

Scholars Research Library

European Journal of Zoological Research, 2017, 5 (1):28-35 (http://scholarsresearchlibrary.com/archive.html)



Small Ruminant Production in Karnataka State of India- an Overview

Shiva Kumara C1*, Reddy BS² and Suresh S Patil³

¹Department of Agril Economics, UAS, GKVK, Bengaluru, India ²Department of Agril Economics, AC, Kalaburgi, UAS, Raichur, India ³Dean (Agril), AC, Bhimarayanagudi, UAS, Raichur, India

ABSTRACT

Small ruminants play an important role in Indian economy and are a source of livelihood and employment to millions of rural households. It contributes around 8.5% to the total value of output from livestock sector at current prices (2011-12). Sheep and goats in India are predominantly maintained on natural vegetation on common grazing lands, wastelands and uncultivated (fallow) lands, stubbles of cultivated crops and top feeds. The study is conducted in Tumakuru, Chitradurga, Belagavi and Kalaburagi districts of Karnataka. Total sample size of 120 respondents consisting 60 sheep farmers and 60 goat farmers were selected for the study. The technique of tabular analysis, compound growth rate analysis and garret ranking were used to know growth trend and prioritise the constraints. The findings of the study revealed that the annual growth in sheep (1.13%) and goat (0.73%) population in India increased marginally during 1990 to 2012. Similar trend of growth was observed in Tumakuru, Chiradurga, Belagavi and Kalaburagi district and Karnataka state as a whole. Majority of the farmers are having kaccha type of shed for rearing sheep (41.66%) and goat (80%). The per annum employment generated under sheep and goat farming were 552 man-days and 505 man-days labour respectively. Non availability of grazing land with high cost of feed, especially during summer, incidence of PPR, ET and FMD diseases were the major constraints in sheep and goat rearing as perceived by the farmer.

Keywords: growth trend, man-days, grazing land

INTRODUCTION

Livestock sector plays a critical role in the welfare of India's rural population. It contributes 9% to Gross Domestic Product (GDP) and employs 8% of the labour force. This sector is emerging as an important growth leverage of the Indian economy. As a component of agricultural sector, its share in GDP has been rising gradually, while that of crop sector has been on the decline. In recent years, livestock output has grown at a rate of about 5% per annum, higher than the growth in agricultural sector. This enterprise provides a flow of' essential food products, draught power, manure, employment, income, and export earnings. Distribution of livestock wealth is more egalitarian, compared to land. Hence, from the equity and livelihood perspective it is considered as an important component in poverty alleviation programmes [1].

Small ruminants especially sheep and goats contribute to the livelihoods of millions of rural poor in most of the developing countries of the Asia and Africa, where 95% of the world's sheep and goat population is concentrated and also the majority of world's poor live. Sheep and goat production has witnessed excellent growth over the years despite a negative campaign against it for its perceived adverse impact on vegetation, forest and grazing lands. Small farmers and landless agricultural laborers are increasingly relying on sheep and goats for meeting their cash requirements [2].

Small ruminants (i.e. sheep and goats) make a very valuable contribution to the poor in the rural areas. Their importance is indicating by various functional contributions (meat, milk, fibre, skin etc.), socio-economic relevance and stability to farming systems. Small ruminants contribute enormously towards promotion of livelihood security and as an insurance cover to cope with crop failures particularly for rural landless, small and marginal male /female farmers [3].

Sheep and goat are important livestock species of India. They contribute greatly to the agrarian economy, especially

in the arid/semi-arid and mountainous areas where crop and /or dairy farming are not economical. In the prevailing socio-economic conditions in the country where per capita land holding is hardly 0.2 hectare, sheep and goat rearing becomes an inseparable component of mixed farming system. A number of rural-based industries use wool and skins as raw material. Sheep and goat manure is an important source of soil fertility, especially in southern states [4].

