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Livestock scenario and socio-economic profile of an alpine area in Western Himalaya

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ABSTRACT

The study was undertaken to understand the socio-economic profile and livestock rearing activities, forage resources and problems related to livestock rearing activities in Khanzar, Shukta and Chhaling villages of Udaipur block in Lauhal and Spiti district of Himachal Pradesh through participatory rural appraisal (PRA) and key informant interviews. There has been a sharp increase (40.62%) in population in the state from 1981 census to 2001 census; however, there is a slight decline in population of Lahaul and Spiti. Among livestock kept by the farmers, sheep ranked highest (74.62%) followed by cattle (12.07%), other animals (7.42) and goats (5.89%). Average number of sheep and goats per household were 12.17 and 2.17, respectively, while cattle and horses were 2.62 and 0.13 per household. Semi–migratory system of livestock rearing is prevalent in the area. Leaves of seabuckthorn are fed to animals from Sep to Nov. Twigs of willow and *Betula* sp. trees are fed to the animals from Mar to April, during alternate years only. Stall feeding is done from Oct to May and hay made from the weeds, grasses and tree leaves of willow, *Betula* sp. and seabuckthorn leaves are fed to the animals. Women folk have to spend most of the time in tending the animals, fodder collection, grazing of animals and the distance travelled for fodder collection and distance travelled for animal grazing is much higher as compared to men in all the 3 villages. An individual woman spends about 1.95, 2.08, and 1.97 h/day as compared to 0.19, 0.06 and 0.14 h/day for fodder collection by men in Chhaling, Shukto and Khanzar villages, respectively. *Festuca gigantea* dominated the pastureland of the area at higher altitude, while *Sibbaldia, Phleum, Artemisia* and *Potentila* were the other edible species observed. About 27, 24 and 20% of the farmers indicated that poor herbage production, poor grassland management and overgrazing of the pastures are most significant problems in livestock rearing activities. Poor fodder availability, lack of communication, education and medical facilities were some of the main problems revealed by the farmers and farmwomen through focused group discussions.

Key words: Alpine area, Farmwomen, Feeding calendar, Grazing lands, Livestock scenario, Pasture land

Livestock rearing plays a vital role in the economy of hilly regions, where sedentary, semi–migratory and migratory systems of livestock rearing are followed. The grazing lands in the state are overgrazed, undeveloped and are infested with weeds (Jitedran *et al*. 1998). In Himachal Pradesh grassland/ pastures produce far below their potential and have carrying capacity of only 1.31 ACU (adult cattle unit with an average body weight of 350 kg) for subtropical areas, 1.21 ACU for temperate and 0.64 ACU for alpine areas (Katoch and Dogra 1999). The gap between demand and supply of green fodder is 26.0 and 54.0%, respectively in the state. On dry matter basis the shortage of fodder in different districts varied from 38 to 67%. The grazing pressure and intensity were 0.14 ACU/ha and 7.18/ha/ACU in Lahaul and Spiti district of Himachal Pradesh (Dev *et al*. 2006). Overgrazing has resulted in permanent damage to the vegetative cover leading to massive soil erosion over a period of time in the state. The extremities of climate, overgrazing and poor management have added to the degradation process at an alarming rate. Due to harsh climate the farmers can grow only one crop in a year, therefore the current study aims at understanding the socio–economic milieu of livestock rearing and related problems.

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MATERIALS AND METHODS

The study was undertaken in alpine region of Himachal Pradesh covering Udaipur, Keylong and Spiti in Lauhal and Spiti district of Himachal Pradesh to understand the land use pattern, cropping pattern, livestock inventory and feeding

pattern etc. of the area. PRAs and key informant interviews were undertaken to understand the socio-economic profile, livestock rearing activities, forage resources and problems related to livestock rearing activities in Khanzar, Shukta and Chhaling villages of Udaipur block. The villages taken for the study were the last villages enroute to Thanpattan (one of the largest alpine pasturelands in Himachal Pradesh, located an altitude of 3450 m to 4365 m above msl). The number of respondents selected for the present study were 29. Simple statistical tools were used to analyse the data.

