

# A study on the status of fodder balance in Himachal Pradesh

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**Abstract.** The study was aimed at estimating the fodder balance in Himachal Pradesh. Stratified multistage random sampling technique was used for sample selection. The result showed that average land holding size was 2.40 ha and average number of livestock per household was 5.80. The survey indicated the overall deficit of 32% of fodder requirement of which deficit was 13% in case of grasses, 14% in cases of tree fodder and 55 per cent for straw.

**Keywords:** Agroforestry, fodder availability, fodder balance, fodder requirement, livestock

## Introduction

The livestock farming is one of the important component of rural economy in the hills. Increased livestock population has resulted in high grazing pressure and has also necessitated continuous search for supplementary leaf fodder. The main sources of fodder component in hills are grasses, crop residues and leaf fodder. It hardly needs to be emphasised that the quantity and quality of fodder would be one of the major prerequisites for supplementary farm incomes. Fodder availability is a critical aspect of livestock management. According to an estimate the available fodder resources can meet only 50 % of the demand (Negi). Under such scarcity most of the livestock will not be able to maintain their average productivity.

Fodder is grown as an independent crop or mixed crop in some areas, which may form an insignificant part of the total requirement. Other important sources of fodder are pasture and grazing lands, culturable wastes, fallow and barren lands. There are mainly two reasons which are responsible for poor performance of livestock viz. poor quality of cattle and low availability of fodder. The problem of fodder scarcity can be solved by promoting the cultivation of green fodder, specially by plantation of tree fodder on community lands and other lands which are marginal for food crops. The present trend of fodder development does not indicate the possibility of increasing fodder

supply, unless we add new dimensions to fodder production programme. However, before suggesting new strategies. It is necessary to understand the present status of fodder availability, amount of deficit or surplus if any.

## Materials and methods

In the present study stratified multistage random sampling technique was used with district as first stage unit. One district was randomly selected from each of 4 agroclimatic zone, 3 blocks from each district, 3 villages from each block and ultimately 10 households from each village. Thus a sample of 90 households from each zone and consisting total sample size of 360 households for the study. The data for the study was collected during 1993-94 and information collected pertained to aspects like family size and educational status, land holding, livestock inventory, sources and consumption pattern of fodder etc.

The availability of fodder in sample villages was estimated using data from both private and public lands. The fodder availability estimates based on the estimates of actual fodder consumption by the livestock. Green fodder was converted into dry fodder equivalent using dry:green fodder requirement for different categories of livestock was estimated by using the fodder requirement standards (Ray 1978). The fodder requirement for different categories of livestock was estimated by using the fodder requirement standards (Ray 1978) for each categories of livestock:

Livestock category	Dry fodder requirement (kg/head/day)
Bovine young stock	4.62
Cattle/Bufaloes	9.00
Sheep	0.88
Goat	1.00

By calculating such requirement, average fodder requirements of cattle for each households were estimated. The requirements of different types of fodder for various categories of livestock was estimated using fodder relation composition standard:

Livestock Category	Composition		
	Grass	Straw	Tree fodder
Bovine	50	45	5
Sheep	50	30	20
Goat	30	20	50

The availability of fodder from all sources were grouped into different types of fodder such as grass, straw and tree fodder (expressed in dry fodder equivalent). The proportion of these fodder types were also estimated. Fodder requirement estimates were matched with fodder availability to determine the extent of fodder surplus or deficit.

## Results and discussion

Socioeconomic indicator: Family size and educational status has got importance for proper utilisation and future planning of fodder resources. It is generally believed that higher education status leads to better living standard and easily adoption of new practices. It could be seen from the Table 1 that average family size in Himachal Pradesh was 5.69 out of which about 79% were literate. The Kangra district have exhibited a family size and education status much above the mean level, while Chamba district have smaller values. Also average size of land holding in Himachal Pradesh was 2.40 ha and grass lands accounted only for 26% of the total land holdings. The average land holding in Kangra and Shimla district was higher than the average holding for the state, while in Mandi and Chamba district it was smaller than mean land holding. It was also observed that proportion of grass lands to total land was relatively higher in Mandi district followed by Shimla and Kangra district.

