Developing the Conceptual Model for Environmental Education Expansion by Evaluation of Strategic Parameters

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Abstract

With the appearance of the new paradigm for development in the seventies, numerous regional and international agreements were signed in the world to protect the environment. In the meantime high emphasis has also been put on the need for creating and maintaining an educational system aimed at changing the public behavior and attitude towards the environment as the first step towards sustainable development. The objective of this research is to present a conceptual model for developing the national environmental education by evaluation of the strategic parameters. The research tool was a questionnaire and the validity of the indicators was realized by obtaining the opinions of the relevant professionals and experts, while their credibility was computed as equivalent to 0.95 using the Cronbach's alpha formulae. In this research, following a review of the different international views, the results of global conferences, library study, review of documents as well as interviews with environmental experts, a questionnaire was also prepared in the frame of SWOT table and presented to 50 environmental pundits and experts to allocate weight. The findings show that the total weighted score was 2.73 in the matrix of internal parameters and 2.61 in the matrix of external parameters. These scores are above the average of 2.5, signifying that the strengths and opportunities in the development of environmental Education dominated the weaknesses and threats, and the type of resulting strategy was aggressive. In the end, a conceptual model based on all parameters was prepared and proposed for the development of environmental Education.

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Assessment of Environmental and Economic Consequences of Global Warming with Emphasis on the achievements of Kyoto Protocol Implementation in Iran

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Abstract
One of the most important issues which has recently drawn attention is the preservation of the earth's ecosystems due to the events and environmental crises caused by industrial activities. The formation of more than a dozen conventions and protocols in different areas of environment also shows the importance of this issue. Given the implementation of the Convention and the Protocol, particularly the economic, social and environmental effects on all countries, especially developing countries with weak and vulnerable economy, in this article we Introduce environmental indices for Sustainable Development. In the case of carbon dioxide emissions, to examine emissions spectrum in the member states of Kyoto Protocol concurrent with the implementation of the first period, then climatic approaches were analyzed after the implementation of the first round. This research employs explanatory- analysis method. Examining indices shows that industrialized countries meet environmental requirements of the Kyoto Protocol and with regard to their own economic policy try to fulfill their obligations to reduce their greenhouse gas emissions but we face the global trend of rising emissions. This trend can be observed in non-Annex countries, including the Islamic Republic of Iran that there is no obligation in the first round to reduce greenhouse gas emissions.

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Economic Evaluation and Planning of Waste Collection and Transportation System in Ardabil and Dehdasht Cities

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Abstract
Today, Municipal Waste Management is very important topic, which neglecting it caused multiple issues such as environmental pollution and spread of disease. A majority of financial investment in solid waste management is due to collection and transportation of waste. For to municipal macro policies and for economic planning of municipal solid Waste Management, WAGS software used to count capital required to supply, repair and maintenance of machinery, providing personnel and fuel costs over the next 15 years for Ardebil, as a metropolitan, and Dehdasht, as a small city. It was found that most of the cost for waste collection in both cities belongs to personnel cost. In Ardebil for the project period, the total cost of collection and transportation of waste was $120,315,000. Price per capita per year was equal to $88.12. Expenditure per family per year was equal to $14.46. Management Fee equals to $96.42 per ton. In Dehdasht, total cost of collection and transportation of waste was to $11,687,000. Price per capita per year was $61.10. Price per family per year was equal to $91.47 and $75.36 per ton.

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Spatial Analysis Livability of Urban Neighborhoods
(Case Study: 18ᵗʰ Region of Tehran)

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Abstract

Livable city is one of the new concepts of determining an urban's current systems that has found the necessities and appropriate status due to developments in thoughts and aspirations of a contemporary society. Today, having the livability properties of cities is very important to achieve sustainable development in society. The aim of this study was to evaluate the status of region 18ᵗʰ of Tehran's livability at the local level. Comparative Assessment Methodology was used. Data were collected using a questionnaire so 384 questionnaires were sampled. Livability criteria are evaluated in the form of 6 dimensions (social, economic, facilities and utilities. Urban management, environmental and historical pattern) SPSS&GIS for analyzing of the data were used. The results indicate that livability in the study area is down the average. The neighborhoods of Valiasr-e-jenoubi is at the highest level, and Yaftabad is at the lowest level of livability, respectively, and facilities and utilities dimension have also been most efficacy on spatial analysis of the livability of the region.

