



# A review on the role of indigenous knowledge in rearing livestock in rangelands (Olad village, Andika, Khuzestan province, Iran)

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## Abstract:

Cultural ecology is a knowledge that examines the cultural aspects of the relationship between human being and its surrounding. In this regard, this study with a qualitative method and a naturalistic approach using a technique that focused on groups and also a profound interview has investigated indigenous ecological knowledge to manage the herds in Olad village, Andika town, Khuzestan province, Iran, 2016. The findings of the study showed that the people living in this village for many years use their local knowledge in order to interact with the surrounding environment, breeding and keeping livestock in various pasture. They also divide the pastures based on recognizing the need in any physiological stage of livestock. In this regard, they acquired ecological memory in the field of livestock identification. They also have acquired indigenous knowledge in all fields, including mating and calving, time management, taking care of lambs, young goats, breastfeeding or milking, and forming the structure and composition of the herds according to the cultural and environmental conditions. They have a pity on the treatment of livestock and culture of collaboration and co-operation in using pastures. Ultimately, the present study confirmed the protective aspects, and economic, social, cultural and indigenous knowledge of villagers in order to express their potential natural resources and also upgrade their development physically and spiritually. It has been stated that indigenous ecological knowledge of herders plays an important role in the stability of land and livestock management and also all natural fields.

**Keywords:** Herd formation; Indigenous knowledge; Rearing livestock; Olad village

## 1. Introduction

Landscapes are complex creative systems that are continually transformed due to ever-changing relationships among environments and organisms including human beings. During the past half-century, those who study these relationships and ones who manage them have become increasingly isolated from one another in their attempts to understand and manage landscapes [1]. Human ecology is the study of interactions between organisms and their surrounding environment and in fact, the study of culture derived from man's relationship with the nature studied as a knowledge called cultural ecology. Cultural ecology is a knowledge that analyzes the interactions and relationships between human beings and the environment. One of the aspects discussed in cultural ecology is the indigenous knowledge of pasture ben-

eficiaries in managing livestock herds in natural fields [2]. Ranching or livestock system is a kind of animal husbandry; on contrary, its main purpose is to keep livestock with an emphasis on providing all or the majority of animal forage by grazing on the pasture and agriculture [3]. In general, common indigenous knowledge in rural communities is one of the most important economic and social components of rural development, animal husbandry and utilization of pastures in the different regions where herders and rural communities through this knowledge used pastures for hundred years [4]. The indigenous technical knowledge (ITK) of animal husbandry is considered as old as domestication of various livestock species [5]. Accordingly, researchers in the field of indigenous knowledge paid much attention to the ways in order to use pastures traditionally and they have achieved some results. Afsharzadeh and Papzan in a study

have expressed the role of indigenous knowledge of animal nutrition in Kalhor nomadic tribe, Iran [3]. They stated that nomadic herders have a special attention to the differences of dietary patterns in the various physiological processes such as pre-mating, pregnancy, lactation, and pasture evaluation and management as one of the most important sources in order to provide livestock feeding in a nomadic system. Muammeri et al. reviewed the beneficiaries on livestock grazing management in the pasture and have suggested that farmers and shepherds have a lot of knowledge in various fields of grazing livestock, including livestock distribution, utilizing of monotonic pasture, grazing night, choosing the rest place of livestock, site selection, grazing, segmentation of pasture with traditional methods and also safe drinking water of livestock [6]. They used a lot of strategies in order to keep the pastures. Devaki and Mathialagan have studied various ways of traditional dairying, keeping sheep and goats, poultry farming and breeding ducks in Kanchipuram of India [5]. They stated that traditional knowledge as an experience forms familiar and unfamiliar challenges. Oba, in a study has examined Shepherd's indigenous knowledge to manage pastures in three African regions [7]. In this study, she helped shepherds to evaluate rangelands and stated that special knowledge has been used for an ethnic group considering the basis for decision-making on problems and rangeland shepherds using human-ecological indicators. For example, shepherds used key species to assess grazing suitability as well as grazing in the soil. In another study, Oba et al. have suggested that pastor's participation in decision-making is one of the basic principles of pasture management to monitor and assess the environment [8]. Therefore, it must be acknowledged that pastors or shepherds have a useful knowledge to manage pastures over the generations and their knowledge is quantifiable and comparable; moreover, it can be contributed in political decisions for pastures. Kakinuma et al. have also studied shepherd as a factor that understands the pastoralist strategy during droughts to change the key resources and distance traveled, and they finally have defined two strategy groups: They used key resources for small herds moving short distances, and for large herds long distances that they moved to other areas instead of using key resources in areas with higher rainfall and more plants [9]. They stated that the changes express in expenses related to the long-distance travel and it shows that the degradation caused by grazing can occur at multiple scales. Consequently, degradation of key resources in the studied area which corresponds to the distance traveled may occur on a small scale for small flocks. Accordingly, the present study aims to examine indigenous knowledge of ranchers in Olad village in the field of herd management through a traditional way, and tries to take a step towards evaluating, analyzing and identifying this knowledge.

