot shape for the floors with excellent coverage is very good and has decreased significantly for good and poor ground cover classes. this indicator can be useful in urban planning. among the studied classes, all classes are regular in both years and have the highest order of excellent coverage (agricultural lands).

Conclusion

The NDVI vegetation index is one of the most applicable vegetation indices, and its usefulness has been reported in many studies by various researchers. landscape analysis results show broader insights on vegetation changes. the results of the measurements at the surface of the land indicate that Shannon diversity is higher than 1 in both years, which show a high diversity and frequency in Hamedan city. The Shape Indicator (SHI) on the surface of the land indicates a high order of stains. also, the survey of the nearest nearest neighbor (MENN) measure at this level indicates that this metric has been increasing since the beginning of the year. the results obtained from this study can be used to provide decision makers with a sustainable pattern of land use and land use policy. in this regard, the continuous monitoring and mapping of the dynamism of the landform is essential for the management of natural resources.

Keywords: Markov chain, Landscape ecology, Vegetation, Change Detection, Hamedan city.

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Investigating the Role of Geomorphology Factors on the Establishment and Decay of Gareeran Historical Site in Alashtar Plain of Lorestan Province

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Introduction

Geomorphology is one of the natural factors which has played an outstanding role in establishing settlements, such as Gareeran hill, in North Alashtar plain. This hill is the largest and the most important settlements Alashtar plain that has a history of about 8000-years old. Therefore, in the present study, considering geomorphology and historical this site, and considering this question have been considered to the geomorphology, the geomorphology features of this site were examination.

Methods and Material

In this study,with respect to geomorphological and historical features Garriran, using satellite images, topographic and geological maps, the geomorphological features influencing establishment of this site have been recognized, thus the geomorphological map of this region have been provided with the help of GIS software. Also, by creating trenches the sedimentary properties of site are addressed and described within geomorphological maps.

Results and Discussion

Data from field surveys and satellite images of the region indicate that this region, from the start of its formation so far, have been subjected to a great deal of changes. In a way that, in addition to tectonic movement, external forces interactions affected the region. These factors in turn had an influence on formation and development of water resources and alluvial systems. According to the investigation of alluvial sections, alluviums with different thickness and grading have been shown. Therefore, from stratigraphy of these sections we can elicit that low and high-energy streams impacted the surface alternatively. Also, on the grounds that a vast part of Alashtar area is confined with Limestone Mountains and suitable Karst systems and the amount of rain and water fall is also in good conditions, such characteristics lead to the formation of rich water sources in this area. So,

enriched sources of water and fertile soil have provided a situation for formation of settlement from a very long time ago.

In order to understand the role of geomorphological elements in the establishment of historical site Garriran in north Alashtar a series of geomorphological and sedimentological studies have been carried out,sedimentological surveys and geomorphological maps in this study can greatly contribute to archeological studies.

Conclusion

The analysis of the results showed that adequate water and fertile sediments provided a basis for establishment of sustainable settlement, as well as the evacuation of this site in 1977 and has been due to archeology survey. However geomorphological factors have had a little effects on the site, replacement and destruction. These patterns reflected conditions considering geomorphological features in the establishment of this settlement.

Keywords: Garriran, Geoarchaeology, Alashtar , Lorestan.

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Seismic Analysis in Abpakhsh Region by Using Analytical Hierarchy Models

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Introduction

Programing with the aim of crisis management and evaluate severity and the rate of seismicity of different regions for counting against the damage caused by seismicity has always been one of the main concerns of planners and urban management .Earthquake is one of the natural disasters which its side effects are more in the developing countries than the developed ones. Regarding the statistics 95% of the total victims of earthquakes are in the developing and the casualties are 20 times more than the developed countries (Soleimani, 2016: 3). So the recognition of the situation of tectonic plates, the behavior and performance fault , and also the status of the seismicity of different regions have a large impact on the strategies appropriate direction caused by movement to minimize the damages. The spread of earth science and the incorporation with mathematics thereby more recognition of the natural environmental stringent and thus it makes more awareness about the resistance of the natural environment in the face of the earthquake (Masashi, 2003: 3). AS an example determine the potential earthquake fountain is one of the basic element for evaluating assessing seismic is hazard at the start of the risk. (Boostan and Tahernia, 2014: 28). For this reason getting a reliable method to forecast place, time and intensity has been the main goal in recent research. In this regard according to the position of the structural and physical condition and the physical Abpakhsh region .this research is trying to use the amount of seismic to assess analysis hierarchical.

