American-Eurasian J. Agric. & Environ. Sci., 13 (2): 250-260, 2013
ISSN 1818-6769

DOI: 10.5829/idosi.aejaes.2013.13.02.2946

Investigation of the Useable Indigenous Knowledge for Range Management: A Case Study of Northern Khorasan Province, Iran

[1]Mehdi moameri, [2]Mohammad Fayyaz and [3]Masoomeh Abbasi Khalaki

[1]Faculty of Natural Resource, University of Tehran, Iran
[2]Research Instructor, Range Research Division,
Research Institute of Forests and Rangelands, Tehran, Iran
[3]Faculty of Natural Resource, University of Tehran, Iran

Abstract: Understanding Indigenous Knowledge in rangelands helps to ensure that pastoralism practices. In addition it will cause the correct planning and also the accurate management of rangeland and livestock. This study was conducted in northern Khorasan province, Iran. This province lies between the coordinates 36° 42' to 38° 14' N latitude and 56° 31' to 58° 30' E longitude. Statistical population shepherds, ranchers and elders were that use of rangelands traditionally. Data were collected during fieldwork using interview and questionnaire. Four nomadic tribes and ten rural were selected. In each tribe or village, three people were selected and were performed interview. The information was also taken from workfield as well as through observation of the activities that shepherds and pastoralists had done in rangeland management. The descriptive statistical parameters such as frequency, frequency percentage, cumulative frequency percentage, mod, mean and standard deviation were used. Through these indigenous techniques, pastoralists have been able to survive in unpredictable environments, where conceptualization of ecological proceedings takes different forms, ranging from observable attributes to superstitious beliefs. It is important to recognize the existence and contribution of local knowledge to the livelihoods of pastoralists and the entire livestock production in the rangelands. Recognition of local practices and indigenous knowledge not only gives confidence to the pastoralists for the fact that their knowledge and skills are valued, but also leads to preservation and continued use of their local knowledge. Indigenous knowledge of can help broaden the scope of understanding of conventional range management and animal husbandry science. The integration of local knowledge systems and modern range science would allow for better results.

Key words: Indigenous knowledge · Pastoralism · Rancher · Range management · Shepherd

INTRODUCTION

Indigenous knowledge (IK) is the information that people in a given community, based on experience and adaptation to a local culture and environment, have developed over time and continues to develop. This knowledge is used to sustain the community and its culture and to maintain the genetic resources necessary for the continued survival of the community.

IK is a local knowledge derived from interaction between people and their environment and is characteristic of all cultures. It spans the entire range of human experience, including history, linguistics, art as well as technical aspects: agriculture, medicine, animal husbandry, engineering and fishing [1]. Traditional knowledge (TK) includes mental inventories of local biological resources, animal breeds and local plant, crop and tree species. It may include such information as trees and plants that grow well together and indicator plants, such as plants that show the soil salinity or that are known to flower at the beginning of the rains. It includes practices and technologies, such as seed treatment and storage methods and tools used for planting and harvesting. TK also encompasses belief systems that play

Corresponding Author: Mehdi Moameri, Faculty of Natural Resource, University of Tehran, Iran.

a fundamental role in a people's livelihood, maintaining their health and protecting and replenishing the environment. TK is dynamic in nature and may include experimentation in the integration of new plant or tree species into existing farming systems or a traditional healer's tests of new plant medicines [2].

The increasing attention in IK is receiving by academia and the development institutions have not yet led to a unanimous perception of the concept of indigenous knowledge. None of the definitions is essentially contradictory; they overlap in many aspects. IK is the local knowledge - knowledge that is unique to a given culture or society. IK contrasts with the international knowledge system generated by universities, research institutions and private firms. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resource management and a host of other activities in rural communities [3]. Indigenous Knowledge is the information base for a society, which facilitates communication and decision-making. Indigenous information systems are dynamic and are continually influenced by internal creativity and experimentation as well as by contact with external systems [4].

The importance of IK and effort in compilation of that with modern knowledge were considered and it was tried to make general and stable view in relation with environment and the way of living through this way [5]. Our today's world is the contradictions and collision's world. Contradictions there are between cultures, religions, different societies and countries. In recently years, from Renaissance till now, as much as human had developed, they also had contradictions and collisions in their world. One of these contradictions is the contrast between tradition and modernism. Maybe we can find these contrast roots in colonial era, the time when colonists promote their innovation in their colonies. Mostly these techniques and innovations show their Indigenous knowledge and the way of their living is foolish and inefficient and tried to enter industrial ways in to their life to increase production efficiency through this way. Thus the way of their living which was been formed during thousands of years has gone to be forgotten little by little [6]. A decade ago, there was very little research that focused on IK and there were even fewer examples of successful IK-based interventions. But since the early 1990s, IK has been fertile ground for research. With so much activity, there is now a wealth of information on the topic in fact, lots of "pieces" of information all over the place. Because IK research is still relatively new, comprehensive source materials are rare. Through extensive use of field examples and a review of current theory and practice, it provides a succinct and comprehensive overview of IK research and assessment [7].