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Investigation of Effect of Drying of Lake Urumia on Waterbirds Community structure and Species Diversity of Kaniborazan Wetland in 1995, 2005 and 2015

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Abstract

Dryness effects of Lake Urumia on waterbirds population and species diversity was analyzed by total count in 1995, 2005 and 2015. 28 waterbirds species with a population 5576 individuals counted in 1995 (water level of Lake Uromia was 1277.96 masl and the area of wetland was 907 hectare). 23 waterbirds species with a population 2363 individuals counted in 2005 (water level of Lake Urumia was1273.41masl), area of Kaniborazan was 600 hectare. 17 waterbirds species (11species were waterfowl and 6 species were wading birds) with a population 660 individuals counted in 2015 (south part of lake was dried completely and depth of north part of lake was less than one meter), water level of lake Urumia was 1270.1 masl and area of the Kaniborazan was 200 hectare. Comparison of number of birds and number of species in three periods showed the bird's population and number of birds species declined. The species reduction was 41 percent, and population reduction was 88 percent. βr diversity was 0.24, 0.38 and 0.43 in 1995, 2005 and 2015 respectively. Diversity was 28, 23, and 17 in 1995, 2005 and 2015 respectively, and γ diversity was 32. Margale's index were 3.36, 3.09 and 2.47, Fisher-Alpha index, were 4.16, 3.90, 0.19 and Simpsons evenness were 0.31,0.47 and 0.49 in 1995,2005 and 2015 respectively. Comparison of diversity indices showed that they reduced, and Dominance and Evenness indices decreased in three periods. The main reason was drying effects of Lake Urumia on the Kani Borazan Wetlands Ecosystem.

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Investigation of Seasonal Variations in Water Quality of Karoon River Using Principal Component and Principal Factor Analyses

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Abstract

Assessment of seasonal changes in Surface Water Quality (SWQ) is one of the most important steps in evaluating variations of the river pollution due to inputs of point and non-point source contaminants. The most famous techniques for seasonal variation assessment are multivariate statistical analyses such as Principal Component Analysis (PCA) and Principal Factor Analysis (PFA). In this study, PCA and PFA techniques were applied to identify the most important SWQ parameters which seasonally contributed to water quality variations in Karoon River. To that end, data for nine physical and chemical parameters collected from five monitoring stations in Karoon River during the years from 1379 to 1382 were used. Results showed that important parameters in contributing to water quality variations for one season may not be important for another season. The important SWQ parameters in the spring season were electrical conductivity (EC) and turbidity (Tur), while important parameters for winter season increased to five, including EC, nitrate, pH, water temperature, and total dissolved solid (TDS). However, the main SWQ parameters in summer were chemical oxygen demand (COD), EC, TDS and for autumn were the five-day biochemical oxygen demand, nitrate, pH, TDS, respectively. The presented method in this study can be a useful tool for authorities to assess water quality variations dealing with a large number of data in a water body.

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Zoning the Soil Affected by Wastewater Irrigation with Using IDW Method (Case Study, South of the Rey City)

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Abstract
Recently the limitation of water resources and necessity of using unusual waters is among the most important issues, especially in dried and semidried area. Less attention to water quality standards can led to less soil quality and reducing theirs functions. This study was done to investigate the spatial distribution of soil fertility characteristics including: pH, phosphorus, nitrate, organic carbon and electrical conductivity. For obtaining maps of the spatial distribution, sampling was done from 57 points in two difference depths, first (0-30 cm) and second (30-60 cm) in 1200 hectares of study area, with using systematic random sampling. To creating the maps, the GIS software V 9.3, was used. The resulted map of the spatial distribution of pH in the two depths indicates that according to standards of Soil and Water Research Institute, at the studied area the limitation of alkalinity is high. Also the results of spatial distribution maps for phosphorus indicates that 360 hectares of study area at depth 1, and 330 hectares at depth 2, has concentrated more than 15 mg kg^{-1}, which is more than acceptable range, according to standards of Soil and Water Research Institute. Furthermore the results of spatial distribution maps for nitrate at two depths indicated that concentration of nitrate in study area was not more than acceptable standard, but its concentration is increased from north up to south. In addition maps of spatial distribution for changes in organic carbon at two depths showed that the amount of this parameter is suitable according to standards of Soil and Water Research Institute. Finally the results of electrical conductivity showed that the amount of this parameter at two depths in whole studied area, except in small area, is not more than acceptable amount.

