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Investigation of possibility of landslide number and area estimation using determination area and volume frequency distribution (Case study: Mazandaran providence)

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ABSTRACT

Landslides are the major natural hazard, causing significant damage to properties, lives and engineering projects in all mountainous areas in the world. In order to estimate the role of the landslides in erosion processes and evaluation of their risks, it is necessary to quantify landslides. This quantifying can be performed by applying the probability distributions that show the landslide size against the probability density. This study was investigated the behavior of landslide areas and volumes on Frequency distributions in Mazandaran province. Also total number, area and volume of landslides that have occurred over time were estimated using the approach suggested by Malamud et al. Result of cumulative frequency distribution of landslide area and volume revealed the significant proportion of large landslides in determining the total landslide area and volume. According to Malamud et al. approach total numbers of landslides were estimated to be 9823 ± 2323. These landslides have been obliterated over the time by soil erosion, vegetation growth or by human activities and total of their affected area and volume by these landslides were 31.5 ± 7.1 km^2 and 0.232 ± 0.052 km^3, respectively. The obtained results also presented an area of 2×10-3 km^2 as a critical threshold area for transition between resistances against slope failure.

Keywords: area, landslide, landslide magnitude, Mazandaran province, three-parameter gamma distribution, volume.

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An investigation on the effect of floodwater spreading on physicochemical soil attributes (A case study: Gachsaran Floodwater spreading station)

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ABSTRACT

Small precipitation with temporal and spatial variation of rainfall is the main responsible factors on flood occurrence in arid and semi arid regions. Floods in their regions usually contain high concentration of sediments which when they are deposited on the surface of lands, they change the properties of soils of the area. In this research, the effect of floodwater spreading on physic-chemical characteristics of soil in Gachsaran floodwater spreading station, after 12 years of floodwater spreading, is investigated. For this purpose, soils and sediments were sampled from 0-15, 15-30, 30-45 and 45-60 centimeter depths, from the flood spreading and representative (without floodwater spreading) fields. Samples were analyzed for following proportion: Percentages of clay, silt, sand and gravel, pH, EC, percentage of lime, anions and cations. The result have show that the amounts of clay, silt and sand have increased, chemical properties have changed slightly and among the chemical properties, pH and percentage of lime have higher change so that pH decreased and lime increased in floodwater spreading field respect to the representative field. It is concluded that due to floodwater spreading, physical properties of the field underwent considerable amount of changes and gravelly texture has changed to less gravelly texture. The surface soil has undergone more changes and from the surface to the depth, change of physical and chemical properties becomes negligible.

Keywords: floodwater spreading, Gachsaran station, physicochemical characteristics, top soil.

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Investigation of granulometry of aeolian sediments in relation of sand dune morphology (Case Study: Kashan Erg)

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ABSTRACT

Kashan Erg is one of the most important sand dunes complexes in Iran. It is included the most important various type of sand dunes in Iran. This study was performed to compare the granulometry of aeolian sediments in different sand dunes and also from plinth to crest of transverse dunes that located in Kashan Erg's north. In order to determining different statistical variables, aeolian sediment sampling was conducted in different sand dunes. Then, the sample's granulometry test was done based on dry sieve analysis. Finally, statistical parameters such as mean diameter, Sorting, Skewness, Kurtosis, d10, and d90 were determined. The results showed that the mean diameter, Sorting, d10 and d90 parameters have significant differences at the 95% significance level between the stabilized sand dunes and active ones. Moreover, it was found that in transverse sand dunes, there are a significant difference at the 95% significance level between mean diameter and d90 parameters in bottom of the stoss side and lee side.

Keywords: active dunes, granulometry, Kashan Erg, stabilized dunes, transverse dunes, wind erosion.