Understanding IK in rangelands helps to ensure that pastoralism practices. In addition, it will cause the correct planning and also the accurate management of rangeland and livestock. In fact it should cater for sustainable food security and conservation of the variety and variability of animals, plants and very vital soil properties such as physical, biological and chemical properties.

The indigenous system of range management has complex features reflecting the interrelationships between human adaptation, environmental variability, systems of land use and local decision-making systems [8]. Indigenous rangeland management knowledge (as used by herders) is the product of environmental management over time [9]. Environmental condition, livestock production and the social milieu influence herder knowledge [10]. The main reason for continuous functioning of IK is that herders put the knowledge to continuous use [11]. In the words of a Somali elder ‘a rangeland cannot be a rangeland without pastoralists [knowledge] and a pastoralist cannot [practice pastoralism]…without rangeland’ [12] the two are mutually interrelated. Herders’ indigenous knowledge has potential for promoting local participation in the implementation of the global environmental conventions such as the UN Convention on Combating Desertification and Convention on Biological Diversity [13]. This would demand that range scientists become more familiar with indigenous knowledge; its concepts and functions [14]. Pastoralism is an ancient from of animal production often complemented with other activities such as crop production or practiced alone without any supportive activity [15]. The remoteness of the areas occupied by pastoralists as well as their continuous mobility has endowed pastoralists with a high degree of self-reliance and conservatism [16]. These factors must be borne in mind when designing or implementing research and development (R & D) activities targeted towards pastoralists. Many development ventures have failed because the concerned or target population was not specially addressed and its actual needs as well as technological potentials were not tapped [17]. This may

be appreciated considering that herders have evolved in-depth knowledge in terms of systems of landscape classification, using diverse environmental features such as topography, soil and the dominant vegetation. This is the knowledge that herders use to determine the spatial distribution of livestock grazing [18]. The landscapes have identities. The names describe the physical topography, soils and vegetation. Other names describe historical events. The landscape classification criteria may combine cultural events, such as historical settlements and the types of topography. Grazing landscapes used by herders include key resources grazed during the dry season or drought periods [19]. The key resources might include marshes, mountain grazing lands, river valleys and floodplains. Policies for alternative economic developments such as irrigated agriculture alienated the rights of herders' access to key resources by disrupting their flexible land use [20].

IK will cause the correct planning and also the accurate management of rangeland and livestock. In fact it should cater for sustainable food security and conservation of the variety and variability of animals, plants and very vital soil properties such as physical, biological and chemical properties. Conservation of Northern Khorasan's rangelands depends on human beings and their interaction with the environment which is very much related to the IK that has been communicated and passed down from generation to generation through family members and communities. The indigenous knowledge systems (IKS) among the ethnic Northern Khorasan province, Iran are unique and dynamic in nature changing through creativity and innovativeness. This knowledge is usually preserved by adults and passed down to younger generations by word of mouth, practice and informal educational system originating from the elaborate social interaction systems among the members of the Northern Khorasan province communities. So, Northern Khorasan province in Iran was selected for investigation, identification and documentation the indigenous knowledge of the herders about range management. This region has large pastoralist populations of different ethnicities and cultural groups, who manage, small ruminants in summary and winter rangelands. The practical utility of indigenous rangeland management knowledge for assessing impacts of traditional range management on the environmental requires knowledge of indicator types, which are crucial for decision-making by pastoralists and policy-makers. In general, main purposes of this study are; investigation, identification and documentation of the IK that by shepherds and ranchers are used in range management in Northern Khorasan province, Iran.

MATERIALS AND METHODS

Study Sites: This study was conducted in northern Khorasan province, Iran. This province lies between the coordinates 36° 42' to 38° 14' N latitude and 56° 31' to 58° 30' E longitude. The rangelands of this province are semi-arid and highly heterogeneous. The largest area of the province lands are devoted to rangelands. These rangelands divided into the dense (vegetation percent > 50%), semi-dense (vegetation percent = 25-50%) and low dense (vegetation percent = 5-25%). The low dense, semi-dense and dense rangelands are 52.8, 40.3 and 6.9% of the province rangelands, respectively. The region has complex landforms resulting from folding, faulting, volcanic eruptions and erosion. The climate is semi-arid with medium annual rainfall and high inter-annual variability. The average rainfall for northern Khorasan province during the past decade was approximately 268 mm.

Methodology: In Anthropology studies after researching the topic and goals, the first step is to identify groups of humans. In this studies a social unit such as clan, tribe, family etc. is chosen and be investigated. Statistical population of the herders in province was very broad and does not allow interviews with all bearers of IK. So, some people were chosen and field interviews were conducted. Statistical population in this study shepherds, ranchers and elders were that use of rangelands traditionally. Data were collected during fieldwork using interview and questionnaire. In this study four nomadic tribes and ten rural were selected. In each tribe or village, three people were selected and were performed interview (Fig. 1).

