

# ABSTRACTS

**Estimating Suspended Sediment Concentration by a Neural Differential Evolution and Comparison it with ANFIS and RBF Models  
(Case study : Givi Chay River )**

**Dr. Masoume Rajabi**

Associate Professor of Geomorphology  
University of Tabriz

**Dr. Mehdi Feyzolahpour**

Assistant Professor of Geography  
University of University

**Dr. Shahram Roostaiee**

Professor of Geomorphology  
University of Tabriz

In this study, neural differential evolution (NDE) models were used to estimate suspended sediment concentration. NDE models are improved by combining two methods, neural networks and differential evolution. At the first part of the study, the neural differential evolution is trained using daily river flow and suspended sediment data belonging to Givi Chay River at the northwest of Iran and various combinations of current daily stream flows, past daily stream flows and suspended sediment data are used as inputs to the neural differential evolution model so as to estimate current suspended sediment. In the second part of the study, the suspended sediment estimations provided by NDE model are compared with adaptive neuro- fuzzy inference system (ANFIS) and radial basis function (RBF) results. The Root mean squared error (RMSE) and the determination coefficient ( $R^2$ ) are used as comparison criteria. Obtained results demonstrate that NDE and ANFIS are in good agreement with the observed suspended sediment concentration; while they depict better results than RBF methods. For example, in Givi Chay River station, the determination coefficient ( $R^2$ ) is 0.9586 for NDE model, while it is 0.9152 and 0.8872 for ANFIS and RBF models, respectively. However, for the estimation of maximum sediment peak, the NDE was mostly found to be better than the ANFIS and the other techniques. The results also indicate that the NDE may provided better performance than the ANFIS and RBF in the estimation of the total sediment load ( $Re = -47\%$ ).

**Keywords:** Neural differential evolution, Multi-layer Perceptron model, Generalized regression neural network, Sediment rating curves, Givi chay river.

### **Assessment of Social Capital Parameters in Rural Areas of Khorramabad City**

**Dr. Morteza Tavakoli**

Associate Professor of Geography and Rural Planning  
University of Zabol

**Soleyman Mirzapour**

M.Sc of Geography and Urban Planning  
University of Payam Nour

**Mohamadkazem Shams pouya**

Yong Researchers and Elite Club, Islamshahr Branch  
University of Islamic Azad

Today, social capital is an affective factor on community development and the discussion and study subject of a great number of researchers, especially in villages due to the fact that most of activities and associations are public-based and done with public collaboration, the social capital valued twice more. The aim of present study is to measure social capital in khorramabad villages and to use spatial differences of social capital in rural areas.

The research methodology is of field type and filling questionnaires and to some extent library and documentary method have been used. In this research 180 rural households were asked. To analyze the data, we used SPSS software. The results showed that there are differences in social capital among the studied villages. There are less social capital in larger and more developed villages.

Also, the distance between khorramabad city and villages was an important factor in the level of social capital.

**Keywords:** Social capital, Trust, Participation, Rural areas, khorramabad.

## Study the Effect of Subsidy on the Household Demand of Water in Qom

**Dr. Farkhonde Jabal ameli**

Associate Professor of Economics  
University of Tehran

**Yazdan Gudarzi farahani**

M.Sc Student of Economics  
University of Tehran

This paper studies the effect of subsidy on household demand of water and consequently estimates long term demand function of water for household use in Qom. To this end, we used monthly time series data from 2008 to 2010. The theoretical principles indicate the general form of demand function of water which extracted from maximization of Ston-Gray utility function. At the next step, the demand function of urban water for Qom was estimated by implementing vector auto-regression and a basis of Johansen-Juselius method. It worth to mention that the selected period for the study is related to the period prior to the enforcement of cash subsidy law (Direct Subsidy) and just covers the issue of subsidy on water price. Results show that a decrease in or an elimination of subsidy on water price leads to a decrease in water demand of household section. Besides, the demand of urban water in Qom has an inverse relationship with the price of water and other goods according to the economic theories and has a direct relationship with income. The demand for urban water in this province has no attraction with respect to the prices of water and other goods and it is also a necessary good according to resulted income. Moreover, the minimum consumption of household water of Qom citizens is 42 liters per day with considering the elimination of price subsidy.

