SURVEY ON ANIMAL HUSBANDRY PRACTICES, BOTTLENECKS IN ANIMAL PRODUCTION AND STRATEGIES FOR IMPROVEMENT: A PROFILE OF SELECTED VILLAGES IN HIMACHAL PRADESH

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INTRODUCTION

The state of Himachal Pradesh is located between latitude 30°22'40"N to 33°12'40"N and longitude 75°45'55"E to 79°04'20"E and altitude range from 350 to 6,975 m above msl. About 92% population in Himachal Pradesh is rural and depends directly on agriculture, horticulture and animal husbandry (Anonymous, 1994). The rearing of livestock is an integral component of the economy of the state and inseparable from the agricultural component of almost every household in rural areas of the state due to small size of the holdings. A survey was conducted to study the animal husbandry practice and problems in selected 300 households.

STUDY AREA AND METHODOLOGY

Kangra district of Himachal Pradesh was selected for the study. Twelve villages (Bandla, Suggar, Guggar, Khilroo, Sidhpur, Banuri, Rajpur, Patti, Barol, Gadhiara and Deogran) were identified as target area belonging to Palampur block (latitude, 32.6°N; longitude, 76.3°E; altitude, 1,290.8 m) in Kangra District (H.P.). The area is characterised by mild summer and moderate to severe winter having the mean monthly minimum and maximum temperature (°C) varying from 5±0.9 in January to 20.4±1.2 in June and 14.7±1.8 in January to 29.6±3.4 in June, respectively. The average monthly rainfall ranged from a minimum of 26.5±29.4 mm in October to a maximum 655.2±175.8 mm in August and the relative humidity from 35.8% in April to 77.6% in August months. Linkages between the institute and the state departments and other voluntary agencies were established to collect the demographic information particularly with reference to human population, livestock population, animal husbandry practices, veterinary inputs *etc*. The survey was conducted on the basis of households, which represents the smallest unit of a village. 300 households from these 12 villages were selected by random sampling technique and the farmers inquired through personnel interview by door to door survey based on a questionnaire mainly on rural animal husbandry practices and problems faced by the farmers. Meteorological data were collected from the Department of Agronomy and Agrometeorology of H.P.K.V., Palampur (H.P.).

Table 1. Demographic information of the study area

Name of village	Human	Cattle	Buffalo	Sheep	Goat	Equine	Poultry	Rabbit	Pigs
1. Bandla	3500	957	225	3500*		-	800	19	-
2. Sugar	1500	200	60	15	10	-	70	30	-
3. Ghuggar	3975	363	54	65	14	18	40	8	8
4. Khilroo	1500	120	30	25	12	45	-	-	-
5. Sidhpur	1400	350	225	180	20	30	480	2	-
6. Tanda	1815	420	15	15	-	50	-	-	-
7. Rajpur1800	300	30	35	-	-	-	-	-	
8. Patti	3110	600	50	350	-	10	325	-	-
9. Barol	1765	250	25	25	5	4	-	-	-
10.Ghadiara	1400	268	45	67	16	8	420	18	-
11.Deogran	1150	300	30	15	-	7	-	-	-
12.Banuri	1200	340	40	28	22	14	400	-	-
Total	24,115	4468	829	4419*		186	2535	77	8

*Total number of sheep and goats

RESULTS

Demographic information

General profile of the farmers: Table 1 shows the demographic information of the selected villages. About 40% heads of the households were illiterate. The general profile of the households, family size and main occupation of heads of the family is shown in Table 2.

Table 2. General profile of farmers

I	Type of farmers	No of households	% of households

	Nuclear	133	44.33
	Joint	167	55.77
II	Family members/household		
	1-5	141	47.0
	6-10	129	43.0
	11-15	22	7.33
	16-20	7	2.33
	20-25	1	0.33
III	Main occupation of the heads of the family		
	Farming	200	66.66
	Business	15	5.0
	Service	65	21.6
	Daily wages	20	6.66

Type of land holding and farming: The Table 3 shows the land resources of the farmers. Majority of the farmers were landholders and the percentage of landless, small, marginal and big farmers were 7.6, 40.7, 43.7 and 8%, respectively. 89.7% farmers had mixed farming (agriculture and livestock production), while 9% had livestock and remaining 1.3% owned agricultural activity alone.

