

6. Green Fodder Revolution – Geography

India needs a Green Fodder Revolution. India, despite being the world's largest milk producer, faces a severe fodder and feed shortage due to limited cultivation area, climatic stress, and poor seed availability, impacting livestock productivity. The government is implementing schemes like the National Livestock Mission and Rashtriya Gokul Mission to bridge this deficit.

Context

India, the world's largest milk producer, contributes nearly 24% of global milk output. Despite this leadership, the country faces a serious fodder and feed shortage that threatens the sustainability of its dairy sector. The average milk yield per animal remains far below global standards, mainly due to poor livestock nutrition and inadequate feed availability.

Current Status of Fodder Deficit

India faces a 24–32% deficit in green fodder and about 23% deficit in dry fodder. Comprehensive studies show a 35.6% shortfall in green fodder, 5% shortfall in dry crop residues, and 44% shortfall in concentrate feed ingredients. The total requirement of green fodder is 827.19 million tonnes, while the availability is 734.219 million tonnes, implying a 24% deficit.

State-wise Data on Fodder Gaps

State	Green Fodder Deficit	Dry Fodder Deficit
Uttar Pradesh	~23.6%	~30.4%
Gujarat	up to ~36%	up to ~23%
Maharashtra	~59%	~31%

Fodder – Fodder refers to food provided to domesticated livestock such as cattle, buffaloes, sheep, and goats. It includes cultivated or naturally grown plants that are cut and fed directly, unlike grazing on open pastures.

Types of Fodder

- Green Fodder** – Includes fresh plants such as maize, berseem, sorghum, napier grass, and lucerne. Rich in moisture, protein, and vitamins. Enhances milk yield, fertility, and overall animal health.
- Dry Fodder** – Includes dried crop residues like wheat straw, paddy straw, and groundnut haulms. Used during lean or dry seasons when green fodder is scarce.
- Concentrated Feed** – Composed of nutrient-dense materials like oil cakes, grains, pulses, and bran. Provides protein, minerals, and energy to balance the diet.

Importance of Fodder

- Ensures nutritional security for livestock.
- Directly affects milk yield, fertility, and disease resistance.
- Supports rural livelihoods – around 80 million Indian households depend on livestock.
- Promotes soil fertility through recycling of organic manure.

Evolution of Fodder Development in India

Period	Focus Area	Major Policy/Initiative	Key Impact/Outcome
Pre-1950	Traditional live-stock feeding	Community pastures, crop residues	Unorganized grazing; low productivity
1950–1970	Foundational fodder development	Central Fodder Development Scheme (CFDS); Grassland Management (2nd Five-Year Plan)	Initiated fodder seed and pasture improvement
1970–1990	Dairy–fodder linkage	Operation Flood; Establishment of IGFR (1962)	Boosted milk output; promoted high-yield fodder crops
1990–2010	Research & diversification	ICAR Fodder Mission; seed programs; fodder in cropping systems	Introduced drought-tolerant, multi-cut fodder varieties

2014–2020	Climate-smart fodder	National Livestock Mission; Rashtriya Gokul Mission	Strengthened seed hubs, fodder banks, and farmer outreach
2020–2025	Tech-based management	AI-based forecasting, hydroponics, Amrit Kaal Vision 2047	Improved productivity and resilience; deficit reduced to ~11.24%

Key Challenges

- Supply–Demand Gap** – Persistent 24–32% deficit in green fodder and 23% deficit in dry fodder. Growing livestock population intensifies demand pressure.
- Land and Cultivation Constraints** – Fodder crops occupy only 4% of cultivated land, stagnant for decades. Competition with food crops limits fodder cultivation area.
- Seed, Technology & Input Issues** – Poor availability of certified fodder seeds –
 - Sorghum/Bajra – 56% deficit
 - Maize – 50% deficit
 - Berseem – 52% deficit
 Limited access to modern techniques and improved varieties.
- Climatic and Environmental Stress** – Droughts, erratic monsoons, and heat stress reduce yields of major fodder crops. Lack of climate-resilient fodder species.
- Economic and Livelihood Impact** – Feed shortages cause a direct decline in milk yield and income. Small dairy farmers are most vulnerable to price fluctuations in feed and fodder.

Government Measures for Fodder Development

Scheme/Initiative	Objective/Focus Area	Key Measures/Features	Impact/Outcome
National Livestock Mission (NLM)	Fodder production & feed security	Sub-mission on feed & fodder; support for cultivation, seed hubs, fodder banks	Enhanced seed availability and awareness
Rashtriya Gokul Mission (RGM)	Genetic improvement & nutrition	Encourages fodder cultivation, silage units, and hydroponic systems	Improved feed efficiency and milk yield
National Dairy Plan (NDDB)	Strengthening dairy sector	Promotes high-yielding fodder varieties like CO-4 Napier	Improved fodder productivity and reduced gap
Fodder Seed Production Programme (ICAR-IGFRI)	Research and innovation	Development of drought-tolerant, multi-cut fodder varieties	Improved resilience to climate variability
National Fodder Development Programme (NFDP)	Coordinated fodder planning	Financial assistance for pasture, silage pits, and seed distribution	Expansion of cultivated fodder area
Digital & AI-based Initiatives	Data-driven fodder management	Remote sensing and AI-based mapping of fodder-deficit areas	Better planning and policy targeting

Way Forward

- Dedicated Fodder Zones** – Develop village-level Green Fodder Clusters on common lands and under-utilized farms. This will optimize land use and reduce current fodder deficit, ensuring a steady supply for livestock.
- Climate-Resilient Varieties** – Promote multi-cut, drought- and heat-tolerant fodder crops such as Napier hybrids, Bajra-Sorghum, and COFS-29. These can increase fodder yield by 30–40% under rain-fed conditions.

3. **Integration with Cropping Systems** – Introduce fodder-based crop rotation and intercropping with pulses or oilseeds. Ensures year-round fodder availability, improves soil fertility, and enhances sustainability.
4. **Technology and Digital Monitoring** – Use AI, GIS, and remote sensing to map fodder-deficit regions and enable predictive planning. This can improve planning efficiency by 10–12%.
5. **Silage and Hydroponics** – Train farmers in silage-making, hydroponic fodder, and azolla cultivation. Provides off-season fodder, reduces feed cost by 20%, and enhances livestock nutrition.
6. **Public–Private Partnerships** – Encourage cooperatives and private dairy firms in contract fodder farming. Strengthens supply chains, ensures timely feed availability, and increases efficiency by 15–20%.
7. **Research and Capacity Building** – Strengthen fodder R&D through ICAR and agricultural universities. Establish fodder research clusters and farmer extension programs. Aim to meet 80% of feed demand by 2047 through scientific innovation and improved practices.

Source – <https://www.downtoearth.org.in/agriculture/india-needs-agreen-fodder-revolution>