## 2. Materials and methods

### 2.1 Study area

To do this research, it selected Olad village located in Abezhdan region, Andika town, Khuzestan province of Iran. The average annual rainfall based on data from the nearest

weather station on Abezhdan region is About 715 mm, and the minimum and maximum annual temperature is 6°C and 43.8°C, respectively. According to statistics obtained from the local Health House, the population of this village is 290 people and 56 households. But most people of this village were illiterate or unable to read or write. All residents belong to Bakhtiari tribe and they use Bakhteyari dialect in their communications. Tribes living in rural areas are mostly Kotaki and Murry and they are all related to each other and they are also all Shi'a Muslims. In the past, the most common jobs of residents were animal husbandry and agriculture, but today, in addition to animal husbandry and agriculture, they sometimes do self-employed work. The climatic conditions in this area have changed the village as winter quarters. Climatic conditions, topography and vegetation area diversity have provided the possibility to keep a variety of light and heavy livestock. The villagers keep these animals for their own production such as meat, milk and wool. Herders in this village use pastures commonly. Milking the sheep is done in the spring and summer and for this purpose, the animals have been brought in the barn and then, they have been returned to the pasture for grazing again. The herbal landscape of arena is shaped like herbaceous plants, shrubs, trees, and shrubs. Type of pastures in this region is wooded, mountainous pastured of agricultural lands.

### 2.2 Research methodology

This study was done as a qualitative method with naturalistic approach. The purpose of the naturalistic approach with the scientific method is to understand the relationship between livestock ranchers and their natural environment. It addresses the role of nature in the formation of indigenous knowledge, and what kind of knowledge of farmers has been taking account with regard to the environmental conditions. Some executive techniques were used for focus group and in-depth interviews. Commensurate with the nature of qualitative research that does not follow statistical sampling, it was used as a purposive sampling in this study. In purposive sampling, the goal is selecting the cases they have a lot information with regard to the research topic [3]. In this research, the purposive sampling was used selectively in order to achieve the same objective.

It means that while visiting the village, certified and experienced men with high age related to the herd management in the pasture had traditionally been selected. The statistical population in this study included men living in Olad village. To identify people based on full recognition, the researcher easily selected ones living in the village. It should be noted that to understand the nature of research, it is necessary to become familiar with the culture and language of their indigenous knowledge, so in this study, the researcher was familiar with the dialect and culture of people living in the village so that there was no need for the help from an interpreter or local adviser. It should not be forgotten that this research has been done with a high accuracy since it includes direct observation and cooperation with the owners of this knowledge and in this respect, it can be considered as an excellent advantage. To conduct this study,

four experts were interviewed. In other words, to identify people who were experienced with an average age of more than 60 years and with over 50 years experience in the field of management and keeping the herd, nine people were identified and ultimately, four knowledgeable men were selected for profound interview. For this reason, people over the age of 60 were used due to their average age and livestock occupations because they had more indigenous knowledge to manage their herds. Also, in this study, based on purposeful and selective sampling, 4 out of 9 people with the most referrals were selected as sample members. Take noting of the contents was done simultaneously and the content analysis was conducted for data analysis after general study noted subjects. The discussion was categorized in different domains and the related data were placed in the same domain. The main research questions that the researcher sought to answer were designed in a way that can get the most information in all areas of traditional herd management, and they were approved by experienced and knowledgeable experts. Considering the purpose of the research, the study of indigenous knowledge of herd management in Olad village, the main research questions are designed based on a comprehensive understanding of this knowledge.

