Pistachio Growing Area Zonation Based on Climatic Parameters in East Azerbijan Province

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١-Introduction

Arid and semi-arid regions of the world is mainly characterized by lack or little amount of precipitation as well as irregular tempo-spatial distribution of annual rainfall and highly evapotranspiration. On the other hand, recent permanent drought in East Azerbaijan province has led to a reduction in available water resources, a sharp drop in the groundwater levels, Urmia Lake receding and drying and increasing saline lands surrounding the Urmia Lake . Also the orchards and farm lands that seriously depend on groundwater level have been indiscriminately and disproportionately developed related to the climate condition. Therefore, modification of agricultural patterns is the best way to efficient water use in agriculture and is considered as the only practical solution in relation to the sustainable development of agriculture. This study was conducted in order to determine the appropriate area for growing pistachio orchards and replacing it with second and third order of gardens.

١- Theoretical Basis

East Azerbaijan province is located in a semi-arid region. On the other hand, Evidence of climate changes as well as recent permanent drought condition are quite remarkable in this region. As it is reported

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more than ۸۰ percent of consumed water is in the agricultural sector, Therefore, it is assumed that there is no equilibrium between available water with its consumption, and also, the current crop pattern is not compatible with climate change. Result of this research, help to decision-makers to select new crop pattern which it will compatible with climate changes. Also, this practice will save much water specially in the agricultural sector.

۲- Materials and Methods

Suitability Pistachio site selection is the main goal of this research. For this mean, suitable cultivation area was spatially determined into GIS environment. Research method followed by model building processing using Weighted Overlay algorithm of ArcGIS software. The model was built based on different bio-climatic variables such as: altitude, cold requirement criteria, Environmental temperature and humidity in the growing season, Environmental temperature and humidity at pollination time in the different plant growth stages. These criteria were based on Iranian Pistachio Institute. Finally, suitable sites for pistachio cultivation was spatially determined throughout of east Azerbaijan.

۳- Finding and Discussion

Pistachio suitability site selection Results showed that about ۲۵ percent of the east province area is completely suitable, ۲۷ percent is relatively suitable and ٤۸.٤ percent is completely unsuitable for pistachio cultivation. Also, result displayed the throughout of Urmia lake shore line is located in the suitable zone. It is indicated that replacement of pistachio orchards with those gardens with highly water consumption is fully practicable and feasible in this area. The results could provide more reliable basis for agricultural decision-makers to provide an alternative model related to new appropriate crop pattern which will showed highly Adaptation with climate change condition in the east Azerbaijan. This practice helps to save much water especially in the agricultural sector.

Keywords: Climate zonation, Pistachio, Suitable areas, East Azerbaijan province.

An Analysis on Satisfaction Level of Flower and Plant Tourists in Arriving Peak Times to Mahallat Township

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Introduction

Mahalat province which is located in Markazi province could lead to dynamism of different economic sections with planning, guidance and development of flowers and plants tourism due to having favorable climatic and natural conditions; it also can play a drastic role in earning income and creating employment along with social, cultural, and environmental impacts. The present study was carried out in September ٢٠١٢ with identifying the influential factors on satisfaction of tourists of flowers and plants in Mahalat province. Elicitation of these factors and applying them in tourism policy making will result in providing a desirable context for improvement and development of planning and the level of satisfaction as well as the increase of the attraction of tourists which finally will lead to flourishing of flowers and plants tourism of the region.

Theoretical Basics

Agritourism is a combination of two words of agriculture and tourism. This term indicates the link between industry and agriculture section (Ghadiri Masoom et al., ١٣٨٩:١٢٨). The identification of tourist's satisfaction factors is one of the most important research domains of tourism industry. The subject literature expresses this fact that the level of a tourist's satisfaction in a trip results from various factors which are evaluated in the process of comparison between tourist's

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viewpoint toward products and received services and expectations before and during the trip (Armario, ٢٠٠٧:٣٦٧).

Materials and Methods

This study is descriptive-analytical and in terms of purpose, it is an applied research. In the study, the selected items were first measured in terms of validity of the questionnaire; experts' opinions were applied and necessary modifications were made. Then the final questionnaire was prepared and used for collecting required data of the study. Pretest method and Cronbach's Alpha were used to measure the reliability of the measurement tool. The number obtained from Cronbach's Alpha for ٣٠ introductory questionnaires was ٨٩/٠ that is higher than the defined minimum (٧/٠) and it is a desired coefficient for the reliability of the questionnaire. Finally, in order to obtain more precise results the personal estimation method was used to determine the sample size with ١٨٠ questionnaires in a random way among visitors of the flowers and plants exhibit and festival of Mahalat province in September ٢٠١٢ which ١٥٣ people answered the questionnaire.

The Analysis Factor method was used in order to prepare and to more process the data as well as to decrease the volume of indices. Furthermore, the data analysis in this model was conducted by SPSS software.

Findings and Discussion

The Analysis Factor was used to decrease the number of variables to less factors and to determine the portion of each factor in affecting the level of tourists' satisfaction. A total of ٢٤ indices related to tourists' satisfaction level were evaluated that are shown in table ١.

Table ١: ٢٤ indices related to tourists' satisfaction

Row Number	Indices	Row Number	Indices
١	Local and traditional customs and culture	١٣	Road condition
٢	Flowers and plants exhibit and festival	١٤	Media advertisements
٣	Alley gardens	١٥	Distribution of brochures
٤	Floriculture Farms and flower gardens	١٦	Leading and guiding tourists
٥	Local handicrafts and products	١٧	Health facilities
٦	The way people of the region deal	١٨	Medical facilities
٧	Natural landscapes and perspectives	١٩	Parking
٨	Weather of the Region	٢٠	Banking and monetary services
٩	Kite festival	٢١	Being near to Tehran-Esfahan highway
١٠	The ceremony of turning the shovel	٢٢	Recreational facilities
١١	Historical attractions	٢٣	Fuel, energy, and gas station installations and equipment
١٢	Access to the region	٢٤	The traffic level of the region

The factor of the natural and flower and plants tourism attraction

In this factor, the indices of flowers and plants exhibit and festival, alley gardens, floriculture farms and flower gardens, natural landscapes and perspectives, weather of the region, and historical attractions with the specific amount of ٠٨٩/٨ accounts for ٧٠٥/٣٣ percent of variation on their own. The factor load of the above mentioned variables regarding the rotating matrix is fluctuating from ٧٨١/٠ to ٦٤٢/٠. From among the mentioned indices, ٣ indices are related to flower and plant tourism attractions and ٣ indices are related to natural attractions that depict a good correlation in the first factor; this factor can be called "natural and flower and plant tourism attractions".

Service Factor

There are ٦ relatively homogeneous indices in this factor that are called "service factor" according to the loaded variables. These variables with the specific amount of ٧٧٣/٢ totally account for ٥٥٤/١١ percent of variance. As shown in table ٥, according to the rotated matrix, the factor load of the mentioned variables is fluctuating from ٠/٧٤٥ to ٠/٦٣٩.

Social-cultural Factor

٥ variables of local and traditional customs and culture, local handicrafts and products, the behavior of the local people, kite festival, and the ceremony of turning the shovel are located in this factor which with the specific amount of ٦٩٦/١ account for the overall amount of ٠٦٩/٧ percent of variance. The factor load of these criteria regarding the rotated matrix is fluctuating from /٠٥٢٨ to /٠٧٤٤. According to the indices in this factor, this factor could be called "social-cultural factor".

Infrastructure Factor

The region access status, being near to Tehran-Esfahan highway, road condition, fuel installations and equipment are located in this factor. These factors with the specific amount of ٣٧/١ in total represent ٧٣٠/٥ percent of the total variance. The factor load of the mentioned variables fluctuates from ٦٦٤/٠ to ٧٧٣/٠ according to the rotated matrix.

The Advertisement Factor

There are ٣ variables of media advertisements, leading and guiding the tourists, and the traffic level of the region in this factor. This factor with the specific amount of ٣١٢/١ represents ٤٦٦/٥ percent of variance in total. The factor load of its variables fluctuates from ٧٠٠/٠ to ٨٠٩/٠ according to the rotated matrix.

Results and Suggestions

The present research was conducted to identify the most important factors influencing the flower and plant tourist's satisfaction of

Mahalat province and better analysis at the peak of arrivals that is in September ٢٠١٢. According to the analysis of the data with Analysis Factor method about the satisfaction of tourism attractions of the region, the factor "Natural flower and plant attractions" was identified as the most important factor and received the highest rate of tourists' satisfaction. This indicates the importance and attractiveness of attractions for tourists as well as the high capabilities of the region in expanding agricultural tourism of the type of flower and plant tourism. Therefore, it is suggested that the development programs of tourism be focused on development of this type of tourism due to the relative advantages of the region in flowers and plants. The factor of services has received relatively good satisfaction after the factor of natural flowers and plants factor. In this regard, providing more diversity in tourism facilities and services are recommended to increase the level of satisfaction and the number of tourists. The least rate of tourists' satisfaction was identified for advertisement factor and its indices as well as the infrastructure factor. Thus, it is suggested that the government invest in infrastructure equipment and the private sector be encouraged and supported by the government and authorities to invest in tourism places of the province; the development of infrastructure facilities and improvements of roads, accommodation places such as hotels and campsites should also be focused on. It is necessary to take serious and fundamental steps in the form of short-term programs in the field of informing and advertising.