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Polyacrylamide effects on splash erosion rate in different soils using rainfall simulator

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ABSTRACT

Splash erosion recognized as first stage of erosion process that results of bombing soil surface with rain drop. Falling rain drops to soil surface resulted moving soil particles and destructing soil structure. At this research effects of various PAM rate (0, 2, 4 and 6 kg.ha) on splash erosion on three soil textuere clay, silty clay and sandy clay loam was tested. Simulations were done with rain intensity of 95 mm/h using a FEL3 rainfall simulator in laboratory. Splash erosion rate were measured using splash cup. Results showed that there is no statistically difference between different soil textures in order to decreasing splash rates. Effect of different applying PAM in splash erosion rate showed that there is significantly differences between control treatment with 4 and 6 Kg/ha treatment in 95% level (Fvalue=4.5, Pvalue= 0.039) in sandy clay loam soil texture. Also the results showed splash erosion rates have decreased by 42.3 and 52 percent comparing to control treatment when applied 4 and 6 Kg/ha treatments. Our findings can be useful for better management of agricultural soils in order to sustainable yield and soil sonservation.

Keywords: Polyacrylamide, Splash Erosion, Soil Texture, FEL3 Rainfall Simulation, Splash cup

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Cultural ecology: Analysis of indigenous knowledge and social cohesion in milk management of grazing animals on rangeland (Case study: Ghasr e Yaghub village, Khorram Bid, Fars Province)

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ABSTRACT

Cooperation in pastoralism and indigenous knowledge of dairy management had been considered for many years in Iran and had been adapted with culture and environment of every region. This research had illustrated the analysis of indigenous knowledge and social cohesion in dairy management of grazing livestock in Ghasr e Yaghub village. Research method was a combination of filed studies, direct observation, and cooperative observation and organized interview. The results include functions of cooperative management system of "Ham Shiry" among rural women named "Shir Dan", different dimensions of indigenous knowledge, mechanism of dairy management among women and related traditions and local cooperation. The results demonstrated that rural women in the study area had been created social institution based on local rules and in order to manage dairy products. This kind of associations had been rooted in indigenous knowledge and has a significant role to save and improve social cohesion and sustainability of economical characteristics of local inhabitants.

Keywords: cultural ecology, Ghasre Yaghub village, indigenous knowledge, Shir Dan, social cohesion, social institution.

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Survey of vegetation degradation in the East of Esfahan using Lada model

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ABSTRACT

Arid and semi-arid areas, due to the sensitive, have variable ecosystems, so continuous assessment and monitoring of the environment is required for most of managerial and adjustment practices. Vegetation is one of the most important assessment tools and used as a criterion for evaluation and monitoring of ecosystem functions. In this study, for the first time in the country, we have evaluated status of vegetation in a desert area by the method provided by the Land Degradation Assessment in Aridlands as one of the last instruction of the vegetation status assessment. The model uses 16 different indicators to assess vegetation status: Total Bare Soil; Bare Spots; Litter cover or Surface organic matter; Vegetation Vigour; Proportion of perennial species; Proportion of Useful Species; Proportion of each vegetation strata; Species that decrease with grazing pressure; Species that increase with grazing pressure; Poisonous plants; Alien Invasive or proliferous weed species; Pest damage; Damage due to diseases; Bush /shrub encroachment; Utilization (Deforestation); Biomass decline. After running the model in the desert rangelands of East and compared the results with the reality, We found this model at least for the desert area, have very good performance.

Keywords: assessment, LADA, rangeland status, vegetation degradation.

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Evaluation of seed germination features of *Bromus kopetdaghensis Drobov* under different temperature

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ABSTRACT

Bromus kopetdaghensis is one of perennial plants of Poaceae family and it is important in biodiversity of arid and semi arid grasslands of Iran. This experiment was conducted as a completely randomized design with 4 replications in laboratory of faculty of Agriculture, Ferdowsi University of Mashhad, Iran. Treatments were different constant temperature of 5, 10, 15, 20, 25, 30, 35, and 40°C with 4 replications and in each replication 25 seeds were used. The results showed significant effects on different germination features of *Bromus kopetdaghensis*. The lowest germination rate (with 2.26 seed per day) was obtained at 5°C and the highest (with 11.39 seed per day) at 30°C. The maximum and minimum length of caulicle was obtained at 35°C (with 9.41 cm) and 10°C (with 2.48 cm), respectively. Maximum length of radical was also observed at 35°C (with 9.62 cm) and minimum length of radical was observed at 10 and 20°C, without significant different with 3.63 and 3.48 cm. Based on the regression analysis between rate of germination and temperature the cardinal temperature of maximum, optimum, and minimum were obtained in the range of 0.71-4.25, 24-30.36 and 41.01-45.48, respectively.