The main research questions were:

1. How do villagers use pasture as the main source of livestock feed?
2. How is livestock feeding done in various physiological conditions?
3. What is the difference between livestock feeding with each other? [3].
4. What are the criteria for herd classification?
5. How are animals identified and separated?
6. What is the division of pastures based on?
7. How is it keeping and feeding lambs and goats?
8. How does time management do mating and breeding?
9. Based on what features and conditions are the rams and their number determined?
10. In what cases are the main activities of animal health done?

### 2.3 Livestock feed source

In general, herders in Olad village use supplementary forage of two postural nutrient resources of agricultural lands, mountain pastures and steep slopes in winter. There is no limitation in using pastures of agricultural lands in terms of numbers and type of livestock for village pastoralists as well as nearby villages; however, they have adopted an approach about alpine pastures, which is based on the principles of ancient ancestors. They created special strategy to observe grazing capacity traditionally to use alpine pastures. In this strategy, out of all the Mountain Shoo pasture, 400 shares had been bought and divided among 7 tribes Gandali, Keyaresy, Monjezi, Mori, Kotaki, Sadat Saleh Kotah and Madmalil. In this division, the highest share is 200 toman, of the total rangelands of Kuh-e-Shu, and in the same proportion, the largest area belongs to the Gandali tribe and the lowest share belongs to the Kataki tribe.

Each tribe is required to consider the mountain grazing (Kochhareh) based on the number of livestock and pasture area. There are several families in each tribe that may not be ranchers. So, they can award their pasture right with giving a permission to the rancher who does not have any share of mountain pasture (Mountain Shoo) for a grazing period in autumn or spring to the pasture shareholder based on the shares determining the number of livestock. All herders adhere themselves to these principles, and they create a friendly and cooperative relationship in the alpine pastures. It is obvious that due to the awareness of their rights of the pastures, there will be no disturbance or damage to the principles of the contracts between the tribes. Another key strategy in this village is individually conducting each herd by the shepherds; this leads to have a better management of the herd using pasture uniformly; consequently, it will cause specific profitability and utilization by each of the shepherds.

### 2.4 Segmentation of ange

The herders divide the pastures according to the characteristics of grassland vegetation, being far and near, the stones, pebbles and rocks and slopes. Each of these parts used is based on the type of animal and its physiological stages.

Varah: it is a part of the pasture as a whole and in fact, it is the biggest part of the pasture divided into smaller pieces "Kool", "Dool", la and "Pagah".

Kool: It is top of the pasture with a steep slope (slope head) of the mountain pasture with huge cliffs and a convenient covering for goats.

La: The middle part of the pasture with milder slope, fewer cliffs, but more and more coverage, denser compared to Kool that is used for ewes grazing.

Dool: The lower part of the pasture placed lower than Kul and La, its state is valley like, and it is higher because of its sluice cover. This field is chosen for grazing Ewes and for a near parturition period chosen for goat grazing.

Pagah or Pachah: the lowest part of the surrounding rural pasture that is paved with good coverage for lambs and kids.

Nassar: steep slopes covered with forest facing north, high herbaceous and density understory in winter and spring, and it is allocated for goats and Ewes but the grazing here is more efficient for Ewes since it has higher grass. Because this domain is cool and moist, Ewes grazing is easier and more comfortable.

Baraftow: It is a part of a pasture that lay heavily influenced by the sun and covered with large sparse pebbles fitted for goat grazing.

Kelour: Residue of agricultural lands and its grazing usually begins from the early April and ends prior to September before the mating and pregnancy.

### 2.5 Herd combination

The main herd formation factor for herders in the village is Livestock raising since they do not have any other skills or changing jobs. In this study, it was tried to express the herd combination according to the villager's opinions and their management practices. Due to the direct observation of herd

combination, different types of livestock, predominantly the sheep and goats, and sometimes a combination of both were chosen. The basis of this type of composition and number of livestock is generally similar behavioral and nutritional properties. There are several factors affecting the herd composition formed in the village including: farmer's favorite, farmer's finance for supplemental feeding and costs of animal fold, assistance Force for rancher, especially sons, vegetation cover, climate and type of pasture, breastfeeding and Secondary products manufacturing.

