



Assessment of Goat Management Practices in the Southern Transition Zone of Hassan District, Karnataka, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: <https://doi.org/10.9734/acri/2025/v25i71341>

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://pr.sdiarticle5.com/review-history/139136>

Original Research Article

Received: 01/05/2025

Accepted: 05/07/2025

Published: 08/07/2025

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Cite as: B N, Niteesh Patel, Guruprasad R, Jaishankar N, Jagadeeswary V, and Shivakumar M C. 2025. "Assessment of Goat Management Practices in the Southern Transition Zone of Hassan District, Karnataka, India". Archives of Current Research International 25 (7):351-61. <https://doi.org/10.9734/acri/2025/v25i71341>.

ABSTRACT

Arkalgudu Taluk, situated in the Southern Transition Zone of Hassan district, Karnataka, is a prominent goat-rearing region, with goats constituting 35.81% of the livestock population. This study aimed to assess goat management and marketing practices across four villages in the taluk, involving 100 goat farmers with flock sizes of 20 or more. Data were collected *via* structured interviews and analyzed using IBM SPSS software. Results revealed that, goat housing predominantly consisted of kutchas, closed sheds with earthen floors and asbestos or thatch roofing, mostly located within household compounds. Ventilation was generally inadequate, reflecting limited awareness and financial constraints. Feeding practices relied heavily on community grazing lands (82%) and natural water sources (74%), with most farmers watering goats once daily. Colostrum feeding was timely in most cases, with 64% of kids receiving colostrum within 30 minutes of birth. Solid feeds and green fodder were introduced between 1 and 2 months, supporting early growth. Breeding was mainly uncontrolled natural mating, with farmers maintaining their own bucks at recommended buck-to-doe ratios. Artificial insemination adoption was minimal despite government support. Health management showed moderate vaccination coverage, especially for Haemorrhagic Septicaemia, and regular deworming practices, supplemented by Ethno-Veterinary treatments. Waste management involved composting manure, primarily used as fertilizer in agricultural fields. Overall, a semi-intensive rearing system prevailed with established weaning and castration practices. While traditional management practices dominated, awareness of scientific methods was evident in areas like health care and breeding. The study highlights the importance of integrating improved housing, feeding, and breeding strategies to enhance goat productivity in the Southern Transition Zone of Hassan district.

Keywords: *Breeding; feeding practices; goat management; health care; housing.*

1. INTRODUCTION

Goats, often referred to as the "poor man's cow," play a crucial role in the livelihoods of resource-poor farmers by serving as a supplementary source of income and nutritional security. Goat farming is particularly well suited to marginal and smallholder farmers due to its low initial investment, minimal maintenance costs, and short reproductive cycle. As a cash generating asset, goats offer financial resilience to rural households, especially during periods of economic distress.

In India, goat husbandry contributes significantly to household income and rural employment. However, despite the potential of this sector, goat rearing throughout the world is predominantly characterized by traditional or unscientific management systems, often involving open grazing or mixed farming practices (Sessarego et al., 2025, Escareño et al., 2013). These practices are typically limited to basic husbandry methods and lack the adoption of improved scientific technologies. Factors such as limited awareness, inadequate extension support, and socio-economic constraints hinder the widespread implementation of modern, profitable management interventions. Increasing demand for goat products and the socio-

economic importance of goats in rural systems, there is a pressing need to assess and improve existing management practices. Strategic interventions, tailored to agro-climatic and socio-cultural conditions, especially strengthening the market linkages can enhance goat productivity, improve economic returns, and contribute to economic upliftment of rural farmers (Chinnamani et al., 2022). The present study was taken up to assess the husbandry practices associated with goat farming adopted by the farmers of Southern Transition Zone of Hassan district in Karnataka, India.

2. MATERIALS AND METHODS

Arkalgudu Taluk, located in the Southern Transition Zone (STZ) of Hassan district, Karnataka, represents one of the four distinct agro-climatic zones of the district. This region is characterized by a high proportion of goat-rearing households, with goats constituting approximately 35.81% of the total livestock population. The taluk comprises five revenue blocks, locally referred to as 'hoblis'. Among these, four villages were selected based on the prevalence of goat farming activities. Five goat farmers possessing a minimum flock size of 20 goats were randomly selected from each village, resulting in a total sample size of 100 respondents.

Data on various goat husbandry and management practices were collected using a structured interview schedule, which was developed, pre-tested, and validated for reliability, efficiency, and practicality. Information was obtained through direct, in-person interviews with the selected farmers. The collected data were compiled in Microsoft Excel and subjected to statistical analysis using IBM SPSS software to draw meaningful inferences.

