Estimation of Actual Evapotranspiration with Mountain SEBAL Method in Meshginshahr Region

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Abstract

evapotranspiration have the essential role in water balance, accurate estimates on many projects and scientific studies in the fields of hydrology, agriculture, industry, water engineering and other allied sciences, for efficient management of water resources and the design of hydraulic structures required. In recent years expanded use of satellite imagery in estimating real evapotranspiration, methods have been developed such that they can be SEBAL method mentioned. SEBAL model for estimating evapotranspiration in the study- the actual evapotranspiration in the study area (Meshginshahr region) was selected. This model has been implemented in many countries and it has achieved remarkable results. These models are generally designed for flat areas and the impact of altitude, slope and is ignored in the calculation. In this study, the involvement of these factors in the model, the new model called "Mountain SEBAL "has been introduced. Meshginshahr region in northwestern Iran with respect to an appropriate specification for the model selection and the calculation of the inputs to the model are: layer DEM, Slope, aspect, incoming sun, the sun angle Cosine, Radiance spectral reflectance, kind of surface, the incident radiation, the normalized vegetation index, surface radiation surface temperature, outgoing longwave radiation, incident longwave radiation, soil heat flux, sensible heat flux and latent heat flux to calculate the evapotranspiration actual moment have been studied in the region. By comparing the normalized surface temperature and vegetation index (NDVI) -0.969 correlation was observed between them. The comparison between evaporation-actual evapotranspiration calculated vegetation indices, indicating the applicability of these two factors together (correlation of 0.81), so that areas with high vegetation density, with areas of evapotranspiration and high real comply. On the other hand, compared to images of surface temperature and actual evapotranspiration inconsistency confirms them as areas of high surface temperatures and evapotranspiration are down.

Keywords: Evapotranspiration, SEBAL, Surface temperature, Vegetation index, Meshginshahr.

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Analysis of the Socio-economic Impacts of Dams on Rural Development (Case of Solaimanshah Dam)

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Abstract

Dam projects that affect people's basic rights violated by these projects, homes, farms, orchards and social affiliations have lost their culture. Dams impact on livelihoods, social and cultural systems and are often not explicitly given in the categories of dams and the benefits analysis is not addressed. Therefore considering worldwide development trend for dam construction, especially in Iran, the necessity of reviewal the socio-economic impacts of dam construction thus becomes apparent. Solymanshah dam was constructed in 2006 in the Sonqur city. The main purpose of research was analysis of socio-economic impacts of solymanshah dam on rural development in areas under irrigation and drainage network. Statistical population consisted of householders in rural that are under direct effects of dam (1273 member) 291 of whom were selected for Morgan table by using stratified sampling method with Proportional allocation. Composite Index (CI) and Moris mode were used for analysis of data. Results showed that the most important positive socio-economic impacts of dam on region includes addition in people's income via promotion in agricultural activities that have carried out by dam, development of agricultural lands, interance of tourism in the region and the development of rural tourism. In addition in people's income via nonagricultural occupations, the development of rural roads and the improvement of communication, addition are added to economic worth of farm lands, and the revival of green and enjoyment landscapes of villages. Also the results showed that the most important negative socio-economic impacts of dam on region included: loss of socio-cultural attachments (memories, mosques and religion places, the upset of customary land in Villages, sinking grave

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ancestors), distortion of some part of high quality farm lands, distortion of rural houses, losing the first job for many of the villagers especially farming, the lose of adult fruit trees and worthwhile gardens and seizing of villager's land with low prices. The results also showed that between 12 villages which were directly under irrigation and drainage network of the dam, Soleimanshah and Joubkabod Olya were under development and other were loss developed. Also results showed that two villages of Ghiasabadi and Qorveh less than others have enjoyed the benefits of dam construction.