## 2.6 Rancher favorites

In this case, the herder or rancher has a special interest in goat and sheep. The most important factors are the interest of rancher, and his physical ability to steer and nurturing cattle in the pasture and fold so that the goats require more physical strength while the ewes move in closer and smoother pastures, so it does not take a lot of physical strength for a shepherd. Occasionally, it has been found that old ranchers choose herd composition from the ewes and the younger ranchers choose the goats. Another factor that affects ranchers interest is more economic value of ewes compared to the goat; as a result, they prefer to keep ewes although they know that keeping ewes has a lot of financial and human costs.

## 2.7 Assistance force and financial base of rancher

This factor also affects the composition of the herd in the village. In this case, an important and main factor of ewes grazing at night in the field is the herder's ability to purchase additional forage and feeding for periods longer than periods for the goats. If the farmer can handle this, he chooses the herd from the ewes and otherwise, he prefers the goats. Because goats are more capable of using pasture forage in difficult conditions.

Since this village has winter (winter) climate and its vegetation is affected by climate change, on the other hand, since there are many mountain pastures, it is a good reason to raise goats there. Because goats have a greater capacity to withstand harsh weather, sloping mountain pastures are more suitable for them than ewes.

## 2.8 Breast feeding and producing secondary products

They do not expect the flock of ewes breast feeding or producing the secondary products; however, one of the main objectives of raising goats or ewes is producing milk and secondary products. In this regard, it can help a lot of the family members. In general, according to the above mentioned, with several years of experience by considering the condition, the herder himself measures which type of ewe is more economically viable and he spends his financial and physical ability on it.

## 2.9 Indigenous knowledge of livestock denomination

livestock denomination is done based on their appearance with different goals. This denomination is carried out based on hair color and livestock wool, colored tattoo number and location of moles on the skin of animals, size of ears and horns, livestock body size, age of animals, with the aim of counting the number of livestock, livestock easy

identification in case of loss, separation and detection of animals from other animals around, and he determines the best type of livestock based on size and appearance and consequently, formation of a herd by combining the best types of animals. In this regard, Indigenous knowledge has existed among herders in the village for many years. Then, separating each type of nomenclature is based on the desired characteristics as follows:

- a) Naming Ewe according to its eye and colorful spots
- b) Naming ewes based on ear characteristics
- c) Naming Ewes based on their horns
- d) Naming a goat based on hair color and spots on its body
- e) Naming goats based on ear characteristics
- f) Naming goats based on horn characteristics
- g) Naming Ewe based on the age of the animal and the number of calves

## 2.10 Indigenous knowledge of mating herd management

In this regard, the number of livestock and rams, ram race, physical condition, aesthetic or appearance beauty and also, the nutritional management of the ram among herders of village are very important. Mating time for flock of sheep and goats is determined based on economic objectives and birth. If the goal is to be sold in current year, birth time is adjusted so that the size of lambs and young goats should be grown in late March and early Spring to be sold more economically. This birth is usually completely finished by the end of November, and this lambing is locally said "Kellarza"; otherwise, it is adjusted so that by the mid-February, lambing flock has been done and lambs can use fresh forage locally called "Rivarza" and they may be sold at the end of spring or June. Here, they usually buy Ram from Turki or Lori races specially chosen from Chahar Mohal and Bakhteyari areas or they keep their lambs and young goats until they will be reached to the age that is suitable for mating. The number of rams is usually kept for a herd of 80, 3 heads; otherwise, under 30, one ram is enough. For goat flocks, they usually keep more than 2 male goats for a combination of more than 30 heads of a cattle. The desired ram for goat flocks in terms of appearance and head shape, body size and color should be approved by the farmer; the rancher himself based on his experience chooses the desired ram among lambs purposefully and in some cases, the desired ram is bought outside of the village. In general and according to what was explained, for empowering ram nutrition and adjusting time lambing, the time period of the first lamb birth and young goats from the last birth are not more and more, and nutrition management and keeping lambs and young goats are occurred about two months before; so, the ram feeding will be done separately from the fold with hay, oats and dry grass. At the same time, this nourishment and mating time is continued until the end of this cycle. In some cases, emaciated livestock in order to mate successfully are fed in pasture at night while the cattle is in the fold. During mating, the rams of the flock are dyed (hair) with henna which makes it more beautiful, and for the goats, if it has a white spot, henna is used as well. It is considered as a great sanctity thing among ranchers.