RESULTS AND DISCUSSION

Population indicators of Lahaul and Spiti

Population in the state showed a sharp increase (40.62%) from 1981 census to 2001 census (Table 1), however there is a slight decline in population of Lahaul and Spiti (1.51%). Overall literacy rate of the state as well as of the Lahaul and Spiti district has increased substantially. Density of population per square km of the state has increased by about 40% in 20 years (1981 to 2001); however, the population density did not vary in the Lahaul and Spiti district. It is inferred from the Table 1 that in reality the population of the Lahaul and Spiti district has increased, however due to poor availability of employment opportunities, other avenues for sustaining life and most importantly the natural hazards has resulted in the migration of people to other parts of the state as well as the country.

Land resource and livestock inventory: Lahaul and Spiti covers the largest geographical area in Himachal Pradesh (Table 2). Area under fodder cultivation is meager (1.55 thousand ha). Area under pastures/grasslands has increased substantially during 1997–98 and 2005–06 over 1991–92, which is the major source of grazing for the local livestock as well as for the migratory sheep and goats. Farmers rear cattle, sheep, goats, yak and horse etc., as their main occupation as well as subsistence occupation. Data revealed that sheep dominates the livestock population in Lahaul and Spiti district. It can further be observed that during 2003 the herd comprised sheep (74.62%) followed by cattle (12.07%), followed by other animals (7.42) and goats (5.89%). Buffaloes are not found in this region of Himachal Pradesh (Table 2).

Socio-economic status of the study area: Socio–economic profile, land holdings, family size, literacy, occupation, land use pattern, crop cultivation and livestock inventory of the villages namely Chhaling, Shukto and Khanzar were studied and results are presented in Table 3.

Socio-economic profile: Family size, education, land holding, cropping pattern, livestock inventory are considered to be the most dominant factors which determines the socio–economic conditions and status of households in a rural area (Table 3).

Land holdings: Average landholding of 0.7 ha was in the study area, and it varied 0.66 to 0.75 ha in the selected villages. The data indicated that the entire households in the area fall under categories of marginal farms (Table 3).

Family size: Family size, which represents the work force available in the family, revealed that most common family size had been 6–10. About 58% of the household had their family size 6–10 and about 21% of the households had their family size of <5 and >10 for each of the category (Table 3).

Table 1. Population indicators of Lahual and Spiti district

Indicators	1991		2001		% change (1981–2001
	Lahaul and Spiti	HP	Lahaul and Spiti	HP	Census)
Population (No.)	33,734	43,21,901	33,224	60,77,248	–1.51	40.62
Male (%)	53.87	49.81	55.42	49.64	–	–
Female (%)	46.13	50.19	44.58	50.36	–	–
Density/km^2	2	78	2	109	–	39.74
Literacy (%)	31.35	42.48	73.17	77.13	–	–

Source: Statistical Outline of Himachal Pradesh (2001).

Table 2. Land resource and livestock population of Lahaul and Spiti

Land Resource	Area ('000 ha)		
	1991–92	1997–98	2005–06
Geographical area	1383.5	1383.5	1383.50
Net sown area	3.2	3.12	3.30
Area under fodder cultivation	1.55	1.55	1.55
Permanent pasture/grasslands	95.3	230.9	220.10
Cultivable wasteland	0.8	2.6	0.60
Barren and uncultivable land	4.4	4.4	415.80
Forest area	212.3	135.40	135.40
Livestock population			
	1992		2003
Cattle	8117 (36.62)		8463 (12.06)
Sheep	9694 (43.73)		52297 (74.62)
Goats	4137 (18.66)		4128 (5.99)
Others	219 (0.99)		5198 (7.42)
Total	22167 (100.00)		70086 (100.00)

Source: Integrated Sample Survey (2001–2002), Directorate of Animal Husbandry (Himachal Pradesh).

Table 3. Socio–economic profile and land use pattern of the households in the alpine area

