

Comparative Economic Analysis of Livestock on Orchard and Agrarian Farm in Goa State

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ABSTRACT

The study was conducted to learn about the comparative economics of costs, returns and profitability of livestock on orchard farm and agrarian farm in Goa state. For cow: the total cost was Rs. 30349.81 on orchard farm followed by that of Rs. 28065.21 on agrarian farm indicating that total cost was higher on orchard farm as compared to agrarian farm. Output-input ratio was also higher on orchard farm than that of agrarian farm. In case of per buffalo annual costs and returns on orchard farm and agrarian farm, the total cost was Rs. 32353.69 on orchard farm followed by that of Rs. 28357.88 on agrarian farm. Output-input ratio was 1.57 and 1.51 on orchard farm and agrarian farm, respectively. Per goat annual costs and returns on orchard farm and agrarian farm, the total cost was Rs. 3998.59 on orchard farm followed by that of Rs. 3203.13 on agrarian farm. Further, output-input ratio was more on agrarian farm than that of orchard farm because of comparatively less cost of expenditure in goat rearing on agrarian farm as compared to orchard farm. As regards to per bird annual costs and returns on orchard farm and agrarian farm, the total cost was higher as Rs. 62.94 on agrarian farm while that was Rs. 61.59 on orchard farm. It was concluded that total cost of expenditure was higher on agrarian farm than that of orchard farm. Output-input ratio was 1.32 on agrarian farm and 1.31 on orchard farm. Bird maintenance was more profitable on agrarian farm as compared to orchard farm because of more utilization of inputs on agrarian farm.

Key words: Livestock, costs, returns, profitability, per animal returns

INTRODUCTION

Livestock especially cattle and buffaloes are the traditional component of production system. Major cattle breeds in Goa are Sahiwal, Red Sindhi and Gir. Major crossbreeds in Goa are Jersey and Holstein. Total number of livestock and poultry in Goa state is 132406 and annual production is 60.14 thousand tonnes and that of poultry 400.18 lakh number of eggs (Anonymous, 2021a). In Goa state, total number of crossbreed cattle is 27529 and that of indigenous cattle's is 60247. Total number of buffaloes is 27207 and that of goats and poultry is 9446 and 144204, respectively. (Anonymous, 2021b). The rearing of domesticated and semi domesticated animals has prominent expectations of direct and indirect nature viz., dairy, farm activities, food, industry related products i.e. wool, fur, hair, feather, etc. to extract and to satisfy the needs. This resource plays a vital role in the livelihood of people in general and economic development of the people of a region/nation in particular (Cainzos

et al., 2022). The prevailing facts reveal that taluka-wise and year-wise distribution of livestock in the state confined to interior talukas viz., Sattari, Sanguem, Canacona and Quepem. In these talukas, rearing of livestock was meant for farm activities, later on the attention of the people led to intensify the same to get gainful employment and to supplement the economic standard through milk, manure and sale at the time of urgency (Alba-Reyes *et al.*, 2024). In course of time, people also found out the scope in dairy farming, market-based livestock rearing with the incentives by the government (Hiremath, 2018).

MATERIALS AND METHODS

Multistage sampling method of survey was conducted to collect the data. Orchard farm consisted with more than 60% area under orchard crops and remaining area under seasonal crops, annual crops and dairy as well as farm enterprises. On the contrary, agrarian farm consisted of more than 60% area under

seasonal crops, annual crops and remaining area under orchard crops and dairy as well as other farm enterprises. In first stage, Sanguem and Quepem tehsils were selected on the basis of higher number of livestock in the area. In the second stage, eight villages were selected from each of tehsils on the basis of highest number of livestock in the area. From Sanguem tehsil villages selected were Bhati, Cotarli, Kale, Netravali, Rivona, Uguem, Vadem and Xeldem, while from Quepem tehsil villages selected were Avadem, Balli, Barlem, Dhadem, Malkarne, Mirabag, Pirla and Quitol. In the third stage, from each village, the separate list of orchard and agrarian farmers along with their holding sizes were obtained. From each of the lists, three orchard farmers and three agrarian farmers were randomly selected from each of the villages. In this way, from 16 villages, 48 farmers were selected for the present study.

Per livestock marginal difference of enterprises on orchard farm over agrarian farm and per farm marginal effect of farm business as a whole of orchard farm over agrarian farm were obtained and analyzed.