**Keywords:** Stone - Gray Utility Function, VAR Model, subsidy.

JEL Classification: Q24, Q25, Q31.

### **Review the Trend of Frosty Days in Iran**

**Dr. Seyed Abolfazl Masoudian**

Professor of Climatology  
University of Isfahan

**Dr. Mohamad Darand**

Assistant Professor of Climatology  
University of Kordestan

In this study, by the help of interpolated data of minimum temperature of Iran within the time period of 21, March 1961 up to 19 March 2003, the trend of frosty days in Iran was reviewed and studied. An array with dimension  $15705 \times 7187$  was obtained and day was inserted on rows and cells on the column. For all the months of the year, the number of frosty days on each cell was counted. Nonparametric Mann-Kendall test was used for identification of the trend and Linear regression test of least square method was used for calculation of the trend slope.

In total, the study results showed that, the number of frosty days in an extensive area of Iran has a negative and decreasing trend. These regions located on northwest and also on even and plain areas at the central, eastern and southern part of Iran. Only on a small part of higher elevations including Zagros and Alborz mountain chains, the trend is positive. The most extensive negative trend was observed in January while the most extensive positive trend observed in March. The frosty days in Iran summer and May is fixed and without any trend.

**Keywords:** Frosty, Trend analysis, Mann-Kendall test, Regression, Iran.

## **Reconstruction of the Last Glacial Snow Lines by the Evidences of Glacial Periods in North West Zagros (Case study: Anticline Qalajeh)**

**Dr. Aliakbar Shamsipour**

Associate Professor of Climatology  
University of Tehran

**Dr. Sajad Bagheri SeyedShokri**

University of Tehran

**Maryam Jafari aghdam**

Ph.D Student of Geomorphology  
University of Isfahan

**Jabbar Salimimanesh**

University of Payame Nour

Existence of glacier and sub glacier landforms on Qalajeh mountains indicates the climate changes and changes in morphogenic boundaries. The main problem of the research is identifying cold glacier and sub glacier territories and estimating snow line height in folded Zagros due to lack of any study in this area. Therefore, the purpose is to identify evidences and prove the dominancy of existence of glacial morphogenesis territory and determine snowline of the last glacial period on Qalajeh heights. Topographic and geology maps, IRS satellite images, and monthly temperature and precipitation climate data are the main tools and data for research.

Using satellite images and several field visits, the position of the area's cirques were identified and the past snow and ice equilibrium line (ELA) were reconstructed. Porter and Wright's method were used to estimate snow line for the last glacier and the current one. Ki squared test (Pearson) used to calculate the relationship between the spread and distribution of cirques with roughness aspects. Using Porter and Wright methods, Worm's Snow-line obtained at height 2019 and 2015 meters respectively. Also water and ice equilibrium line at the north and south slopes obtained 2033 and 2075 meters respectively and ELA of area is equal to 42 meters. Results of Ki squared test showed that there is a significant relationship between cirques formation with geographic and roughness sides. Circus of the study area has more spread on the north sides. So 66.7 percent of the region's circus have formed at the northern slopes and 33.3 percent of them are in the south ranges. Comparison of the results of the climate models and geo-morphological evidences of the last glacial period, proved the existence of glacier territory on above 2000 meters in Qalajeh mountain.

**Keywords:** Climatic changes, Quaternary, Mountain glacier, Snow-line and Qalajeh anticline.

**Assessment and Prioritizing of Drinking Water Resources Risks in Rural Areas**  
**Case study: Villages in Central District of Minoodasht Township**

**Dr. Mohamad Salmani**

Assistant Professor of Geography and  
Rural Planning  
University of Tehran

**Dr. Mohamadamin Khorasani**

Assistant Professor of Geography and  
Rural Planning  
University of Tehran

**Ali Toorani**

Ph.D Student of Geography and  
Urban Planning  
University of Tabriz

**Abasali Nouri**

Ph.D Student of Geomorphology and  
Environmental Planning  
University of Kharazmi

Lack of safe drinking water especially in Third World countries such as Iran is one of the fundamental problems. Hence it is necessary to apply underlying policies while different managerial aspects of this vital resource to be considered. The current study through identifying and classifying risks which threat the drinking water sources in villages of the central district of Minoodasht township, has accessed and prioritized them. Research method in this study is descriptive - analytical type and done by measurement technique.

