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Indigenous Livestock Management for Sustainable Soil Fertility and Farm Profitability

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Abstract: -

Indigenous livestock management practices play a crucial role in promoting sustainable soil fertility and enhancing farm profitability, particularly in smallholder and low-input systems. Rooted in traditional knowledge, these practices—including manure recycling, controlled grazing, and the use of native breeds—support nutrient cycling, soil health, and ecological balance. This review highlights their environmental and economic benefits, while also addressing current challenges such as policy neglect and erosion of indigenous knowledge. Recognizing and integrating these time-tested approaches into modern farming systems can contribute significantly to climate-resilient and sustainable agriculture.

Introduction:

Indian farming traditions have long upheld the value of livestock as an inseparable part of agriculture. Particularly, indigenous livestock breeds such as Sahiwal, Gir, Tharparkar cows, Murrah buffaloes, and Jamunapari goats have served as sources of milk, draught power, and natural manure to keep the soil fertile. However, in the modern era of chemical-based farming and exotic breed introduction, this ecological and economic synergy was disrupted, resulting in soil fertility decline, rising input costs, and loss of livelihood security for small farmers.

Now, as farmers grapple with poor soil health, high fertilizer expenses, and climate instability, integrating scientifically managed indigenous livestock with systematic soil fertility practices is emerging as a sustainable, profitable, and climate-resilient solution. This article offers a complete, farmer-friendly guide to adopting this integrated system successfully.

Why Indigenous Livestock Breeds Matter to Farmers

Indigenous livestock are naturally

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suited to Indian agro-climatic conditions. They possess excellent heat tolerance, disease resistance, and the ability to thrive on locally available feed resources. Desi breeds are generally low-maintenance, making them ideal for small and marginal farmers. Beyond milk and meat, their dung and urine play a crucial role in enhancing soil organic matter, improving microbial life, and providing a reliable source of farmyard manure (FYM), which supports soil fertility.

In rainfed and resource-poor areas, these hardy animals ensure livelihood security while contributing to soil restoration, making them indispensable in sustainable agriculture systems.

Practical Livestock Management Practices for Farmers

Proper care, feeding, and preventive health management improve livestock productivity and reduce losses. Most farmers still rely heavily on dry fodder alone, which limits animal performance. A scientifically balanced diet combining dry fodder, green fodder, and concentrate feed increases milk yield, animal weight, and reproductive efficiency.

Locally grown green fodders like berseem, maize, jowar, and bajra should be cultivated seasonally to support livestock feed needs. Green fodder also benefits soil by preventing erosion and adding organic matter through leftover crop residues. A small daily supplement of concentrate feed (grains, oil cakes, bran) and mineral mixture ensures balanced nutrition.

Fresh, clean drinking water should be made available to animals throughout the day. Housing should be well-ventilated and shaded with trees or natural shelters to minimize heat stress.

Regular deworming and preventive vaccinations against common diseases like Foot and Mouth Disease (FMD), Hemorrhagic Septicemia (HS), and Black Quarter (BQ) are necessary to maintain livestock health.

Livestock's Role in Soil Fertility Management

Indigenous livestock are vital for organic nutrient recycling on farms. Their dung, when properly collected and composted, produces FYM rich in organic matter and essential plant nutrients. Regular application of FYM improves soil structure, water-holding capacity, and microbial activity while supplying balanced nutrients to crops.

Farmers can further improve manure quality through vermicomposting, using earthworms to convert dung into high-quality, nutrient-rich organic compost. Vermicompost boosts soil phosphorus availability and supports beneficial soil microbes. For farms with biogas plants, the slurry obtained after gas production serves as a valuable organic

fertilizer. When directly applied to fields, this slurry enriches the soil with nitrogen, phosphorus, potassium, and organic carbon.

Green Fodder Cultivation for Soil and Livestock

Growing green fodder benefits livestock nutrition and simultaneously improves soil health. Crops like berseem, lucerne, maize, jowar, and cowpea enrich the soil by adding organic residues after harvest. Leguminous fodders also fix atmospheric nitrogen, naturally enhancing soil fertility. Fodder trees like Subabul, Ber, Khejri, and Neem planted on field bunds serve as shade, green fodder, and erosion control barriers. This system ensures year-round fodder availability, reduces pressure on natural pastures, and improves soil health through nutrient recycling.