Nomadic tribes in North Khorasan province are: Bachvanloo, Badele kooh, Brimanloo, Pahlevanloo, Topkanloo, Diranloo, Sarkhani, Ghelyanloo, Ghahramanloo, Kavanloo, Keykanloo, Malavanloo, Mylanloo. In this study, indigenous knowledge of four famous clans *viz*. Bachvanloo, Mylanloo, Sarkhani and Keykanloo were studied.

For investigation of the IK in rural regions were consulted with experts of Department of Natural Resources and Tribal Affairs of North Khorasan province.

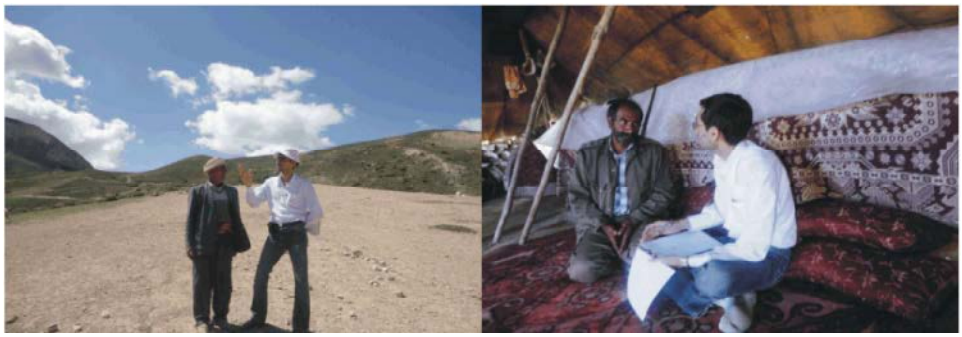

Fig. 1: Images of interview with ranchers.

Fig. 2: Observation of the rancher's activities.

Table 1: Scoring of Likert scale.

Selection switch	Never	Very low	Low	Average	High	Very high
Score	0	1	2	3	4	5

The experts have introduced villages that had a long history in pastoralist, rancher and range management. In rural regions of this province most ranchers use of rangeland the common. Ten villages studied were: Keshanak, Chamanbid, Azadegan, Roeyn, Bam, Badranloo, Kolab, Pishidareh, Tabar and Hashtmark. The information was also taken from workfield as well as through observation of the activities that shepherds and pastoralists had done in rangeland management (Fig. 2).

Validation of data has been done through interview and dialogue with ranchers, elders and shepherds who were experienced and informed and also knows more and understand the rangelands in which they ranch and that answers to many questions can be found in the collective experience of the rancher community and doing informal experiments over the years. In social sciences and humanities researches, most used to of the measure attitudes scales. The most famous of these scales are: Likert, Semantic differential, Thurston, Guttman, Bugardus. Likert scale is one of the most common and popular scales. So, in this research for scoring to the questions of questionnaires Likert scale was used.

It is a psychometric response scale primarily used in questionnaires to obtain participant's preferences or degree of agreement with a statement or set of statements. Likert scales are a non-comparative scaling technique and are unidimensional (only measure a single trait) in nature. Respondents are asked to indicate their level of agreement with a given statement by way of an ordinal scale. Most commonly seen as a 5-point scale ranging from "Strongly Disagree" on one end to "Strongly Agree" on the other with "Neither Agree nor Disagree" in the middle; however, some practitioners advocate the use of 7 and 9-point scales which add additional granularity. Sometimes a 4-point (or other even-numbered) scale is used to produce an ipsative (forced choice) measure where no indifferent option is available. Each level on the scale is assigned a numeric value or coding, usually starting at 1 and incremented by one for each level.

In this study a 6-point scale is used. Likert scale outlined in Table 1. Then the data were put in the statistical analysis. Analysis was conducted as descriptive. The descriptive statistical parameters such as frequency, frequency percentage, cumulative frequency percentage, mod, mean and standard deviation were used. Data analysis was performed by $SPSS_{16.0}$ software.

RESULTS

Investigation of Ik of Ranchers and Shepherds about Range Suitability: Data analysis based on Likert scale showed that IK and informed 52.4% ranchers and shepherds about range suitability was high. Therefore, mod is high switch. Standard deviation is 0.85, too (Table 2).

Investigation Knowledge and Informed of Ranchers and Shepherds about Range Plants and Rangelands Landscape: Data analysis based on Likert scale showed that IK and informed 40.5% ranchers and shepherds was average. Therefore, mod is average switch. Standard deviation is 0.9, too (Table 3).

Investigation of Knowledge and Informed Ranchers and Shepherds about Effects of Climate Changes on Range and Livestock Management: Data analysis based on Likert scale was showed that IK and informed 47.6% ranchers and shepherds was high. Therefore, mod is high switch. Standard deviation is 0.67, as well (Table 4).

