

ECONOMICS OF LIVESTOCK PRODUCTION SYSTEM IN HIMACHAL PRADESH,1997 by Ranveer Singh (Mimeograph)

Abstract *Next to agriculture land livestock is the largest productive asset in rural areas. The type of animals reared depends on the socio-economic and agro-climatic conditions prevailing in the region concerned. The studies giving details of farming system and economics of livestock production assume importance because of their in depth analysis and location specific relevant results. It was from this view point that the present study was undertaken in the Himachal Pradesh. The agro-climatic conditions prevalent in the region offer good scope for the development of livestock industry. The importance of livestock in the state can be judge from the fact that the livestock density per sq. km. was 94 while human population density was 93 during 1991. The total population of livestock in the state was 50.93 lakh during 1992 livestock census. The annual growth rate from 1972-1992 worked out to be 0.59 per cent out of total population in 1992 . 42 per cent were cattle. 14 per cent buffaloes, 21 percent sheep, 22 per cent goats and 1 per cent other animals. The study reveals that per farm number of livestock were 10.68 heads. The number of milch animal per farm were 2.66 heads. Nearly 25 per cent of the total population on sample farms was cross-bred. The value of total livestock was Rs. 7153 per farm. Proportion of animals grazed in total population was 61 per cent and 39 per cent were stallfed. Per standard animal unit fodder fed was 17 quintal annually. The net returns per SAU were Rs. 401 and per farm were Rs. 2477 annually. The output –input ratio in livestock rearing was 1.26. The milk yield in whole lactation among cross-bred cows was 964 litres, in local cows 444 litres, in improved buffalo, 965 litres and in local buffalo 802 litres. Per farm annual milk production was 1211 litres out of which 41 per cent was consumed by the family member, 29 per cent sold and 30 per cent was processed. The annual per farm employment in livestock rearing was 275 mandays out of which 58 per cent was the contribution of women. On an average, 23 days of bullock pair per farm were utilized in agricultural operation. The estimated quantity of roughage is sufficient to feed the 34 per cent of total livestock in the state during 1992. Thus, 66 per cent livestock in the state are surplus. The various livestock development programme and suggestions in improving the livestock system in Himachal Pradesh are also discussed in the study.*

Objectives

1. To study the dynamic of livestock population in different regions of Himachal Pradesh.
2. To review the livestock development programmes in the State.
3. To study the livestock rearing system among different categories of farmers in Himachal Pradesh.
4. to study the production system of different livestock on various categories of farms in the State.
5. To examine the costs and returns from different livestock on sample farms in the State.
6. To study the contribution of livestock rearing an income and employment of various categories of farmers in the State.
7. To estimate the sustainable livestock population in the state: and
8. To suggest policy measures to accelerate the development of livestock in Himachal Pradesh.

Methodology The type of animals reared depends on the socio-economic and agro-climates conditions prevailing in the region concerned. Hence, Himachal Pradesh has been divided into four zones on the basis of agro- climatic conditions viz. low hish zone, mid hill zone, high hill wet zone and high hills dry zone. The livestock systems were analysed zone wise in the state.

Three stages stratified random sampling with the tehsil level as the first stage of sampling, village or clusters of villages as the second stage and the farming household the third and the final stage of the sampling. This methodology is followed for the data collection in the Comprehensive Scheme for Cost of Cultivation of Principal Crops in Himachal Pradesh and the data collected during 1990-91 have been used for the present study. Out of total sample of 300 farm households chosen under the scheme 150-farm households were taken for the present study. The number of farm households

in low hill zone were 80, in mid hills, 30 and 20 each in high hill wet zone and high hill dry zone. Further, sample farmers were classified into three categories i.e. marginal, small and large farmers and this was 29 per cent were marginal. 36 per cent small and 33 per cent were large farmers. The livestock population data and other related information were gathered from Directorate of land records, Department of animal Husbandry, govt. of Himachal Pradesh etc. Sample tabular analysis has been made use of in order in arrive at the conclusions.

