

Assessment of grasslands and livestock production in Kangra Valley of Himachal Pradesh

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Introduction

In Himachal Pradesh 89.96 percent as per 2011 census of population lives in rural areas. The mainstay of the people of Himachal Pradesh is agriculture and has an important place in the economy of the State. Agricultural census shows that 87.95 percent of the total holdings are of small and marginal. Rearing of livestock is an integral component of rural economy (Anonymous, 2014). Livestock depend to a certain extent on fodder and grass grown on common property resources (CPR) as well as on crops and residues. Animal production is an integral part and forms part of the earning of small and marginal farmers. Almost every household in the State maintains a few heads of livestock of one kind or the other. The indigenous livestock population, and in many cases their cross bred progeny are dependent on grazing/pasture land and forest. When these animals become unproductive, old or sick, there is a tendency to abandon them rather than be responsible for feeding them. Grassland/pastures produce far below their potential and there is a gap between demand and supply of green fodder. The geographical area of Kangra is 5, 63,832.3 ha and area under grasslands is 69,781.7 ha that comes around 27.51%. (Singh *et al.*, 2009). The problem of animal productivity has been exacerbated by the shortage of fodder as holdings have become smaller and the extent and productivity of common grazing lands has also reduced over time. There are mainly two reasons which are responsible for poor performance of livestock *i.e.*, low productive animals and low availability of fodder.

Materials and Methods

The study was conducted to assess the production and nutritional status of the grasslands harvested at different schedules during 2009. Three sites at low hills (Nurpur), mid hills (Palampur) and high hills (Bir) were selected in Kangra district of Himachal Pradesh. The productivity assessment was done at five locations of each sites viz., open forest area; enclosed forest area; community land; farmer's field; and wasteland. Assessment of biomass was done in mid March; mid June; mid July; mid August; mid September and mid December from the same unit area and single harvest done in the month of September as per farmer's practice. The composition of grasses in the grasslands was *Saccharum spontaneum*, *Imperata cylindrical*, *Chrysopogon gryllus*, *Bothriochloa intermida*, *Eragrostis sp.*, *Arundinella nepalensis*, *Dichanthium annulatum*, *Cynodon dactylon*, *Trifolium repens* etc. A survey was also conducted in the three villages Bharmat, Rajpura, Tanda and Dhoren (Ghaneta) of Kangra District of Himachal Pradesh, to know the forage requirements, feeding pattern, productive and reproductive status of the animals in different livestock holdings and also to study the level of knowledge of farmers about animal husbandry practices.

Results and Discussion

It was observed that mean production level was highest in low hills, closely followed by mid hills; much less in high hills. The average herbage production obtained through 6 cuts at periodic intervals (March to December) was 8.66 t DM/ha as compared to single harvest 5.96 t DM/ha in low-hill conditions; 7.70 t DM/ha and 4.55 t DM/ha (mid-hill conditions) and 4.10 t DM/ha and 2.03 t DM/ha (High-hill conditions), respectively. The average herbage production obtained through 6 cuts at periodical intervals (March-December) was consistently higher as compared to single harvest obtained in September (Table 1). The percentage CP, CF and total ash ranged 4.35-7.90; 31.17-43.42 and 5.95-6.81, respectively in single cut treatment in low hills under different locations. In mid-hills conditions the % CP, CF and total ash ranged 4.80-8.57; 36.24-41.71 and 4.15-8.91, respectively and in high hill conditions the % CP, CF and total ash ranged 8.37-11.97; 34.16-36.69 and 9.47-11.01 respectively in different locations. The average family size is 5.12 and the family size is positively co-related with the size of holding. The average size of farm holding of the sample farmers ranged from 0.64 – 0.94 ha. The average livestock holding is 4.23. About 29% of sample size in the District was illiterate. Similar findings been reported by Chachra Sandeep (2014) although the locations were different but area of study was same. The livestock population of Kangra is reported as 396557(Cattle), 164695 (Buffalo), 107627 (Sheep) and 209086 (Goat), respectively