Keywords: *Bromus kopetdaghensis*, cardinal temperature, germination, temperature, regression model.

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Evaluation of hydrogeochemical of Oshtroankooh Karst springs in association with geological formations of this region

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ABSTRACT

To evaluate the hydrogeochemical characteristics of karst water resources of Oshtorankooh, chemistry details of springs has been considered as the most important evacuator of karst resources. This research has been performed to study hydrogeochemical nature of karst springs and their origin with an emphasis on the type of formation. Accordingly, five samples of the water of permanent springs of this region in the water scarcity time period have been collected and analyzed. To precisely characterize the hydrochemistry of the region, Piper as well as Stiff graphs were employed. The former graph confirmed that the dominant type of the water the region is Calcite-Bi carbonate based. This water possesses a temporal hardness wherein according to the Stiff graph the dominant cautions and anions are bicarbonate and calcium, respectively. The water of the springs Panbekar S1 and Gahar lake S3 are saturated of calcite mineral, and the positive saturation index implies a diffusive flow. The respective flow reflects less development of fractures in the catchment of the springs. The saturation index of dolomite in the springs of Absefid S2, Tamdarbasoo S4 and Mehrghayoonja S5 is negative implying the saturation conditions and reflecting the higher density of surface and sub-surface fractures as well as the type of conduit-diffusion flow along the flow path of this springs. The results of hydrogeochemical analysis also XRF of Karst springs of the field demonstrated that super saturation phenomenon mainly occurs in water scarcity period. Moreover, the chemical nature of the underground waters present in the carbonated stones (rocks) is strongly dependent on the dissolution of calcite also dolomite. The higher water temperature of the Panbekar spring is affected by saturation index of dolomite in Dalan formation. The results of factor analysis also verified that the most important factor could be dissolution of carbonate then magnesium and electrical conductivity. The water of this spring is classified in the group of relatively hard and hard waters.

Keywords: formation, hydrogeochemical, Karst springs, Oshtorankooh.

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Environmental and managerial factors effects on plant species distribution (Case study: Saral rangelands of Kurdistan province)

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ABSTRACT

This research has been done with the aim of explaining environmental and managerial factors that effects on rangeland vegetation distribution in Saral rangelands of Kurdistan province. After selecting plant types as working area were done sampling from plant types and determined some of plants parameters such as kind and number of plants and cover percentage. Various environmental factors such as topographic factors (slope, slope direction and elevation), soil physical factors (depths, soil texture, gravel and saturation moisture) and various chemical factors such as acidity, electrical conductivity, lime, gypsum percentage, organic material, nitrogen, phosphor and potassium) were measured and grazing intensity were considered as managerial factors. After collecting data, the Principal Component Analysis (PCA) was used to determine relationship between vegetation cover and environmental factors by PC-ORD software. The results showed that among various environmental and managerial factors affecting in plant distribution, soil depth, grazing intensity, elevation, sand, gravel and silt percentage have the highest correlation with Principal Component Analyses. These factors are the most effective factors on plants type distribution in rangeland ecosystems. Among effective soil factors on distribution of plant communities in this study, soil physical factors have greater impact than soil chemical properties. Physiographic factors including elevation and managerial factors including grazing intensity have considering effect on distribution of plant communities.

Keywords: environmental factors, Kurdistan Province, multivariate analysis, plants distribution, Saral rangelands.

