Sustainable Livelihoods through Small Ruminants: An Economic Study of Sheep and Goat Rearing in Karnataka.

Madegowda M[a*], Dr. K S Veerendrakumara[b]

[a*]Department of Economics, Associate Professor, Government college for Women (Autonomous) (affiliated to Mandya University), Mandya-571401.

[b] Department of Economics, Associate Professor, Department of Studies and Research in Economics, Karnataka State Open University, Mukthagangothri, Mysuru.

Abstract

Livestock rearing constitutes an integral component of Karnataka's agrarian economy, providing sustainable income and nutritional security to millions of small and marginal farmers. Among different livestock species, sheep and goats often referred to as "walking banks" play a crucial role due to their low investment needs, high reproductive efficiency, and adaptability to diverse environments. This study undertakes an economic analysis of the sheep and goat population in Karnataka, focusing on demographic trends, economic viability, and their contribution to farmers' livelihoods. The analysis is based on secondary data drawn from the 20th Livestock Census (2019), National Sample Survey Office (NSSO), and government reports, and employs descriptive statistics alongside financial indicators such as Net Income and Benefit-Cost Ratio (BCR). The results reveal that both enterprises are highly profitable, though sheep rearing shows a relatively larger flock size and greater aggregate economic output, driven by the demand for wool and meat. Conversely, goat rearing demonstrates higher profit margins per animal, owing to lower maintenance costs and premium prices for chevon. The study concludes that both sub-sectors are economically resilient and recommends targeted policy interventions such as breed improvement, development of organized market infrastructure, and strengthened veterinary services to further enhance rural household incomes.

Key Words: Sheep and Goat Rearing, Economic Analysis, Livestock Census, Benefit-Cost Ratio, Rural Livelihoods.

1. Introduction

The agricultural sector in Karnataka is marked by considerable diversity, encompassing crop cultivation, horticulture, and livestock husbandry. Within this framework, livestock rearing serves as a critical subsidiary occupation, especially in the arid and semi-arid regions of the state where agriculture is highly vulnerable to recurrent droughts and crop failures. For millions of rural households, livestock provides a sustainable source

of income, employment, and food security, thereby acting as a stabilizing force in an otherwise uncertain agrarian economy.

Among the livestock resources, small ruminants such as sheep and goats hold particular importance. According to the 20th Livestock Census (2019) [1], Karnataka ranks among the leading states in India in terms of sheep population and maintains a considerable number of goats as well. The predominance of these species is not only linked to their adaptability to harsh climatic conditions but also to their ability to thrive on low-cost feed resources such as crop residues, stubble, and common grazing lands.

Sheep and goat rearing are generally practiced by landless laborers, marginal farmers, and traditional pastoral communities for whom livestock constitutes a principal source of livelihood. These enterprises are characterized by several advantages: they require relatively low initial capital investment, involve low maintenance costs, and provide multiple returns in the form of meat, wool, skin, and manure. Moreover, the short reproductive cycle of these animals ensures rapid flock expansion, offering quick economic returns compared to larger livestock enterprises such as cattle rearing.

The consistent market demand for mutton, chevon, and wool further enhances the economic viability of these activities. In recent years, growing consumer preference for small ruminant meat has also contributed to higher profitability. Thus, sheep and goat rearing not only supplement household incomes but also play a vital role in strengthening rural livelihoods and contributing to the overall agrarian economy of Karnataka.

2. Objectives of the Study

Despite their significant economic contribution, systematic comparative studies of sheep and goat rearing at the state level remain limited. This study seeks to bridge this gap by pursuing the following objectives:

a) To analyze the trends and composition of the sheep and goat population in Karnataka.
b) To compare the economic viability and profitability of sheep and goat rearing enterprises.
c) To identify the major constraints faced by rearers and propose suitable policy interventions for sustainable development.

3. Review of Literature

The role of small ruminants, particularly sheep and goats, in strengthening rural livelihoods has been widely recognized in the development literature. Numerous studies underscore their significance in poverty alleviation, nutritional security, and as a coping mechanism against agrarian risks. Small ruminants are often described as “assets of the poor,” as they require minimal investment, reproduce quickly, and generate multiple outputs such as meat, milk, wool, and manure.

Singh et al. (2020) [2] emphasized that small ruminant husbandry provides an effective financial buffer against crop failure, particularly in rainfed regions of South India where droughts and erratic rainfall undermine crop-based income. Their findings highlight that the resilience of these enterprises makes them especially valuable for marginal and landless farmers.