MAIN FINDING

Dynamics of Livestock Population In Himachal Pradesh total livestock population was 46.24 lakh in 1972 which has increased to 50.93 lakh in 1992. The annual growth rate during this period is 0.59 per cent. Annual growth rate in population of equines was relatively higher (r.43%), followed by buffaloes (1.79%), goats (1.01%), cattle (0.23%) and sheep (0.13%). The pig population increased by 7.08 per cent annually during 1972 to 1992. The population of yaks and camels in the state declined by 0.36 and 4.75 per cent annually respectively. The population of livestock in low, mid, high hill wet and high hill dry zones was 26.31 lakh, 12.61 lakh, 4.39 lakh and 7.61 lakh respectively during 1992 census. The annual growth rate in different zones during 1972-92 was 1.0, 0.40 and 0.27 per cent respectively. In high hill wet zone the populations of livestock decreased by 0.50 per cent annually during this period.

Cattle population dominated the scene of the total livestock population, which accounted for 45.37 per cent in 1972 and declined to 42.25 per cent in 1992. The population of cows and buffaloes in total livestock population has increased from 14.58 to 15.29 per cent and 7.82 to 9.27 per cent during this period respectively. However, proportion of bullocks decreased from 17.82 per cent in 1972 to 16.66 percent in 1992. The sheep population, which was 22.48 per cent in 1972, decreased to 21.09 percent in 1992 census. On the other hand goat population has increased from 19.06 to 21.91 per cent during this period. The proportion of equines increased from 0.61 to 0.74 per cent. The proportion of yaks in total population remained constant during the period under study.

Livestock Development Programme In 1951, upgrading programme of cows was started under the all India Key Village Scheme at Kotgarh and Solan where Red Sindhi bulls were located. It was successful programme but coverage was very limited. Subsequently, it was started in 1954-55 by transporting Jersey semen to Himachal Pradesh. In 1962, German Highland Spotted Breed i.e. Fleischschaff was brought but this breed was not suitable for the hills and replaced by jersey breed imported from Denmark. The real break through in cattle breeding programme was achieved with the implementation of the Indo-Newzealand livestock improvement project in 1974. The staff members of Animal Husbandry Department and University were trained at Newzealand and West Germany in handling deep Frozen semen technology during this period. The expert opinion favoured exploitation of continuous hybrid vigor with Jersey as the exotic breed and step wise substitution of non-descript inheritance with Jersey and Singhi in lower hills. For high hills, Jersey and selected Jersey cross-breed bulls with indigenous cows was prescribed. Hence, Jersey bulls and cow were imported from Australia, Newzealand, Denmark etc., under various schemes. These animals have been serving as distribution centres of superior germplasm for grading up of local cows. Presently nearly 1.5 lakh cows are inseminated every year in the Pradesh. The milk yield in local cow is 450 kg. per year and 3000 kg in Jersey cow. The first generation of cross breed giving an average 4.5 kg. milk per day as recorded under INLIP and 2.9 kg. per day under ICDP areas.

The work on buffalo breeding could be initiated in 1980. During this period breeding was performed through natural service. Later on AT technique was developed at Palampur laboratory and now AT facility has been extended to 190 institutions in four districts covered in ILIP and presently about 75 thousand buffaloes annually are being inseminated with the semen processed at the Palampur laboratory.

Number of exotic breed of sheep were tried for cross-breeding and 241 sheep of polwarth breed from Australia were imported first time in the state during 1956-57. The other exotic breeds of sheep were also imported from U.K. in 1960-61. Spanish Merino from Spain in 1963-64. Soviet merino in 1965-66. Corriedales and South Down from Australia in 1968-69. And Rambouillet from USA in 1980-81. The progeny born of

Rambouillet are better than other merinos. Annually more than 500 pure breed exotic male hoggets are distributed to the farmers and as a result total wool production increased by 100 per cent during the last 26 years.

