



International Journal of Agriculture and Food Science

ISSN Print: 2664-844X
ISSN Online: 2664-8458
NAAS Rating (2025): 4.97
IJAFS 2025; 7(10): 225-229
www.agriculturaljournals.com
Received: 26-08-2025
Accepted: 27-09-2025

KP Pawar

M.Sc. Research Scholar,
Department of Agricultural
Extension Education, MPKV,
Rahuri Dist. Ahilyanagar,
Maharashtra, India

MB Dhadwad

Assistant Professor,
Department of Agricultural
Extension Education, MPKV,
Rahuri Dist. Ahilyanagar,
Maharashtra, India

GK Sasane

Head, Department of
Agricultural Extension
Education, MPKV, Rahuri
Dist. Ahilyanagar,
Maharashtra, India

RG Nimase

Assistant Professor,
Department of Animal
Husbandry and Dairy Science,
MPKV, Rahuri Dist.
Ahilyanagar, Maharashtra,
India

SS Ghodke

Junior Research Assistant,
RCDP on Cattle, MPKV,
Rahuri Dist. Ahilyanagar,
Maharashtra, India

GR Darokar

M.Sc. Research Scholar,
Department of Agricultural
Extension Education, MPKV,
Rahuri Dist. Ahilyanagar,
Maharashtra, India

Corresponding Author:

KP Pawar

M.Sc. Research Scholar,
Department of Agricultural
Extension Education, MPKV,
Rahuri Dist. Ahilyanagar,
Maharashtra, India

Constraints in Sustainable Goat Production: Market, Fodder, and Land Issues in Maharashtra and Farmer-driven Solutions

KP Pawar, MB Dhadwad, GK Sasane, RG Nimase, SS Ghodke and GR Darokar

DOI: <https://www.doi.org/10.33545/2664844X.2025.v7.i10d.875>

Abstract

Goat farming plays a critical role in sustaining rural livelihoods and ensuring food security among smallholder farmers in Maharashtra's semi-arid regions, yet contemporary goat farming encounters significant challenges spanning market access, feed availability, infrastructure, and resource management dimensions that limit productivity and threaten the sustainability of livestock-based livelihood systems. This study examined the critical constraints affecting sustainable goat production in Maharashtra, focusing on market-related barriers, fodder scarcity, and grazing land degradation while analyzing farmer-identified constraints and documenting community-driven solutions to enhance the resilience and profitability of goat farming systems. A cross-sectional survey was conducted with 240 goat farmers selected through stratified random sampling from 24 villages across five operational clusters in Ahmednagar, Nashik, and Pune districts, employing interviews focusing on constraint identification, ranking, and farmer-suggested solutions with thematic categorization and frequency-based ranking analysis. Five primary constraints were identified and ranked by severity: middlemen dominance affecting price realization, limited availability of nutritious green fodder during dry seasons, inability to sell goats at doorstep, rapidly reducing grazing land and unavailability of feed supplements, while farmers advocated five key solutions including linking to Farmer Producer Organizations (FPOs) for enhanced market access, subsidized quality fodder seeds and silage-making inputs, e-marketing platforms through FPOs, fodder plantation on grazing lands, and community-based feed supplement production. Marketing challenges dominate farmer concerns, with middlemen exploitation emerging as the foremost constraint limiting income potential, and the overwhelming preference for FPO-based solutions indicates the critical importance of institutional interventions alongside technical improvements, demonstrating that success in addressing constraints requires coordinated efforts integrating institutional development, technological support, and market infrastructure creation for enhancing the sustainability and resilience of smallholder goat farming systems in Maharashtra's semi-arid regions.

Keywords: Sustainable goat production, fodder scarcity, farmer producer organizations, market constraints, livelihood resilience, Maharashtra

Introduction

Goat farming plays a critical role in sustaining rural livelihoods and ensuring food security, particularly among smallholder and marginal farmers in semi-arid regions (Miller & Lu, 2019; Devendra, 2013) ^[11, 5]. Indigenous goat breeds are well-adapted to local environments and offer dualpurpose utility for meat and milk production, contributing economically, socially, and environmentally to farming systems (Sah & Dixit, 2021; Caroprese *et al.*, 2015) ^[15, 3]. Small ruminants, particularly goats, play an important role in the food and nutritional security of millions of rural people, especially the landless, marginal and small farmers in arid and semiarid rainfed regions (Kumar & Roy, 2013) ^[7]. The socio-economic value of goat rearing as compared to other livestock species for poor farmers is immense, providing stable income and nutrition for large numbers of rural people in regions suffering from low agricultural productivity. India possesses one of the world's most extensive goat genetic resources, with 41 recognized indigenous breeds distributed across diverse agro-ecological zones (Sah & Dixit, 2021) ^[15].

