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Effect of topography on utilization from mountain rangelands of Mazandaran Province —case study : rangelands of Babolrood Basin , IR-Iran

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Key points In mountain rangelands , due to topographic variations , animal grazing in whole areas is not equally distributed . Based on dissemination of grazed animal in range lands is more influenced by topography . This factor is affecting to the percentage of utilization . After study of aerial photography and topographical map , and field surveying the requirement maps was created . In order to suitable tools , selection of grazing distribution in mountain rangelands was investigated by topographical impact on vegetation . In order to determine relation between percentage of utilization and topographic factors correlation and multiple regressions was used . Result shows that slope was the most effective on the utilization factor and aspect was less effect to utilization .

Key words : Topography , Animal Distribution , Utilization , Stepwise Regression Method

Introduction In mountain rangeland percentage of utilization is affected by topography , stage of plant growth and distribution of water . Therefore , mixed use of parameters is usually the most effective way to grazing management . In order to choose of suitable instrument , on grazing distribution in mountain rangeland evaluate of topography effect on percentage utilization is necessary . Type of vegetation , relief , season and kind and age of animal's effect on utilization was studied (Mesdaghi , 2000 , Gholami , 2004 , Delcurto et al . , 2005) and showed that the topography is one of the most important factors that affected to the distribution of animals to use of plants , as extremely slopes and mountains are inhibited to animal grazing . The objective of this study was to determine topographic effective factors on non-homogenic grazing distribution of Babolrood watershed at the Mazandaran province that utilization of animal is uncorrected .

Materials and methods The study area was located in Babolrood Basin at the Mazandaran province of IR-Iran . After survey of map topography and the aerial photograph of study area overlaid and with finding field operation slope , high stratum and vegetation map were provided . Pay attention to coral five utilization unite that view of topography , kind of animal and type of vegetation were homogenic chosen in each of utilization unit with use of high to weight method , the percentage of utilization were measured . Comparison of means was done by LSD method ($p < 0.05$) and table of matrix simple correlation was computed .

Results and discussion Matrix correlation of different variables at five utilization units showed that , in utilization units of first , second and fourth , greatest correlation value was found between utilization percentages and slope . The final results showed that a regression model in fourth unit was the best (Table 1)

Table 1 Regression characteristics of the best model .

Dependent variable	Independent variables	R ²	Regression equation
UT Unit 4	Slope , height and interaction of slope & height	0.97	$Y = 102.0 - 0.60X_1 - 0.01X_3 - 2.60X_1X_3$

The result of this study showed that in the amount of topographical factors , the slope was highest affected on utilization factor . Relationship between slope and utilization was inversely , when slope increased the utilization decreased . This is due to decrease of animal activity and movement in sharp slopes . Height factor was less effective on the amount of utilization . This was probably due to chief effect to the other parameters of plants . Some research in Haraz basin in the North of Iran showed that with increasing of height and UV ray and decreasing of temperature , was decreased plant diversity and grazing intensity (eg . , Ebrahimi , 2003) .

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