Socio-economic Dimensions of Equine-rearing in Himachal Pradesh

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Abstract

Since equines play an important role in the economy of Himachal Pradesh, this study has examined the growth trends in equine population and socio-economic characteristics of equine-rearers. The problems being faced have been identified and some policy recommendations have been made. It has been found that equine population had a compound growth rate of 2.57 per cent per annum during the period 1966-2003 and constituted about 1 per cent of the total livestock population in 2003. Amongst different constituents of equines, viz. horses, ponies, mules and donkeys, mules have shown the maximum rise in number. The contribution of equines has been assessed to be 40 per cent in the gross household income of rearers. A mule pair has been found to be highly profitable for load-carrying activities. Road links to the villages having modern means of transport have been perceived to be the greatest threat to equine-rearing activity, followed by its disliking by younger generations and non-availability of locally-bred mules. The study has emphasized on increased supply of *Chamurthi* horses through identification of additional local breeders by adopting systematic breeding policy, particularly in the Pin Valley of Spiti area. Keeping in view the demand for mules, their breeding should be undertaken at both public and at private levels so that local-bred mules become available at affordable prices.

Introduction

In Himachal Pradesh, livestock-rearing is an integral part of the state economy, contributing one-third to the total value of agriculture. In the livestock sector, equines, representing nearly 1 per cent of total livestock population, play an important role in the economy of Himachal Pradesh. Equines — the important means of transport in the mountain areas, despite being affected by the incessant process of mechanization and rural development, continue to be useful in view of the emerging environmental degradation threats following construction of intensive road network in the state. Interconnectivity of every village through roads in mountain areas is still a dream to achieve. Under these mountain specificities, equines carry out multifarious activities

such as immediate transportation of highly perishable cash crops like fruits and vegetables grown in hills in the event of road blockades due to landslides; carrying wood logs and other minor forest produce to the road heads/depots (Birthal *et al.,* 2002 b); transporting building materials from rivulet/river beds and road heads to construction sites; maintaining supply of foodgrains through PDS, particularly to the tribal communities inhabited in far flung areas and threshing of foodgrains. The mules have also become a source of motive power for agricultural operations like ploughing and sowing, particularly for mule-keeping households with marginal landholdings (Anonymous, 2003). Besides, horse-breeding has been adopted as the major source of livelihood by the tribal communities in certain pockets of cold desert (Lahaul-Spiti and Kinnaur districts) since times immemorial (Dixit, 1997). A review of literature on equine husbandry

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revealed that its economic aspects have not been adequately studied in our country (Birthal *et al.*, 2002 a) and therefore, a study was undertaken with the following objectives:

- To examine the growth trends in equine population over a period of time,

- To study the socio-economic characteristics, viz. social status, traditions, employment, costs and returns of equine-rearers, and

- To identify the problems and constraints of equine-rearers and suggest policy recommendations for a better development of equine-rearing.

Methodology

The study forms a part of the University *ad hoc* research project entitled, "Socio-economic Perspectives of Equine-rearers in the Mountains", funded by ICAR, New Delhi. The study was undertaken in five most equine-populous districts of Himachal Pradesh, namely Kangra, Kinnaur, Lahaul-Spiti, Mandi and Shimla. Multi-stage random sampling technique was followed to select a sample of 150 equine-rearers through the proportional allocation method. Both primary and secondary data were collected during the years 2001 and 2002. Regression and tabular analyses were followed to arrive at the specified objectives.

Results and Discussion

Growth Trends in Livestock Population

The livestock population in Himachal Pradesh during the period 1966-2003, shown in Table 1, indicates that cattle, followed by goats, sheep and buffaloes constitute the important components of livestock in the state. The equines constituted about 1 per cent of the total livestock population in the state, with an increasing trend over the study period. The growth pattern of equines population, given in Table 2, revealed a compound growth rate of 2.57 per cent per annum for the period 1966-2003. Amongst different constituents of equines, viz. horses & ponies, mules and donkeys, mules have shown the maximum rise in their number, from 6.49 thousand in 1966 to 23.94 thousand in 2003, with an overall compound growth rate of 7.27 per cent per annum. Donkeys have shown a constant rise in their number with overall growth rate of 2.48 per cent per annum for the period 1966-2003. Horses and ponies recorded a negative growth rate during 1972-77 and 1982-92, with the overall growth rate of 0.49 per cent per annum.

