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Role of Goat Farming in Livelihood Security of Rural Households in Union Territory of Puducherry

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ABSTRACT

The paper examines the contribution of goat farming to the livelihood of rural households, particularly among landless and low-income groups. The research focuses on the extent of adoption of goat-rearing practices, costs, returns, and constraints faced by goat farmers. Data was collected from 96 goat-rearing households in Puducherry through a field survey. The study found that goat farming is a significant source of livelihood for landless laborers, with an average flock size of 5.56 goats per farm. Fixed costs accounted for 47.25 per cent of total production costs, with an average gross return of Rs. 23,442 per farm and a benefit-cost ratio (BCR) of 3.30. The mortality of goats due to diseases such as Foot and Mouth Disease (FMD) resulted in substantial economic losses for farmers. Most goat farmers lacked awareness of scientific rearing practices, leading to poor herd health and productivity. The paper suggests that restoring community pasture lands, improving veterinary infrastructure, and providing access to improved goat breeds could enhance the economic viability of goat farming. Additionally, promoting better health care practices such as vaccination, deworming, and disease control through farmer training programs would increase profitability and contribute to the livelihood security of rural households in Puducherry.

Keywords: Goat farming, extensive system of rearing, cost and returns, Cobb-Douglas function, constraint analysis
JEL codes: D24, Q12, Q18

I

INTRODUCTION

Goat farming is a livelihood option for ruralites in several developing countries. They are valuable current assets liquidated during natural disasters like droughts and are a major ex-post coping strategy for rural households. Goats can thrive in harsh conditions and be reared in varied agro-climatic environments. Goats are prolific breeders with high feed conversion efficiency, which are preferred traits for economic viability. The goat production systems can be categorized into intensive, semi-intensive, and extensive. The extensive grazing system in pasture lands is widely prevalent in India, requiring less management with minimal or zero inputs. However, the grazing lands are degrading fast, resulting in low productivity for goats. Further, the non-adoption of scientific rearing practices leads to the incidence of diseases like Foot and Mouth disease (FMD), Goat pox, pneumonia, jaundice, etc., causing substantial economic loss to goat keepers. The lack of maintenance of genetic purity of breeds is yet another cause for the poor health and low productivity of goats.

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The goats constitute 27.74 per cent of the total livestock population of 536.76 million (20th Livestock Census of India). The country exported 10828.99 MT of sheep and goat meat valued at 77.68 million USD during 2023-24 (www.apeda.org). With rising incomes, people's consumption patterns shift from rice and wheat to high-value commodities like milk, eggs, and meat. Among the sources of meat, goat meat (chevon) is widely preferred by people as it is a rich source of animal protein, vitamins, and minerals and plays a key role in contributing to the nutritional security of rural households. Goats yield products like meat, milk, manure, skin, and fibre. Goat rearing is a primary income source for marginal and small farmers and landless labourers. Against this background, the present study was taken up to assess the extent of the adoption of goat-rearing practices and the contribution of goat farming to livelihood security by a survey of 100 rural households in the Puducherry district of Union Territory of Puducherry.

II

DATABASE AND METHODOLOGY

Selection of Sample

The U.T. of Puducherry comprises four geographically segregated districts: Puducherry, Karaikal, Yanam, and Mahe. Puducherry was purposively chosen as goats constitute 48.64 per cent of the total livestock population (151368 nos.), and goat meat production accounts for 34.70 per cent of the total meat production (0.1464 lakh tonnes) in the state (BAHS, 2023). Puducherry district has five communes: Ariyankuppam, Bahour, Nettapakkam, Villianur and Mannadipet. A stratified sampling method was adopted to select the goat keepers. The first stage involved the selection of communes, followed by a random selection of villages with a larger goat population and sample respondents. The sample size is 100 goat farms. The outliers were removed, and the analysis was confined to 96 respondents. Primary data on the socio-economic profile of goat keepers, cost and returns, and constraints in goat rearing were obtained using a pre-tested interview schedule. The survey was taken up during April – June 2022.

Tools of Analysis

Percentage and average analysis were used to describe the socio-economic profile of respondents and compute costs and returns from goat farming.