The mating is adjusted so that for lambs bigger than one year, “shishk” and goat “Tishtar” have a capability to mate and fertilize since below this age even if mating happens and the lamb or goat which is born is weak or breastfeeding and the amount of milk is low, and they are both problematic for the ranchers. The useful life of a sheep or a goat is expressed up to 7 years.

### 2.11 Indigenous knowledge forming herd structure

There are three kinds of herd combination in the village, a flock of sheep or ewes, goat flocks and a combination of both livestock. The sheep flock structure usually is formed by fewer goats due to cost maintenance. The General structure of ewe flock consists of male and female lambs one-year-old “Cove”, one year old Ewe and six month old ones called “Shishk” and biennial ewes with one-year birth and more than two year old “Ram” or male Ewe, and one or two castrated males are chosen in order to guide and accelerate the movement of cattle. Goat herd includes one-year-old female yeanelings, “Tishtar” and two-year old “Tirboz” and more than two years called goat. Herd formation including sheep and goats has a similar composition. In general, the age composition of the herd is influenced by factors such as aging, which tries to form a herd with lower age, healthier and more dynamics. In order to achieve a young combination, the herder sells male young lambs and goat kids and keeps females for reproduction of each year. From the point of view of herders, the useful life of each sheep and goats for healthy births is 5 – 6 childbirth. They also have mothers with 5 – 6 birth that are sold during spring of each year so that they sell sheep and goat in the same year and mothers with 5 – 6 birth will be sold next spring.

### 2.12 Animal nutrition management before mating and gestation period

In both desired periods, ewes are fed with better quality and quantity forage than goats. During the pre-mating and while fresh fodder consisting of clover, vetch and alfalfa is not planted in the agricultural plot, they are fed day and night in late winter to early May; otherwise, they are taken near the pasture and in smooth places with the most fodder “La” and “Dole”. In the case of goats, ranchers usually do not buy fodder, instead they use fresh mountain fodder and the “Cole” pasture. The herds are fed from May onwards because they can use the inhabitants of the “chlorine” agricultural lands. Nutrition is even more important for ewes during pregnancy. Moreover, they are fed by “Kelour” at the first three months of their pregnancy and the last month of pregnancy, they were returned to the cage earlier in the evening than usual, so they are fed by straw and oats twice a day. At this time, from October to early January, goats continue to use pasture forage, and from mid-January, they are fed with supplementary forage of straw and barley along with grazing in the pasture. The role of indigenous knowledge in nutrition management is important during breastfeeding and caring for lambs and yeanelings.

At the time of lambing and breastfeeding, both mother’s nutrition, lamb nutrition and yeaneling, the distance between livestock grazing and breastfeeding are very important. Therefore, the livestock that were lambing or those who

are pregnant are fed separately with better nutritional status of more straw and barley than other livestock “Hoshk” who are not pregnant. Breastfeeding livestock are fed by complete and enough nutrition every morning and afternoon twice a day. The rests are taken to the near pasture with complete and nutritious fodder. They are fed three times a day during rainy days. Non-pregnant livestock to a lesser extent than other livestock use supplementary forage. In general, feeding the goats compared to ewes in terms of quantity is done at a lower level. Complementary feeding of ewes usually starts from September with straw and barley while feeding goat begins from early January, a lesser extent of ewes use the same nutrition and supplementary forage. For goats, they have greater ability to get away from the fold and also using pasture forage, in some cases, the economic value of their meat is very important. It should be noted that the “salt down” the herd is carried out in the spring on several occasions. The available salt can be prepared in autumn near mineral springs with salt water springs near the village. When the herd lick rocks or gathering a place in which they have licked salt rocks last year, it means that they need salt. Herders mix salt with roasted and milled barley, and shed on the smooth stones in the pasture. At times, they use salt to lead the flock to a particular point of pasture. At the time of lambing, several lambs or goat may be born in one day that is why the herd should not be away from the fold in ordinary days. In another case, inspecting the herd during the day and night is done by a shepherd of the flock. It is said that newborn lambs may be smothered at birth or die under the pressure of hands and feet of livestock. The newly born lambs and kids are also laid in a dry place, paved wall with large rocks and soft, short black tents made of goat hair, or carpet and its floor covered with fresh and soft branches of an almond tree “Amygdalus spp” which is prepared from the “show” mountain. This is locally called “Kolah”. Each of these cases has its own reason. The location of newborn lambs and kids if they are wet due to their weak body become frostbite and die early. So, it must be completely covered and warm, paved wall is for lambs and yeanelings are very interested in licking. If the walls are dirt or mud, it makes them sick heavily and after a while they will die. Using almond branches is useful since their place sleeping should not be rough or may use them when they are needed. Because of the interval between lambing, newly born lambs and goats that have a smaller size than the others are kept separately for two days; then, they entered the “Kolah” literally. Observing all of these cases for a successful lambing period and having healthy lambs and kids is very important.