RESULTS AND DISCUSSION

Per cow annual costs and returns on orchard and agrarian farm were analyzed (Table 1). It was clear that employment of human labour was higher on orchard farm (36.13 man days) as compared to agrarian farm (27.72 man days). Use of concentrate was also higher on orchard farm than that of agrarian farm. Use of green fodder and dry fodder was more or less same on both the farms. Thus, it can be concluded that orchard farmer was using more concentrate and human labour per cow per annum. Regarding output, milk production was higher 925.06 l on orchard farm as compared to agrarian farm (848.13 l). Thus, the milk production per cow per annum was more on orchard farm because of higher use of concentrate. It was observed that manure production was higher on orchard farm as compared to agrarian farm. It can be concluded that natural grazing was more on agrarian farm, while in case of orchard farm stall feeding was higher (Kumar, 2020).

Total cost was higher on orchard farm (Rs. 30349.81), while it was Rs. 28065.21 on

Table 1. Per cow annual costs and returns on orchard and agrarian farm

S. No.	Particulars	Orchard farm			Agrarian farm		
		Physical Input	Amount	Per cent	Physical input	Amount	Per cent
Costs							
1.	Dry fodder (q)	16.96	7633.01	25.15	16.38	7369.74	26.26
2.	Green fodder (q)	18.01	6306.60	20.77	18.7	6545.61	23.32
3.	Concentrate (kg)	42.13	1095.43	3.6	35.56	924.6	3.29
4.	Human labour (man days)	36.13	6503.77	21.42	27.72	4989.47	17.78
5.	Veterinary aids		235.84	0.77		230.7	0.61
6.	Electricity charges		38.2	0.12		37.28	0.13
7.	Miscellaneous charges		75.47	0.24		56.14	0.2
8.	Interest on working capital @ 13.50%		2954.92	9.73		2720.73	9.69
9.	Variable cost (Σ 1 to 8)		24843.28	81.85		22874.27	81.5
10.	Depreciation on cow @ 12.50%		2336.70	7.69		2189.46	7.8
11.	Depreciation on shed @ 10%		454.93	1.49		438.48	1.56
12.	Depreciation on equipments @ 10%		75.31	0.24		73.31	0.26
13.	Interest on fixed capital @ 11%		2639.57	8.69		2489.69	8.87
14.	Fixed cost (Σ 10 to 13)		5506.52	18.14		5190.94	18.5
15.	Total cost (Σ 9 and 14)		30349.81	100		28065.21	100
Returns							
16.	Milk (l)	925.06	37002.64	88.25	848.13	33925.26	89.2
17.	Manure (q)	19.05	2382.07	5.68	13.45	1610.29	4.42
18.	Young livestock (no.)	1.03	2542.45	6.06	0.99	2428.51	6.38
19.	Gross returns		41927.16	100		38034.69	100
20.	Net profit		11577.35	-		9969.48	-
21.	Output-input ratio		1.38	-		1.35	-

agrarian farm. With respect to individual items of expenditure, dry fodder was dominant item of expenditure on both the farms followed by green fodder and human labour (Munshi *et al.*, 2024). In relation to returns, gross returns were higher (Rs. 41927.16) on orchard farm as compared to Rs. 38034.69 on agrarian farm. In gross returns, share of milk production was more than 88% on both the farms. Cow maintenance was more profitable on orchard farm as compared to agrarian farm because of higher stall feeding in nature on orchard farm. It was obvious that output-input ratio was also higher on orchard farm than that of agrarian farm. The similar results were found by Alders *et al.* (2021) regarding profitability of cow enterprise.

Per buffalo annual costs and returns on orchard farm and agrarian farm were also analyzed (Table 2). The use of concentrate was higher on orchard farm than agrarian farm. Employment of human labour was higher on orchard farm (36.90 man days) as compared to agrarian farm (29.83 man days). It can be concluded that orchard farmer was using both dry fodder and green fodder in more quantity

than that of agrarian farmer. Regarding output, milk production was higher 1146.15 l on orchard farm as compared to agrarian farm (951.46 l) (Malik *et al.*, 2021). Thus, the milk production per buffalo per annum was more on orchard farm because of higher use of concentrate, dry fodder and green fodder than that of agrarian farm. Similarly, manure production was higher on orchard farm as compared to agrarian farm. Young livestock production was more or less the same on both the farms.

