



## Popular Article

Domain: **Agriculture Science**

Vol 5 Issue 2, Feb 2026, 246-249

# Pulses for Sustainable Agriculture: Nutritional Security, Soil Health and Policy Imperatives in the 21st Century

**Ankita Mukherjee**

PhD Agricultural Economics, Igkv, Raipur, C.G

[DOI:10.5281/TrendsInAgriculture.18907408](https://doi.org/10.5281/TrendsInAgriculture.18907408)

## Introduction

World Pulses Day, observed annually on 10 February, is not merely symbolic. It reflects a global recognition — reinforced by the Food and Agriculture Organization — that pulses are central to achieving Sustainable Development Goals (SDGs), particularly Zero Hunger, Climate Action, and Responsible Consumption.

In India, where nearly 86% of farmers are small and marginal, pulses are not just crops; they are strategic assets for nutritional security, soil sustainability, climate resilience, and income diversification.

## Nutritional Security: A Data Perspective

India continues to face a “protein gap” despite cereal sufficiency. Pulses provide:

- 18–25% protein
- High dietary fiber
- Iron (3–7 mg/100g)
- Zinc and magnesium
- Folate and B-complex vitamins
- Low Glycemic Index (GI: 29–35)

Per capita pulse availability in India has fluctuated historically, declining to around 32–35 g/day in the early 2000s and recovering to around 55–60 g/day in recent years. However, the ICMR recommends ~65–75 g/day for balanced nutrition.

## Why Pulses Matter for India:

- India accounts for ~27–28% of global pulse production
- Consumes nearly 30% of global pulses
- Yet continues to import 2–3 million tonnes annually (depending on year)

Pulses directly address:

- Protein-energy malnutrition
- Anaemia (particularly among women and children)
- Rising diabetes burden (due to low GI properties).

Thus, pulses are not only agricultural commodities but public health instruments.

**Agro-Ecological Significance: Scientific Foundations****1. Biological Nitrogen Fixation**

Pulse crops host *Rhizobium* bacteria in root nodules, fixing atmospheric nitrogen (N<sub>2</sub>) into plant-usable forms.

- Nitrogen fixation potential: 30–200 kg N/ha
- Reduces chemical fertilizer requirement in subsequent crops
- Lowers greenhouse gas emissions from synthetic nitrogen use

This makes pulses central to climate-smart agriculture.

**2. Soil Carbon and Structure**

Pulse residues contribute to:

- Improved soil organic carbon
- Enhanced microbial biomass
- Better soil aggregation
- Increased water infiltration

In rice–wheat dominated systems, pulse inclusion significantly improves soil health indicators.

**3. Water Efficiency**

Compared to rice (requiring 3,000–5,000 liters/kg), many pulses require significantly lower water inputs.

Pulses thrive in:

- Rainfed systems (which cover ~52% of India's net sown area)
- Semi-arid and dryland regions

Thus, pulses are ideal under increasing water stress and erratic monsoon conditions.

**Economic and Production Trends in India**

India cultivates pulses on approximately 28–30 million hectares, producing around 26–27 million tonnes annually (recent averages).

Major pulse crops include:

- Chickpea (Gram)
- Pigeon pea (Arhar/Tur)
- Lentil (Masoor)
- Black gram (Urad)
- Green gram (Moong)
- Field pea

Chickpea alone contributes nearly 40–45% of total pulse production. However, productivity remains around 900–1,000 kg/ha, below global potential in many regions.

**Policy Landscape: Government Interventions****1. National Food Security Mission (NFSM–Pulses)**

Launched in 2007–08, NFSM aimed to increase pulse production through:

- Distribution of high-yielding varieties

- Integrated nutrient management
- Pest and disease management
- Cluster demonstrations

The programme contributed significantly to production increases post-2016.

## 2. Minimum Support Price (MSP)

The Commission for Agricultural Costs and Prices recommends MSPs annually for major pulses.

Recent MSP increases aim to:

- Ensure remunerative prices
- Encourage diversification away from water-intensive cereals
- Improve farm profitability

However, procurement levels remain uneven across states.

## 3. Import Policy and Buffer Stocks

The Government of India uses:

- Import quotas
- Stock limits
- Buffer stock creation

to stabilize domestic prices and protect farmers from price crashes.

## 4. Pulse Promotion in Nutrition Schemes

Pulses are increasingly integrated into:

- Mid-Day Meal Scheme
- Public Distribution System (PDS)
- Integrated Child Development Services (ICDS)

This creates assured demand while improving nutrition outcomes.

## Climate Change and Pulse-Based Cropping Systems

Under rising temperature and rainfall variability:

- Pulses show shorter crop duration
- Better adaptability in stress conditions
- Suitability for intercropping systems

Promoting rice–pulse and millet–pulse rotations support both soil sustainability and income diversification.

## Structural Challenges

Despite progress, several issues persist:

- Yield variability under rainfed conditions
- Limited irrigation coverage
- Pest incidence (e.g., pod borer in pigeon pea)
- Market volatility
- Inadequate processing infrastructure

Bridging the yield gap (potential vs actual) could significantly reduce import dependency.

**Way Forward: Policy Recommendations**

1. Expand pulse cultivation in rice fallows (~11–12 million ha potential).
2. Strengthen seed systems for improved varieties.
3. Enhance decentralized procurement of pulses at MSP.
4. Promote Farmer Producer Organizations (FPOs) for aggregation and value addition.
5. Encourage pulse-based crop insurance products.
6. Integrate pulses into climate-smart village models.
7. Incentivize crop diversification through direct benefit transfers linked to sustainable practices.

**Conclusion**

Pulses represent a rare convergence of nutrition, sustainability, climate resilience, and economic viability.

In the 21st century, strengthening pulse-based farming systems is not merely an agricultural reform — it is a national development strategy. If India strategically aligns production, procurement, and nutrition policies, pulses can simultaneously address protein deficiency, soil degradation, import dependence, and farmer income instability.

Pulses are not minor crops. They are macro-solutions.