ORIGINAL RESEARCH ARTICLE

ASSESSMENT OF GOAT MANAGEMENT PRACTICES IN THE SOUTHERN TRANSITION ZONE OF HASSAN DISTRICT, KARNATAKA

**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 kutcha, 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.

**Key words**: 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 practices1,2. 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 contributes to economic upliftment of rural farmers3. 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.

1. **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 constraints4,5,6 &7. Better housing conditions in regions where, farmers had awareness about the scientific goat rearing was also observed8. 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 country9.

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| **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 | Kutcha | 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 |  |

**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.

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.

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| **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% |

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 region4,9,10,11 & 13 In contrast, a higher incidence of concentrate feeding among goat keepers, highlighting regional variation in feeding strategies was also recorded14.

**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.

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| **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% |

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 norms15 & 16. Goat owners in some parts of India also relied on community or rented bucks with limited use of AI13 &17.

**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.

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 outreach and traditional practices10,11&15. There were recordings where, many of the farmers did not comply with the recommended vaccination schedule18&19.

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| **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% |

**Table 4: Health care management practices followed by goat farmers**

**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 were 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.

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 practices11, and active support to does during kidding and hoof trimming in newborns was also carried out by certain section of the farmers16.

**Table 5: Waste Management practices adopted by goat farmers**

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| **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% |

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| **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% |

**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 managemental 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)**

Option 1:

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

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