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Constraints in Small Ruminant Rearing Perceived by the Pastoralists

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Abstract

Pastoralists mainly depend on three resources livestock, pasture and water and for this purpose they migrate and this is the only way for they can survive and sustain the ecological balance of nature. The pastoralists in Jammu and Kashmir still follow their traditional occupation of rearing animals and their condition have still remained unchanged. A study was conducted to find the constraints in improved small ruminant practices perceived by the pastoralists. The data was collected from 400 pastoralists belonging to Kathua, Jammu, Anantnag and Leh district of Jammu and Kashmir and Ladakh with the help of structured interview through personal interview technique. Constraint like increasing inputs cost makes it difficult to achieve profitability. It was the most serious constraint perceived by the pastoralists followed by lack of good quality breedable animals and non-availability of veterinary surgeons. However, inadequate knowledge to detect signs of heat in animals was the least serious constraint perceived by the pastoralists.

Keywords: Constraints, Improved Small Ruminant Rearing Practices, Pastoralists

Introduction

Pastoralism is an age-old livelihood option for a number of communities and ethnic groups in the mountains, who mainly use traditional knowledge to optimize the interaction between humans, environment and livestock. Pastoralism is a system of production devoted to gaining a livelihood from the care of large herds of animals. This is a form of adaptation of natural resource management, which requires maintaining an ecological balance between pastures, livestock and people. The pastoralist requires the technologies that will suit to their situation and socio-economic condition along with the preservation of indigenous technical knowledge. Pastoralists have developed extensive traditional knowledge about their environment and have evolved strategies that allow them to survive and thrive in arid lands. For pastoralists themselves, pastoralism is not just a production system; it is a viable and important livelihood and existence system.

Pastoralism in the Himalayas is based on transhumant practices and involves cyclic movements to take advantage of seasonally available pastures (Bhasin, 1998). Transhumance is the regular movement of herds between fixed points to exploit seasonal availability of pastures. In the terms of ecological adaptations, the two most significant factors for transhumance are seasonal severity of winters, associated with presence of territorial use of highland and lowland pastures. Transhumant agro-pastoralists have regular encampments or stable villages with permanent houses. They often practice subsistence level agriculture at one or the other destinations in summer. They trade their animals and animal products in town markets for grains and other necessities of life, which they do not produce themselves. Ethnic groups in transhumant category are few and are of low population density in relation to the total land mass. There is low margin of surplus because of low level of technology, little occupational specialization, high participation of women in the economy and highly flexible residence. The emergent pattern of social structure has kinship and functional groups that help in meeting the demands of a migratory mode of production. As all follow the same mode of production, there is little variation in economic level and behavior from one household to another. The relations of economic control, which are legally manifested as property ownership are absent in transhumant societies.

In Jammu and Kashmir, the main pastoral communities, which are involved in small ruminant rearing, are Bakerwal, Chopan, Gaddi, Changpa etc. They are distributed throughout the state. Bakerwals are found in both the Jammu and Kashmir provinces, Chopan in almost every district of the Kashmir province, Gaddis in the Kathua district and Changpas in the Leh district of the state. They are involved in pastoralism. These pastoral communities have seriously been marginalised due to their ignorance, migratory lifestyle, small population, cultural stereotyping and irrational government policies. They have traditionally been ill treated as less civilized, less productive and more degrading than a settled life style (Dabral and Malik, 2004). In this context the study was planned to assess the constraints of pastoralists regarding improved small ruminant practices.

Material and Methods

Research Design

The study was conducted in Jammu & Kashmir and Ladakh (2017-2018). Ex-post facto and exploratory research design was followed in the present investigation. A multistage random sampling technique was used for the selection of pastoralists

Locale of the Study

The present study was conducted in of Jammu & Kashmir and Ladakh. It is a hilly region with total area of 2,22,236 sq. km that sprawls over the western Himalaya and Korakoram mountains between 32.17^0 N and 36.58^0 North latitude and 73.26^0 E and 83.30^0 East longitude. It is surrounded by Pakistan in the West, Afghanistan in the Northwest and China in the Northeast. The Jammu region falls in Pir Panchal range which is situated 2000 meters above the sea level. Kashmir region lies totally within the Himalayas surrounded by high hills of Peer Panchal range and Korakoram range (K2). Livestock is an integral part of agricultural economy and plays a multifaceted role in providing livelihood support to the rural population.