These breeds have evolved through natural selection and selective breeding practices by farmers to adapt to specific environmental conditions, demonstrating remarkable variation in productivity, feed utilization, disease resistance, and adaptability (Sharma *et al.*, 2013; Singh *et al.*, 2025)^[17, 20]. However, several indigenous goat breeds face significant threats due to inadequate breeding policies, insufficient numbers of quality breeding bucks, indiscriminate crossbreeding, and intermixing with local animals (Sah & Dixit, 2021)^[15]. Among these breeds, the Sangamneri goat represents a dual-purpose breed indigenous to Maharashtra, primarily distributed in Ahmednagar, Nashik, and Pune districts (Kuralkar *et al.*, 2018)^[8]. Despite its low population and threatened status in its breeding tract, Sangamneri goats have demonstrated remarkable adaptability to semi-arid conditions and perform well under poor-quality range conditions (Shirke *et al.*, 2024)^[18].

Sustainable livestock systems should be environmentally friendly, economically viable for farmers, and socially acceptable, particularly regarding animal welfare (Caroprese *et al.*, 2015)^[3]. The sustainability of goat production systems encompasses multiple dimensions including environmental impact mitigation, economic resilience, and social acceptability. However, achieving sustainability in goat farming requires addressing various systemic challenges that constrain productivity and threaten long-term viability of the enterprise. Contemporary goat farming faces numerous constraints that limit productivity and sustainability, encompassing genetic, health, nutritional, management, and socioeconomic dimensions (Gunaseelan & Singh, 2021; Mohammed, 2025)^[6, 12]. Disease prevalence constitutes a major constraint, with goats being susceptible to parasitic infections, pneumonia, and contagious caprine pleuropneumonia (CCPP), while limited veterinary services exacerbate these health challenges (Mohammed, 2025; Armson *et al.*, 2020)^[12, 1]. Nutritional constraints represent critical limitations, as feed and fodder scarcity, particularly during dry seasons, adversely affects growth, reproduction, and overall animal health (Kumar & Roy, 2013; Sime *et al.*, 2022)^[7, 19]. The degradation and reduction of grazing land further exacerbate feed shortages, compromising sustainable management practices (Mijena & Getiso, 2022)^[10]. Market-related constraints present substantial barriers to profitable goat farming, with smallholder farmers facing challenges in accessing markets due to inadequate transportation, price fluctuations, and lack of market information (Armson *et al.*, 2020)^[1]. The dominance of middlemen in marketing chains reduces farmers' share of consumer prices, limiting economic returns, while financial constraints restrict farmers' ability to invest in improved breeding stock, feed, and infrastructure (Meemken & Bellemare, 2020)^[9].

Several studies have characterized goat farming constraints and proposed solutions. Documented feed resource shortages and recommended community silage units to ensure year-round fodder supply. Identified marketing inefficiencies and advocated direct sales through producer cooperatives to bypass middlemen. Gunaseelan and Singh (2021)^[6] reported nutritional and health management gaps among Tamil Nadu farmers and suggested mobile veterinary clinics and local feed supplement production. Kumar and Roy (2013)^[7] emphasized the importance of institutional support, recommending the formation of farmer producer organizations (FPOs) to improve input procurement and product marketing reviewed ecological constraints,

advocating integrated fodder tree-shrub plantations on communal grazing lands to restore pasture productivity. These studies underline the need for research that not only catalogs constraints but also systematically aligns farmer driven solutions.

This study addresses the identified research gap by examining critical constraints affecting sustainable goat production in Maharashtra, focusing specifically on market-related barriers, fodder scarcity, and grazing land degradation among Sangamneri goat farmers. The research scope encompasses systematic constraint identification and ranking based on farmer experiences, documentation of community-driven solutions, and analysis of the alignment between major challenges and preferred interventions. The study covers major constraints faced by sangamnri goat rears across five operational clusters in Ahmednagar, Nashik, and Pune districts, providing insights into how coordinated interventions influence farmers' constraint perceptions and solution preferences. The findings contribute evidence-based recommendations for policymakers and development practitioners to formulate targeted interventions that enhance the sustainability and resilience of smallholder goat farming systems in Maharashtra's semi-arid regions.