Production and management systems in India: Traditionally sheep and goats were maintained by people of particular communities in different regions who were either landless or small holders, illiterate, economically poor and socially backward or sheep and goats have been their primary source of livelihood. Land holdings in general have negative association with sheep and goat rearing. Some medium to large herd/flocks were common in most of the villages. During last few decades, people across the income and social group have been involved in sheep and goat farming. Herd/flocks of large size (50 animals to 300 animals) are reducing due to gradually shrinking of grazing land in almost all the regions. Sheep and goat possess an important mechanism for coping up draught, because of better adaptability and mobility as compared to crops and large ruminants in arid and semi-arid parts of southern and western regions. Major forage sources in this region are rangelands, common grazing lands and post-harvest crop field or residues [5]. Small herd and flock size are reared under extensive mixed farming systems. Sheep and goat population in southern region is consistently increasing mainly due to increase in number of keepers. Several feeding management systems are being practiced in all the regions are given below:

Extensive system: More than 80% population of sheep and goats are reared under extensive system. This system includes transhumance, free range, pasture and range grazing management. The system is based on low resource use and a low level of productivity. Grazing on common property resources (CPR) viz. hills, mountain, forests, waste land etc.

Semi-intensive system: It is a combination of limited free range grazing and feeding in stalls. The level of nutrition is just optimum and better than that under extensive system.

Intensive system: The intensive system of sheep and goats includes grazing on developed pastures and/or feeding completely in stalls on cultivated fresh or conserved fodders, crop residues and concentrates. Sheep and goat under this system is less than 1% of the total population. Poor adoption of production technologies is major limiting factor under intensive system. Sheep and goat contributes around 39% of the total livestock population in the country. The total number of sheep and goat in the country were 65 and 135 million respectively. Karnataka stands second and thirteenth position in sheep and goat population respectively. Karnataka accounts for 14.7% (9.57 million) to the total sheep population in the country, similarly goat accounts about 3.55% (3.50 million) of goat population in the country [2].

Need for the present Study: Karnataka is one of the important sheep and goat producing state, it contributes around 7% to countries sheep and goat population. Sheep and goat rearing is the backbone of the economy of small and marginal farmers. There is a huge potential of common property resource in general and pastures and grazing land in particular. Large number of local and improved sheep and goat breeds is also available; majority of small, marginal and landless famers depends on sheep and goat for their livelihood. Keeping this in mind the study was conducted on small ruminant's production in Karnataka to suggest suitable policy measures for encouraging small ruminant's production activities in the state.

METHODOLOGY

Karnataka state extends about 750 km from north to south and 250 km from east to west and covers an area of 191791 km². As per 2011 census, the state has a population of 6, 10, 95, and 297. Karnataka receives an average annual rainfall of about 1409 mm both from south-west and north-east monsoons. Livestock is one of the most important sectors in the country and is contributing 4.11% to the total GDP and 26% to the agricultural GDP. Karnataka is one of the progressive states with excellent potential for livestock in general and sheep and goat farming in particular. Karnataka stands second position in sheep population with 9.57 million and thirteenth position in goat population with 3.5 million [6].

Selection of district: The selection of districts was based on highest number of sheep and goat population in the state. The top four districts having highest population namely Tumakuru, Chitradurga, Belagavi and Kalaburagi were chosen. Due to non-availability of livestock population data of newly formed Yadgir district on 10th April, 2010, earstwhile Kalaburagi district is considered for the study (Tables 1 and 2).

Sampling procedure adopted: The multistage random sampling technique was adopted in selecting sample for the study. In the first stage, four districts namely, Tumakuru, Chitradurga, Belagavi and Kalaburagi were selected based on highest number of sheep and goat population. In the second stage, one taluka from each district was selected based on potentiality and highest number of sheep and goat in the district. In the third stage, 30 farmers (15 sheep

farmers, 15 goat farmers) from each of selected taluks were selected at randomly. The total sample size constituted 120 farmers for the study as a whole. For selection of the villages in selected taluks, identifying the potentiality as well as concentration of sheep and goat farmers, experience of the officers of Animal Husbandry and Veterinary Service, Marketing department at taluka level along with market intermediaries were consulted. District wise time series data on sheep and goat population for the period from 1990-1991 to 2011-2012 were collected from Animal Husbandry and Veterinary Services department, Government of Karnataka, Bengaluru, livestock census and Indiastat.com website.