Kumar and Prasad (2018) [3], in a study conducted in Andhra Pradesh, compared the economic returns of goat and sheep rearing under traditional management systems. Their results indicated that goat rearing achieved a higher Benefit-Cost Ratio (1:1.68) than sheep rearing (1:1.52). This difference was attributed to the relatively lower maintenance costs of goats and the growing consumer demand for chevon. The study suggested that goats offer higher profitability at the individual household level, though sheep contribute more significantly at the aggregate community level.

In the context of Karnataka, Hegde (2019) [4] examined the role of sheep rearing in sustaining the livelihoods of the Kuruba community, a traditional pastoral group. While the study acknowledged the cultural and economic importance of sheep husbandry, it also highlighted the lack of comparative analyses involving goat rearing. This gap has limited policy insights into the relative advantages of the two enterprises.

Building on these foundations, the present study aims to provide a systematic comparative economic analysis of sheep and goat rearing in Karnataka, thereby contributing to informed policy formulation and sustainable livestock development.

4. Data and Methodology

4.1 Data Sources

This study relies exclusively on secondary data obtained from multiple authentic sources to ensure reliability and accuracy. The primary datasets are drawn from the 20th Livestock Census (2019) [1] [Table 1] published by the Government of India, which provides detailed statistics on livestock population and distribution. Additional data were sourced from the Department of Animal Husbandry and Dairying, Government of Karnataka, offering region-specific insights into small ruminant management. Supplementary information was collected from National Sample Survey Office (NSSO) reports [5] [Table 2] on livestock and livestock products, which provide household-level patterns of ownership, consumption, and income derived from livestock activities. Further, published research articles, policy briefs, and reports from agricultural and veterinary universities were reviewed to enrich the analysis with contextual understanding and empirical evidence.

4.2 Analytical Framework

The analytical framework integrates descriptive and economic analyses to examine demographic trends and profitability in sheep and goat rearing enterprises.

- **Descriptive Statistics**: District-wise data were analyzed to identify the distribution and composition of sheep and goat populations in Karnataka. Specific focus was placed on leading sheep-rearing districts such as Mysuru, Kolar, and Vijayapura, and goat-rearing clusters in Belagavi, Kalaburagi, and Tumakuru. These comparisons highlight regional variations in species preference and production patterns.
- **Economic Analysis**: Profitability was assessed using standard financial metrics calculated on the basis of average flock sizes.

    a) Cost Concepts*:* Fixed costs (shed depreciation, interest on capital) and variable costs (feed, labor, veterinary expenses, transportation, and marketing).
    b) Return Concepts*:* Income streams from the sale of live animals (meat), wool (specific to sheep), manure, and skins.
    c) Net Income*:* Derived as the difference between total income and total costs.
    d) Benefit-Cost Ratio (BCR)*:* Calculated as Total Benefits / Total Costs, where a ratio greater than 1 indicates profitability.

This combined approach enables a systematic comparison of sheep and goat enterprises, providing insights into their relative economic viability and contribution to rural livelihoods.

5. Results and Discussion

5.1 Demographic Profile and Trends

According to the 20th Livestock Census (2019) [1], Karnataka has a total livestock population of 29.99 million. Among this, the sheep population accounts for 9.60 million (32% of total livestock), while the goat population stands at 7.63 million (25.4%). These figures establish Karnataka as one of the leading states in India in terms of sheep population.

The distribution pattern shows that sheep are predominantly concentrated in the southern and northeastern dry zones, particularly in districts such as Mysuru, Kolar, Vijayapura, and Chitradurga. Goats, by contrast, are more evenly distributed across the state, with higher concentrations in Belagavi, Kalaburagi, Tumakuru, and Ballari. This wide distribution reflects the adaptability of goats to diverse ecological conditions.

Table 1: Sheep and Goat Population in Karnataka (20th Livestock Census, 2019)

Species	Population (in millions)	% of Total Livestock	Key Districts
Sheep	9.60	32.0%	Mysuru, Kolar, Vijayapura, Chitradurga
Goat	7.63	25.4%	Belagavi, Kalaburagi, Tumakuru, Ballari

5.2 Economic Viability and Comparative Profitability

A representative model with a flock size of 20 animals was used to assess the economic performance of sheep and goat rearing.

Table 2: Comparative Economic Analysis per Animal (Annual, in INR)

Economic Parameter	Sheep Rearing (in Rupees)	Goat Rearing (in Rupees)
A. Fixed Cost	600	500
B. Variable Cost	4,200	3,800
• Feed & Fodder	2,500	2,200
• Labour	1,000	1,000
• Medicine/Vet	500	400
• Miscellaneous	200	200
C. Total Cost (A+B)	**4,800**	**4,300**
D. Returns		
• Sale of Meat/Animal	7,500	8,000
• Wool	800	–
• Manure & Others	300	300
E. Total Returns	**8,600**	**8,300**
F. Net Income = (E - C)	3,800	4,000
Benefit-Cost Ratio (BCR) = E/C	**1.79**	**1.93**

5.3 Discussion

The analysis indicates that both sheep and goat rearing are economically viable and profitable enterprises in Karnataka.