Cost and Returns Analysis

Goat farms were post-stratified into small farms (1-5 adult goats), medium farms (6-10 adult goats), and large farms (> 10 adult goats). Total cost comprises fixed and variable costs. Fixed cost includes depreciation on the goat shed, machinery / equipment, and interest on fixed capital. Variable costs include compounded feed and hay expenses, deworming (prophylaxis), medication, vaccination, and miscellaneous expenses. A similar methodology was adopted by Deoghare and Bhattacharyya (1994), Khadda *et al.* (2018), and Nizamuddin *et al.* (2022) for the computation of cost and returns in goat farming. The human labour efficiency was significantly less considering flock size. So, the imputed value of family labour for grazing and other charges was not included in the computation of the variable cost (Kumar *et al.,* 2010). The data on the initial parent stock of goats could not be obtained from goat keepers by recall, which is a limitation of the study. Therefore, gross revenue from goat farming is taken as revenue from selling kids, adult goats, and manure during the previous year and the present value of unsold kids. Benefit-Cost Ratio is the ratio of Gross Income to Gross Cost. The estimated loss from the death of kids and adult goats due to various diseases was not accounted for in the computation of cost and returns from goat farming. Major constraints in goat farming were identified using Garrett's ranking technique.

Functional Analysis

A Cobb-Douglas function was estimated to determine the factors influencing income from goat farming. The specification of the model is as follows:

$$Y= \alpha X_1^{\beta 1} X_2^{\beta 2} X_3^{\beta 3} X_4^{\beta 4} X_5^{\beta 5} e^{u} \quad \ldots.(1)$$

The linear additive form of the function is given by,

$$\ln Y= \ln \alpha + \beta_1 \ln X_1+ \beta_2 \ln X_2+ \beta_3 \ln X_3+ \beta_4 \ln X_4+ \beta_5 \ln X_5+ u \quad .... (2)$$

where,

Y= Gross income from goat farming (Rs./farm/year)
α = Intercept
$\beta_1, \beta_2, \ldots \beta_5$ = Parameters to be estimated
X_1= Age of the respondent (years)
X_2= Quantity of concentrate feed (kg/farm/year)
X_3= Total kid goats (Number/farm)
X_4= Total adult goats (Number/farm)
X_5= Misc. expenses (Rs./farm/year)
e = error term

Garrett's Ranking Technique

Garrett's ranking technique was used to identify the major production and marketing constraints in goat farming. The respondents were asked to rank the

identified problems, and ranks were transformed into percentage position using the formula:

$$\text{Per cent position} = \frac{100\ (R_{ij} - 0.5)}{N_{ij}}$$

where, R_{ij} = Rank given for i-th factor by the j-th individual

N_{ij} = Number of factors ranked by the j-th individual

The percentage positions of each rank were converted into scores by referring to the table given by Garrett and Woodworth (1969). The mean score was derived from the scores obtained, and constraints were ranked based on the mean score.

III

RESULTS AND DISCUSSION

Socio-Economic Profile of Sample Respondents

The socio-economic profile of respondents influences the adoption of goat-rearing practices. Table 1 reveals that 8.34 per cent of respondents were below 40 years, 41.67 per cent were 41-50 years and 50 per cent were above 60 years of age. About 80.21 per cent had primary education, 8.33 per cent were educated up to middle school level, 10.42 per cent had high school education, and only 1.04 per cent were graduates. A majority (93 per cent) were landless, and only 34.38 per cent of the respondents had goat farming as their primary occupation. The non-farm sector was the predominant source of income for the sample farms.

TABLE 1. SOCIO-ECONOMIC PROFILE OF SAMPLE RESPONDENTS

Particulars		No.	Per cent to total
(1)		(2)	(3)
Age (yrs)			
	≤ 40	8	8.34
	41 – 50	40	41.67
	51 – 60	29	30.20
	> 60	19	19.79
	Total	96	100.0
Educational level			
	Primary school	77	80.21
	Middle school	8	8.33
	High school	10	10.42
	Higher secondary	0	0
	Graduation	1	1.04
	Total	96	100.0
Goat farming as			
	Primary occupation	33	34.38
	Secondary occupation	63	65.62
	Total	96	100.0

Current Flock Size in Sample Farms

The details on goat inventory in sample farms are given in Table 2. Out of the total kids of 546 numbers, 47.80 per cent were males and 52.20 per cent were females. Adult goats were 534 in number, and 25.84 per cent were males while 74.16 per cent were females. Generally, goat keepers retain female goats and sell male goats after one year of age, retaining few for reproduction. The average value of a kid below six months and 6-12 months of age was Rs.1575/- and Rs.2485/- respectively, and of an adult goat was Rs.4137/-.

