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ECONOMIC ASPECTS OF LIVESTOCK ENTERPRISE IN A SEMI-ARID WATERSHED

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ABSTRACT

Study was conducted in a semi-arid watershed with the objective to analyse the economic aspects of livestock enterprise. The study revealed that expenditure on feed and fodder and family labour formed the chunk among the different cost components. Average maintenance cost and returns from buffalo was highest compared to other type of animals. Labour use pattern reveals that the human labour input in livestock rearing was mostly family labour. The gross income per animal during a year was Rs. 4195.31 from cow and Rs. 6276.67 from buffalo inside watershed and the same was Rs. 4229.50 and Rs. 6412.00 outside the watershed. The results showed that there was little influence of watershed management programme over the yield and costing aspects of livestock enterprise.

INTRODUCTION

Studies, time and again have shown that livestock rearing is an important component of farming system. The farming classes have been rearing milch animals along with cultivation of crops since traditional times. The cattle/buffalo were kept to meet the twin needs of domestic milk consumption and draught power requirements. This enterprise is believed to be employment intensive and income bright. The planners and policy makers advocate dairying particularly for ameliorating the economic conditions of the weaker sections of the society, i.e., small and marginal farmers and also landless classes. Dairying, *inter alia* is also advocated to promote diversification of agriculture. We, however, feel that there are several wrong notions about the scope of this enterprise and dairying may not turn out to be a sound economic alternative under the prevailing situations of input and output prices for this enterprise relative to other competing crop enterprises. The subject needs an objective analysis to bring out a clear picture. In this paper, we have made an attempt to analyze the economic and employment aspects of livestock enterprise in a semi-arid watershed (P.C. Pyapili - B) in Ananthapur district of Andhra Pradesh.

MATERIAL AND METHODS

Sampling and data collection: In order to study the impact of watershed development programme on livestock production system, a watershed namely, P.C. Pyapili - B in Vajrakarur Mandal of Anantapur district (A.P.) was taken up. From the same Mandal one village (Kamalpadu) was selected as control area, which has not been covered under any watershed based programme or activities for examining differential impact of watershed development programme on livestock production system, if any. Since, cattle and buffaloes are the two important constituents of the farm livestock, accounting for nearly the entire returns in terms of milk, draught power and employment; these two species were considered only for approaching the households for data collection. A family or household was adopted as the unit of investigation in this study. Data were collected on investment pattern, costs and returns, inputs and output of livestock enterprise, employment pattern, disposal pattern of livestock products, etc. on pre-tested schedule by personal interview. After collecting the data, 46 households from watershed village and 24 households from the village at outside the watershed were sorted out for further analysis based on the completeness of

information. The selected households maintained about 43 cows, 26 buffaloes and 113 bullocks inside the watershed and the same were found as 16, 8 and 30, respectively, outside the watershed. However, local/ indigenous (non-descript) cattle and buffalo population dominates the herd of the sample farmers. Post stratification of the respondents into small, medium and large group were done on the basis of land holding size, by using Cumulative frequency square root method of stratification (Dalenius and Hodges, 1950).

Estimation of cost of maintenance: The cost were classified into variable costs and fixed costs. Variable costs included the cost of feeds and fodders, human labour cost and miscellaneous expenditure on minor repairs of cattle shed and stores, dairy equipments, water and electricity charges, cost of health cover and breeding fees, etc. and interest on working capital. The value of family labour was calculated on the basis of prevailing local wage rates for hired labour (Jayachandra, 1991). Fixed costs computed in present study included depreciation on animals, cattle shed and stores, dairy equipments and interest on fixed capital. The interest on working capital was not computed for milch animals as there was regular income flow from the sale of milk (Grover *et al.*, 1992). The joint costs as the expenses on human labour, miscellaneous expenses etc. was apportioned to individual animal on the basis of Standard Animal Units (SAUs) present in the herd (Patel and Kumbhare, 1980). Net maintenance cost was worked out by deducting the value of dung from total maintenance cost.

Estimation of cost of milk production and returns: In order to estimate the cost of producing a litre of milk, the average net maintenance cost per milch animal per day was divided by the average milk yield per day. Gross income was arrived at by multiplying the quantity of milk produced by the average price of milk prevailing in the area (Rs. 9 per litre for cow as well as buffalo milk) plus value of dung. Net income was calculated as the difference between gross income and net maintenance cost.

RESULTS AND DISCUSSION

Maintenance cost of bovine animals: As bovine maintenance was incidental to agriculture, the farmer did not spend cash on many of the items. The by-products of crops were used as fodder and family idle labour was used to manage bovines. However, to understand the economic aspects of the livestock enterprise, maintenance cost for milch cows and buffaloes and bullocks were calculated and presented in Table 1.