Keywords: Tourism, Agritourism, Plant and Flower Tourism, Mahalat Township, Tourist Satisfaction

Application of Artificial Neural Network in Modeling and Forecasting Land Use Changes in Sardroud City (١٩٨٤ـ ٢٠٣١)

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١- Introduction

Rapid urbanization brings opportunities to new urban developments. However, it also brought about serious losses of arable land, which has occurred in other developed countries. Changes in land use will cause changes in environmental conditions. Cities expanding by converting land use at the fringes from rural to urban a process that is usually referred to as green field development. In order to keep ecosystems functioning well, it is necessary for environmental researchers, managers, and decision makers to understand the spatial dynamics of an ecosystem. Importantly, remotely sensed imagery provides an efficient means of obtaining information on temporal trends and spatial distribution of urban areas needed for understanding, modeling, and projecting land change. In this paper, changes of land use are analyzed in Sardroud city using Satellite images in duration ١٩٨٩-٢٠١٠. Also in this paper, we proposed recommendation for reducing of settlement sprawls development and environmental problems in this area.

٢- Theoretical Basis

Fast growing of urbanization causes loss of lands and its recourse, leads to decrease of green areas, open spaces and serious environmental and social problems. So, an essential step to urban planning, management and evaluation of its effects is to simulate physical development of the city. The term urban sprawl is so cloudy and confused that more precise language is needed to characterize what is bad urban growth. The term is used variously to mean the gluttonous use of land, uninterrupted monotonous development, leapfrog discontinuous development and inefficient use of land. Urban sprawls are characterized by: Premature or poorly planned conversion of rural land to other uses, the creation of areas of urban development

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or uses which are not functionally related to adjacent land, the creation of areas urban development or uses which fail to maximize the use of existing public facilities and the use of areas within which public services are provided. Change detection is an important process for monitoring and managing natural resources and urban development because it provides quantitative analysis of spatial distribution in the area of interest. The aim of this study is to understand parameters of physical development at Sardou city with regard to sustainable spatial development of urban issues from ecological and environmental viewpoint in the next two decades.

٣- Materials and Methods

Detection of changes in land use/ land cover involves use of at least two period data sets. For monitoring the changes in Land use of Sardroud, TM digital data of ١٠nd. July ١٩٨٤ of Landsat satellite along with TM digital data of ٥th July ٢٠١١ have been used. The path/ row number of TM and ETM+ imagery is ١٦٨/ ٣٤. Main reason of using TM and ETM+ data was unavailability of time series of high resolution images and ability of TM and ETM+ data in extracting green area land use that had a large scale change in our study area. The Artificial Neural Network LTM is a land use forecasting model as well as a tool that can be used to examine the spatial and temporal aspects of driving forces of land use change. The model uses a set of spatial interaction rules and machine learning, through neural net technology, to determine the nature of spatial interactions of drivers, such as transportation, urban infrastructure and proximity to lakes and rivers that have historically contributed toward land use change in the past. Effective Factors of physical development of Sardroud city based on research literature identified in ١٤ indicators and artificial neural network based on LTM Model used for preparing of Urban Development probability map.

٤- Findings and Discussion

In the period of ١٩٨٤-٢٠١١, based on Change detection map and initial state and final state matrix, barren land area has increased from ٦٦١.٢٣ hectares to ٥٧٣.٨٤, buildup area has increased from ١١١.٢٤ hectares to ٥٢٨.١٢, agricultural land has decreased from ٤١.١٣

hectares to ٢٣.٤٩ hectares and garden land has decreased from ٨٤٣.١٢ to ٥٣١.٢٧ hectares. In the mentioned period, the population of the city has reached from ١٣١٨٩ to ٢٦٨٥٦ which mean reducing the population density from ١١٨ to ٥٠ people in HA. Based on the Holdern model of the sprawl index of Sardroud city is ٥٣ percent and the biggest Role in the development of buildup area made belonging to reduction of Garden lands. ٣٢٩.٤٩ hectares of mentioned lands has developed on the Garden and agricultural land, which demands management of future development based on the principles of sustainable development.After predicting the future pattern of urban development in Sardroud city, the protection of gardens and green spaces strategy in the urban development process was operated using hexagonal layout of possibility of urban development map, giving the necessary space for the development, Extraction of natural green belt with the length of ١٥ km applying the ban of urban development in the around of proposed green belt, maintaining the ecological reserves of Sardroud city by reducing agricultural and garden lands, degradation and control of sprawl expansion .

Keywords: Sardroud city, Sprawl growth, Artificial Nerual Network, land use changes, Object Oriented Classification.

A Comparative Investigation of Spatial Structure and Benefits of Urbanization (A Case Study Shiraz and Central Mazandaran)

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Introduction

In recent years, cities became a regional phenomenon in both physical and functional terms. On the one hand, activities concentrated in densely populated centers or scattered throughout the region. On the other hand these activities tend move towards new sub-centers that create polycentric urban regions. It is understood that urban centers of metropolitan polycentric regions can the share of benefits of aggregation without suffering from cumulative depression of monocentric regions such as congestion, crime and high land prices. There are few empirical studies that measure these assumptions in a comparative method. Accordingly, by conducting such researches can promote the perception of policy makers and planners about the advantages of urban polycentric regions. The present paper tries to examine two different metropolitan regions to investigate the role of spatial structure on the spatial costs in metropolitan area of Central Mazandaran and Shiraz.

Theoretical Bases

There are many studies in regional economies which correlate city characteristics to the functional performance; but most of them do not cross from the mean of density and city size spatial dependent agents regarding accumulation. The indices of spatial organization of metropolitan areas need to answer two following questions: first how is urban population distributed in urban centers? Second; to what extent have metropolitan populations concentrated or scattered in urban centers? The first question refers to the aspect of polycentric or

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monocentric while the second one focuses on the dimension of concentration or distribution.

Polycentric against monocentric: Since the size of metro-pole relates to external economies of scale it can link several types of external economies to spatial structure. Current debates about spatial structure of metro-pole; the effects of monocentric and polycentric on the function of metropolitan regions are not clear due to the lack of empirical researches (Parr, ٢٠٠٤). On the scale of metropolitan region, Lee and Gordon (٢٠٠٧:١٢) found that the monocentric or polycentric which were measured by contribution of sub-centre employment affect the growth of population and employment of metro-pole. They are still publicly considered by researchers that polycentric advantage at the local level is that it lacks the accumulation economies (Bertude, ٢٠٠٤) such as intense competition for land, labor, congestion and pollution. Contrary to the theoretical agreement on the "regionalization" of urban economies; the extent to which such regionalization occurs in a polycentric spatial structure has been questioned. According to Bailey and Turok (٢٠٠١: ٧٠١), the idea that the integration of cities apart from each other results in equal aggregate benefits to single-city cities is also "fairly simple". In this regard, Parr pointed out that there is a need for longer journeys, longer flows of goods and more stringent information flows in polycentric urban areas is noted. In addition, it should be noted that "some of the benefits of urban size originated from the nature of the metropolitan environment and are related to factors such as congestion, neighborhood, face-to-face contact, informal structures, unplanned interactions, etc."(Parr, ٢٠٠٤:٢٣٦); consequently, they are less common in urban centers. This topic confirmed by study of Meijers (٢٠٠٨: ٢٣٣٩) which showed that the polycentric areas in the Netherlands had a significantly lower level of recreational, entertainment and sporting opportunities than mono-center areas with urban population in concentrated city.

Concentration or dispersion; the dispersed spatial structure refers to a situation in which a large part of the population and activity are living in centers; but scattered throughout the land in a decentralized pattern. In this regard, there are assumptions that the dispersed patterns can

also create a positive external cost for commerce within the region through an effective sharing of capital and benefit from a larger labor market and specialized services (Priemus, ١٩٩٤). In addition, these areas can cooperate with each other and enjoy via spatial proximity and reduce travel costs and expand their business networks (Lambooy, ١٩٩٨). In addition, these cities can develop and utilize supplements or complementarities between different locations (Turok & Bailey). This topic follows Porter's discussion of the values of regional clusters of dependent economic activities. Accordingly, scattered metropolitan areas can also compete with the metropolitan areas to achieve these economies. In addition, there are empirical studies that, by comparing metropolitan areas in the United States, the dispersion of population and activity in metropolitan areas leads to a reduction in labor productivity and therefore no accumulation of income (Meijers & Burger, ٢٠١٠). Meanwhile, the finding of Veneri and Burgalassi (٢٠١١) in the metropolitan areas of Italy show an inverse result and confirm the hypothesis that the concentrated pattern compared to dispersed pattern leads to higher accumulation benefits and as a result economic performance will be higher.