With the implementation of various cattle improvement programme and increase in the production of milk, the state Government started two milk supply scheme with the daily milk collection of 100 liters which rose to 5000 liters per day in course of time. During 1972-73 a modern dairy plant was established at Mandi in collaboration with the West Germany Government. Two more milk supply scheme were also stated during 1972-74. Presently there is a milk supply scheme operating in the State which is manage by the H.P. State Cooperative Milk Producers Federation Ltd. (Milkfed). To bring the marketing system of wool in an organized form, the state Govt., under the guidance of Govt. of India, established, the Himachal Pradesh State Cooperative wool Procurement and Marketing Federation Limited, in 1986. This organization came to operation during 1991-93 and providing marketing channel to the shepherds.

Livestock Rearing on Sample Farms Per farm totals number of livestock were 7.28 heads in low hills, 19.70 heads in Mid hills, 10 heads in high Hill wet Zone and 11.40 heads in high hill dry zone. On the whole, per farm total livestock were 10.68 heads. The proportion of cattle in total livestock population was 43.41, 39.39, 70 and 41.23 per cent in low, mid, high hill (wet) and high hill (dry) zones respectively. Further, proportion of buffaloes was higher in low hills, followed by high hill wet zone, mid hills and high hill dry zone. The proportion of equines was higher in mid and high hill wet zone. Sheep/goats constituted about 58 per cent of total livestock in mid hills, 56 per cent in high hill dry zone, 23 per cent in high hill wet zone and 22.66 per cent in low hill zone. In standard animal units the total number of animals in low mid high hill (wet) and high hill dry zone were 5.15, 8.86, 6.77 and 5.66 heads per farm respectively. About 39 per cent of total population of cows were in the age group of 5-10 years, 33 per cent in the age of above 10 years. Nearly 86 per cent of total population of bullocks were in the age group of 5-10 years. Fifty per cent of total population of in the age group of up to 3 years and 3-5 years. Sheep/goats up to 3 years of age constituted about 73 per cent of total population. Per farm milch animals were 2.66 heads in which 1.58heads were

cows and 1.08 heads were buffaloes. Nearly 53 per cent cows and 74 per cent buffaloes were in lactation period during the reference year. On all sample farms about 25 per cent of total livestock were cross-bred. The value of livestock per standard animal unit was Rs. 1158 which is directly related with the farm sizes. Per farm total value of livestock was Rs. 7153 which was higher in mid hills zone (Rs. 8713) and lesser in high hill dry zone (Rs. 4732/ farm).

The herd size in the beginning of the year was 10.68 heads which increased to 11.58 heads in the end of the year under study. On an average, per farm 1.42 animals were born. 0.67 head purchased. 0.56 head died and 0.63 head sold on sample farm under study. On the whole, value of herd on all sample farm was decreased from Rs. 7153 to 6499 during the reference year.

Feeding Practices of Livestock Generally, animals like sheep/goats, young stock, dry milch animals are depends on grazing. Milch animals in milk and bullocks during working period are stallfed. In the state, animals par grazed in harvested fields. Grass land, common land and in forests. On average, 61 per cent of total animals were grazed during the year understudy. The grazing practice of animals was more on rainy and summer seasons while majority of animals stallfed in winters. Grazing of animals was more on marginal farms, followed by small and large farms. Per farm average annual consumption of fodder was about 155 quintals in which 50 quintals was dry fodder and 105 quintal was green fodder. In dry fodder 60 per cent was dry grass collected from grassland and 40 per cent obtained from crop by products. The share of green grass, fodder crops and green leaves in total green fodder fed to animals was 61.10 and 29 per cent respectively. Per SAU quantity of dry and green fodder of fodder of farmers were from forest, 48.39, owned land, 49.47, common land, 1.07 per cent and market 0.67 percent. On an average, quantity of concentrates fed per SAU was 38.62 kg. annually. Nearly 39 per cent of total concentrates fed were purchased and 61 per cent was home produced. The value of concentrates fed was Rs. 522 per farm annually.

