# ROLE OF CAMEL IN THE PASTORAL ECONOMY OF MARRI TRIBE IN BALOCHISTAN, PAKISTAN

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#### **ABSTRACT**

Marri belt is situated in the Suleiman mountain region of the northeastern part in Balochistan province of Pakistan. The camel breeders of Marri tribe are traditionally and historically professional in camel breeding. The belt is a habitat of many important livestock species mainly raised on the vast ranges. The camel of Marri the area (Kohi breed) is well adapted to climatic extremes and is well praised for their significance in the pastoral economy. The concurrent drought, socio-economic changes and the environmental instability once again have realised the importance of camel. Therefore, a survey study was conducted in the Marri belt of Suleiman region to investigate its socio-economic profile, followed by its documentation. It was revealed that camel still plays an important role, provides cash earning, transportation, food and wool. The camel herders follow a regular pattern of seasonal migration according to the season, foliage availability and agricultural operations. Women perform all management practices at home, and take care of young and sick animals. Camel is still a valuable animal genetic resource.

Key words: Balochistan, camel, management, marri tribe, Pakistan, pastoral people, production

Marri belt (Kohlu district) is the extreme south of the Suleiman mountain region of Balochistan. Livestock farming has been a century's old occupation of a vast majority of the population in this district, and was the only source of food winning for most of the households. The area is very famous for its livestock agriculture, especially, large herds of camels and fullsize small ruminants' flocks. The livestock farmers follow a regular pattern of seasonal migration; mainly depend upon the season and agricultural operation. Camel is an important animal genetic resource, plays a very pivotal role in herders' socio-economic life and providing valuable food items in the most stressful conditions (Aujla and Jasra, 1996). The camel of the area (Kohi breed) is well adapted to the climatic extremes and is well appreciated for its significance in the pastoral economy (Raziq and Younas, 2006). The region comprised of vast ranges and are used judiciously by the well adapted various livestock breeds of the pastoral people especially camel, which otherwise go waste. The camel is praised in many parts of the world's arid and semi-arid zones for their unique characteristics especially, under the harsh conditions (Schwartz and Dioli, 1992).

While living in the remote and poor infrastructures, the pastoral people having good expertise while using ethnic knowledge they had gained from their fore fathers. The camel breeders of

the region are well familiar with the significance of camel for their hardiness, adaptation and valuable turn out. The concurrent drought, socio-economic changes and the environmental instability have once again realised the importance of camel, and therefore, a survey was conducted in the Marri belt of Suleiman region to evaluate its socio-economic profile.

#### Materials and Methods

The camel survey was conducted in April, 2007. All the general aspects of camel were studied through a pre-tested proforma, specially designed for this purpose. The camel herders in general, progressive owners, Jaths and ethno veterinarians from the different camel sanctuaries (Kohlu tehsil itself, Thamboo, Kahan and Maiwand) of the district were interviewed. Both group discussion and personal interview methods were adopted. The vegetation samples were collected and sent to Botany Department, University of Agriculture Faisalabad for confirmation of botanical nomenclature.

#### **Results and Discussion**

Kohlu is situated at the southern end of the Suleiman mountainous region and consists chiefly of narrow parallel ridges of closely packed hills which form the gradual descent from the Suleiman plateau into the plains (GOB, 1999).

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Large herds of camel and cattle are also visible in the area. The major portion of the people in the district are pastorals and depends upon the livestock. Earning of the inhabitants is mainly from the livestock farming. The last drought and the heavy drainage of the ground water dropped the water table. This abrupt scarcity of water once again realised the importance of local livestock breeds, especially the Kohi camel.

The camel herders follow a regular migration depending on the season and agricultural operation. Migratory period starts with the onset of autumn. The animals meant for sale are sorted from their herds and move towards the Mangrota camel fair in D.G. Khan district of Punjab province (Fig 1). The Mangrota camel fair is the largest camel marketing event in the country (Raziq, 2006; 2007). A migration may originate from Kohlu district and its locality like Chamalang, Thambo and Paza and may end up in the southern part of Kohlu or the Sibbi district of Balochistan. Some herds may reach to the Kachi area (the adjoining area of Balochistan and Sindh province). They stay there, with their animals until March or April. With the onset of the spring season, they move back to the mountain areas. They try to reach Kohlu area in the wheat harvesting season and take part in the crop harvesting and threshing. The movement is along traditionally fixed routes. The migration involves only the pastoral activities, but some people work in the agricultural fields in the canal irrigated areas of Balochistan and Sindh in winter. The Baloch pastorals do not participate in business activities like Afghan nomads.

