Quantitative Analysis of Qanat Water Changes and Its Impact on the Agricultural Cultivated Area in Lenjan from 1991 to 2012

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Abstract

Qanat is one of the most complicated human invention techniques to extract underground water in arid and semi-arid areas which has been constructed for irrigating. In spite of the Zayandehrood River's water, Qanat in Lenjan is still an important source of water for irrigating agricultural areas.

The "descriptive-analytic" method has been used in this research, and all data have been collected from related libraries and institutes. In this research, the relation between the qanat water quantity and the agricultural area under cultivation has been studied in Lenjan. For doing so, the statistical data has been analyzed using SPSS and Excel by standardized score analysis method. Next, the linear regression of time series, hydrograph charts, and correlation methods have been applied for further data interpretation and analysis. It has been found that the rate of qanat discharge has been decreased in Lenjan compared to the previous time periods especially in drought years. This has caused to complete dryness of some of the qanat sources during 19991-2012. In addition, a direct relation has been found between the amount of qanat water drainage and the cultivated areas which have been shown by significant factor 0.001 and the correlation coefficient 0.69.

Keywords: Qanat, Acreage, Drought, Hydrograph, Lenjan County.

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Simulation of the Runoff Resulted from Snowmelt Using of the Remote Sensing Data (Case Study: Dehgolan Basin)

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Abstract

Given the lack of information about the amount of snow in the highland area, the use of satellite imagery can be helpful in distributing of snow cover and resulted stream flow in water basins. The aim of this study is to investigate surface runoff at the Dehgalan basin outlet associate with changes in snow cover in the highlands of the basin. To this purpose the Values of runoff resulted from snowmeltin Dehgalan basin were simulated using snowmelt runoff model. In order to simulate, first climatic and hydrometric data were collected from Iran meteorological organization and Kurdestan Regional Water Co and then physical characteristics of basin include perimeter, area, and high zones were calculated using digital information. Climatic and hydrometric information were obtained from linked organizations. The ratio of basin snow cover was prepared by the SNOWMAP algorithm using 8-day snow cover products at the global scale bands of MODIS snow cover data from NASA site. The information that was essential for modeling were entered to model and simulating process was done according to the requirements of the particular specification of catchment. The assessment parameters that were used by model to evaluating the accuracy of the simulation included the coefficient of determination and volume differencing. The procedure of simulation of runoff resulting from snowmelt was conducted by calculateion necessary factors and parameters in the time period of December 2004 to April 2005. The results of simulation showed that snowmelt-runoff model was efficiently capable to simulating runoff from snowmelt in Dehgolan basin by 52% coefficient determination and volume difference of 2.23. The obtained correlation coefficient and difference

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of volume shows the mean accuracy of model in simulation of snowmelt- runoff in the basin. It could be caused by the physical characteristics of the basin. The results of this study showed that the operation of SRM model in study area as a coupled of mountainous and plain basin was less than mere mountainous basins.

Keywords: Snow cover, Snow melt-runoff model, Dehgolan basin, Simulation.

The Determination of Infrastructures and Tourism Establishments in west Azerbaijan Province County

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Abstract

Today, tourism development as a profitable activity, in the countries planning, is in priority. But tourism development is needed to infrastructure development. usually in third world countries, focusing tourism infrastructure in major cities and provincial capitals, lads to tourism development in big cities, and towns, even villages with high potential which have little interest from its advantages. So identifying development level of cities, in terms of tourism infrastructure can be efficient method to planning for less developed regions. This research method is descriptive-analytical, trying to analyze tourism infrastructure in the cities of west azerbaijan province. To this purpose, 14 variables were selected in the field of tourism infrastructure using factor analysis techniques have been analyzed with SPSS software. Variables declined two influenced factors and finally cities were ranked by resulting scores of combined index, then development levels for each city was identified. The results indicate that, Urmia city in terms of having the infrastructure is in priority, Khoy city is second, and cities of showt and poldasht have been ranked in the Sixteenth and Seventeenth. This Fact indicated that, there is heterogeneity in this province. So that, Urmia city is as quite developed and the city of Khoy and Sardasht, developed and cities of Chaldoran, maku, Mahabad, Salamas, Miandoab, Nagadeh and Bukan are developing, while other cities are underdeveloped. Between the rank of each city in terms of its infrastructure and tourist attractions, there is a positive relationship.

Keywords: Tourism, Tourism infrastructure, Factor analysis, Western Azerbaijan.