Annual Maintenance Cost of Livestock Rearing The cost of rearing a cross bred cow was Rs. 1549 annually. Nearly 79 per cent of total cost was operational cost and 21 per cent fixed cost. In operational cost 25.56 per cent was human labour, 40 per cent value of fodder, 17.29 expenditure on concentrates fed and 0.25 per cent were veterinary expenses. In fixed cost, about 12 per cent was depreciation and 9.25 per cent of total cost accounted for interest on fixed investment. Total cost of rearing a local cow was Rs. 890 annually. The share of fodder in total cost was 42 per cent, human labour 36.20 per cent concentrates 7.68 per cent and fixed cost 14 per cent. The annual maintenance cost of a heifer/calf of cross-bred and local cow in standard animal unit was Rs. 224 and Rs. 177 in which major share was the value of human labour and fodder fed to the animals. On an average, per improved buffalo total cost of rearing was 2398 annually. In total cost concentrates fed accounted for 33.28 per cent, human labour 16 and expenditure on fodder was about 24 per cent. The fixed cost was about 25 per cent of the total cost. In case of heifer of this breed total cost of rearing was Rs. 213 annually. In total cost 88.56 per cent was operational cost and remaining 11.44 per cent was fixed cost. The annual maintenance cost of rearing a local buffaloes was lesser (Rs. 1557) than that of improved buffalo. However, maintenance cost of rearing a he-buffalo was Rs. 717 in which 36.61 per cent was human labour, 44.6 per cent fodder and 18.69 per cent was fixed cost. The annual cost of rearing a pair of bullocks was Rs. 2270. the major expenditure was on fodder followed by human labour and fixed cost. In case of equines (Horse, mule, poney/donkey) total cost of rearing per animal was Rs. 1008 annually. Among total cost items 32 per cent was human labour, 29 per cent fodder, 11 per cent value of concentrates and Rs. 97 annually. Nearly 51 per cent of total cost accounted for value of human labour, 20 per cent interest on fixed investment and 23 per cent was the depreciation on equipments, cattleshed.

Per farm annual cost of rearing all animals was Rs. 9673 in which 32 per cent share was of human labour, 39 per cent fodder, 11 per cent value of concentrates and 0.9 per cent veterinary expenses. Further, 7 per cent of total cost was the interest on fixed investment and 11 per cent was the depreciation on animals, equipments and cattleshed.

Returns From Livestock Rearing The total value of various livestock products obtained were valued at prevailing current prices in the area. The annual out put from cow of cross bred, local, buffalo improved, local breed, he-buffalo, pair of bullocks, equine and sheep/goat was Rs. 3764 and Rs. 180 per animal respectively. Per SAU returns were Rs. 1967 while per farm output was Rs. 12150 which is directly related with the farms sizes.

Annual net returns over total cost were Rs. 1987 per animal in case of cross-bred cow, Rs. 679 in local cow, 1344 in improved buffalo, Rs. 1501 in local buffalo, Rs. 710 in he-buffalo, Rs. 2933 in equine and Rs. 83 in sheep/goat. Incase of a pair of bullocks farmers incurred the loss of Rs. 843 annually. The annual net returns per SAU were Rs. 1966 which ranged from Rs. 1841 on small farms to Rs. 2165 on large farms. Per SAU net returns were higher in low hill zone followed by high hill wet zone, mid hill zone and high hill dry zone. Per farm net returns were Rs. 12150 annually which are directly related with the farm sizes. Per farm net returns were higher in low hill followed by mid hills, high hill wet zone and high hill dry zone.

The output-input ratio in livestock rearing indicates that output per rupee of input was higher in equines (3.33), followed by cross breed cow (2.12). local buffalo (1.82), sheep (1.85) and he-buffalo (1.56). on the whole, the ratio per SAU was higher in high hill wet zone. Followed by mid hills, low hills and lesser in high hill dry zone. Per SAU output-input ratio in all livestock was 1.26.

Production and Utilization of Livestock Products The yield of milk in cross-breed cow was 964 liters in whole lactation while it was 423 litres in local cow. The difference in these breed was 128 per cent. Incase of improved and local buffalo the yield of milk was 965 and 802 liters showing the difference of 20 per cent. On an average a goat provided 16 litres milk of whole lactation. Per farm annual milk production on all sample farm was 1211 liters which was higher in mid hills (1546) litter) and lesser in high hill dry zone (362 litres). Further, 62 per cent of total milk produced was consumed, 26 per cent was sold, 56 per cent was contributed by buffaloes and 44 per cent was from cows. The entire quantity of wool produced was consumed by the farm family. The utilization

of bullock power on the farm was 23 days annually which was higher in low hill followed by high hill dry zone, mid hills and high hill wet zone.