At present, national herd comprises about one million heads of camels (Economic survey, 2007-2008) and 13% growth rate has been observed since 1996 to



Fig 1. Mangrota camel fair.

2006. Out of the total national camel population 41% found in Balochistan province alone, while 27% of the camels of Balochistan are found in the Suleiman region. The Marri belt possessed about 60% camel of the Suleiman region (ACO, 2006).

#### Characteristics of Kohi Camel

The body size of Kohi camel is smaller as compared to riverine camel of the Indus delta (Fig 2). An average milk production per day was about 10 litres and live body weight was 550 and 485 kg for male and female, respectively. The foot of the camels were round and hard, the wool of white Kohi camel is short, curly and fine. The detailed characteristics of Kohi camel have also been reported previously by Raziq and Younas (2006).

Camels provide important source of subsistence and income to the people residing in the mountain areas of Balochistan, which has also been reported by Aujla and Jasra (1996). The survey finding revealed that camel is still performing an important role, providing cash profit by selling mature male camels for draught purpose, transportation for daily life, and food as milk and wool for household needs. They earned a reasonable amount of cash while selling their mature bulls, sick and culled animals in vicinity and annual camel fairs. The camel is the sign of prestige for Marri camel herders and source of recreation and hobby. After the severe drought (1994-2004) in the region, the economic value of camel was boosted and camel was considered as important source of cash earning. They earn Rs 60,000 to 75, 000 (US \$ 1000-1200) per mature male camel, which is almost ten times more than the prices ten years back.

In the Marri belt, the camels are being raised by the Jaths, a community of the Marri tribe who look



Fig 2. White Kohi camel of the research area.

after the camel herds. The Jaths are very often illiterate, they use simply prepared bread (Kak) with the camel's milk and their earning comes from the camel rearing.

The Jath is paid Rs. 100 and 3 *Kasa* of wheat grain per year on each animal rearing. In addition to that, one *Bharri* of wheat per *Jorra* land of the herder is also provided. A pair of shoes, a bed, a pair of cloths, a loomer, and a turbine on weeding is also given each year by each herder. The herd size is counted in the month of October when the animals are sorted for sale. The herders have to pay next year on the number of camels left after sorting. The rearing cost of all the age classes of camels is same.

Women plays a pivotal role in the production and management of camels in the region. They perform all the management practices at home which include; taking care of young and sick animals and perform all other household activities.

The Kohi camel is well reputed for its production potential. Their various productive traits are given in the table 1. The role of camel as food animal is being accepted globally and the camel scientists (Faye and Esenov, 2005) stated that camel has unfathomed potential for satisfying human's future dietary and medical needs. The camel milk is well praised for its medicinal value as it grazes on certain herbs which are the potential sources of medicinal ingredients. In the summer season when there was scarcity of water and the vegetation was no more accessible for the young calf, camel milk is

**Table 1.** Productive traits of the Kohi camel.

No	Traits	Values	
	Traits	Male	Female
1	Average birth weight	32-40 kg	31-40 kg
2	Average weaning weight*	160-185 kg	155-180 kg
3	Average live weight	550 kg	485 kg
4	Height at wither	2 m	1.7 m
5	Ready for workload	3 yr	3 yr
6	Use for heavy duty	7-8 yr	-
7	Age of puberty	4 yr	3 yr
8	Average work life	25 yr	-
9	Average reproductive life	25 yr	21 yr
10	Conception rate out of herd	-	50-53%
11	Gestation period	-	375-386 day
12	Calving rate out of herd	-	45-50%
13	Calving interval	-	2 yr
14	Average milk production	-	10.7 kg/day
15	Lactation length	-	8-11 month
16	Wool Production	-	2.5 kg

\*Weaning age is 8 month.

the only source of food and water. The dromedary has an accepted and well known peculiarity, as its milk water contents increases with the shortage of water and may reach up to 90% (Wernery, 2006). In the survey area milk was used for the treatment of different diseases i.e. water belly, typhoid and arthritis, and the camel herders are well familiar about the camel's milk prospective for its therapeutic values.

