

Socio-Economic Profile and existing Management Practices of Goat Farmers in Tiruvarur District of Tamil Nadu

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ABSTRACT: A study was conducted to determine the socio-economic status of the goat farmers in Tiruvarur district of Tamil Nadu state during the year 2022. A total of 250 goat farmers were selected randomly and interviewed through a pre-tested questionnaire. To explore the socio-economic status of the goat farmers, seven criteria were used in order to establish a baseline. It was observed that most of the goat farmers were literate, aged between 20 to 39 years, landless or small landholders, possessing herd size of less than 30, and marketing less than 20 goats per annum. It was observed that the majority of goat farmers were females. There was a significant ($P < 0.01$) positive association of gender with each of the seven socioeconomic categories, including age, literacy level, primary occupation, trained skilled labour, land ownership, goat flock size and a number of goats marketed per annum. More than half of the farmers were rearing smaller flock sizes under an extensive system providing only night shelters. The flock size and breeding solely depend on the availability of grazing land and neighborhood bucks. Only one third of the farmers were feeding concentrate, mineral mixture and deworming their flock. Hence, a proper breeding programme and its dissemination through capacity building programmes for farmers could improve the overall population and productivity of the goats in Tiruvarur. Since goats can easily be reared on zero input managemental conditions. It can uplift even the "poorest of the poor" to reduce their poverty through goat enterprise.

Keywords: Socio-economic, management, goat farmers, grazing, breeding, Tiruvarur,

INTRODUCTION

Tiruvarur is one of the 38 districts of Tamil Nadu state and a part of the Cauvery Delta Zone. The district encompasses a 2161 sq km area. It is bordered by the Palk Strait on the south, Thanjavur district on the west and Nagapattinam district on the east. Tiruvarur is located in the major paddy belt, with three times the paddy cultivation for the year. This land is drained by more water canals and channels from the rivers and the grasses on these beds forms the major source of grazing area for the livestock. The goat population shares 58% of Tiruvarur livestock resources. The goat population in Tiruvarur district is 2.9 lakh, which is 120 times more than the population of sheep in this district, according to the 20th livestock census conducted in 2019. This statistic highlights the significant role played by goat farming in the livelihood security of the farmers of

Tiruvarur district. A considerable number of marginal and small-scale farmers, as well as landless agricultural labours, depend on goat for their living. This scenario prevails, especially in areas where crop and milk production are not very profitable. Regional variations could be found in the management practices, adopted by goat farmers (Sabapara *et al.*, 2010). To create effective intervention strategies, it is essential to determine the strengths and weaknesses of the goat farming community in management practices. There was no sufficient data available regarding the socio-economic status of goat farmers of Tiruvarur district. Hence, this study was aimed at analysing both the socio-economic characteristics of goat farmers along with the managemental practices of goat farming in Tiruvarur district.

MATERIALS AND METHODS

This study was conducted in Tiruvarur district during April 2022 to September 2022, over a period of six months. The farmers approaching the Farmers Training Centre (FTC, Fig. 1), Tiruvarur, an outreach centre of Tamil Nadu Veterinary and Animal Sciences University, for various extension services were interviewed (Table 1 and Fig. 2). A pre-tested questionnaire was used to collect the data by the personal interview method (Kumar *et al.*, 2014). Randomly, 250 farmers who reared a minimum of five numbers of goats were selected for collecting the data on socio-economic status, goat rearing management practices and production. Goat flocks were categorised as small sized flock (upto15 goat), medium sized (16 to 30) and large sized flock (more than 30) in this study. Base line demographic information about age, sex, education, primary occupation, training attended, land owned and number of goats reared and marketing was also collected to assess the socio-economic profile of

the goat farmers (Chandra *et al.*, 2005). Goat farmers are categorised into four age groups: as young adult middle age, old middle age and old adult age groups (Hornig *et al.*, 2001). Based on education, the respondents were classified into illiterate, primary and middle school, higher secondary and degree (Nithiaselvi *et al.*, 2023). Based on operational and land holdings, the farmers were grouped as landless, marginal, small, semi medium, medium, large farmers (Agricultural Census, 2019) and farmers with lease land. To calculate the income from the goats owned by the farmers, the number of goats marketed per year was recorded. In this study, it was assumed that a one year old goat will attain a minimum body weight of 10 kg at their marketing age and can fetch a net income of Rs. 3000 per goat. The collected data were compiled, tabulated and analyzed with descriptive statistical parameters. To interpret the results frequency, percentage and the chi-square test were used to arrive at the logical conclusion of the investigation.