Material and Methods

With respect to the nature of the subject and the research questions, the comparative logic and descriptive analytical approaches were applied in order to answer questions and better understanding the benefits of polycentric metropolitan areas. Data and information were collected via secondary documents. Then, the extent of polycentric distribution of two metropolitan areas were measured based on the research components and compared with each other. Then, by calculating the indices of urbanization derived from theoretical and experimental literature, the effect of spatial structure variables on their economic performance was studied comparatively.

An important precondition for analyzing the relationship between urban and spatial cost and spatial structure is to measure regional spatial structure. To measure size, this study focused on two aspects which affect spatial concentration. The first dimension is concentration or dispersion which refers to the extent that population

and employment are concentrated in cities, or dispersed in non-urban areas of the region in a decentralized pattern. The second aspect is monocentric or polycentric shows the extent to which urban population and urban employment are concentrated in a city or distributed in several cities in the region.

Findings and Discussion

This paper dealt with a comparative study of two metropolitan areas of Shiraz and the Central Mazandaran; investigated some claims about the relationship between optimal spatial structure and accumulation costs.The results indicated the dispersed and polycentric pattern of central Mazandaran against the concentrated and centralized pattern of the metropolitan area of Shiraz.

The analysis of spatial and urban economics with regard to the differences between the regional spatial patterns in these two metropolitan areas shows the following results: First, a dispersed and polycentric model cannot provide equal urban economics with a centralized and mono-centric metropolitan area. The most important problem on this issue seems to be the Lack of a centralized pattern and a large metropolitan area. A large metropolitan area creates a bigger market with a large number of potential customers. As a result, it seems that the absence of a dominant city with the metropolitan environment and culture from the point of view of consumption should be considered as the most important factor in not achieving such savings. This will impede the achievement of higher levels of service and facilities especially lower private sector investment. Nevertheless, the analysis of the findings shows from present case examples; this does not include diversification in production. It also seems that although the higher density of industrial activities for the central Mazandaran may be somewhat mitigating, the urbanization cost of the metropolitan area of Shiraz may be somewhat mild, however, calculating and comparing the productivity of labor in the two regions; as long as the region does not fully define itself as an integrated entity by the private and public sector, the inability to access these costs is inevitable. In other words, the dispersed pattern of the central Mazandaran area and the competition for more allocation

of infrastructure and facilities by each of the cities undermine the activity density to take advantage of more urbanization for the entire region. The second result is that a scattered and polycentric metropolitan pattern cannot create equal external economies for companies, compared to concentrated metropolitan areas. The main reason for this can be explained in the first result. Lower urban benefits in relation to size will undermine investors to set up larger companies and more productions. Also, concentration in larger cities leads to higher productivity, since they display a high concentration of specific industries. As a result, as long as urban economies are more than non-spatial economies, intermediary firms are more likely to concentrate on settling in metropolitan areas. Since the central Mazandaran area can be considered a fusion model from the polycentric metropolitan area, the results of this study confirmed the doubts by Parr (٢٠٠٤), Bailey & Turok (٢٠٠١), Lambregts (٢٠٠٦), Hall & Pine (٢٠٠٦) about the benefits of polycentric metropolitan areas of central Scotland, Randstad, Rhine-Ruhr and Flemish Diamond. However, the present research focuses solely on the accumulation economies due to the constraints of information and the difficulty of their measurement. Therefore, researches that focus on accumulation deprivation can better understand the economic assumptions about regional optimal spatial structure. In addition, the research limitation in access to comparable data is one of the cases that reduced the number of case examples to two regions. Hence, empirical results from a larger range of regions can create new windows on these assumptions. Also, the final point to be noted is the difference between the concept of a "network" and a "polycentric urban area"; so that these two concepts are often synonymous with each other. But the important point is the advantages of polycentric metropolitan areas in relation to network characteristics. In fact, a significant part of the economic assumptions that they attribute to these areas is the benefits of the network. Hence, conducting studies that could take advantage of these benefits has a fundamental role in understanding decision makers on the features of polycentric metropolitan areas.

Keywords: Spatial structure, location advantages, mega-polis, central Mazandaran, Shiraz

The Prediction Probability of Repeated Drought Periods and Effects on Vegetation in Golestan Province

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Introduction

Based on a comprehensive plan for its water, precipitation (more than ٤١٣billion cubic meters), provide the main source of water. From this amount, about ٧١٪ of it evaporates and only part of it (٨٨.٥ BCM) for agriculture, industry, mining and wine are harvested. Although ٩٤٪ of these costs are only allocated to the agricultural, But because of the limited water resources, from about ٣٧ million ha of fertile agricultural land, only ٨.٧ million ha are irrigated using (Brimnezhad and Paykani, ٢٠٠٥: ٦٩-٩٥). Investigate ways to mitigate the effects of drought in Iran shows that is impossible in short-term and easily the recompense and are require opportunities, efforts and huge investments, and planning to be a kind of accommodate with the effects of drought (Farajzadeh, ٢٠٠٥: ٢٥).

Theoretical Basis

Asakreh (٢٠٠٩) the frequency and persistence probability of rainy days in the city of Tabriz using the Markov chain model is investigated. The results showed that are ٥ days return period rainfall and drought return period of ١ day, respectively. In fact, the probability of precipitation ٠.٢٢ and non-precipitation ٠.٧٨ was in per day. The most probability is occurrence of rainy days in the spring. Sadqinya et al. (٢٠١٣) using Markov Chain Model and SPI index were studied probability of drought and phenomena in Tehran. Taymori and Fathzadeh (٢٠١٤) surface water resources using Markov chain model and SWSI index were monitored. Tavousi et al. (٢٠١٤) using a

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Markov chain model, the probability of accumulation of cold air days in the Gavkhoni studied.

Materials and Methods

For study changes in precipitation was used the Moving Average test that for this purpose during ١٩٨٠-٢٠١٠ were used Gorgan station data. To evaluate drought, the Standardized Precipitation Index (SPI) were used in the analysis of regional drought (Mc Kee, et al., ١٩٩٥: ٢٣٥). To examine the trends in precipitation was used from Mann-Kendall test (Zahedi et al., ٢٠٠٨: ١٨٨).

Mathematical methods in the study of Markov chains are used to predict drought. These methods provide a transition probability matrix, the prospect of a position with respect to the current situation provides. Random process $X = [X_t, t \in N]$ is called a Markov chain if for any $t \in N$ and $j \in E$, the following requirements apply where E is a countable set (Hakimipour, ١٩٩٨: ١).

To study the vegetation variability were used from the AVHRR images. For this purpose, images of the May, which is preparation the maximum vegetation in a five-year period and investigated vegetation changes in the various classes and Then, using the Markov chain mathematical methods were used to predict changes in vegetation. In the present study, to investigate the possibility of predicting drought and vegetation changes is used from the first order Markov chain.

Findings and Discussion

Based on moving average test, Gorgan station is passed Wet and dry periods. Longest wet period between ٢٠٠١-٢٠٠٧ and ١٩٩٠-١٩٩٤ was occurred in Gorgan station. Longest drought during ١٩٨٢-١٩٨٦ and ٢٠٠٥-٢٠١٠ year periods are observed. Mann-Kendall test have shown a mutation in ١٩٨٣ to ٢٠٠٠ in the rain trend and two lines U$_i$ and U$_i$' in the critical value ±١.٩٦ come together and be a decreasing trend in precipitation. Precipitation increased during ٢٠٠١-٢٠٠٦, that this trend has not been fixed, and again from ٢٠٠٦ to the end decreased. The probability of transition from severe drought to severe drought is ٠.٦. The state transition probability of severe drought to moderately

drought is ٠.١٣. In drought state is most likely in moderate drought to normal conditions. Probabilities of the transition conditions from drought state to normal and normal drought is ٠.٥٧. Most probability is +١ to -١ in normal conditions. These conditions with ٠.٧٩ are more likely in the Markov chain. The probability of transition from wet to normal conditions is ٠.٢٨. In the wet state the highest probability, is ٠.٢٨ in moderate to same. Chances are very wet conditions are only ٠.٤٣ in Gorgan station.

