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Strategic insights into goat marketing: A study on the marketing constraints of rural household goat farmers of Pondicherry District of Puducherry

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Abstract

This study analyzed marketing constraints faced by rural goat farmers in Pondicherry District, Puducherry using data from 50 randomly selected respondents across five communes. Structured interviews were conducted via Epicollect5 software. Results showed 60% of farmers were aged 31-50, with 54% being women. Educational levels varied, with 18% having no schooling and only 10% graduates. Farming was the main income source for 52% of respondents. Major constraints included lack of access to marketing information, limited market availability, middlemen interference, and poor transport. A Probit Regression Model revealed that access to marketing information significantly reduced marketing constraints. Barriers to information access stemmed from social (limited networking, women's access), economic (high digital costs), and technological (lack of information and communications technology training) challenges. The study underscores the importance of knowledge as a vital production factor and recommends institutional support from Krishi Vigyan Kendras (KVKs) and academic institutions to empower rural communities and improve market access for goat farmers.

Keywords: Pondicherry District, Probit regression model and middlemen, marketing constraints, goat farmers, rural households

1. Introduction

Goats are the most important traditional livestock found in most rural parts of Pondicherry. They can be used for both subsistence and commercial production. However, most goat farmers rear goats for no reason. Rural household goat farmers in Pondicherry District pay less emphasis on goat production management and the significance of goat husbandry. In addition, there is a paucity of information about marketing information or market structures that trade live goats in Pondicherry's rural areas. Goats are typically sold informally as live goats for religious, traditional, and other events like weddings and festivities to raise income. In addition, goat by products such as goat milk are extremely hard to obtain in supermarkets or shops for sale in Pondicherry's remote areas. Perhaps dairy goats and their milk can provide an alternate source of revenue at the family level. They are most effective as a strategy for reducing poverty and improving rural livelihoods^[1].

Marketing plays a vital role in the development of all sectors, particularly in goat farming, where an efficient marketing system can ensure fair prices for producers, reduce unnecessary costs and margins, and benefit society as a whole. However, the marketing of goats and their products remains one of India's most neglected areas, facing challenges such as the presence of numerous middlemen with high margins, avoidable marketing expenses, transportation-related animal mortality, and export barriers due to poor quality and lack of information. To maintain the momentum of increased goat production driven by technological advancements, producers must be assured of remunerative prices, which can be achieved through a well-structured marketing framework^[2].

Despite its importance, rural goat farmers frequently encounter marketing constraints that hinder their ability to maximize profits.

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This study aims to examine the demographic characteristics, marketing challenges, and factors influencing marketing decisions among rural household goat farmers in the Pondicherry District, with the goal of developing appropriate policy interventions to strengthen this underappreciated sector of the livestock economy.

2. Methodology

2.1 Study Area

The study was conducted in all five communes of the Pondicherry District of the union territory of Puducherry. The four taluks that make up the Pondicherry district are Pondicherry, Uzhavarkarai, Villianur, and Bahour [3]. Only Uzhavarkarai taluk is devoid of any rural areas out of these four [4]. The remaining three taluks' rural areas are further subdivided into commune panchayats or just communes [5].

2.2 Data Collection

A case study was used as the applicable method of research design in this work. The data for the study was gathered through surveys from primary sources, predominantly rural household goat farmers. Data collection was done using a standardized questionnaire in EpiCollect 5 software. Both open-ended and closed-ended interview questions were designed to meet the unique goals of the study. Rural household goat farmers were free to share their opinions, views, and experiences in depth when asked open-ended questions, but they were limited in their ability to do so when asked closed-ended ones.

2.3 Sampling Procedure

The study employed simple random sampling in data-collection process. Two villages were selected from each five communes, and five rural household dairy goat farmers were sampled from each selected villages totaling 50 rural household dairy-goat farmers which served as units of analysis for the study. The data was collected from both men and women household farmers.

Table 1: Sampled Villages within Pondicherry District

Communes	Villages
Ariyankuppam	Thavalakuppam, Ariyankuppam
Bahour	Kirumampakkam, Manamedu
Mannadipet	Mannadipet, Thirukkanur
Nettapakkam	Korkadu, Nettapakkam
Villianur	Ariyur, Sulthanpet

2.4 Data Analysis

The main data obtained from Rural Household Goat Farmers in the Pondicherry District was summarized into descriptive statistics using the Statistical Package for Social Sciences (SPSS Version 21) computer software and presented in the form of charts and graphs. The Probit Regression Model (PRM) and a Likert scale were used to determine goat farmer's marketing constraints by identifying relationships between dependent and independent variables. Table 3 summarizes the variables employed in the study's probit analyses.