3. RESULTS AND DISCUSSION

3.1 Housing Practices

Proper housing is fundamental to effective livestock management. In the present study, goat housing practices in the Southern Transition Zone of Hassan district are summarized in Table 1. Goat sheds were primarily located within the household compound (50%), adjacent to the residence (35%), or at the farm (15%). A majority of the farmers provided closed (82%) and kutcha (84%) type sheds, while only 18% and 16% maintained open and *pucca* sheds, respectively. All respondents practiced night sheltering of goats. Roofing materials commonly used included asbestos sheets (40%), thatch (32%), and Galvanized Iron (GI) sheets (25%). Shed structures were supported by steel (43.29%), wood (37.11%), or stone (19.58%). Ventilation was inadequate in most sheds, with only 10.63% having sufficient ventilation, 7.44% with limited, and 81.91% with none.

Most goat sheds (93%) lacked a basement and were constructed directly on earthen floors; only 7% had proper foundations. Brick walls (65.65%) were predominant, followed by wooden (28.28%) and stone (6.06%) walls. Drainage type corresponded with the flooring, with 90% being mud-based and 10% cemented. White washing was not practiced by 81% of farmers; among those who did, it was done biannually (56%), annually (28%), or occasionally (16%). Daily cleaning of sheds was practiced by 87% of respondents, while 13% cleaned twice daily.

The average shed dimensions were 13.96 ft (length), 7.68 ft (width), with central and side heights of 8.15 ft and 4.87 ft, respectively. Inadequate ventilation and poor shed design were primarily due to limited awareness of scientific housing and financial constraints (Nandi et al., 2011, Sabapara et al., 2014, Jana et al., 2016, BeriHu et al., 2015). Better housing conditions in regions where, farmers had awareness about the scientific goat rearing

was also observed (Islam et al., 2018). Traditional housing systems were preferred for lowland areas whereas, raised slatted floor housing was the choice of housing goats in mid altitude regions of the country (Manoj and Aditi, 2024).

3.2 Feeding Practices of Goat

3.2.1 Source and frequency of feed and water

Feeding and watering practices adopted by goat farmers in the study area are summarized in Table 2. The majority of respondents (82%) relied primarily on community grazing lands for feeding their goats, while only 18% utilized privately owned land for grazing purposes. This indicates a strong dependence on common property resources for sustaining goat production. Regarding water sources, the predominant supply for goats was from natural water bodies such as rivers, channels, and tanks (74%). Additionally, 16% of farmers depended on open wells, while 10% utilized bore wells as a water source.

The frequency of watering was predominantly once daily (91%), with only 9% of farmers offering water twice a day. These findings suggest a general trend of minimal water provision, which may have implications on animal health and productivity, especially during dry seasons. The reliance on open and seasonal water sources also highlights the vulnerability of goat rearing to water scarcity in the region.

3.2.2 Colostrum and solid feeds

The colostrum feeding practices among goat farmers in the study area are detailed in Table 3. Timely colostrum intake is critical for neonatal immunity and survival. In the present study, 64% of farmers ensured that newborn kids received colostrum within 30 minutes of birth. A further 24% administered colostrum within one hour, while the remaining 11% delayed colostrum feeding to between one- and two-hours post-parturition.

The frequency of colostrum feeding varied among respondents. A majority (74%) reported feeding colostrum four times daily, whereas 22% practiced a thrice-daily feeding schedule. These findings reflect generally acceptable colostrum management practices, although there remains scope for improving uniformity and promptness.

Regarding the introduction of solid feeds, 71% of farmers initiated feeding between 1 and 2

months of age, while 24% delayed this beyond two months. Only 5% introduced solid feeds before the kids were one month old. This suggests that most farmers follow

conventional timelines for introducing concentrate or dry matter into the diet, which aids rumen development and supports early growth.