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An Analysis of Tabriz Mehr Housing Localization

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Abstract

In this research, by using 10 natural criteria and AHP model, Tabriz district was studied from natural environment perspective to identify the optimal location for construction of Maskan- Mehr and compare the current Mehr housing location. The method of this study is descriptive-analytical and the data were collected by documentary and field study methods. According to the proper zones identified for localization of Mehr housing in Tabriz district and since all zones were not optimal and lacked capability of planning, so by using TOPSIS, SAW and MORIS, the optimal zones were prioritized from implementation perspective. Also, the analysis of sensitivity of the identified zones was investigated based on 10 localization criteria. The results show that there are seven proper zones 10 km of Tabriz that have the best conditions for localization of the Mehr housing according to studied criteria. Also, ranking models show that the first zone is near to Tabriz- Maragheh road. The results show that Mehr housing in Tabriz that selected based on the economic conditions and land ownership issue could be localized in a proper environmental conditions near to Tabriz to consider environmental and natural disasters in addition to economic support of the owners of these dwellings.

Keywords: Mehr Housing, Environmental Evaluating, Multi Criteria Decision Making, AHP, Tabriz.

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The Evaluation of amount of Realization of Approved Usages Managing Plans and Their Adaption in Implementation Phase of Project (Case Study; Villages of Khaf County)

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Abstract

Today rural managing plans are the most important tools of the management of rural development. After more than three decades, from the beginning of the implementation of such plans in rural areas of the country and to acquire experience, it is necessary to know that such plans for rural community of the country, has had what results and outcomes. This article, take notice the evaluation of amount of realization of suggested usages and then the amount of adaption of this usages in the implementation phase of project with the map of approved usages of this plan in the vilages of khaf County. For estimating the amount of realization of suggested usage of managing rural plans was used. A compilation of approved suggested map of studied villages in 2001 –2003 and the map of their status quo in the current year 2013. In this article, research method is descriptive–analytical and for data collection was used of field and documentary methods. Search finding, was ArcGIS and also preparation and analysis of all plans by using software shows that the highest percentage of realization is related to sport usage with 87.8 percent and the lowest is related to green space with 12.1 percent of realization. Also the lowest adaptability of suggested usages is related to Sedeh village with 71.8 percent of adaption and highest is related to Khergerd village with 99.3 percent. In the field of becoming operational of suggested usage, regarding the implementation just 53 percent of area of suggested usage, we can conclude that in these village's has been poor. But this same running area had the necessary adaption with the usages of suggested plan.

Keywords: Realization, Adaptability, Location–spatial factors, Suggested usage, Khaf County.

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Investigation on Impervious Surface (ISA) and the Normalized Difference Vegetation Index (NDVI) as Representative Parameters of the Urban Heat Island by Using Satellite Imageries

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Abstract

Urban heat island phenomenon is generally caused by a reduction in latent heat and a rise in sensible heat in urban areas. Today, this is one of the major problems of the large cities which has attracted the attention of many researchers and experts in various fields. This study investigates heat island in Tehran metropolitan as the most densely populated city of Iran. This paper aims to use satellite imageries to compares the normalized difference vegetation index (NDVI) and impervious surface (ISA) as representative parameters that of surface urban heat island (SUHI) by examining their relationship with land surface temperature indices (LST) and land-use map. For this purpose, LANDSAT 5 TM imageries and Tehran1:2000 land use map and sub-pixels model has been used. The results show that there are a linear and strong relationship between LST and ISA, while the relationship between LST and NDVI is much weaker and in order to quantitative investigation of LST in urban heat island we used thermal remote sensing. Results indicated that ISA indicator is suitable than NDVI. Also, the investigation on percentage of impervious surfaces in each land-use represents that residential land uses has the highest percentage of impervious surfaces because having the surfaces like asphalt and concrete and vegetation is the lowest one.

Keywords: Impervious Surfaces (ISA), Land Surface Temperature (LST), Normalized Difference Vegetation Index (NDVI Linear Spectral Mixture Model (LSMA) and Urban Heat Island.

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The Evolution of Village Residency, Case Study: Tabriz Metropolitan East Villages

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Abstract

The spatial and functional interrelationships between cities and surrounding areas, including rural areas in their influence on districts, gradually lead to different changes in different cases. One of these phenomena is spatial mobility (positional movement) of population from village to urban areas. Considering the effect of the village-urban migration, it is quite clear that the population, economy and villages physical structure will change. The present study discusses the changes in demographics, economics and the physical structure of rural settlements in east Tabriz which have been taken based on the village residency. Moreover, an attention has been paid to the root causes of such formation. This article is based on field studies (direct observation, various questionnaires and interviews with experts).The ultimate goal of the present study is the applied one, because it is aimed at understanding the physical changes, demographic and economic way to provide optimal solutions. The results of this article revealed that the interactive effect of the spatial and functional interrelationships between Tabriz metropolitan and under study villages has had a major role in the development of population, economy and physical changes of villages. Among this, ungovernable extension of Tabriz and existence of problems like high costs of life and livelihood problems, high price of land and settlement, excessive air pollution, are the educator elements on the contrary of the low cost of land and settlement, clean air in villages and existence of equipment of transport and the suitable roads in the under study villages which acts as a suction element and actuates some of the urban people to settle in the stated villages.