TABLE 2. CURRENT FLOCK SIZE IN SAMPLE FARMS

Particulars	No.		Value (Rs.)		
	Male	Female	Male	Female	Total
(1)	(2)	(3)	(4)	(5)	(6)
< 6 months	194	216	322500	323500	646000
6 – 12 months	67	69	187000	151000	338000
Total kids	261	285	509500	474500	984000
Adult goats	138	396	641526	1567682	2209208
			Average value of a kid < 6 months		Rs.1575.60
			Average value of a kid 6 – 12 months		Rs. 2485.29
			Average value of an adult goat		Rs.4137.09

Adoption of Goat Rearing Practices in Sample Farms

Adopting scientific goat-rearing practices is a prerequisite to having healthy flocks and obtaining higher meat yields. Table 3 reveals that in the sample,

TABLE 3. EXTENT OF ADOPTION OF GOAT REARING PRACTICES

Knowledge on goat rearing practice	Aware	Not aware	If aware, extent of adoption		
			Fully adopted	Partially adopted	Not adopted
Improved breeds of goat	7 (7.29)	89 (92.71)	0	3 (3.12)	4 (4.17)
Diseases	45 (46.88)	51 (53.12)	3 (3.12)	38 (39.59)	4 (4.17)
Vaccination	52 (54.17)	44 (45.83)	11 (11.46)	41 (42.71)	0
Artificial insemination	1 (1.04)	95 (98.96)	0	0	1 (1.04)
Deworming	77 (80.21)	19 (19.79)	0	77 (80.21)	0
Ectoparasitic control	50 (52.08)	46 (47.92)	6 (6.25)	44 (45.83)	0
Use of Tags	0	96 (100.0)	0	0	0
Feeding practices	52 (54.17)	44 (45.83)	2 (2.08)	10 (10.42)	40 (41.67)
Scientific knowledge	2 (2.08)	94 (97.92)	0	2 (2.08)	0
Breeding practices	41 (42.71)	55 (57.29)	2 (2.08)	0	39 (40.63)
Live weight sales	90 (93.75)	06 (6.25)	1 (1.04)	49 (51.04)	40 (41.67)
Government schemes	0	96 (100.0)	0	0	0
Goat insurance	0	96 (100.0)	0	0	0

Figures in parentheses indicate the percentage of the total

non-descriptive goats are reared by most of the goat keepers. About 92.71 per cent were not aware of improved breeds like Tellichery. Only 46.88 per cent knew diseases infecting goats, and only 42.71 per cent adopted prophylactic measures either partially or fully. About 54.17 per cent were aware and resorted to periodic vaccination either partially or fully, as specified by Veterinarians. About 98.96 per cent were not aware of artificial insemination in goats. About 80.21 per cent of them were aware of deworming but were partial adopters. About 52.08 per cent were aware of ectoparasitic control with partial or complete adoption of control measures.

None of the sample respondents were aware of tagging goats for identification. About 54.17 per cent were aware of balanced feed, like the use of concentrates, dry fodder, and green fodder, but only 2.08 per cent were full adopters, 10.42 per cent were partial adopters, and 41.67 per cent were non-adopters. There are improved production technologies (high-quality breeds) and management practices (feed and fodder, veterinary and breeding management) in goat rearing for higher meat yield and, in turn, higher income. However, 97.92 per cent of the goat farmers had no scientific knowledge of goat rearing, while only 2.08 per cent were aware of partial adoption. Only 42.71 per cent had knowledge of breeding practices, of which 2.08 per cent were full adopters and 40.63 per cent were non-adopters. Understanding the adoption of goat-rearing practices would help formulate appropriate interventions for scientific goat farming in the region.

About 93.75 per cent were aware of live weight sales, but only 1.04 per cent fully adopted, 51.04 per cent partially adopted, and 41.67 per cent were non-adopters. High transportation costs and lack of transport facilities have forced goat farmers to sell live goats to intermediaries, traders, or butchers at a lower price, and very few sell live goats on a weight basis. Kumar *et al.* (2009) observed that farmer's share in the consumer's rupee was 65-76 per cent for various marketing channels of goat in Rajasthan, and organized production and trade would enhance revenue from goat farming.