Analysis and Evaluation of Development of Urban Services Indicators in West Azerbaijan Province Cities by Using MCDM Techniques

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Abstract

The present paper, seeks to analyze and ranking the cities of west Azerbaijan province in terms of urban services development indicators with regard to the inseparable linkage between balanced distribution of urban facilities and services with social welfare, social justice and urban sustainable development. This research was implemented with descriptive- analytical approach by using MCDM techniques. According to the SAW model results, the cities of Maku, Silvana, Sero, Urmia and Miandoab are placed within first to fifth ranking, respectively, and the cities of Bazargan, Nooshin, Mohammadyar, Mir Abad and Rabat are in the ranking of 32 to 36 across the province in terms of development of indicators and functions of urban services. In this regard, based on the VIKOR technique, according to the development of studied indicators the city of Silvana became the provincial superior and the cities of Sero, Maku, Urmia and Sardasht are in the 2nd to 5th rankings and the cities of Nalas, Shut, Qarazia'eddin, Mir Abad, Rabt and Mohammadyar are in the rank of 31 to the end. Combining the results of both Vikor and SAW models, displayed that the cities of Silvana and Maku together are in first ranking and the cities of Sero, Urmia, Mir Abad, Mohammadyar and Rabat are placed in the 2nd to end ranking. Finally, the province cities, according to the ranking of developing the urban services per capita, were classified in three levels using hierarchical cluster analysis. The research finding also indicated that there was no significant correlation between ranking of developing the urban services and province cities population ranking.

Keywords: Development of urban services, West Azerbaijan, MCDM.

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The Survey of Regional Changes in Annual Precipitation Using Geostatistic techniques (Case Study: Ilam Province)

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Abstract

Selection of an optimal interpolation method for estimating the characteristics of the not-sampled points was the main aim of this study, due to the important role of data management. In this study, ordinary Kiriging interpolation models including linear, exponential, spherical, Gaussian were used to estimate the mean annual rainfall of Ilam Province. For this purpose the normality of the data was checked using the Kolmogorov-Smirnov method and then the variogram of each model was calculated and plotted. In continuation, the best spatially fitted variogram between the data was used being compared to the other variograms. For this purpose, the relation between the piece effect and the roof of variogram was used (C_o+C). According to the parameters obtained from the fitted variograms, the Gaussian variogram with the 0.33 best fitted the correlation between the data and was used for interpolation. In order to evaluate the efficiency of employed models, the root mean square error (RMSE) and the standard error of results were used. The results showed that the Gaussian Variogram having the lowest estimation error (6.12) and root mean square error (166) were the best model for the interpolation of the data in this investigation. Furthermore, comparison of RMSE with Standard Error (SE) for calculating the amount of expectations demonstrated that the four models gave overestimations.

Keywords: Interpolation, Ordinary Kiriging, Variogram, Mean Annual Precipitation, Ilam Province.

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Analysis of the Status of Building Density in Plans of Urban Development in Tabriz

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Abstract

Building density as the total floor area ratio of all storeys used for residential purposes is an important issue in urban planning and land management. Today, because of the lack of resource and to decrease urban development costs and to provide goods and commercial services attention toward the increment of to more dense and increasing building density has increased. This article reviews the concept of building density and documents and regulations approved on this subject during recent years in Tabriz. It is a descriptive-analytic research. The increasing of building density in cities with growing populations is one of the strategies approved for controlling extension and balance of urban space. Increasing density in cities without attention to balances and equilibrium might cause problems and solving that will take much time, energy and would require higher costly. Studies show that among the regulations approved for comprehensive plans and regulations in the detailed plans and projects, there is an obvious difference. For instance, open space reduction rule was approved in master plan to be 55 m^2 upto 10 m^2 in detailed plan of Tabriz. Obviously, if in the process of determining the building density measures such as occupied building, height, proportion of mass and space, and residential neighborhoods carrying capacity are considered, it ciykd have helped achieve a coherent and systematic space for the city and add to the quality of urban spaces continuously.

Keywords: Building Density (FAR), Regulations, Urban Development Plans, Tabriz; Articles 269 and 329.

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The Effects of Document Issuance Plan of Places Ownership on the Development of Rural Settlements (Case study: Eghlid County)