Methods and Material

Research method here is (descriptive-analytical) and applied in this study. field and library is used to collect required information and then by using of excel, Autocad, Arc GIS, google, software and using of Dematel and AHP model and average rating in 2 stage to investigate the subject. In the first by using of available resources such as topographic map and geological model, digital elevation and recorded earthquake in the range study at the last map that was prepared and then in the second stage by using the AHP method in weighting the substandard and by method of Dematel and AHP weight the original research substandard and ultimately to draw the last map of the final zoning seismicity in Abpakhsh research.

Results and Discussion

According to 1112 epicenter of the recorded seismicity in the radius 200 km from the studying scope, most seismicity in this rage related to the earthquake 357 Hejri at the region of Siraf in a large scale 5.3 surface waves, ms scale, and the recent seismicity related to the earthquake of the 1396 with a large scale 3.4 Richter at 6 km north Saadabad city .Evaluating the power of fault seismic show that they are all alike with no important different. However calculation show that the Borazjan fault with a length of 188 km and quake power 5 has the most seismic power and fault mountain from (mff) with length of 74.40 km and quake 4.73 has the least seismic power. Research finding shows that there is a direct relation between the fault and power quake.so that if the fault length be small it has little power, so based on this what we get the most powerful earthquake in this study is 5 and at least 3.9 and as the result with the average of 4.6 Richter so by addition the distance from the fault the earthquake power will be less.

Conclusion

Abpakhsh region due to the numerous active fault like Qatar-Kazeron ,Borazjan, Rag sefid and Zagross are the most seismicity part of Bushehr and most of the time many earthquake happened in this regions and sometime they are very powerful with the power about 5 Richter. The result indicate that fault seismicity and earthquake intensity in rang (0.086 and 0.063) and the most effective parameter, lithography and depth of soil with (0.110) and (0.103) gradient and the most important parameters in Abpakhsh. In other word if the slope of the land is less and the main material be more resistant and also the depth of soil is less and the earthquake power will have little effect on it and so the lands around Abpakhsh are more resistant against earthquake. According to it and based on the result if we go toward northwest the earthquake are more powerful .although both AHP and Dematel model compare every factor with the other parameters the metal model only study on impress and impressible factor on the others and AHP model compare the classes with based on which one that is better. Thus the hierarchical analysis model because of impress and impressible have better outcomes so in this study with respect to the contradiction of the waiting parameter final result combines the wait by using the average rating.at last we conclude that in the north west of the region the earthquake are more and powerful.

Keywords: Zoning, Hierarchical Model, Seismicity, Abpakhsh.

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Morphotectonic Analysis of Ramhormoz Fault, Khozestan, Iran

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Introduction

Ramhormoz fault in Dezful Fall is one of the important faults in Khuzestan province. Therefore, the study of morphometric indices for understanding the behavior of young tectonics is important. In this research, using remote sensing and geographic information systems, morphometric parameters were investigated along Ramhormoz fault. Morphotectonics involves the study of geological imagery to determine the tectonic activity in any area (Burbank and Anderson, 2012; Grohmann, 2004; Rangzan et al, 2003). Determination the amounts of geomorphic indices can help to fast estimate from a different tectonic manner of faults in different parts Some of geomorphic indices can help to the geologist for determine the different tectonic activity or neo-tectonic manner of faults. In this research, some morphometric indices have been studied during this fault to understand the young tectonic behaviors of Ramhormoz fault.