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Development Environmental Impact Assessment (EIA) on Karkas Protected Area by Using Destruction

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Abstract

Protected areas are one the places that need to be continuously monitored. In order to determine the effects of development on karkas protected area, impact assessment was done. Degradation model for protected areas can provide useful information to the managers of these areas. In addition to identifying vulnerable areas and resistant to degradation caused by human activities and the implementation of activities in the past, it also shows a possible development in the future. Hydrologic units were chosen as a unit work for the first time. The elements of this model, including the severity of damage and physiological density and ecological vulnerability was computed in each unit. Then, each of these elements were mapped. After computing the parameters of the degradation model, final map was prepared. Also in this study, degradation coefficients based on fuzzy theory was categorized for the first time. Thus, all subjects were compared in terms of intensity and extent of damage and the entire region were divided into 3 zones, prone to development, need rehabilitation and need conservation. Yet despite the development of the second- prone areas in the region, according to priorities based on the local conditions and also taking into account the socio-economic issues, there is no possibility of further development.

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Environmental Impact Assessment in Aquaculture: Life Cycle Assessment Meta-analysis

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Abstract

As global demand for aquatic products and seafood is increasing, aquaculture has become the world's fastest growing animal production sector. In this situation, the environmental impact of aquaculture is so important and become a challengeable issue for stakeholders. In attempts to evaluate the environmental consequences of this rapid expansion, life cycle assessment (LCA) approach has become a frequently used method. In this study, analysis was done beetwen 2000-2012 with the use Life Cycle Assessment methodology. Finally, A number of 14 papers dealing with the life cycle assessment of aquaculture were reviewed and then, we tried to introduce LCA approach and it's various dimensions. The six parameters include: functional unit, system's boundary, date type, impact assessment methods and interpretation methods. Finally, we introduce a model for aqauaculture systems in Iran.

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Choice Experiment –Conditional Logit: a New Approach in Estimate of Visitor's WTP Environmental

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Abstract

Nowadays, environment is one of the most important economic sectors of each country and its valuation is one of the main topics of environmental economics. The purpose of this study is to determined protective - tourism value of different characteristics of zayanderoud and its monuments, with attention to the environmental and tourism's importance of historical and entertainment areas. To realize this purpose we estimated the implicit prices, evaluate the effect of economic-social variables on these values and also evaluate welfare effects of changing hypothetical policies. In this study we used 3438 data row that came from 270 choice experiments questionnaire in 6 types, 18 choice sets, 3 choice options, 72 hypothetical policies. Hausman test shows that we can use the conditional logit model. Results of model shows that Visitors have willing to pay 6832, 6745, 4552, 9707 Rials (Dollar is 4000 Rials) for "maintaining forest diversity", "protection of monuments", "river hygiene" and "water flow in the river" respectively. Economic-social variables –i.e. age, sex, family size, marriage, income level, and education, being native - have positive effect on visitor's "willing to pay". Finally, this study offers using market mechanism and visitor's willing to pay, to preservation of quality of environmental services in zayanderoud.

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The Effects of Landscape Index on Bird's Aboundance in Forest Patches in Gorgan Township

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Abstract
Habitat fragmentation is a concern in conservation biology that sometimes leading to habitat destruction .In this study, the effects of landscape variables on bird's aboundance were studied in forest patches in Gorgan Township. All variable were surveyed in 26 different patch sizes (<1 ha, 1-10 ha, 10-25 ha and >300 ha). Also landscape index was calculated by FRAGSTAT software. Birds were detected within a 25m radius of each of 74 sampling points. The Results showed that Red breasted flycatcher and bolbol had negative correlation with size of patches but GreatTit had positive correlation with size, para and shape of patches. According this study Red breasted flycatcher and bolbol were detected as Forest interior and GreatTit was detected as Forestedge.The results of this study indicated the importance of forest patches for conserving and enhancing of avian and following it conserving biodiversity of the forest ecosystems.