Due to the rainfall in the province, from ١٩٨٠ to ٢٠٠٠ decline in rainfall and vegetation are also taken by the precipitation trend. Moderately dense vegetation in ١٩٨٥ was ٤٩٤,٤٧٩ha decreased to less than ٣٨٠,١٢٠ha in ٢٠٠٠ year. From ٢٠٠٠ to late ٢٠٠٥ rainfall increased, thereby the density and area of vegetation has also increased. Semi dense vegetation also has ٧٩١,٧٢٥ ha. The drought years of ٢٠٠٦ to the end of the period, particularly in ٢٠٠٨ to ٣٠٠millimeters of rain has fallen, Area in all categories of vegetation decline and the trend is downward. Due to the recent drought and vegetation density fluctuations, the transition probability matrix shows classes of vegetation ٠.٤٨ likely no vegetation classes remained in same condition and its area have not increased. Possibility of converting lands with sparse vegetation class is no vegetation about of ٠.٤١, which is highest probability of converting vegetation to non-vegetation. Accordingly likely to land covers ٢١٤٠٦٠ha of land with no vegetation becomes sparse vegetation. So, is reduced density the ١٤٨٢١٠ha of land with moderately dense, by affected drought and change to weak vegetation. Land use and land cover change is the dynamic and complex process that are consequences the economic, social and environmental in global, regional and local scale. Based on the results of Gorgan Station longest period between ٢٠٠١-٢٠٠٧ and ١٩٩٠-١٩٩٤ a long wet period and during ١٩٨٢-١٩٨٦ and ٢٠٠٥-٢٠١٠ a period of prolonged drought has occurrence. Study of drought index showed precipitation trend in same period and has occurred wet period in ٢٠٠١-٢٠٠٥ and drought period from ٢٠٠٥. According to Markov Probabilistic matrix probability alternation from severe drought to same is ٠.٦ and severe drought to moderate drought is ٠.١٣. In same trend, have decrease semi-dense vegetation from with ٤٩٤,٤٧٩ha in

١٩٨٥ to less than ٣٨٠,١٢٠ha in ٢٠٠٠. Density and area of Vegetation have increased from ٢٠٠٠-٢٠٠٥, but for the reason of drought decrease recently and with ٠.٤١ probabilities will remain non vegetation class in same conditions. The most probability changing is related to sparse vegetation to non-vegetation with ٠.٤٨. On this basis, may be will changed ٢١٤٠٦٠ ha to non-vegetation.

Keywords: Mann-Kendall, Markov chains, NDVI, drought, Golestan.

Analysis and Forecasting Drought Days Using Artificial Neural Networks Model (Case Study: Station Tehran)

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F. Sayadi[2]

١- Introduction

Recently, with regard to the consequences of climate change, geoscientists seek to study climate change, detect and discover the consequences of using it. Among the methods that has recently played a major role in studying Earth system changes. The significance of the application of nonlinear methods of time is apparent when we know that the climate system is a nonlinear system and the climatic processes resulting from these climatic elements have been placed in a row of random and random seasons. Extensive studies have been carried out on the use of neural networks in the field of climate research and hydrology since the ٢٠٠٠s. Rajorgkar et al. (٢٠٠٤) modeled the relationship between rainfall and runoff using the neural network for ٥ stations in the Indian basin. In this study, using the Feed-Forward artificial neural network by combining genetic algorithm in networks, the networks have the same human brain for forward connections, and there is no path in the network. ٢- In predicting climatic and climatic elements using the network, due to the ability to separate and maintain the past data, this is usually the case. Networks are used a lot. ٣- By combining these two models, the speed of data analysis is higher and ultimately the error rate is reduced, the prediction of the number of dry days in Tehran's synoptic Station during the next ١٠ years (٢٠٠٩-٢٠١٨).

٢- Methodology

An artificial neural network is a mathematical-computational model simulated based on a biological neural network. Each neural network has three layers of input, hiding, and output; the input layer can contain several neurons. . The length of the statistical period included

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daily rainfall data of synoptic station in Tehran (Mehrabad airport) from ١٩٧٦ to ٢٠٠٨. Due to the fact that the training algorithm in multi-layer networks is a kind of post back error, so the neural network calculations are carried out in the leading calculation state. For the training of the network, has been used the post-return algorithm. The mathematical equation for the leading calculation is as follows.

$Net_{pi} = \sum w_{ij} a_{pi} + b_i$

In this regard, a_{pi} the output of the previous layer, w_{ij} the corresponding layer weights, and b_i, the bias rate. (I, j are used to represent each neuron in the grid.

Then, the value of $f(net_{pi})$ is calculated, where f is a stimulus function.

$f(net_{pi}) = (١ + \exp(-net_{pi}))$

Therefore, in order to predict the values of b_i and w_{ij} should be trained and tested so that the network has better prediction, in which case we need to calculate the bottom line for weight training and bias. If we assume that DD_{obc} is the real dry day and DD_{pre} pre dry days, then the leading calculations are as follows:

$E = \sum_q (DD_{obc} - DD_{pre})^٢$

$$\Delta w_{ij} = -\eta \frac{\partial E}{\partial w_{ij}}$$

In this case Δw_{ij} is added to w_{ij} for training η ؛in which learning and numeric learning rates are constant and positive

٣– Discussion

The total data used in the network for the Tehran station includes: at the stage; (a) training for ٦١٣٧ days; (b) validation with ٢٠٥٤ days; c) a test with ٢٠٥٤ days. The data type is defined by dry and wet days. For dry days, the number ١ and days were set to zero. ⊠Then, the

mean square error (RMSE) was evaluated using the simulation function as well as the function in the selected model. Simulation actually shows the correlation between input data and network performance to predict. Which in the training phase of the network, combining an algorithm with ٨٧.٤ percent of the correct poles for the model. For prediction, it is usually necessary to set the w and b values so that the network can provide optimal prediction.

For prediction, it is usually necessary to set the w and b values so that the network can provide optimal prediction. Usually, the amount of weight and bias varies depending on the network designer's purpose, the type of algorithm and the stimulus function. So, for the Tehran station was dealt wit, the ١٠-year forecast (٢٠٠٩-٢٠١٨). For the Tehran station with a delay of ٤ years, the last ٤ years with one year priority were considered for prediction. So that the last ٣ years were given to the network to predict the next year. For the station, experiment and error with ٤ input layers and ٥ neurons were hidden and an output layer was considered to be the optimal prediction of dry days. The results of the network prediction without combining with the algorithm (Table ٥) showed that during ٢٠١٥-٢٠١٨, compared to previous years, the forecast of dry days has been increasing, so this increase can be clearly seen in January. Compared to the different months during the period (٢٠١٨-٢٠٠٩), which has been predicted, the number of dry days has risen in almost all months. According to equation (٥), the dry days predicted by the model have increased trend. Therefore, it can be expected that on average every ٢٠ years a dry day would be replaced by one more day during the statistical period. The minimum probability of occurrence of the expected day is estimated by using the February network model with ٥٩.٨٪, which is close to the probability of the occurrence of the Markov chain, which is roughly ٦٥٪, but the maximum annual probability in both models isalmost close to (٨٣.٤٪)

٤– Conclusion

Precipitation is one of the most important inputs to hydrological systems. Considering the importance of rainfall and its shortage in a country like Iran, studies on rainfall prediction have been limited. In

this research, we have tried to predict the number of dry days in Tehran station using Artificial Neural Network and Genetic Algorithm. By combining the neural network with the genetic algorithm, the speed of data analysis increases and eventually the error rate is reduced. The network used in this study is feed-forward with a structure of ٤-٥-١ and ٥ hidden neurons in the middle layer. The results showed that the number of dry days in the station, followed by the lack of rainfall in the years to come, will result in a slight upward trend for the future with the combination of the algorithm. This is quite evident by comparing actual data with predicted values over the years (٢٠٠٩-٢٠١٢). According to the predicted values of the number of dry days, it can be said that there has been an increasing trend over the past ten years, with the increase being very low.

But in general, it can be said that there has been no significant trend that has been proven in past studies on the precipitation of this station. The results of network prediction by combining the algorithm showed that the correlation between data input to the network and its performance is close to ٨٨٪. However, the correlation coefficient obtained from the network without combining with the algorithm is about ٨٦٪. Therefore, we can conclude that the model of the neural network by combining the genetic algorithm as a nonlinear model can be considered as a suitable tool for predicting important hydrological and climate issues.

Keywords: Artificial Neural Network, Feed-forward, Genetic Algorithm, Tehran.

Evaluation of Climate Change Impacts on Groundwater Levels in Tasuj Basin

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T. Jalali [2]

In recent decades, in addition to population growth, increasing the temperature of the planet has led to extensive changes on the Earth's surface and has caused changes in the amount, shape, severity, duration, time and place of precipitation. On this basis, it is expected that the activity of the hydrological cycle of the world and the atmospheric moisture content will bring a lot of damage to man. Although the most important impact of climate change can be fluctuations in the surface waters and their quality, but the main worry for governments is the potential decline of groundwater resources. It is the main source of drinking water for human use and irrigation of agricultural products around the world. This is especially true in regions with a dry climate such as Iran. Various studies have been done using a mathematical and physical model to estimate the effects of climate change on groundwater. Vaccaro (١٩٩٢) reviewed the climate change and its impact on the future recharge of groundwater basins in the northwest of the United States. The results showed that the annual amount of recharge in the future would be less than historical data. Rahmani and Sadahi (٢٠٠٤) used time series model for patterning and forecasting groundwater level in Bahar Hamedan- plain and concluded in case of remain constant patterns of use and also no change in the recharge aquifers, Bahar Hamedan- plain during the next twenty years will face with reducing ١٧.٥ meter of water level compared to current state of the aquifers. Habashi (٢٠١٤) for predicting of groundwater levels of Urmia plain used time series model and reported its operation satisfactory.