Materials and Methods

Study Area and Sampling

The study was conducted in the operational area of the All India Coordinated Research Project (AICRP) on Sangamneri Goat across five clusters: Sangamner, Shirampur, Rahuri, Belha, and Sinnar, covering three districts (Ahmednagar, Nashik, and Pune) in Maharashtra, India. A total of 240 respondents were selected through stratified random sampling, from 24 villages across the five clusters.

Data Collection

Open ended questionnaire was used for primary data collection through personal interviews. The schedule was designed to capture information and specifically focused on constraints faced by farmers and their suggested solutions for overcoming these challenges.

Constraint Assessment Methodology

Constraint Identification: Farmers were asked to identify major constraints affecting their goat farming operations through open-ended questions during personal interviews. The constraints were recorded in farmers' own words and subsequently categorized into thematic groups.

Constraint Ranking: The frequency of each constraint mentioned by farmers was calculated, and constraints were ranked based on the percentage of farmers (N=240) reporting each specific issue. The ranking system helped identify the most prevalent challenges across the study population.

Constraint Categorization: Identified constraints were systematically classified into major categories including market-related issues, feed and fodder availability, grazing land access, infrastructure, and management challenges.

Solution Documentation Process

Farmer-Suggested Solutions: Following constraint identification, farmers were asked to provide their recommendations and solutions for addressing each major

constraint category. These suggestions were captured through structured questions about practical approaches they believed would be effective.

Solution Prioritization: The frequency of each suggested solution was calculated based on the number of farmers (N=240) recommending each approach. Solutions were ranked in order of preference according to farmer responses.

Solution Validation: The suggested solutions were cross-verified across different farmer groups and clusters to ensure representativeness and practical applicability across the study region.

Data Analysis

Descriptive statistics including frequencies and percentages were used to analyze constraint prevalence and solution preferences. Constraints and solutions were ranked based on the percentage of farmers reporting each item. The data were organized and presented in tabular format to clearly show the hierarchy of problems and farmer-preferred solutions.

Statistical Framework

The analysis focused on frequency distribution and ranking methodology rather than inferential statistics, as the objective was to document and prioritize farmer-identified constraints and solutions rather than test hypotheses about group differences in this specific component of the study.

Results and Discussion

This section presents an analysis of the constraints faced by Sangamneri goat rearing farmers and their suggestions for addressing these challenges. The study examined to identify key barriers to sustainable goat farming and develop actionable recommendations for improvement.

Constraints Faced by Goat Farmers

The analysis revealed that several systemic constraints significantly impact the effectiveness of goat farming enterprises. These constraints span across marketing, feed management, infrastructure, and resource availability domains.

Table 1: Constraints Faced by Beneficiary and Non-Beneficiary Sangamneri Goat Rearing Farmers

Sr. No	Constraint	F (N=240)	Percent	Rank
1	Struggle to fetch fair prices due to middlemen dominance	188	78.33	I
2	Limited availability of nutritious green fodder, especially in dry seasons, affects goat health and growth	178	74.17	II
3	Inability to sell the goats at doorstep	163	67.92	III
4	Rapidly reducing grazing land for goats	137	57.08	IV
5	Unavailability of feed supplements in nearby area	127	52.92	V

The findings reveal that middlemen dominance emerged as the most critical constraint, affecting 78.67% of farmers and ranking first in severity. This aligns with research by Kumar and Roy (2013) ^[7] who observed that poor marketing systems deprive farmers of real benefits in most marketing channels. The exploitation by intermediaries results in farmers receiving lower prices while consumers pay higher costs, creating a lose-lose situation for both producers and end-users.

Fodder scarcity during dry seasons was identified as the second most significant constraint (74.67%), consistent with studies showing that 87% of livestock farmers face fodder shortages during lean periods. This seasonal feed gap significantly impacts animal health, growth rates, and overall productivity, directly affecting farmers' economic returns.

The inability to sell goats at the doorstep (68.00%) reflects inadequate rural infrastructure and limited market

accessibility. This constraint forces farmers to depend on middlemen, further exacerbating the pricing challenges identified in the primary constraint.

Reducing grazing land (57.33%) represents a long-term sustainability challenge, with urbanization and land-use changes diminishing traditional common property resources. This aligns with findings from Maharashtra where goat keepers reported shrinkage of grazing land as a major concern.

Unavailability of feed supplements (53.33%) in nearby areas creates logistical challenges, particularly during critical periods such as pregnancy and lactation when nutritional requirements are highest.

Suggestions for Overcoming Constraints

Based on farmer experiences and successful models documented in literature, the study identified five key strategies to address the identified constraints.