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Comparison of Different Biodiversity Indexes in Different Sampling Designs (Case Study: Chahartagh Forested Reserve, Chaharmahal & Bakhtiari Province)

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Abstract
In this research we assessed species diversity of trees and shrubs in Chahartagh forest reserve using diversity, richness, equitability and dominance indexes derived. Based on random and systematic random sampling methods each method including 32 circle plots with 10, 15 and 20r area. We also derived the actual value of each index using 100% inventory and then compared statistical and actual amount of indexes. Regarding heterogeneity of variances, we used Gims-Hawell test for comparing averages. According to results, there are meaningful differences between different sampling methods and different plot areas. The results of single sampling t-test for comparing actual and statistical values of indexes show that just equitability index is not meaningful while other indexes(richness, diversity ad dominance) have meaningful differences compared to their actual values. Therefore, in conditions similar to Chaharagh reserve we could use equitability index derived from random sampling method for estimating trees and shrubs biodiversity status confidently but other indexes and sampling methods with some care.

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A Study on the Self- Rehabilitation of Natural Ecosystems in Flooded Hazard Areas for Developing Applied Methods in Ecological Rehabilitation
(Case Study: Golestan Recreational Area of the Golestan National Park)

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Abstract
Nature is always at the risk of natural and non-natural injury and damages. Therefore the effort should be for the reconstruction and rehabilitation of the nature after natural disaster including floods.
In this study, the mechanisms are proposed to improve the damaged ecosystem components which are damaged by the flood. Components of ecosystem, including vegetations and soil ecosystem, are major injuries after disasters such as floods. Golestan National Park is one of the environments damaged by the flood. Thus improvement of soil and vegetation and other important components of the National Park and Biosphere are necessary.
In this study, applied methods of ecological rehabilitation have been described for soil, forest and vegetation, and river. Then, research has been done on damaged ecosystem of Golestan National Park, before and after flood. These methods have been modified and proposed based nature and adaptation to natural conditions.

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Comparison of Ecosystem- Based Land Allocation Using Genetic Algorithm and MOLA

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Abstract
Land use planning is a broad term that can be applied to different processes related to management of land use. One of the most complex tasks in this process is allocating land use categories to spatial units, resulting in a land use zoning map. Specifying the appropriate land unit for land allocation is one of the typical issues that are mainly divided into two categories including cell (such as MOLA approach) and polygon units (such as map overlay and systemic analysis). Optimization algorithms are the part of land allocation methods that have both Multi-Objective approach and cell or polygon structures. In this study, the Genetic Algorithm (GA) is used for land allocation based on suitability and landscape metrics in Gorgan Township. Moreover, in an innovative approach, object-oriented classification (based on environmental parameters) was used to create ecosystem units and land allocation was applied to these units. The results showed that land allocation through ecosystem-based Genetic Algorithm leads to a significant improvement of landscape metrics in comparison with MOLA. The genetic algorithm approach improved four landscape metrics including number of patches, contiguity, and effective mesh size and cohesion index. In this process, land use was allocated to homogeneous units in terms of ecological resources. Thus, diversity was minimum in the environmental units considered for the land allocation processes.

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Effect of Non Ecological Factors in Ecotourism Capability Evaluation of Using GIS (A Case Study In Traditional Ghoori Ghale Basin of Paveh Township)

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Abstract
In this study the appropriate areas for tourism and ecotourism plans were identified Using GIS and the system analysis model. No class1 mass ecotourism existed in the study area. Twenty nine percent of the area has capability for class2 intensive ecotourism 38% for class1 extensive ecotourism and 33% for extensive ecotourism. Due to the fact that for the management and deployment of any facilities the views and needs of tourists also should be considered in addition to the natural potentials of the region, were considered. Therefore, the method of assessing the socio - economic Clawson to assess needs and recreational demands were used. In this study, a comprehensive questionnaire was used to collect information. Recreational demand assessment results showed that most people choose to walk places that are closer to water sources and its access is easy. In order to access to the so, water and road map was prepared. Therefore these factors as positive information layer was overlaid with maps can be obtained ecotourism and ecotourism map can be obtained final. These results show that the factor of water resources through access to physical factors have the greatest impact on the assessment process in the tourist suitability evaluation.