Table 1. Housing management practices followed by the farmers

Sl.No	Characteristic	Respondent (N=100)	
		Number	Percentage
Type			
1	Open	18	18%
2	Closed	82	82%
Location of the shed			
1	Adjacent	35	35%
2	Within Compound	50	50%
3	At farm	15	15%
Structure			
1	Kutchra	84	84%
2	Pucca	16	16%
Roof			
1	Thatch	32	32%
2	GI sheet	25	25%
3	Asbestos sheet	40	40%
Roof Support			
1	Wood	36	37.11%
2	Steel	42	43.29%
3	Stone	19	19.58%
Ventilation			
1	None	77	81.91%
2	Wall	7	7.44%
3	Ridge	10	10.63%
Basement			
1	Yes	7	7%
2	No	93	93%
Drainage			
1	Mud	90	90%
2	Cement	10	10%
Wall			
1	Stone	6	6.06%
2	Brick	65	65.65%
3	Wood	28	28.28%
White washing done			
1	Yes	19	19%
2	No	81	81%
Frequency of white washing			
1	None	16	16%
2	6 Month / Biannual	56	56%
3	12 Month / Annual	28	28%
Shed cleaning			
1	Once a day	87	87%
2	Twice a day	13	13%
Average shed dimensions (ft)			
1	Shed length	13.96	
2	Shed width	7.68	
3	Shed height at centre	8.15	
4	Shed height at sides	4.87	

Similarly, the practice of introducing green fodder to kids showed that 75% of farmers began feeding greens between 1 and 2 months of age. About 14% delayed green feeding until after two months, while 8% introduced greens within the first month. These feeding practices are important indicators of nutritional management and overall kid health in the early developmental stages.

Feeding management is a critical component of successful goat farming, directly influencing growth, reproduction, and overall productivity. In the present study, the primary sources of fodder for goats included natural pastures, community grazing lands, roadsides, and riverbanks. Most of the respondents were marginal farmers with limited land holdings, relying heavily on communal grazing resources. A small proportion of farmers supplemented their goats' diets with maize grains; however, the overall use of concentrate feeds was minimal.

Water for livestock was predominantly sourced from rivers, ponds, and canals. Typically, goats

were offered water once daily during grazing. In some instances, potable water was also provided in the shed, particularly upon the animals' return from grazing, with a few farmers supplying water twice daily. These practices suggest a dependence on natural and accessible water sources, with moderate attention to hydration management.

Farmers in the region demonstrated awareness of the importance of colostrum feeding, with a majority ensuring that newborn kids received colostrum within 30 minutes of birth. To facilitate early rumen development and reduce dependence on maternal milk, solid feeds and green fodder were introduced at an early age. The feeding and watering practices observed in this study align with the natural availability of resources in the region (Nandi et al., 2011, Manoj and Aditi, 2024, Sabapara et al., 2010, Lavania et al., 2014, Hossain et al., 2015). In contrast, a higher incidence of concentrate feeding among goat keepers, highlighting regional variation in feeding strategies was also recorded (Khadda et al., 2017).

Table 2. Feeding management practices adopted by goat rearers

Sl.No	Characteristic	Respondent (N=100)	
		Number	Percentage
Type of grazing land			
1	Owned	18	18%
2	Community	82	82%
Water Source			
1	Open	16	16%
2	Bore well	10	10%
3	Other	74	74%
Water frequency			
1	Once a day	91	91%
2	Twice a day	9	9%
Colostrum fed (after birth)			
1	< 30 min	61	63.54%
2	1 Hr	24	24.00%
3	1-2 Hr	11	15.00%
Freq. of Col. feeding (times/day)			
1	3 times	22	22.91%
2	4 times	74	77.08%
Initiation of solid feed (age)			
1	< 1 Month	5	5.20%
2	1-2 Months	68	70.83%
3	> 2 Months	23	23.95%
Initiation of greens (age)			
1	< 1 Month	8	8.33%
2	1-2 Months	75	78.12%
3	> 2 Months	13	13.54%

3.2.3 Breeding practices

Breeding practices among goat farmers in the study area are summarized in Table 3. The majority of farmers (94.79%) followed uncontrolled natural mating, while only 5.20% adopted controlled breeding methods. Most farmers-maintained breeding bucks within their flocks, with a male-to-female ratio of 1:10 in small to medium-sized flocks (64.58%) and 1:15 in larger flocks (35.41%), aligning with standard recommendations.

Regarding mating systems, flock mating was predominant (85.26%), followed by artificial insemination (12.5%) and pen mating (3.12%). Artificial insemination was conducted using Osmanabadi semen supplied by the Department of Animal Husbandry and Veterinary Services, indicating government support for improved breeding. However, its adoption remained limited.

A majority of farmers (88.42%) used farm-owned bucks for breeding, while 11.57% relied on hired

males. Selection of breeding bucks was primarily based on morphological traits (90%), followed by the reliability of the buck's owner (35%) and, to a lesser extent, pedigree information (2%). These findings suggest that while traditional breeding practices remain dominant, farmers showed awareness of scientific breeding norms (Ekambaram et al., 2011, Mataveia et al., 2019). Goat owners in some parts of India also relied on community or rented bucks with limited use of AI (Hossain et al., 2015, Nirmala et al., 2017).