CL N-	District	Sh	eep	G	Goat		Total	
SI. NO.	District	No.	Percent	No.	Percent	No.	Percent	
1	Tumakuru	1061330	11.07	326890	6.82	1388220	9.65	
2	Belagavi	788929	8.23	491545	10.25	1280474	8.9	
3	Kalaburagi	563543	5.88	630311	13.14	1193854	8.3	
4	Chitradurga	940038	9.81	231279	4.82	1171317	8.15	
5	Bagalkote	733600	7.65	324741	6.77	1058341	7.36	
6	Bellary	756270	7.89	187270	3.9	943540	6.56	
7	Raichur	647549	6.76	281710	5.87	929259	6.46	
8	Koppal	547061	5.71	156509	3.26	703570	4.89	
9	Vijayapura	309278	3.23	367563	7.66	676841	4.71	
10	Mandya	341774	3.57	261300	5.45	603074	4.19	
11	Chickballapur	432691	4.51	137050	2.86	569741	3.96	
12	Kolar	445100	4.64	86263	1.8	531363	3.7	
13	Davanagere	343178	3.58	103187	2.15	446365	3.1	
14	Mysore	218381	2.28	168299	3.51	386680	2.69	
15	Haveri	254708	2.66	127757	2.66	382465	2.66	
16	Gadag	259047	2.7	106353	2.22	365400	2.54	
17	Ramanagara	152938	1.6	120238	2.51	273176	1.9	
18	Hassan	160685	1.68	99405	2.07	260090	1.81	
19	Bidar	88402	0.92	145942	3.04	234344	1.63	
20	Chamarajnagar	128483	1.34	102854	2.14	231337	1.61	
21	Bangalore (R)	124870	1.3	80740	1.68	205610	1.43	
22	Chickmagalur	91312	0.95	46068	0.96	137380	0.96	
23	Dharwad	73982	0.77	62140	1.3	136122	0.95	
24	Bangalore (U)	77302	0.81	44725	0.93	122027	0.85	
25	Shimoga	36791	0.38	58034	1.21	94825	0.66	
26	D. Kannada	265	0	24628	0.51	24893	0.17	
27	U. Kannada	4783	0.05	8961	0.19	13744	0.1	
28	Kodagu	1401	0.01	7785	0.16	9186	0.06	
29	Udupi	70	0	6600	0.14	6670	0.05	
	Total	9583761	100	4796147	100	1.4E+07	100	

Table 1: District-wise sheep and goat population of Karnataka during 2011-12

Source: Census report, 2012

Table 2: Demographic and geographic profile of the study area.

Sl. No	Particulars	Tumakuru	Chitradurga	Belagavi	Kalaburagi
1	Geographical area (km ²)	10597	8436	13433	10954
2	Hoblies (No.)	50	22	35	32
3	Villages (No.)	2715	1063	1775	918
6	Literacy ratio (%)	75.14	73.71	73.48	64.85
7	Average annual rainfall (mm)	584	548	825	776
8	Forest land (ha)	45177	73719	190424	35316
9	Cultivable barren land (ha)	108771	216731	350309	81178
10	Fallow land (ha)	216731	108771	350309	81178
11	Cultivable waste (ha)	62642	21612	11465	9417
12	Permanent pasture (ha)	76453	88740	24877	25855
10	Agriculture land (ha)	556945	453417	896070	941636
11	Livestock population	2109363	1608347	2733715	1061802
12	Sheep and goat population	1388220	1171317	1280474	473012

Sources: Karnataka at glance (2013-14)

For easy comparison, sheep herd size and goat flock size was classified using below mentioned criteria.