Selection of the Districts

The population of pastoralists is more or less concentrated in all the districts of Jammu and Kashmir and Ladakh. Four districts namely Kathua, Jammu, Anantnag, and Leh were selected through purposive sampling technique due to predominant pastoralist population in these districts. Four pastoral communities, Gaddi from Kathua, Bakerwal form Jammu, Chopan from Anantnag and Changpa from Leh, were selected from these districts of Jammu and Kashmir and ladakh.

Selection of Villages

A comprehensive list of villages from the selected districts was prepared. Five villages from each district were selected through systematic random sampling technique because systematic sample is spread more evenly over the entire population and is quick, easier and convenient in large populations. Thus, a total of 20 villages were selected from four districts.

Selection of Respondents

A list of pastoralists engaged in small ruminant rearing in each village was prepared and respondents were then selected following random sampling method. Twenty respondents from each village were selected, constituting a total sample size of 400 respondents.

Collection of Data

The data was collected from the study area with the help of interview schedule by using the personal interview technique in their local language. The responses obtained were recorded and only one respondent was interviewed at a time, so that others were not influenced by the reply of that particular respondent. These were documented separately in areas of management, feeding, breeding, healthcare and economic/marketing. The items in each of these areas were 10, 11, 6, 9 and 8 respectively. Pastoralists were asked to rate them on three-point continuum i.e., very serious (score=3), serious (score=2) and somewhat serious (score=1), based on seriousness of the perceived constraint. The constraints were then ranked based upon their mean percent score (MPS). The maximum possible score for management, feeding, breeding, healthcare and economic/marketing area of constraint perception of pastoralists were 12000, 13200, 7200, 10800 and 9600, respectively whereas, the maximum possible score for each item in different areas of improved small ruminant practices was 1200.

Mean Percent Score (MPS)

$$\text{MPS} = \frac{\text{Score obtained}}{\text{Maximum possible score}} \times 100$$

Analysis of the Data

The collected data were tabulated and analysed using the software; Statistical Package for the Social Science (SPSS, 16.0). The presentation of data was done to give pertinent, valid and reliable answer to the specific objective. Inferences were drawn in the light of available knowledge and literature. Frequencies, percentage, arithmetic mean, mean percent score, standard deviation were worked out for meaningful interpretation.

Results and Discussion

The constraints in the study were divided into five main areas of management, feeding, breeding, healthcare and economic/marketing constraints. While considering the overall scores obtained in the major areas, it was found that healthcare constraints were perceived as the most serious, followed by economic/marketing constraints, whereas, management constraints were perceived as the least serious by the pastoralists (Table 1). The possible reason might be due to emerging and reemerging diseases of small ruminants and shortage of veterinary and para-veterinary staff in the state department. Also, the high-altitude terrain of all the pastoralists made marketing a difficult task. The results were corroborated by the findings of Shah *et al*. (2015) who conducted a study on perceived constraints in

the adoption of improved goat husbandry technologies in Jammu and Kashmir and observed that availability of inputs was considered as one of the most important constraint. Poor veterinary infrastructure and services, availability of quality buck and poor extension activity, were the most serious input constraints. Sankhyan *et al.* (2016) conducted the study on constraints of goat and sheep farmers in Western Himalayan region of India and reported that diseases, predators, environmental extremes, veterinary aid at high altitudes and poor marketing infrastructure were major constraints. Choudhary *et al.* (2018) studied the constraints perceived by the Bakarwal tribe in sheep and goat rearing practices in Jammu district of Jammu and Kashmir and revealed that majority of the respondents perceived migration, scarcity of green fodder, costly feeds, poor conception rate in animals and inefficient treatment of animals as the most serious constraints in management, feeding, breeding and healthcare, respectively.

Table 1: Constraint perception scores in improved small ruminant practices perceived by the pastoralists

Constraints	Total statements	Score obtained	Mean	Mean percent score (MPS)	Rank
Management	10	7026	17.56±0.113	58.55	5
Feeding	11	7998	19.99±0.139	60.59	3
Breeding	6	4235	10.58±0.060	58.81	4
Healthcare	9	7426	18.65±0.112	68.75	1
Economic/Marketing	8	6581	16.45±0.090	68.55	2