The under study statistical sample are villages with Dehyari. The model used in this study is Fuzzy TOPSIS. The results indicate that the highest risk is related to the risks relevant with physical characteristics of water resources and reservoirs and the risks resulting from human factors, the risks related to natural factors and locating water resources ,reservoirs and water quality are placed at the next rank. The highest risk in different groups is relevant with the lack of or non specifying the resources, reservoirs and transmission lines' border, lack of water resources and reservoirs' map, transmission lines and distribution network, evaporation and loss of water in reservoirs or resources and lack of possibility for development of water distribution network and the lack of continuous monitoring of water quality by the in charge organizations.

**Keywords:** Drinking water, Risk management, Water reservoirs, Rural areas, Minoodasht township.

## **Analysis of Spatial and Temporal Patterns of Convective Systems With Precipitation of More Than 10mm**

**Dr. Zahra Hejazizadeh**

Professor of Climatology  
University of Kharazmi

**Dr. Parviz Zeaiean**

Associate Professor of Remote Sensing and GIS  
University of Kharazmi

**Dr. Mostafa Karimi**

Assistant Professor of Natural Geography  
University of Tehran

**Dr. Somayeh Rafati**

Assistant Professor of Geography  
University of Sayed Jamaledin Asadabadi

In this study, spatial and temporal characteristics of convective systems in southwest of Iran has assessed with Global merged IR brightness temperature data (acquired from Meteosat, GOES and GMS). Convective systems detected and traced on the basis of 228 K and 1000 Km<sup>2</sup> temperature and area thresholds, respectively. In total , 268 convective systems identified at heavy precipitation times (based on WMO with precipitation of more than 10mm during 6 hours and also shower phenomena recorded at least in three stations). Results show that December and April with 69 and 67 cases respectively has the most occurrence and February with 5 cases has minimum occurrence. The results Such as a fairly great number of large and long lived systems shows the importance of dynamic factors in formation of MCSs in this region. The most frequency of movement direction was southwest-northeast (53%) and west- east (38%), thus movement direction of this system conform with middle level flow and controlled by it. The analysis revealed that convective systems initiation and termination location was influenced by topography. In general, they were most predominant across northeast of study area with a decreasing southwest ward gradient, that follows topography, but this pattern was different in cold and warm months, so that we have observed the most conformity in warm months and the least conformity in cold months.

**Keywords:** Convective systems, Spatial and temporal pattern, Brightness temperature images, Southwest of Iran.

## **Geography, Constructivism and Constructivist Explanation of Geopolitics**

### **Introduction to Constructivist Geopolitics Approach**

**Dr. Afshin Mottaghi**

Assistant Professor of Political Geography  
University of Kharazmi

**Mostafa Rashidi**

Ph.D Student candidate of Political  
Geography  
University of Tehran

Geo politics, as a science which forms the political aspect of geography science, has been considered from different aspects and approaches. From traditional geopolitics and theories of Friedrich Ratzel , Hoover and Mackinder, Mahan , Spikeman up to the theories of Koohan, Lacoste and finally post modern and critical geopolitics, each one has presented an interpretation based on their own objectives and imaginations. But what shall be followed by geo politics is a new approach in geopolitics and consider the new philosophic strategy for geopolitics and explain this field based on the new philosophic approaches to promote geopolitics science, and use such theories with geopolitics nature for their fundamental and functional analyses.

Today, geopolitics requires to expand his theoretical and philosophical domain. To this end, the writers of this article firstly, try to review the harmony and symmetry which exists between geography and constructivist approach and then by explaining the constructivist geopolitics, introduce a new approach in geopolitics named constructivist geopolitics, the questions arise in this regard are as the following: what symmetry and harmony we can find between the geography and the constructivist approach? And what fundamental concepts are required to propose for constructivist explanation of geopolitics science? It is noted that this article is written by analytical –descriptive method.