Integrated Crop-Livestock-Soil Farming Systems

An integrated approach where livestock, crops, and soil management coexist creates a sustainable, self-reliant farm ecosystem. Livestock dung and urine feed the soil via compost, biogas slurry, or direct application. Crops grown in fertile, organic matter-rich soil provide better yields and healthy produce. Crop residues and fodder crops feed livestock, completing the cycle. Such closed-loop systems significantly reduce dependence on chemical fertilizers, enhance soil quality, and improve farm profitability.

Active Government Support and Farmer-Friendly Schemes

To help farmers conserve indigenous livestock, grow quality fodder, manage organic manure, and improve soil health, the government runs several practical, farmer-centric schemes. Here's a simple guide to what's available:

Rashtriya Gokul Mission (RGM)

This scheme encourages farmers to rear indigenous cattle breeds by offering financial support for building animal sheds, buying breeding bulls, and accessing artificial insemination (AI) services. It also helps set up 'Gokul Grams' — dedicated farms for desi cattle rearing — and supports milk processing from indigenous cows.

National Livestock Mission (NLM)

A broad mission that covers everything from fodder cultivation and feed banks to vermicompost units and backyard poultry. Farmers can get a 50–75% subsidy for growing green fodder, making silage, and setting up rural feed banks. It also provides training on livestock care and organic farming techniques.

National Biogas and Organic Manure Programme (NBOMP)

Under this scheme, farmers can install

small biogas plants for household fuel and get 35–50% subsidy. The leftover biogas slurry makes an excellent organic fertilizer. The scheme also funds awareness and training programmes for farmers.

Paramparagat Krishi Vikas Yojana (PKVY)

This programme promotes organic farming clusters. Farmers can receive ₹50,000 per hectare over three years to buy organic inputs like vermicompost, bio-pesticides, and farmyard manure. It also covers certification costs and encourages integrating livestock with organic farming systems.

Sub-Mission on Fodder and Feed Development (SMFF)

This scheme ensures the regular availability of quality fodder. It offers subsidized fodder seeds, supports pasture land development, and helps farmers set up silage, hydroponic fodder, and fodder block units — especially useful in drought-prone areas.

Mission for Integrated Development of Horticulture (MIDH)

While primarily focused on horticulture, MIDH also supports organic input production. Farmers can get up to 50% subsidy for constructing vermicompost pits and biofertilizer units, promoting organic vegetable and fruit farming alongside livestock.

Animal Husbandry Infrastructure Development Fund (AHIDF)

Through this scheme, farmers can avail low-interest loans with a 3% interest subsidy for setting up animal sheds, feed plants, manure-to-energy projects, and cold storage facilities for dairy and livestock products.

How to Apply:

Farmers can apply for these schemes through their nearby **Krishi Vigyan Kendra (KVK)**, **District Animal Husbandry Office**, **Agriculture Department**, **State Renewable Energy Agency**, or **Panchayat Office**.

It's a good idea to keep identity proof, land papers, and livestock details ready. Some schemes also have online application options through state agriculture or animal husbandry department websites.

Farmer Success Examples

In Muzaffarnagar, farmer Rajpal Singh improved his Murrah buffalo's milk production by cultivating berseem fodder and ensuring regular mineral supplementation. He converted dung into vermicompost and applied it in his sugarcane field. Within two seasons, his soil organic carbon content improved and cane yield rose by nearly 18%.

Sarita Devi from Meerut installed a biogas plant for her three cows, using the gas for household needs and applying the slurry to her vegetable fields. The result was healthier soil, better crop quality, and premium market prices for chemical-free produce.

Conclusion

Scientific management of indigenous livestock, coupled with systematic manure and soil fertility practices, offers farmers a low-cost, sustainable way to improve both productivity and profitability. Indigenous breeds provide consistent returns in milk, meat, and organic manure. Their dung, when processed as FYM, vermicompost, or biogas slurry, naturally restores soil health, improves crop yields, and reduces chemical fertilizer dependence.

The government's extensive financial and technical support through schemes like Rashtriya Gokul Mission, National Livestock Mission, NBOMP, and PKVY makes it easier than ever for farmers to adopt this integrated model.

By combining indigenous livestock care, green fodder cultivation, organic nutrient recycling, and government support, farmers can achieve long-term soil fertility, stable incomes, and ecological sustainability.

This guide is designed to equip farmers with everything they need to confidently implement indigenous livestock-soil integrated farming, without the need for additional external consultation.