District	Family size	Educational Status		Land holding(ha)	
		Illiterate	Literate	Total	Grass land(%)
Kangra	6.69	6.65	93.45	3.11	25.00
Mandi	5.44	17.72	82.28	1.23	42.00
Shimla	5.81	13.26	86.74	3.92	27.00
Chamba	4.82	47.36	52.64	2.33	11.00
Overall	5.69	21.25	78.75	2.40	26.00

**Table 1.** Socio-economic indicators of the sample households.

Livestock Resource Analysis: Livestock number and composition would determine demand for fodder. It is observed from the Table 2 that the average livestock holding in the State was 5.80. Livestock composition shows that bovine young stock dominated with 26.90% of the total livestock population followed by cows (24.48%), bullock (22.07%), sheep/goat (17.59%) and buffaloes (8.59%). Bovine forms 82.41% of the total livestock holding. It is also observed that bovine forms highest proportion of livestock population (97.5%) in Kangra district while ovine forms highest proportion in Chamba district (41.73%). Table 2 also indicated that average number of bovines per household was observed to be maximum (5.75) in Shimla district followed by Kangra (4.88) and Mandi (4.31). Livestock population in Chamba district were dominated by ovines.

District	Bovine				Total	Ovine	Total
	Bovine young stock	Cows	Bullock	Buffaloes			
Kangra	1.56 (31.25)	1.44 (28.75)	1.25 (25.00)	0.63 (12.50)	4.88 (97.50)	0.13 (2.50)	5.01 (100.00)
Mandi	1.69 (36.48)	1.31 (28.38)	0.50 (10.81)	0.81 (17.57)	4.31 (93.24)	0.31 (6.76)	4.62 (100.00)
Shimla	1.81 (28.43)	1.56 (24.51)	1.75 (27.45)	0.63 (9.80)	5.75 (96.20)	0.62 (9.80)	6.37 (100.00)
Chamba	1.19 (16.52)	1.38 (19.13)	1.62 (22.61)	0.00 (0.00)	4.19 (58.27)	3.00 (41.73)	7.19 (100.00)
Overall	1.56 (26.90)	1.42 (24.48)	1.28 (22.07)	0.52 (8.96)	4.78 (82.41)	1.02 (17.59)	5.80 (100.00)

**Table 2.** Average livestock holding of sample farmers in Himachal Pradesh (Note: Figures in parenthesis indicate the percent).

Fodder Availability Estimate: The quantity of fodder available from different sources were estimated to compare with the estimated fodder requirement to obtain quantity of fodder surplus or deficit. An interesting issue was total share of private and public land for different types of fodders. It is noticed from the Table 3 that on an average 122.35 quintals fodder (Dry fodder equivalent) was available with each household for their cattle for the year and contribution of fodder from private land was 74% while that of public land was 26%. Proportion of fodder available from private land was highest in Chamba district (84%) and lowest in Mandi district (59%). The availability of different types of fodder per household per year was 71.64 quintals grasses, 33.65 quintals straw and 7.06 quintals tree fodder. It was also noticed that the all quantity of straw used as fodder comes from private lands. In overall situation contribution of grasses from private land was 64% and that of public land was 36%, while in case of tree fodder figure was 58% and 42% respectively. The share of tree fodder from private land was maximum in Mandi district and lowest in Kangra district. Also share of grasses available from private land was more than public land in all the sampled district except in Mandi district.

Table 4 gives percentage share of different types of fodders used by farmers for their livestock in sampled districts of Himachal Pradesh. Grasses constitutes 64% followed by straw (30%) and tree fodder (6%). Almost similar type of trend was observed in all the sampled district.

Fodder Balance: The fodder balance estimates were derived to analyse comparisons of fodder availability and requirement estimate. Fodder requirement estimates as discussed in previous section is based on the basis of standard livestock units per households with respect to 3 types of fodder viz. grass, straw and tree fodder. In overall situations average estimated requirements of fodder for total livestock in Himachal Pradesh was 165 quintals per households per year (dry fodder equivalents) of which 82.5 qtls is required on the form of grass, 74.2 qtls as straw and 8.3 qtls as tree fodder.