As the Jaths remain in remote areas along with their camels, far from their families, they don't need more milk. The animal is milked only when needed or in the case when the udders are firmly full, which otherwise causes mastitis. On an average Kohi camel produced 10.7 litre milk/day, and the lactation period was reported as normal 8 to 10 months. The lactation period however, depends upon the age, body conditioning, parity and health status of the cow. The only production criterion of the camel herders was the production of a calf in 2 years. As the camel is a seasonal breeder therefore, they dry the camel in October to November to provide a dry period of 3 to 4 months. A jal (udder covering) is provided to keep the calf away from suckling. In the mean time the lush green vegetation also get scarce in the autumn and winter, which affect the cow's health and vigour for breeding. If the cow is not being dried at proper stage the two factors i.e. decreasing vegetation and the continuous calf suckling, will adversely affect the body conditioning of the camel and will cause fertility failure in the coming breeding season. Colostrum is also used by the Jaths locally called as Boli which believed to be the rich source of energy and power.

The Marri tribe does not slaughter camel for meat production. The animal not fit for work and sale is slaughtered. Camels with fracture of long bones are slaughtered and the meat is distributed in the families of the community, but free of cost. The other occasion for camel slaughtering is *Sadqa* (Khairath), in which camel is scarificed in the name of Allah and the meat is distributed free of cost in the community. The camel is rarely used for Muslim religious rituals of Eid ul Azha in the Marri belt.

The majority of the respondents believed that camel meat also had medicinal value; it decreases the backache, and the long bones pain. The hump fats are used for the treatment of infertility in women and mastitis in cows and small ruminants. The hump fat is crushed and tied at the lower abdomen of the infertile women. The hump fat is boiled and applied on the udder for the treatment of mastitis. Meat of old camel is also used as an anthelmentics in small ruminants. The meat is boiled in water, thrived well, and a

viscous solution is prepared and fed to the parasites infested animals.

Since last few years, camel's meat demand has been increased among the coal mines workers in the adjoining Duki area of Loralai district. The mine workers believed that camel meat is better to remove the deleterious gases accumulated in their bodies during mine digging. The old, sick and used animals are now moving to that market for better returns.

Camel is used for all sort of work like, transportation of fuel wood, home utilities, agricultural operations, bringing fodder for the animals kept at home and riding. The male animal is introduced to work at the age of 3 years and is used up to the age of 18 years. A mature male camel can carry 200-240 kg on his back in Rug Mountains and 320-360 kg in plain area. Female is rarely used for work, sometimes the kids of the pastorals and light weight like family hens etc. are loaded on its back.

The animals are trained for riding and are locally called as Mahari. The Mahari camel can carry 2 persons depend upon the type of saddle. A Mahari camel run at an average speed of 10 km/hr and may cover up to 40 km in a day. The Mahari camels are well decorated and are well cared especially, on occasions like wedding etc.

The wool is widely used for bedding material but some people also used it for ropes, horse and camel saddles and rugs. The herders believed that the camel's wool bedding is very comfortable and treat the body aches. The camel wool is also used for some medicinal purposes both in animals and human being. A thread is made by the camel wool and tied around the neck of the sheep for the treatment of the chronic respiratory problem. The camel's wool smoke is smelled by the new born baby with a view, that it keep the baby safe from the tetanus.

## **Camel management practices**

## **Production systems**

The transhumant production system makes the major portion of the production system in the region, the sedentary and nomadic system are very rare. Some draught purpose camels are being kept in the vicinity of the Kohlu town by some agriculturists and wood cutters. There is no special arrangement of housing for the camels in this area. As the camels are always on move, they hardly spend more than one month at one place. The camel in the transhumant system is rarely brought to the home. The Jaths stay with their camel herds in mountains. The Jaths in the vicinity gather on one place at night, called as Jhok.

### Feeding

Camel production predominantly depends on the community owned rangelands. The rangelands of the region have copious woody vegetation and bushes, liked by the camel. The camels proceed early in the morning to the grazing areas, where they drink water first, especially, in summer followed by grazing. The water is offered twice in summer and once in winter. The sources of water are river, ponds and sometimes tube wells. The herders of the area are well familiar with the importance of salt bushes in camel nutrition and therefore, they prefer bush area at least once in a weak. The herders believe that the camel browse well on other vegetation after allowing to graze on salt bushes. Keeping away from the salt bushes and off salt may cause serious problem of pica. Salt deficiency symptoms were well known to the herders.

