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Case Study

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Analyzing factors that effecting on rangeland degradation (case of study: District of Pirtaj)

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Abstract

The purpose of this study was to analyze factors that effecting on rangeland degradation. Statistical population of this research consisted of whole farmer in Pirtaj district (N= 1600); from that 120 farmer were selected as sample using cluster sampling. The main tool to collect data was a researcher made questionnaire that content validity of the questionnaire was approved, by a panel of experts and its reliability was confirmed by calculating Cronbach's alpha coefficient ($\alpha \geq 0.74-0.82$). Data was analyzed by SPSS software. Results of correlation analysis indicated a positive statistically significant relationship between rainfed land with personal ownership, number of livestock and rangeland degradation. Also, there are negative and significant relationships between irrigated lands with personal ownership, garden size, and rangeland degradation. Results of stepwise regression showed that in generally garden size, amount of rainfed land with personal ownership, and amount of irrigated lands with personal ownership, has been defined 35.00% of rangeland degradation variances.

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Keywords: Rangeland degradation, Livestock, Grazing, Rainfall, Irrigate lands.

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1. Introduction

Rangeland is one of the natural renewable resources in every country that has a key role in water production, soil conservation, feed production, wildlife habitat, air clean-up, and etc (Arzani et al., 2009). Nowadays, despite implementation the rangeland management, continually exploit of rangeland without regardless to the basic sustainability principles, irregular exploitation and use of rangeland over than rangeland's productive capacity led to rangeland degradation in this century (Azkia, 1996). Several factors led to quantitative and qualitative negative changes in natural resources that ultimately cause to intensive degradation of soil and vegetation reduce beneficiary income, destructive flooding, migrated of villagers and nomads to the urban place and in end the beneficiary poverty (Ghorbani et al., 2011). In this regard, several studies have been done to exploration factors that effecting on degradation of rangeland in different aspects; such as Kaviani et al. (2011) in their research concluded that the most important factors that effect on rangeland's degradation are large numbers of livestock, early grazing, cultivation and transform rangeland to farm.

Rafsanjani firouzi (2009) showed that in perspective of villagers the intense grazing of livestock, long-time grazing, transform rangeland to farm, early grazing and finally increasing number of livestock are important factors that affected on rangeland degradation. Ghorbani et al. (2011) concluded that the intense livestock in rangeland, early grazing, cultivation, rangeland transform to farm and then declared vegetation are important factors on rangeland degradation. Ansari (2007) in his study classified twenty variables that effect on rangeland degradation in three factors: (1) factors that related to livestock, (2) factors that related to destroy the vegetation cover, and (3) factors that related to change of use. He argued those factors that related to livestock have most effect on rangeland degradation in compare another factors.

O'Conner et al. (1995) analyzed the effect of rainfall and grazing on vegetation change during 1949 until 1971 in South Africa. They argued that change of vegetation more influenced by rainfall but in the long term, the grazing have more effect. Pabbot (1969) stated that the large number of livestock, transform livestock to farm, intensive grazing, and imbalance between numbers of livestock and rangeland capacity are the main factors that effect on rangeland degradation in Iran. Sabeti (1997) emphasis of grazing, extend the farm lands, and fires are the important factor in rangeland degradation. Bajian and Mehrabi (1994) in their research showed that the first factor in rangeland degradation is people and second factor is livestock. Based on what we told, the purpose of this study was to Analyzing factors that effecting on rangeland degradation.

2. Methodology

This research in its nature is a quantitative; in terms of objective is an applied and in term of statically is descriptive-correlation. The purpose of this study was to Analyzing factors that effecting on rangeland degradation. Statistical population of this research consisted of whole farmer in Pirtaj district (N= 1600); from that 120 farmer were selected as sample using cluster sampling. The main tool to collect data was a researcher made questionnaire that Content validity of the questionnaire was approved, by a panel of experts and its reliability was confirmed by calculating Cronbach's alpha coefficient ($\alpha \geq 0.74 - 0.82$). Finally, Data was analyzed by SPSS software.

3. Results and discussion

The results of descriptive statistics show that 97.50% of beneficiaries were man and only 2.50% were women. In term of education more than 85% of the responsible are illiterate and other have primary degree (Table 1). In table 2, has been shown the total amount of farmers' rainfed lands, irrigated lands, and fallow lands. According to this table it becomes clear that distribution of dry lands between farmers is inappropriate. Also, each farmer on average transforms 1.12 of rangeland to rain-fed lands.

Findings showed that (table 3) in the exploitation with personal ownership the extent of field to gain more profit, don't have any income except of agriculture, competition between farmers, and lack of knowledge about rangeland's role in the human life, were important factors that effect on rangeland degradation.

Findings showed that (table 4) in the rental exploitation the don't have any income except of agriculture, extent of field to gain more profit, obtain the consent of the owner, competition between farmers and lack of knowledge about rangeland's role in the human life were important factors that effect on rangeland degradation.