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Abstract

Despite the long history of rural settlements in Iran, ownership in different areas has left a great impact on rural communities, however, it is hoped with implementation of Document Issuance Plan of Rural Places Ownership (DIPRPO) could help decrease the unorganized physical conditions of rural areas. The study area has a long history in being chosen for residence in Iranian plateau, in which the implementation of DIPRPO began in 2000's and ever-since this area has taken the consequences of the plan. This study aims to investigate the social, economic, and physical impacts of implementing of DIPRPO in Eghlid County. In terms of the aim of the study, the research applied is and with regard to the methodology is descriptive- analytical one. The statistical population of the study included 3,270 households in 10 villages, and based on Cochran equation 247 questionnaires were prepared out according to systematic random sampling method. Research findings showed that there was a moderately suitable significant correlation between DIPRPO and changes in social, economic and physical dimensions of villages in the study area with the P statistic of 0.364 to 0.529. The impact effect of the variable of DIPRPO on changes in villagers' life was approximately 0.325. Rise in investment in rural areas with a co-efficient of 34.5 % had the greatest role in paving the way for changes in villagers' life. DIPRPO had 0.32 direct effect on the economic dimension, and 0.50 direct effect on physical dimensions of rural life. According to the findings, the following guidelines were proposed: exemption of certain social classes from paying the charges of implementing this plan, establishing a comprehensive database of rural property and its management by Dehyars[3], etc.

Keywords: Ownership Document, Economic and Social Changes, Physical Changes, Rural Development, Eghlid

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The Influence of Weathering on Hydrogeochemistry of Streams Draining Volcanic Rocks: Bidkhan Stream, Southeast of Bardsir in Kerman

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Abstract

Bidkhan stream drains the caldera of the inactive volcano of Bidkhan which lies at a distance of 40 Km southeast of Bardsir town of Kerman Province. The main purpose of this study was to determine the source of ions and compounds dissolved in this stream water, with specific regard to chemical weathering. Therefore, 12 samples were taken along the route of this stream. EC, pH and temperature were determined in the field and the concentration of ions and compounds were determined using standard laboratory methods. After controling precision and accuracy of the analyses, the Piper diagram, ionic ratios and statistical techniques (multivariate analysis, cluster analysis and correlation matrix) were used to interpret the data. Accordingly, all samples belonged to "temporary hardness" class and were of calcium bicarbonate and magnesium bicarbonate type. Ionic ratios indicate silicate weathering. In factor analysis, Li, Sr, Ba, Ca, Na and Mg cations and bicarbonate, sulphate and chloride anions all groups in factor 1. So, almost all of the cations are released from silicate weathering, chloride from rainwater, bicarbonate from CO_2 gas of air and soil and sulphate from rain water and probably pyrite oxidation. Fe, Mn and Al are grouped in factor 2 which means source (mafic silicate weathering). Hence, a common silicate weathering is the main source of major cations and heavy metals. Considering the chemical composition of waters, both mafic and felsic silicates have played a role. This is attested by the lithological diversity of the volcanic rocks of the area.

Keywords: Chemical weathering; Hydrogeochemistry; Bidkhan stream; Volcanic rocks.

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CDS as Participatory Approach in Future Visioning of City Development Process: Case Study of Mahabad

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Abstract

Since the beginning of modern times in Qajar era and its further expansion in Pahlavi era, urban management in Iran has failed expectations on satisfactory performance in many areas including especially local and participatory management, hence failing to meet citizens' diverse needs due to the flawed mutual relations between people and the city management, and creating severe challenges to contemporary city planning. City Development Strategy (CDS), with its most prominent feature of – according to Cities Alliance guidelines – participatory future visioning and social capacity-building of sustainable city development, is a modern approach in city planning, poverty reduction, improvement of quality of life, and promoting public participation in city management. The present paper examines this approach in Mahabad, West Azerbaijan province, with the objective being preparing grounds for participation in future visioning of city development – which provides a justified framework of future planning. An applied descriptive-analytical research will us survey as the method of collecting data. The findings of the study, according to three major categories of theories on city planning, indicate that citizens in Mahabad have an appropriate level of common knowledge of opportunities, threats, and capabilities of their city issues, which makes conditions conducive for future visioning of the city planning.

Keywords: City Development Plan, Participatory Visioning, City Management, City Planning, Mahaba.

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Evaluation of Urban Poverty in Informal Settlements across Kermanshah, Iran through Factor Analysis (A Case Study of Dolat Abad & Shater Abad Settlements in 2006)

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Abstract

Informal Settlements, resulting from swift urbanization in the contemporary world and the socioeconomic inequalities across regions, have made cities-especially metropolises like Kermanshah, Iran- face a great deal of problems. Therefore, the present study aimed to evaluate the informal settlements of Dolat Abad and Shater Abad in Kermanshah. To this end, an analytic-quantitative method with an applied approach was used, and the statistical population of the research consisted of Dolat Abad and Shater Abad settlements, based in western and eastern Kermanshah, respectively. So, the information on the statistical blocks in 2006 and 30 indexes, changed into three combined factors, were analyzed by factor analysis, Arc/GIS and Arc/View Software. As for Dolat Abad settlement, the results showed that 20 blocks (11.1% of the population) had appropriate states in terms of poverty, and 31 (17.2%), 57 (31.7%), 50 (27.8%) and 16 blocks (8.9%) held relatively appropriate, average, relatively inappropriate and inappropriate states in terms of poverty, respectively. Furthermore, the results of evaluation of poverty in