Investigation of Knowledge and Informed Ranchers and Shepherds about Forage Supply: Data analysis based on Likert scale was showed that forage supply for 54.8% ranchers was average. Therefore, mod is average switch. Standard deviation is 0.62, too (Table 5).

Investigation of Knowledge and Informed Ranchers and Shepherds about Livestock Grazing Management: Data analysis based on Likert scale was showed that IK and informed 61.9% ranchers and shepherds was average. Therefore, mod is average switch. Standard deviation is 0.62, too (Table 6).

Investigation of Knowledge and Informed Ranchers and Shepherds about Effect of Guidance the Flock on Rangelands Management: Data analysis based on Likert scale was showed that IK and informed 52.4% ranchers and shepherds was average. Therefore, mod is average switch. Standard deviation is 0.61, too (Table 7).

Investigation of Knowledge and Informed Ranchers and Shepherds about Accessible Water and Grazing Management: Data analysis based on Likert scale was showed that IK and informed 57.1% ranchers and shepherds was high. Mod is high switch. Standard deviation is 0.5, too (Table 8).

Investigation of Knowledge and Informed Ranchers and Shepherds about Strategies of Rangeland and Livestock Management in Times of Drought: Data analysis based on Likert scale was showed that 50% ranchers and shepherds had have low strategies. Therefore, mod is low switch. Standard deviation is 0.7, too (Table 9).

Table 2: Frequency distribution of knowledge and informed about range suitability.

Variable	Selection switch/ Likert scale	Frequency	Frequency%	Cumulative frequency %	Other statistics
Range suitability	Never	0	0	0	S.E= 0.85
	Very Low	0	0	0	Mod= High switch
	Low	8	19	19	
	Average	10	23.8	42.9	
	High	22	52.4	95.2	
	Very high	2	4.8	100	
Sum	-	*42*	*100*	-	

Table 3: Frequency distribution of knowledge and informed about range plants and rangelands landscape.

Variable	Selection switch/ Likert scale	Frequency	Frequency%	Cumulative frequency %	Other statistics
Range plants and	Never	0	0	0	S.E= 0.9
rangelands landscape	Very Low	3	7.1	7.1	Mod= Average switch
	Low	15	35.7	42.8	
	Average	17	40.5	83.3	
	High	6	14.3	97.6	
	Very high	1	2.4	100	
Sum	-	*42*	*100*	-	

Table 4: Frequency distribution of knowledge about effects of climate changes on range and livestock management.

Variable	Selection switch/ Likert scale	Frequency	Frequency%	Cumulative frequency %	Other statistics
Effects of climate	Never	0	0	0	S.E= 0.67
changes on range	Very Low	0	0	0	Mod= High switch
and livestock	Low	3	7.1	7.1	
management	Average	18	42.9	50	
	High	20	47.6	97.6	
	Very high	1	2.4	100	
Sum	-	*42*	*100*	-	

Table 5: Frequency distribution of knowledge and informed of the ranchers and shepherds about forage supply.

Variable	Selection switch/ Likert scale	Frequency	Frequency%	Cumulative frequency %	Other statistics
Forage supply	Never	0	0	0	S.E= 0.62
	Very Low	0	0	0	Mod= Average switch
	Low	4	9.5	9.5	
	Average	23	54.8	64.3	
	High	15	35.7	100	
	Very high	0	100	-	
Sum	-	*42*	-	-	

Table 6: Frequency distribution of knowledge and informed about livestock grazing management.

Variable	Selection switch/ Likert scale	Frequency	Frequency%	Cumulative frequency %	Other statistics
Livestock grazing	Never	0	0	0	S.E= 0.62
management	Very Low	0	0	0	Mod= Average switch
	Low	4	7.1	7.1	
	Average	26	61.9	69	
	High	12	28.6	97.6	
	Very high	1	2.4	100	
Sum	-	*42*	*100*	-	

Table 7: Frequency distribution of knowledge and informed about effect of guidance the flock on rangelands management.

Variable	Selection switch/ Likert scale	Frequency	Frequency%	cumulative frequency %	Other statistics
Effect of guidance the	Never	0	0	0	S.E= 0.61
flock on rangelands	Very Low	0	0	0	Mod= Average switch
management	Low	17	40.5	40.5	
	Average	22	52.4	92.9	
	High	3	7.1	100	
	Very high	0	0	0	
Sum	-	*42*	*100*	-	

Table 8: Frequency distribution of knowledge and informed about accessible water and grazing management.

Variable	Selection switch/ Likert scale	Frequency	Frequency%	Cumulative frequency %	Other statistics
Accessible water and	Never	0	0	0	S.E= 0.5
grazing management	Very Low	0	0	0	Mod= high switch
	Low	0	0	0	
	Average	18	42.9	42.9	
	High	24	57.1	100	
	Very high	0	0	0	
Sum	-	*42*	*100*	-	

Table 9: Frequency distribution of knowledge and informed about strategies of rangeland and livestock management in times of drought.