Table 3. Type of land holdings

Type of land holdings	No of farmers	Percentage
Big	24	8.0
Small	122	40.7
Marginal	131	43.7
Land less	23	7.6

Animal resources

94.3% farmers had cattle and 23% had buffaloes either singly or in combination with other livestock. The average livestock to human population was found to be 84.7% : 100.56% of the livestock owner were having crossbred animals and 44% had local breeds. Majority of the farmers (88.66%) had cattle of small herd size (1-5) while the rest (5.33%) had a medium herd size (6-10). No farmer was having large herd size except a couple of owners possessing migratory flocks of sheep and goats only in one of the villages. The estimated population of cross bred and local breed per household was 1.14 and 1.69, respectively. All the farmers were having veterinary and animal health services either at home or at veterinary dispensaries located between 2-12 km from the household. The distance between the veterinary hospital/dispensaries and the household had a direct impact on utilisation of the facility by the farmers. Agricultural operations were mainly by utilisation of draught animal power in these villages located in hilly terrain. The dung was mainly used as manure but is also used as fuel by some animal owners.

Feeding and nutritional status of the livestock

There was great irrationality in the feeding practices. In general the nutritional status of the livestock was far from satisfactory. Economic status of the farmers, most of whom in the study area are small and marginal (84.4%) was found to be the major impediment in providing recommended plane of nutrition to the livestock. Similarly, land holdings being very small in relation to the family size, the farmers preferred to grow only cash crops and no fodder at all. Thus, in spite of the implementation of cross breeding programmes during the last couple of decades, there was no corresponding increase in livestock products. Data based on the "on-the-farm research" for comparative returns from utilisation of the land for fodder cultivation and growing cash crops are not available for these areas.

Mineral mixture was offered to animals only by a limited number of farmers. Most of the farmers were not aware of the need for providing salt routinely in the feed and did so only once in a week. The animal rearing was mostly based on grazing in the pastures, and feeding systems utilising the tree forages. The pastures are undeveloped, overgrazed, contain poor quality grasses and are infested with poisonous plants like *Lantana, Eupatorium* and *Ageratum*. Stall feeding is on paddy straw, maize stover, local grasses, rice bran and oil cakes. 90% households were utilising the tap water for drinking purpose for human consumption and 20% used tap water for livestock as well while the remaining 80% households allowed their livestock to drink water from ponds, streams and ditches. This could be a reason for the high parasitic infections reported by the farmers.

The maintenance diet for local cattle comprises of fodder trees, grasses cut from forests, grazing in nearby forests and hay stored for lean seasons. Obviously, many farmers prefer indigenous cattle because they are `less demanding' and `less prone to the problems' usually associated with crossbred

animals. Moreover, the native animals are more sustainable in the prevailing circumstances. Nutritional deficiencies in crossbreeds, in general, cause serious problems leading to poor productivity, infertility, abortion and high morbidity & mortality.

Breeding

Cross breeding programmes had their impact in these representative villages since it yielded desirable results in terms of germplasm. While artificial insemination (AI) facilities are available for cows, buffalo owners have difficulty in arranging breeding of buffaloes. 64.7% farmers adopted AI practices for cattle breeding, while 22.3% were adopting natural services and 7% adopted both the practices (Figure 1). 6% farmers are neither adopting AI nor natural services for breeding of their animals, but kept animals for draught purpose only. Repeat breeding was found to be a major problem in these villages. The percentage of conception was low which may be due to silent heat or failure to take the animal at proper time for AI or insemination failure. The problem of repeat breeding (4-6 times) was reported by 16.7% farmers in about 76 cattle. The problem of infertility was also emphasised by the farmers but the exact cause (s) are yet to be elucidated.

Production and utilisation of milk

The milk yield of livestock in these villages ranges from 1.28 to 10.5 kg/day/household and the average was 2.9 ± 2.4 kg/day/household (Table 4 & 5). The milk yield was lowest in Patti village and highest in Tanda which may be due to its location near the city area and the farmers getting all possible help from the experts of various agencies besides better transport, communication and marketing facilities. The higher ranges in milk production signified the higher production potential of the animals and the lower ranges indicated poor feeding and management practices.