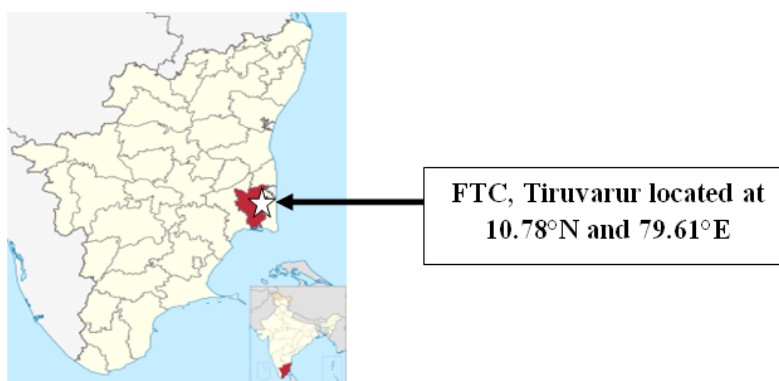


Fig. 1. Location of FTC, Tiruvarur.

Table 1: Classification of repondents based on purpose of visit to FTC, Tiruvarur.

Sr. No.	Taluk	Purposeofvisit			Inputs		Total (N=250)
		Training	Bankable project	Advisory services	Fodder	Mineral mixture	
1.	Kodavasal	2	2	18	1	1	24
2.	Tiruvarur	16	7	10	4	5	42
3.	Nannilam	6	4	19	1	2	32
4.	Valangaiman	8	0	17	1	0	26
5.	Koothanallur	12	1	14	2	0	29
6.	Needamangalam	12	2	8	0	0	22
7.	Mannargudi	4	2	7	2	2	17
8.	Thiruthuraipoondi	28	3	16	8	3	58
	Total	88	21	109	19	13	250



Fig. 2. Percentage of the respondents availed extension service.

RESULT AND DISCUSSION

Socio-economic profile of goat farmers. The socio-economic profile of goat farmers in Tiruvarur district (Table 2) is discussed below.

Gender and age. It is observed that 72.4% (181) of the respondents in this study were women farmers. Among the female respondents, 54.7% (99) were 20 to 39 years of age, followed by 38.12% (69) in the middle-aged group belonging to 40 to 49 years. They approached the Farmers Training Centre in Tiruvarur for attending the scientific goat farming training, bankable projects or other advisory services. The number of young women goat entrepreneurs has increased substantially, indicating the success of the various government initiatives to promote women entrepreneurs through priceless goat distribution schemes (AHD, policy note 2022). A small number (13) of women farmers rearing goats aged between 50 and 59 years have been intuitive in seeking training or any advisory services on goat rearing. No women farmers older than 60 approached the centre for scientific advice on goat farming. This revealed that older women have more learned experience in goat farming (Mallikarjuna *et al.*, 2021; Nithiaselvi *et al.*, 2023). The highest number of men goat farmers belonged to the middle age group (43.03%), followed by young adults (27.54%), older adults aged above 60 (18.84%) and the least number of farmers belonged to the older middle age group (10.14%). Similar findings of the involvement of women farmers were recorded by Tanwar *et al.* (2008) in Udaipur of Rajasthan, indicating women farmers had a substantial role in goat farming. But Beigh *et al.* (2020) in the Gurez Kashmir valley, Singh *et al.* (2018) in Jabalpur, Madhya Pradesh, Gamit *et al.* (2020) in Saurashtra of Gujarat and Kumar *et al.* (2015) in Uttar Pradesh reported that the majority of the middle age group were goat farmers. The difference in the present study was due to the difference in classification of age groups, where they had a wider middle or adult age group. Whereas Deshpande *et al.* (2010) found that the old age group dominated goat farming in south Gujarat. In the present study, most of the young age groups were new job seekers in Tiruvarur district, especially after the COVID pandemic, due to the young migrant working population from abroad. They prefer livestock rearing and have the intension to adopt scientific goat rearing practices. If they were technically guided and trained, they could turn into successful entrepreneurs in goat farming.