Relationship between Equine Population and Human Population

Since livestock population varies according to human population, an attempt was made to quantify

Table 1. Livestock population in Himachal Pradesh: 1966-2003

(Per cent)

Sl No.	Species	1966	1972	1977	1982	1992	2003
1	Cattle	45.0	46.3	43.9	43.6	42.3	43.5
2	Buffalo	9.9	11.5	11.7	12.3	13.7	15.3
3	Sheep	25.0	22.1	22.0	21.9	21.1	18.0
4	Goats	19.3	19.3	21.6	21.3	21.9	22.1
5	Horses & ponies	0.4	0.3	0.3	0.3	0.3	0.3
6	Mules	0.2	0.2	0.2	0.3	0.3	0.5
7	Donkeys	0.1	0.1	0.1	0.1	0.1	0.2
8	Equines (5+6+7)	0.6	0.6	0.6	0.7	0.7	1.0
9	Others (camels, pigs, yaks, etc.)	0.1	0.2	0.2	0.2	0.3	0.1
10	Total livestock ('000 heads)	4,201	4,702	4,795	4,989	5,117	5,046

Source: *Livestock Census* (1992 & 2003), Directorate of Land Records and Animal Husbandry, Government of Himachal Pradesh.

Table 2. Growth pattern of equine population in Himachal Pradesh: 1966-2003

Sl No.	Species	Compound growth rate (% per annum)					
		1966-72	1972-77	1977-82	1982-92	1992-03	1966-03
1	Horses & ponies	1.88	-1.75	2.33	-1.69	1.99	0.49
2	Mules	1.27	3.22	9.06	2.60	4.19	7.27
3	Donkeys	0.99	4.38	1.72	1.30	1.55	2.48
4	Equines (1+2+3)	1.57	0.71	4.29	0.55	2.87	2.57
5	Total livestock	1.90	0.39	0.79	0.25	- 0.13	0.54

Table 3. Spatial densities of equines in Himachal Pradesh as per 2003 Census

(Number/km^2)

Sl No.	District	Horses & ponies	Mules	Donkeys	Equine	Human population	Equine population (% of total)	Human population (% of total)
1	Bilaspur	0.083	0.782	0.347	1.212	292	2.83	5.60
2	Chamba	0.279	0.599	0.087	0.955	71	12.48	7.58
3	Hamirpur	0.123	1.048	0.225	1.396	369	3.13	6.79
4	Kangra	0.739	0.771	0.078	1.588	233	18.25	22.03
5	Kinnaur	0.102	0.058	0.398	0.558	12	7.16	1.29
6	Kullu	0.478	0.087	0.029	0.594	69	6.54	6.28
7	Lahaul-Spiti	0.085	0.003	0.166	0.254	2	7.04	0.55
8	Mandi	0.601	1.217	0.087	1.905	228	15.07	14.83
9	Shimla	0.399	0.772	0.176	1.347	141	13.86	11.89
10	Sirmaur	0.390	0.819	0.143	1.352	162	7.65	7.55
11	Solan	0.264	0.743	0.231	1.238	259	4.80	8.24
12	Una	0.223	0.105	0.059	0.387	291	1.19	7.37
13	H.P.	0.308	0.430	0.159	0.897	109	100	100

(i) Regression equation showing the relationship between spatial equine population and human population densities:

$D_{ep} = 0.6573 + 0.0023^* D_{hp}$: $R^2 = 0.2871$; $r = 0.5458$

   (0.242) (0.001)

where, D_{ep} and D_{hp} are densities of equine and human populations, respectively

