

India's Agricultural Transformation

From Food Security to Food Systems Value · A 2026 White Paper

Independent analysis · Dr. Nitika Mukhi · Agricortex · agricortex.in · July 2026

EXECUTIVE SUMMARY

India has decisively solved the problem it set out to solve in 1965: calorie sufficiency. Foodgrain output reached a record **357.73 million tonnes** in 2024–25 — up 106 MT in a decade — and the state distributes free grain to **81.35 crore people**. The binding constraint has moved. It is no longer production; it is **value, nutrition, and resilience**: post-harvest losses of ~**₹92,651 crore** a year, storage capacity covering barely a quarter of output, ~90% import dependence in alternative-protein inputs, and farm incomes anchored to low-value staples.

Policy has followed. The 2025–26 Union Budget launched nine agriculture missions; BioE3 (2024) made biomanufacturing a national priority with a **\$300B bioeconomy target by 2030**. Yet private capital has moved the other way: agritech funding fell to **~\$202M in 2025**, down ~25% year-on-year, even as the market is projected to grow at ~25% CAGR. **That divergence — state capital expanding while venture capital retreats — is the defining feature of the current cycle, and the central opportunity for institutional players.**

1. Where India Stands: The Sufficiency Dividend

Agriculture employs ~46% of India's workforce and contributes ~18% of GDP — a structural asymmetry that makes every productivity gain a poverty-reduction instrument. The last decade delivered exactly that gain. Foodgrain production rose from 251.54 MT (2015–16) to a record 357.73 MT (2024–25), an ~8% jump over the prior year, with rice (150.18 MT), wheat (117.94 MT), oilseeds (42.99 MT) and pulses (25.68 MT) at or near record levels. Provisional 2025–26 estimates point to ~376.56 MT.

This underwrites the world's largest food-security programme. Under PMGKAY, free foodgrains flow to 81.35 crore beneficiaries — about 57% of the population — extended to December 2028 at an estimated **₹11.80 lakh crore**. Aadhaar-linked authentication and One Nation One Ration Card have cut leakage substantially and made entitlements portable for migrant workers.

Indicator	Value	Source
Foodgrain output, 2024–25	357.73 MT (record); +~8% YoY; +106 MT vs 2015–16	MoA&FW; / PIB
Foodgrain output, 2025–26 (est.)	~376.56 MT	MoA&FW;
PMGKAY coverage	81.35 crore beneficiaries; ~ ₹11.80 lakh crore (2024–2028)	Union Cabinet
Agriculture in economy	~46% of workforce; ~17.7% of GDP (FY24)	EPW / ICRIER
Agri budget, 2025–26	~ ₹1.49 lakh crore (~2.9% of Union Budget, incl. allied)	ICRIER
Post-harvest losses	~ ₹92,651 crore/year across 45 commodities	NABCONS / MoFPI
Storage capacity	~91.8 MT vs 357.73 MT output (~26% coverage)	FCI / Parliament

Read-across: sufficiency is achieved; the marginal rupee of public spend now yields more in storage, processing, and nutrition than in additional cereal tonnage.

2. Why the State Intervened — and For Whom

The policy architecture answers three failures that markets did not correct on their own.

- **Productivity dispersion.** Yields vary several-fold across districts. The **PM Dhan-Dhaanya Krishi Yojana** targets 100 low-productivity districts and an estimated **1.7 crore farmers**, converging existing schemes on irrigation, credit, post-harvest storage and diversification.
- **Import dependence in protein and oils.** The **Mission for Aatmanirbharta in Pulses** (six years; **■1,000 crore** in FY26) targets tur, urad and masoor with open-ended MSP procurement; parallel missions address high-yielding seeds, cotton productivity, vegetables and fruits.
- **Credit and information exclusion.** The Kisan Credit Card limit rose from **■3 lakh** to **■5 lakh**; the **Digital Agriculture Mission** (**■2,817 crore**) is building **AgriStack** — a farmer registry and digital public infrastructure intended to do for agriculture what UPI did for payments.

The beneficiary is explicit: the smallholder. Average holdings are ~1.08 hectares, and ~140 million farming households sit below the threshold at which mechanisation or private advisory is commercially viable. Every instrument above is designed to aggregate that fragmentation — through FPOs, PACS, shared infrastructure and digital identity — rather than eliminate it.

2.1 The Vision: from grain security to bio-economy

The strategic pivot is captured by two documents. The **World's Largest Grain Storage Plan** (cooperative sector) adds ~70 MMT of storage at PACS level — **~■1.25 lakh crore** over five years — attacking the loss problem directly. And the **BioE3 Policy** (August 2024) — Biotechnology for Economy, Environment and Employment — names **smart proteins and functional foods** among its priority themes, funds biomanufacturing hubs and biofoundries via DBT and BIRAC, and sets a **\$300 billion bioeconomy target by 2030**.