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Investigating the Performance of Artificial Neural Network- Based Model in Simulating the Urban Growth Using Relative Operating Characteristics and Landscape Ecological Metrics (Study Area: Hashtpar Coastal City)

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Abstract
Urbanization is one of the most significant global changes. The rapid urban growth has been imposing high pressure to land and their resources. Neural networks are a powerful tool for understanding the spatial processes and patterns. Hence, the neural network model called multi-layer perceptron was applied as a tool for simulating the urban growth in Hashtpar township. The Root Mean Square Error (RMSE) was used as an index in design and stopping the training process of the network in this study. After normalization and removal of the covariate variables, distance to city center, main transportation and hydrographical networks, agriculture, grassland, barren land and slope were chosen as effective variables on the urban growth for study area. Architecture of the network has been designed as 7-14-1, which stands for number of input, hidden and output nodes, respectively. The training process was conducted by implementation of the sigmoid function and extracting the training samples of the urban change (1989-2000) and then simulating the urban growth for 2007. Investigating the performance of the model and analyzing the pattern of the simulated landscape was carried out using the relative operating characteristic and the landscape ecological metrics. The values of the ROC and landscape Ecological metrics indicate an acceptable spatial agreement between the simulated and classified maps. Accordingly, the neural network model has a good reliability in simulation of the class area, Euclidean nearest distance and fractal dimension index of the urban patches, as well. Finally, sensitivity of the model was examined using stepwise independent variable elimination and comparing the results with the full model. The results revealed that the distance to city center and the main transport network can be considered as the most effective variables in simulating the urban growth in the study area.

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Detection of Changes Resulting from Construction of Shirin Darreh Dam on Land Use/Land Cover in Downstream Basin

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Abstract
Monitoring and detecting land changes are the most important process in landscape planning and management. In this study we analysed changes trend and the land uses changes in Shirin Dare Watershed Basin in North Khorasan province from 1996 to 2015 using remote sensing techniques and geographical information systems (GIS). A series of satellite images of Landsat Thematic Mapper (TM) and Enhanced Thematic Mapper Plus (ETM+) and Operational Land Imager (OLI) data (1996, 2005, 2015) respectively were used to produce classify land use/cover map. The area and percentage of land use/land cover types were calculated using GIS. Remote sensing techniques are particularly suited for providing reliable, up-to-date and comprehensive data on land-use/land-cover. Based on the results obtained by employment of GIS and RS, it is concluded that the land cover/land use area have altered significantly during the years. Our results indicate a decrease in garden and forest and also show mutual transformations among dry farm lands and garden. This changes will create serious threat to watershed resources.

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Application of Sensitivity Analysis and Error Propagation in Spatial Multi- Criteria Decision Making (Case Study: Urban Suitability Assessment for Tehran Province)

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Abstract

In real world situations, available data to decision makers are often uncertain and imprecise due to measurement errors and incomplete understanding of the situation by the decision makers, normally, But also wrongly spatial multi-criteria decision making is conducted without due regard to data errors and their propagation in the process. However, these errors can propagate during the decision making process and get confounded by other errors including criteria relationships and ultimately impact on the final decision made. In this research, error analysis was carried out regarding spatial multi-criteria decision making that included uncertainties in factors and their associated weights. Urban suitability mapping for Tehran Province provided a case study in which two methods were used to introduce errors and assess their effects: 1. insertion of errors in each factor and simulation of their propagation in the process, and 2. changing of factor weights and evaluation of their effects on ranking of suitable sites. Our results indicate that uncertain and imprecise data can be safely used in these circumstances given knowledge of how uncertain and imprecise they are and how they propagate during data analysis.