The maintenance cost of cow, buffalo and bullock was Rs. 3733.61, 5466.54 and 4841.42 inside watershed and Rs. 4946.55, 6029.62 and 4995.54 outside the watershed, respectively. Considering the breaking up of expenditure, fixed cost shared the total maintenance costs to the tune of 36.52 and 60.94 per cent for cows, 45.86 and 63.36 per cent for buffalos and 56.90 and 69.08 per cent for bullocks, inside and outside the watershed, respectively. Among the components of fixed costs, family labour formed the major cost item. Of the total maintenance cost, the variable costs accounted for 43.10 to 63.48 per cent inside the watershed and 30.92 to 39.06 per cent outside the watershed for different types of animals. Among the variable cost components, the contributing share of feed and fodder in the total cost was at the highest. It is noticeable that the cost incurred on maintaining the buffalos was found to be higher than cows and bullocks inside and outside the watershed.

Production and disposal of milk: Average annual production, consumption and marketed surplus as on sample farms were worked out and are presented in Table 2. On an average, milk produced per farm was 327.68 litres inside watershed and 268.00 litres outside the watershed. Contribution of

Table 1. Maintenance cost of bovine animals (Rupees/annum)

Items of costs	Inside watershed			Outside watershed		
	Cow	Buffalo	Bullock	Cow	Buffalo	Bullock
Variable costs						
I Feed	2021.45	2630.26	1679.81	1774.46	2084.00	1340.69
	(54.14)	(48.12)	(34.70)	(35.87)	(34.56)	(26.84)
II Hired labour	182.07	187.96	162.31	0.00	0.00	0.00
	(4.88)	(3.44)	(3.35)	(0.00)	(0.00)	(0.00)
III Maintenance expenses	26.94	55.56	36.81	50.58	53.72	42.82
	(0.72)	(1.02)	(0.76)	(1.02)	(0.89)	(0.86)
IV. Interest on working capital	0.00	0.00	100.04	0.00	0.00	73.56
	(0.00)	(0.00)	(2.07)	(0.00)	(0.00)	(1.47)
V. Misc. expenses	139.66	86.07	107.79	106.94	71.63	87.67
	(3.74)	(1.57)	(2.22)	(2.16)	(1.19)	(1.75)
Total	2370.12	2959.85	2086.76	1931.98	2209.35	1544.74
	(63.48)	(54.14)	(43.10)	(39.06)	(36.64)	(30.92)
Fixed Costs						
I Depreciation on fixed asset	40.89	114.90	56.72	20.29	16.71	24.57
	(1.10)	(2.10)	(1.17)	(0.41)	(0.28)	(0.49)
II Depreciation on animal	185.76	483.33	753.56	240.00	600.00	651.79
	(4.98)	(8.84)	(15.57)	(4.85)	(9.95)	(13.05)
III Interest on fixed capital	92.65	443.43	102.22	27.55	30.08	35.73
	(2.48)	(8.11)	(2.11)	(0.56)	(0.50)	(0.72)
IV. Interest on value of animal	356.67	610.00	708.16	335.00	600.00	625.71
	(9.55)	(11.16)	(14.63)	(6.77)	(9.95)	(12.52)
V. Family labour	687.52	855.03	1134.00	2391.73	2573.48	2113.00
	(18.41)	(15.64)	(23.42)	(48.35)	(42.68)	(42.30)
Total	1363.49	2506.69	2754.66	3014.57	3820.27	3450.80
	(36.52)	(45.86)	(56.90)	(60.94)	(63.36)	(69.08)
Total maintenance cost	3733.61	5466.54	4841.42	4946.55	6029.62	4995.54
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Figures in parenthesis indicates the per cent of total maintenance cost.

Table 2. Average milk production and disposal by sample households

Particulars	Inside watershed				Outside watershed
	Small	Medium	Large	Pooled	
Milk production (litres/annum)					
Cow	151.76	162.67	288.89	187.68	212.33
Buffalo	30.59	112.50	383.33	140.00	55.67
Total	182.35	275.17	672.22	327.68	268.00
Disposal of milk (litres/annum)					
Consumption	112.28	165.92	423.61	202.95	187.17
Marketed surplus	70.07	109.25	248.61	124.73	80.83
Per capita consumption (g/day)	65.04	79.89	224.05	108.81	81.27
Marketed surplus to production (%)	38.43	39.70	36.98	38.06	30.16

cow milk was maximum compared to buffalo milk both inside and outside the watershed. A positive relationship was discernible between milk production and holding size inside the watershed.

Consumption of milk on an average was more inside the watershed (202.95 litres per annum) than the households outside the

watershed (187.17 litres per annum). This worked out to be 108.81 g and 81.27 g per capita per day milk consumption which is far below against minimum nutritional requirement (210 g/day) recommended by ICMR.

It was observed that on an average, 124.73 and 80.83 litres milk was sold per year representing a marketed surplus of 38.06 and 30.16 percent, respectively, inside and outside the watershed. However, inadequate marketing facilities compelled the milk producers to dispose off their marketed surplus through milk vendors and directly to the consumers.

Cost and returns of milk production: The cost of milk production and returns per milch animal in both inside and outside the watershed is presented in Table 3. It could be observed that average cost of milk production was to the extent of Rs. 7.91 and Rs. 10.69 in case of cow milk and Rs. 7.73 and Rs. 8.43 for buffalo milk, inside and outside the watershed, respectively, indicating that the watershed farmers were in better position in terms of cost of milk production per litre as compared to farmers outside watershed in case of both cow and buffalo milk.