Methods and Material

In this research with using Digital Elevation Model, geological map and sub-basin map the geomorphic indices along Ramhormoz fault were calculated. This quantitative amounts show the relative active tectonic manner of Ramhormoz fault in Khozestan province. Usually study of tectonic activity in the different geological setting is so expensive and need to more time for researchers. So the study of geomorphic indices can be used as a faster and cheaper than other methods such as GPS, fault plane solution and borehole data. According to the result of geomorphic indices it is possible to find the neo-tectonic and active tectonic manner of the different geological settings. In this research four geomorphic indices: Mountain front sinuosity (smf), Ratio of valley floor width to valley high (Vf), Drainage Basin Shape Ratio (Bs) and Stream Length-gradient index (SL) have been studied along Ramhormoz fault. Map changes of each geomorphic index along Ramhormoz fault were prepared. Using the method (El Hamdouni et al., 2008), the range of variations of each index was categorized and the classification map of each index for Ramhormoz fault was prepared. Finally, using the overlap of the data of each index, a tectonic map was provided for Ramhormoz fault.

Results and Discussion

The Smf index has been used to evaluate the relative tectonic activity along mountain fronts (Giaconia, 2012) and can be defined as: Smf=Lmf/Ls. Where Lmf is the length of the mountain front along the hillside and Ls is the length of a straight-line measured along the mountain front. The Smf index indicates equilibrium between the tendency of erosional processes to produce a mountain front with irregular (sinuous) shape to produce a relatively straight mountain front, coincident with an active range-bounding fault or fold (Bull and McFadden, 1977; Keller and Pinter, 1986; El-Hamdouni et al, 2008). More active tectonics results show lower Smf values. The amount of Mountain front sinuosity index show results between 1.003 - 1.14 in active and inactive parts of the Ramhormoz fault respectively. The Vf index discriminates V-shaped from U-shaped flat-floored valleys (Bull and McFadden, 1977).This ratio is a measure of the width (Vfw) of the valley floor to the elevation divides at the right (Erd) and left sides (Eld) of the valley at a set distance from the mountain front (Keller and Pinter, 2002) and can be calculated as: Vf =2 Vfw / [(Eld - Esc) + (Erd - Esc)]. Where Vfw is the width of the valley floor, Eld and Erd are respective elevations of the left and right valley divides (looking downstream), and Esc is the average elevation of the valley floor. The value of this index is sensitive to tectonic uplift and indicates that the stream is actively incising to the river flow in broad valley floors with respect to amount of tectonic activity. High Vf values correspond to U-shaped valleys representing low tectonic activity in contrast to low Vf values for V-shaped valleys, which are characterized by rapidly uplifting ranges and higher valley incision. The amount of this parameters have been changed between 0.37 – 13.48 for area with active and inactive tectonic manner. The drainage basin shape index quantifies the planimetric shape of a basin to the distance between the two most distal points in the basin (Mahmood and Gloaguen, 2012) and can be expressed as: Bs=Bl/Bw. Where Bl is the length of a basin measured from the highest point to the most distant drainage divide, and Bw is the width of a basin measured at its widest point across the basin Basins draining tectonically active areas are more elongated and become more circular with the cessation of uplift (Bull and McFadden, 1977). This geomorphic index shows the amounts between 0.5- 6.5 in inactive and very active parts of the faults. The Stream length–gradient index (SL) was to discuss influences of environmental variables on longitudinal stream profiles and to evaluate whether rivers have reached equilibrium condition or not. The SL reflects stream power or differential rock erodibility (Keller and Pinter, 2002) and can be calculated as: SL= ($\Delta H/\Delta L$) L. Where $\Delta H/\Delta L$ is the local channel gradient (slope) of the specific reach in which ΔH is the elevation difference between the upper and the lower part of the reach, ΔL is the length of the reach and L is the total river length from the river head to midpoint of the reach, where the index is calculated (Keller and Pinter, 2002). According of this index the main parts of the fault show inactive tectonic manner.