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Diversity and Pattern of Wildlife Roadkills in Golestan National Park

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Abstract
The negative impacts of roads on biodiversity have been of great concern both at national and international levels. Very few studies, however, have examined the effects of road network on wildlife in Iran. The Tehran-Mashhad highway which passes through the Golestan National Park has particularly been of environmental concern in recent years. We studied the temporal pattern of wildlife collisions in Golestan National Park and determined the vulnerable vertebrate groups to traffic accidents. From March 2005 to June 2011, we recorded a total of 588 roadkills from 33 vertebrate species of 14 families and 10 orders. The mean number of roadkills was significantly higher in large herbivores, medium-sized carnivores and birds compared to other vertebrate groups. Six taxa including Wild boar (*Sus scrofa*), golden jackal (*Canis aureus*), owls (Strigidae), Corvids (Corvidae), common fox (*Vulpes vulpes*), and Indian porcupine (*Hystrix indica*) were more prone to collisions and accounted for 81% of all roadkills. Mean number of fatalities did not significantly differ between different months. No seasonality was observed in roadkills of high-fatality vertebrate groups. Seasonal changes in behaviour of these vertebrates may have been responsible for the minor differences in mean number of roadkills among species and seasons.

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Amol Municipality Evaluation in the Implementation of Sustainable Development with Emphasis on Green Space

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Abstract

Nowadays, along with the development of cities and increasing the need for land and houses, we are observing the destruction and changing the green space in the urban areas. So activities of related organizations should be evaluated periodically, for the preservation and development rules and decisions about green space. The research method is descriptive - analytical of purpose. Collecting the data both the documentation and field study in the city of Amol and its municipality, all changes landuse of green space is done for the period of in the 2009- 2004. For analyzing the data, Excel, GIS software have been used .The result of this study showed that along the years of 2004- 2009, there was a change in first class garden with the area of 376616 m2 and 4 lots with park use with the area of 9473 m2, to the total area of 387279 m2.So it is recommended to control urban construction and in execution of rules and allocate the low efficient green space to dense housing use in order to preserve the large amount of urban garden as a green space.

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Investigation of the Effect of Water Removal from Wells Surrounding Parishan Lake on Groundwater and Surface Water Levels

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Abstract
In recent decades the human impacts on global warming and, its consequences, climate change, stirred up earth ecosystems balance and has created many problems all over the world. Unauthorized underground water removal, especially in arid and semi-arid regions of Iran, along with recent decade drought occurrences significantly lowered underground and surface water levels. To investigate the impacts of water removal from surrounding wells in Parishan Lake water level, during 1996 to 2009 interval, 8 buffer layers surrounding the lake were mapped in ArcGIS 9.3 environment. Each buffer layer wells and their total annual discharges were determined. Using SPSS 16 software, the regression equations between wells water levels and water discharges were computed. By employing Thiessen function and creating Thiessen network (TIN) around observation wells, decline of groundwater levels was evaluated. Finally regression equations between wells discharges and groundwater level declines were created. The findings showed that there are highly significant correlations ($p \leq 0.01$), in all buffer layers, between water levels and wells discharges. Investigation of the observation wells surrounding lake showed that severe groundwater level declines has been started since the beginning of the first decade of the 21th century. Using satellite images in ArcGIS 9.3 environment it was confirmed that lake's area has been reduced significantly. In conclusion, it is obvious that human interferences on lake's natural ecosystem by digging unauthorized wells and removing underground water more than annual recharges significantly impacted surface and groundwater levels.

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Analysis the Synoptic- Thermodynamic Conditions of Isfahan Air Pollution (Case Study: Dec, 3- 5 2012)

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Abstract

Metropolises always encounter to air pollution matter. The seasonal variations of pressure and temperature in some polluted cities can result in disaster in vertical structure of atmosphere by producing the Inversion. In this research, we used the air quality index (AQI) data in 5 stations of Isfahan (Azadi Sq, Ahmadabad Sq, Chaharbagh Khajoo, Keshavarz Blvd, Kharazi Highway). We used the upper atmosphere data of NCEP/NCAR database for studying the synoptic condition in Dec. 3- 5 2012, 13-15th, 1391 and used the Skew-T graph for vertical air structure. The results indicated that the pollution amount was more than permissible level in studied days and the pollution peak in Dec. 5, in school and university off, registered to 247 in Ahmadabad Sq. The air stability condition, forming the high pressure system on the earth surface and the air descending caused to creating a temperature inversion layer near to earth surface, and this prevent from shift and displace of air that cause to the maximum pollution in Isfahan.

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