Variable	Selection switch/ Likert scale	Frequency	Frequency%	cumulative frequency %	Other statistics
Strategies of rangeland	Never	0	0	0	S.E= 0.7
and livestock	*Very Low*	*13*	*31*	*31*	*Mod= Low switch*
management in	*Low*	*21*	*50*	*81*	
times of drought	Average	8	19	100	
	High	0	0	0	
	Very high	0	0	0	
Sum	-	*42*	*100*	-	

DISCUSSION

The results of investigation of the knowledge and informed showed that range suitability is one of the important topics that the shepherds and ranchers attention to it for rangelands management and livestock grazing. They prevent entering livestock to the steep areas that can cause damage to livestock and rangeland. Moreover, some parts of rangelands that have accessible water and favorable forage by shepherds and ranchers are good. Shepherds have paid much attention to the rangelands topography. They were claim that the topography affect of the herd grazing, the herd management, herd movement in rangeland, the resting place and move toward trough (or reserve water). Because, maybe some of the places have suitable a forage for livestock grazing, but slope be high (slope>60%) and so shepherds ignore the herd grazing on it. In steep areas, shepherds try the herd move perpendicular to the slope. So, forage is trampled lower. In addition to, in these areas, shepherds never allow the herd move from the top to down and towards trough. Therefore it is prevented from entering the livestock waste and stones and pebbles into trough.

Almost 57% of the ranchers and shepherds have knowledge and awareness average to high about range species, topography and rangelands landscape. Traditionally the shepherds divide rangeland use into several major categories depending on the solar radiation and the dominant vegetation type. These are Zemang, Barooj, Ulang, Goneshk and Bashadav rangelands. Principally there are no formal laws determining this pattern of use. Zemang rangelands are the rangelands back to the sun and the northern slopes. Usually, when the temperature increases these areas are used. Barooj rangelands are the rangelands to the sun and the southern slopes. Usually, when it is the cold or rainy are used. Ulang rangelands are the rangelands that are covered with grass and forbs and usually are observed in the valley floor. Shepherds believe that these are the best places for grazing lambs. In other words, these rangelands are the soft ground and suitable for lambs. Because, lambs have soft hooves and in other rangelands are damaged. Bashadav rangelands are the rangelands back to the sun. They are more forage than Zemang rangelands but later they are ready for grazing. Goneshk rangelands are the rangelands back to the sun. Kilongozi *et al*. [21] reported that traditionally the Barbaigs divide rangeland use into two major categories depending on the season and the nature of the climate. These are dry season's pastureland and rainy season's pastureland. Principally there are no formal laws determining this pattern of use. Their use is governed by traditional institutions mostly decided by the council of elders; the 'kwarukwa' who ensure that grazing is undertaken for the benefit of the entire pastoralist community in the area. It is the role of these elders or heads of households to decide which part of the rangelands in the village proximity is suitable for grazing at that time. Some areas are deferred for future use, usually during the dry season. In this case special areas are reserved for weak animals and calves. These areas known as 'radaneda' are always close to Barbaig homesteads and are considered rich in both pasture and water resources. Rotational grazing Barbaig pastoralists use rotational grazing as a strategy for effective utilization of rangelands. These classifications of rangelands by the shepherds and ranchers for livestock and rangeland management are very important. In early spring because of Barooj rangelands are the sooner are readiness, first, the herd is entered the rangelands. Then herd is entered Zemang rangelands. This is a sample of rotation grazing in official knowledge in official science of the range management. Therefore, by combing shepherds indigenous knowledge and formal knowledge can be applied a comprehensive management for rangelands management. Barani [22] reported that these words are well known to shepherds and ranchers and they when hear these words can explain appearance and characteristics of the rangelands.

Shepherds have a good understanding about rangelands plants. They know names of plants, medicinal properties, place of growth, their nutritional value and the degree of soil conservation. For example, they point out that *Stachys lavandulifolia*, *Thymus kotschyanus*, *Ferula gummosa* and *Hyoscyamus niger* etc. are medicinal. Bizimana [23] express both men and women of the Maasai and Barbaig ethnics can describe every forage plants' palatability to different animal species they keep; they also understand various plants' seasonality, nutritiousness, toxicity and other pharmacological benefits.