(ii) Regression equation showing the relationship between spatial (district-wise) percentage of equine population and human population:

$P_{ep} = 2.7084 + 0.6750^* P_{hp}$: $R^2 = 0.5267$; $r = 0.7257$

   (2.025) (0.202)

where, P_{ep} and P_{hp} are percentages of equine and human populations, respectively

the relationship between them and the results have been presented district-wise in Table 3. From the data in this table, it was revealed that there existed a positive correlation (0.54) not only between equine and human population density but also between spatial percentage of equine and human population variables to the extent of +0.72. It was also found that for one per cent increase in human population, the average percentage increase in equine population was 0.68 at 1 per cent level of significance.

Relationship between Equine Population and Road Network

The district-wise equine population and road network in Himachal Pradesh, presented in Table 4, revealed that district Solan had the largest network

Table 4. Relationship between equine population and road length in different districts of Himachal Pradesh

Sl No.	District	Equine population per km² of geographical area (No.)	Road length per km² of geographical area (km)
1	Bilaspur	1.21	1.08
2	Chamba	0.95	0.41
3	Hamirpur	1.40	1.17
4	Kangra	1.59	0.78
5	Kinnaur	0.56	0.15
6	Kullu	0.59	0.23
7	Lahaul Spiti	0.25	0.08
8	Mandi	1.90	1.14
9	Shimla	1.33	0.74
10	Sirmaur	1.35	0.84
11	Solan	1.24	1.20
12	Una	0.39	0.89
13	Himachal Pradesh	0.90	0.49

Estimated linear function:

$$EP= 0.4138 + 0.8978^*RL, \quad R^2 = 0.51$$

SE   (0.228)   (0.276)

where, EP and RL are the equine population and road length per km², respectively.

of roads, followed closely by Hamirpur and Mandi districts. However, the density of equine population was highest (1.90 heads/km²) in the Mandi district, followed by the districts of Kangra, Hamirpur, Sirmaur and Shimla. In Himachal Pradesh as the state, the road length and equine population per km² of geographical area were estimated to be 0.49 km and 0.90 head, respectively. It was also noticed that for every one km² increase in road length, the increase in equine population was significant, to the extent of 0.90 units. The coefficient of determination indicated that the road length alone determined 51 per cent variation in the equine population.

Profile of Equine-rearers

A study on socio-human profile of equine-rearers revealed that about 43 per cent of them belonged to the age group of 41-60 years; nearly 52 per cent of them were illiterate. An equal (≈43 %) fell in the category of 26-40 years of age where the illiteracy level was low (14 %). The population literacy was 65.7 per cent, and was higher among males (77%) than female (51%). Equine-rearing was concentrated among the other backward classes (OBCs) (38.7%) and *Rajputs* (36.7%). For 58.7 per cent households, the equine-rearing was the main occupation. About eighteen per cent each of the households belonging to agriculture and horticulture households had adopted it as one of their sources of livelihood. The study revealed that a large number (80%) of households were doing equine-rearing for a long time (> 10 years), while about 10 per cent each had adopted this profession during the past 5 years and earlier. It has been a family profession for a large number of households (63.3%), whereas, 36.7 per cent had adopted it at their own level. The average family size was larger (5 and more) in the aged (41-60 years) category of equine-rearers. The family-size increased with increase in the age group. About 95 per cent of the households had adopted sedentary equine-rearing, while for about 5 per cent, it was of migratory nature. The sex ratio was found to be highest (874 F/1000 M) in the age group of 26-40 years and lowest (597 F/1000 M) in the younger category, which clearly gives signals of emerging gender inequality.