Maximum score =12000,13200*,7200*,10800*,9600**

From the different areas of improved small ruminant practices, item wise scores have been obtained and presented in tabulated form (Table 2-6). It was observed that constraints like 'increasing input costs makes it difficult to achieve profitability', was the overall most serious constraint perceived by the pastoralists followed by, lack of good quality breedable animals, non-availability of veterinary surgeons, attack of wild animals, lack of insurance facilities for animals. On the other hand, inadequate knowledge to detect signs of heat in animals, was the overall least serious constraint perceived by the pastoralists followed by lack of knowledge about preservation of fodder, migration is problem, lack of knowledge about cheap and scientific housing of animals. It might be due to the increasing costs (inflation), inbreeding and understaffing of the department. The results were more or less in agreement with the findings of Mohan *et al.* (2009), who while assessing the factors restraining the adoption of scientific goat farming in Mathura, Utter Pradesh, observed that lack of grazing land, lack of veterinary services in the adopted villages, non-availability of improved breeding bucks, lack of money, non-availability of medicines, lack of drinking water, non-availability of vaccination facility against contagious diseases, lack of knowledge about improved goat farming, delay in expulsion of placenta by goats, lack of knowledge about goat diseases, problems of pre-mature delivery/abortion, delay puberty in goats and distant goat market, were perceived by the goat farmers as the factors restraining adoption of scientific goat rearing. Kotach (2013) reported that untimely supply of farm inputs, high cost of inputs, lack of technical knowledge and training facilities respectively as, the first three farm problems faced by Gaddi community in Kangra district of Himachal Pradesh. Kumar *et al.* (2010) conducted a study on the role of goats in livelihood security of rural poor in the less favoured environments in semi-arid zones of two major goat keeping states of Uttar Pradesh and Rajasthan and observed that major constraints perceived by the farmers were seasonally related low levels of nutrition, mortality and morbidity losses, lack of good quality breeding stock and poor flock management and poor marketing opportunities, that needed to be overcomed. Similarly, Jana *et al.* (2014) analyzed the perceived constraints in goat rearing in Burdwan district of West Bengal and reported that lack of pure breed buck, high incidence of diseases and lack of capital to start a goat farm were perceived as the major constraints by the goat rearers. Contrary to this, Choudhary *et al.* (2018) revealed that majority of the respondents perceived migration as the most serious constraint.

Perceived Constraints of Pastoralists in Improved Management Practices

In case of management practices (Table 2), attack of wild animals was perceived as the most serious constraint, followed by limited availability of resources for providing scientific housing to animals and high cost of raw materials for animal shed, whereas, 'migration is problem' was perceived as the least serious constraint. The results were in consonance with the findings of Sankhyan *et al.* (2016) who reported that diseases, predators, environmental extremes, veterinary aid at high altitudes and poor marketing infrastructure, were the major constraints. Chaturvedani *et al.* (2017) conducted a study to evaluate the constrains faced by goat rearers in adoption of scientific goat husbandry practices from the different agro-climatic zones of Chhattisgarh state and reported that poor knowledge about improved technology was the most serious constraint perceived by the goat farmers, followed

by poor veterinary infrastructure, services and shrinkage of grazing land, poor extension service, low literacy rate and high cost of veterinary service, in adoption of scientific goat rearing practices. Further, Shah *et al*. (2015) reported that availability of inputs was considered as one of the most important constraint. Poor veterinary infrastructure and services, availability of quality buck, poor extension activity were the most serious input constraints. Similarly, Khandi *et al.* (2011), revealed that the most important constraints faced by the Gujjars of Jammu and Kashmir were lack of finance for improved management practices, high cost of feed supplement/mineral mixture, lack of good breeding stock, and non-availability of veterinary facilities.

Table 2: Perceived constraints of pastoralists in improved management practices

S. No.	Constraints	Score obtained	Mean	Mean percent score (MPS)	Rank	Overall rank
1.	Limited availability of resources for providing scientific housing to animals	868	2.17±0.030	72.33	2	15
2.	High cost of raw materials for animal shed	817	2.04±0.027	68.08	3	18
3.	Lack of knowledge about cheap and scientific housing of animals	488	1.22±0.021	40.66	9	40
4.	Lack of knowledge about importance of sanitation and hygiene	631	1.57±0.026	52.58	7	32
5.	Non availability of clean drinking water in sufficient quantity round the year	676	1.69±0.041	56.33	6	28
6.	Lack of knowledge about keeping up to date management records	707	1.76±0.022	58.91	5	25
7.	High cost of disinfectants	762	1.90±0.025	63.5	4	21
8.	Migration is problem	453	1.13±0.022	37.75	10	42
9.	Attack of wild animals	1015	2.53±0.030	84.58	1	4
10.	Conflict with forest staff	609	1.52±0.039	50.75	8	34

*Maximum score =1200**

Perceived Constraints of Pastoralists in Improved Feeding Practices

For feeding practices (Table 3), lack of knowledge about availability of multi-nutritional feed blocks was perceived as the most serious constraint, followed by less grazing lands and scarcity of feeds, especially in winter. The least serious constraint perceived was lack of knowledge about preservation of fodder.