Table 1
Personal characteristic of the study population.

	Variable	Frequency	Percent	Cumulative percent
Gender	Man	117	97.50	97.50
	Women	3	2.50	100.00
Level of degree	Illiterate	60	50.00	50.00
	Primary degree	42	35.00	85.00
	Middle degree	9	7.50	92.50
	Diploma	6	5.00	97.50
	B.S	3	2.50	100/00

Table 2
Frequency distributions of farmers lands based on type of land.

	<i>Total rainfed lands under cultivated</i>	<i>Total irrigated lands under cultivated</i>	<i>Total fallow rainfedlands</i>	<i>Total fallow irrigated lands</i>	<i>Fallow rainfed lands with national ownership</i>	<i>Fallow irrigated lands with national ownership</i>	<i>Rainfedlandunder cultivationwithnational ownership</i>	<i>irrigated landunder cultivationwithnational ownership</i>
Mean	24.80	3.73	16.89	0.73	0.48	0.00	1.12	0.00
S.D	22.49	2.96	16.85	0.25	0.47	0.00	1	0.00

Table 3
Ranking of factors that effect on rangeland degradation in personal exploitation.

Factors	Mean of 4	S.D	C.V	Rank
Extent of field to gain more profit	2.90	0.30	0.10	1
Don't have any income except of agriculture	2.80	0.68	0.24	2
Competition between farmers	2.47	0.74	0.30	3
Lack of knowledge about rangeland's role in the human life	1.62	0.91	0.56	4

Table 3
Ranking of factors that effect on rangeland degradation in rental exploitation.

Factors	Mean of 4	S.D	C.V	Rank
Don't have any income except of agriculture	2.42	0.83	0.34	1
Extent of field to gain more profit	1.92	0.75	0.39	2
Obtain the consent of the owner	1.97	1.06	0.53	3
Competition between farmers	1.65	0.91	0.55	4
Lack of knowledge about rangeland's role in the human life	1.42	0.83	0.58	5

Spearman's correlation coefficient was used to clarify the relationship between the variables that effect on rangeland degradation. Results showed that a positive and significant relationship between rainfed land with personal ownership, number of livestock and rangeland degradation. Also, there are negative and significant

relationships between irrigated lands with personal ownership, garden size, and rangeland degradation. Based on these findings, we can conclude that rangeland degradation was influenced by these factors (Table 4).

Table 5
Correlation analysis between variables that effect on rangeland degradation.

Variables	Correlation coefficient	Significance level
Garden size	-0.459	0.00
Amount of rainfed land with personal ownership	0.414	0.00
Amount of irrigated lands with personal ownership	-0.362	0.00
Number of livestock	0.223	0.01

Stepwise regression was applied to identify the role of each factor on rangelands degradation. Results showed that in generally garden size, Amount of rainfed land with personal ownership, and Amount of irrigated lands with personal ownership, has been defined 35.00% of rangeland degradation variances (Table 5).

Table 5
Results of stepwise regression.

Variables	B	Beta	t
Constant coefficient	0.725	-----	3.58**
garden size X ₁	-.102	-0.39	-5.19**
Amount of rainfed land with personal ownership X ₂	0.01	0.405	4.91**
Amount of irrigated lands with personal ownership X ₃	-0.08	-0.21	-2.60**
F= 43.629**			R ² _{Adj} = 0.33
			R ² = 0.35

**significant at the 0.01 level.

According to stepwise regression outputs, the research equation presented in below.

$$Y = 0.725 - 0.102X_1 + 0.01X_2 - 0.08X_3$$

Rangeland is one of the natural renewable resources in every country that has a key role in water production, soil conservation, feed production, wildlife habitat, air clean-up, and etc. Nonetheless, several factors led to quantitative and qualitative negative changes in natural resources. Therefore, the purpose of this study was to analyze factors that effecting on rangeland degradation. Findings showed that in the exploitation with personal ownership the extent of field to gain more profit, don't have any income except of agriculture, competition between farmers, and lack of knowledge about rangeland's role in the human life, were important factors that effect on rangeland degradation. These finding confirmed the researches' results of Ansari (2007), Sabeti (1997), Kaviani et al. (2011) and Rfsanjanifirouzi (2011). Moreover, Results correlation coefficient showed that there was positive and significant relationship between rainfed land with personal ownership, number of livestock and rangeland degradation. Also, there have been negative and significant relationships between irrigated lands with personal ownership, garden size, and rangeland degradation. Therefore, based on these finding suggested that:

- ✓ Responsible organization attempt to extension gardening in rural area and help to farmers for created the garden based on scientific principles.
- ✓ Rangeland and forest organization should be considered budgeting for created balance between rangeland capacity and number of livestock.

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