

***Environmental Design of Golab Dare Mountainous Area
(in Zone Number One of Tehran City)
with an Emphasis on Ecotourism Development***

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Abstract

In this study all the ecological- social, environmental factors and tourism dimensions are considered to create a recreational site for the of mountainous environment. The mountainous environment is a specific environment with specific ecological characteristics. These properties in particular are the principles and rules suited for the specific environment.

Proposed project try to balance and protect the natural environment for efficient use for recreation and sustainable tourism.

Integrated approach to environmental management systems is seeking the ways to deal against problems in environmental management planning (such as coordination problems). It also ensures that environmental management in its administrative process brings lots of economic and social benefits.

In case study, internal and external strategic factor evaluations are considered after the identification and sampling list of all the strengths, weaknesses, opportunities and threats which exist in the area. Evaluation of the internal strategic factors (IFE) and external strategic factors (EFE) are discussed as well.

Key words: Park mountains, Landscape design, Ecotourism, Golab dare area

Determination of Vulnerable Areas to Grazing in Forest (Case study: Patom District of Kheyroud Forest)

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Abstract

Today, the destruction of forests has increased with the overgrazing of livestock and so in regard with the critical role of forest, measures must be programmed to conserve, rehabilitate and manage this divine gift. The investigation on the damages of grazing on forest indicates that grazing can significantly affect ecosystem sustainability and impose many negative impacts on forest ecosystems such as soil, vegetation, forest regeneration, biodiversity, landscape, wildlife etc. Therefore determination of vulnerable areas to grazing is vital to control the degradation of forest ecosystems. The object of this study is to determine vulnerable forest areas to grazing through determination of severity of environmental quality degradation caused by grazing, assessment of probability of grazing and determination of ecological vulnerability in Patom District of Kheyroud Forest. The results of this study showed that there are 15 regions with different sensitivity to grazing in Patom District that part of compartments 101 and 107 are the most vulnerable areas to grazing.

Key words: Grazing, environmental impacts, Vulnerable areas, Kheyroud forest

Determining the Ecological Carrying Capacity of Forests Case Study: Kheyroud Forests

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Abstract

To determine the Annual Allowable Cut (AAC) in agreement with sustainable development, presenting a comprehensive approach which considers the ecological indices, seems quite essential and inevitable. One of the principal and useful concepts for determining the allowable limits for environmental changes is Carrying Capacity (CC) concept, by which maintaining the key elements of the ecosystems. Therefore, present study addresses the determination of the AAC in Gorazbon district of Kheyroud Forest located in the Northern Forests of Iran applying the CC concept. For this purpose first, the site was classified into ecological homogenous units then the amount of increment was estimated for each unit. The analysis showed that there is no difference between the ecological units. Therefore, to find the real homogenous units with different ecological capability, units with the most similarity were integrated and finally the real homogenous units were distinguished. The results showed that Gorazbon district consists of two separated ecological units and in each unit the AAC estimated from the traditional method(4.90) is significantly different from the CC method(5.65 and 4.74) ($p < 0.01$). For the parcels with different capability, we considered both upper and lower limit of CC to cover the heterogeneity. Regarding the comprehensiveness and fuzzy nature of the CC concept in making up the existing deficiencies and uncertainties in estimating the AAC, this method can be a highly practical alternative for determining the AAC in the forest ecosystems with the capability for wood harvesting.

Keywords: Annual allowable cut, Ecological carrying capacity, Kheyroud forest- Gorazbon

***Application of Multiple Attribute Decision Making Methods in
Environmental Hazards Analysis of Protected Areas
(Case study: Helleh Area of Boushehr)***

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Abstract

This study was conducted to analyze the hazards of Helleh Area of Boushehr. For this purpose, risks were identified in the region according to the field visits, interview with natives as well as studying the environmental characteristics. Then the screening of identified risks was completed using Delphi technique and its related questionnaires. Finally 26 risk factors were determined in both natural events and environmental risks. In the next step, Multiple Attribute Decision Making methods namely AHP and TOPSIS were applied for analyzing and prioritizing of identified risks. In this research, risk factors were analyzed using three criteria of the severity, occurrence probability and sensitivity of recipient environment. Entropy technique was used for obtaining the criteria weights of TOPSIS method. Then the final priorities of risks were concluded from Average Method (combined TOPSIS and AHP). Water supply for Rayis Ali Delvari dam at the upper part of the study area threatens for the wetland. So according to result of Average method, water supply for Rayis Ali Delvari dam as the most important risk factor with score 1 places in first preference. Unpermitted hunt of birds, irregular use of chemical poisons and fertilizer, construction of border road from safe and sensitive areas of wetland with score 4 place in second preference and conflagration in forest places in third preference with score 5. This prioritization shows the high importance of human risks than natural events. Use of modern irrigation systems in the area and biological ways for pest control are recommended among the most effective managerial strategies to control the identified risks.