Table 3: Perceived constraints of pastoralists in improved feeding practices

S. No.	Constraints	Score obtained	Mean	Mean percent score (MPS)	Rank	Overall rank
1.	Lack of knowledge regarding improved feeding practices	646	1.61±0.028	53.83	7	30
2.	Lack of knowledge about balanced ration	858	2.14±0.023	71.5	4	16
3.	Scarcity of dry fodder	637	1.59±0.034	53.08	8	31
4.	Shortage of green fodder	712	1.78±0.042	59.33	6	24
5.	Less grazing lands	960	2.4±0.031	80	2	8
6.	High cost involved in purchase of concentrates	730	1.82±0.024	60.83	5	23
7.	High cost of mineral mixture/ feed supplement	618	1.54±0.026	51.5	9	33
8.	Distant location of market for purchase of concentrate and mineral mixture	549	1.37±0.030	45.75	10	37
9.	Scarcity of feeds especially in winter	873	2.18±0.034	72.75	3	12
10.	Lack of knowledge about preservation of fodder	448	1.12±0.019	37.33	11	43
11.	Lack of knowledge about availability of multi-nutritional feed blocks/Complete feed blocks	967	2.41±0.030	80.58	1	7

*Maximum score =1200**

The results were in agreement with the findings of Singh *et al.* (2018) who reported that the major constraint to small ruminant production was lack of grazing area. Rajkumar and Kavithaa (2014) studied the constraints in goat farming perceived by farm women in Erode district of Tamil Nadu and revealed that shrinking of grazing land / lack

of grazing land, was the main feeding constraint. Shiva *et al*. (2017) also reported that non availability of grazing land, with high cost of feed, especially during summer, was the major constraint in sheep and goat rearing as perceived by the farmers. Similarly, Choudhary *et al.* (2018) revealed that majority of the respondents perceived that scarcity of green fodder and costly feeds as the most serious feeding constraints.

Perceived Constraints of Pastoralists in Improved Breeding Practices

In case of breeding practices, lack of good quality breedable animals was perceived as the most serious constraint, followed by low genetic potential of indigenous animals and lack of knowledge about the time of mating. On the other hand, inadequate knowledge to detect signs of heat in animals, was perceived as the least serious by the respondents (Table 4). Shah *et al*. (2015) observed that availability of quality buck as the most important economic constraint. Similarly, Kumar *et al.* (2010), Rajkumar and Kavithaa (2014), Jana *et al.* (2014), Koli and Koli (2016) and Vamsi *et al.* (2017) reported that the inadequate availability of breeding buck (non-availability of improved breeding bucks), was perceived to be the major constraint. Tanwar (2011) revealed that inadequate availability of breeding buck, lack of knowledge about breeding practices and indiscriminate breeding practices, were the main constraints.

Table 4: Perceived constraints of pastoralists in improved breeding practices

S. No.	Constraints	Score obtained	Mean	Mean percent score (MPS)	Rank	Overall rank
1.	Inadequate knowledge to detect signs of heat in animals	442	1.10±0.015	36.83	6	44
2.	Lack of knowledge about the time of mating	597	1.49±0.025	49.75	3	35
3.	Low genetic potential of indigenious animals	933	2.33±0.024	77.75	2	9
4.	Lack of good quality breedable animals	1139	2.84±0.019	94.91	1	2
5.	Misconceptions about using crossbred animals	533	1.33±0.024	44.41	5	38
6.	Problem of abortion in sheep and goats	591	1.47±0.025	49.25	4	36

*Maximum score =1200**

Perceived Constraints of Pastoralists in Improved Healthcare Practices

In case of healthcare practices, non-availability of veterinary surgeons was perceived as most serious constraint, followed by growing problem of foot rot in sheep and high cost of veterinary medicines, whereas, lack of knowledge about deworming schedule in sheep and goats, was perceived as least serious by the pastoralists (Table 5).

Table 5: Perceived constraints of pastoralists in improved healthcare practices

S. No.	Constraints	Score obtained	Mean	Mean percent score (MPS)	Rank	Overall rank
1.	Lack of healthcare facilities during migration	685	1.71±0.030	57.08	8	26
2.	Lack of veterinary dispensaries/hospitals	747	1.86±0.025	62.25	7	22
3.	Non-availability of adequate medicines in veterinary dispensaries/hospitals	872	2.18±0.021	72.66	4	14
4.	High cost of veterinary medicines	891	2.22±0.031	74.25	3	11
5.	Lack of knowledge about deworming schedule in sheep and goats	476	1.19±0.021	39.66	9	41
6.	Vaccination facilities are not timely available	855	2.13±0.037	71.25	5	17
7.	Growing problem of foot rot in sheep	1002	2.50±0.042	83.5	2	6
8.	Lack of awareness about common contagious/infectious diseases, their causes and control measures	812	2.03±0.020	67.66	6	19
9.	Non-availability of veterinary surgeons	1119	2.79±0.023	93.25	1	3