Category of Goat Farms

The details on current flock size by category of farms are given in Table 4. Out of 96 goat farms, 56 farms (58.33 per cent) were small farms with a goat population of 181 nos. valued at Rs.750508/-; 34 farms (35.41 per cent) were medium farms with a goat population of 275 nos. valued at Rs.1144700/- while only six farms (6.25 per cent) were large farms with a goat population of 78 nos. valued at Rs.314000. The average flock size was 3.23, 8.09, and 13 numbers, respectively, in small, medium, and large farms. Overall, the flock size was 5.56 nos. of adult goats.

TABLE 4. CLASSIFICATION OF GOAT FARMS ACCORDING TO FLOCK SIZE

Category of farms (1)	No. of farms (2)	Adult goats (nos.)			Value of Adult goats (Rs.)		
		Male (3)	Female (4)	Total (5)	Male (6)	Female (7)	Total (8)
Small (1-5)	56	29	152	181	132026	618482	750508
Medium (6-10)	34	87	188	275	409500	735200	1144700
Large (11-15)	06	22	56	78	100000	214000	314000
Overall	96	138	396	534	641526	1567682	2209208

Capital Investment in Sample Goat Farms

Understanding the cost and returns would help to know the contribution of goat farming to the income and livelihood security of rural households. Table 5 reveals that total investment was high in medium farms (Rs. 1529080/-) due to the high adult goat population of 275. Of the total investment in small farms, goats accounted for 69.80 per cent and sheds 29.91 per cent. In medium farms, investment in adult goats was 74.86 per cent and shed 24.98 per cent of the total investment, while in large farms, it was 83.11 per cent and 16.68 per cent, respectively. The share of machinery/equipment was less than one per cent of the total investment in all the categories of farms. The average investment per farm was Rs. 19198/-, Rs.44972/- and Rs.62966/- respectively, in small, medium, and large farms. The investment pattern reveals that total investment increased with flock size due to the higher share of goats in total capital investment.

TABLE 5. CAPITAL INVESTMENT IN GOAT REARING IN SAMPLE FARMS

Particulars	Adult goats (Rs.)	Shed (Rs.)	Equipment / Machinery (Rs.)	Total investment (Rs.)	Average investment per farm (Rs./yr)
Small farms (N=56)	750508 (69.80)	321500 (29.91)	3100 (0.29)	1075108 (100.0)	19198.35
Medium farms (N=34)	1144700 (74.86)	382000 (24.98)	2380 (0.16)	1529080 (100.0)	44972.94
Large farms (N=06)	314000 (83.11)	63000 (16.68)	800 (0.21)	377800 (100.0)	62966.67
Overall (N=96)	2209208 (74.09)	766500 (25.70)	6280 (0.21)	2981988 (100.0)	31062.37

Economics of Goat Farming

Fixed Cost Incurred in Goat Farming

The details on the cost incurred in goat rearing are given in Table 6. The fixed cost per farm was high in large farms (Rs. 6469/-), followed by medium farms (Rs.4724/-) and small farms (Rs.2196/-). Among the items of fixed cost, interest on

fixed investment accounted for 87.41 per cent and depreciation on a shed for 12.34 per cent in small farms; the respective share was 95.19 per cent, 4.66 per cent in medium farms, and 97.33 per cent, and 2.46 per cent in large farms. As the extensive system was predominant, the overall fixed cost per farm was only Rs.3358/- of which interest on fixed capital, including breeding goats, accounted for 92.48 per cent, followed by depreciation on shed (7.32 per cent) and depreciation on machinery/equipment (0.20 per cent) of total investment per farm.

