



ECONOMICS OF SHEEP FARMING IN NELLORE DISTRICT OF ANDHRA PRADESH

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ABSTRACT

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The study was conducted in Nellore district of Andhra Pradesh. The per unit total costs on sheep farms worked out to ₹ 27,763, among which total variable costs (TVC) was ₹ 18,373 and total fixed costs (TFC) ₹ 9,389. Gross income was estimated to be ₹ 54,873 per unit. Returns per rupee of expenditure was ₹ 1.98. With regard to resource use efficiency MVP/OC ratio of flock size and human labour indicated the scope for their further use.

KEYWORDS: Sheep farming, costs and returns, total costs, net income, resource use efficiency.

INTRODUCTION

Sheep rearing is predominantly practiced by landless labourers and marginal farmers, who are considered as socially and economically disadvantaged sections in the rural society. Sheep farming is a traditional avocation and the farmers are in the enterprise for generations, but they don't have adequate knowledge in deriving higher returns from the enterprise. Studies of this nature are going to help the farmers to know in reality the costs incurred and returns obtained. Further they do require information on productivity of input factors employed in the sheep farming so as to bring in the necessary changes in the use of the same. The study was conducted to estimate costs and returns and to assess resource productivity and resource use efficiency in sheep rearing.

METHODOLOGY

The present study has been conducted in Nellore district of A.P for its importance in sheep rearing in the state. From the Nellore district, Gudur and Udayagiri mandals which had highest sheep population were purposively selected for the study. From the selected mandals, villages with high sheep population were identified and 5 villages were randomly selected. From each village so selected, 10 farmers were once again randomly chosen. The total number of respondents selected for the purpose of study was 50. Primary data were collected by the survey method through a well designed schedule for the year 2014-15. To study the

resource productivity and resource use efficiency Cobb-Douglas production function was applied, which is of the following form.

$$Y = a X_1^{b_1} X_2^{b_2} X_3^{b_3} e^{\mu}$$

Y : Gross income in Rs.

X₁ : Flock size

X₂ : Human labour

X₃ : Veterinary expenditure

a : Intercept

μ : Stochastic disturbance term

e : Napier base

b₁ to b₃ partial elasticity coefficients of X₁ to X₃ inputs.

Resource use efficiency:

Equality of marginal value product to factor cost is the basic condition that must be satisfied to assess the resource use efficiency.

$$\text{MPP of } X_j \text{ input} = b_j \cdot \bar{Y} / \bar{X}_j$$

where,

MPP : Marginal Physical Product of jth input.

b_j : Partial elasticity coefficient of jth input.

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\bar{Y} : Gross income from the enterprise at its geometric mean level.

\bar{X}_j : j^{th} independent variable at its geometric mean level.

The marginal value product for each factor is obtained by multiplying the MPP of each factor with unit price of output i.e

$$\text{MVP} = \text{MPP} \times P_y$$

Marginal value productivities of the resources are compared with their acquisition costs in order to study the resource efficiency. An input is said to be efficiently used when it's MVP=MFC.

RESULTS AND DISCUSSION

Cost structure in sheep farming

On perusal of Table 1 it is clear that the total costs per unit (20 ewes + 1 ram) on sheep farms worked out to ₹ 27,763. The percentage of variable costs and fixed costs constituted 66.18 and 33.82 per cent respectively. These findings deviated with that of the findings of Dastagiri and Rao (1991), Vamsi (2014) in which fixed costs accounted for 87.72 and 63 per cent respectively, in which they included the purchase value of flock at starting of the enterprise, whereas in this study, interest on fixed investment was taken into consideration, as sheep rearing was spread over many years. In fact, most of the farmers rear sheep as an age old traditional occupation.

Among the operational costs, human labour cost which included both family labour and hired labour was the most important one with 49.75 and 1.60 per cent together constituting 51.35 per cent of the total costs. Human labour occupied major share among total costs, followed by interest on investment (33.03%). Veterinary expenditure accounted for 12.21 per cent among the total costs. These findings are in tune with those reported by Prabu *et al.*, (2009), Gupta *et al.* (2011) and Chandran *et al.* (2013).

The total cost per farm and per unit worked out to ₹ 1,31,436 and ₹ 27,763 respectively.

Returns from sheep farming

Gross returns in the sheep farming included imputed value of animals added to the existing flock, value of sold

animals and income from sheep manure. As seen from Table 2 gross returns per farm and per unit were recorded as ₹ 2,59,782 and 54,873 respectively. The per unit results revealed that the share of imputed value of animals added to the existing flock per unit was ₹ 28,468 (48.24%). The contribution from the sale of animals per unit was ₹ 27,004 (49.21%). Returns from the manure was ₹ 1,400 (2.55%).

The per unit net return after deduction of the total costs was ₹ 27,110, whereas gross margin was ₹ 36,499 which was arrived at by deducting variable costs from total costs. Returns per rupee of expenditure was ₹ 1.98 in sheep farming.

Imputed value of animals added to the existing flock occupied 48.24 per cent which showed that, all the off springs born on the farm were not disposed and females were retained as breeding stock. The overall picture showed that the returns per rupee of expenditure was on the positive side. Similar trend was reported by Prabu *et al.* (2009) and Vamsi (2014).