Conclusion

According to the geomorphic indices studies, the tectonic activity map along Ramhormoz fault was prepared. Different index shows different results of tectonic activity along the fault. According to the Mountain front sinuosity all parts of the faults approximately show active manner. Ratio of valley

floor width to valley high index mainly show inactive manner of Ramhormoz fault. According to the Drainage Basin Shape index the main parts of Ramhormoz fault show low activity manner. The results of Stream Length-gradient index reveal that the main parts of the fault are median tectonic activity. Finally overlying map of the geomorphic indices shows that the high tectonic activity of Ramhormoz fault in the central and southeastern parts respect to other parts of the fault.
Keywords:Ramhormoz fault, Dezful fall, Tectonic activity, Morphtectonic index

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Study the Role of Organizing Urban Spaces for Women's Social Security
Case Study: District 3 of Isfahan City

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Introduction

The rapid growth of urban population has resulted in a lot of problems and issues such as social abnormalities in cities in such a way that the increase in the rate of crimes has threatened citizens' security and convenience. Usually criminal actions are committed more in some parts of a city in that criminals select the pace of committing crimes as accurately as possible and choose those places where committing crimes is with the lowest degree of risk and the most speed. As a result, women's security in urban spaces is very significant and the security of women, as the half population of a society, may result in socioeconomic benefits. If women feel secure in urban public spaces, this issue influences the whole society.

Women as a half of the population of a society, always can be considered as a ground for development of the society. Assuredly, issues and problems related to this layer is one of the social and cultural concerns of each society. One of those issues is social security which seems to be dependent on multiple variables.

The present study is to investigate the effect of organizing urban spaces on reduction in urban crimes committed against women in District 3 of Isfahan.

Methods and Material

The research method is surveyjing research. The population consists of all women residing in District 3 of Isfahan who are about 60000 according to the General Census in 2016. The participants were selected via the random sampling method. The sample size was determined as 320 via Cochran formula. The data were collected via interviews and a researcher-made questionnaire. Then, they were analyzed via regressions, path analysis, factor analysis, and SEM techniques in Amos and SPSS software programs.

In the present study, to assess the six-index urban spaces including distressed areas, historical monuments green spaces and parks, incompatible and disturbing jobs, the state of passages and alleys, abandoned and semi-detached buildings have been considered and to assess 9-index women's social security including financial security, human security, honor security, intellectual and political

security, identity security, welfare security, judicial security, collective security and cultural security, analysis were made according to table 6. As the table indicates, in indices and components of social security, the lowest score is related to intellectual and political security and the highest score is related to cultural security. Regarding the effect of urban spaces, abandoned and semi-detached buildings, state of passages and alleys, incompatible and disturbing jobs, and distressed areas were the most important indices. In all, individuals' attitudes towards 6 indices of urban spaces were positive and all indices had scores higher than the moderate level. The urban green space with an error rate of 0.16 did not have a significant effect, and the abandoned and semi-structured buildings with a regression weight of 0.178 and an error rate of 0.006 best explained the variance of women's social security. In the structural equation model, the historical places with the regression weight of 0.43 had the highest significant effect while the parks and the urban green space with a regression weight of 0.07 showed the lowest significant effect.

Conclusion

Social security is one of the most important concerns and needs of urban life. According to psychological and sociological research, there is a direct correlation between social security and safe urban spaces; thus, by developing and practicing specific principles and rules regarding physical structures and urban spaces, social crimes and problems can be reduced to a great extent. Findings of the research identifies that favorable urban spaces have significant effects on women's social security (urban spaces could explain 32% of the variance of women's social security).

District 3 of Isfahan covers the highest degree of distressed areas and abandoned buildings in the city. The results indicated that this variable has the highest justification in explaining the variance of women's social security. In addition, the existence of historical textures and cultural heritages in this area seem to have the highest indirect effects on women's social security. Historical textures have significant effects on the state of streets, urban spaces, the shape of passages and alleys, etc. in the SEM and regression model.