Aspect	Chhaling	Shukto	Khanzar	Average
Av. land holdings (ha)	0.68	0.75	0.66	0.70
Family size				
<5	1(16.67)	1(20.00)	4 (22.22)	2.0
6–10	4 (66.66)	2 (40.00)	11 (61.11)	5.7
>10	1 (16.67)	2(40.00)	3 (16.67)	2.0
Literacy rate (%) head of family	1 (16.67)	–	4 (22.22)	17.24
Av. No. of livestock (No.)				
Cattle	2.0	2.0	3.0	2.62
Sheep	11.2	11.8	12.6	12.17
Goats	1.8	1.6	2.4	2.17
Horses	0.5	0.2	–	0.13
Occupation (%)				
Agriculture	83.33	100	60.53	84.89
Service	16.67	–	21.11	10.24
Others	–	–	18.36	4.87
Land use pattern (ha)				
Cultivated land	0.45 (66.18)	0.61 (81.33)	0.51 (77.27)	0.52 (74.29)
Pastures/*Ghasnies*	0.20 (29.41)	0.12 (16.00)	0.14 (21.21)	0.15 (21.43)
Others	0.03 (4.41)	0.02 (2.67)	0.01 (1.52)	0.03 (4.28)
Crop cultivation (ha)				
Wheat	0.10 (13.70)	0.12 (18.46)	0.05 (7.25)	0.09 (13.0)
Barley	0.08 (10.96)	0.03 (4.62)	0.07 (10.14)	0.06 (8.7)
Peas	0.13 (16.46)	0.17 (26.15)	0.15 (21.74)	0.15 (21.7)
Potato	0.20 (27.40)	0.16 (24.62)	0.21 (30.43)	0.19 (27.5)
Kathu/Ogla/Buck wheat	0.15 (18.99)	0.11 (16.92)	0.13 (18.84)	0.13 (18.9)
Pulses	0.01 (1.37)	0.03 (4.62)	0.02 (2.90)	0.02 (2.9)
Hops	0.04 (5.48)	0.02 (3.08)	0.06 (8.70)	0.04 (5.8)
Kuth	0.02 (2.74)	0.01 (1.54)	–	0.01(1.5)
Fodder cultivation	–	–	–	–
Total	0.73	0.65	0.69	0.69

Figures in the parenthesis represent per cent.

Literacy: Education plays a crucial role in the adoption of new practices. Literacy rate of head of the family was on an average 17% in the area. None of the heads of the family in Shukto village was literate (Table 3).

Occupation: Agriculture is the most dominant source of income for the farmers. About 89% of the farmers have adopted agriculture as their main occupation. About 9% of the household in the area adopted service as other option of income in addition to agriculture (Table 3).

Land use pattern: Average size of cultivated holding was noticed 0.52 ha, which was 75% of the average holding size. Pastures/*Ghasnis* occupied about 0.15 ha (21.43%) in each of the household, while other land use was limited to only 0.03 ha (4.28%) of the total land holdings (Table 3).

Crop cultivation: The area remains snowbound for more than 6 months in a year, therefore only one crop can be taken in a year. Wheat, barley, peas, potato, buckwheat, pulses, *hops* and *kuth* are some of the important crops grown in the area. However, no fodder cultivation was observed in the area. Potato is grown in about 27.0% of the cultivated land followed by peas (22.0%), buckwheat (19.0%) and wheat (13.0%) (Table 3).

Livestock inventory: The size and composition of livestock kept by households directly affect their economy and determine the demand for fodder. Sheep and goat rearing forms an integral part of the livestock husbandry of the area. Under overall situation average number of sheep and goats per household are 12.17 and 2.17, respectively, while cattle and horses are 2.62 and 0.13 per household (Table 3).

Livestock rearing activities: The climatic variation, physiography, topography and altitude have greatly influenced the livestock rearing activities of the area. Semi-migratory system of livestock rearing is prevalent. In summer, the farmers take their livestock to sub-alpine and alpine pastures or ask their *Gaddis* friends (depending upon their friendship), to take their livestock to Thanpattan, an alpine pasture (Mar – Oct). All villagers of Khanzar hire one grazier (locally known as *Phual*) for an amount of Rs 6500 for about

Fig 1. Twigs of willow being cut for feeding the animal.

Fig 2. Willow tree growing in a deserted area.

4.5 months (June to mid Oct) for grazing their sheep and goats. Arrangement of food and shelter for the grazier is done on rotational basis. Since, Khanzar is the last village enroute to Thanpattan pasture, *Gaddis* stay with the local families while going and coming back from the Thanpattan pasture land. In case *Gaddis* have to get household items; they would do so from this village only.

Feeding calendar: As the area is snow bound for more than 6 months, therefore stall feeding is predominant feature of livestock feeding. During this period animals are kept inside their cattle sheds. From May to Sep, grazing and stall feeding is done in case of cattle, while migration or grazing in the nearby grasslands is adopted for sheep/goats. Leaves of seabuckthorn are fed to animals from Sep to Nov. Twigs of willow and *Betula* sp. trees are fed to the animals from March to April, during alternate years only (Fig. 1). If twigs are cut after April, water starts oozing out from the plant and tree may dry. Stall feeding is done from Oct to May and hay made from the weeds, grasses and tree leaves of willow, *Betula* sp. and seabuckthorn leaves are fed to the animals (Table 4). The willow tree and seabuckthron bush can grow in desert areas very well (Figs 2, 3).

