

Low-cost housing designs for sheep and goat farming

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Abstract

Sheep and goat farming contribute significantly to rural livelihoods, particularly in developing regions where resources are limited. Housing plays a crucial role in maintaining health, productivity, and welfare of small ruminants; however, conventional housing systems are often cost-prohibitive for smallholders. This paper reviews and discusses low-cost housing designs for sheep and goats, emphasizing the use of locally available materials, region-specific modifications, and management practices. Key designs include open housing with shade, raised platform housing, low-cost pens, group housing, and temporary mobile structures. Studies indicate that such housing reduces disease incidence, enhances productivity, and improves profitability. The review concludes that low-cost housing systems are both practical and sustainable solutions for small ruminant farming.

Keywords: low-cost housing, sheep farming, goat farming, small ruminants, sustainable livestock

Introduction

Sheep and goats are among the most important livestock species for meat, milk, skin, and fibre production. Their adaptability to diverse agro-climatic conditions makes them suitable for resource-poor farmers (Devendra, 2013). Proper housing is a fundamental requirement in sheep and goat farming as it influences health, reproduction, and productivity (Banerjee, 2017). However, construction costs often deter smallholders from adopting conventional housing systems. Hence, there is a need to design cost-effective housing models using locally available materials without compromising animal comfort and biosecurity.

Key Requirements of Housing

- Ventilation: Prevents respiratory problems and dampness (Devendra & Burns, 1983).
- Drainage & Flooring: Raised or slatted floors reduce foot rot and parasite buildup (Acharya, 1982).
- Space:
 - Goats: 0.8–1.0 m² per adult in covered area, 2–3 m² in open paddock.
 - Sheep: 0.7–0.9 m² in covered area, 1.5–2 m² in open paddock (ICAR, 2013).

- Ease of Cleaning: Simple layouts and slatted floors improve hygiene (Ranjhan, 1998).
- Protection: Structures must shield animals from rain, cold winds, predators, and theft.

Low-Cost Housing Design Options:

1. Open-Sided Shed

- Materials: Bamboo, wood, thatch, or corrugated iron sheets.
- Design: Three walls semi-open, roof sloped for rainwater runoff. Earthen or raised floors.
- Benefits: Cheap, well-ventilated, suitable for tropical climates (FAO, 2002).

2. Raised Platform Pens (Goats)

- Materials: Bamboo or wooden slats, local timber, thatch/iron roofing.
- Design: Floor 1–1.5 m above ground, with slats (1.5–2 cm gaps) for dung/urine to pass.
- Benefits: Reduces disease, easy manure collection, preferred in humid/high rainfall zones (Devendra, 1987).

3. Pole-and-Thatched Shelter

- Materials: Wooden poles, palm leaves, sorghum stalks, or grasses.

- Design: Simple lean-to roof on poles, temporary enclosure.
- Benefits: Very low cost, portable, suitable for nomadic/migratory flocks (Acharya, 1982).

4. Shed with Open Paddock

- Materials: Low brick wall (up to 1 m), bamboo matting above, GI or thatch roof.
- Design: Covered sleeping area with attached fenced paddock.
- Benefits: Reduces overcrowding, allows exercise and sunning, suitable for semi-intensive systems (ICAR, 2013).

5. Community Housing

- Materials: Bricks, bamboo, GI sheets, thatch.
- Design: Large rectangular shed divided with partitions for different categories (pregnant, young, males).
- Benefits: Cost-sharing among smallholders, facilitates collective management (Banerjee, 2018).

Cost-Saving Features

- Use local and renewable materials (bamboo, crop residues, mud plaster).
- Adopt modular housing for future expansion.
- Utilize integrated systems (e.g., goats above poultry) for efficient manure recycling (Ranjhan, 1998).
- Invest in durable roofing (tiles, GI sheets) in high-rainfall areas to minimize maintenance.

Conclusion

Low-cost housing does not require sophisticated infrastructure but must fulfil essential welfare and management functions. Appropriate designs—such as open-sided sheds, raised pens, and shed-paddock combinations—help improve growth, reproduction, and profitability of sheep and goat farming. Utilizing locally available materials and traditional knowledge reduces costs, while proper layout enhances hygiene and productivity.

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Photographs



(Low-cost house)

(https://agritech.tnau.ac.in/expert_system/sheepgoat/Housing%20of%20sheep%20and%20goats.html)



(Open type housing with run space)

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