Keywords: Urban spaces, Organizing, Women social security, District 3 of Isfahan, Urban life.

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Simulation of Hydrograph of the Flood with Hydrological Model HEC-HMS and Prediction of Return Period in Kermanshah Ravansar Basin

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Introduction

Flood is a natural event that human societies have accepted it as a part of unavoidable events of the earth and no doubt it is the most devastating natural disaster. This has led many experts to pay special attention to the studies related to the floods, ways to lessen their risks and losses, and to predict the possibility of their reoccurrence. Over the past few decades, the use of rainfall-runoff simulation models has been considered by water and soil conservation researchers to predict the flood and this has led to designing various software to simulate the rainfall-runoff process. One of the successful models in this regard is the HEC-HMS software. This model has been implemented by researchers in various regions of the world due to its proper response and the ability to modify its parameters and is now widely used in hydrological discussions. Ravansar watershed area with an area of 1103.05 km2 is one of the main branches of Ghareh Sou river, which is flooded down the river, especially during spring rainfall periods, due to its large volume of flow and lack of sufficient capacity for the current riverbed. Annual damage and damage to the sewage storage at the basin level confirms it. Because of this evidence and high potentiality of this basin, the flood formation of Ravansar watershed has been selected for the study in downstream floods. The purpose of this study was the simulation of runoff-precipitation model and prediction of the return periods of destructive and severe floods using the HEC-HMS hydrologic model and Hyfa software in the studied basin.

Methods and Material

For modeling, extraction of physiographic and hydrological parameters of the basin is very necessary. Therefore, in the first stage, using the 1: 20000 topographic layer of the organization of the armed forces of the country, the bases of the slope, hydrology, and topography of the basin were mapped. Further, the physiographic and hydrologic characteristics of the basin were calculated by the ArcGIS10 software environment. In the next step, statistics and information on precipitation and discharge with flood watershed maps were collected from the meteorological and hydrometric stations. Due to the limitations of hydrometric stations in the basin, to improve the accuracy of the study, the meteorological station and hydrometric station adjacent to the basin were utilized as well. The next step is the calculation of CN basin, which is directly related to soil permeability

characteristics and this parameter is also related to how land use and hydrological characteristics of the soil and vegetation type are. The Curve Number (CN) layer was prepared by combining the of layers of the soil hydrological groups, the land use and the vegetation cover. Using the weighted computation method, the mean of the CN was calculated and the number 66.5 was obtained. The extraction of the corresponding rainfall with the recorded flood sheets and the preparation of the hydrographs from the hydrologic stations were the next stage of the research. Then, the amount of discharge in the flood records of the hydrologic stations was extracted for each rainfall event, and then the daily rainfall corresponding to that event was extracted, after which five events of rainfall and flood corresponding to the synchronization were selected in all stations. In order to simulate the rainfall-runoff process, these estimations, along with other effective parameters in the runoff production, were introduced into HEC-HMS hydrologic simulations.To simulate the flood hydrograph in this study, the HMS-HEC model was used and to predict the hyfa software.

Results and Discussion

At the outset, the discharge data was extracted from the recorded flood records of hydrometric stations, and for each rainfall incident, the average was calculated first and then its hydrograph was plotted. Then, by examining the hydrogrxaphs in terms of having ascending and descending branches and the duration of precipitation and the synchronization of occurrence of rainfall and flood, suitable hydrographs were selected. In the next step, the daily rainfall corresponding to that flood event was extracted. Finally, five incidents of the corresponding rainfall and flood were selected by consistency in the studied stations. The selected flood data entered the HEC-HMS model. The simulation was performed for the whole basin and the initial model was extracted.