Educational status. Educational status is an important criterion not only indicating the socio-economic status of the family but also forming an important factor determining the growth and development of any enterprise (Gamit *et al.*, 2020). Based on their education, they were grouped into four categories. The least were the non-schoolers, which included illiterates of 12.4% and primary and middle schoolers of 23.6%, who know to read and write. In the present study, 50% of the overall goat farmers have completed their schooling either secondary or higher secondary or diploma. About 13.65% of the respondents were degree

holders, who are involved in animal husbandry activities. Conversely, Singh *et al.* (2018) and Kumar *et al.* (2015) found that more than half of the farmers were illiterate. Overall, two third of the (63.6%) goat farmers were found to be educated in this study, which was in accordance with the findings of Nipane *et al.* (2016), who reported that 81.14% of Bhandara district goat farmers in Maharashtra were educated. Hence, it will take comparatively fewer efforts to train the respondents on newer scientific technologies (Chandra *et al.*, 2005).

Primary occupation. Nearly half of the farmers (52.4%) had animal husbandry as their primary occupation followed by agricultural labourers (25.6%) and others (20%). A very small number of farmers under study (8.4%) have both paddy cultivation and goat farming. It was interesting to note that 10.14% of the men farmers in this study had fishing as their primary occupation. These findings are in line with Beigh *et al.* (2020); Mallikarjuna *et al.* (2021); Deshpande *et al.* (2010). The above findings in these regions were due to less industrial activities. Hence, animal husbandry was the primary occupation of the majority of respondents followed by agricultural labourers. Animal husbandry forms a significant source of livelihood for the majority of the farmers, where goat farming is an integral part of their livestock farming under prevailing agro-climatic conditions. Though 20% of the respondents depend on other enterprises for their livelihood, they still own goats as a secondary occupation to add to their family income.

Skilled labour. Data on the training undergone by the farmers was collected. Most of the goat rearing men (60.87%) farmers had been trained for scientific commercial goat farming, whereas the majority of the women (82.32%) farmers had not undergone any training. According to Singh *et al.* (2018), the majority of the farmers relied on their neighbours over state institutions or mass media. Among the 250 farmers surveyed in Tiruvarur, three-fourth (70.4%) farmers were not trained and they followed the traditional method of goat farming. They lack knowledge on scientific goat rearing (Beigh *et al.*, 2020). Since the majority of the farmers were educated, they were eager to learn newer techniques and methods of commercial goat farming. They were interested in attending the capacity building programmes on goat farming. Similarly, Mohanasundarraaj and Tripathi (2012) also reported a positive correlation between education and the information seeking behaviour of farmers. Hence, conducting more awareness programmes and strengthening extension services in their villages will improve the socio-economic status of goat farmers of the Tiruvarur district, which will ultimately lead to improved goat farming (Sharma and Rathore, 2022).

Land holdings. It was observed more than half of goat farmers were landless (58%). Thirty percent of farmers belonged to the marginal group with operational land holdings of less than 1 hectare. Followed by small (5.2%), semi-medium (3.6%) and large landholder groups (0.8%). Few farmers are interested in the goat venture by taking lease land (3.2%) for goat rearing.

The majority of the respondents rearing goats (88%) were landless and marginal farmers, indicating that goat rearing is adopted by landless and small farmers. This finding of the study is similar to the findings of the previous studies of Mohan *et al.* (2012), Singh *et al.* (2018) and Mallikarjuna *et al.* (2021) that revealed 97.47% in Uttar Pradesh, 80% in Rajasthan, 98.75% in Jabalpur district of Madhya Pradesh and 99% of goat farmers in Puducherry belong to the landless, marginal or small farmers category.

Flock size.

The number and type of animals kept by rural households are indicators of the socioeconomic condition of rural communities. Their livestock has the ability to provide a monthly financial flow to meet their social and familial obligations (Sakthivel *et al.*, 2012). It was observed that 76% of the overall goat farmers owned only small flocks. The study revealed that the majority of large flocks are owned by men (34.78%), compared to women (1.10%), who take animal husbandry as their primary occupation. In most of the previously conducted studies in Virudhunagar, Tamil Nadu (Srinivasan and Roopa 2021), Rajasthan (Tanwar *et al.*, 2008), Gujarat (Sabapara *et al.*, 2010) and Madhya Pradesh (Singh *et al.*, 2018), the majority of the goat owners had small herd sizes.