The average gross income and net income from cow milk were estimated at Rs. 4195.31 and Rs. 461.70 for watershed farmers and Rs. 4229.50 and (–) Rs. 717.04 for the farmers outside watershed. From buffalo milk the same was observed to be Rs. 6276.67 and Rs. 810.12 inside watershed and Rs. 6412.00 and Rs. 382.38 outside the watershed, respectively. The family labour income of cattle keepers outside the watershed was more (Rs. 1674.69 and Rs. 2955.86) compared to watershed farmers (Rs. 1149.22 and Rs. 1665.66) both from cow and buffalo milk.

Employment pattern in livestock enterprises: Although the relative share of labour input in dairying in the total cost is less, yet the absolute magnitude of labour employment turns out to be much higher. It could be seen from the Table 4 that the farmers producers outside the watershed were putting more time per day (3.98 hours) against the farmers inside watershed (3.64 hours), though, the per animal labour input works out at 562.95 and 299.70 man hours per year for the same. The operation wise labour input in the area revealed that the fodder collection, grazing and chaff cutting accounted for as much as 50 per cent of the total labour input. The other important operation was feeding and watering, cleaning, etc. The similar trend has been observed outside the watershed also. Therefore, in view of the dairy enterprise being highly labour intensive as reported by Singh *et al.* (1981), efforts are required to encourage dairying which will not only provide opportunities for greater family labour absorption but also generate additional income to the underemployed or unemployed persons in the area.

Table 3. Cost of milk production and returns per milch animal

Particulars	Inside watershed		Outside watershed	
	Cow	Buffalo	Cow	Buffalo
Total maintenance cost (Rs./yr)	3733.61	5466.54	4946.55	6029.62
Income from dung (Rs./yr)	384.31	516.67	407.50	400.00
Net cost (Rs./yr)	3349.30	4949.87	4539.05	5629.62
Milk yield (litre/yr)	423.44	640.00	424.67	668.00
Cost of milk production (Rs./litre)	**7.91**	**7.73**	**10.69**	**8.43**
Gross income (Rs./yr)	4195.31	6276.67	4229.50	6412.00
Family labour income (Rs/yr)	1149.22	1665.16	1674.69	2955.86
Net income (Rs./yr)	461.70	810.12	(-)717.04	382.38

Table 4. Employment in livestock production enterprise (Hours/day)

Activities	Small	Medium	Large	Pooled	Outside
	(2.81)	(3.65)	(6.84)	(4.43)	(2.58)
Grazing	0.76(0.29)	0.90(0.30)	0.289(0.09)	0.65(0.23)	1.25(0.21)
	(18.44)	(18.11)	(15.27)	(17.76)	(31.41)
Fodder collection	1.07(0.42)	1.20(0.36)	0.17(0.05)	0.81(0.28)	1.00(0.23)
	(25.71)	(24.22)	(9.16)	(22.28)	(25.13)
Chaff-cutting	0.39(0.15)	0.44(0.14)	0.26(0.07)	0.36(0.12)	0.35(0.11)
	(9.40)	(8.85)	(14.50)	(10.00)	(8.90)
Feeding and watering	0.60(0.25)	0.67(0.21)	0.31(0.07)	0.53(0.18)	0.56(0.15)
	(14.54)	(13.48)	(6.87)	(14.43)	(14.14)
Cleaning	0.45(0.18)	0.55(0.17)	0.24(0.05)	0.41(0.13)	0.38(0.12)
	(10.99)	(11.16)	(12.98)	(11.40)	(9.42)
Milking	0.15(0.05)	0.25(0.06)	0.13(0.02)	0.18(0.04)	0.15(0.04)
	(3.72)	(5.05)	(6.87)	(4.85)	(3.66)
Miscellaneous activities	0.71(0.26)	0.95(0.25)	0.44(0.09)	0.70(0.20)	0.46(0.18)
	(17.20)	(19.12)	(24.43)	(19.28)	(11.52)
Total hours/day	4.15(1.60)	4.95(1.49)	1.82(0.44)	3.64(1.18)	3.98(1.04)
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)
Hours/year	1513.68	1805.23	664.10	1327.67	1452.40
Hours/SAU/year	538.68	494.59	97.09	299.70	562.95

- Bracketed terms under different categories indicates average SAUs per households;
- 1st bracketed terms indicates average man hours per day per SAUs;
- 2nd bracketed terms indicates percentage to total man hours per day.

CONCLUSION

The foregoing analysis revealed that livestock enterprise is a remunerative proposition and potential source of income and employment for the rural poor in the semi-arid region. It was noticeable that the cost incurred on maintaining the animals and the returns from produce was higher from buffaloes compared to other category of animals. The human labour input in livestock rearing was observed to be mostly family labour which, however, would be wasted on the households not involved in milk production due to lack of other employment opportunities. So, helping such farmers operating at lower levels of production to increase the scale may facilitate the gainful use of family labour. The results, however, showed a very little difference in yield and returns due to implementation of watershed management programme and consequent rapid technological changes in crop farming.

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