3.2.4 Healthcare management practices

The adoption and awareness of health care practices among goat farmers are summarized in Table 4. Vaccination coverage was highest for Haemorrhagic Septicaemia (HS) at 76%, followed by Peste des Petits Ruminants (PPR) at 45%, Enterotoxaemia (ET) at 31%, and Foot and Mouth Disease (FMD) at 7%. Prophylactic vaccination against major diseases was practiced to varying extents, with government-led campaigns playing a key role in disease prevention.

Table 3. Breeding management practices of goat rearers

Sl.No	Characteristic	Respondent (N=100)	
		Number	Percentage
Mating System followed			
1	Controlled	5	5.20%
2	Uncontrolled / Natural	91	94.79%
Buck: Doe ratio			
1	1:10 (small flock)	62	64.58%
2	1:15 (Medium and Large flock)	34	35.41%
Method of mating			
1	Flock mating	81	85.26%
2	Pen mating	3	3.12%
3	Artificial Insemination	12	12.50%
Sources of male for Breeding			
1	Farm Owned	85	88.42%
2	Hired	11	11.57%
Method of Estrous detection			
1	Physical	16	16.66%
2	Mounting	80	83.33%
Criteria for Selection of Buck			
A. Physical appearance			
1	Yes	90	90%
2	No	10	10%
B. Pedigree			
1	Yes	2	2%
2	No	98	98%
C. Reliability of owner			
1	Yes	35	35%
2	No	65	65%

Deworming practices were more consistent among adult goats, with 93% of farmers performing regular deworming, primarily at six-month intervals (74%) or annually (19%). In contrast, only 63% of farmers reported regular deworming of kids, with frequencies of every three months (45%) and every 4–6 months (18%), while 37% dewormed irregularly. Veterinary services were utilized by 69% of the respondents. Notably, 98% of farmers also relied on Ethno-Veterinary practices for treating various ailments, reflecting a strong influence of

traditional knowledge in herd health management.

Annual veterinary expenditure revealed that 49.47% of farmers spent between ₹1,000–2,000, 42.10% spent less than ₹1,000, and only 8.42% reported spending more than ₹2,000 per year. These figures indicate modest but proactive health investments. The findings suggest that farmers in the region have a reasonable level of awareness and adoption of health care measures, largely supported by government

Table 4. Health care management practices followed by goat farmers

Sl. No		Characteristic	Respondent (N=100)	
			Number	Percentage
Vaccination				
1	FMD	Regular	7	7%
		Seldom	93	93%
2	HS	Regular	76	76%
		Seldom	24	24%
3	ET	Regular	31	31%
		Seldom	69	69%
4	PPR	Regular	45	45%
		Seldom	55	55%
Deworming (Kids)				
1	Regular		63	63%
2	Irregular		37	37%
Frequency				
1	No		37	37%
2	0-3 Mon		45	45%
3	4-6 Mon		18	18%
Deworming (Adult)				
1	Regular		93	93%
2	Irregular		7	7%
Adults				
1	No		7	7%
2	4-6 Mon		74	74%
3	6-12 Mon		19	19%
Veterinary care				
1	Yes		69	69%
2	No		31	31%
Ethno-vet practices				
1	Yes		91	91%
2	No		9	9%
Annual vet expenses (Rs.)				
1	500-1000		40	42.10%
2	1000-2000		47	49.47%
3	>2000		8	8.42%
Mortality				
Post mortem conducted				
1	Yes		4	4%
2	No		96	96%

outreach and traditional practices (Sabapara et al., 2010, Lavania et al., 2014, Ekambaram et al., 2011). There were recordings where, many of the farmers did not comply with the recommended vaccination schedule (Tanwar and Rohilla, 2012, Sangameswaran and Prasad, 2016).

3.2.5 Waste management practices

The details of waste management practices adopted by the goat farmers of the study area is presented in Table 5. The present study showed that, majority (89%) of the goat rearing farmers converted the waste into compost by collecting daily at one place and only a small number of them (11%) let out the waste into the field. The distance of compost pit from the goat shed was less than 25 feet in (72%) of the sheds followed by (28%) of the goat farmers dumping the waste into compost pit which was at a distance of about 25 to 50 feet away from the shed.