Role of farm women: Rural women contribute substantially for the economic growth, however the role of

Fig 3. Seabuckthorn growing in a deserted area.

women in economic and social development has not received due recognition. Women in hills attend to almost all the crop operations from seed sowing to storage. Women folk have to spend most of the time in tending the animals, fodder collection, grazing of animals (Table 5). The distance travelled for fodder collection and for animal grazing is much higher as compared to men in all the 3 villages. An individual woman spends about 1.95, 2.07, and 1.97 h/day as compared

Table 4. Feeding calender of respondents in the study area (Zone–1V)

Months	Cattle	Sheep/goats
January February March April	Stall feeding with hay from weeds, grasses and crop residues and twigs of salix and *Betula*	Stall feeding with hay from weeds, grasses and crop residues and twigs of salix and *Betula*
May June July August September	Grazing and stall feeding	Migration to Thanpattan pasture or grazing in the grasslands by hired grazier
October November December	Stall feeding with hay made from weeds, grasses and crop residues and twigs of salix and *Betula* and seabuckthorn leaves	Stall feeding with hay from weeds, grasses and crop residues and twigs of Salix and *Betula* and seabuckthorn leaves

Table 5. Role of farm women

	Activity	Chhaling		Shukto		Khanzar		Average	
		Male	Female	Male	Female	Male	Female	Male	Female
Tending animals	(h/day)	0.10	2.80	0.04	3.10	0.08	2.91	0.07	2.98
Fodder collection	(h/day)	0.19	1.95	0.06	2.08	0.14	1.97	0.12	2.05
Grazing animals	(h/day)	0.21	2.01	0.32	1.91	0.27	2.14	0.28	2.06
Distance travelled for fodder collection	(km/day)	0.08	1.10	0.14	1.46	0.16	1.12	0.13	1.25
Distance travelled for grazing animals	(km/day)	0.12	0.98	0.20	2.12	0.22	1.94	0.17	1.66

Table 6. Livestock rearing problems

Problems	Chhaling	Shukto	Khanzar	Overall
Poor herbage production	2 (33.33)	1 (20.00)	5 (27.78)	8 (27.59)
Lack of quality fodder	–	–	1 (5.56)	1 (3.45)
Weeds infestation	1 (16.67)	1 (20.00)	2 (11.11)	4 (13.79)
Extremities of climate	–	1 (20.00)	2 (11.11)	3 (10.34)
Poor management of grasslands/pastures	2 (33.33)	1 (20.00)	4 (22.22)	7 (24.13)
Overgrazing of pastures	1 (16.67)	1 (20.00)	4 (22.22)	6 (20.69)

Figures in the parenthesis represent per cent.

to 0.19, 0.06 and 0.14 h/day for fodder collection by men in Chhaling, Shukto and Khanzar villages, respectively. Thus, women provide much of the unpaid family labour in agriculture.

Grassland/pasture situation: Festuca gigantea dominated the pastureland of the area at higher altitude, while *Sibbaldia, Phleum, Artemisia* and *Potentila* were the other edible species observed. Grazing pressure in these areas is much higher than the recommended value of 2 ACUs/ha (Katoch 1996). Due to unawareness, villagers do not appear to attach importance to aspects like carrying capacity and nutritional status. Tree leaves fed to the animals during lean period were deficient in zinc (Khatta and Katoch 1983). At the end of winter and during early summer the availability of green fodder is scarce. The survey revealed that pressure is more on the grazing lands, which are inhabited by poor landless villagers dependent on community land. Geetanjali Singh (2000) has reported similar results for Changar area of Kangra district.

Livestock rearing problems: Farmers indicated that poor herbage production, lack of quality fodder, weed infestation, extremities of climate, poor management of grasslands and over grazing of the pastures were some of the most important problems related to livestock rearing. Under overall situation about 27, 24 and 20% of the farmers indicated that poor herbage production, poor grassland management and over grazing of the pastures are most significant problems. Availability of quality fodder was considered as the least priority (Table 6).

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