Immunisation practice

57% of the farmers were aware about the schedule of vaccination against infectious diseases, especially foot and mouth disease (FMD), of which only 52% farmers adopted the vaccination either fully (45%) or partially (7%). The farmers also expressed their difficulties due to the non availability of veterinary aid in time in the nearby areas, medicines/vaccines from state animal husbandry department.

Diseases

Heavy parasitism was one of the major problems of this region in livestock. The relationship between worm infection, animal hygiene and housing is obvious. Fasciolosis was identified as one of the most important parasitic diseases of the livestock in the area with 62% infected cattle and buffaloes out of 227 animals examined by a spot study with an eggs per gram of faeces (EPG) ranging from 30 to 400. Most of the deaths were reported to be due to various diseases followed by accidental poisonings by ingestion of toxic plants or accidents. Amongst poultry and wool rabbits, coccidiosis has been found to be the major cause of morbidity and mortality. Seasonal outbreaks of diseases like FMD, rinderpest (RP) has been reported by the farmers. Problems associated with migratory animals were mainly the lack of pasture land, abortions, infections diseases and lack of veterinary inputs at higher reaches.

Table 4. Milk production in the target area

Name of village	Total milk	No of households	Average milk yield production kg/day
1. Bandla	74.0	32	2.31
2. Suggar	55.5	25	2.22
3. Ghuggar	80.5	25	3.22
4. Khilroo	32.5	23	1.41
5. Sidhpur	44.0	21	2.09
6. Banuri 43.5		25	1.75
7. Tanda	222.0	21	10.5
8. Rajpur	65.5	21	3.1
9. Patti	47.5	37	1.28
10.Barol	52.0	25	2.08
11.Gadhiara	43.0	20	2.15
12.Deogran	65.5	24	2.73

Table 5. Production and utilisation of milk

	Milk yield in kg/day/household	No. of farmers	percentage

Production	Nil	91	30.33
	Up to 5 Kg	169	56.33
	Above 6 Kg	40	13.52
Disposal	Nil	91	30.33
	Home use (HU)	177	59.04
	Sale & Home use	32	10.86

DISCUSSION

Bovines account for 56% of livestock wealth in Himachal Pradesh against the national figure of 63% during 1987. The growth rate of buffalo population (2.03% per annum) increased at a faster rate than cattle (0.5% per annum) during 1966-92 (Chauhan, 1995a). The average daily milk yield of crossbred cow (3.24 kg) was more than double that of the indigenous cow (1.45 kg), however, the average daily milk yield of buffalo (2.86 kg) was not only higher than the indigenous cow but is quite close to that of crossbred cow. Over a period of 13 years (1977-1990), the cattle and buffalo milk production increased by 163.7 and 52.3%, respectively. Buffalo milk constitutes 52.7% of the total milk production. The per capita daily milk availability increased from 191 gm in 1977-78 to 288 gm in 1989-90, an increase of 50.8%. This was higher than the national level of 174 gm, world level of 275 gm and the minimum recommended level of 250 gm by Nutritional Expert Committee of the ICMR (Chauhan, 1995b). However, these figures are far below those of the developed countries. So, there is no reason for being complacent and strategies must be developed for optimum output from the livestock keeping in view their genetic potential. The major problems on animal husbandry practices as perceived by the farmers of these villages are shown in Table 6.

Table 6. Major problems on animal husbandry practices as perceived by the farmers