Generally, almost 93% of the ranchers and shepherds have knowledge and awareness average to very high about effects of climate changes on range and livestock management. This showed that shepherds and ranchers in Northern Khorasan province have long attention to the climate. They pointed out that in order to increase livestock productions attention to plants type and growth period, the effects of climatic factors on the rangelands, plants, time and manner of livestock grazing is essential. Therefore, shepherds and ranchers are equipped with Short-term calendars of pastoralism. Kilongozi *et al*. [21] expressed traditional systems such as observation of stars, moon shapes, birds, flowers and month counting can be used in predicting weather. These systems can also be used in range assessment and improvement, such as rotational grazing, burning pastures to regenerate growth, reduction of parasite infestation and killing of undesirable plant species; traditional animal therapy (ethno veterinary) and mobility to disperse grazing pressure. Avatefi hemat [24] reported that although now the relative importance of these forecast due to the weather radio and TV news is less than last, but short-term forecasts on the local scale are very important and in most cases they are more accurate than official forecasts. These are very important for nomadic shepherds that live away from the audio-visual facilities. For example, in the migration time decision to move livestock between different dwellings during several days, depend strongly on the weather forecast. Even incorrectly forecast or not notify of weather may lead to livestock losses by frost or hail and snow. Moreover, time to go to the mountain to collect medicinal and edible plants is also true.

Shepherds and ranchers are a complete knowledge about the effects of temperature on livestock, rangelands and plants. Shepherds believe that rising temperatures in spring lead to increase plant growth, snow melt, drying of soil surface of the summer rangelands and range readiness. Increase temperature during summer lead to drying and reduction of the desirable forage in the rangelands, as well. This may be cause animal disease, too. Decrease of temperature during autumn lead to move towards the winter rangelands. If do not pay attention to the effects of temperature on plants, maybe herd earlier than promised have been arrived to summer rangelands and thus cause premature grazing and degradation it. Shepherds are a lot of information about the snow effects on rangeland plants, too. They stated in the years that during the winter, snow is less or no snow; root eater worms arise and destroys plants root. But in the years since the snow is high, these worms are destroyed. High snow leads to the spring probe, as well. Shepherds and ranchers state that rain and snow increases plant vegetation and rangelands production. They know that rain and snow at different times of the year and season has what effect on vegetation and rangelands production. They believe that the rainfall during the winter have a large impact on trees and shrubs. While the winter rainfalls have little effect on grasses and forbs. But, spring rainfalls have great impact on grasses and forbs. Shepherds report that spring rains hourly increases the growth of forbs and grass. But, summer rainfalls will cause the cleaning of range plants and as a result healthier forage to get the livestock. The livestock diseases are also reduced.

Ranchers express that the fodder resources available to livestock vary with the temperature, snow, rain, topography, soil, wind and season. Generally, almost 90% of the ranchers are faced with a shortage of forage in rangelands. Therefore, it essential livestock forage requirements is bought from farmers. Ranchers state that one of main problem of ranch on rangeland is the shortage of forage. They point out the key to survival lies in balancing forage supplies with the animals' daily demand for dry matter, as well as their ever-changing requirements for diet quality. A forage inventory can assist ranchers in budgeting forage and in making culling decisions.

Almost 92% of the ranchers and shepherds have knowledge and awareness average to very high about livestock grazing management. The reason is that shepherds and ranchers of past times were given to the livestock selective grazing, benefits of the night grazing compared to daily grazing, grazing uniform distribution on rangelands, select the best place for livestock grazing and rest. Shepherds always try that prevent of the livestock selective grazing on rangelands. Because, it is cause palatable plants weakens and eventually are destroyed. Shepherds try for livestock uniform distribution on rangelands that this is one of the ways to reduce the selective grazing. The livestock night grazing reduces the selective grazing, as well.

The livestock grazing place such is chosen that the possibility not passes a day before the herd it. Shepherds in the precipitation times graze herd on the gravel or rocky rangelands. Because the livestock in this rangelands will not sink into the mud and graze easier. In addition, the rangelands surface trample is less. The Forage under animal's hooves not is destroyed, as well.

When the weather is cold and the wind is blowing, the shepherds will take the flock to ranges of back the wind. The shepherds believe that if the cold weather (winds) deals directly livestock, the livestock milk reduce. Shepherds conduct flock to places that have favorable forage and palatable plants are abundant. The benefit of this process is that livestock in less time get the most energy. Of course, livestock generally prefer to expend the least amount of energy possible. That makes them predictable in their grazing behavior. They will choose "convenience areas." Convenience areas are areas within a rangeland that, because of their proximity to water, level terrain and/or high quality forage is preferred by grazing livestock. The livestock rest in two times (night and day) and two places. The livestock daily resting place will depend on the trough location and so shepherds cannot the decision maker. But, the livestock night resting place is elected directly by shepherds. This place in open rangelands is must have several characteristics: it is like a shelter, herd dogs have a wide view order for not suffered to be rust wolf, it is not the flood path, it be protected from the wind and it is a gravel mode. Shepherds say that grazing management will adequately protect vegetative cover and physical conditions and maintain, restore, or enhance water quality to meet resource objectives. Grazing management will maintain existing habitat or facilitate vegetation change toward desired habitats. Grazing management will consider threatened and endangered species and their habitats.