The Probit Model (PM) is a kind of regression in which the dependent variable can take one of two values: 1 or 0 [6]. In this study, farmers with goat marketing constraints were labelled as 1, while those without were denoted as 0. Farmers' marketing constraints vary, hence a Likert scale of 1 to 8 was used to represent the level of constraint. Following this, the Likert scale scores were divided into two categories. A farmer's scores ranging from 5 to 8 were classed as 1, while scores less than or equal to 4 were classified as 0, forming the Probit Model's dependent variable.

The Probit Model is generally specified as below:

General Probit Model: $Y = \Pr(Y=1 | X) = \Phi(X' \beta)$

In this equation, $\Pr$ represents probability, Φ represents the Cumulative Distribution Function (CDF), and β represents one or more parameters. The Probit Model is a latent variable model with an auxiliary random variable, represented as $Y^* = \beta'X + \varepsilon$.

Where,

$\varepsilon \sim N(0, 1)$.

Then Y can be viewed as an indicator for whether or not this latent variable is positive:

$$Y = 1_{\{Y^* > 0\}} = \begin{cases} 1 & \text{if } Y^* > 0 \text{ i.e. } -\varepsilon < X'\beta, \\ 0 & \text{otherwise.} \end{cases}$$

Specifically, the regression model is estimated as:
 $PMC = Y_i = 0.082 - 1.001 * MI + 0.122 * MA - 0.16 * A + 0.285 * G + 0.791 * I$

1 If Household Farmer has marketing constraints={0
 If Household Farmer has no Marketing constraints

Table 2: Description of Variables

Variable Code	Name of Variable	Variable Description	Unit of measurement
Dependent variable			
Y=PMC	Marketing Constraints	1 if household farmer has marketing constraints; 0 if household farmers are having no marketing constraints.	Dummy
Independent variables			
X ₁ =A	Age	Age of household farmer	Numbers
X ₂ =G	Gender	1=Female; 0=Male	Dummy
X ₃ =M	Marital Status	1=Single, Widowed, Divorced; 0=Married	Dummy
X ₄ =EdcL	Educational Level	1 if the household farmer has secondary education and above; 0 otherwise	Dummy
X ₅ =I	Source of Income	1 if agriculture is the major source; 0 otherwise.	
X ₆ =MI	Marketing Information		Dummy
X ₇ =MA	Market availability		Dummy
X ₈ =MdM	Middlemen		Dummy
X ₉ =T	Transport Facility		Dummy
μ_i	Error Term	Nil	Nil

2.5 Ethical consideration

Respondents were informed about the nature and goal of the study, and their participation was voluntary. There was no guarantee of a reward for participation. All respondents voluntarily participated in the survey. The respondents' information was kept confidential during the study process. Data collected from household farmers was and continues to be confidential, and it was used solely for this study. The surveys and data collected will be discarded once the study is completed.

3. Results

3.1 Demographic Characteristics of Participants

The study revealed important information about the demographic characteristics of rural goat farmers in Pondicherry District. The survey found that 10% of participants were under 30, and 60% were between the ages

of 31 and 50. The results also showed that 24% of participants were between the ages of 51 and 70, with 6% falling between the ages of 71 and 90. Participants were most likely to be 49 years old. The youngest participant was 26 years old and the oldest participant was 81.

In the present study, 54% of the respondents were female and 46% were male respondents, emphasizing that women are actively involved in this sector. There was variety in the marital status of goat farmers: 12% were single, 76% were married, 10% were widowed and 2% were divorced.

Among interviewees 18% had never attended school, 48% attended up to the primary level, 24% up to secondary school and 10% had a university education. The statistics of livelihood of goat farmers showed that 52% get their monthly living from farming, whereas 40% make their living from salaries and 8% from pensions.