Considering the importance of groundwater resources in providing of majority water requirement in Tasuj basin and the importance of optimal and sustainable use of groundwater resources in this basin, the

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aim of this study is prediction of changes in groundwater levels in Tasuj basin with suitable model of artificial neural network. For this purpose, groundwater level data was received in monthly scale from regional water organization in East Azerbaijan province between ٢٠٠٠-٢٠١٢. During the period studied, cumulative level of groundwater in Tasuj basin declined. To study changes in climate parameters in this basin used the data of Chrchr and Sharafkhaneh evaporation stations and Khoy synoptic station for the period ١٩٨٥-٢٠١٢. Data of temperature, precipitation and sunshine were predicted with software LARS-WG. For downscaling we used data of B١, A١B and A٢ general circulation climate model HADCM٣. Results showed conformity of simulated values by the model and the observed values of the base period. Thus, according to this, the ability of model in data creation approved and then data simulated for future period.

To predict groundwater levels of Tasuj basin by using artificial neural network between observation data of precipitation, temperature, groundwater level and discharge, were used of which ٧٥٪ data was for calibration and ٢٥٪ data for verification of model. For investigation of the accuracy of predicted results we used correlation coefficient and root mean squared error. Pearson correlation coefficient used for studying the relationship between climate variables with groundwater level and crossover correlation coefficient was used for studying time lag of precipitation with groundwater level.

The results of downscaling for Tasuj basin between ٢٠١٣-٢٠٣٠ by using general circulation model HADCM٣ and A٢, A١B and B١ scenarios showed the highest increase in temperature and the highest decrease in precipitation will occur in A٢ scenario. In this scenario on a monthly scale precipitation will increase in January ١ % and in November and December months ٩ % but in other month it is decreasing. The highest decrease in precipitation is in August which is ٣٧٪ compared to normal. Reduced precipitation in three scenarios will be higher in the warm months than in the cold month. The temperature trend is also increasing in all months. Maximum decline in water level will happen in A٢ scenario and minimum decline in groundwater levels will happen in B١ scenarios. Also the study of cross-correlation

showed the impact of rainfall on groundwater levels with time lag of ٢ months.

Keywords: Statistical downscaling, Prediction, Cross correlation, Tasuj basin.

The Assessment of Implementation Neighborhood Management on Achievement Good Urban Governance in Tehran Metropolitan; Case Study: Districts ١, ١٢ and ١٦ of Tehran

M.R. Rezaei[1]
S. Moazzen[*2]

Extended Abstract

Introduction

With increasing challenges in the field of traditional urban management, several modern models and approaches have been introduced in urban management system to solve these problems. One of these models, which is the dominant model in urban management, is a good urban governance model. This urban management model is defined as a collaborative process of development, whereby all stakeholders, including the government, the private sector and civil society, provide means for solving urban problems. It seems that realization of the mentioned approach in the urban management of Iran and in Tehran metropolitan area, it is necessary to reform the structure of urban management and objectivity to the participation of citizens. In this regard, neighborhoods have a special role. In fact, urban neighborhoods are focal points and workshops of management and participatory planning, because they are considered the smallest unit of the spatial organization of the city. For this purpose, in recent years, Tehran's urban management has been implementing a neighborhood management plan for Tehran's city administration in order to better manage this city and reduce the problems and inadequacies of citizens of Tehran. Regarding the importance of the subject, the present study aims to find out the relationship between the neighborhood management approach and the good urban governance from the viewpoint of citizens seeking answers to the following questions:

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١. Does the neighborhood management plan provide the fulfillment of good urban governance in the management of the Tehran metropolis?

٢. Has the implementation of the neighborhood management plan succeeded in achieving its goals (participation) in sample areas in Tehran metropolis?

٣. What is the status of urban management in areas ١, ١٢ and ١٦ of Tehran in relation to urban good governance indicators?

Theoretical Basis

"Neighborhood Management"

It can be said that neighborhood management is an approach that enables local communities and service providers to work together to improve neighborhood services and quality of life. This will be done through the provision of local services and a greater sense of accountability for the authorities. This is the kind of process management that recognizes each neighborhood as a unique entity, enabling people who live, work or service in the neighborhood to strengthen their strengths and meet their challenges.

"Urban governance"

The governance discourse is an intrinsic element of the partnership between civil society and the political community, as well as between the state and citizens, and is rooted in a new public management perspective, which in fact responds to the frustration and frustration of the welfare state's marked failures in providing more effective and efficient goods and public services. UNHCR considers good urban governance of the political, economic, social and executive sectors in urban management. This governance is a continuous process that involves all beneficiaries living in the city and in some way involved in managerial procedures. The center suggests that good urban governance is known to be: ١) Sustainability ٢) Submission responsibility to lower levels ٣) Justice and equity ٤) Efficiency ٥) Transparency and accountability ٦) Civil obligation ٧) Security.

Materials and Methods

This research is applied and developmental in terms of its purpose and is of descriptive-analytical type in terms of its nature. The method of collecting information will be documentary and survey. Thus, in order to write the subject literature and the theories surrounding the subject, the library method will be considered and collected in the field method through a questionnaire tool and the observation of the required data. The statistical population of the research is households living in Velenjak, Sangolaj and Takhtyeh districts. To obtain the sample size, ٣٣٧ households were selected using the Cochran formula; to further document the data obtained and to ensure the results of the inquiry, this number increased to ٤٠٠ households. SPSS software was used for data analysis and one-sample T-test and Pearson correlation test were used to test the hypotheses of the research.

Findings and Discussion

"Realization of neighborhood management"

Taking into account the results of a single-sample T test in relation to the success rate of neighborhood management in achieving its most important goal, the partnership has shown that the questioners in the Velenjak and Sangolj neighborhoods have evaluated their neighborhood unsuccessful in implementation participation. In contrast to residents of Takhti neighborhood, they have evaluated their neighborhood management positively. Finally, the results of these three neighborhoods were summed up by combining the results from the Velenjak, Sangolaj and Takhti neighborhoods. The result in general indicates the lack of management of neighborhoods in achieving full participation.

"Urban management status toward good urban governance indicators"

The results show that the respondents have evaluated positively the status of accountability, legality, effectiveness and efficiency indicators in urban management of their regions. But the indicators of partnership, consensus, justice and transparency are not satisfactory.

Finally, by combining all the indicators together, the overall situation of urban governance was measured in these areas. The result showed that the inhabitants of the studied areas have not evaluated positively their urban management in terms of urban good governance indicators.

"Relationship between neighborhood management and good urban governance"

The findings of the Pearson correlation test show that there is a significant relationship between the implementation of the management plan of the neighborhoods and the grounds for realization of a good urban governance approach in urban management of the studied areas. Based on the findings of the research, there is a significant difference between the two variables of neighborhood management and the good urban governance of less than ٠.٠٥ and there is a strong, positive, and direct relationship between the two variables, so that the correlation coefficient between the two variables is above ٠.٦٢.

Keywords: Neighborhood Management, Participation, Urban Good Governance, Tehran Metropolitan.

Statistical Analysis of Climate Fluctuations in Some Stations of the Kordestan Province, Iran

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M. Taleb Haydari[5]

Introduction

Because of importances of the climate change phenomenon and its relationship with regional and local conditions, we examined variables that cover in wider range of climate change such as temperature, precipitation, humidity and wind. Earth average surface temperature increases since the greenhouse gas emissions in recent years. This can lead towards changes in the water cycle and causes changes in precipitation. Evaporation will increase and changes will be observed in current hydrological extreme events such as droughts and floods.

Theoretical Basis

Global climate change is overall and extensive significant and irreversible fluctuations in the climate of an area. Mann - Kendall test usually were used to study the climate change. The strengths of this method are approved in previous researches. H_0 hypothesis of this test implies on randomness and the lack of trend in the data series. And H_1 hypothesis (Rejection of zero hypotheses) indicates existence trend in the data series. Also we used correlation method to study if two variables depend on each other.

Materials and Methods

In this study, a period of ٣٠ years (١٩٨٣ to ٢٠١٢) was used to study the trend analysis. The Run Test was done on variables to ensure

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homogeneity of data. Finally, ٦ stations (Sanandaj, Saghez, Marivan, Qorveh, Zarineh and Bijar) were selected to study. The method used in this study is Kendall statistical-graphics test and Pearson's correlation test. In order to determine trend direction, type and time of change, it is needed the Kendall graphics test to be used. In this test, If Ui and U'i lines, cross each other within the range of critical area (±١.٩٦), represents onset of sudden change, and if they cross each other out of the critical area, this means that there is a trend in the time series.

Findings and Discussion

The results show that there is a trend in monthly temperature mean parameter in the all stations excluding January in the Saghez station. Changes in most months are increasing trend and positive. The greatest change in the average seasonal precipitation variable is related to winter. Saghez station has increasing trend of the maximum wind speed that is significant in the winter and summer. The calculations showed that relative humidity have not changed in stations. The total amount of change suggests that there is greater change in winter and spring compared to summer and fall. The significance level between two variables of precipitation and average annual relative humidity in Sanandaj station is ٠.٠٠٢. Also, Pearson coefficient is ٠.٥٤٤. This means that there is a significant relationship between two variables at level of significance of ٩٩٪. There is a negative significant correlation between average temperature variable and average relative humidity at Level of ٩٥٪ for Sanandaj, Saghez and Qorveh stations and at level of ٩٩٪ for Bijar station. Also the results showed that there is any significant relationship between maximum wind speed variable with other variables.