It was clear that total cost was higher (Rs. 32353.69) on orchard farm, while that was Rs. 28357.88 on agrarian farm. With respect to individual item of expenditure, dry fodder was dominant item of expenditure on both the farms, followed by human labour and green fodder (Windsor *et al.*, 2021). In relation to returns, milk production was more than 89% on both the farms (Prasad and Kumar, 2022). Returns obtained from buffalo were more on orchard farm due to more use of dry fodder, green fodder and concentrate than that of agrarian farm. It was obvious that output-input ratio was more on orchard farm than that of

Table 2. Per buffalo annual costs and returns on orchard and agrarian farm

S. No.	Particulars	Orchard farm			Agrarian farm		
		Physical input	Amount (Rs./buffalo)	Per cent	Physical input	Amount (Rs./buffalo)	Per cent
Costs							
1.	Dry fodder (q)	21.64	9736.36	30.09	20.66	9294.96	32.78
2.	Green fodder (q)	16.57	5800.45	17.92	12.89	4511.76	15.91
3.	Concentrate (kg)	47.52	1188.43	3.67	34.08	885.97	3.12
4.	Human labour (Man days)	36.90	6643.63	20.53	29.83	5369.75	18.54
5.	Veterinary aids		195.45	0.6		204.20	0.72
6.	Electricity charges		36.81	0.11		63.72	0.22
7.	Miscellaneous charges		52.72	0.16		81.04	0.29
8.	Interest on working capital @ 13.50%		3193.27	9.86		2755.54	9.72
9.	Variable cost (Σ 1 to 8)		26847.16	83.00		23166.94	81.69
10.	Depreciation on buffalo @ 12.50%		2336.7	7.22		2189.45	7.72
11.	Depreciation on shed @ 10%		454.93	1.40		438.49	1.55
12.	Depreciation on equipments @ 10%		75.3	0.23		73.31	0.26
13.	Interest on fixed capital @ 11%		2639.57	8.15		2489.69	8.78
14.	Fixed cost (Σ 10 to 13)		5506.52	17.00		5190.94	18.31
15.	Total cost (Σ 9 and 14)		32353.69	100.00		28357.88	100.00
Returns							
16.	Milk (l)	1146.15	45846.18	90.28	951.46	38058.49	89.07
17.	Manure (q)	18.47	2309.09	4.55	17.55	2193.28	5.13
18.	Young livestock (no.)	0.89	2628.18	5.17	0.84	2478.99	5.80
19.	Gross returns		50783.45	100.00		42730.76	100.00
20.	Net profit		18429.76	-		14372.87	-
21.	Output-input ratio		1.57	-		1.51	-

Table 3. Per goat annual costs and returns on orchard and agrarian farm

S. No.	Particulars	Orchard farm			Agrarian farm		
		Physical input	Amount (Rs./goat)	Per cent	Physical input	Amount (Rs./goat)	Per cent
Costs							
1.	Dry fodder (kg)	6.70	33.51	0.84	4.14	20.71	0.65
2.	Green fodder (kg)	28.97	101.40	2.54	21.97	76.88	2.40
3.	Concentrate (kg)	11.53	138.32	3.46	8.27	99.21	3.10
4.	Human labour (man days)	12.52	2253.44	56.36	9.42	1694.53	52.90
5.	Veterinary aids		18.70	0.47		10.69	0.33
6.	Electricity charges		6.68	0.17		3.53	0.11
7.	Miscellaneous charges		8.02	0.20		7.76	0.24
8.	Interest on working capital @ 13.50%		345.61	8.64		258.29	8.06
9.	Variable cost (Σ 1 to 8)		2905.67	72.67		2171.60	67.80
10.	Depreciation on goat @ 12.50%		463.78	11.60		435.08	13.58
11.	Depreciation on shed @ 10%		90.29	2.26		87.13	2.72
12.	Depreciation on equipments @ 10%		14.95	0.37		14.57	0.45
13.	Interest on fixed capital @ 11%		523.89	13.10		494.74	15.45
14.	Fixed cost (Σ 10 to 13)		1092.90	27.33		1031.53	32.20
15.	Total cost (Σ 9 and 14)		3998.57	100.00		3203.13	100.00
Returns							
16.	Milk (l)	17.09	1466.50	15.87	13.71	685.58	15.85
17.	Manure (q)	0.24	101.52	1.10	0.49	61.63	1.42
18.	Young livestock (no.)	1.37	7670	83.03	1.02	3579.06	82.73
19.	Gross returns		9238.02	100.00		4326.27	100.00
20.	Net profit		2376.07	-		1123.14	-
21.	Output-input ratio		1.34	-		1.35	-

agrarian farm. Similar results were found by Thakur (2023) regarding profitability of buffalo enterprise.