If the computational hydrographs (blue line) match the observational hydrographs (black line), then calculations of the values of the parameters introduced into the model are performed accurately. In fact, the model has been capable of simulating well the physical characteristics and coverage of the surface of the basin and the characteristics of the rainfall, such as its intensity, duration, and uniformity, but if the points are below the line, the model will show the prediction values less than the actual value, and vice versa. By observing the graphic hydrographs of the basin in Figures 10 to 14, the severity of the discrepancy in the data is well visible in calculating the peak discharge time of the flood and the time of occurrence of the flood. By analyzing the rainfall hydrographs on the dates of 1989,10,30 and 1994,01,17 and 1994,10,19 the calculated values for estimating the volume of flood and peak discharge are higher than their actual values. In contrast, on the dates of 1992,02,23 and 1992,03,30 computational amounts in estimating the volume of flood and peak discharge are less than their actual values. Also, in all hydrographs, the peak discharge time is calculated as an average of one day earlier than their actual time. Accordingly, due to the high percentage of errors in calculating the parameters introduced into the model, the calibration process was performed. After calibration, some changes were made to the parameters and the simulated hydrographs were approached to observation hydrographs. Calibrated graph diagrams show that computational data were very close to the real-world data in estimating peak fluctuations so that the error rate fell to less than 0.7%. That is, the peak sum of the calculated peak is 99% accurate for reliable prediction. In the calibration step, the error rate in the calculation of flood volume also decreased significantly. The

error rate dropped to 11.1 percent. Noteworthy in hydrographs is the lack of consistency of the lower arm of the observational and computational hydrographs that did not fit perfectly after calibration.
After calibrating the model and obtaining new and fitted values for the parameters used in the model, it is time to check the accuracy of the new parameters. For this purpose, three other incident events were used. After entering the new parameters into the model, the hydrographs of the newly discovered events were calculated and simulated. The evaluation of the diagrams at the accreditation stage shows that there is a significant decrease in the number of computational errors in comparison with the five simulation events. So that the computational hydrographs with a mean error of 0.7% for estimating peak discharge and with a mean of 3.33 error were found to fit the flood volume with observation hydrographs. In fact, the final hydrographs indicate the accuracy of the values of the calibration parameters and these values can be used in the final rainfall-runoff basin model. In the last stage, with the help of the hyfa software and with the maximum instantaneous flow rates of the studied stations, between the years 1955- 1955 to 2009-2004, using normal distribution, normal log 2 parameters, normal log 3 parameters, gamma 2 Parametric, Pearson, Log Pearson and Gumbel statistics were analyzed and extrapolated, and the return periods were 2, 5, 10, 20, 50, 100 years old, and so, which were calculated. Based on the results, the most suitable statistical distribution with which the data was fitted and showing the minimum error is the distribution of gamma 2 parameters. Based on the results, the probability of error in biennial return period is lower, with increasing the number of years added to the error rate.

Conclusion

1. The validation results of HEC-HMS model in this study indicate a mean difference of 0.7% in flood peak estimation and a mean difference of -3.33 in flood volume calculations. The final data show that the time model in estimating peak flows and flood volumes is capable of correctly calculating and calibrating the variable parameters of the model (curve number (CN), initial loss (Ia) and delay time (Tiag)) and then the simulation process with new flood events was validated again.
2. Calibration and validation of the eight selected rainfall events in this study showed that the computational hydrographs with a mean error of 0.4% were used to estimate the peak discharge and with a mean of 1.4 errors in calculating the flood volumes with observation hydrographs. Accordingly, the results of HEC-HMS computational hydrographs are more accurate in calculating peak discharge.
3. The most appropriate statistical distribution for which the maximum instantaneous flood station was fitted to is due to the minimum error associated with the gamma distribution of the 2 parameters. Based on the results, the probability of error in the biennial return period is less than the increase in predicted error rates.
4. In all simulated hydrographs, peak discharge times are calculated with an average of one day earlier than their actual time. Accordingly, this should be considered in predicting the occurrence of flood time.

Keywords: Flood, Rainfall-Runoff, Prediction, Hyfa, HEC-HMS.