The arithmetic mean (\bar{x}) and standard deviation (SD) of sheep and goat herd/flock size were calculated in order to demarcate boundaries between different sizes of sheep and goat.

Small herd/flock size: Mean minus standard deviation (\bar{x} -SD) of overall herd/flock size is the value to demarcate small size.

Large herd/flock size: Mean plus standard deviation (\bar{x} +SD) of overall herd/flock size is the value to demarcate the large size.

Medium herd/flock size: farmers whose sheep and goat herd/flock size lies between mean plus or minus standard deviation ($\overline{X} \pm SD$).

Analytical tools employed

A. Compound growth rate analysis: In order to assess the trend in population of sheep and goat in the study area, Karnataka and Country as a whole, the compound growth rate analysis was employed. Compound growth rates were computed using the exponential function of the form,

 $Y_t = ab^t u_t$

Where,

Y_t: Dependent variable

a: Intercept (constant)

b: Regression coefficient

t: Years which take values, 1, 2, ...,n

u_t: Disturbance term for the year t

For the purpose of estimation, equation (1) was transformed into log linear form and was estimated using Ordinary Least Square (OLS) technique. The compound growth rate (g) in percentage was then computed from the following relationship,

g=(Antilog of $\ln b-1$) × 100.

The significance of regression coefficient were tested for their significance level using, 't' test which was defined as,

$$t = \frac{bi}{SE(bi)}$$

Where,

b=Regression coefficient

SE (b_i)=Standard error of the regression coefficient

B. Garrett's ranking technique: To document the constraints relating to the production and marketing of sheep and goat, Garrett ranking technique was used. The response of farmers on the possible problems was obtained on rank basis to work out the total score of the problem. Garrett's ranking technique gives the change of orders of constraints into numerical scores. The major advantage of this technique as compared to simple frequency distribution is that here constraints are arranged based on their importance from the point of view of respondents.

Garrett's formula for converting ranks in % is given bellow

Per cent position= 100 (R_{ii} - 0.5) / N_i

Where, R_{ii}=rank given for ith factor (constraint) by jth individual

N=Number of factors (constraints) ranked by jth individual

The relative position of each rank obtained from above formula was converted into scores by referring to the table given by Garrett (transmutation of orders of merit into units of amount or scores) for each factor; scores of all

(1)

individuals were added and then divided by the total number of respondents for the specific factor (constraint). Finally, mean scores for all the factors were arranged in descending order and the ranks were given.

RESULTS AND DISCUSSION

Growth in sheep and goat population: Growth rate in sheep and goat population is presented in Table 3. The results of the study revealed that, growth in sheep population in Tumakuru, Chitradurg, Belagavi and Kalaburagi districts were 2.65, 4.46, 2.75 and 2.79% per annum respectively during study period (1990-2012). Similarly, Karnataka state as a whole indicated growth rate of 3.26% per annum, while, marginal growth of 1.13% for the country as a whole. In case of goat population, positive growth rate was noticed in the study area, except Chitradurga (-0.22%/annum). However, highest growth rate of 3.20% was observed in Kalaburagi district followed by Belagavi and Tumakuru, Further, Karnataka (0.96%) state and country (0.73%) as a whole registered marginal growth in the goat population. Across the census, mixed trend of growth in sheep and goat population was found in the study area, Karnataka state and country as a whole. The sheep and goat population in India increased marginally (1.13% in case of sheep and 0.73%/annum in case of goat). However, across the livestock census the growth in population of both sheep and goat were positive except during 2007-2012 inter year livestock census. Lower growth rate during 2007-12 was mainly due to severe droughts in most of the regions of India. However, in contrary to this, Tumakuru, Chitradurga, Belagavi, Kalaburagi and state as a whole have shown mixed trend of positive growth in the inter year census between 1990 to 1997, and 2003 to 2007, Whereas, a negative growth was found during 1997 to 2003 and 2007 to 2012. A study [7] revealed consequences of 2003 drought in Karnataka with respect to livestock and fodder reported that the annual income of the households reduced to half in drought years. The reduction was more in case of crops (61.42%) followed by livestock (30%) which resulted increase in sale of sheep and goat. However, study districts and Karnataka state have shown higher growth in sheep and goat population. Similar results were reported for sheep and goat [8,9]. The positive growth in population was mainly due to higher demand for meat and meat products because of rapid growth in population. To encourage small and marginal farmers for their sustainable livelihood, both central and state government have to introduce special programmes to encourage sheep and goat farming to meet out the consumption demand for meat and meat products of the consumer.