Problems	**Suggestions**
A: Animal Production	
Economic constraints	Increasing the overall productivity from agricultural operations, efficient utilisation of resources, co-operative efforts.
Non availability of fodder	Fodder cultivation, improvement in local pastures/common grazing lands, popularisation of fodder legumes, and trees. Introduction of silvi-pasture systems.
Lack of marketing and transport	Development of co-operative systems/ facilities societies for marketing and transport of livestock products.
Poor extension facilities	Establishment of mobile veterinary clinics, involvement of voluntary organisation in the transfer of technology.
Lack of technical know-how *pragmatic*	Organising health camps, farmer's training on more basis.
Socio-economic status	Improvement in basic civic amenities at village level.
Low genetic potential of the native cattle	Further fillip to cross breeding programmes.
Small land holdings	--
B: Animal Health*	
Bacterial diseases	Brucellosis, rinderpest, mastitis haemorrhagic septicaemia
Viral diseases	FMD, rabies
Parasitic diseases	Liver flukes, amphistomosis, parasitic enteritis, blood protozoan diseases, mange
Miscellaneous	Mastitis, accidents, wild animal injury, pasture poisoning, reproductive disorders like sterility, anoestrus, repeat breeding, abortions, obstetrics, retention of placenta *etc*.
Non availability of veterinary inputs non	Non availability of veterinary aid at home/nearby areas, availability of medicines, vaccines *etc*.

*Preparation of epidemiological data on the disease profile and development of longterm planning on disease prevention and control measures.

Sustainability is a key word in science and development policy over the last one decade. Keeping in view the mountainous agro-ecosystem and the multipurpose nature of the animal resources, the farmers

in the study area adopted technology within the inherent limitations leading to the success of cross breeding programme in the region. The animal resources, milk production and per capita milk availability of milk seems to be consonant with the inputs but there is vast scope for improving the productivity. In a similar survey earlier, Lall *et al.* (1979) reported average daily milk yield of 1.9 kg/cow and 3.4 kg/buffalo. Indigenous cattle breeds are commonly raised by small holder farmers for multipurpose agricultural operations while exotic breeds mainly by progressive farmers, more so by ex-service men in the study area.

Indigenous livestock provide practical means of using natural grasslands where crop production is not possible but the exotic animals cannot perform well because of higher susceptibility to environment, disease and nutritional stresses. Improved livestock management by small holders would contribute to farm income, household nutrition and sustainability of livestock production. Mixed farming will be the choice of farmers in the mountainous agroecosystem since livestock constitutes an inseparable component of hill area agriculture (Chander and Mukherjee, 1995). The prospects for improvement feed resources depend largely on better utilisation of crop residues and pasture improvement. There is a need to demonstrate some promising technologies currently available for crop residue improvement and efficient utilisation of tree forages which are sample, low cost, and easy to adopt by the rural farmers.

Diseases are still a bottleneck in profitability of livestock sector in the region. Chauhan *et al.*(1994) reported that maximum loss to the dairy animals was due to bacterial diseases followed by parasitic diseases. The extent of mortality was higher (2.03%) on small farms with larger dairy herd size and lower (1.30%) on farms with smaller dairy herd size. Further the extent of morbidity did not vary significantly among various categories of farms.

A study conducted during the last one decade indicates that gastrointestinal parasitism along with bacterial and viral diseases are responsible for heavy economic loss to the farmers. Feeding of cut and carry grass from waterlogged areas and allowing livestock to drink water from ponds, streams, ditches *etc*. could be the reasons for the high parasitic infections, especially flukes and nematodes in livestock to these villages. Flukes (*Fasciola*, amphistomes and *Dicrocoelium*) and strongyle were found to be the important parasitic infections throughout the year. *Fasciola* was found to be endemic throughout the year with a high percentage infection in buffaloes than cattle. In general, other fluke infections and strongyle showed a regular seasonal pattern with high prevalence with a small peak in March-April followed by a high peak in the month of July-September. Faecal egg counts of flukes (*Fasciola*/amphistomes) ranged from 50 to 300 in cattle and 50 to 400 in buffaloes with high load during rainy and post rainy seasons. The strongyle egg counts also revealed a similar trend with an overall mean monthly EPG ranged from 85-1,720 in cattle and 90-1,625 in buffaloes, with a high peak during the months of July-September. The important nematodes observed in study include, *Strongyloides, Trichostrongylus, Haemonchus, Oesophagostomum, Bunostomum* and *Mecistocirrus* in the decreasing order of prevalence. Broad spectrum anthelmintic treatment of dairy animals at least twice in year, once in March-April and second in July-September would reduce the parasitism and increase productivity of animals in the region (Jithendran *et al.,* 1998).