Table 2: Suggestions to Overcome Constraints Faced by Beneficiary and Non-Beneficiary Sangamneri Goat Rearing Farmers

Sr. No.	Suggestions	F (N=240)	Percent	Rank
1.	Link farmers to FPOs (Farmer Producer Organizations)	182	75.83	I
2.	Good quality Fodder seed and silage making inputs provided in subsidized rate	144	60.00	II
3.	E-market or FPOs (Farmer Producer Organizations) involved in marketing of animals	131	54.58	III
4.	Fodder trees and shrubs plantation on Grazing land (<i>Gayraan</i>)	118	49.17	IV
5.	Encourage farmer cooperatives or SHGs to produce simple feed supplements using locally available ingredients (e.g., molasses, groundnut cake, bran, etc.).	92	38.33	V

Farmer Producer Organizations (FPOs)

The Primary Solution. The most preferred suggestion (76.00%) was linking farmers to FPOs, which directly addresses the middlemen dominance issue. Research

demonstrates that FPOs provide farmers with collective bargaining power, reducing transaction costs and improving price realization. Successful livestock-based FPOs have shown that organized marketing through producer

collectives can increase farmers' share in consumer rupee from 30-40% to 65% by eliminating multiple intermediaries. FPOs offer multiple benefits including: Enhanced bargaining power through collective marketing, Better access to quality inputs at wholesale rates, Reduced dependency on middlemen through direct market linkages, Economies of scale in both input procurement and output marketing.

Fodder Security Through Subsidized Support

The second-ranked suggestion (60.00%) emphasized subsidized provision of quality fodder seeds and silage-making inputs. Government schemes like the National Livestock Mission already provide 50% capital subsidy for silage-making units, with support up to Rs. 55,250 for 10 MT capacity units. This approach addresses the seasonal fodder scarcity by enabling farmers to preserve surplus green fodder during flush seasons for use in lean periods. Silage technology offers several advantages: Preservation of nutritional quality during storage, Reduced wastage of seasonal surplus fodder, Year-round feed availability ensuring consistent animal nutrition, Cost-effectiveness compared to commercial feed supplements.

Digital Marketing Solutions

E-marketing platforms and FPO-led marketing (54.67%) represents a modern approach to eliminating middlemen exploitation. Digital platforms can provide transparent price discovery, direct buyer-seller connections, and real-time market information. Successful examples include livestock marketing apps that enable direct transactions between farmers and consumers, reducing the marketing chain length.

Ecological Restoration and Community Feed Production

Fodder plantation on grazing lands (49.33%) and community-based feed supplement production (38.67%) represent sustainable, long-term solutions. Planting indigenous fodder trees and shrubs on *Gayraan* (community grazing lands) can restore degraded pastures while providing year-round feed security. Local production of feed supplements using materials like molasses, groundnut cake, and bran can reduce dependency on external inputs while utilizing agricultural by-products.

Discussion

The analysis reveals a clear alignment between constraints and solutions, with FPO-based interventions emerging as the most promising strategy for sustainable goat farming development. This finding is consistent with the Government of India's target of creating 10,000 FPOs by 2027 to enhance smallholder farmers' income and market access. The emphasis on collective action through FPOs addresses multiple constraints simultaneously - reducing middlemen exploitation, improving market access, enhancing bargaining power, and facilitating technology adoption. The success of the AICRP on Sangamneri Goat in improving productivity parameters among beneficiary farmers provides strong evidence for the effectiveness of organized, technical support systems.

The fodder security strategies reflect the critical importance of addressing nutritional constraints that directly impact animal productivity and farmer income. The integration of traditional knowledge (*Gayraan* restoration) with modern

technology (silage making) offers a balanced approach to sustainable feed management.

Conclusions

The analysis of constraints faced by Sangamneri goat farmers reveals that marketing challenges dominate farmer concerns, followed by feed security issues. The overwhelming preference for FPO-based solutions indicates farmers' recognition of collective action as the primary pathway to address these challenges.

The alignment between major constraints (middlemen dominance, fodder scarcity) and preferred solutions (FPO formation, subsidized fodder inputs) provides a clear roadmap for policy interventions and program design. Success in addressing these constraints will require coordinated efforts across institutional development, technological support, and market infrastructure creation.

The study contributes to the growing body of evidence supporting institutional approaches to agricultural development, demonstrating that sustainable livestock farming requires both technical improvements and systemic interventions to address market failures and resource constraints.