No stall-feeding is provided in any part of the year. In the crop harvesting season in the study area, animals are allowed for grazing aftermath in the fields. The stubbles of maize and sorghum are also offered if available. The weak and diseased animals, which are unable to graze, are provided wheat straw, if available but such cases were seen very rarely.

Major Vegetation of Marri belt: The author observed that camel relish twigs and pods of Acacia modesta, especially, when there is good year and the twigs are hanging. Only the pods of Acacia arabica are liked by camel, but not the twigs and leaves. Other woody vegetation like Zizyphus, Olive, Pistachio and jand are also available. The Tamarix trees are the source of salts and minerals and the lactating animal especially like it. The tree form of Tamarix is available on the stream's banks and the bushy Tamarix is found inside the streams. The bushes (Caragana ambigua and camel thorn) are also much liked by the camel, especially, when they are in blooming stage. The salt bushes like Haloxyllon grifithi and Haloxyllon recurvum are also found in the plain terrians, which are one of the main feed sources for camels in the region. The camel rarely liked the grasses except the juicy grasses like Cynodon dactylon, and Stipa capillata when fresh. Some of the important vegetation for camel found in the area is given in the table 2. Some rejected and poisonous plants are also found on the ranges of the area given in the table 3.

## Calf care

The Jaths offer colostrums within one hour, but avoid excessive colostrums, which might cause diarrhoea. Many herders believed that post calving full colostrums feeding is far better than depriving the calf

Table 2. Foraging materials relished by the camel.

Local	Botanical	Local	Botanical					
name	name	name	name					
Trees								
Uzhgai	Oleao officinalus	Karkana	Zizyphus nummolaria					
Showan, Shanani	Oleao ferrugina	Ber	Zizyphus mauritiana					
Wanna	Pistacia cabulica	Helani	Zizyphus sativa					
Sherwan	Pistacia khinjuk	Zarga	Prunus eburnean					
Ghaz, Tamand	Tamarix indica	Sur Ghaz	Tamarax aphylla					
Khler, karar	Capparis aphylla	Pah,	Acacia modesta Palosa					
Bushes/shrubs								
Barar	Periploca aphylla	Pesh	Nannorhops ritchieana					
Mákhae	Caragana ambigua	Ghelmi, Thrath	Haloxylon recurvum					
Tindan	Alhagi camelorum	Khar, Zumai, Lani	Suæda fruticosa					
Shinbutae, shorae,	Haloxyllon grifithii							
Grasses								
Barau	Sorghum halepense	Sargarae, shang	Fraxinus xanthoxyloides					
Raghbolae, sába	Stipa capillata	Murgha, khabbal	Cynodon dactylon					

Table 3. A list of rejected and poisonous plants.

Local name	Botanical name	Local name	Botanical name				
Rejected plants							
Urgalama	Rhazya stricta	Leghunae	Daphne oleoides				
Spalmai	Calotropis gigantea	Ghozera	Sophora grifithii				
Khamazurga	Withania coagulans						
Poisonous plant							
Orgalama	Rhazya stricta	Genderi, kaneer	Nierum odorum				
Uzhgai	Oleao officinalus <sup>*</sup>						

<sup>\*</sup>only the dry leaves of the O. officinalus\* are considered as poisonous.

of colostrums. The herders know the importance of the colostrums feeding and believed that it is important in keeping the calf healthy, strong and vigorous.

Calf mortality was very rare and it might be the result of bull selection and replacement, colostrums feeding and good husbandry care. According to the respondents, intensive care was needed to save the calves from cold and predators. The dams accept the calf in majority of the cases but very rare dams

especially the young ones, quite often refuse to nurse their calves, so they must be forced to accept otherwise milk production would ceased within days. Pastoralists have developed several elaborate techniques to reach this objective (Schwartz and Dioli, 1992). All these techniques cause discomfort or even pain to the mother which will absorb her attention to such an extent that she will forget to reject the calf. After the calf has suckled a few times, the device is removed and in most cases the relief is so strong that the mother will accept the calf permanently.