Shepherds believe that the herd true guide is closely related to the rangelands degradation and/or degradation. If herd do not guided properly, it may moves as the train. As a result, is created the micro traces on rangelands. But, if herd do guided properly, will maintained rangeland soil. The result, soil nutrients are preserved and plants can use it. These management practices will either maintain existing desirable conditions or move rangelands toward statewide standards within reasonable timeframes. In other words, for maintain desirable conditions and/or recover from disturbance within acceptable timeframes, plant communities must have the components present to support the nutrient cycle and adequate energy flow. Plants depend on nutrients in the soil and energy derived from sunlight. Nutrients stored in the soil are used over and over by plants, animals and microorganisms. The amount of nutrients available and the speed with which they cycle among plants, animals and the soil is fundamental components of rangeland health.

Almost 100% of the ranchers and shepherds have knowledge and awareness average to high about accessible water and grazing management. Ranchers and shepherds express that the strong interrelationship is between livestock behavior and water quality and quantity. Water associated with grazing land is influenced by livestock distribution. Landscape characteristics that may influence livestock distribution include: livestock water (kind, location, quantity and quality), shade (presence or absence, location, canopy characteristics), topography, landscape temperature differentials, prevailing winds and facility (feeders, rubs, etc.) locations. Relationships between landscape characteristics, rangelands conditions and facilities determine where livestock will likely graze and congregate and thus the location and relative degree of defoliation and waste deposition. Water locations preferred by livestock strongly influence where livestock graze and congregate because thirst is a primary physiological demand. Loafing and social behavior tend to prolong livestock concentration around watering points. Loafing may be prompted by the need to rest, ruminate and/or take advantage of evaporative cooling or shade. Social interactions that tend to be concentrated around watering points include pecking order establishment, suckling and breeding. Livestock preference between similar watering facilities in the same rangeland is usually determined by prevailing wind direction, proximity to shade, location of salt/mineral supplements, feed and/or other factors that satisfy physiological needs. In general, the ranchers and shepherds point out that palatability and water temperature significantly influence water consumption. Some of shepherds said that livestock drinks brackish waters better of absolutely fresh waters. A variety of safety concerns may also exist in and/or near watering facilities. Livestock also instinctively prefer watering at locations having good visibility to avoid predation. Water sited in topography that limis livestock access tends to be used less resulting in over use of other water sources or reduced intake by livestock (reducing animal performance). Properly placed water facilities have the potential to enhance grazing distribution and allow safe and easy access to palatable water. Troughs, supplied by pipelines from wells or springs, can be strategically located to provide a water source in a desirable portion of the rangelands and in topography that allows easy access by livestock.

The results showed that 81% of the ranchers and shepherds had low and very low strategies about rangeland and livestock management in times of drought. A few strategies to put ranchers in this area include; sales of livestock, lease the farms in large sizes, purchasing of the forage and/or move livestock to rangelands where the drought has had less impact on. Ranchers depend upon the natural production of rangeland grass and other forage plants to feed their free ranging livestock. In reality, ranchers utilize domestic livestock to market the forage that is produced on the range. When we think about drought management from this viewpoint, it becomes obvious why it is important to have an understanding of how drought affects rangeland forage production and more importantly, how we management practices can help buffer the consequences of drought when it comes.

CONCLUSIONS

Northern Khorasan's rangelands should be managed with consideration of the State's historical, cultural and social development and in a manner which contributes to a diverse, balanced, competitive and resilient economy in order to provide opportunity for economic development. The combination of IK and formal knowledge, pay attention to the culture of the indigenous people and following healthy rangelands can best sustain these uses.

Given the fast changing social, economic and development policies on the use of natural resources and rangelands especially, there is need for the Ministry of Government to focus on the use and management of the rangelands. Unfortunately, now rangelands and ranchers have not received adequate attention they deserved. The lack of concern for pastoral communities and their production system is leading to gradual decline in productivity of rangelands, loss of biodiversity and increased marginalization of herders.

Through these indigenous techniques, pastoralists have been able to survive in unpredictable environments, where conceptualization of ecological proceedings takes different forms, ranging from observable attributes to superstitious beliefs. It is important to recognize the existence and contribution of local knowledge to the livelihoods of pastoralists and the entire livestock production in the rangelands. Recognition of local practices and indigenous knowledge not only gives confidence to the pastoralists for the fact that their knowledge and skills are valued, but also leads to preservation and continued use of their local knowledge. IK can help broaden the scope of understanding of conventional range management and animal husbandry science. The integration of local knowledge systems and modern range science would allow for better results.

ACKNOWLEDGMENTS

We would like to thank National Elite Foundation and Research Institute of Forests and Rangelands, Iran for economical supports of fulfillment of this project.