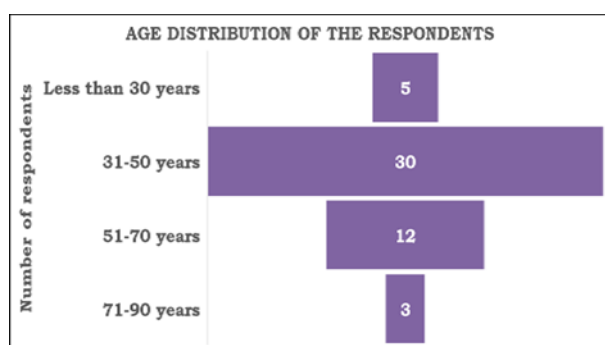


Fig 1: Age distribution of the respondents

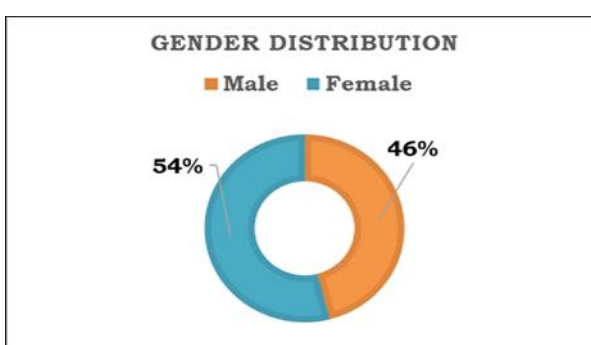


Fig 2: Gender Distribution of the respondents

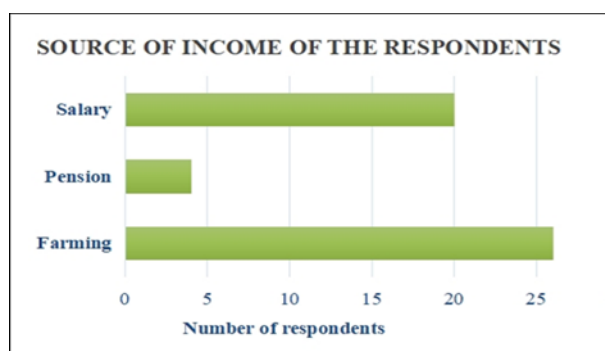


Fig 3: Income Source of the respondents

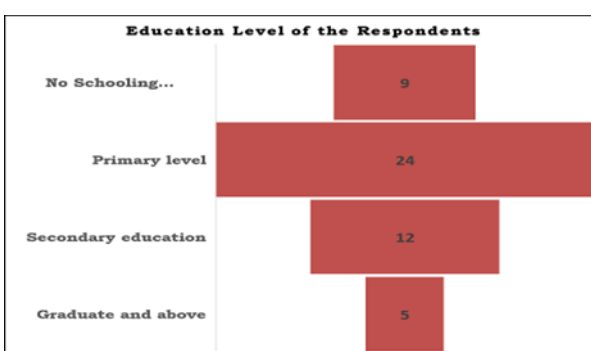


Fig 4: Education level of the respondents

3.2 Marketing Constraints of Goat Farmers in Pondicherry District of Puducherry

The study discovered several significant marketing obstacles such as transportation difficulties for 66% of the respondents, lack of availability of markets for 64% of the respondents, restricted availability of marketing information for 52% of the respondents and 48% of the respondents had an existence of middlemen as an obstacle. The inability of farmers to obtain timely and accurate marketing information had an impact on their capacity to make wise marketing decisions. Goat farmers also faced substantial hurdles from the dominance of middlemen in the marketing chain and the absence of a strong market infrastructure. Farmers were frequently offered poor prices by middlemen, who took advantage of their position to undercut their profitability. These issues were exacerbated by transportation limitations, which made it harder for farmers to reach far-off markets and charge competitive prices. Another significant obstacle mentioned by the four goat farmers is the decline in goat market value as a result of ill health or debility.



Fig 5: Major marketing constraints indicated by the respondents

3.3 Probit Model Results: Factors influencing marketing constraints of goat farmers

Results of the Probit Model Multiple Regression analysis showing factors influencing marketing constraints are presented in Table 4. Inferential analysis using the Probit

Regression Model provided valuable insights into the determinants of marketing constraints. The results indicate a very significant Chi-square at 5%. This is an indication of acceptable goodness-of-fit of the model. The results of

inferential analysis indicates that the availability of marketing information (ϵ -1.001; sig. 0.031) had a statistically significant negative effect on the marketing constraints, indicating access to marketing information decreases marketing constraints.

Table 3: Parameter estimates of probit analysis of factors influencing marketing constraints of goat farmers

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	DF	Sig.
1.(Intercept)	.082	.9876	-1.853	2.018	.007	1	.934
2.Marketing Information	-1.001	.4633	-1.909	-.093	4.669	1	.031
3.Income	.791	.4408	-.073	1.655	3.220	1	.073
4.Market Availability	.122	.4839	-.826	1.071	.064	1	.800
5.Gender	.285	.4199	-.538	1.108	.461	1	.497
6.Age	-.016	.0145	-.045	.012	1.265	1	.261
7.(Scale)	1 ^a						

Dependent Variable: cons

Model: (Intercept), Marketing Information, Income, Market availability, Gender, Age