TABLE 6. COSTS INCURRED IN GOAT FARMING IN SAMPLE FARMS

Particulars	Average investment / farm (Rs./year)			
	Small Farms	Medium Farms	Large farms	Overall farms
(1)	(2)	(3)	(4)	(5)
Depreciation on shed	270.93	220.17	159.25	245.97
@5% per year	(12.34)	(4.66)	(2.46)	(7.32)
Depreciation on machinery	5.53	7.00	13.33	6.54
and equipments@10% per year	(0.25)	(0.15)	(0.21)	(0.20)
Interest on fixed investment	1919.84	4497.29	6296.67	3106.24
@10% per year	(87.41)	(95.19)	(97.33)	(92.48)
Total fixed cost	2196.30	4724.46	6469.25	3358.75
	(100.0)	(100.0)	(100.0)	(100.0)
Concentrates	1799.20	4814.60	6570.00	3165.39
	(76.37)	(93.65)	(74.23)	(84.45)
Hay	--	--	1277.50	79.84
			(14.44)	(2.13)
Deworming	80.35	77.94	166.67	84.90
(prophylactic)	(3.41)	(1.51)	(1.88)	(2.26)
Disease treatment cost, including	369.33	72.24	436.67	268.31
medicines	(15.68)	(1.40)	(4.93)	(7.16)
Vaccination	--	--	--	--
Misc. expenses	107.14	176.47	400.00	150.00
(electricity charges, etc)	(4.54)	(3.44)	(4.52)	(4.00)
Total variable cost	2356.02	5141.25	8850.84	3748.44
	(100.0)	(100.0)	(100.0)	(100.0)

Variable Cost Incurred in Goat Farming

The total variable cost per farm per year was Rs.2356/-, Rs.5141/- and Rs.8850/- respectively, in small, medium, and large farms. In small farms, feed costs accounted for 76.37 per cent of total variable costs, followed by disease treatment costs (15.68 per cent), miscellaneous expenses (4.54 per cent), and deworming (3.41 per cent). In medium farms, the share of feed was 93.65 per cent, followed by miscellaneous expenses (3.44 per cent), deworming (1.51 per cent), and disease treatment cost (1.40 per cent) in the total variable cost. In large farms, feed and fodder together constituted 88.67 per cent, disease treatment cost (4.93 per cent), miscellaneous expenses (4.52 per cent), and deworming (1.88 per cent) of total variable cost. Overall, the total variable cost was Rs.3748 per farm per year. The share of feed and fodder was 86.58 per cent, medicines 7.16 per cent, miscellaneous expenses 4 per cent, deworming 2.26 per cent, and total variable cost.

Returns from Goat Farming in Sample Farms

The returns from goat farming comprise the value of sold kids and adult goats, the value of sold/used manure, the value of unsold kids, and the sale of milk (Kumar and Deoghare, 2002). The details on returns from goat rearing are given in Table 7. In small farms, the sale of kid and adult goats accounted for 39.69 per cent, the sale of manure accounted for 1.11 per cent, and the value of unsold kid goats accounted for 59.20 per cent of the gross revenue (Rs.10799/-) from goat farming. In the case of medium farms, the sale of kids and adult goats accounted for 64.55 per cent, the value of unsold kids accounted for 34.81 per cent, and the sale of manure 0.64 per cent of total revenue (Rs.41235/-). Gross revenue from large farms was Rs.40617/-.

TABLE 7. RETURNS FROM GOAT FARMING IN SAMPLE FARMS

Particulars	Total Revenue			Gross Returns per farm (Rs./year)	%
	Qty (nos./kg)	Price / Unit (Rs.)	Value (Rs.)		
(1)	(2)	(3)	(4)	(5)	(6)
Small farms					
Sale of kids	07	3214.28	22500.00	401.78	3.72
Sale of adults	51	4264.71	217500.00	3883.92	35.97
Value of unsold kids	207	1729.47	358000	6392.86	59.20
Value of manure utilized/sold			6750.00	120.54	1.11
Gross returns			604750.00	10799.10	100.0
Medium farms					
Sale of kids	89	2449.438	218000.00	6411.76	15.55
Sale of adults	153	4490.196	687000.00	20205.88	49.00
Value of unsold kids	273	1787.545	488000.00	14352.94	34.81
Value of manure utilized/sold			9000.00	264.71	0.64
Gross returns			1402000.00	41235.29	100.0
Large farms					
Sale of kids	4	2975.00	11900.00	1983.33	4.88
Sale of adults	18	4978.60	89614.80	14935.80	36.77
Value of unsold kids	66	2090.91	138000.00	23000.00	56.63
Value of manure utilized/sold			4189.74	698.29	1.72
Gross returns			243704.54	40617.42	100.0
Overall					
Sale of kids	100	2524.00	252400.00	2629.17	11.22
Sale of adults	222	4477.99	994113.78	10355.36	44.17
Value of unsold kids	546	1802.19	984000.00	10250.00	43.72
Value of manure utilized/sold			19939.74	207.70	0.89
Gross returns			2250454.54	23442.23	100.0

Cost and Returns from Goat Farming in Sample Farms

The sale of adult and kid goats accounted for 41.65 per cent, the sale of unsold kids 56.63 per cent, and the sale of manure 1.72 per cent of the gross revenue from goat farming. The gross revenue from goat farming in sample farms was Rs.23442.