Labour Utilization in Equine-rearing

Operation-wise utilization of family labour for equine-rearing, shown in Table 6, revealed that 175 days of human labour per annum was used for the upkeeping of equines. Grazing, followed by grass and fodder fetching, and feeding were the important activities of labour utilization. District-wise labour utilization per annum for equine-rearing varied from 154.5 days in Lahaul-Spiti to 198 days in Shimla district. The lower requirement of human labour in the Lahaul-Spiti district was due to letting the animals loose in the nearby high altitude pastures for grazing.

Source-wise Employment Status

Transportation of various commodities, such as agricultural and horticultural inputs/outputs, major and minor forest produce and building materials were the important activities offering employment

Table 5. Profile of equine-rearers in Himachal Pradesh

Sl No.	Particulars	Age (years)			
		Up to 25 (N=22)	26-40 (N=64)	41-60 (N=64)	Total (N=150)
1	Sample size (%)	14.6	42.7	42.7	100
2	Education level of household-head (%)				
	(i) Illiterate	4.5	14.1	51.6	28.7
	(ii) Literate	95.5	85.9	48.4	71.3
3	Population literacy (%)	62.61	64.89	67.48	65.71
	(i) Male	76.39	76.84	77.46	77.05
	(ii) Female	39.53	51.20	53.59	50.83
4	Caste structure (%)				
	(i) *Rajput*	63.6	32.8	31.3	36.7
	(ii) *Brahman*	4.6	7.8	3.1	5.3
	(iii) Other backward castes	22.7	37.5	45.3	38.7
	(iv) Scheduled castes	9.1	21.9	20.3	19.3
5	Main occupation (%)				
	(i) Agriculture	13.6	15.6	21.9	18.0
	(ii) Service	4.5	1.6	3.1	2.6
	(iii) Equine-rearing	54.5	60.9	57.8	58.7
	(iv) Business	4.5	3.1	1.6	2.6
	(v) Horticulture	22.7	18.7	15.6	18.1
6	Experience in equine-rearing (%)				
	(i) Up to 5 years	27.3	10.9	1.6	9.3
	(ii) 6-10 years	22.7	15.7	1.6	10.7
	(iii) Above 10 years	50.0	73.4	96.8	80.0
7	Status of profession (%)				
	(i) Ancestral	95.4	60.9	54.7	63.3
	(ii) Self-started	4.6	39.1	45.3	36.7
8	Average family size (%)				
	(i) Small (up to 4 members)	36.4	25.0	4.7	18.0
	(ii) Large (5 and above)	63.6	75.0	95.3	82.0
9	State of rearing (%)				
	(i) Migratory	4.5	4.7)	4.7	4.7
	(ii) Sedentary	95.5	95.3	95.3	95.3
10	Sex ratio (F/1000 M)	597.0	874.0	718.0	762.0

Table 6. Operation-wise labour utlization for equine-rearing in Himachal Pradesh

(Per cent)

Sl No.	Operation	Kangra	Kinnaur	Lahaul Spiti	Mandi	Shimla	All regions
1	Grazing	44.9	50.3	38.8	50.0	35.3	44.0
2	Fetching grass and fodder	17.1	20.4	22.7	16.1	18.2	18.3
3	Feeding	12.5	12.0	13.6	13.1	19.2	13.7
4	Cleaning and dung disposal	10.8	9.0	11.7	10.1	12.1	10.9
5	Grooming	9.1	2.4	5.8	5.4	9.6	7.4
6	Medical care	5.1	5.3	7.1	4.8	5.1	5.1
7	Shoeing the animal	0.5	0.6	0.3	0.5	0.5	0.6
8	Total (humandays/annum)	176.0	167.0	154.5	168.0	198.0	175.0

Table 7. Source-wise employment status of equine-rearers

(Per cent)

Sl No.	Source	Kangra	Kinnaur	Lahaul Spiti	Mandi	Shimla	All regions
1	Transportation of farm inputs and crop produce	9.5	37.7	67.9	15.9	41.7	22.5
2	Transportation of orchard inputs and fruit output	0.0	47.3	0.0	0.0	19.6	9.0
3	Transportation of forest produce	1.2	0.0	3.6	0.9	0.0	1.0
4	Transportation of building materials	89.3	15.0	21.4	76.2	21.6	63.0
5	Joyriding in tourism	0.0	0.0	7.1	7.0	17.1	4.5
6	Total (human-days/annum)	243.0	167.0	84.0	227.0	199.0	200.0