Production status. The income generated from the goat flocks was calculated. The study showed that overall, 74.8% of the farmers were able to sell less than ten goats per year. Hence, the income from their goats was less than Rs. 30,000. About 14.4% of the farmers were able to market more than 30 goats, fetching an income of more than Rs. 90,000 per annum, which can place their household above the poverty line. A higher number of male farmers marketing goats (36) does not correlate with a higher number of male farmers owning larger flocks (24). It is a slightly higher number, indicating that skills acquired through training play an important role in carrying out better management practices in commercial goat farming. The results are almost similar to the findings of Mallikarjuna *et al.* (2021), who reported only 3.4% of the Puducherry goat farmers. They were able to earn above one lakh rupees from the animal husbandry sector. Deshpande *et al.* (2010); Mohan *et al.* (2012) also reported similar findings that the majority of goat farmers were earning less than Rs. 15,000, Rs. 30,000 and Rs. 80,000 per annum respectively. Thus, goat farming can substantially increase farmers annual income (Singh *et al.*, 2021; Gamit *et al.*, 2020). Technological intervention by scientific management practices alone can alone accelerate the population size as well as goat production (Kumar, 2007).

Managemental status. Current goat farming practices, including the farming system and the impact of the geoclimate on stocking density. Data on the four wheels of livestock production *viz.* housing, feeding, breeding and health management practices followed by goat farmers in Tiruvarur district, were presented in Table 3 and discussed under this section.

Rearing pattern. In this study, a large number of goats rearing farmers were found to be rearing goats alone

(62.4%), showing the preference and interest of the farmers towards goats and chevrons. More than one third (37.6%) of farmers were also interested in having goats as an integral part of their integrated farming system, similar to the findings of Pattanaik *et al.* (2022). The majority of the goat farmers adopted an extensive system of management (59.2%), providing only night shelter for their goats outside their dwelling or in their agricultural fields. These animal sheds were lacking a manger or waterer. Hence, no additional feeding is followed other than grazing. Only less than one third (31.2%) of goat farmers were rearing the goats under a semi-intensive system of feeding with some tree fodder or grasses from the bunds of the paddy field or self-prepared concentrates. Very small numbers of farmers (9.6%) were also raising their goats under an intensive system with slatted flooring. Srinivasan and Roopa (2021); Deshpande *et al.* (2010); Shakthivel *et al.* (2012) also found the same kind of observations in their studies.

Environmental parameter. It was found in the study area that nearly two third of farmers (63.2%) have reduced their flock size by marketing their animals during the September and October months to maintain a minimum number of goats during the rainy and winter months. They also reported that they face various problems, like high kid mortality during the winter months and the non-availability of grazing land or fodder due to waterlogging of the fields. Nearly two third (63.2%) of farmers revealed that they reduced their flock size during the winter and less than one fourth (16%) during the summer. 20.8% of the farmers were not shrinking their flock size and were either skilled or intensive goat farmers. More number of capacity building programmes on stress and disaster management could be conducted for the goat farmers. In turn, it might help them to increase perception of climate change. It will equip them to manage their goats in a better way during summer, drought and flood conditions.

Housing facilities. About 23.6% of farmers were maintaining their goats in open paddocks. Two third of the goat farmers were providing shelters for their goats, of which 17.6% were providing *Kutch* type of houses with mud flooring. Pucca and slatted floored sheds were 32.8% and 26% of the farmers housed their goats in concrete floored stable roofed sheds, followed by 26% in slatted floored and well roofed houses with mud floors. Similar observations were recorded by Srinivasan and Roopa (2021) among Virudhunagar goat farmers.

Feeding behavior. The study revealed that the majority (90.4%) of the goat farmers allowed their goats to graze in the paddy harvested fields, Cauvery River basins or water canal boundaries and the common grazing lands. Since the grazing area is a paddy cultivation field in the study area, the vast stretch of land was an open area without any trees or bushes. These browsers had now turned into grazers. About 36.4% of the respondents were feeding extra concentrate feed to their goats. Along with grazing, 31.2%, 26.8% and 17.6 % of the goat farmers were feeding cultivated fodder,

concentrates and both, respectively. Most of the goats (59.2%) were allowed 5 to 6 hours of grazing between 8 a.m. to 6 p.m. Grazing times and periods vary depending on the season and paddy cultivation. Community grazing is not allowed during peak paddy cultivation periods. The goats were either tethered for grazing or fed by a cut-carry and feed system during these periods. Those flocks were grazed either during the morning or evening hours by farmers who lopped the tree leaves for their goats. The most important constraint for non-expansion of the farm or increasing the goat numbers was lack of grazing land and seasonal reduction of grazing area during peak paddy cultivation periods, which resulted in seasonal reduction of goat farms under an extensive production system. Similar findings of a shorter duration of grazing time were also reported by Kumar *et al.* (2010) in Uttar Pradesh during the main cropping season. The situation was different in the high goat population districts of Tamil Nadu, where 80.37% of goat farmers herds grazed for more than 6 hours per day (Nithiaselvi *et al.*, 2023).