Break up of returns from sheep farming

It is evident from Table 3 that returns from the sale of male lambs formed the highest percentage (56.40%) in the total value of animals sold, followed by sale of female lambs (20.95%), sale of ewes (17.24%) and sale of rams (5.40%). The total income received from sale of animals was ₹ 1,27,846 and ₹ 27,004 per farm and per unit respectively.

The transactions in sheep farming were through sale of male lambs, naturally if the male lambs were more on a farm, it ensured the sheep farmers to receive more cash income. In case, on a farm if the female lambs were more, it would not facilitate more cash income but they did add to the imputed value of animals added to the existing flock. Therefore as long as lambing rate is higher, it hardly matters whether the lambs are male or female because any offspring born in the flock adds to value of the animals. These findings supported the findings of Kanal Jothi (2004) and Vamsi (2014). In the study area the income from sale of ewes was mostly due to distress sale or as a part of culling. Only in few reasons ewes were sold for cash purpose. Income from sale of rams was very negligible. If at all it was there, it was mainly to replace the new rams or distress sale.

Economics of sheep farming

Table 1. Cost structure of sheep farming (₹)

S. No.	Particulars	Per farm	Per unit
Variable costs			
1.	Human labour	65,390 (49.75)	13,812 (49.75)
a.	Family labour	2,100 (1.60)	444 (1.60)
b.	Hired labour	67,490 (51.35)	14,256 (51.35)
	Total	1,100 (0.84)	232 (0.84)
2.	Conc. Feed	16,052 (12.21)	3,391 (12.21)
3.	Veterinary expenditure	1,100 (0.84)	232 (0.84)
4.	Annual repairs and maintenance	1,243 (0.95)	263 (0.95)
5.	Interest on working capital	86,985 (66.18)	18,373 (66.18)
	Total Variable costs	65,390 (49.75)	13,812 (49.75)
Fixed costs			
1.	Interest on investment	43,415 (33.03)	9,170 (33.03)
2.	Depreciation	1,036 (0.79)	219 (0.79)
	Total Fixed costs	44,451 (33.82)	9,389 (33.82)
	Total costs (TVC + TFC)	1,31,436 (100.00)	27,763 (100.00)

Resource productivity of sheep farming

The adjusted coefficient of multiple determination was found to be 0.98 indicating that 98 per cent of the variation in the total returns in the sheep farming was explained by the three factors included in the production function.

The coefficient of variables flock size (X_1) and human labour (X_2) were positive and significant while that of veterinary expenditure (X_3) was significant but exhibited a negative sign. These trends indicate that increase in flock size by 1 per cent keeping others constant will increase the gross returns by 1.02 per cent, while

similar increase in human labour would increase the gross returns in sheep production by 0.07 per cent. On the other hand increase of veterinary expenditure by 1 per cent will decrease the sheep production by 0.06 per cent.

Resource use efficiency of sheep farming

MVP/OC ratio was more than 1 for flock size and human labour. It was negative in the case of veterinary expenditure. MVP/OC ratio of flock size, and human labour was 4.24 and 1.45 indicating the scope for increasing the flock size and human labour further, so as to derive more income from the sheep enterprise. There is an immediate need to reduce the expenditure regarding

Table 2. Returns from Sheep of different enterprises (₹)

S. No.	Particulars	Per farm	Per unit
1	Imputed value of animals added to the existing flock	1,25,307 (48.24)	26,468 (48.24)
2	Value of sold animals	1,27,846 (49.21)	27,004 (49.21)
3	Income from manure	6,630 (2.55)	1400 (2.55)
4	Gross returns	2,59,782 (100.00)	54,873 (100.00)
5	Total costs	1,31,436	27,763
6	Net returns	1,28,346	27,110
7	Gross margin	1,72,797	36,499
8	Returns per rupee of expenditure	1.98	1.98

Table 3. Break up of returns from the sale of sheep (₹)

S. No.	Particulars	Per farm	Per unit
1.	Ewes	22,046 (17.24)	4,657 (17.24)
2.	Rams	6,910 (5.40)	1,460 (5.40)
3.	Male lambs	72,111 (56.40)	15,232 (56.40)
4.	Female lambs	26,779 (20.95)	5,656 (20.95)
5.	Total	1,27,846 (100.00)	27,004 (100.00)

Table 4. Production elasticities of input factors in sheep farming

Particulars	Coefficients	Standard errors
Intercept	-0.14539322	0.0518604
Flock size (X ₁)	1.021243452*	0.03815652
Human labour (X ₂)	0.073802225*	0.03040072
Veterinary Expenditure (X ₃)	-0.06103859*	0.01743708
Adjusted R square	0.98	0.0518604

* Significant at 5 per cent level

Table 5. Resource use efficiency of sheep rearing

Particulars	MVP (₹)	Opportunity Cost (₹)	MVP/OC ratio
Flock size (X ₁)	4241.844	1000	4.241844
Human labour (X ₂)	217.7595	150	1.45173
Veterinary expenditure (X ₃)	-120.746	1	-120.746

veterinary aid as revealed by MVP/OC ratio. These observations are similar to that of Ramarao and Raghuram (1998) and Kanal Jothi (2004).

CONCLUSIONS

The per unit total costs on the selected sheep farms were ₹ 27,763. Gross returns from the enterprise were ₹ 54,873 rewarding the farmer with a net income of ₹ 27,110. Returns per rupee of expenditure came to 1.98. Male lambs represented the major source of income for the farmers followed by sale of female lambs. The resource use analysis proved that the increase in flock size and human labour component would increase the gross income further.

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