Keywords: Risk, Environmental risk assessment, Multiple attribute decision making, AHP method, TOPSIS method, Helleh protected area of boushehr

Ranking Protected Areas for Ecotourism by Analytical Hierarchy Process

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Abstract

Developing successful tourism in natural areas demands for an evaluation system for the ecotourism capability of protected areas. In this study, a number of protected areas under jurisdiction of the Department of Environment were evaluated using Analytical Hierarchy Process. The most important criteria influencing ecotourism in protected areas were determined and a hierarchical structure based on these criteria was designed. To determine the weight of each factor, viewpoints of natural environment experts of the Department of Environment were then collected through a questionnaire including a pair-wise comparisons matrix. Each protected area was rated for ecotourism with regard to the hierarchical structure criteria. The developed evaluation system in this study serves as an information bank for tourists, environmental protection authorities, managers and planners of the tourism industry. This evaluation system also provides a basis for involvement of both tourists and experts for ranking the protected areas for ecotourism capabilities.

Keywords: Ecotourism; Assessment; Analytical hierarchy process; Protected areas

***Impact Assessment of Timber Extraction to Residual Stand in
Natural Managed Forests
(Case Study: Gorazbon District in Kheyroud Forest)***

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Abstract

Damage to the trees left behind after thinning is a consequence of any harvesting activity and may include root abrasion and breakage, bole wounds, and broken branches and crowns. The objective of this study was to study the effect of ground skidding system on forest regeneration and residual stand in natural managed forests. This study was carried out in compartments no. 305, 306 and 309 of Gorazbon district, in Kheyroud forest. In this study the extent of damage to regeneration and residual stand have been determined using full inventories of damage along skid trails in the three compartments. Results showed that the most of damage were occurred to the small sapling and sapling, and broken and wounded were the most types of damage in regeneration. The majority of the damage occurred in two 40-20 and 70-40 cm diameter classes and the most of the wounds were superficial. Fifty percent of all scars found were larger than 500 cm² in all species and more than 90% of the damage on a tree occurred within 1 m of ground level and located on the tree roots. The results showed that the most of the damages also occurred within 1 m of the skidder centerline. Tree location appears to have an influence on both scar height and the number of scars a tree may receive. Therefore, efforts to reduce residual damage should be focused on protecting the trees located near skid trails and the first 1 m of the bole, where the likelihood of wood decay is greatest.

Keywords: Environmental impact assessment, Residual stand and regeneration, Harvesting damage, Wound, Skid trail, Gorazbon district

A new Approach to Combine Multi- Criteria Decision Making Systems and Gray Clustering Method for Spatial Optimization of Environmental Monitoring Stations (Case Study: Naybandan Wildlife Refuge)

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Abstract

Knowledge of conservation biology has received much attention from both authorities and experts of environment in the recent decades maintaining biodiversity values. One of the strategies for environmental management, is to create infrastructure facilities required for physical protection of conserved areas. Conservation of arid ecosystems, such as Naybandan wildlife refuge that has the ability to achieve least natural conditions and introduced as one of the most significant habitat of Asiatic Cheetah (*Acinonyx jubatus venaticus*), should be placed on conservation priorities. Objectives of the current study were zoning and site selection for environmental monitoring stations using multiple criteria decision making systems, in the Naybandan wildlife refuge. Therefore, effective criteria and indicators were identified by the Delphi method and the internal structure of the criteria and indicators were characterized using DEMATEL technique. Next, indicators were weighted using Analytic network process technique and combined using Gray Cluster method and classified in five classes, that class one represents the best areas for the installation of the environmental monitoring stations. Finally, we used the three-dimensional analysis and satellite images to determine the exact location of the station and the exact location of environmental monitoring stations were identified. The results showed that between technical and socio-economic criteria, distance from the point of gravity and distance from communication lines are the main criteria affecting the positioning of the environmental monitoring stations, respectively. These findings indicate the efficacy of the combination of multiple criteria decision making systems with Gray functions in location decisions.

