

Indigenous Cattle Breeds in India: Current Status, Challenges and Extension Strategies for Sustainable Dairy Development

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India possesses one of the world's richest indigenous cattle genetic resources, with 55 registered indigenous cattle breeds recognized by ICAR-National Bureau of Animal Genetic Resources. These breeds are well adapted to diverse agro-climatic conditions and are highly resistant to heat stress, tropical diseases, and feed scarcity. Although crossbred cattle contribute substantially to commercial milk production, indigenous breeds such as Gir, Sahiwal, Tharparkar, Rathi, Red Sindhi, and Deoni are gaining renewed importance because of climate change, sustainable livestock farming, and increasing consumer demand for A2 milk. Government programmes like the Rashtriya Gokul Mission, sex-sorted semen technology, genomic selection, and digital breed registration are promoting conservation and genetic improvement of indigenous cattle.

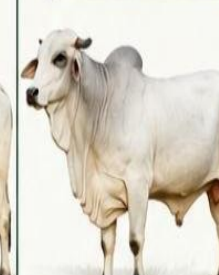
GIR	SAHIWAL	RED SINDHI	THARPARKAR	ONGOLE (NELLORE)
				
• Home tract: Gujarat • Dual purpose • High milk yield • Heat tolerant	• Home tract: Punjab • High milk yield • Good disease resistance • Suitable for tropical climate	• Home tract: Sindh • Good milk yield • Heat tolerant • Efficient draught animal	• Home tract: Rajasthan • Good milk yield • Highly heat tolerant • Disease resistant	• Home tract: Andhra Pradesh • Strong draught power • Heat tolerant • Good for dry farming

Figure: Indigenous Cattle Breeds of India

From an agricultural extension perspective, extension personnel play a vital role in educating farmers about scientific breeding, balanced feeding, disease prevention, clean milk production, fodder cultivation, and value addition of indigenous cattle products. Farmer Producer Organizations (FPOs), dairy cooperatives, mobile veterinary services, ICT tools, and village-level awareness campaigns are strengthening technology transfer and improving adoption of scientific dairy practices.

Indigenous cattle breeds are not only a part of India's livestock heritage but also a foundation for climate-resilient, sustainable, and profitable dairy farming. Strengthening extension services, scientific management, and conservation programmes will ensure

improved farmer livelihoods while safeguarding indigenous animal genetic resources for future generations.

Schemes

The major government schemes for indigenous cattle development, structured for extension farmers and capacity building.

Scheme Name	Core Objective for Indigenous Breeds	Extension & Capacity Building Mechanisms	Subsidies, Incentives & Financial Benefits
Rashtriya Gokul Mission (RGM)	Genetic upgradation and conservation of native breeds (e.g., Gir, Sahiwal).	• MAITRI Training: Local youth trained for doorstep artificial insemination. • Awareness Camps: Conducts calf rallies, fertility camps, and milk yield competitions.	• IVF Support: ₹5,000 subsidy per assured IVF pregnancy. • Sex-Sorted Semen: 50% subsidy to ensure female calf delivery.
National Programme for Dairy Development (NPDD)	Creating infrastructure for quality milk and value chains.	• A2 Certification: Training farmers to verify and brand premium native milk. • ICT / Digital Literacy: Digital training for automated milk collection and testing tools.	• Infrastructure Funding: Fully or partially financed Bulk Milk Coolers (BMCs) for village cooperatives.
National Livestock Mission (NLM)	Upgrading livestock farming into sustainable commercial entrepreneurship.	• FPO/SHG Formation: Grouping extension farmers for bulk input buying. • Feed Security Training: Programs on silage making and hydroponics.	• Fodder Kits: Subsidised or free high-yielding fodder seed distribution through extension channels.
Gopal Ratna Award Scheme	Promoting social extension by celebrating best practices.	• Peer-to-Peer Learning: Winners act as community models for indigenous herd management.	• Cash Rewards: Up to ₹5 lakh national cash prizes for best farmers, AI technicians, and dairy cooperatives.
Kisan Credit Card (KCC) for Animal Husbandry	Providing financial stability for dairy farm management.	• Financial Literacy: Bank-led extension to bring landless livestock owners into formal banking.	• Working Capital: Low-interest short-term credit lines for feed, veterinary medicines, and breeding expenses.
Animal Husbandry Infrastructure Development Fund (AHIDF)	Incentivizing processing and value addition of native breed products.	• Project Mentorship: Technical handholding for farmers to set up processing units.	• Interest Subvention: 3% interest discount on bank loans taken by FPOs, MSMEs, and private individuals.