The newly born calves stay at Jhok almost ten days and then move with the herd, while providing cover to the udder of the mother. The new crop is well cared and the leaves and twigs were offered and *ad lib* water was provided.

## Shearing

Shearing is done once in a year in the month of April depending upon the health of individual animal and the season. Shearing is sometimes delayed up to May, if animals are weak, sick, freshly calved or the weather is rainy and cold. Almost 4 *Gorrie* (1 Gorrie=600g of wool) wool is produced per shearing.

## Identification

The identification sign is applied below the ear, cheek and sometimes on the thigh. Each herder has his own sign of identification. Red hot iron is used for this purpose; mostly the first capital English word of the herder's name is used. Branding of the new comers in the herd is done in the month of October, before the animals move to the low lands.

#### Breeding

#### Selection of animals for breeding

Calf is selected for bull replacement at the age of 9 month, when the calf is generally weaned. The selection criteria is based on the fine and curly wool, pure white or creamy colour, body conformation, vigour, pedigree record, milk production, hardiness, viability and body development. The breeders like Roman nose, strong and wide canon bones and arms, broad chest, prominent eyes and strong neck. They dislike hanging lips, rough body coat, weak legs and short neck. The bull kept for breeding is usually farm produced, because they know the pedigree background well. The breeders memorise the pedigree record and there is no formal register for this purpose. The breeders give much emphasis on the selection of bull in their breeding program. The breeders are well aware about the importance of the bull.

A bull is not allowed in the herd longer than 5 years, to prevent mating with his own offspring. Very few herders use the bull for more than 10 years. Sometimes, the herders introduce bull from other herds to harvest the high worth blood. At 4 years of age, male become ready to mate the female. The bull used for breeding is never used for draught purpose, because of the fear that burden would affect the vigour and libido for breeding. However, the bull is trained for work and the nose ring is applied at the age of 3 years, for its future value as draught animal. The healthy fully grown bull when retired from breeding purpose is then sold in the camel Fair, which is used for heavy draught duty in mountain areas.

More emphasis is given to the bull selection. All heifers produced are kept in the herd except the deformed and abnormal which cannot move with the herd. Moreover, if choice is given to the herders, they will select heifer with the same characteristics as in the bull selection. Culling level among the female calves is very low. Only the very old, sick and non fertile animals are culled.

### Other aspects

Male are fit for breeding at the age of 4 years, while female at the age of 3 years and the M: F ratio was 1:50. The breeding season starts in the last week of December and ends in mid April. The fertility is generally low in start of the breeding period because of the low rutting intensity of the bull. With advancement of the breeding season, rutting intensity and fertility rate increases simultaneously. The herders believe that the fertility is governed by 2 factors, intensity of the rutting and the level of humidity, therefore, fertility is high in the rainy and humid season. Calving interval was 2 years but in green years it may produce 2 calve in 3 years.

The newly introduced bull need assistance in mating, but no more help was needed in the following seasons. Male camel plays important role in camel breeding due to its rutting behaviour. The rutting is directly correlated to temperature, and remains at peak in the coolest period of the year. The bull remained inactive in the summer season (non-rutting), when the temperature is high. The female usually show lesser breeding behaviour compared to male. The camel is considered to be seasonal polyestrous. In mature female the ovarian activity is in association with the breeding cycle (Wilson, 1984 and Skidmore, 2000). It is as interesting fact that the pastoral people of the Marri tribe practice forced mating, whenever a rutting bull is available. The same exercise is common

in some camel tribes of East Africa (Schwartz and Dioli, 1992). The herders believe that by this practice, either the female will be conceived or will come in heat naturally after one week. The author observed mating of a camel cow again just after 2 days of parturition. This practice depends upon the richness of the year, health status and age of the camel. The same cases are reported from the other parts of the world, especially, Middle East (Yagil, 2006).

Approximate birth weight was 32-35 kg and there was no noticeable difference between the weight of male and female. Weaning weight (36 week) was almost 180 kg for male and 165 kg for female. Dry period was 3 month and service period was almost 4 months. The average herd fertility rate was 48-50 %. Abortion and reproductive disorders were rarely reported. One she camel produce up to 12 calves in her whole life span. The stud life reaches up to 30 years. Detailed reproductive traits of the camel are given in table 4. The cow could produce more calves but she lost her eye sight in the advanced age and many times fall from the mountains and died. The blind cow cannot care her calf and cannot fulfill her body requirements by browsing.