Key words: Environmental monitoring station, ANP, DEMATEL, Gray clustering analysis

***Environmental Risk Assessment of Wetlands Using
TOPSIS and EFMEA
(Case Study: International Wetland Gavkhoni)***

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Abstract

Gavkhoni wetland one of the most important wetlands in the country's, that with unique habitat features had been registered in the list of wetlands of international Ramsar Convention in the June 23, 1975. This study (2012) aims to identify and analyze the risks that threaten Gaavkhoni wetland which is located in 140 km southeast of the isfahan city. After identifying the risks, analyzing and ranking them was done by using TOPSIS. Analytical Hierarchy Process (AHP) was used for determining occurrence probability and Environment Failure Mode and Effect Analysis (EFMEA) were used for determining other criteria. Results shown that risk of drought and low water of wetland and Construction of Zayandehrood dam were the first to second in priorities. After determining the risk priority number by TOPSIS, risk levels were determine that show the priorities of management to control the risks. The advantage of TOPSIS in environmental risk assessment is ranking of risk by different criteria. By using this method in environmental risk assessment, infinitely risk can be ranked based on the infinitely criteria. High accuracy and use of spreadsheet software are other advantages of this method.

Key Words: Environmental risk assessment, Gavkhoni wetland, Isfahan province, EFMEA, TOPSIS, AHP

Land Capability Evaluation for Tourism Using GIS
(Case Study: the Tight Solk Bahmaei, Kohgiluyeh and Boyer-Ahmad)

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Abstract

Ecotourist is responsible tourist which visit of natural areas and have also negative impact. This study identifies ecological capability of Solak sight over 2326 hectares for ecotourism, by systemic analysis method (Boolean logic) based on Ecological Tourism Makhdoum model. To accomplish this aim, at first the environmental resource of the area were collected and by overlaying data layers in GIS environment and the use of Makhdoum ecological model extensive recreation and intensive recreation areas were identified for a variety of ecotourism. The results showed that, 58/133 hectares of the area is capable for intensive recreation on class2 and 81/485 hectares is capable for extensive recreation class 2.

Keywords: Ecotourism, Ecological capability evaluation, Extensive recreation, Intensive recreation, Boolean logic, Makhdoum models

The Carbon Sequestration in Three Soils Types with Different Plant Coverage in Gazvin and Zanjan Provinces

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Abstract

The aims of the current research were determination of the carbon sequestration in three soils types with different plant coverage in Gazvin and Zanjan provinces. One of the studied sites was located in Gazvin province with saline soils. This site was covered with plants for saline soils. The second site was located in Zanjan province with gypsum soils. This site was covered with plants for gypsum soils. The third site also was located in calcic soils of Zanjan province. This site was under barley cultivation. The sequestered carbon was studied in 2 layers of each soil profile including 0-30 and 0-100 cm and the distribution of the organic carbon were mapped by GIS software. The results showed that the total soil organic carbon was significantly different among the locations. Total carbon stores of 0-30 cm for the first, second and third locations were 279, 303 and 220 ton/ha, and carbon stores of 0-100 cm for the first, second and third locations were 486, 320 and 602 ton/ha, respectively.

Keywords: Carbon sequestration, GIS, Plant, Electrical conductivity, Clay

***Land Quality Assessment in Protected Areas,
Using Degradation Model
(Case Study: Touran Protected Complex)***

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Abstract

The main issue of this paper is monitoring of sustainable land management using land quality assessment in protected areas. We aimed at improving indicators to assessing land quality in protected area (case study: protected complex of Touran) and explaining land quality from past to present. Around the world, the methods of land quality assessment are in two kinds: one based on detailed biological data and the other based on assessing human activities. Degradation Model follows the second one. Components of this model include cumulative past to present impacts, physiographic density of population, and habitat vulnerability which calculated by AHP, EA and reciprocal effects matrix using GIS. Finally the area zoned based on land quality.