Table 8. Source-wise annual earnings from equine-rearing in different districts

(Per cent)

Sl No.	Particulars	Kangra	Kinnaur	Lahaul Spiti	Mandi	Shimla	All regions
1	Transportation of farm inputs and crop output	7.9	42.1	16.8	31.0	32.7	20.4
2	Transportation of orchard inputs and fruit output	0.0	49.2	0.0	0.0	13.6	5.3
3	Transportation of forest produce	1.0	0.0	1.8	1.7	0.0	0.9
4	Transportation of building materials	91.1	8.7	45.6	50.5	19.1	60.0
5	Joyriding in tourism	0.0	0.0	35.8	16.8	34..6	13.4
6	Total (Rs/household)	59,708	12,475	14,316	52,938	75,112	47,974
7	Earnings (Rs/animal)	18,485	3,862	2,983	19,042	50,075	15,576

opportunities to the equine vendors in Himachal Pradesh. Besides, tourism had also created employment avenues for the equine-rearers, particularly in the districts of Lahaul-Spiti, Mandi and Shimla. A perusal of Table 7 reveals that transportation of building materials was the major activity undertaken by the equine-rearers in Kangra and Mandi, where most of them maintain mules. Transportation of horticultural input-outputs had played a vital role among the equine-rearers of the Kinnaur district. In the Lahaul-Spiti and Shimla districts, transportation of agricultural inputs/outputs had played a greater role in providing employment opportunities to the equine-keepers. In all, 200 human-days per annum employment was availed of by the equine-rearers, in which transportation of building materials provided maximum (63%) employment, followed by the transportation of agricultural-related commodities (22.5%). The share of services of horses in tourism was 4.5 per cent.

Earnings from Equine-rearing

Different activities mentioned above in providing job opportunities to the equine-rearers were the main source of revenue to the sample households. The total annual earnings from equine-rearing through different activities varied across districts, it can be seen from the Table 8 that the total revenue/household/annum earned through equine-rearing activity ranged from Rs 12,475/household in Kinnaur to Rs 75,112/household in Shimla. At the overall level, the earning per household/annum was Rs 47,974. Transportation of building materials being the major source of earning, generated maximum (60%) income for the households, followed by transportation of crop produce (20%). Joyriding to tourists and transportation services to trekkers could provide only 13.4 per cent to the earnings of equine-rearers. District-wise earnings per animal varied from Rs 2,983 in Lahaul-Spiti to Rs 50,075 in Shimla. The higher earnings per animal in the Shimla district were largely due to commercialization of off-season vegetables

Table 9. Annual costs and returns from equine-rearing in different districts

(Rs/household)

Sl No.	Particulars	Kangra	Kinnaur	Lahaul Spiti	Mandi	Shimla	All regions
1	Fixed cost	8,153	5,127	11,419	6,924	5,851	7,555
2	Variable cost	40,084	19,416	20,949	20,667	44,849	31,823
3	Total cost	48,237	24,543	32,368	27,591	50,700	39,378
4	Gross returns	59,708	12,475	14,316	52,938	75,112	47,974
5	Net returns over total cost	11,471	-12,068	-18,052	25,347	24,412	8,596
6	Net returns over variable cost	19,624	-6,941	-6,633	32,271	30,263	16,151
7	Net returns /animal	3,551	-3,736	-3,761	9,118	16,275	2,791

Table 10. Annual cost and returns from different categories of equines

(Rs/household)

Sl No.	Particulars	Equine category		
		Horse	Mule	Donkey
1	Fixed cost	7,473	7,997	2,480
2	Variable cost	28,965	24,621	18,914
3	Total cost	36,438	32,618	21,394
4	Gross returns	49,573	56,923	20,267
5	Net returns over total cost	13,135	24,305	-1,127
6	Net returns over variable cost	20,608	32,302	1,354
7	Net returns/animal	4,811	9,421	-385

cultivation and use of horses for joyriding in tourism. At the overall level, the annual income from equine-rearing in Himachal Pradesh was Rs 15,576/household.