**Keywords:** Constructivism, Constructivist Geopolitics, Geography, Geopolitical Structure, Geopolitics.

## **Review the Urban Changes and Hierarchical Patterns in Gilan Urban System**

### **Dr. Esmail Aghaeizadeh**

Assistant Profesor of Geography and  
Urban Planning  
University of Gilan

### **Dr.Ahmad Zanganeh**

Assistant Profesor of Geography  
University of Kharazmi

### **Abolfazl Zanganeh**

Ph.D Student of Geography and  
Urban Planning  
University of Kharazmi

### **Elham Amirhajlou**

Ph.D. Student of Geography and  
Urban Planning  
University of Kharazmi

Cities because of their characteristics have accepted different roles and functions therefore they show a different strength and influence. In the meantime, some of the cities are considered more for various reasons and therefore by achieving more power have predisposed for decreasing the importance of their downstream cities and lead to the urban primacy. The aim of this research, is to study the urban network of the cities of Gilan province. To this end, the models of rank-size, coefficient of variation, Jefferson and Davidson's primacy have been used. the method of this research is of descriptive-analytical and historical one.

The study results of urban network in Gilan province indicates the undesired relations between cities. Rasht city in Gilan, considering its influence as the province centre has earned most strength in comparison with the other cities of province, for instance Bandar Anzali as one the most important cities in this province, has a very less influence compared with Rasht.

Study of urban system in Gilan, in addition to the approval of existing the characteristics of urban primacy, indicates the formation of a special pattern in its cities which may be named as stair urban hierarchy system. In this system, cities can be classified and various several urban groups have caused more homogenous hierarchy system than entire of urban system in the province. Study of this system and mechanism of its function, can lead to identifying new dimensions of urban hierarchy system in other provinces and even country scale.

**Keywords:** Urban system, Urban hierarchy, Urban primacy, Quantitative models, Stair urban Hierarchy system, Gilan.

### **Comparison of Methods for Locating Suitable Areas for Rain Water Collection by Using Decision Support System (DSS) Based on GIS**

**Dr. Abolfazl Akbarpour**

Associate Professor of Civil Engineering  
Faculty of Engineering  
University of Birjand

**Shahrzad Sadeghi**

M.Sc Student of Water Engineering  
Department, Faculty of Agriculture College  
University of Birjand

**Dr. Hamed Foroghifar**

Assistant Professor of Water Engineering  
Department, Faculty of Agriculture College  
University of Birjand

**Dr. Ali Shahidi**

Assistant Professor Water Engineering  
Department, Faculty of Agriculture College  
University of Birjand

Uncontrolled draw off of groundwater resources has caused a severe drop at water table levels. However, loss of runoff from rainfall in the world and especially in our country is very high and significant. Therefore the tendency toward the optimum use of surface water runoffs and uncontrolled, instead of uncontrolled draw off of groundwater resources is necessary. In this paper, two different methods for determining the areas suitable for rainwater collecting in two decision support systems (DSS) based on the GIS is presented which helps decision makers for selecting appropriate sites for collecting rain water in Birjand plain, Southern Khorasan province.

In this study, Six criteria including rainfall, catchment area's slope, soil's depth and texture, the plain water course and land uses were applied. In the first method, different characteristics of the basin is directly involved in decision making and the second one acts based on the capacity of the area for production of runoff and also social -economical factors. The results obtained of each method, in terms of capacity of Rain Water collection, classifies the area in 4 groups: low, medium, good and very good. Comparing the two methods shows that in Birjand plain, using the first method is more suitable and generally from the West part to the East part of the plain, its ability to collect Rain Water will increase.

**Keywords:** Rain water collection, Decision support systems, GIS, Birjand plain.

## **Zoning the Landslide Hazard in Jahan Watershed in the North Khorasan Province**

**Hamid Alipour**

Ph.D Student Combnat Desertification  
University of Yazd

**Dr. Arash Malekiyan**

Assistant Professor of Natural Resources  
University of Tehran

Landslide zoning is one of the methods which can help to determine the critical areas from slope stability point of view and the obtained zoning maps can be used in planning for sustainable development. In land slide zoning of Jahan watershed, six factors were used as slope, direction, rainfall, geology, distance from fault and distance from streams.