Sometimes, the case of abnormal calf (mostly alopecia) has been observed, which might be because of some poisonous vegetation or the continuous use of same bull for breeding for more than 4 years, which result in inbreeding. The respondents replied that there were rare cases of infertility, but sometimes infertility or repeated services were observed. The causes for infertility were believed due to some hidden diseases, poor vegetation and lengthy lactation. The ethnoveterinary practice for the treatment of infertility is *Ponni*.

#### Marketing

The camel's herders sell their male animal of any age depending upon their management policy. The main reason for selling camels was family cash need to meet their basic needs. There is a custom of selling larger sized, old and unproductive camels. They sell camels in the Mangrota camel fair but Table 4. Reproductive parameters of Kohi Camel.

No. **Traits** Values 1 Conception rate 50 53 %\* 2 Gestation period 375-386 days 3 48-50 %\* Calving rate 4 Calving interval 2 years 5 Reproductive life 25-30 years

Of the mature female herd

some animals are also sold in the community. In community level, they either exchange or buy and sell camel according to their needs. In many countries especially, in Africa and India the main market for camel sale is festivals and fairs (Mehari et al, 2007). Now a days, a new market for the spent animal has been emerged. Since last few years camel's meat demand has been increased among the coal mines workers as discussed earlier. Table 5 indicates the average prices collected from the Mangrota Fair. The animals are kept for grazing in uplands of Kohlu district i.e. Kohlu tehsil, Chamalang, Thamboo and Paza area since March to the end of the September. At the end of September, the animals selected for sale are sorted and moved to the (Mela) fair of Mangrota. The rest herd is moved towards the lowlands of Suleiman region and the adjoining areas of Sibi region, where they spend autumn and winter season.

## Health aspects and ethnoveterinary practices

The camel breeding area was far-flung from the modern animal health service. Its remoteness and poor infrastructure nature made it isolated from other parts of the province. In such circumstances it is very difficult to provide veterinary services according to the western model. The same situation exists in the other parts of the world where the camel reared in pastoral system (Köhler-Rollefson et al, 2001). Only few animals get benefit from the health service provided by the Government Livestock and Dairy Development Department and other private practitioners. The draught animals while coming to the Kohlu city, if sometimes injured or sick are brought to civil veterinary hospital. Most often, the Jaths practice ethnoveterinary care. The respondents consider ethnoveterinary care as painless, easy available and applicable, cheap and reliable.

#### *Problems of the camel breeders*

In Kohlu district and other Suleiman mountain region, the major threat is deforestation and expanding agriculture.

Table 5. Average Prices of camel in Mangrota camel fair.

	Age of the Camel	2006	2007
No.		Average Price (Rs.) and 1 US \$ = 60 Rs.	
1	Mature heavy male	47,000	50,000
2	Mature female	40,000	40,000
3	Yearling male	17,000	20,000
4	Yearling female	19,000	18,000
5	Bi-yearling male	23,000	25,000
6	Bi-yearling female	23,000	22,000

The need for crop cultivation is continuously increasing with the passage of time. In areas having electricity, the agricultural activities creep very progressively. The natural vegetation is being removed to bring more land under agriculture; as a result area for camel is progressively decreasing. The extra burden of livestock and over grazing also accelerated the process of deforestation. The energy sources are limited, and the firewood is the only source for the cooking, heating home in the winter. The government has no control on the ranges because their administrative control is under the tribes. The landless and poor people therefore, sell the natural fauna to fill their bellies.

The drought since last decade has seriously affected the rangelands and livestock productivity. The immunity of the animals against different diseases decreased due to the poor feeding. More than 15% of the camels of the area were affected badly due to poor vegetation and the severe mange (Shafiq and Kakar, 2007).

## Marketing issue

No proper facilities have been provided to the camel owners for marketing. Illegal export of camel is common, in which the income goes in the pockets of the smugglers and the real farmers are ignored. Hence, government is facing a lot of financial loss in this context. Moreover, the prices of camels are at the highest in the history due to many reasons. There is no value addition to the camel products. The milk goes waste in the remote areas, which need market access and value addition.

The herders are always on move; therefore, they couldn't avail health facilities for them and their livestock. Their kids are always deprived of modern educational facilities.

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