REFERENCES

1. Kroma, S., 1995. Popularizing science education in developing countries through indigenous knowledge. Indigenous knowledge and Development Monitor, 3: 13-15.
2. Hansen, S.A. and J.W. Van Fleet, 2003. A Handbook on Issues and Options for Traditional Knowledge Holders in Protecting their Intellectual Property and Maintaining Biological Diversity. American Association for the Advancement of Science (AAAS) Science and Human Rights Program, pp: 82.
3. Warren, D.M., 1991. "Using Indigenous Knowledge in Agricultural Development"; World Bank Discussion pp: 127. Washington, D.C. The World Bank.
4. Flavier, J.M., 1995. The regional program for the promotion of indigenous knowledge in Asia", pp; 479-487 in Warren, D.M. L.J. Slikkerveer and D. Brokensha (eds) The cultural dimension of development: Indigenous knowledge systems. London: Intermediate Technology Publications,
5. Popzan, A., 2002. Design and compilation of indigenous knowledge, modern media in order to achieve a partnership approach in Kermanshah province - end of period letter PhD Tehran University Faculty of Agriculture to help Azkia and Seyed Mahmoud Hosseini.
6. Bouzarjmehri, K.H., 2004. Indigenous farming knowledge of gender and its role in Rural Development and Research, Centre of Quarterly Tehran University Women (Women's Research).
7. Grenier, L., 1998. Working with Indigenous Knowledge - A Guide for Researchers, IDRC, Ottawa. Published by the International Development Research Centre PO Box 8500, Ottawa, ON, Canada K1G 3H9, ISBN 0-88936-847-3, pp: 130.

8. Little, P.D., 2003. Pastoral ecologies: Rethinking interdisciplinary paradigms and the political ecology of pastoralism in East Africa. In African savannas: Global narratives and local knowledge of environmental change, ed. Bassett, TJ and D Crummey, pp: 161-177. Oxford: James Currey.
9. Ford, J. and D. Martinez, 2000. Traditional ecological knowledge, ecosystem science and environmental management. J. of Ecological. Applic., 10: 1249-1250.
10. Boardman, J., J. Poesen and R. Evans, 2003. Socio-economic factors in soil erosion and conservation. J. Environ. Sci. Policy. 6: 1-6.
11. Grice, A.C. and K.C. Hodgkinson, 2002. Challenges for rangeland people. In Global rangelands progress and prospects, ed. Grice, AC and KC Hodgkinson, pp: 1-9. Wallingford, UK: CABI Publishers.
12. Bouh, A.M. and Y. Mammo, 2008. Indigenous conflict management and resolution mechanisms on rangelands in Somali Regional State, Ethiopia. J. of Nomadic Peoples, 12: 109-121.
13. Oba, G., E. Sjaastad and H.G. Roba, 2008. Framework for participatory assessments and implementation of global environmental conventions at the community level. J. Land Deg. Dev., 19: 65-76.
14. Mapinduzi, A.L., G. Oba, R.B. Weladji and J.E. Colman, 2003. Use of indigenous ecological knowledge of the Maasai pastoralists for assessing rangeland biodiversity in Tanzania. African J. Ecol., 41: 329-336.
15. Allen, W., 1965. The African Husbandman. New York: Barnes and Noble, pp: 216.
16. Gauthier-Pilters, H. and A. Dagg, 1981. The Camel: Its Evolution, Ecology, Behavior and Relationship to Man. Chicago: University of Chicago Press, pp: 208.
17. Hogg, R., 1990. An institutional approach to pastoral development: an example from Ethiopia. Pastoral Development Network, Paper No. 30D, London, ODI, pp: 18.
18. Scharieka, N., 2001. Environmental knowledge and pastoral migration among the Wodaabe of south-eastern Niger. Nomadic Peoples, 5: 65-88.
19. Angassa, A. and G. Oba, 2007. Relating long-term rainfall variability to cattle population dynamics in communal rangelands and a government ranch in southern Ethiopia. J. of Agric. Syst., 94: 715-725.
20. Kassahun, A., H.A. Synman and G.N. Smit, 2008. Impact of rangeland degradation on the pastoral production systems, livelihoods and perceptions of the Somali pastoralists in Eastern Ethiopia. J. Arid Environ. 72: 1265-1281.
21. Kilongozi, N., Z. Kengera and S. Leshongo, 2005. The Utilization of indigenous knowledge in range management and forage plants for improving livestock productivity and food security in the Maasai and Barbaig communities. pp: 52. Available in: www. fao. org/sd/ LINKS/ documents _ download / Nelson_41.pdf.
22. Barani, H., 2003. Investigation of the culture fundamental of range management among ranchers of the west Alborz, Iran. Thesis of Ph.D. University of Tehran, pp: 700.
23. Bizimana, N., 1994. Traditional Veterinary Practices in Africa. Published by Cooperation of republic Germany ISBN 3-88089-502-1.
24. Avatefi Hemat, M., 2006. Study of rural knowledge about natural resource (Case study: Chatan village, Iran). Thesis of M.Sc. University of Tehran, pp: 152.