In this study, statistical index (SI) method was used for landslide zoning. In this method, according to the extent of the slip zones in each classes of the different under study parameters, weighted value for each cell was considered and finally the sum of weighted values for each cell was studied with several overlaying layers.

Then the landslide hazard classes using Histogram analysis and using Jenks optimization method was developed. Analysis indicated that among the factors, geology and rainfall factor have more important role in causing landslides in the study area. From the view point of land sliding hazard, J1 is at the first priority and J13, J'24, J'14, J'17, J'22, J'20, J'21, J'19, at the last one. Under the northern watersheds, due to the risk of land sliding, they are placed at high and very high risk area.

The best way to reduce landslide risk in Jahan watershed is to increase vegetation cover through revival, modification and managerial operations in pastures.

**Keywords:** Zoning, Landslide, Statistical Index, Jenks Method, Jahan Watershed.

**Assessment of Hill Side Instability Potential by Using Regional Model  
in the North West Part of Zagros, Regarding Leile Landslides**

**Dr. Zahra Rahimzadeh**

Assistant Professor of Geomorphology  
University of Razi, Kermanshah

**Dr. Mahmoud Alaiee taleghani**

Assistant Professor of Geomorphology  
University of Tarbiyate Moalem, Kermanshah

Zegros hillsides in some zones of these mountain chains is suitable for different mass movements. In this paper, the sensitivity of slopes at the northwest part of zagros mountain has been evaluated regarding the landslide risk of Leile zone. The aim was not only zoning the hill sides of Leile from the view point of intensity and weakness in occurrence of land sliding, but also it was for obtaining a model to distribute the hillsides zoning to other areas from instability point of view.

To this end, the slopes of the considered area was zoned by using eight variables including: lithology, slope gradient, slope morphology, slope direction, land-use type, distance from drainage, distance from road and distance from settlements or by four methods such as weight, informative value, surface density, and analytic hierarchy process (AHP); the above said parameters, with respect to the statistical relationship between spatial dispersion of 39 sliding mass were selected at the area with any type of class of variables effective on surface landslides. Selecting the above methods was made based on their extensive use by the Iranian researchers.

The study results which was presented as four zoning maps in four levels i.e very high risk zone, high risk zone, medium risk zone, and low risk zone, indicates that the two variables statistical method of the surface density has the highest and weight method has the lowest conformity with the specifications of the under study area. Based on the results of surface density, about 16.86% of Leile area is faced with very high risk, 49.21% high risk and 8.57% with low risk of land sliding.

**Keywords:** Leileh watershed, Modelling, Zoning, Landslide.

**Assessment of Flow and Sediment Regime Properties in Arid and Semi Arid  
Catchment Areas (Case study: Lorestan province)**

**Dr. Samaneh Poormohammadi**

Ph.D of Watershed Science and  
Engineering of Water Research Institute  
(Researcher of National Cloud Seeding  
Research Center)

**Dr. Mohamadtaghi Dastorani**

Ph.D of Watershed (River engineering),  
Associate Professor, Department of Natural  
Resources and Environment  
University of Mashhad

Study the behavior of the rivers at arid and semi arid areas is of the main and basic activities in the country (since a great portion of Iran has arid and semi arid climate). The main differences of arid areas from humid areas are the different climatic factors including the precipitation amount and pattern. This issue can cause the change of flow regime and sedimentation regime (FSR) and their ratios in these areas. Also temporary flood ways of arid areas, in which the water flow is limited to heavy rainy and wet seasons, has a great influence on flow and sediment regime (FSR). In this research, by statistical review of flows discharge in arid and semi arid areas at the west part of country, it is tried to review the effect of climate on flow and sediment regime.

For this purpose, flood discharge with different return periods were estimated by the best statistical distribution of 21 hydrometric stations. Then by using rating flow of sediment, sediment amount was measured in different return periods. At the next step, flow and sediment regime was calculated and the relationship between flow and sediment regime and the area of relevant up stream sub-catchment areas was determined. Also the results of this study show that the relation of up stream sub-catchment areas of each station will increase with FSR increase in high return periods.

**Keyword:** Flow regime, Sediment regime, Arid and semi arid regions, Area.