Cost and Returns from Equine-rearing

The cost and returns structure from equine-rearing, presented in Table 9, shows that gross returns were Rs 47,974/household. The net returns over total cost were found to be positive, except for Kinnaur and Lahaul-Spiti districts, where most of the farmers had donkeys and horses, respectively, which were not used for heavy load-carrying. The annual net returns over total cost were estimated to be Rs 11,471/household in the Kangra district to Rs 25,347/household in the Mandi district, where mules were mostly used for heavy works like transportation of building materials, etc. At the aggregate level, the annual net returns per household over total cost were worked out to be Rs 8,596. The net returns over variable cost in all the districts, except Kinnaur and Lahaul-Spiti were positive. At the overall level, the

returns over variable cost were Rs 16,151/household. It needs to be explained that the net returns over variable cost would have been positive in all the districts if the human labour (mostly family labour) would have not been considered as a part of the cost because the opportunity cost of these people was zero on the sample households. The net returns/animal worked out to be Rs 2,791 over total cost. The study revealed that nearly Rs 4,000/household/month was earned as a gross income through equine-rearing, with an average size of 3.08 animals.

The annual cost and returns from different categories of equine-rearing, depicted in Table 10, show that net returns over total cost were highest (Rs 24,305) in case of mule-owning households, followed by horse-rearing households (Rs 13,135). The net returns over total cost were found negative for donkey-owning households. The net returns per animal were estimated at Rs 9,421 from mule and Rs 4,811 from horse, and were negative (–Rs 385) in case of donkeys.

Table 11. Pair-wise economics of different categories of equines

Sl No.	Particulars	Equine category		
		Horse	Mule	Donkey
1	Investment (Rs)	28,297	33,563	6,712
2	Labour for maintenance (human-days/annum)	132	148	100
3	Available employment (human-days/annum)	136	175	116
4	Income generation (Rs/annum)	36,317	44,126	13,834
	(i) Transportation of agricultural products	4,107	8,395	8,830
	(ii) Transportation of horticultural products	672	2,150	4,371
	(iii) Transportation of forest products	99	133	23
	(iv) Transportation of building materials	13,316	33,448	610
	(v) Tourism	18,123	—	—
5	Total cost of maintenance (Rs/annum)	26,454	22,493	16,790
6	Gross income (Rs)	36,317	44,126	13,834
7	Net income (Rs)	9,863	21,633	-2,956
8	Output-input ratio	1.37	1.96	0.82
9	Household income excluding equines (Rs)	57,029	72,196	1,41,619
10	Household income including equine pairs (Rs)	93,346	1,16,322	1,55,453
11	Contribution in household income (%)	38.91	37.93	8.90

The economics of a pair of equine-rearing, summarized in Table 11, reveals that the average investment per pair of horse, mule and donkey was Rs 28,297, Rs 33,563 and Rs 6,712, respectively. In the maintenance of animals, a mule pair required maximum labour, and therefore provided employment for more number of days (175 days/annum). In all, a pair of horse, mule and donkey could generate Rs 36,317, Rs 44,126 and Rs 13,834 gross income, respectively, against the total cost on maintenance as Rs 26,454, Rs 22,493 and Rs 16,790, respectively. The net income from a pair of animal was assessed at Rs 9,863 from horse and Rs 21,633 from mule, while it was negative (- Rs 2,956) for donkey. The output-input ratio shows that an investment of one rupee on a pair of animal could generate Rs 1.96 from mule, Rs 1.37 from horse and Re 0.82 from donkey. The contribution to the household income by a pair each of horse, mule and donkey was 38.91 per cent, 37.93 per cent and 8.90 per cent, respectively.