A. Fixed at the displayed value.

Omnibus Test^a

Likelihood Ratio Chi-Square	DF	Sig.
13.285	5	.021

Dependent Variable: cons

Model: (Intercept), Marketing Information, Income, Market availability, Gender, Age^a

A. Compares the fitted model against the intercept-only model.

4. Discussion

The survey revealed that 60% of goat farmers in Pondicherry District were aged between 31 and 50, indicating that goat marketing is predominantly managed by adults, with minimal involvement from youth-consistent with Kinyua (2011) [7], who noted that goat keeping is traditionally not practiced by younger individuals. Women slightly outnumbered men (54%) in goat farming, challenging the stereotype that men dominate this field and suggesting women's stronger involvement in income-generating activities related to household sustenance. Most participants (76%) were married, which aligns with findings by Sagwe (2012) [8], highlighting the collaborative nature of goat production and marketing between spouses. Educational levels were generally low, with only 10% having attained university education, likely due to systemic educational barriers faced by older generations. While agriculture, salary, and pension were primary income sources for 52%, 40%, and 8% of respondents respectively, goat farming was found to be a supplementary income activity rather than a primary livelihood, reflecting its inconsistent profitability (Mahajan SK *et al*, 2023) [9].

4.1 Marketing constrains of goat farmers in Pondicherry District of Union Territory of Puducherry

In the Pondicherry District, rural household goat farmers reported several significant marketing barriers, with 52% facing challenges in accessing marketing information and 64% experiencing difficulties in finding marketplaces to sell their goats. Additionally, 48% identified middlemen as a constraint, which is unsurprising given the absence of formal goat markets in many rural areas, where sales often occur informally through word of mouth. Transportation was reported as the most critical issue by 66% of farmers, who noted a lack of transit facilities to move goats to markets and slaughterhouses, likely due to poor road conditions and reliance on gravel roads. These findings align with Bultossa (2016) [10], who similarly reported that inadequate roads and

transport infrastructure negatively affect market access for small-scale farmers in Ethiopia.

4.2 Inferential analysis of factors influencing the marketing constraints of goat farmers in the study area using the probit regression model

The Probit Regression Model used to analyze determinants of marketing constraints among goat farmers in the study area revealed that the model had a good fit, with a significant Chi-square at the 5% level. Among the five independent variables tested, only access to marketing information had a statistically significant impact, with a negative coefficient (-1.001, sig 0.031), indicating that better access to marketing information significantly reduces marketing constraints by helping farmers understand market trends and avoid middlemen interference. Although age also had a negative coefficient (-0.16), suggesting that older farmers face fewer constraints due to experience, it was not statistically significant (sig 0.261). The lack of access to marketing information may stem from social, economic, and technological barriers such as limited networking, high costs of digital tools, and insufficient training in ICT usage. Given that knowledge plays a critical role in agricultural productivity-akin to land, labor, and capital-empowering rural farmers with relevant information is essential to overcoming marketing challenges in the region.

4.3 The possible strategies to reduce marketing constraints of goat farmers in Pondicherry District

Government intervention is essential in enhancing agricultural efficiency, safeguarding farmer incomes, and ensuring food security, particularly in the goat farming sector (Miloje *et al.*, 2014) [11]. Key marketing challenges identified include limited market access, lack of marketing information, middlemen interference, and poor transportation, with 40% of farmers recommending government-supported cooperative markets. Veterinary health services are another concern, with 8% of farmers linking poor goat health to reduced market value, highlighting the need for timely and adequate treatment. Additionally, 10% of more educated farmers emphasized the importance of training and workshops provided by institutions like Krishi Vigyan Kendras and the Rajiv Gandhi Institute of Veterinary Education and Research to enhance goat production techniques. However, increasing awareness about these available training programs is crucial to bridge the existing knowledge gap.

5. Conclusion

Goat farming significantly contributes to rural livelihoods in India by providing income, employment, nutrition, and serving as a financial safety net, especially for small and marginal farmers due to its low investment and adaptability (1). The study highlights the pressing need for targeted interventions to address marketing challenges faced by goat farmers in Pondicherry District. Key solutions include improving access to marketing information, enhancing infrastructure, and reducing the role of middlemen to boost profitability and sustainability. Strengthening transportation systems and veterinary services is also crucial for overcoming logistical and health-related barriers. Policymakers and stakeholders must collaborate on comprehensive strategies to empower farmers, strengthen market linkages, and promote inclusive growth in the goat farming sector. By tackling these issues thoroughly, we may realize goat farming's full potential as a driver of rural development and poverty alleviation in the Pondicherry District and beyond.

Conflict of Interest

Not available

Financial Support

Not available

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