I.Sheep						
District	1990-1997	1997-2003	2003-2007	2007-2012	1990-2012	
Tumakuru	5.97	-0.18	2.72	-0.09	2.65	
Chitradurga	10.33	-0.05	3.88	0.12	4.46	
Belagavi	10.54	0.55	-0.17	-1.86	2.75	
Kalaburagi	6.81	-0.88	3.46	-0.47	2.79	
Karnataka	7.81	-1.36	3.99	0.03	3.26	
India	1.79	0.96	2.19	-1.35	1.13	
		II.Goat				
Tumakuru	2.05	-0.86	7.01	-6.36	0.43	
Chitradurga	-1.51	0.21	7.56	-6.45	-0.22	
Belagavi	1.98	2.32	2.33	-3.04	1.11	
Kalaburagi	8.91	-0.26	4.29	-2.56	3.2	
Karnataka	3.28	-1.16	4.61	-3.51	0.96	
India	0.9	0.19	1.76	-0.55	0.73	

Table 3: Growth in sheep and goat population

Categorization of sheep and goat rearing farmers: As mentioned in methodology, both sheep herd size and goat flock size, the farmers were classified into small, medium and large size based on their mean and standard deviation value. Table 4 indicated that, sheep farmers having less than 36 animals were considered as a small herd size; more than 106 animals were considered as a large herd size and between 36 animals to 106 animals were classified as medium herd size. Majority of the farmers in the study area were having medium (70%) herd size with ranging from 37 to 106 animals, followed by large (16.67%) and small (8%) herd size. On an average, total number of sheep per household was 25, 67 and 127 in small, medium and large herd size respectively, with an overall average of 71 sheep's per herd size.

In case of goat rearing farmers, who were having less than 20 animals were considered as small flock size and famers who have more than 39 goats were considered as a large flock size and those having between 21 to 39 goats considered as medium flock size. The number of farmer's falls under small, medium and large flock size in the study area was 10,

40 and 10 farmers respectively. On an average, 17 goats were found in small flock size and 29 goats in medium and 43 goats in large flock size with an overall average of 30 goats per flock.

Particulars	Herd/Flock size	No. of farmers	Average size	
	I. Sheep he	rd size		
Small	~26	8	25	
Siliali	<30	-13.33	25	
Madium	27.106	42	67	
Medium	57-108	-70	87	
I ana	> 100	10	127	
Large	>106	-16.67	127	
Overall	-	-	71	
	II. Goat flo	ck size		
G 11	<20	10	17	
Siliali	~20	-16.67	17	
Madium	21.20	40	20	
Medium	21-59	-66.66	29	
Larga	>20	10	43	
Large	~39	-16.67	43	
Overall	-	-	30	
1. Decimal values are rounded to 2.Figures in parenthesis indicate	o its nearer value e per cent to respective total			

Table 4: Categorization of s	heep and goat	rearing farmers	based on herd	and flock size
------------------------------	---------------	-----------------	---------------	----------------

Composition of sheep herd size and goat flock size: The composition of sheep herd size and goat flock size (Table 5) indicated that in small, medium and large herd size, female sheep were 18, 46 and 80 respectively. However, lambs were 7, 18 and 44 in small, medium and large herd size, respectively. Similar trend were noticed in case of goat flock size. It is clear from the table that the composition of sheep and goat size indicated dominance of female sheep (48) and female goat (14) with only 2 and 1 male sheep and goat respectively.