Key words: Land quality, Degradation model, Protected area, AHP, EA, GIS

Impacts Assessment of Land Use Change on Surface Water Using L-THIA Model in Gorgan Area

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Abstract

Land use changes, mostly relate to great socio - economic benefits, however, many of these changes cause negative effects on the natural environment. One of the important effects is the direct reduction of water resources and water quality. An effective approach in assessing the effects of land use change on water resources is using hydrological models. In the present study, the effects of land use change on surface water in the Gorgan area was evaluated using L-THIA model. The L-THIA model for evaluating long-term effects of land use change on water resources uses available and simple data such as long-term climate data, and land use. In this study we covered 19 years in the period 1988-2007. Land use maps were generated from satellite imagery for the years 1988, 1998 and 2007. The 30-year daily rainfall data were obtained and hydrologic soil groups were also distinguished on soil maps. The model results showed the average amount of runoff depth from 1988 to 2007 changed from 28/55 to the 29/18. Results from the model indicated increased volume and depth of surface runoff in the studied time interval. This shows the necessity of monitoring land use changes in order to control the depth and volume of runoff. The results of this study can assist managers make decisions and monitor land use changes to control changes of depth and volume of runoff in the area. Output maps identified areas high in the mean runoff based on which management programs to control runoff rates can be implemented in the area. Also, the results of this study can be used to prevent increased runoff by controlling land use changes in the area.

Key words: Land use change, hydrological modeling, L-THIA model, Gorgan area, Iran.

Impact of Nomadic Communities on Habitat Suitability of Wild Goat (Capra aegagrus aegagrus) in Lar National Park

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Abstract

Lar national park is one of the best habitats for Wild Goat in the central Alborz Mountains, with a population of around 600 heads. There are about 289 nomadic families, spending one hundred days of the year (from late June until late August) in this area. This study was conducted to evaluate the effect of this nomadic tribes and their cattle on habitat suitability of Wild Goat, before and after of their presence in the area, in spring and summer of 2010. In order to model habitat suitability for this species, a presence only layer was used as input to Ecological Niche Factor Analysis (ENFA) method in Biomapper software. Ecogeographic factors were also used as independent variables elevation, slope, aspect, geomorphological features, main roads, predators which consist of wolf and panther, presence point of nomadic tribes . Our results revealed that about twenty percent of the most suitable habitats will be lost, after nomads' arrival to the area. Furthermore, the marginality index of the species will be increased; meaning that the population is pushed to marginal habitats and the species occupies narrow niche. These results emphasize the importance of regulation of grazing systems, as well as determining prohibited core zone within the national park, where grazing will be strictly forbidden during spring and summer.

Keywords: Lar national park, Nomads, Wild goat, Habitat suitability, ENFA.

***The Application of Integrating Fuzzy Logic and Matrix Method in
Environmental Impact Assessment
(Case study: Golestan Forest Northern Highway)***

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Abstract

Environmental Impact Assessment of a project consists of analyzing the impacts during construction and operation on environmental factors such as physico- chemical, biological and socio-economical. Determining the impacts derived from these analyses is done by experts utilizing statistical analysis tools and local surveys. Meanwhile because of the lack of information, the application of semantic and quantitative variables increase in order to describe them, which results in high degree of uncertainty and unreliability. In this regard using an appropriate approach like fuzzy logic facilitates the achievement of tangible results, according to its ability to illustrate the level of uncertainties by full integration of qualitative and quantitative information and efficient management.

In this study a method of environmental impact assessment, based on fuzzy matrix is proposed to assess the Golestan Forest Highway project. Main activities at this project (A) and important environmental factors (F) that are influenced by these activities were determined to construct matrixes and each effect (A-F) was estimated regarding three properties which are intensity, extent and persistency in the form of triangular fuzzy numbers. Finally all of the positive (EI^+) and negative (EI^-) effects that induced by this project were computed and the total amount of environmental impact (EI) is obtained.

Key words: Environmental Impact Assessment (EIA), Matrix method, Impact properties, Fuzzy logic

***The Environmental Approach for the Determination of the Optimal Cropping Pattern by Using Goal Programming Model
(Case Study: Varamin Plain)***

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Abstract

Due to rapid increase of country's population, the requirement to produce more agricultural products is felt in society more than before. But increases in production have always been associated with increasing the acreage or more consumption of pesticides and chemical fertilizers. Because the use of pesticides and chemical fertilizers can make serious risks for the environment and health, the purpose of this study is determining optimal pattern of agricultural crops by environmental approach (using a minimum of pesticides and chemical fertilizers). In this research, the statistics and information of products in Varamin plain has been used during 2008- 2009. The Goal Programming Model also is used to determine the optimal pattern. The results show that if the pattern of crop based on minimal use of fertilizers (phosphate, urea and potash) and chemical pesticides (herbicide, fungicides and insecticide); the area of cultivation reduces from 51520 to 35534/33 hectare. As a result, at first, the cultivation of cucurbit crops is decreased and in the second the cultivation of cereals is reduced. Also, planting of alfalfa is increased.