### 2.13 Feeding lambs and goats (River and Kelar)

Feeding is done for 3 to 4 weeks and twice a day in the morning and evening. They are fed only on colostrum “Aghouz” or breast milk. In some cases when they grow up bigger, since female livestock will not return to the fold until night for more than 4 weeks, feeding by breast milk is not enough and fresh grass is left in their home “Kolah” literally and they are taken to graze a half of the day by forming a herd called “Rivar” (small lambs and kids) separated in

pasture near the fold covered with grasses and annuals, called “Pagah”. When the herd is born in the fall, since there is no fresh forage, and as long as the lambs can use the dry forage, which is the same straw (barley and barley) and barley seeds, they are fed with breast milk. When the flock gives birth in the fall and there is no fresh forage, as long as the lambs cannot use the dry forage that is the same straw (barley and wheat) and barley seeds, they are fed with breast milk. Births for ewes usually occur in the fall and for goats in the winter.

#### **2.14 Unkind mother (Mehal) and childless one (Chaper)**

In some cases, it may be happened that female livestock does not let the young goat use its breast milk; in this case, for lambs and goats, they use the term “Danah”, and for mother ewes, “Barah mehal” and goat “Big mehal”, respectively. While mother livestock wants to feed its child, in every period of breastfeeding, they should pour salt on the back of it and kept isolated from others until the problem is resolved. If that way fails, they will compulsorily fasten livestock’s hands so that it does not move and the lambs and kids can eat mother’s milk comfortably. The term “Chaper” is used for mothers in which they lost their babies. There are a lot of unexpected events that newly born lambs and yeanling die. So for the milk not be wasted, and those who were twinning and they cannot afford breastfeeding, one of their babies forcefully is consigned to such mothers to be fed. To do this in addition to the two mentioned above, there is a third method that experienced individuals by manipulating in the womb of their mothers create a state similar to the feeling of childbirth and then, they turn the mother so that it feels dizzy and finally pour some salt on the lam or yeanling so that she believes she has given birth herself. In these two cases, newborns are usually very spoiled and weaker than others.

#### **2.15 Weaning lambs and kids (Da Berry)**

Weaning lambs and kids is done for two main objectives such as milking herd and strengthening and tendency of livestock for the next mating. It is done in the late spring of June in four ways. First, lambs and kids are completely separated from their mothers and kept in a fold for 2 to 3 months. In this case, lambs and young goats are taken to pasture separately. Second, lambs and kids enter a new cattle from the surrounding villages. Third, they cover them by a piece of wood, literally “Kover”. “kover” is a piece of wood from the almond branch put in the mouth of lambs and yeanlings; then, they tied it with string behind their head or horn. This will make them prevent from sucking milk, and it does not cause much trouble for grazing; however, this method is less used. The fourth method is putting livestock mother’s breast in a bag. It prevents their bodies from injury; consequently, lambs and yeanlings cannot eat their mother’s milk. It should be noted that weaning is less done for male lambs and yeanlings since lambs are sold the same year in April and the yeanlings are sold in May.

#### **2.16 Indigenous knowledge, the main activities of livestock**

The local and main treatment activities of livestock in the village were regarding to their hands and foot fractures, bruising effects and falling down from height, lice and tick disease, infection and wound infection between livestock hooves.