		Male	Female			
Herd/Flock size	Ram/Buck		Inmilk	Dry	Total	Lamb/Kids
		I. S	heep			
Small	1	-	9	9	18	7
Medium	2	1	21	25	46	18
Large	3	4	41	39	80	44
Overall	2	2	23	25	48	21
		II.	Goat			
Small	1	-	4	4	8	8
Medium	1	1	7	7	14	13
Large	2	2	11	10	21	22
Overall	1	1	7	7	14	14
Decimal values are rounded to its n	earer value					

Table 5: Composition of sheep herd and goat flock size

Possession of sheep and goat shed: Sheep and goat production system in our country is predominantly extensive system with zero input concepts. Majority of sheep and goats were reared either in open yard or in mixed type houses without scientific standard. The possession of sheep and goat shed by the respondents is presented in Table 6. The study revealed that, majority of respondents had constructed kaccha type of house for rearing sheep (41.66%) and goat (80%), whereas about 32 and 10% of respondents had used pacca type of house for sheep and goat management respectively. About 26.66 and 6.00% of the farmers had used mixed type house for sheep and goat keeping respectively. The findings of the study proved that, majority of the farmers have used kaccha type of house for rearing sheep (41.66%) and goat (80%). The reason might be lower annual income earning capacity of the respondents and their family members and is also discussed in the earlier section. Similar findings were reported by Braj Mohan et al. revealing that majority of the goats are reared either in open yard or in mixed type houses without scientific basis. A proper shelter controls the incidence of diseases, pests and enhances the productivity of the animal.

Table 0. I ossession of sheep and goat sheep of sample respondents.						
	S	Sheep farmers		Goat farmers		
Type of house	Number	Percentage(%)	Number	Percentage(%)		
Pacca	19	31.67	6	10		
Kaccha	25	41.66	48	80		
Mixed	16	26.67	6	10		
Total	60	100	60	100		

Table 6: Possession of sheep and goat shed by sample respondents.

Employment pattern under sheep and goat farming: Per day labour use and employment pattern is presented in Table 7. On an average, cost incurred on labour per day was $\overline{\xi}$ 418.50 and $\overline{\xi}$ 382.15 in sheep and goat rearing respectively. However, labour hours spent on different activities carried out by farmers indicated that, maximum time spent was on grazing of animals (64.08%) followed by collection of feed and grass from field (15.77%), feeding and watering of animals (14.62%) and milking (5.53%). The per annum employment generated under sheep and goat farming revealed that, on an average, 552 man-days and 505 man-days were employed in sheep and goat farming, respectively. Among the different components, grazing of animal (338.08 man-days) required maximum number of man-days followed by collection of grass (68.44 man/days), feeding and watering (67.98 man/days) and milking (30.57 man/days) activities. Similar pattern of labour use and employment per annum was observed in goat farming.

Among the different components of sheep and goat rearing, grazing of animal (338.08 man/days) required maximum number of man-days. The findings of the study are in line with Ajith Singh in the study on labour utilization patterns which identified farming system in Chittoor district of Andhra Pradesh. The above discussion revealed regular employment to the rural small and marginal farmers in addition to fulfilling emergency expenditure through sale of animals.