Keywords: Optimal cropping pattern, Goal programming, Varamin plain, Environment

***Survey the Effect of Scale on Leopard
(Panthera Pardus Saxicolor)
Habitat Modeling in Golestan National Park***

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Abstract

To understand the effects of spatial scales on habitat modeling, it is necessary to apply a hierarchical spatial analysis of habitat as wildlife species exhibit varied reactions at different scales. Determining the ecologically relevant criteria at different spatial scales for predicting species occurrences is an important step when determining species–environment relationships. Therefore, species distribution modelling should consider all ecologically relevant spatial scales. Leopard belongs to the Palearctic Realm and its population has highly reduced in recent decades because of habitat destruction, hence is classified as endangered in the IUCN evaluation. We used ecological niche factor analysis (ENFA) and Biomapper software to study the habitat of this species at different scales. Leopards' habitat was modeled using ENFA method with layers ranging in resolution between 30×30 , 60×60 , 90×90 , 120×120 , 150×150 , 180×180 and 210×210 , cell sizes. According to the marginality, specialization and tolerance values of each resolution and also comparing its boyce index the best scales were found to be 60×60 and 90×90 cell sizes.

Keywords: Spatial scales, ENFA, Habitat modeling, Leopard

Strategic Management of Asiatic Cheetah in Iran

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Abstract

Strategic planning and management is a widespread decision-making tool in a variety of nature protection projects across the world and various approaches have been developed. Accordingly, the present research applied SWOT analysis to evaluate one-decade of comprehensive conservation efforts in Iran which is one of the first strategic planning for a wildlife protection plan in the country. We aimed to evaluate efficacy of past actions in regard to cheetah conservation objectives and to illustrate future perceptiveness for conservation prioritization of the Asiatic cheetahs in Iran. Opinions from 27 related experts and managers were taken into account in order to understand internal and external factors affecting the program. Thus, a proper approach was concluded, according to availability of strengths and opportunities to promote cheetah conservation in the country. A total of five strategies were extracted as 1) improving and protecting network of cheetah reserves, 2) local community-based capacity development programs, 3) enhancing law enforcement parallel to establishing captive breeding program, 4) monitoring cheetahs and their prey species, and 5) fostering administrative support for cheetah conservation at national and international level. The strategies were discussed and proper activities were recommended.

Key words: Asiatic cheetah, SWOT analysis, Strategic planning, Conservation, Iran

Prediction of Land Use/ Land Cover Change of Rasht County Using Cellular Automata- Markov Chain Model

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Abstract

Increase in urban population has caused fast sprawl of man made areas in Rasht county in three last decades. Hence, it is expected to degrade natural landscape and change in the pattern and structure of natural and semi natural ecosystems in case of continuing the trend. This study is designed, aiming to understand the changes and prediction of future changes in Rasht county LULC (land use/ land cover) in order to help land and resources planning. Accordingly, LULC change detection is conducted applying three TM satellite images at 1987, 1999 and 2011 and post classification comparison method. To predict the LULC changes up to 2023, a coupled cellular automata and Markov chain model (CA_Markov) is applied base on validation of this model in the study area. The results indicated that man-made areas increased 56.7 % and itself degraded 11 % of agriculture land and 4 % of forest cover in 24 years ago. Validation of CA_Markov model revealed that it has had an acceptable performance in prediction of the LULC changes in the study. Moreover, the man-made areas will increase by 38 % if current trend in the observed changes continues. Accordingly, it will degrade 15 % of agriculture land and 2 % of forest cover in comparison with present situation. To prevent degradation of the agricultural and natural lands in competition with present sprawl of man-made areas, it is necessary to implement vertical and compact development policies as well as allocation of land resources according to land use planning principles in the study area.