Turning of compost was not commonly practiced (95%) and it was disposed mainly through sales (53%) by the goat farmers. whereas, 28 per cent of them used as fertilizers to their agriculture land and 19% farmers followed both ways of disposing the waste obtained from the goat farm. Majority of the goat farmers disposed those wastes annually (88%) and some even followed it biannually (12%).

Goat farm waste was either stored up in an open area or dumped into ditches, or it was composted. Majority of the livestock owners used their manure as fertilizer and the present study

showed a similar tendency by the farmers. Since the majority of farmers chose to use goat compost as their preferred manure to their agricultural fields due to its high nutritional value, disposal was done on a yearly basis.

3.2.6 General management practices

The routine management practices followed by goat farmers are summarized in Table 6. All respondents (100%) practiced a semi-intensive rearing system. Navel cord treatment of newborn kids was largely neglected, with 76.13% of farmers not adopting this critical practice, while only 23.86% practiced it. Post-kidding management involved confining does within the shed; 85.41% of farmers allowed grazing within two days after kidding, and 12.5% permitted grazing between two to three days. Weaning was predominantly conducted between 1 to 2 months of age by 78.12% of farmers, with 15.62% weaning after 2 months, and 6% before 1 month.

Castration of unwanted males was performed by 79% of farmers between 6 to 12 months of age, and by 21% before 6 months, using either the Burdizzo method (60.82%) or local techniques (39.17%). Animal washing was mainly practiced during festive occasions (68%), while 32% washed their goats monthly. The average flock size was approximately 40 animals, with most farmers (95%) managing their flocks without hired labor. Only 7% insured their animals, reflecting limited awareness of insurance benefits (Jayashree et al., 2014).

Table 5. Waste management practices adopted by goat farmers

Sl. No	Characteristic	Respondent (N=100)	
		Number	Percentage
Processing method			
1	Compost	89	89%
2	Let out to field	11	11%
Compost distance			
1	< 25 ft	72	72%
2	25-50 ft	28	28%
Turning of compost			
1	Yes	5	5%
2	No	95	95%
Disposal			
1	Fertilizer	28	28%
2	Sale	53	53%
3	Both	19	19%
Frequency of disposal			
1	6 Months	12	12%
2	Annual	88	88%

Table 6. General Management practices adopted by goat owners

Sl.No	Characteristic	Respondent (N=100)	
		Number	Percentage
Systems of rearing			
1	Semi-intensive	100	100%
Navel care			
1	Yes	21	23.86%
2	No	67	76.13%
Doe sent for grazing after kidding			
1	< 2 Days	84	85.41%
2	2-3 Days	12	12.50%
Weaning age of kids			
1	< 1 Month	6	6.25%
2	1-2 Month	75	78.12%
3	> 2 Month	15	15.62%
Castration (Age)			
1	< 6 Mon	21	21%
2	6-12 Mon	79	79%
Castration Method			
1	Burdizzo	59	60.82%
2	Local	38	39.17%
Washing frequency			
1	Monthly	32	32%
2	Festive Occasions	68	68%
Hired labour			
1	Yes	5	5%
2	No	95	95%
Insurance for animals			
1	Yes	7	7%
2	No	93	93%

These findings indicate that while essential management practices such as weaning, castration, and post-kidding care are commonly followed, knowledge gaps exist in practices like navel cord treatment. Similar observations were also reported with regard to colostrum feeding and newborn cleaning practices (Lavania et al., 2014), and active support to does during kidding and hoof trimming in newborns was also carried out by certain section of the farmers (Mataveia et al., 2019).

4. CONCLUSION

Goat housing predominantly consisted of kutcha structures with earthen floors and asbestos roofs, located within residential premises but lacking internal enclosures. Breeding was exclusively natural and unregulated, with farmers favouring their own bucks. Feeding relied primarily on communal grazing lands and available browse. Early colostrum feeding within 30 minutes of

birth, followed by timely introduction of solid feeds and greens, supported kid development. Vaccination and deworming were effectively implemented, facilitated by robust veterinary services. The semi-intensive rearing system prevailed, with weaning commonly practiced between one and two months of age and castration performed scientifically using the Burdizzo method between 6 and 12 months. Manure management was efficient, with waste composted and applied to agricultural fields, reflecting integrated farming practices. The present study appraises regarding the existing managerial practices associated with goat farming and gives insights into the policy support that can be framed in order to improve the profitability of goat sector in the region.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models

(ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

CONSENT

As per international standards or university standards, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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