Particulars	Sheep			Goat			
i ai ticulai ș	Per day (Hrs)	Annual (MD's)	Percent	Per day (Hrs)	Annual (MD's)	Percent	
Feeding and watering of animals	1.77	80.76	14.62	1.49	67.98	13.46	
Collection of grass from field	1.91	87.14	15.77	1.5	68.44	13.55	
Grazing of animal	7.76	354.05	64.08	7.41	338.08	66.94	
Cleaning of animal	-	-	0	-	-	0	
Milking	0.67	30.57	5.53	0.67	30.57	6.05	
Total labour (hr)	12.11	552.52	100	11.07	505.07	100	
Value (₹)	418.35	165756	-	382.15	151521	-	

Table 7: Labour use and employment pattern in sheep and goat farming

Constraints opined by sheep and goat farmers: The details of ranks for various constraints opined by the respondent in sheep and goat farming and their mean (Garrett) scores were given in Table 8. The major constraints opined by sheep and goat rearing farmers are non-availability of grazing land (74.98), followed by severity of diseases (PPR, ET & FMD) infection (67.55). The other major constraints opined by respondents were, involvement of large number of middlemen (47.83), lack of availability of water for drinking and cleaning of animals (44.34), in-adequate space for shelter (42.84), non-availability of feed and fodder (57.43), lack of awareness of the insurance (37.34), inadequate veterinary services (34.05), lack of market information on arrival and prices of animals in different markets of the locality (28.11). Security of the animal, was plagued by wild animals (15.43) and non-availability of the subsidy for establishing sheep and goat farming (14.93) were the other minor problems encountered by sheep and goat farmers [10].

Particulars	Garrett score	Rank
Lack of grazing land	74.98	I
Incidence of disease	67.55	П
Involvement of large no. of middlemen	47.83	III
Lack of water availability	44.32	IV
In-adequate space for shelter	42.84	V
Lack of insurance protection	37.34	VI
Inadequate veterinary services	34.05	VII
Lack of market information	28.11	VIII

Non-availability of feed	19.31	IX
Plagued by wild animals	15.43	X
Government subsidy	14.93	XI
Lack of transportation facility	14.88	XII
Non-availability of credit	11.34	XIII
High Price fluctuation	7.93	XIV
Labour scarcity	5.96	XV
Higher cost of lamb/kid	0.43	XVI

CONCLUSION

The annual growth in sheep (1.13%) and goat (0.73%) population in India increased marginally during 1990 to 2007. Similar trend of growth was observed in Tumakuru, Chiradurga, Belagavi and Kalaburagi district and Karnataka state as a whole. The total number of sheep per household was 25, 67 and 27 under small, medium and large herd size with an overall average of 71 sheep's per farm. Similarly, about 17, 29 and 43 goats were found in small, medium and large flock size of goat with an average of 30 goats per flock. Majority of the farmers are having kaccha type of shed for rearing sheep (41.66%) and goat (80%) with an average investment of ₹ 26136 and ₹ 10000 respectively. Non availability of grazing land with high cost of feed, especially during summer, incidence of PPR, ET and FMD diseases were the major constraints in sheep and goat rearing as perceived by the farmers.

REFERENCES

- [1] Jabir, A., Livestock. Res. for rural development, 2007. 19.
- [2] Arya, and Mahesh, C., Special report, Indian Veterinary Research Institute, Izatnagar, UP, 2002.
- [3] Ramesh, D., Meena, HR, and Meena, KL., A Vet World, 2012. 5: 288-293.
- [4] Vivek, MP., Msc. Thesis, submitted to Karnataka Veterinery, Animal and Fischeries Sciences University, Bidar, 2012.
- [5] Dixit, AK. and Singh, MK., The Indian Journal of Small Ruminants, 2014. 20: 165-168.
- [6] Anonymous, Livestock census report, 2012.
- [7] Nagaratna, B. and Shridar, K., J Human Eco, 2009. 26: 123-130.
- [8] Mahanthesh., Thesis submitted to University of agricultural sciences Raichur, Karnataka, 2012.
- [9] Dixit, AK. and Braj, M., The Indian Journal of Small Ruminants, 2014. 20: 96-98.
- [10] Anonymous, Karnataka at a glance, Directorate of Economics and Statistics, Government of Karnataka, Bengaluru, 2012.