Keywrds: Climate change, Mann-Kendall test, Pearson correlation test, trend, Kurdestan.

Evaluation of Climate Change Impacts on Groundwater Level in Tasuj Basin

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Extended Abstract

In recent decades, in addition to population growth, increasing the temperature of the planet has led to extensive changes in the Earth's surface and has causes changes in the amount, shape, severity, duration, time and place of precipitation. On this basis, it is expected will change the activity of the hydrological cycle of the world and the atmospheric moisture content that will bring a lot of damage to man. Although the most important impact of climate change can be fluctuations in the surface waters and their quality. But the main worry for governments is the potential decline of groundwater resources. It is the main source of drinking water for human use and irrigation of agricultural products around the world. This is especially true in regions with a dry climate such as Iran.

Various studies have been done using a mathematical and physical model to estimate the effects of climate change on groundwater. Vaccaro (١٩٩٢) were reviewed the climate change and its impact on the future recharge of underground water basins in the northwest of the United States. The results showed that the annual amount of recharge in the future would be less than historical data. Rahmani and Sadahi (٢٠٠٤) has used time series model for patterning and forecasting groundwater level in Bahar Hamedan- plain and Concluded in case of remain constant patterns of use and also no change in the recharge aquifers, Bahar Hamedan- plain during the next twenty years will face with reducing ١٧.٥ meter of water level Compared to current

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state of the aquifers. Habashi (٢٠١٤) for predicting of groundwater level of Urmia plain used time series model and reported its operation satisfactory.

Considering the importance of groundwater resources in providing of majority water requirement in Tasuj basin and the importance of optimal and sustainable use of groundwater resources in this basin, the aim of this study is prediction of changes in groundwater levels in Tasuj basin with suitable model of artificial neural network. For this purpose, groundwater level data was received in monthly scale from regional water organization in East Azerbaijan province between ٢٠٠٠-٢٠١٢. During the period studied, cumulative level of groundwater in Tasuj basin declined. To study changes in climate parameters in this basin used the data of Chrchr and Sharafkhaneh evaporation stations and Khoy synoptic station for the period ١٩٨٥-٢٠١٢. Data of temperature, precipitation and sunshine were predicted with software LARS-WG. For downscaling used data of B١, A١B and A٢ general circulation climate model HADCM٣. Results showed conformity of simulated values by the model and the observed values of the base period. So according to this, the ability of model in data creation approved and then data simulated for future period.

To predict groundwater level of Tasuj basin by using artificial neural network between observation data of precipitation, temperature, groundwater level and discharge, has been used ٧٥٪ data for calibration and ٢٥٪ data for verification of model. For investigation the accuracy of predicted results used correlation coefficient and root mean squared error. Pearson Correlation Coefficient used for study the relationship between climate variables with groundwater level and crossover correlation coefficient used for study time leg of precipitation with groundwater level.

The results of downscaling for Tasuj basin between ٢٠١٣-٢٠٣٠ by using general circulation model HADCM٣ and A٢, A١B and B١ scenarios showed the highest increase in temperature and the highest decrease in precipitation will occur in A٢ scenario. In this scenario on a monthly scale precipitation will increase in January ١ % and in November and December months ٩ % but in other month it is

decreasing. The highest decrease in precipitation is in August which is ٣٧٪ compared to normal. Reduced precipitation in three scenarios will be higher in the warm months than in the cold month. The temperature trend is also increasing in all months. Maximum decline in water level will happen in A٢ scenario and minimum decline in groundwater levels will happen in B١ scenarios. Also study cross-correlation showed the impact of rainfall on groundwater levels is with time lag of ٢ months.

Keywords: Location-time changes, Static level, Collapse, Isopis maps, Ghaleh area in Tasuj.

An Analysis of the Locational Patterns of Metro Terminals in Urban Areas: Case Study of Tabriz

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Extended Abstract

١- Introduction

The rapid growth of urbanization in the past three decades was not proportional to the development of urban space facilities and infrastructure and failed to create the required jobs. Since the spatial distribution of cities and population settlements handling are not done based on a comprehensive program according to a sectorial and regional coordination, problems resulting from rapid urban growth have become complex. Overpopulated cities, uncontrolled migration from rural to urban areas, impoverished densely populated settlements, lack of integrity and respect for the different land use within the urban district, poor access to facilities and inadequate allocation of land uses are the problems that most of the Iranian cities face. This article evaluates the conditions of subway stations according to ٢٤ indexes which are provided by hieratical analytic model.

٢- Theoretical Basis

Metro stations are places that are located in significant points with traffic that have urban and meta-urban roles. These kinds of stations are used as a place for changing vehicles. There are bus stations, taxi stands and other motor vehicles nearby to move people to other parts of the city. Since these stations are used for changing vehicles, they have communicative roles and are known as node and place properties. The first property, which is referred to as nodes, in fact, considers these stations as a central point from which sub-sectors are branched from the main part of a network. In this definition, stations are known as the accumulation point of system infrastructure (the

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metro network) and economic activity of people. This point is in fact a point to exchange vehicles. That's why it has fine features and special spaces that will be referred to in the following after the locational properties of metro stations have been dealt with. The second property of the metro terminals is determined by its location in the city and is defined as follows: a station includes all built and open spaces, with applications and activities related to its nature that is located within a walking distance around the station building. It is also structured according to the psychological and physical characteristics of its users, historical characteristics of its location and the developments taking place around it.

On the third millennium the combination of the principles of urban design and public transportation, especially rail way system, to establish more compact communities, mixed-use with the ability to walk around transportation terminals is emphasized more than ever. One of the theories presented in this regard is the idea of transportation villages which is intended to create a more dynamic and stable neighborhood with a focus on the public transportation stations.

٣- Materials and Methods

The analytic hierarchy process (AHP) is a structured technique for organizing and analyzing complex decisions, based on mathematics and psychology. It was developed by Thomas L. Saaty in the ١٩٧٠s and has been extensively studied and refined since.

It has particular application in group decision making, and is used around the world in a wide variety of decision situations, in fields such as government, business, industry, healthcare, shipbuilding and education.

Rather than prescribing a "correct" decision, the AHP helps decision makers find one that best suits their goal and their understanding of the problem. It provides a comprehensive and rational framework for structuring a decision problem, for representing and quantifying its elements, for relating those elements to overall goals, and for evaluating alternative solutions. In this study, ٢٤ indicators were used with analytical hierarchy analysis method to analyze metro station

location patterns which include there clinic and emergency ward for emergencies, the use of the water element in the design, associated with the user station, stations, metro stations need inspired architecture of the historic fabric of the region, quality of green space design, treatment and cleaning of air pollution, access to services facilities, amount of order handling units, quality of flooring, the number of obstacles and holes in walkways, how to monitor amount of social space (activities, staff, passengers), create space for children, easy access for the disabled to access to space station, the population of the area stations, activity vendors in the space, pause space and spending time on the subway.

٤- Findings and Discussion

Choosing a suitable location for Metro transportation stations in major cities like Tabriz is very important. Showing prudence in selecting and locating terminals is one of the concerns in the context of the contemporary cities. The importance and validity of any city depends on the urban services of the city. The article shows that ٢٩ Bahaman and Shahriyar stations mark the highest point in furniture quality variable while Khayyam station comes last. Station four has the most immediate access to emergency aid while station ٦ has the least. Land uses around stations ٢ and ٧ are more relevant to the function of the stations. In terms of esthetic principals, Shahriyar station scores the highest among the stations in the first phase of the first line. Because of its proximity to Elgholi depot, station ١ has easier and greater access to infrastructure facilities while station ٥ has the least among the seven stations. Station ٣ is in close proximity to commuter taxis and also in good order among other stations. The findings of the article have implications for giving priorities to organizing the subway system in ٢٩ Bahman and Shahriar stations gained the most points in furniture variable quality and the lowest score from this option is for Khayyam station.

١) ٢٩ Bahman and Shahriar stations gained the most points in furniture variable quality and the lowest score from this option is for Khayyam station.

٢) Station ٤, in first aid and emergency sub-indexes has the highest score and station ٦ has the lowest.

٣) Station ٢ and Station ٧ are more relevant to the performance of a station. Due to business centers, taxi stands, a large number of commuters in Station ٢ and Station ٧ and trading centers such as commercial Crystal Tower, Javaher trading center, Tabriz scientific and research centers and universities and so on, these two stations are connected with the land around them much further.

٤) The need for architectural inspiration of metro stations from the historical context of the region: this variable scores less in comparison with other physical variables. In designing stations of line one this case is not paid due attention. In the first line, Shahriar station will get more points among other stations.

٥) The element of water is one of the main items of traditional Iranian architecture. Psychologically it exercises very beneficial effects on the human psyche. Existence of the element of water and its sound creates a sense of calmness to people in public spaces such as metro stations. This variable has not been met in our stations.

٦) Station ٧ is along the river of Mehran Chay. That's why its building and implementation over weights other stations.

