



Grazing system and solar fences, innovation and opportunity in rangeland of developing countries

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Abstract. The future of the development and management of pasture resources depends on increasing the use of scientific innovations. In some countries rangeland livestock production majority relies on natural ecological processes of plant and animal production, despite the progress in all of the infrastructure, rangeland management have a little growth and base on traditional ranching management, grazing livestock is based on a free grazing system. In this study grazing system was applied and electric fence was useful for bounding the grazing system and reducing management cost. The system also reduced movement of livestock to use energy obtained from vegetation for meat production instead for abnormal movement electrical fence was used to made possible running grazing system and also preventing entrance of livestock to adjacent segmentation. Electric fencing or creating smaller pastures to achieve tighter control on distribution and intensity. This strategy can enable more flexible for diverse management objectives, increase economic efficiency, reduce to rangeland dependency and inevitably lead to sustainability in rangeland.

Keywords. *Rangeland management, Segmentation, electric fence, grazing system.*

Introduction:

Using of new management tools in countries with a long history of utilizing rangelands has led to lower production costs as a result of increasing the production of rangelands. Research suggests that technologies that use to improve profits, regardless of their form and type, are more attractive to operators, and therefore have better prospects (Didier and Brunson 2004, Arzani, et al., 2015). Today, the development of livestock technology has largely focused on raising livestock production. In the traditional rangeland management, the grazing of livestock is carried out on the basis of a free grazing system, the livestock are supervised by the shepherds and, in fact, animal grazing is handled by the shepherd. The implementation of the free grazing system is economically feasible because of its initial and limited infrastructure, but variable costs due to the presence of shepherds in this system have a high economic burden. Other disadvantages of the free grazing system are the lack of proper livestock management and excessive grazing of species with a suitable palatability class in the short term. Destruction of rangeland in the long term, Inappropriate distribution of livestock in the ranch and marching through the livestock are a great source of energy and consequently a loss of livestock production.

Materials and Methods:

The evaluation and analysis carried out in this study was based on the data of the using solar energy for combining application of herbal plants and plants for grazing livestock, in the Taleghan Research Station on a test scale for three years from 2014. Taleghan station has a height of 1850 meters and a cold semi-humid climate. The rangeland was divided into equal parts based on the type of plants and their phenological characteristics, a periodic-delayed grazing system was implemented by the electric fence. In order to estimate the range of rangeland utilization, we evaluated the production of plants inside each paddock (Table.1). To determine the changes in grazing behavior as well as the weight gain of animals with observational methods over time, we recorded the behavior of the livestock and the amount of deterioration of the electrical fence wire during the period in each segment and weight measurement at the end of the course.

Table.1) Rangeland characteristics evaluated in this study

Year	Paddock number	Vegetation Type	Cover percentage	Rangeland Condition	Rangeland trend	Utilization	yield (kg/ha)			Available forage (kg/ha)
							palatability			
							High (I)	Moderate (II)	low (III)	
2014	(I)	<i>Ta.ci – As.ef</i>	40	Moderate	Constant	40 %	38.2	21.9	30.2	90.1
	(II)	<i>Ta.ci – As.ef</i>	42.2	Moderate	Constant	40 %	35	15.9	22.5	73.4
2015	(I)	<i>Ta.ci – As.ef</i>	41	Moderate	Constant	40 %	35.7	15.8	26.1	77.6
	(II)	<i>Ta.ci – As.ef</i>	42	Moderate	Constant	40 %	32.8	16.6	24.2	73.6

**Taeniatherum crinitum -Astragalus effusus*

Results and Discussion:

The results indicated that the use of electrical fence current with rotating currents and short pulses would have a better effect and better management of livestock in the system. These fences completely prevent the entrance and exit of the trap from the piece to the adjacent piece. Investigating the paired plot and livestock behavior showed the plants with a different palatability, done in the same level and over grazing was not done. Observing the weight of livestock before entering the livestock to each plot and before entering into another part indicates an increasing trend in livestock weight. Testing Difference between Two Means it was significant at the level of 0.05 (table 2,3).

Table. 2) Comparison of the weight of livestock at the time of entering the parts and at the end of the grazing season (2014)

Variable	Difference between Two Means (95%)	Std. Error Mean	Std. Deviation	t	P-Value
livestock weight (Kg)	1.7	0.44	0.766	3.7%	* 0.063

P>0/05*

Table. 3) Comparison of the weight of livestock at the time of entering the parts and at the end of the grazing season (2015)

Variable	Difference between Two Means (95%)	Std. Error Mean	Std. Deviation	t	P-Value
livestock weight (Kg)	1.7	0.4	0.565	11.5%	0.055 *

P>0/05*

Conclusions and Implications:

The results of the implementation of the grazing system using the electric fence showed that this management strategy has a positive effect on the weight increase of livestock in both areas due to the increased grazing duration of rangelands and the use of plant growth (quality forage) (Baghestani, et al., 2008, Sandgol, et al, 2006). The results of the study on the severity of grazing on key species and pathogenic species showed that the intensity of grazing on species with different palatability levels in two years evaluated the whole surface of each component was uniform and Even plants such as *Salvia limbata* and *Acanthopylom bracteatum*, which are considered to be class III plants and non-palatable, have been used sufficiently by livestock.

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