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Shater Abad settlement demonstrated that 12 blocks (4.5% of the population) had inappropriate states in terms of poverty, and 74 (28%), 92 (34.8%), 60 (22.7%) and 13 blocks (4.9%) held relatively inappropriate, average, relatively appropriate and appropriate states in terms of poverty, respectively. In addition, the results of the present study suggested that the residential blocks based in Kermanshah were sites for manifestation of social, economic, cultural and structural distinctions. These settlements symbolize poverty and go through a different process in terms of dynamics, and more to the point, the existence of inequality across the urban areas of Kermanshah has led to spatial, social and economic segregation. Not to mention, the results of the present work were dependent on the applied indexes, which may be affected through applying other ones.

Keywords: Informal Settlements, Kermanshah, Factor Analysis, GIS.

Synoptic Analysis of Heavy Rainfall in Northwest of Iran (With an Emphasis on Patterns of Atmospheric Thickness)

M. Rezaee Banafshe[1]

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F. Jaffari Shendi[3]

M. AliMohammadi[4]

Abstract

In this study, the heavy rainfall of Northwest of Iran has been analyzed using environmental circulation approach. Isohyte maps were depicted using Kriging method on 14*14 km pixels from 21/3/1961 up to 31/12/2004 (a17508 ×533 matrix). Based on these interpolated data we selected super heavy rainfalls for all in Northwest of Iran as a whole. Heavy rainfall and their locations have been detected from 0^0 to 1200 E and 00 to 800 N in the five this levels (1000, 925, 850, 700, 600 and 500 hPa level) at 00:00, 06:00, 12:00 and 18:00 UTC. The results of this study showed that four thickness circulation patterns play role in producing these super heavy rainfalls. In analysis of these precipitations one representative day was introduced for every circulation pattern. The analysis showed that the circulation patterns 2 justify the most of precipitations. These findings can play an important role in forecasting the precipitation and preventing from flooding in the region.

Keywords: Heavy Rainfall, Northwest of Iran, Cluster Analysis, Circulation Pattern

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Prediction of Climatic Parameters Using LARS-WG Model in Ghare-su Basin

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Abstract

A stochastic weather generator can serve as a computationally inexpensive tool to produce multiple-year climate change scenarios at the daily time scale which could incorporate changes both in mean climate and in climate variability as well. In this paper, LARS-WG model was used to downscale GCM outputs and then tp assess the performance for generated daily data of precipitation, minimum and maximum temperature and sunshine hours. Study area was Ghare-su basin in Gorgan and the station is called Gorgan synoptic station. The first step was running the model for the 1970-1999 periods. Then mean of observation and synthetic data were compared. T-test was used in the 99% significance level, and the difference between observation and synthetic data was not significant. Finally monthly mean of observation and synthetic data were compared using statistical parameters such as NA, RMSE & MAE. As a final result, it was found that performance of model was appropriate for generating daily above-listed data in Ghare-su basin. Thus, it was possible to predict the climatic parameters from GCM output using LARS-WG model. Also minimum and maximum temperatures had the highest and sunshine hours involved the lowest correlation. After ensuring performance of model to simulate above-mentioned parameters, this model used to predict future trends (in 2011-2030 and 2080-2099) with A2, A1B and B1 scenarios of the HadCM3 model was. Results showed that future temperature would increase 0.56-4.04 degrees centigrade while precipitation would increase 10.28-23.71%.

Keywords: Climate Change, Climatic Scenarios, Down-scaling, LARS-WG, Ghareh-Su.