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Assessment of the Role of Nature Tourism Attraction on Development of the Baghbahadoran Tourism and Analysis of its Effective Indicators

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Introduction

Tourism is a phenomenon that noticed human societies from long period and has continued different requirements in terms of social, economic and historical. At the present time increasing population growth and subsequent uncontrolled urbanization, especially in developing countries (shortage of green spaces, urban pollution) has created problems in terms of leisure and many natural beauties. Human escape the life of the machine to benefit nature so this is the basis of beginning in the name of ecotourism. Activities aimed at exploiting the natural beauty and amazing aspects of creation and at the same time responsible journey in lowest vulnerability environmental are done without the physical space area Development of tourism industry in places that have the potential attracting tourists can be used a useful tool in order to growth and comprehensive development of host communities. One of the areas with high potential to develop ecotourism in the province of Isfahan is Baghbahadoran region in terms of different attractions and beautiful natural landscapes, considered as local and foreign tourists resorts. Because of high potential of tourism in this area tourism attraction and promotion can make to sustainable development. So this study was to determine the role of tourism in developing ecotourism attractions of Baghbahadoran region and identify influencing factor onthe optimal approach for planning infrastructure

Methods and Material

The research method is Descriptive- Analytical and the main tool for data collection is a researcher-made questionnaire. the Statistic population included experts, the local community and tourists of Baghbahadoran region with a population of 47, 249 members. The sample size was calculated by Sample Power software to 254 cases. For analyzing the results of the questionnaire, various descriptive- inferential methods like T-test, ANOVA in SPSS software were used and for modeling, fitting and relation test, structural equation modeling in AMOS software were applied.

Results and Discussion

The results of the gender of respondents indicate that 79 percent of respondents equivalent to 7/35 of the volume of the sample population are women and 142 men of 3/64 Check frequency index results suggest that 7/21 percent of respondents visit the region for the first time, 1/27 twice and 7/50 percent, more than twice the percentage have traveled to the region.

In order to assess the role of ecotourism on the development of tourist attractions of Baghbahadoran based on research theory bases, study research history and the characteristics of the studied area was developed 17 indicators that tested respondents' views on the role of ecotourism attractions in the area. One-sample t test was used for analysis. According to the results, for all criteria for the development of ecotourism valued according to the Student t test and a significance level of zero confirmed gravity and potential impact of ecotourism on the development of tourism in Baghbahadoran. In order to identify the variables and factors affecting tourism development used structural equation modeling in the area. The results of the second order factor model shows that, ultimately, Baghbahadoran has significantly more important and more obvious effects on tourism development. The results show that the elements welfare service - banking services with 91/0 dedicated to the highest load factor more than any other influenced the development of tourism in Baghbahadoran. After a Bank-welfare services, enhancing communication with the load factor is 90/0 second place is allocated in terms of influence. Accommodation services among the factors affecting operating with a load factor of 86/0 is the third place. Finally, the investigating effective factors on tourism development in information and advertising Baghbahadoran vary from with a load factor 850 influencing factor is determined as the fourth. So we can say that the development of banking-welfare services with a subset of the most significant role in promoting the development of tourism Baghbahadoran allocated to tourism development in the sector more than other factors Baghbahadoran will be effective.

Conclusion

The findings indicate that ecotourism attractions in the region is most effective in attracting tourists. The results of structural equation modeling show welfare facilities - banks with 91/0 influential factor load factor for tourism development planning. Of this loadings factor 90/0 for facilitating communication puts the developing planning tourism in second place And lodging services with 86/0 loading factor information and advertising with loadings factor 850 placed in the third and fourth rankings. The use of t-test to select the most appropriate development strategy represents private sector participation as the best solution development. It is suggested to expand ecotourism and tourism in the study area. development planning should be based on the potential of ecotourism and providing for the participation of the private sector and the local community due to communication gaps meet, welfare, accommodation and advertising is necessary than ecotourism planning.

Keywords: Ecotourism, Baghbahadoran, Ecotourism attractions, Structural equation modeling.

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