Arm and leg fractures that occur for any reason are splinted. The size of splint of ewes is bigger than lambs and yeanlings. The number of used splint is 4 made of (*Phragmites australis*) reed wood in the form of a ruler that its upper part is like a circle carved and they are tied by a thread. No one can diagnose the fracture site and using of a splint is just done by local experts that have a great experience to do it and this action is continued until the full recovery of the livestock. Splinting continued until the animal is fully recovered so that he can put its foot on the ground and is fed in the fold.

#### **2.17 Treating lice and tick disease**

The disease is also treated with an average of three times a year: spring, summer and autumn with chemicals produced by veterinary medication of the city so that a small amount of the material is poured in a large tub of water and they wash and bath the livestock in it.

#### **2.18 Contusion due to beating or falling livestock from the height**

They feed the animal by some black substance called “mi-mana” (mummy) by dissolving it in water. It is done twice a day until the animal is completely healed.

#### **2.19 Wound infection between livestock hoove**

This type of wound prevents the animal from moving. To heal the wounded animal, they use the gum of mastic tree (*Frankincense*) in local term called “Berizah”. To do this, the desired gum is heated and poured between livestock hooves and then, they firmly fasten it with a cloth and fed in the fold. It is continued until full recovery of the livestock.

### **3. Conclusion**

The results of this study show that inheritors of nature mysteries have always been consistent with the nature and their splendor depended on loving the nature. Some interactions used had been transferred from person to person, and these interactions are themselves independent, and we interpreted them as indigenous ecological knowledge. Therefore, these interactions suggest that the villagers for many years due to their knowledge established their jobs and income traditionally based on animal husbandry. In this regard, they divided pastures and used their knowledge so that it would have the most advantages and the lowest pressure on the pasture. Thus, for each member of the family, they must have 45 heads of livestock, but in the village for every member of the family, they do not even hold 20 heads. This principle due to people’s knowledge of climate condition and available pasture cover does not allow more capacity. Therefore, this factor has led to agricultural work being done alongside traditional livestock. The obtained products

are also used for feeding animals that have no economic justification. So, they were deprived of many side costs and welfare. However, they are interested in animal husbandry by maintaining interaction and balance with the pasture. In a study measuring the vulnerability of women herding in Kwara state of Nigeria with the impact of the dry season, when their husbands moved with their livestock and how the women have a lot of difficulties to live on, it was found that food insecurity, low-income, seasonal changes, conflict and cultural changes have a negative effect on welfare of women. In this study, organizations and policy makers have been suggested paying special attention to indigenous knowledge to reduce the vulnerability of individuals. It is done to increase their sustainability of livelihood [10]. In the traditional animal husbandry system, ranchers play a key role in managing herds and determining how to use pastures. Basically, in this system, feeding livestock is mainly coming from pastures. Also, the herders of this village have formed their indigenous knowledge for many years to preserve livestock in different farms, and they apply what they have already learned. They divided the pastures and used them based on diagnosis of the need in any physiological stage of livestock. In this regard, they have acquired ecological memory in the field of animal identification. According to Dygard, Bakhtiarians, they use various names for sheep and goats based on their color and shape of the ears [11]. Popzan and Afsharzadeh, believe that livestock division system among Kalhor tribe is based on age, sex, and their appearance characteristics [3]. This kind of division helps the nomads in some cases to recognize livestock at the time of missing, counting and disease livestock. In addition, people living in intended village have acquired their indigenous knowledge in all fields of animal husbandry such as time management of mating, caring lambs and yealings, weaning, forming the herd according to the environmental and cultural conditions, and finally, they should have a pity while treating animal diseases and a culture of collaboration, cooperation and collaboration in using the pasture. In fact, they are aware of that mother livestock before and after mating or calving requires a full and adequate nutrition, and they have acquired this experience by having the knowledge that their parents and they themselves gained in a long interaction with the livestock and recognizing nature characteristics. It should not be forgotten that their knowledge has also well analyzed and they distinguish the delicate and sensitive genus of lambs and goats, and it has caused this weak creature to be managed for high growth and performance in a way that he has an ability to continue his generation. To create a healthy interaction considering the natural conditions, they have learned how to combine herds, and it is very important for them to maintain friendship or cooperation between the herds and having compassion towards animals is very important for them. As Meuret and Provenza used a conceptual model of four steps, which represent four intertwined processes for a given herder-herd-fodder resource, they describe how herders 1) teach their animals to use the full range of forages, 2) train the herd to respect the boundaries of