*Maximum score =1200**

The results were corroborated by the findings of Jeelani *et al.* (2015) and Koli and Koli (2016) who reported that veterinary center/dispensary functioning without a veterinary assistant surgeon was the most serious healthcare constraint. Tanwar (2011) found that lack of veterinary services in villages, high cost of treatment, ignorance about

importance of deworming, lack of knowledge about common diseases and vaccination programme not carried out by any agency, were the major constraints in healthcare practices. Singh *et al*. (2018) revealed the high cost of medicines as one of the important constraints. Similarly, Mohan *et al.* (2009) reported factors restraining the adoption of scientific goat farming in the adopted villages which were taken into account included, lack of veterinary services in the adopted villages, non-availability of medicines, non-availability of vaccination facility against contagious diseases, lack of knowledge about goat diseases, problems of pre-mature delivery/abortion, delayed puberty in goats. Khandi *et al.* (2011), Rajkumar and Kavithaa (2014) and Shah *et al*. (2015) reported that the poor veterinary infrastructure and services were the main constraint. Jana *et al.* (2014) and Shiva *et al.* (2017) reported the high incidence of diseases was the major constraint in sheep and goat rearing, as perceived by the farmers.

Perceived Constraints of Pastoralists in Improved Economic/Marketing Practices

In case of economic/marketing practices (Table 6), increasing input costs makes it difficult to achieve profitability was perceived as the most serious constraint by the pastoralists. This was followed by lack of insurance facilities for animals and the price of produce is not remunerative. On the other hand, lack of market for value added products, was perceived as the least serious constraint by the respondents. The findings were more or less in agreement with Mohan *et al.* (2009) who determined the factors restraining the adoption of scientific goat farming and observed that distant goat market was perceived by the goat farmers as the main constraint in the adoption of scientific goat rearing. Tanwar (2011) revealed that the main constraints in marketing were lack of marketing infrastructure, middlemen not offering remunerative price to male kids, unorganized goat owners and not even a single agency helping in marketing. Similarly, Kumar *et al.* (2010), Vamsi *et al.* (2017) and Singh *et al*. (2018) reported inadequate marketing facilities and poor marketing opportunities as the most serious marketing constraints.

Table 6: Perceived constraints of pastoralists in improved economic/marketing practices

S. No.	Constraints	Score obtained	Mean	Mean percent score (MPS)	Rank	Overall rank
1.	Location of market is far away	680	1.7±0.039	56.66	6	27
2.	Marketing of products is a problem	652	1.63±0.035	54.33	7	29
3.	Lack of appropriate marketing channel	773	1.93±0.034	64.41	5	20
4.	The price of produce is not remunerative	913	2.28±0.040	76.08	3	10
5.	Lack of credit facility for small ruminant farmers	873	2.18±0.022	72.75	4	12
6.	Lack of insurance facilities for animals	1011	2.52±0.025	84.25	2	5
7.	Increasing inputs cost makes it difficult to achieve profitability	1186	2.96±0.009	98.83	1	1
8.	Lack of market for value added products	493	1.23±0.021	41.08	8	39

*Maximum score =1200**

Conclusion

In the five major areas, healthcare constraints were perceived as the most serious followed by economic/marketing constraints, whereas, management constraints were perceived as the least serious by the pastoralists. From the different areas of improved small ruminant practices, constraints like increasing inputs cost makes it difficult to achieve profitability, was the overall most serious constraint perceived by the pastoralists, followed by lack of good quality breedable animals, non-availability of veterinary surgeons, attack of wild animals and lack of insurance facilities for animals. On the other hand, inadequate knowledge to detect signs of heat in animals was the overall least serious constraint perceived by the pastoralists, followed by lack of knowledge about preservation of fodder; migration is problem and lack of knowledge about cheap and scientific housing of animals. Emphasis should be given on healthcare aspect of small ruminant rearing, as the foot rot in certain areas has caused huge production losses. Superior breeding animals have to be made available to improve the genetic potential and to avoid the inbreeding. Special importance may be given for pasture and grazing land development. There is need for sufficient technical and professional manpower for better delivery of veterinary care services. Opening of remunerative marketing channels and livestock markets will help in better returns to pastoralists.

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Conflict of Interests

There is no conflict of interest.

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