Key words: Prediction, Land use/ Land cover, Rasht county, Cellular automata, Markov chain

Environmental Impact Investigation of Nemone Tehran Slaughterhouse Using Integrated Methods AHP and TOPSIS

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Abstract

For surveying the environmental effects of Nemone Tehran Poultry slaughterhouse correlation Scaling Weighting Checklist measurement methods, TOPSIS and AHP Techniques are applied. Therefore at the beginning of the Checklist method by analyzing the project effects, the required criteria and options have been marked. For final validity of criteria under study, we used experts questionnaire. In order to set priorities for criteria and options and achieve the relative weight, AHP method is used in the form of the special vector technique by using the Expert Choice Software. The overall index is calculated by the sum of the criteria weight times criteria scale in each Checklist. TOPSIS method was employed to measure the results achieved by Checklist method. By determining the options and criteria, the weight of indices calculated as well as options graded. The results indicate that from the pollutions perspective in the slaughterhouse, wastewater weighted 1.278 is primary and sound; air and odour weighted 0.261, 0.216, 0.091 are the subsequent priorities. Social, cultural and economic environment, weighted 0.699, towards chemical and physical environment, weighted 0.237, and then biological environment, weighted 0.064, has higher rank. In social, cultural and economic environment in relation to quality of life, health weighted 0.783 was considered the first priority. Regarding the chemical and physical environment in relation to its effect on water resources, groundwater weighted 0.951 has achieved the first place. From the biological environment perspective and about the plantation, the greenspace weighted 1/041 dedicated to the slaughterhouse has been of the high priority. At the end, optimization of the slaughterhouse wastewater treatment system is advised as the most important approach in decreasing the harmful effects.

Key words: Environmental impact investigation, Slaughterhouse, Scaling weighting checklist method, AHP technique, TOPSIS technique, Nemone Tehran slaughterhouse

***Effects of Technology Innovation
Bioenvironmental on Hospital Industry
(Case Study: Social Security Hospitals of Mazandaran)***

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Abstract

Technology is the main factor of wealth production and wealth is a matter more than money that can include factors such as the promotion of knowledge, intellectual capital, effective use of resources, protection of natural resources and other effective factors that improve the standard and quality of life. Nowadays things that introduce the country as developed or undeveloped is the extent use of technology in different aspects of development. Over three recent decades, risks and environmental damages become more visible. This damages is arisen by a combination of factors such as population growth, economic growth, use of energy and industrial activities .In general, the environmental assessment process gives the meaning of the consideration process and formal studies to predict the effects of a project's activities and functions on the environment , human health and welfare, or in other words, the systematic recognition and evaluation of consequence of projects, programs and plans on the components of the physical, chemical, biological, cultural and socio-economic environment .The main objective of this study is investigating the environmental impact of technological innovation on hospital industry within the framework of present laws in the Mazandaran province social security hospitals area .The literature review identified five variables . then with using designing questionnaire in during surveys of chosen groups (managers, experts) the data have collected and analyzed. Our results shows a weakness in the variable Research & Development and investing, and four other variables are in desirable rate .At the end of research we provided detailed results and findings and compared and practical and relevant suggestions for similar research in the future is presented.

Keywords: Innovation, Technological innovation, Environment, Hospital

Visual Impact Assessment of Tehran Towers on the Observers' View

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Abstract

Landscape arrangement significantly influences the observer's visual experience of the environment. Since measuring this qualitative experience is based more on personal judgments than on mathematical techniques, the representation of "quantifying methods" in this field demands a significant amount of caution and accuracy. This research is an attempt to quantify the visual impacts of seven-storey and higher buildings on observers' views of Tehran's District 3 from 1993 to 2006. For this purpose the visibility of the surrounding landscape to observers was computed for seventeen random points of the region, at 1.5m and 10m, before and after the construction of towers in that period, by the use of the Geographical Information System (GIS, Arcmap V.9.2) (in this research, seven-storey and taller buildings are considered as towers). For calculating visibility, the "Viewshed" tool in Arcmap was used, which reproduced accurate and quantitative data of changes in visual capability resulting from new obstacles in the view line. The result of this research indicates that the visual capability of citizens of Tehran decreased from 13% in 1993, after the construction of 12 towers, to 45% in 2006 after the construction of 255 towers. Also assuming this rate of construction continues in District 3, by 2013 the citizens will experience a 60 per cent decrease in the visibility of the surrounding landscapes, and an 80 per cent decrease by 2024. The objective of this research was to assess the visual impacts of structures on the landscape and to attempt to clarify the necessity and importance of applying VIA (Visual Impact Assessment) among other environmental assessments in new urban developments.