Role of Agricultural Extension in These Schemes

- Organize farmer training programmes on scientific management of indigenous cattle.
- Conduct demonstrations on balanced feeding, clean milk production and scientific breeding.
- Promote Artificial Insemination (AI), sex-sorted semen and genomic technologies.
- Create awareness about conservation of indigenous breeds and the benefits of A2 milk.

- Facilitate formation of dairy cooperatives, self-help groups (SHGs) and Farmer Producer Organizations (FPOs).
- Use ICT tools, mobile advisory services, village meetings and veterinary extension to improve technology adoption.

Encourage participation of women and youth in indigenous cattle-based enterprises. These schemes collectively support breed conservation, higher milk productivity, climate resilience.

Scheme Name	Key Focus / Objective
Rashtriya Gokul Mission (RGM)	Conservation and development of indigenous breeds; upgradation of Gaushalas and establishment of breed improvement centres.
National Programme for Bovine Breeding and Dairy Development (NPBB&DD)	Genetic improvement, breed conservation, and infrastructure development.
NABARD Dairy Entrepreneurship Development Scheme (DEDS)	Financial assistance for dairy infrastructure, including indigenous breed promotion.
ICAR Schemes	Research, breed improvement, and technology development for indigenous cattle.
National Dairy Plan (NDP)	Supports dairy infrastructure, productivity improvement, and market development.
Animal Husbandry Infrastructure Development Fund (AHIDF)	Financial support for dairy infrastructure, including indigenous breed farms and value addition.

Improvement Strategies for Indigenous Cattle Breeds

Improving indigenous cattle breeds is essential to increase milk productivity while preserving their unique genetic traits such as heat tolerance, disease resistance, and adaptability. The following scientific and extension-based strategies are widely recommended:

- **Selective Breeding** - Identify and breed superior indigenous bulls and cows based on milk yield, fertility, and disease resistance. Avoid indiscriminate crossbreeding to maintain breed purity.
- **Artificial Insemination (AI)**- Use semen from genetically superior indigenous bulls. Improve conception rates and accelerate genetic improvement.
- **Genomic Selection** - Apply DNA-based technologies to identify elite breeding animals at an early age. Increase the accuracy and speed of genetic improvement.
- **Embryo Transfer Technology (ETT) and In-Vitro Fertilization (IVF)** - Multiply superior indigenous germplasm rapidly. Conserve elite female genetics.

Expected Outcomes

- Increased milk production without losing breed purity.
- Conservation of indigenous genetic resources.
- Improved farmer income and livelihood security.
- Enhanced climate resilience and disease resistance.
- Sustainable dairy development through scientific breeding and effective agricultural extension.

Conclusion

The future of indigenous cattle development depends upon the successful integration of scientific breeding, genetic conservation, effective agricultural extension, policy support, institutional collaboration, market development, and farmer participation. Strengthening conservation programmes, expanding genomic research, promoting community-based breeding initiatives, improving market incentives for indigenous cattle products, and increasing public awareness regarding the ecological and economic value of indigenous breeds will contribute significantly to sustainable dairy development. Conserving indigenous cattle is not only essential for protecting India's rich animal genetic heritage but also for ensuring resilient livestock production systems capable of meeting future challenges related to climate change, food security, and sustainable rural development.