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Assessing the impact of input variables preprocessing into support vector machine through Gamma Test method for suspended sediment volume prediction

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ABSTRACT

This study aimed to examine the influence of pre-processing input variables by Gamma Test on performance of Support Vector Machine in order to predict the suspended sediment amount of Doiraj River, located in Ilam Province from 1994-2004. The flow discharge and rainfall were considered as the input variables and sediment discharge as the output model. Also, the duration of the model training period was determined through GT .Thereafter, in order to carry out the influence of pre-processing input variables on performance of model, the suspended sediment was predicted using SVM model while no pre-processing has been done on its input variables and the results were compared to each other. Results show the performance of the GT-SVM model in the test phase with minimum RMSE was equal to 0.96 (ton/day) and the maximum coefficient of R^2 was equal to 0.98 between the predicted and actual values, was better than SVM model.

Keywords: Doiraj River, Gamma Test, performance evaluation, support vector machine, suspended sediment.

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The effect of different intensities of clipping on some of vegetative and reproductive characteristics *Ajuga chamaecistus* in Kordan rangelands of Albroz province

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ABSTRACT

Due to the growing trend of rangelands degradation, study effects of different harvesting intensities on species in order to gain a more fundamental utilization of ranglands can be effective for reclamation and improvement. The purpose of this research was to study effects of different harvesting intensities on key species Ajuga chamaecistus.This species has a forage value in the study area. In this first region and a key area of one hectare in area Kordan and In the first year and was grazed, and fencing. Selected and removed from any of 0, 25, 50, 75% and control is exercised (a basic 10 treatments). Monthly by the clipper and the area is grazing season. Effect of harvest was study with the changes in the characteristics the species treated, including; forage and seed production, vitality, mortality and growth of shoots. Finally, production data the combined analysis of data with a split plot design and seed production, vitality, mortality and growth of shoots data in SAS software was analysed. Results of studies of the effects on forage production and harvest of Ajuga chamaecistus species showed the effect of different levels, different years, and their interactions on the production level is a significant percentage. This shows that in different years with different weather conditions of production are different. Also results of the analysis data showed seed production, vitality, mortality and growth of shoots are affected different levels of harvest and weather conditions. In general according to results indicated the negative effects harvesting at the level 75% was observed. In other words, heavy grazing has a negative impact on the species treated. So harvesting up 75% endangering the survival of these species and In fact, harvesting 50 percent it is not a serious problem.

Keywords: ajuga chamaecistus, different intensities of harvest, vegetative and reproductive characteristics and Kordan.

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Economic valuation of rangelands' soil conservation function, Case of Mid-Taleghan rangelands

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ABSTRACT

Soil conservation is one of the most important regulative functions of natural ecosystems. This function is of high importance in Taleghan Watershed due to high erosion quantity and sediment accumulation in Taleghan Dam reservoir. Soil loss reduction, sedimentation control and fertility conservation were considered as different aspects of soil conservation. Effect of land use and vegetation cover on soil conservation was studied by overlaying soil erosion map with other environmental data layers. Abandoned rainfed lands with low cover were considered as benchmark to evaluate the role of rangeland vegetation cover in soil conservation. Economic value of soil loss reduction function was estimated using opportunity cost approach and the benefits of rainfed agriculture. Economic value of sedimentation control also was calculated considering SDR ratio and avoided cost approach. Soil fertility conservation was quantified regarding the volume of soil conserved and nutrient content of soils of the study area. Economic value of this function was estimated using replacement cost approach. Results show that Mid-Taleghan rangelands conserve 60545 cubic meters of soil per annum. Annual economic value of soil loss reduction, sedimentation control and fertility conservation functions were estimated about 6262, 25287 and 8626 US dollars, respectively. These functions are just some limited aspects of rangeland functions and economic valuation of these functions could effectively be utilized for conservation of rangeland ecosystems.

Keywords: economic valuation, Mid-Taleghan, rangeland cover, sedimentation, soil erosion.

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فهرست