Keywords: Landscape, GIS, Viewshed, Visibility, Building, Quantification, Urban planning

Evaluation of Removing Volatile Organic Compounds from Wastewater with Using Dissolved Air Flotation

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Abstract

Volatile organic compounds (VOC) are the main class of air contaminants that have harmful effects on human, plants and animals. So, it is necessary to prevent VOC's emission to environment. In this study feasibility of dissolved air floatation for removing VOCs (Toluene as a Case) was evaluated. Air stripping method was used. Also, a pilot plant was constructed. For generation of bubble the technique of dissolved air flotation utilized. In addition the effect of saturator pressure, flow rate of imported saturated water, the proportion of wastewater flow rate to the saturated water was studied. Maximum removal of toluene was 52% that was obtained at p=2 bar, saturated flow rate=0.4 lit/min and the proportion of flow rates=2. Binary and ternary interaction of main parameters analyzed with Minitab 14 software which indicated that proportional of flow rates, saturated water flow rate and saturator's pressure alternatively had the highest impact on elimination. In this study, air stripping was used for removing organic compounds from effluents.

Key words: Dissolved air flotation, Volatile organic compounds, Saturator, Bubble column

Applying Fuzzy and Analytical Hierarchy Process (AHP) in Site Selection of Tabriz Oil Refinery

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Abstract

Tabriz is one of the industrial metropolitan cities in northwest of Iran. The main objective of this study was to implement a spatial analysis, using geographic information system (GIS), to site selection of optimal environs with minimum negative environmental effects for Tabriz oil refinery. Therefore, different information layers such as slope, land use, landside, distance to city center, protected areas; residential areas, available land use, and hydrology were entered in ArcGIS and IDRISI software and organized in a specific data base. Next, the digital layers were weighted and classified on the basis of available standards. Then, with the aim of finding appropriate sites for establishment of Tabriz oil refinery, the Analytical Hierarchy Process and Weighted Linear Combination, were used. The result of this study introduced the best sites for establishment of Tabriz oil refinery. The results of this method can help pinpoint the desirability of the development and its impacts on the environment.

Keywords: Tabriz, Oil refinery site selection, MCE

An Analysis on Aggregation of Nest Investment Location for *Eretmochelys Imbricata*

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Abstract

Sea turtles are considered of the globally threatened species in the world. Several threats affect survival and regeneration of these species. Therefore, to support their habitat and survival, identification and managing factors which affect nesting are inevitable. Considering that sea turtles do one of the critical stages of their life, hatchery period at the beach, so identifying nesting sites and factors influencing their hatching play an important role for conserving these endangered species. Many studies revealed that one of the main factors in nest selection is grain size.

In this study the grain size in the nest locations of *Eretmochelys imbricata* in Shib-deraz of the Qeshm Island was investigated. The results showed that from the 13 reviewed community nest locations, 10 of them had a coarse sandy texture which is in line with different studies in other countries. In summary we can conclude that sea turtles start the action of implantation in a sandy shores and fine-grained texture in course (grain size 0.125 to 1 mm) which sandy textures are preferred by *Eretmochelys* in Qeshm Island.

Keywords: *Eretmochelys imbricata*, Qeshm Island, Grain size, Nest location

An Analysis of Responsible Environmental Attitude and Behavior of Students (A Case study: Students in Mazandaran Province Universities)

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Abstract

To overcome environmental problems and achieve sustainable environment requires trained manpower having graduated with a favorable attitude towards the environment and sustainability. To identify and explain the students' attitudes toward the environment as knowledgeable and influential segments of society is an essential and important step in the generation of policy and education to the environment and its hazards and how to deal with it and accepting and adjusting to environmental policy. To explore environmental attitudes and behaviors of students in higher education, the current survey was conducted in Mazandaran province. The surveyed universities included Mazandaran University, Babol Industrial Noshirvani University, Sari University of Agricultural Sciences, Veterinary University Amol, Babol University of Medical Sciences, 816 students were selected from these universities using stratified sampling. The results show that students' attitudes and behavior are relatively low. Furthermore, correlation test results showed that there is a positive relationship between environmental attitudes and behavior. Moreover, the results indicated that there is a gender difference in environmental attitudes and behaviors. Finally, the results showed that while environmental attitudes in terms of residence and the college seems the same, environmental behavior depending on the location and college is different.

Keywords: Environment; Environmental attitude; Environmental behavior; New environmental paradigm; Higher education, Mazandaran province