Commonly used concentrate. Among the concentrate users, about 30% of them were using only gram husk with rice bran. Groundnut oil cake was added by 32%

of the farmers, whereas 10% used other types of oil cakes. Only 18% of them prepared their own concentrate feeds for rearing larger flocks under an intensive system and only 6.4% of the respondents were using commercially available goat feeds. Sakthivel *et al.* (2012); Srinivasan and Roopa (2021) also reported similar findings on concentrate preparation and feeding.

Supplementation of mineral mixture. In the present study area, 75.2% of the goat farmers were unaware of the mineral mixture feeding. Among the 24.8% of goat farmers feeding mineral mixture to their goats, 11.2% were feeding TANUVAS mineral mixture, 8.8% used commercially available mineral mixture and 4.8% got the mineral mixture free of cost from the veterinary dispensaries to feed their goats. A similar type of observation was made by Beigh *et al.* (2020), who reported that few goat farmers used mineral mixtures and the majority kept on grazing alone with very little or no exposure to mineral supplements. Thus, there could be a negative impact from mineral imbalances among the goats reared in the study area, which could predispose the animals to poor performance and production.

Table 2: Demographic details of goat farmers in Tiruvarur district (N=250).

Sr. No.	Socio-economic Profile of goat farmers		Men (n=69)		Women (n=181)		Over all %	Chi-square (γ2)
			f	%	f	%		
1.	Age group of the Farmer	20 to 39 years (young adults)	19	27.54	99	54.70	47.2	43.76**
		40 to 49 years (middle age group)	29	42.03	69	38.12	39.2	
		50 to 59 years (Old middle age group)	8	11.59	13	7.18	8.4	
		60 and above (old Adult age group)	13	18.84	--	--	5.2	
2.	Education status	Degree holders	18	26.09	16	8.84	13.6	20.08**
		Secondary /higher secondary /Diploma	38	55.07	87	48.07	50	
		Primary and middle schoolers	10	14.5	49	19.6	23.6	
		Illiterates	3	4.3	29	16.02	12.4	
3.	Primary Occupation	Animal Husbandry	29	42.03	95	52.49	49.6	69.93**
		Agriculture	18	26.09	3	1.66	8.4	
		Agricultural labours	4	5.80	60	33.15	25.6	
		Fishery	7	10.14	--	--	2.8	
		Others jobs	11	15.94	23	12.7	13.6	
4.	Skilled Labour	Capacity building enabled	42	60.87	32	17.68	29.6	44.71**
		Capacity building Unabled	27	39.13	149	82.32	70.4	
5.	Land Holdings	Land less Labourers	12	17.39	133	73.48	58	96.25**
		Marginal (< 1 H)	30	43.48	45	24.86	30	
		Small farmers(1-2 H)	13	18.84	--	--	5.2	
		Semi-Medium (2-4 H)	4	5.79	3	1.66	2.8	
		Medium (4-10 H)	2	2.89	--	--	--	
		Large Farmers (>10H)	--	--	--	--	--	
6.	Flock size	5-15	26	37.68	164	90.61	76	93.01**
		16-30 size	19	27.54	15	8.29	13.6	
		31 and above	24	34.78	2	1.10	10.4	
7.	Production Status - No. of Goats Marketed /annum	Less than 10 number	15	21.74	172	95.03	74.8	150.93**
		10-20 number	18	26.09	9	4.97	10.8	
		30 number and above	36	52.17	--	--	14.4	

f-Frequency; %- percentage; H- Hectare =2.471 acres; ** - Significant (P < 0.01)

Table 3: Management practices of Goat farming in Tiruvarur district.