Employment and Income From Livestock In livestock rearing 275 maydays per farm were utilized out of which 46 per cent were utilized intending of animals, 41 per cent in fodder collection and 13 per cent in grazing of animals. Nearly 58 per cent of total work in livestock rearing was done by women and 42 per cent by men. At overall level, about 30 per cent of total time devoted to all activities was utilized in livestock rearing. The contribution of income from livestock rearing in total household income of Rs. 16444 was 15 per cent. The share of income of Rs. livestock rearing was 11 per cent in total income of Rs. 1554/ households in low hills, 22 per cent in total income of 19363/households in mid hill, 14.62 per cent in total income of Rs. 34601/household in high hill wet zone and 7.16 per cent in total income of Rs. 5241/ household in high hill dry zone.

Sustainable Livestock Population The total roughage production from all sources in Himachal Pradesh was 26 lakh metric tonnes in 1972 and 26.41 lack metric tones in 1992. In total dry matter production during 1992, 52 per cent was obtained from crop by products, 23 per cent from gestures and grazing land, 17 per cent from forest, 4.73 per cent from cultivable wasteland, 2.75 per cent from fodder crops and 0.78 per cent from orchards. The estimated quantity of roughage in the state was sufficient to meet the need of the 14.24 lakh cow-equivalent units in 1972 and 14.47 lakh co-equivalent units in 1992. The estimated quantity of fodder in the state was far below the animal population of Himachal Pradesh during all the livestock censuses. If one compares the actual population with carrying capacity surplus livestock in cow equivalent units were 22.99lakh in 1972 and 27.61 lakh in 1992. The population of surplus livestock has almost increased in all censuses. This means keeping in view the resource situation and ecological stresses the existing livestock population must be reduced to 34.39 per cent of the present level (i.e. there is 65.61 per cent of total livestock population is surplus) during 1992. In various zones surplus livestock populatio9n was 81 per cent in high hill dry zone, 69 per cent in low hills, 53.72 per cent in mid hills and 50.16 per cent in high hill wet zone during 1992 census.

Policy Issues No drastic changes can be expected in regard to livestock holdings unless effective substitute can be offered for the various goods and service which livestock provide directly or indirectly, not only in the form of milk, meat, wool and traction requirements but also the contribution they make to the fuel and fertilizer of the poor peasants.

While surpluses of livestock might exist, it is fairly clear that such surpluses are likely to exist more in the smaller than in the larger farms. No drastic solutions to reduce the number can therefore, even be contemplated without paying heed to the distributional aspects of the problem. As is clear in the high hill wet zone, livestock population shows sign of getting stabilized by higher degree of rationalization through reduction in the proportion of useless animals and culling of the unnecessary young stock.

Keeping in view the present status of livestock sector, there is need to focus attention on following points:

- Proper breeding, feeding and weeding of livestock for obtaining higher returns is urgently needed.
- Development of marketing for livestock input supply and output selling is needed which is presently lacking due to hilly terrain and inaccessible villages.
- Agro-forestry on degraded CPR lands for soil and water conservation and enhancing leaf fodder-supply is very essential for balanced feeding of livestock.
- To reduce dependence on draught animals development of farm machinery suitable for hills as per farm size.
- Adoption of balanced farming system integrating livestock and crop enterprises for proper utilization of by-products from each sector.
- Agro-ecological micro-level planning for livestock management and development.

- The role of women in livestock rearing is significantly higher in Himachal Pradesh. Therefore, they must be educated about the modern techniques of livestock rearing, scientific management of grass and farm forestry etc.
- Stall feeding should be encouraged to increase the efficiency of fodder utilization.
- Reducing farm income inequalities, improving livestock production efficiency through reduction in numbers and improvement in quality of animals and meeting feed needs of livestock without environmental and natural resource degradation are the major policy issues in livestock planning and management in Himachal Pradesh.