References

1. Armson RB, Lovatt F, Reeve I, Green M. Using veterinary data to identify opportunities for enhanced disease surveillance in commercial goat herds. *Small Rumin Res.* 2020;193:106261. <https://doi.org/10.1016/j.smallrumres.2020.106261>
2. Battini M, Vieira A, Barbieri S, Ajuda I, Stilwell G, Mattiello S. Animal-based indicators for on-farm welfare assessment for dairy goats. *J Dairy Sci.* 2014;97(11):6625-6648. <https://doi.org/10.3168/jds.2013-7493>
3. Caroprese M, Albenzio M, Sevi A. Sustainability of sheep and goat production systems. In: *Sustainable Agriculture Reviews*. Vol. 16. Springer; 2015. p. 65-75. https://doi.org/10.1007/978-3-319-16357-4_6
4. Deokar DK. Genetic characterization of Sangamneri goat breed [Doctoral dissertation]. Mahatma Phule Krishi Vidyapeeth; 2007.
5. Devendra C. Investments on pro-poor development projects on goats: Impact on livelihood and food security. *Asian-Australas J Anim Sci.* 2013;26(1):1-12. <https://doi.org/10.5713/ajas.2012.12627>
6. Gunaseelan M, Singh BP. Constraints perceived by farmers in commercial goat farming system in Tamil Nadu, India. *Int J Ext Educ.* 2021;17(1):189-195. <https://doi.org/10.26725/IJEE.2021.17.1.189-195>
7. Kumar S, Roy MM. Small ruminants' role in sustaining rural livelihoods in arid and semiarid regions and their potential for commercialization. Agrotech Publishing Academy; 2013.
8. Kuralkar SV, Mandakmale SD, Kuralkar P. Genetic diversity analysis of Sangamneri goat using microsatellite markers. *Indian J Anim Res.* 2018;52(8):1143-1147. <https://doi.org/10.18805/ijar.B-782>
9. Meemken EM, Bellemare MF. Smallholder farmers and contract farming in developing countries. *Proc Natl Acad Sci USA.* 2020;117(1):259-264. <https://doi.org/10.1073/pnas.1909501116>

10. Mijena D, Getiso A. Environmental sustainability challenges in goat production systems: A review. *Sustain Agric Res.* 2022;11(2):45-58. <https://doi.org/10.5539/sar.v11n2p45>
11. Miller BA, Lu CD. Current status of global dairy goat production: An overview. *Asian-Australas J Anim Sci.* 2019;32(8):1219-1232. <https://doi.org/10.5713/ajas.19.0253>
12. Mohammed A. Determinants of smallholder farmers' participation in goat value chain in developing countries: A systematic review. *SAGE Open.* 2025;15(1):21582440251329066. <https://doi.org/10.1177/21582440251329066>
13. Mwaba M. The benefits of goats to rural households' food security: The case of the World Vision Zambia goat project in Chibombo district [Master's thesis]. Van Hall Larenstein Univ Appl Sci; 2011.
14. Prasad RMV, Ramachandran N, Kumar A. Economic viability of goat breed improvement programme (Barbari × non-descript) at farmer's flock in Uttar Pradesh. *Indian J Anim Sci.* 2013;83(6):656-660.
15. Sah N, Dixit SP. Conservation priorities of Indian goat breeds based on population size, genetic diversity and socio-economic relevance. *Indian J Anim Sci.* 2021;91(4):336-342. <https://doi.org/10.56093/ijans.v91i4.114219>
16. Sah N, Jai Kumar R, Bhattacharya TK, Maurya S, Sharma A. Extinction probability of indigenous goat breeds of India as affected by population sizes over time. *Anim Genet Resour.* 2020;66:73-81. <https://doi.org/10.1017/S2078633619000325>
17. Sharma A, Kumar D, Kumar S, Nagarajan M, Mukesh M, Soren NM, Singh LB. Polymorphism of BMP4 gene in Indian goat breeds differing in prolificacy. *Gene.* 2013;532(1):140-145. <https://doi.org/10.1016/j.gene.2013.08.048>
18. Shirke RS, Deokar DK, Kuralkar SV. Genetic and non-genetic factors affecting birth weight of Sangamneri kids. *Pharma Innov J.* 2024;12(12):2776-2780.
19. Sime G, Tilahun M, Mekasha Y. Goat production constraints and opportunities in pastoral and agro-pastoral production systems in Ethiopia: A review. *Trop Anim Health Prod.* 2022;54(2):98. <https://doi.org/10.1007/s11250-022-03094-8>
20. Singh A, Kumar R, Sharma R, Patel M. Genomic advancements in goat breeding: Enhancing productivity and disease resistance through molecular approaches. *Genomics.* 2025;117(2):110792. <https://doi.org/10.1016/j.ygeno.2025.110792>