Role of NGOs

The non-government-organizations (NGOs) can play a very important role in the hill areas. The hill states of India have a difficult terrain which makes the approach and access of Government agencies very difficult and some times even impossible. There are a number of voluntary organisations which operate in rural sector, have "firsthand" experience of the rural potentials and problems and can play a pivotal role in transfer of technology. It is important that Government extension agencies involve NGOs in all transfer of technology programmes. The activities centered around the following aspects are expected to boost the dairy development in the region (Kaushal, 1996).

* Awareness amongst both the local people and the Govt. about the importance of livestock sector in hill farming.
* Programmes involving selection of indigenous breeds to get higher outputs without losing their natural adaptability.
* Providing veterinary facilities like vaccination, therapeutic and prophylactic veterinary *etc*.
* Improving the quality of locally available fodder in the hills in order to meet the nutritional inputs for the livestock.
* Supporting local hill communities in marketing of animal produce through the creation of self help groups, group marketing entrepreneurship, co-operative societies.
* Demonstration of model dairies, fodder cultivation, nurseries, creation of voluntary groups to seek technology.

CONCLUSIONS

Keeping in view of the mountainous agro-ecosystem and the multipurpose nature of the animal resources, the farmers in the study area adopted technology within the inherent limitations leading to the

success of cross breeding programme in the region. The animal resources, milk production and per capita milk availability has increased remarkably although, there is a vast scope for improving the productivity and sustainability of these animals. Education of the farmers on balanced and improved feeding of the animals, better management practices and disease prevention and control strategies would go a long way in improving the livestock productivity in the region. Sustainable development in hills can only be achieved through optimum utilisation of its natural resources. Veterinary service needs to be strengthened and improved. The potential of indigenous cattle breeds needs to be tapped by improving nutrient availability from locally available feed resources. Involvement of NGOs to educate the farmers on available technology and to motivate the farmers to seek technology would be a step forward in this direction. If the efforts of farmers, research institutions, extension agencies, Government and NGOs are integrated for promotion of hill area agriculture, the bright future is not far away for the hill farmers.