Per goat annual costs and returns on orchard and agrarian farms are presented in Table 3. The use of green fodder was high on orchard farm as compared to agrarian farm because of ready availability of green fodder on agrarian farm (Zamuner *et al.*, 2023). It was clear that employment of human labour was higher on orchard farm (12.52 man days) as compared to agrarian farm (9.42 man days). Use of concentrate was also higher on orchard farm than that of agrarian farm. Use of dry fodder was more or less same on both the farms. Regarding output, young livestock production was more on orchard farm than that of agrarian farm. Per annum per goat milk and manure production was high on orchard farm as compared to agrarian farm because of the use of green fodder, concentrate. Human labour was more on orchard farm in comparison with that of agrarian farm (Rajak *et al.*, 2024).

It was clear that total cost was higher as Rs. 3998.57 on orchard farm while that was Rs.

3203.13 on agrarian farm. With respect to individual item of expenditure, human labour was dominant item of expenditure that was contributing more than 52.00% on both the farms. In relation to returns, gross return was higher as Rs. 5383.15 on orchard farm as compared to Rs. 4326.27 on agrarian farm. In gross return, the share of young livestock was more than 82.00% on both the farms (Singh *et al.*, 2024). It was obvious that output-input ratio was more on agrarian farm than that of orchard farm. Similar results were comparable with those of Panth *et al.* (2021) regarding output-input ratio 1.31 and 1.34).

Per bird annual costs and returns on orchard farm and agrarian farm are discussed in Table 4. Use of feed per bird per annum was high on agrarian farm as compared to orchard farm. It can be concluded that use of feed was more on agrarian farm than that of orchard farm. With respect to output, poultry bird production was more or less same on both the farms. It was observed that manure production was more on agrarian farm than orchard farm. Egg production was higher on

Table 4. Per bird annual costs and returns on orchard and agrarian farm

S. No.	Particulars	Orchard farm			Agrarian farm		
		Physical input	Amount	Per cent	Physical input	Amount	Per cent
			(Rs./bird)			(Rs./bird)	
Costs							
1.	Feed (kg)	0.78	15.52	25.20	0.80	15.96	25.37
2.	Human labour (man days)	0.05	9.99	16.22	0.08	14.03	22.28
3.	Veterinary aids		3.95	6.42		2.25	3.58
4.	Electricity charges		2.13	3.45		1.43	2.28
5.	Miscellaneous charges		2.6	4.22		1.47	2.34
6.	Interest on working capital @ 13.50%		4.61	7.49		4.74	7.54
7.	Variable cost (Σ 1 to 7)		38.81	63.01		39.89	63.38
8.	Depreciation on shed @ 10%		3.99	6.47		4.47	7.10
9.	Depreciation on equipment's @ 10%		0.97	1.56		0.97	1.53
10.	Interest on fixed capital @ 11%		17.84	28.96		17.61	27.98
11.	Fixed cost (Σ 9 to 11)		22.78	36.99		23.05	36.62
12.	Total cost (Σ 8 and 12)		61.59	100		62.94	100
Returns							
13.	Poultry bird (no.)	0.66	66.20	81.82	0.68	67.95	81.75
14.	Manure (kg)	0.76	0.76	0.94	0.77	0.76	0.93
15.	Egg (no.)	2.79	13.95	17.24	2.88	14.41	17.34
16.	Gross returns		80.91	100		83.13	100
17.	Net profit		19.31			20.19	
18.	Output-input ratio		1.31			1.32	

agrarian farm than that of orchard farm because of more utilization of inputs on agrarian farm as compared to orchard farm. It was concluded that total cost of expenditure was higher (Rs. 62.94) on agrarian farm, while that was Rs. 61.59 on orchard farm. With respect to individual item of expenditure, human labour was dominant item of expenditure on both the farms followed by feed. In relation to returns, gross return was Rs. 83.13 on agrarian farm, while that was Rs. 80.91 on orchard farm (Malik *et al.*, 2022). In gross return share of poultry bird production was more than 81.00% on both the farms. Similarly, share of egg production was more than 17.00% on both the farms. Thus, output-input ratio was higher on agrarian farm as compared to orchard farm. Similar results were obtained by Khadka and Thapa (2020).

CONCLUSION

Farmer should give more importance to orchard farming as compared to agrarian farming because as livestock business had one and half times more net profit on orchard farm as compared to agrarian farm.

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