The cost and returns from goat farming are given in Table 8. The total cost ranges from Rs.4552/- in small farms to Rs.15320/- in large farms. Net income realized per farm per year was Rs. 6246/-, Rs.31369/- and Rs.25297/- in small, medium, and large farms, respectively. The benefit-cost ratio reached 4.18 in medium farms, 2.65 in large, and 2.37 in small farms, with an overall BCR of 3.30.

TABLE 8. COST AND RETURNS FROM GOAT FARMING IN SAMPLE FARMS

Particulars (1)	Cost / Returns (Rs./year)			
	Small farms (2)	Medium farms (3)	Large farms (4)	Overall (5)
Total cost	4552.32	9865.71	15320.09	7107.13
Gross Income	10799.10	41235.29	40617.42	23442.22
Net Income	6246.78	31369.58	25297.33	16335.09
Net Income over variable cost	8443.08	36094.04	31766.58	19693.78
Benefit:Cost Ratio	2.37	4.18	2.65	3.30

Functional Analysis

The results of the estimated Cobb-Douglas function are given in Table 9. The R^2 is 0.57, and the F value is 24.02, significant at a 1 per cent level, indicating the goodness of fit of the model. The negative and significant coefficient of age (X_1) suggests that the tendency to participate in goat farming is much higher among older people. The coefficient of concentrate feed (X_2) is 0.130, which is significant at a 10 per cent level. The number of kid goats (X_3) positively influences gross income from goat rearing. The coefficient of adult goats (X_4) is negative and significant at a 5 per cent level. The investment in adult animals constitutes 74 per cent of the total fixed cost and denotes only potential income realized after sales. The coefficient of miscellaneous expenses, which includes electricity and other costs (X_5), positively influences income from goat farming but is not significant.

TABLE 9. RESULTS OF ESTIMATED COBB-DOUGLAS FUNCTION

Ln Y = Log of Gross income from goat farming (Rs,/farm/year)

Variables	Coefficient	Std error	t statistics	P value
Age (years)*	-1.624	0.986	-1.65	0.103
Quantity of concentrate feed (kg/farm/year)*	0.130	0.075	1.72	0.089
Total kid goats (no./farm)***	2.719	0.264	10.28	0.000
Total adult goats (no./farm)**	-0.771	0.388	-1.99	0.050
Misc. expenses (Rs,/farm/year)	0.097	0.081	1.20	0.234
Intercept	12.028	3.734	3.22	0.002
R^2 = 0.57				
Adj R^2 = 0.54				
F (5,90) = 24.02				
N = 96				

***, **, and * denote significance at 1, 5, and 10 per cent levels, respectively

Economic Loss Due to Goat Mortality in Sample Farms

Many diseases like FMD, goat pox, and jaundice, apart from health ailments like abortion, diarrhoea, external parasitic infection, etc., affect goats. The details of expenses on treatment and losses due to mortality in the sample goat farms are given in Table 10. The estimated annual economic loss was Rs.130365/- The occurrence of unknown diseases (44.76 per cent) and FMD (25.16 per cent) were the major causative factors for economic loss in the sample farms.

TABLE 10. ECONOMIC LOSS DUE TO MORTALITY IN GOAT FARMS (N=96)

Name of the disease (1)	No. of goats affected (2)	Expenses for treatment (Rs.) (3)	No. of goats died (4)	Value of goats died (Rs.) (5)	Estimated loss (Rs./year) (6)
FMD	27	8300	11	24500	32800 (25.16)
Jaundice	9	4050	4	8000	12050 (9.24)
Diarrhoea	52	4965	3	3000	7965 (6.11)
Worms	34	1600	2	5000	6600 (5.07)
Indigestion	3	1000	1	6000	7000 (5.37)
Cold	2	200	--	--	200 (0.15)
Goat pox	2	1400	1	4000	5400 (4.14)
Unknown reason	57	13550	18	44800	58350 (44.76)
Total	186	35065	40	95300	130365 (100.0)

Constraints in Goat Farming in Sample Farms

The farmers faced several constraints in goat farming, and major constraints were identified using the Garrett ranking technique. Table 11 reveals that parasitic infestation ranked first with a score of 62.53, followed by the problem of predators/thefts (score of 59.77), lack of insurance coverage (score of 51.70), and disease outbreak in goats (score of 49.59). The other major problems in production are resistance from the neighbourhood and lack of space for housing goats, as most were landless in the sample and obtained V and VI ranks, respectively (Table 10).