(Anonymous, 2009). It was found that 5% farmers cultivated fodder on small areas. Stall feeding is practiced by 20% of the respondents. Livestock are looked after by female members of the household. The animals are housed in open, covered spaces or congested houses. About 58% farmers had semi pucca cowsheds and 38% had semi concrete floor for housing the animals. About 8% of the animals were offered required amount of nutrients. Only 30% farmers were feeding concentrates to lactating cows and 40% farmers were feeding green fodder to lactating cows producing average 6 kg milk/day. Feeding practices of milch animals revealed that average quantity of fodder and concentrate feed fed per day to the pregnant cows by livestock farmers was 20.8 - 24.6 and 1.19 and 1.34 kg, respectively. About 3-5 kg of tree leaves is fed to the adult animals during the months January to April. Mineral mixture feeding was done by 3% of farmers. Most of the farmers prepared concentrate mixture by blending locally available concentrate ingredients such as mustard cake, oats bran, wheat bran and wheat grain and provided this to the animals in the form of sani. Concentrate feeds of different brands are purchased from the market and provided to the milking animals. Wheat straw was the sole roughage fed during all seasons. The type of feed and fodder fed to animals is much similar between different categories of the farmers but production scenario of different category of the farmers varied significantly. The total requirement of fodder is 145.78 quintals of dry fodder/household/year and the available dry fodder is 119.54 quintals/household/year. It has been recorded that the average time spent for grazing by goats varies between 8-10 hours and average distance covered is 3-7 Kms/day. The major fodder resources during different season were grasslands, community lands, wastelands, weeds from cultivated lands, wheat straw, maize stover, paddy straw, green grass, sorghum, oats etc. The gap in the fodder availability is met with large scale import of wheat straw from adjoining states of Punjab and Haryana. The results of the study also indicated that the feeding schedule followed for different animals is highly imbalanced. Most of the farmers informed that the availability of green fodder and crossbred animals have enhanced during recent years but majority of farmers were ignorant about the balanced feeding, forage requirements of the animals and management system.

Table 1: Fodder production (DM t/ha) at different intervals at different locations.

Hill Zone	Location	Harvest Period						Total	One Cut'
		A	B	C	D	E	F		
Low Hill	1	0.19	0.55	2.42	3.31	1.88	0.03	8.38	4.52
	2	0.37	0.78	2.54	2.98	2.21	0.02	8.9	6.85
	3	0.28	0.71	2.96	5.45	1.16	0.04	10.6	7.82
	4	0.24	0.89	4.39	5.97	1.27	0.03	12.79	8.75
	5	0.17	0.38	0.51	1.25	0.26	0.05	2.62	1.86
	Average	0.25	0.66	2.56	3.79	1.36	0.03	6.66	5.96
Mid Hill	1	0.18	0.76	2.32	2.45	1.72	0.02	7.45	2.98
	2	0.41	0.47	2.11	3.01	2.18	0.02	8.2	4.07
	3	0.29	0.51	2.42	4.45	0.96	0.03	8.66	6.78
	4	0.39	0.94	4.01	4.82	1.41	0.04	11.61	7.96
	5	0.15	0.45	0.91	0.89	0.14	0.02	2.56	0.97
	Average	0.20	0.63	2.35	3.12	1.20	0.03	7.70	4.55
High Hill	1	0.22	0.26	0.81	1.82	0.62	0.02	3.75	1.31
	2	0.27	0.38	1.09	2.21	0.71	0.04	4.7	2.02
	3	0.19	0.29	1.01	2.45	0.82	0.03	4.79	2.92
	4	0.26	0.41	0.95	2.61	0.91	0.02	5.16	3.06
	5	0.09	0.26	0.33	0.65	0.75	0.01	2.09	0.85
	Average	0.21	0.32	0.84	1.95	0.76	0.02	4.10	2.03

(1=Open forest area; 2=Enclosed forest area; 3=Community land; 4=Farmers' field; 5=Wasteland)
(A= Mid March; B=Mid June; C=Mid July; D= Mid August; E=Mid September; F=Mid December)
(*= Single harvest during September)

Conclusion

It can be concluded that the region is deficit in fodder which support livestock population. The results of the study also indicated that the feeding schedule followed for different animals is highly imbalanced. However, further studies for identification and improvement of forage resources are needed on a large scale for ensuring fodder security so that all available genetic potential of animals could be exploited for sustainable livestock production in the region.

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