grazing areas, 3) modulate what they call the “temporary palatability scoring” of forages, and 4) establish daily grazing circuits to stimulate appetite and intake through meal sequencing [1]. This knowledge is also valuable when the objective is to boost appetite for particular forages such as coarse grasses, scrub, and invasive species. Also, the performance of ranchers according to scientific studies shows that plant biodiversity is important for enabling animals to choose a nutritious diet, animal education, nutrition culture, production, and health. Devaki and Mathialagan believe that an aboriginal or native person is a main player in the structure of traditional societies [5]. In many cases, indigenous communities are not well aware of their native values. So, individuals and stakeholders such as academic institutions, government agencies or NGOs can play an important role in the field of capacity building among the local community or promoting traditional techniques. Today, there is an urgent need to evaluate indigenous innovation in which all are being accepted by people. For scientific reasons, users study government initiatives to access indigenous technology. Therefore, according to current conditions of the country’s natural resources, as well as the economic situation of rural areas such as urban migration or the loss of indigenous knowledge, it is essential to take extra efforts to understand and analyze this knowledge. It is also expected that the present research could take important steps to identify this knowledge or it can create the authorities considering this valuable wealth. It is hoped that effective efforts to enhance this knowledge or combining it with modern methods, thereby improving the living conditions of inheritors of nature secrets. As all societies and nations have tribal and rural communities, the competition should be directed towards their attention to the current situation.

#### **Conflict of interest statement:**

The authors declare that they have no conflict of interest.

#### **References**

- [1] M. Meuret and F. D. Provenza. “When art and science meet: integrating knowledge of French herders with science of foraging behavior”. *Rangeland Ecology and Management*, **68**:1–17, 2015.
- [2] S. Hosseini Nia, A. Jalali, and J. Hussein Neyae. “Indigenous knowledge in managing cattle (Case study: Gabriel village Bijar-Kurdistan)”. *The first national conference on population, natural resources, water and environment: Challenges and Solutions*, , 2015.
- [3] N. Afsharzadeh and A. Popzan. “Kalhor nomadic indigenous knowledge of animal nutrition”. *Pasture Research Journal*, **5**:322–333, 2011.
- [4] S. Rasekhi, A. A. Mehrabi, A. Javadi, and M. Ghorbani. “The role of indigenous knowledge in managing livestock and herding (Case Study: Ghasr Yaghob Village-Safashahr)”. *The first national conference on population, natural resources, water and environment: Challenges and Solutions*, .

- [5] K. Devaki and P. Mathialagan. “Animal husbandry traditional knowledge in kancheepuram district”. *International Journal of Science, Environment and Technology*, **4**:1289–1295, 2015.
- [6] M. Muammeri, M. al Mahdi Fayyaz, and Z. A. Almasi. “A survey of beneficiaries opinions about managing livestock pasture (Case study: Northern Khorasan province)”. *Journal Range and Desert Research of Iran*, **23**:1–13, 2016.
- [7] G. Oba. “Harnessing pastoralists’ indigenous knowledge for rangeland management: three African case studies”. *Pastoralism: Research, Policy and Practice*, **2**:1–49, 2012.
- [8] G. Oba, E. Sjaastad, and H. G. Roba. “Framework for participatory assessments and implementation of global environmental conventions at the community level”. *Land Degradation and Development*, **19**:65–76, 2008.
- [9] K. Kakinuma, T. Okayasu, U. Jamsran, T. Okuro, and K. Takeuchi. “Herding strategies during a drought vary at multiple scales in Mongolian rangeland”. *Journal of Arid Environments*, **109**:88–91, 2014.
- [10] S. A. Aderinoye-Abdulwahab and J. J. Chimgonda-Nkhoma. “A measure of pastoralist women’s vulnerability to the impact of seasonality: evidence from Nigeria”. *International Journal of Agricultural Management and Development*, **5**:207–220, 2015.
- [11] J. P. Dygard. *Techniques of Bakhtiari nomads*. CNRS Editions, 1990.