Sr. No.	Managemental practices	Frequency (f)	Percentage (%)	
1.	Rearing Pattern	Goat Farm	156	62.4
		Integrated Type	94	37.6
		Extensive	148	59.2
		Semi-Intensive	78	31.2
		Intensive	24	9.6
2.	Environmental Parameter (Temp and Rainfall)-On Stocking Density	Low in Summer	40	16
		Less in Winter	158	63.2
		Indifferent to seasons	52	20.8
3.	Housing Facilities	Slatted Floor	65	26
		Concrete floor + Roof	92	36.8
		Katcha (Mud floor + Roof)	44	17.6
		Open Paddock	83	33.2
4.	Breeding Pattern	Unaware on age of Breeding / Puberty	172	68.8
		Sex ratio Maintained		1:7
		Own Buck	132	52.8
5.	Feeding behavior	Grazing	226	90.4
		Concentrate feed	91	36.4
		Grazing +Cultivated fodder	78	31.2
		Grazing +Concentrate	67	26.8
		Grazing + Cultivated fodder +Concentrate	44	17.6
6.	Grazing	2-3 hours	78	31.2
		5-6 hours	148	59.2
		8 hours and more	24	9.6
7.	Commonly used Concentrate	GNC	45	18
		Mixed oil cakes	25	10
		GNC + bran	35	14
		Gram husk + bran	75	30
		Own Concentrate prepared	45	18
		Commercial Concentrate	16	6.4
8.	Supplementation of Mineral mixture	Commercial mineral mixture	22	8.8
		TANUVAS mineral mixture	28	11.2
		Veterinary Dispensaries	12	4.8
		Unaware of Mineral mixture	188	75.2
9.	Health management	Deworming	156	62.4
		Dipping	93	37.2
		Vaccination	170	68

Breeding pattern. It was observed that 52.8% of the farmers are maintaining their own bucks for breeding. Half of the farmers were dependent on the bucks in common community grazing area of their neighbours for random mating without any specific breeding system. It was also noted that the majority of the farmers (68.8%) were unaware of the age of the breeding does and bucks. This led to a lower birth weight for the kids and low survivability, which in turn reflected on the sex-ratio of 1:7 maintained by the goat farmers of the district. These findings were similar to Sakthivel *et al.* (2012) observation that the overwhelming majority (95%) of the Namakkal farmers utilised their neighbouring bucks for breeding. Nithiaselvi *et al.* (2023) also reported that 86.80% of the mating of Thanjavur black goats happens on grazing lands. In the breeding tracts of Kanniadu and Kodiadu, Srinivasan and Roopa (2021) observed that most of the farmers owned their own bucks in their herds. Stray mating from the community buck was the reason for the

dilution of the *Sruti* goat breed character in their breeding tract of Gujarat (Deshpande *et al.*, 2010). Hence, there is an immediate need to form a unique breeding policy for the goat farming sector to improve the germplasm and overall economic merit of the existing goat population.

Health managemental practices. The survey revealed that *pestedes petits ruminants* (PPR), goat pox and foot and mouth diseases were found to be affecting the goat flocks. Vaccination against PPR was only available for goats through the state animal husbandry department. Nearly 68% of the farmers vaccinated their goats against PPR and 32% are still unaware of the PPR vaccine. The majority of the farmers (62.4%) routinely dewormed their goats with the help of Government veterinary dispensaries. Dipping was followed by 37.2% of the farmers. Mostly, farmers were performing manual deticking and unless there was a severe infestation, dipping was not carried out. These results were similar to the findings of Kumar *et al.* (2021);

Nithiyaselvi *et al.* (2023). Therefore, additional mass contact and awareness campaigns may be conducted to enhance the health status of the goat flocks.

CONCLUSIONS

This study revealed that goat farming is emerging as a new entrepreneurial self-employment opportunity among the rural youth population. Education and skill development training play a key role in inspiring the disguisedly employed young population into goat farming on a commercial scale. Integration of agriculture with goat farming and wage employees with goat farming were the occupation models existing in the Tiruvavur district. Reducing the herd size during the adverse environmental conditions that exist among the goat farmers. Hence, the effective implementation of fodder cultivation schemes and special projects to develop community grazing lands will address this issue. The creation of massive awareness on concentrate feeding, mineral mixture supplementation, deworming, dipping and vaccination will enrich the knowledge and skills of goat farmers to augment their income and the poverty line from goat husbandry.

FUTURE SCOPE

To develop a plan to increase goat health, population and production with suitable technical interventions. Strategies can be undertaken to enhance the adoption of improved and innovative scientific managemental practices.

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Conflict of Interest. None.

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