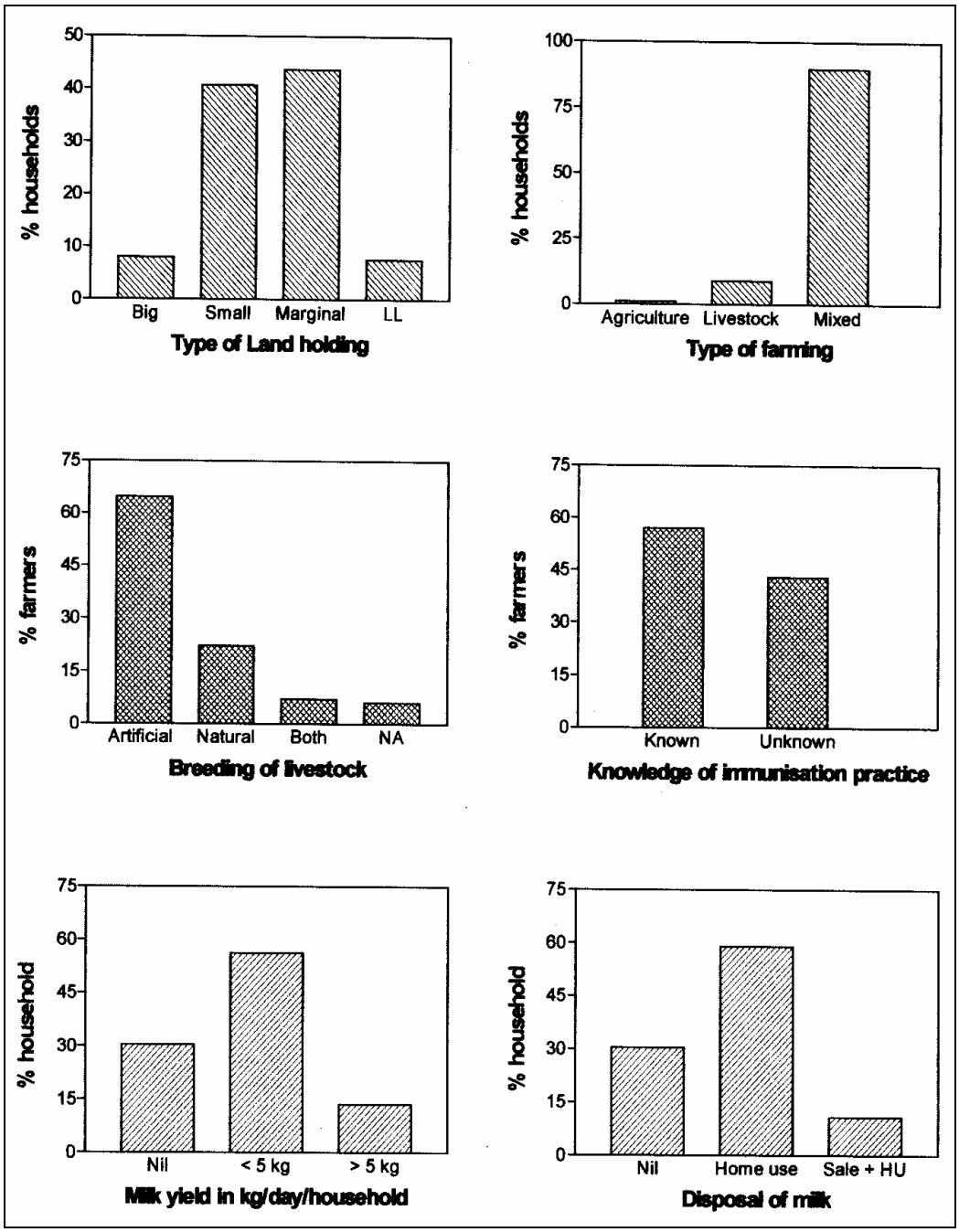

Figure 1. Profile of land holdings, type of farming, breeding, knowledge on immunisation, milk yield and milk disposal in the study area

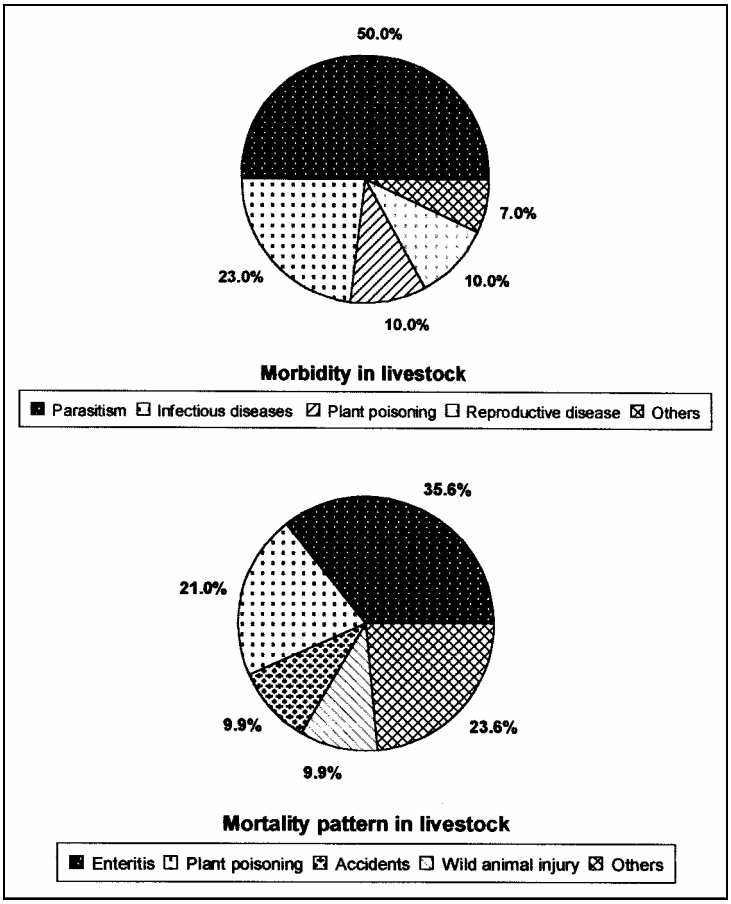

Figure 2. Morbidity and mortality pattern in livestock in the study area

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