TABLE 11. PRODUCTION CONSTRAINTS IN GOAT FARMING

Constraints (1)	Garrett Score (2)	Rank (3)
Non-availability of pasture lands	46.94	VII
Lack of space for housing the goats	48.41	VI
Lack of veterinary facilities	44.84	IX
Lack of insurance coverage	51.70	III
Predators / Thefts	59.77	II
Poor productivity of animals	46.66	VIII
Disease outbreak	49.59	IV
Parasitic infestation	62.53	I
Resistance from neighbourhood	48.53	V
Lack of technical knowledge	40.02	X

The goat farmers rarely sold live animals to traders/butchers on a weight basis, which led to the undervaluation of animals, thereby fetching lower prices for goat

farmers. Table 12 reveals that the low sale price of goats, with a mean score of 70.72, was the major constraint in the marketing of goats, followed by lack of marketing facilities (score of 67.85), distance to goat market (score of 43.17), exploitation by middlemen (score of 36.49) and lack of transport facilities (score of 31.38) in that order.

TABLE 12. MARKETING CONSTRAINTS IN GOAT FARMING

Constraints (1)	Garrett Score (2)	Rank (3)
Lack of marketing facilities	67.85	II
Low price for goats	70.72	I
Distance to goat market	43.17	III
Lack of transport facilities	31.38	V
Exploitation by middlemen	36.49	IV

IV

CONCLUSION AND POLICY IMPLICATIONS

Goat farming is crucial in ensuring the livelihood security of rural households in Puducherry, particularly for landless laborers and low-income families. The study conducted on 96 goat-rearing households highlights that goat farming is a major source of income, with an average flock size of 5.56 goats per farm and a high benefit-cost ratio (BCR) of 3.30. However, the study also identifies several challenges faced by goat farmers, including the high mortality rate of goats due to diseases like Foot and Mouth Disease (FMD), poor herd health, and limited access to veterinary care and scientific rearing practices. There is a need for a more structured approach to goat farming to increase its economic viability. Farmers were found to rely heavily on traditional practices, with limited knowledge of improved breeding, health care, and nutrition management techniques. The mortality rate, primarily due to preventable diseases, highlights the importance of strengthening veterinary infrastructure and implementing regular vaccination and deworming programs. Moreover, restoring community pasture lands would not only reduce feed costs but also improve the productivity of goats by providing them with more suitable grazing areas.

The study calls for a holistic approach to supporting goat farmers. Firstly, the government should focus on improving veterinary services by setting up more accessible healthcare facilities in rural areas. Training programs that promote scientific rearing practices, including breeding, feeding, and disease management, should be conducted to ensure that farmers can maintain healthier and more productive flocks. Additionally, promoting collective marketing and awareness of selling live goats based on weight could increase farmers' incomes by reducing their dependence on intermediaries. By focusing on these strategies, policymakers can enhance the economic sustainability of goat farming, reduce the impact of diseases, and ultimately improve the livelihood security of rural households dependent on goat rearing. Community involvement is crucial for long-term success, especially in managing common resources like pasture lands. These initiatives would increase income from goat farming and contribute to food security and rural economic development.

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ANNEXURE

CORRELATION MATRIX OF EXPLANATORY VARIABLES USED IN REGRESSION ANALYSIS

(1)	Gross income (Rs./year) (2)	Age (years) (3)	Total kids (nos./farm) (4)	Total adults (nos./farm) (5)	Concentrate feed (kg/farm/year) (6)	Misc. expenses (Rs./farm/year) (7)
Gross income (Rs./year)	1					
Age (years)	0.418	1				
Total kids (nos./farm)	0.906	0.401	1			
Total adults (nos./farm)	0.378	0.363	0.486	1		
Concentrate feed (kg/farm/year)	-0.075	-0.019	-0.038	0.166	1	
Misc. expenses (Rs./farm/year)	0.266	0.147	0.179	0.214	-0.125	1