Problems and Constraints in Equine-rearing

Identification of problems in equine-rearing revealed that the rural connectivity (road-linked villages) and development of modern means of transport to be the biggest threat as perceived by 85 per cent of the households. According to some rearers, their business had reduced by 33 per cent due to mechanized motor vehicles. Disliking of younger generation for equine-rearing, signifying it as a lower-status activity, was reported to be another major threat to this enterprise by about 45 per cent households. Lack of suitable mules, especially locally bred in the hilly areas, shortage of natural resources (sand, boulders and *bajri*), and advancement in education were identified as the other challenges to the equine-rearing profession. Shortage of fodder and grazing areas and rising costs of feeds were also among the perceived problems. Acute shortage of fodder in winters was the specific problem in the Lahaul-Spiti district. Regarding payments, in majority (72 %) of cases, equine-owners received their payments in time; however, in 27 per cent cases, the payments were delayed while some equine-rearers (about 4 %) in the Mandi district reported non-realisation of their payments. It was noted during investigations that Spiti – synonymous *Chamurthi* horses (Dogra *et al.* 2002) bred in the high altitude

Table 12. Problems in equine-rearing of Himachal Pradesh

(Per cent equine-rearers)

Sl No.	Particulars	Kangra	Kinnaur	Lahaul Spiti	Mandi	Shimla	All regions
1	Emerging threats due to						
	(i) Lack of locally-bred mules	43.9	18.2	55.0	0.0	54.2	35.3
	(ii) Road-linked villages (Rural connectivity)	98.2	86.4	15.0	96.3	100.0	85.3
	(iii) Shortage of natural resources/ mines material	10.5	0.0	15.0	0.0	0.0	6.0
	(iv) Disliking of future generations	86.0	22.7	20.0	22.2	16.7	45.3
2	Shortage of fodder and grazing areas	43.9	45.4	75.0	18.5	16.7	39.3
3	High cost of feed	70.2	45.4	40.0	44.4	50.0	54.7
4	Payments for the job performed						
	(i) Early payments	98.3	4.6	15.0	92.6	95.8	72.0
	(ii) Late payments	1.7	95.4	85.0	3.7	4.2	27.3

areas (3500-4000 m above msl) in the Pin valley of Lahaul-Spiti district of Himachal Pradesh were in great demand due to their sure footedness, short stature and enormous stamina in high altitudes. About one-third of the total demand for this breed during International Lavi Fair, 2001 remained unfulfilled. Also, the *Chamurthi* horses bred in the State Horse Breeding Farm of Himachal Pradesh located at Lari in the Spiti valley were exported (7 in number during 2000) to Royal Government of Bhutan. The ITBP forces of Indian Government also purchased these horses at the International Lavi Fair.

Policy Implications

The study has emphasized on the increased supply of *Chamurthi* horses through identification of additional local breeders and forming of SHGs, particularly in the Pin Valley of the cold desert (Kaza/ Spiti) area. Breeding techniques and feed and fodder schedules developed by the *Chamurthi* State Breeding Farm, Lari, should be disseminated among the stakeholders through extension programmes. Keeping in view the increased demand for mules throughout the state, their breeding should be undertaken at both public and at private levels by forming SHGs so that buyers get the desired local-bred mules at affordable price. The Veterinary and Animal Husbandry College of H P Farm University

should reorient its programme by including equine-rearing as the training component. Rural youths should be provided training and encouragement in adopting horse-rearing as an enterprise, particularly in the famous tourist and trekking pockets of the state. To safeguard the interests of equine-rearers involved in transportation activities, natural resource extraction policy (extraction of mining material from the rivulets and river bed areas) needs to be rationalized. While floating tenders, areas should be earmarked separately for mechanized vehicle (tractor/tempo) operators and equine-keepers.

Acknowledgements

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