Keywords: Village residency, Urban-rural migration, Tabriz metropolis.

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Evaluation of Site Selection for Settlements That Affected by Natural Hazards Using D-InSAR Techniques (Case Study: Googerd Village)

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Abstract

To reduce vulnerability of some villages to natural hazards, shifting their location is inevitable. The rural relocation and resettlement is a plan to determine the optimum establishment and activity site for the study of villages by studying the causes of displacement, evaluating social and economic characteristics of villagers and environmental and physical assessment are of options for a new location. Googerd village due to its vulnerability to landslides was studied which several times was displaced and finally a place is specified for the displacement. If this site itself be vulnerable to natural hazards, it will cause the collapse of the physical, economic and social environment of villages. Vulnerability assessment in relation to natural hazards requires precision tools with applications in the spreadsheet spatial level. Therefore, in this study, in order to evaluate the rate of stability of the chosen site for displacement and relocation of Googerd village, at first the rate and range of displacement during the period from 2003 to 2010 were derived using 25 ASAR ENVISAT radar images and SBAS differential radar interferometry (D-InSAR) technique. The results showed that the stability of the selected sites does not have the favorable conditions and experience on average 12 cm line of sight (LOS) displacement. In order to conduct survey on the hillside of study area against mass movements and assessment of environmental stability and optimized understanding of them, displacement time series plots was drawn for six points around the selected site. These

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figures indicate that there is variable line of sight (LOS) rate of downward motion between 14-8 cm in all sides of selected site.

Keywords: Applied geomorphology, Differential interferometry techniques, Relocation, Googerd.

Classification and Quantitative Characteristics Analysis of Iran North- West Salt Domes from Aspect of Structure

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Abstract

There are more than 50 salt domes with neogene age in the northwest of Iran 48 Domes of which have measurable dimensions. One of the criteria's according with which we can classify Iran north-west salt domes is structural features of salt's appearances in the region.

In this article salt domes in north west of Iran, according to their structural characteristics, have been divided into two groups with mono-clinal structure and anticline structure, at first the scatter diagram, regression line, the kind and amount of correlation between morphometric parameters of each group have been analyzed. Then the parameters of each group have been compared with those of the other group.

Examining the salt domes morphometric parameters show that mono-clinal domes in comparison with the anticlinal domes have area, circularity coefficient and height but more stretching and elongation coefficient. Also, mono-clinal domes are located on faults or in a near distance from faults, therefore the mono-clinal domes in comparison with the anticlinal domes, are more influenced by the faults.

Keywords: Northwest of Iran, Salt dome, Anticline, Mono-clinal, faults, Morphometric parameters.

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Trend Analysis of Water Chemical Quality of East Azerbaijan Rivers

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Abstract

The aim of this study is trend analysis of streamflows of east Azerbaijan using the non-parametric methods. For this purpose the information of consentration of water quality ions (Ca, Mg, Cl, Na, HCo3, pH, So4, TDS, EC, SAR, Total Cations, Total Anions and Na%) of ten hydrometric stations (1983-2008) were used. To test trends the Mann-Kendal scheme after removing all significant autocorrelation effects from the data were used. To estimate trend line slope the non-parametric Sen´s estimator method was used. Results showed that trends of positive ions and EC were upward for most of the stations. Those stations which had negative trend in streamflow also exhibited positive trend in concentration of chemical elements of surface water. Furthermore, investigation of streamflow water quality using the Wilcox on method showed that the quality of water declined comparing the last decades. The reason of such declination attributed to the decreasing trend of streamflow and conveying pollutant materials into the rivers.

Keywords: Homogeneity, Mann-Kendal, Sen´s estimator, Trend, Water Quality.

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Analysis of the Frequency and the Spell of Rainy Days Using Markove Chain Model in Southwest of Iran

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Abstract

One of the most important issues in arid and semi-arid regions is water resources management. Thus the study of the occurrence or non-occurrence of precipitation behavior can improve management water resources in these areas. In this study, the occurrence of days with precipitation in the south west of Iran using daily rainfall synoptic stations in the 1994-2009 periods and adapting Markov chain was performed. The frequency matrix, switching matrix and stable matrix as well as continuous rainfall and the rainfall return periods of 2 and 5 days were calculated. The results show that the minimum probability of rain is in the plain area while the highest probability of rainfall belongs to the mountainous area. Also the highest probability of monthly precipitation is in January and the minimum is that of summer. The minimum of return period and the maximum continuous rainfall are in the mountainous stations and the maximum of return period and minimum continuous rainfall are in the plain area. Also unlike the other months, the maximum of probability rainy days in June is in eastern parts of mountains.