- **Goat rearing** demonstrates a slightly higher net income (INR 4,000) and BCR (1.93) compared to sheep rearing. This advantage stems primarily from the higher market price of chevon, which often commands a 10–15% premium over mutton in many markets, as well as relatively lowers feed and veterinary costs. Being browsers, goats depend less on concentrated feed, which further reduces expenses.
- **Sheep rearing**, while yielding a slightly lower per-animal profit, offers an additional revenue stream from wool, contributing an average of INR 800 per animal annually. Moreover, sheep are generally maintained in larger flocks than goats, particularly in community-managed systems. These results in

economies of scale, such as reduced labor costs per unit, and higher aggregate household income from sheep rearing.

Overall, the results suggest that both enterprises are resilient, with goats being more profitable per animal, while sheep offer larger-scale economic benefits due to flock size and multiple output streams.

6. Challenges and Constraints

Despite their profitability, both sheep and goat rearing enterprises face several challenges that limit their productivity and sustainability:

- **Feed and Fodder**: The scarcity and rising cost of quality feed, particularly acute during drought years, pose a major constraint to flock management.
- **Animal Healthcare**: Frequent outbreaks of infectious diseases such as Peste des Petits Ruminants (PPR), Foot and Mouth Disease (FMD), and parasitic infestations contribute to high morbidity and mortality rates.
- **Marketing**: The absence of organized livestock markets, dependence on middlemen, and frequent price fluctuations reduce farmers' bargaining power and profitability.
- **Breeding**: Limited access to improved breeds and inadequate facilities for artificial insemination restrict genetic improvement and productivity gains.
- **Insurance**: The penetration of livestock insurance remains very low, leaving farmers vulnerable to sudden shocks from disease outbreaks, accidents, and natural calamities.

7. Conclusion and Policy Implications

The findings of this study reaffirm that both sheep and goat rearing are economically viable enterprises and play a crucial role in the rural economy of Karnataka. While goat rearing provides higher profitability at the individual animal level due to lower maintenance costs and premium market prices, sheep rearing offers diversified income streams through meat, wool, and manure and is often practiced on a larger scale, generating higher aggregate household income.

To enhance productivity, resilience, and profitability, the following policy measures are recommended:

1. **Promotion of Fodder Banks**: Establish community-based fodder banks in drought-prone districts to ensure year-round feed availability at subsidized rates.
2. **Strengthening Veterinary Infrastructure**: Expand mobile veterinary clinics and intensify vaccination campaigns, especially in underserved rural areas.
3. **Market Development**: Promote organized livestock markets (shandies) and introduce e-trading platforms to enable transparent price discovery and reduce middlemen exploitation.

4. **Genetic Improvement Programs**: Implement state-led initiatives to distribute improved breeds, such as Mandya sheep and Osmanabadi goats, to enhance productivity.
5. **Financial Inclusion**: Broaden the reach of livestock insurance schemes and provide subsidies to protect farmers against losses from disease and mortality.

By systematically addressing these constraints, policymakers can transform sheep and goat husbandry from a largely traditional subsistence activity into a more organized, profitable, and sustainable enterprise. Such interventions have the potential to significantly enhance the incomes of Karnataka's rural poor and strengthen the resilience of its agrarian economy.

References:

1. Department of Animal Husbandry and Dairying (2019). *20th Livestock Census - All India Report*. Government of India.
2. Singh, M.K., Meena, B.S., & Patel, A. (2020). "Role of Small Ruminants in Rainfed Agriculture: A Review." Agricultural Economics Research Review, 33(1), 1–12.
3. Kumar, S., & Prasad, R. (2018). "Economic Analysis of Small Ruminant Production System in Rayalaseema Region of Andhra Pradesh." *Indian Journal of Animal Sciences*, 88(5), 612–616.
4. Hegde, N.G. (2019). "Sheep Rearing and Livelihood Security of Kuruba Community in Karnataka." *Journal of Rural Development*, 38(2), 245–260.
5. National Sample Survey Office (NSSO) (2019). Key Indicators of Land and Livestock Holdings in India. *Ministry of Statistics and Programme Implementation, Government of India.*

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Both authors contributed to the study conception and design. Author a* performed data collection and analysis. The first draft of the manuscript was written by author a*. Authors b contributed to review, editing, and supervision.

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