٧) Station ١, due to its proximity to the depot Elgoli, it has the most weight in terms of access variable to services. Station ٥ has the least access to services among seven stations.

٨) Station ٣ is in a position that has the highest commuter taxis. And enjoys a high level of order in transportation units.

٩) Station ١ enjoys a diversity of age and sex compared to other stations due to its proximity to Elgholi Park. It even includes the tourists that are visiting the park. The population living in residential areas uses at station ٣ increases the weight of this variable in comparison with other stations. Unfortunately, pause and spent time in our urban space stations have been paid less attention. Because subway system in the city has only been designed and built to transport people. Easy access for the disabled at the entrance is observed and the most weight is assigned to Station ٥. Stations ٢ and ٤ have equal weights in terms of access to

large centers. Station ٦ has the highest weight in this variable. Volume of traffic is also high near these stations.

١٠) At stations ١ and ٢ the most residential area with an area of ٢٦٧١١٥ square meters and ٤٥٪ of employment is the most user of the site. The area of industrial users with an area of ٥٢٥ meters and a ٠.٠٩٪ level of employment is the lowest.

١١) At stations ٣ and ٤ the most residential area with an area of ٢٨١ ٩٩٤ square meters, and ٦٠.٦٥٪ of the members of the desired level of employment. The religious area covers an area of ٣٩٨ square meters and ٠.٠٨٪ of the employment is the lowest.

١٢) At Stations ٥, ٦ and ٧ largest areas with an area of ١,٣٦٤,٤٤٧ km and research and technology account for ٦١٪ of employment is the user of the site. The area of industrial users with an area of ١٦٧ m and ٠.٠٠٧٪ employment level is the lowest.

١٣) According to the map, depot is located in compatibility with the environment.

Precipitation Waiting Time Duration in Kordestan Province

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Extended Abstract

١-Introduction

Precipitation is the most important atmospheric parameter which plays high effect on climate and has many changes in spatial and temporal. The amount of receiving precipitation over a specific region is affected by many factors like topographic configuration, near to or far from the sea, time of year, configuration of synoptic atmospheric systems and etc. Variation in characteristics of precipitation is considered as one of the climatic change index. Many researches have been done on this atmospheric parameter but there are many unknown characteristics about its behavior. The main aim of this research is recognition of precipitation waiting time duration over Kordestan province in the west of Iran.

٢- Theoretical Basis

It is well-known for everyone that waiting time duration of precipitation is varies in different regions. In temporal view, there are high differences in waiting time duration of precipitation in different months of year. So having enough knowledge about spatiotemporal precipitation waiting time duration is very useful for many activates like agriculture, environmental planning, making dams, water resource and land use planning.

٣-Materials and Methods

To doing this research daily precipitation data from ١٦٢ synoptic, climatic and rain gauge stations in and out of province during ٢١/٣/١٩٦١ to ٣١/١٢/٢٠١٢ extracted from Kordestan Regional Water

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Company and meteorology organizations. By geo statistic Kriging method daily precipitation interpolated on ٦×٦ kilometers and one digital map has been created for each days. Then data over province on the ٨١١ pixels that covers whole of province extracted. A database was created in dimensions of ١٨٩١٤×٨١١with time (day) on the rows and pixels (place) on the column. The average, high and low thresholds and standard deviation of waiting time duration calculated for each pixel during different months. To detection thresholds the t-student test has been applied. The thresholds calculated in ٩٩٪ confidence level.

٤-Findings and Discussion

The results showed that Mountains features have important effects on precipitation waiting time duration. The different precipitation waiting time duration observed over Kordestan province during different months. The distribution of precipitation waiting time during the different seasons of the year shows route of Rain-bearing systems on Kordestan province. In total, the cores of minimum precipitation waiting time are located on the North-West of province in spring, on the North and North-East of province in summer, and on the North-West and West of province in autumn and winter. The shortest and most prolonged precipitation waiting time is related to the months of February and September respectively. In February on the part of the western and northwestern parts of Kurdish province precipitation waiting time duration is about ٣ days. While waiting period in September on the mentioned areas is more than ٦٠ days.

Keywords: Waiting Time Duration, Precipitation, Interpolation, Kordestan Province.

Assessment of Wind Erosion Intensity by IRIFR.E.A Model (Case Study: Qahavand, Hamedan)

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M. Moradi[2]

Abstract

The intensity of wind erosion desertification processes means reducing the ecological and biological land that occurs naturally or artificially by human activity. So far a large variety of methods to estimate the wind erosion rate is presented by various experts around the world. Because not consistent with climate models provided by experts in other countries, Iran, in ١٣٧٥ IRIFR.E.A experimental model was devised and proposed. Ghahavand plains in areas which are the province of the destruction of production in the decades to face the desert. The study area is located in Sanandaj parallel to the Zagros region and has been strongly altered and magmatic activity in it. The purpose of this study, mapping of wind erosion area is IRIFR.E.A model. For this purpose, the ٩ factors affecting wind erosion on the basis of the model in seven units of geomorphology and geology, soil, vegetation and weather data were analyzed. According to the results found that most points related to changes in land use and zoning salt is granulated or saline flats, and the last one on the regional of the village. Also according to the assessments of the area showed that ٧.٠٤percent in grade low and, ٢٣.٥٩ percent in grade average and ٦٩.٣٥ percent in the class wind erosion is very intensity.

Introduction

One of the most important factors influencing wind erosion is aerodynamic roughness, which is dependent on soil surface conditions and its significance is determined which reduces wind speed at the contact surface of wind and soil and thereby decreases the erosion rate Gives. Curbing wind erosion will be more effective when it comes to

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how the soil and sediment are removed by wind, wind erosion and erodibility of soil. (Rafahi, ٢٠٠٤: ٣٢٠). Therefore, the higher the wind speed, the more kinetic energy and hence its more erosion and more material will be transferred. So far, a lot of research has been done by scientists about erosion. The desertification project of the Ghahavand area of Hamadan is one of the research projects in which various environmental factors of the region are investigated and then by their integration to identify the most important desertification factors in the region. The purpose of this study is to estimate wind erosion based on the IRIFR.E.A model. The results of this study can be used to highlight the environmental and socioeconomic conditions of the region in desertification.

Materials and Methods

The study area:

Hamedan's Ghahavand area with an area of ٣١٢٥٠٠ square meters is located in the eastern part of Hamedan province.

Research Methodology

In this study, Ghahavand plain was determined using topographic maps ٥٠٠٠٠: ١ and ٢٥٠٠٠: ١, then using aerial photos ٢٠,٠٠٠: ١ and satellite images of gradient, geology and geomorphology were investigated. In this The research also provided a map of geomorphological work units and then nine factors affecting wind erosion including lithology, landform and elevation, wind speed and condition, soil texture and non-lining, soil surface, type and distribution of wind deposits Finally, land management using the IRIFR.EA model was investigated. In the studied area, seven units of work included: (Coniferous), stabilized hills, clay plains, fine or puffy salt zones, active hills, land use change and rural lands were determined. To assess the severity of wind erosion in each of the units of work the experimental method of IRIFR.E.A was used. In this method, nine effective and effective factors in wind erosion along with scoring tables are presented and analyzed. Depending on the severity and weakness of each factor and its effect on sedimentation, it is given a privilege. The sum of the numbers obtained for different

factors indicates the severity of wind erosion. With the help of adaptation of basic maps such as geological formations, vegetation, land use, landform, elevation, soil and land suitability and other available information such as humidity, wind and surface erosion status with geomorphologic map (as the basis And the basis of wind erosion studies) In each of the geomorphologic facies, effective factors have been evaluated using the ARC GIS .٩.٢ software.

Discussions
In this study, the severity of wind erosion is calculated based on the seven geomorphological units and the evaluation of the nine effective factors in the Arifer model and the result is adjusted for each unit of work. After identifying the units in the region, the factors considered in each unit are evaluated based on the designed tables and the results of the evaluation and scoring of the indicators are presented in the study method presented in Table (١٤) and eventually Based on the results obtained from the previous steps, the current status of desertification using the IRIFR model in the studied area is presented in Fig. ١. The areas with very severe floors with an area of ١٢٤٣١ hectares have the highest percentage of the area, including fine-grained or puffed salt zones and land use change. After preparing the land susceptibility map for wind erosion, the range of each class in the entire study area is calculated using the digital system and the relative percentage of wind erosion classes in the studied area is presented in Table (١٥). Using the IRIFR.EA model and measuring ٩ effective factors in erosion and determining the erosion class and erosion severity and the score of each of the seven geomorphologic facies of the study area and calculating its erosion class, based on these points, the co-ordination and desertification map of the area It was drawn. In this map, three erosion classes are specified (Fig. ٧ and ٨). The severity and erosion class in the units of the study area are presented in Table (١٦).