Keywords: Markov chains, Precipitation in South West Iran, Occurrence Probability.

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The Reconstruction of the Annual Rainfall of over a Century through from Quercus Persica Tree Rings in Zagros Forests (Case Study of Dena Region)

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Abstract

Knowledge of past climate needs long-term and accurate climatic data for future planning and predicting. In this study, we reconstructed the average maximum temperature in spring and minimum temperatures in fall and winter by applying the width of annual rings of Quercus Persica through multiple- regression. With this goal in mind, two growth heights were selected in Dena Forests and 40 growth samples from 20 bases in two geographical directions of southwest and northeast were extracted at breast height and measured with AutoCAD software with an accuracy of 3 microns. After cross dating stage, to eliminate non-climate effects, all climatic parameters and tree rings time series were standardized. The calculated Residual Chronology (RES) was calibrated with climatic variations of the period 1881-2011 and positive and significant correlation with the width of growth rings was confirmed. Based on the relations and correlation between the calculated chronology and joint statistical climatic data the reconstruction of annual rainfall was performed and it was found that the average rainfall of the last three decades had a 4 percent increase in comparison to the average rainfall of the last century.

Keywords: Chronology, Dendroclimatology, Growth samples, Multiple-regressions

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Classification of Annual Temperature of Iran Meteorological Stations Using Fuzzy Cluster Analysis and Kohonen Artificial Neural Networks

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Abstract

Classification of Meteorological stations, causing a large volume of data to be allocated a smaller homogeneous groups, Ease of use in modeling and also can help to spread the information to point to the lack of regional data to Statistics regional statistic. Meteorological stations in the region has a crucial role in the management and effective use of information. In this study, 112 stations were analyzed in order to classify regions with fuzzy cluster analysis and Kohonen artificial neural Networks. Four parameters, namely mean annual temperature, longitude, latitude and elevation are considered as the classification criteria for grouping to obtain the optimal number of groups the lowest value of Davies- Bouldin index were used. Demarton climatic zonation was performed to evaluate the spatial distribution of clusters obtained from various methods. The results showed that the fuzzy clustering technique with the Demarton climatic zones is more consistent.

Keywords: Classification, Meteorological stations, Fuzzy cluster analysis, Kohonen artificial neural Networks, Climatic zonation.

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Prediction of Minimum and Maximum Temperature, Radiation and Precipitation in Rasht Synoptic Station under Different Climate Change Scenarios

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Abstract

Prediction and evaluation of meteorological data in effect of climate change is very important especially in water resources management. LARS is a model that generates weather data and predicts weather parameters by downscaling global circulation models (GCM). In this study, in order to evaluate 15 GCM models performance in simulating the minimum and maximum temperature, radiation and precipitation in Rasht synoptic station (2011-2012), statistical downscaling of each model was performed by LARS model. Then, the mentioned data were predicted on the basis selected GCM models for 2013-2042 and 2043-2072 periods. The results showed that the highest increase in annual average of minimum and maximum temperature will occur during the 2043-2072 periods with 1.3 and 2.0 °C, under A2 scenario, respectively. The amounts of radiation will decrease in future periods for all seasons. The highest decrease (143.4 MJ m^{-2}) of radiation will occur in 2013-2042periods in winter under A2 scenario. The seasonal precipitation will often increase in future periods. The highest increase of seasonal precipitation (55.5 mm) will occur under B1 scenario in 2043-2072 periods for autumn.

Keywords: Global circulation models, LARS-WG, Climate change, Rasht.

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Evaluation of Rose Cultivation Impacts in Lalehzar Rural District Community of Kerman

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Abstract

Iran's rural economy has a decisive role in the whole community for various reasons such as food security and export production supplying, contribution in GDP and value added. As well, it is highly responsible to create the occupation and income opportunities for the rural communities and organize the socio-economic situations in rural areas. This study purposes to assess the floriculture impacts, as a relatively new farming activity in the Lalehzar district rural community of Bardsir township in the Kerman province. Statistical population is rural resident households in four villages of Lalehzar. 250 persons were randomly sampled and interviewed in order to gather the needed primary data. Secondary data required by referring the documentations. The self-organized questionnaire was pretested in order to assess its reliability and realize the main variables variation to estimate the size of the sample. After the statistical description of the sample properties and research variables, further inferential analysis was carried out by employing factor analysis and varimax rotation. Results indicated that the most important impact of the floriculture activity has been shifting the farming systems of the region towards the sustainability which is considered as an environmental impact. Social impacts, mainly in promoting the rural women's socio-economic status has been the next major consequence, following the economical impacts such as employment and income earning opportunities provided via lateral activities. Existence of a lot of environmental and peripherals conditions, promises development and a more effective role for continuing this activity at the future of the study area.

Keywords: Rural economy, rural economic development, Rose breeding activity, Lalezar.

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