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The Assessments of Orginizing Policies in Worn out Textures and Priority of Current Challenges in Urmia Using ANP Technique

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Abstract

The worn out texture is a type that has been formed, developed and faced functioned problems through years and does not meet today needs. Therefore it is very important to pay attention and plan to improve the current situation of the worn out textures to avoid it from worsening over time. There are 1313.2 acres of worn out texture which include three types firstly, historical worn out texture, secondly, middle worn out texture, and third, marginal worn out texture; each has its own specifications pushing different results according to their areas. This paper has tried to evaluate organizing policies, identify of important criteria, analyze current challenges in timeworn textures and finally prioritize different worn out textures by using network analyze process. This article has used ANP model in housing and timeworn texture sector.

Keywords: Policy, Organizing, Worn Out Textures;, Challenge, Urmia, Anp.

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Survey of Using Multi-criteria Decision-making Methods and Multi-objective Optimization for Site Selection of Schools, Case Study: Region 17 of Tehran

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Abstract

The ever-increasing population leads to establishing new educational centers. One of the important stages in school establishing, is selecting the optimal locations for them according to different objectives and criteria. The objectives are defined to determine well-distributed schools with balanced capacity and minimize the incompatibility of land-uses in the area. Increasing the related factors and criteria makes the location-allocation problem more complicated. Therefore, it is necessary to use efficient methods to solve it. In this paper, GIS, Multi-criteria decision making methods and multi-objective evolutionary algorithm were used to location-allocation of multiple girls' primary schools in region 17 of Tehran urban area. Equity in geographic access and balance of schools capacity were considered in optimization process. Furthermore, suitability of the selected sites was determined considering the distance from the compatible and incompatible land-uses of the area. Because of using a multi-objective evolutionary algorithm, multiple solutions are presented in results instead of only one solution. In this research, five solutions were selected and investigated. In the best solution according to the first objective function, although the suitability of sites is adequate, the capacities of schools are imbalanced. In the best solution according to the second objective function (equity in geographic access), the chosen sites are well-distributed, but the compatibility of the land-uses and suitability of the sites are not satisfactory. Similarly, in the best solution according to the third objective function (balance of schools

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capacity), compatibility of the land-uses and suitability of the sites are inappropriate. Anyway, decision-makers can compare different optimal solutions and choose one of them to implementation according to different relative importance of objective functions.

Keywords: Location and Allocation; Multi criteria decision making, Multi-objective optimization, Geographical information system.

Zoning of Rural Transportation in Iran

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Abstract

Nowadays, while there are a number of definitions have been introduced for the concept of zoning, there is no general consensus due to different disciplines adopt this term. In the field of planning, the zoning is a conscious and contemplative process to detect homogenous areas by an authority to allocate certain kinds of resources to them. Therefore, the process of zoning is an essential task to allocate and monitor the development projects for different type of territories. In this article, zoning is took into consideration from the rural transportation point of view to find what would be the homogeneous zones of rural transportation for Iran? To answer this question, an in-depth spatial analysis through the Geographical Information System (GIS) is performed with regards to a descriptive-analytical method. Based on four main indices which are fully explored in the paper (i.e., access to the link road, distance to urban hierarchical levels, rural density and land use), five homogenous distinct zones for Iran is emerged. The resulted zones which are presented on a country map would be useful for future rural transportation planning in Iran.

Keywords: Zoning, Transportation, Rural, Geographical Information System (GIS), Iran.

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The Study Physiographic Basin of Cold Water fish Farms Shamrood the Talent GIs Software

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Abstract

Rivers should be in the national zone of protection, exploitation and development as well as favorable terms and conditions for the quality and quantity of river fish are evaluated. In this study, the role and physiographic form in locating station Shamrood river fish (salmon) have been studied. Shamrood river due to biological indicators and a lot of potential fish production of 348 kg per hec, The river in June is the highest fish production. In this study, the physico-chemical elements such as water PH fish, water flow rate, turbidity, suspended solids, water hardness, water conductivity (EC), chemicals, salt water was investigated. River flood in May and end of September due to heavy rains and according to the source of River Heights Shamrood the crowbar and connecting sub-rivers on the river's water volume is added.

To identify potential areas for aquaculture and the inclusion of the aforementioned factors and using GIS software localization was shown by the six locations are favorable for cold water fish. Finally, check the condition of the area is mountainous and steep for cold water fish and waterways overlay maps, political parts, lithology, slope, aspect and on the factors needed for growing salmon Put them vulnerable areas suitable for fish farming stations and semi-favorable and unfavorable for Construction of fish was found

Keywords: Physiography; River; Salmon fish; Pool of fish culture; Sham rood

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