District	Grass			Straw	Tree fodder			Total		
	Private Land	Public Land	Total	Private Land	Private Land	Public Land	Total	Private Land	Public Land	Total
Kangra	40.48 (57.57)	29.84 (42.43)	70.32 (100.00)	47.91 (100.00)	4.85 (50.00)	4.85 (50.00)	9.7 (100.00)	93.24 (72.88)	34.69 (27.12)	127.93 (100.00)
Mandi	33.20 (41.55)	46.70 (58.55)	79.90 (100.00)	31.71 (100.00)	5.49 (69.23)	2.14 (30.77)	7.93 (100.00)	70.40 (58.89)	49.14 (41.11)	119.54 (100.00)
Shimla	55.38 (72.82)	14.88 (21.18)	70.26 (100.00)	32.09 (100.00)	3.88 (60.06)	2.58 (39.94)	6.46 (100.00)	91.35 (83.95)	17.46 (16.05)	108.81 (100.00)
Chamba	53.30 (80.66)	12.78 (19.34)	66.08 (100.00)	22.88 (100.00)	2.12 (50.96)	2.04 (49.04)	4.16 (100.00)	78.30 (84.09)	14.82 (15.91)	93.12 (100.00)
Overall H.P.	45.59 (63.64)	26.05 (36.36)	71.64 (100.00)	33.65 (100.00)	4.08 (57.78)	2.98 (42.22)	7.06 (100.00)	83.32 (74.16)	29.03 (25.84)	112.35 (100.00)

**Table 3.** Average fodder availability: Source wise and type wise analysis in Himachal Pradesh (dry fodder equivalent) (**Note: Figures in paranthesis indicate the percent.**)

District	Cows equivalent	Grass			Straw			Tree fodder			Total fodder		
		Require-ment	Availa-bility	Defecit (%)	Require-ment	Availa-bility	Defecit (%)	Require-ment	Availa-bility	Defecit (%)	Require-ment	Availa-bility	Defecit (%)
Kangra	4.78	78.53	70.32	10.46	70.68	47.91	32.22	7.85	9.70	23.44	157.06	127.93	18.55
Mandi	4.44	79.90	79.90	0.00	65.60	31.71	51.66	7.29	7.93	8.76	145.38	119.54	17.99
Shimla	5.78	94.96	70.26	26.01	85.46	32.09	62.45	9.50	6.46	31.97	189.92	108.81	42.71
Chamba	5.09	83.66	66.08	21.02	75.30	22.88	69.61	8.37	4.16	45.81	167.33	93.12	44.35
Overall H.P.	5.02	82.51	71.64	13.17	74.26	33.65	54.69	8.25	7.06	14.42	165.02	112.35	32.12

**Table 5.** Analysis of fodder balance in Himachal Pradesh

District	Grass	Straw	Tree fodder	Total
Kangra	54.97	37.45	7.58	100
Mandi	66.84	26.53	6.63	100
Shimla	64.57	29.49	5.94	100
Chamba	70.96	24.57	4.47	100
Overall H.P.	63.70	29.94	6.29	100

**Table 4.** Share of different types of foder in Himachal Pradesh.

The corresponding fodder requirement estimates were compared with the fodder availability estimates to obtain the fodder surplus or deficit. Table 5 shows that fodder deficit was 13% of requirement in cases of grass, 14% for tree fodder and 55% for straw. It was also observed that sample villages of Kangra and Mandi district exhibited surplus in tree fodder while in Chamba district a high deficit to an extent of 45% was noticed. Situation in Shimla district resembles that of Chamba district. No deficit for grasses in Mandi district was noticed. It is evident from the Table that in overall situation of Himachal Pradesh, the fodder deficit to total requirement was about 32%. Mudgal and Pradhan (1988) showed deficit of 36% in fodder requirement in India. Chamba district showed the higher deficit of fodder requirement (44%) followed by Shimla (42%), Kangra (19%) and Mandi (18%) district.

Low deficit in Kangra and Mandi districts may be due to higher education status of people as they have adopted the different agroforestry practices.

This deficit in fodder requirement will force the livestock to move towards adjoining areas and ultimately wide area is covered for grazing by them. The overgrazing due to enormous livestock population also increased trampling of land and inhibits the vegetation to regrow. Moreover desiccated vegetation of adjoining area as resulted due to deforestation brings dust storm and wind erosion. An efficient network of extension workers is also required for disseminating the information from Scientists to the rural folk and for providing feedbacks to the Scientists. The survey indicated introduction of cultivation of fodder crops There is also better scope for introducing fodder trees on field bunds, backyards community land and wastelands as a regular source of fodder. Most of the farmers had not adopted this practices. They were either ignorant or had several confusion about the methodology.

The deficit in fodder availability in relation to requirement suggests gap in demand and supply of fodder. Hence this trend of deficit suggests need for promoting grasses and tree fodder development programme.

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