Conclusion
The results of the survey on the intensity of wind erosion in the area of Figure ٧ show that ٧.٤٤٪ of the area in the low desertification class, ٢٣.٥٩٪ of the area is in the middle class desertification class, which is

in most of the land These areas of vegetation or covering surface pebbles and hardened clay surfaces prevent wind erosion. ٦٩.٤٤ percent are in severe and very desertification classes, the most active sand dunes and lands where they have been modified. According to the evaluation of the factors studied in the IRIFR method, it has been determined that the unit of work of fine-grained or puffed salt zones (Working unit D) has been identified as the most critical part of the study area with the highest score among the geomorphic facies. . According to table (١٥), which represents the results of the IRIFR method, it has been determined that the studied area is low, moderate, severe and very severe in desertification classes. Based on this method, the main cause of desertification in the study area is undoubtedly environmental factors. Because in most units of work, environmental factors (wind and vegetation) have been identified as the main causes of desertification with the highest rates. Based on the results of this study and the observations made in the area, it was determined that the model used is good for estimating the intensity of desertification in the study area, because it depicts the true desert landscape and the desert region Fully specified. According to the results presented in Table (١٦), it was determined that the management factors, wind and climatic conditions of the area with the highest percentage of points have the greatest role in land degradation in these lands, given that the main factor is the destruction of the wind, and the increase The severity of wind erosion in the Ghahavand area is due to the lack of vegetation, unconventional exploitation of land, excessive grazing and so on. It is recommended that in order to prevent the progress of the desert, the construction of a non-living wind breaker will be established, along with which biologic stabilization can be made using indigenous species. By comparing the results of this research with the research carried out by Pahlavanuri Zahtabian, in the central regions of Iran and Nemat Abad Bijar, the results are acceptable considering the critical conditions of the study area.

Keywords: IRIFR model, Wind Erosion, Ghahavand, Unit.

Channel form Analysis of Garangu River in Mountain Interval (between Khorasanak Village of Hashtrood Cities to Mianeh City)

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١- Introduction

Various and different controls on Channel formation in the mountain and plain area are cause of channel different dynamic in different region. This is an important research topic for researchers in geomorphology. The Monitoring on route changes trend and geometric pattern of rivers is essential for identifying and evaluating eventual problems and risks in order to maintain and optimize utilization of natural resources and it is among the priorities of Geomorphology Studies. The purpose of this study is analysis of affecting factors in pattern forming and channel dynamic in mountainous Intervals of Garangu River between Khorasanak villages in Hashtrood to input of river in Mianeh city.

٢- Theoretical Basis

Streams and rivers progressively change from headwaters to mouth, i.e., from turbulent, narrow, and steep streams to wide, deep, and meandering slow flowing channels. Fluvial geomorphologists and biologists have widely examined their downstream pattern at various scales. Longitudinal gradient, width and depth, velocity and size of the bed material display interrelated changes (Bravard, F. Petit, ٢٠٠٩)The fluvial system changes progressively through geologic time, as a result of normal erosional and depositional processes, and it responds to changes of climate, base level, tectonics, and human impacts (Kondolf and Piegay, ٢٠٠٣: ١٠٥). On the other hand, River channel self-adjustment and variability may create hazards for humans in the form of floods, bank erosion, or bed scour around bridge piers (Wohl, ٢٠٠٤: ٢٩).

٣- Materials and Methods

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The pattern of research is comparative – deductive. materials of research are include of Topographic map, Geological map, flow Hydrological data, data provided from Dem and field data. In this research were used methods of River Power Analysis, River specific power, Sinuosity Index, Central angle, Route Sinuosity and longitudinal profile analysis in order to channel pattern and dynamic analysis. In order to study the river power and its effect on the erosivity, River discharge was calculated in different return periods. Then the river power was calculated by the following equation:

$\Omega = \gamma QS$

The flow power can also be expressed in units of the bed surface if the width of the river (W) is divided, Therefore, in order to express the power of the river at any point, it is necessary to calculate the special power of the river, is calculated by the following equation:

$\omega = \gamma QS/W$

To study the shape and pattern of the river, coefficients Sinuosity Index, Central angle, Route Sinuosity were used. Then the Sinuosity Index size for each arc was calculated by the following equation:

$$S = \frac{L}{\lambda / 2}$$

The center angles of the arches on each of the intervals were calculated using the following equation

$$A = \frac{180L}{R\pi}$$

The sinuosity of the river route was also calculated using the following equation

٤- Findings and Discussion

Plan form of Garango river channel tend to meandering pattern. The morphology of river is largely controlled by geological variables. In most parts, the development meandering is limited due to connect to the mountain. Results indicated that forming of channel pattern and dynamic in studied area was controlled by lithological features of

sections. So channel dynamic in sections such as section ١ is impressed by lithological resistance of river bed and sides mainly bed deepening and it in sections such as section ١٠ is impressed by erodibility and loose formation mainly bed Widening that it was controlled by river lithological features strongly. The results of this study can be used to identify of interval Maximum River power and interval affected by river erosion. The results of this research can be useful in identifying maximum river power intervals and intervals affected by river erosion. Therefore, identifying hazardous areas can be managed in the best way possible against river hazards.

Keywords: Channel dynamic, River pattern, Bed lithology Garangu River**.**

Evaluation and Modeling of Urban Growth Pattern of Piranshahr (In the Period of ١٩٨٤- ٢٠١٤)

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A. Sheykhi[3]

Introduction

Piranshahr by having social, economic and tourism attractions etc., is considered as population poles of the region and demographic transitions and then physical growth of the city after the Islamic revolution of Iran prove it. Despite the mutual spatial impacts and functional relationship among Piranshahr and peripheral rural areas including Shinabad village and it's merging in the city, Piranshahr surround the river in the southern and northern area. Since to navigation of physical-spatial growth of the city and according to the effective factor in the growth, the process should be in such a way that despite having physical growth have less damage on the agricultural lands of peripheral rural areas. Thus, the research object is determined to study function of physical-spatial growth of the city in regard to the effective indicators on land cover change and changes in peripheral lands of the city and its countries lands which by it evaluate in the micro level the role of the Piranshahr spatial growth role on the land change and on the other hand, to address the question of which factors and indicators are important in determining the direction of spatial growth and land changes of Piranshahr.

Theoretical Basis

Urban growth would be a kind of planning that through social, economic and environmental factors lead wastelands and equipped to the essential infrastructure or will have them in future. This condition have the main role on determination of the size of the city and peripheral rural areas. Thus, uneven physical development of cities depends more on the urban-rural official policies and stocking and

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gambling deals of the effective factors of sprawl growth. This kind of uneven development that is mainly happening in prepared lands of cities will have consequences on the peripheral area and favorable lands. Thus, by emphasizing on the developed theories (urban growth) and new studies in urban geography, effective indicators were collected.

Effective factors to form urban growth pattern

slope	location
Zoning of lands	
Comprehensive plan	
Sustainability of lands	
Undeveloped lands	Neighb
Appropriateness to urban lands	
Spatial security	
Distance to main road	Vicinity
Distance to industrial Centre's	
Distance to urban centers	
Distance to shopping centers	
Distance to river	

Through changing the condition and effective factors in its peripheral, the amount of enjoyment of formed communities have specific role on the forming of cities. Perhaps, planned growth of cities has allocated most of new literature on urban management. Such that, today, principles of sustainable development in urban growth are concerned as a rational approach in physical-spatial urban growth.

Materials and Methods

The research through descriptive- analytical method and qualitative and scientific categories tried to select different methods that by using mixed indicators in physical urban planning and multi-criteria logistic regression model and SPSS software and categorical sampling is to analyze spatially Piranshahr by its dweller point of view and statuesque data and information gained by Holdren model. In next step, according to the different planning periods of the city and its growth is to study in Idrisi, Landsat٧, ٨ maps and Satellite images ETM+ TM (١٩٨٤-٢٠١٤).furthermore, to explain of problem and to

determine what amount was the growth of the city favorable, in GIS and different periods have done spatial analyses. Finally, to make known of main cause of urban growth of the city (by the population increase or dense urban pattern) Holdren model were used.

Findings and Discussion

The results of the research shows that forecasting in high urban growth in is more than medium and low one. By selecting this factor in comparison with other factors, have more possible forecast. Similarly, Holdren model shows that despite of increase in the urban population of the city, there is no urban sprawl in it and the city growth was in appropriation to population. Though, Shin Abad insertion to city and destroying the available more agricultural lands were seen. On the other hand, due to the improvement in economic situation of the dweller, ruined and one floor residential land used increasingly changed to new land uses having more floors that facilitate infill development and is concerned as a barrier to urban sprawl. Holdren model shows that there was no sprawl in any period of the city and that is ١١٨ hectares of the city area changed to informal settlement area but that wasn't sprawl and was based on population. In the research different models and software's such as Binomial logistic regression, Holdren model, SPSS, Idrisi and satellite imagery were used. The results of inserting remote sensing data and LR in SPSS represent that Tamarchin border market and its economic growth in recent years as well as improvement in creating employment grounds was the main factor in migration to Piranshahr and consequently its physical growth so that due to the this process Shin Abad rural area inserted to the urban area. As well, the model results shows that Piranshahr growth mainly was based on the population increase (-.٩٩٧) which have no density urban pattern and urban sprawl in any period.

Keywords: Urban Growth, Land Cover Change, Logistic Regression, Piranshahr.