The ultimate goal is therefore not more calories. It is to move Indian agriculture up the value curve: from *commodity* to *ingredient*, from *bulk staple* to *manufactured nutrition* — capturing domestically the processing margin that currently accrues abroad. India still imports an estimated **~90% of its alternative-protein inputs**; the smart-protein segment is projected to scale from **~\$42M today to ~\$4.2B by 2030**.

3. The Startup Layer: Scale Without Capital

India hosts roughly **3,900–5,000 agritech startups** that have cumulatively raised on the order of **\$6.5 billion**. Notably, **BIRAC — a government body — is among the most active investors by deal count**, alongside Omnivore: public capital is not merely regulating this market, it is seeding it.

Company / Vehicle	Focus	Scale marker
Ninjacart	B2B fresh-produce supply chain	~\$400–508M raised; 1,400+ t sourced daily
DeHaat	Full-stack inputs, advisory, credit, market linkage	~\$270M+; >■3,000 cr FY25 revenue; exports to 32 markets
AgroStar	Digital farmer network & agri-inputs	~5M farmers; \$30M (Nov 2025, Just Climate)
Arya.ag	Warehousing & warehouse-receipt finance	>■2,000 cr in WRF disburseals
Cropin / Fasal	Satellite & sensor intelligence, yield forecasting	Precision ag; input waste cut ~20–40%
Ecozen / Garuda / BharatRohan	Solar cold-chain; drones; crop surveillance	Deep-tech, hardware-led
Phyx44, Zero Cow, Biokraft	Precision fermentation & cultivated protein	Smart-protein cohort; DBT/BIRAC-linked
Govt. vehicles	Agriculture Accelerator Fund (■500 cr); RKVY-RAFTAAR (grants ≤■25 lakh); Namo Drone Didi (■1,261 cr); Bharat AgriTech Foundation (2025)	Public seed & incubation capital

Sources: Tracxn (May 2026); Inc42; Decentro; company reporting. Funding totals vary by database definition.

4. The Central Tension: A Growing Market, A Shrinking Cheque

Market forecasts and capital flows currently point in opposite directions — the single most important fact for anyone allocating to this sector.

- **Forecasts are bullish.** Inc42 × StarAgri project India’s agritech market growing from **\$9B (2025) to \$28B (2030)**, ~25% CAGR, with AI-led agritech rising from ~\$900M to **\$5.6B** (~44% CAGR) and market linkage capturing ~45% of value.
- **Capital is retreating.** Agritech funding fell to **~\$202M across 36 deals in 2025**, down ~25% from ~\$269M in 2024, and far below the 2021–22 peak. Agritech has drawn only ~2% of Indian venture funding since 2020. Shutdowns (BharatAgri) and stalled unicorn paths are common.
- **Estimates diverge wildly.** Independent trackers put the agritech market anywhere from **~\$1B to \$24B** depending on scope. Treat any single number with caution; the direction and the mix matter more than the level.

Interpretation. The retreat is not a verdict on demand; it is a verdict on *business model*. Capital-heavy marketplaces with thin margins and high customer-acquisition costs underperformed. What is being funded now is infrastructure-like, B2B, and often government- or enterprise-facing: storage and collateralised credit, AI underwriting, precision inputs, and biomanufacturing. Public capital — BIRAC, BioE3, the Accelerator Fund — is filling the early-stage gap private VCs vacated.

5. Outlook: Five Scenarios to 2031

The following are analytic scenarios, not forecasts. Each is stated with the condition on which it depends.

Vector	Expectation to 2031	Conditional on
Value migrates post-farm	Market linkage — storage, logistics, financing — becomes the dominant value pool (~45% of agritech value by 2030)	Grain-storage plan execution at PACS level
AI becomes the fastest sub-sector	~\$0.9B → ~\$5.6B; concentrated in yield forecasting, credit underwriting, insurance, price discovery	AgriStack reaching usable API maturity
Smart protein infects	~\$42M → ~\$4.2B; India positions as low-cost biomanufacturing hub	BioE3 hubs commissioned; FSSAI pathway clarity; input localisation
Consolidation, not proliferation	Startup count plateaus; survivors are full-stack or infrastructure-like; more M&A than IPO	Continued funding discipline
Public capital leads, private follows	BIRAC/DBT remain top early-stage backers; private capital re-enters at growth stage once unit economics prove out	Demonstrated exits

6. Risks to the Thesis

- **Climate.** Monsoon dependence remains the largest uninsured exposure; heat events in Feb–Mar threaten wheat.
- **Fiscal.** Agriculture receives ~2.9% of the Union Budget while employing ~46% of workers; a subsidy-heavy mix (input support over R&D and income support) constrains long-run productivity.
- **Execution.** Storage and biofoundry build-outs are multi-year capital projects with well-documented slippage risk.
- **Adoption.** ~1% technology penetration and a persistent digital-trust gap mean hybrid physical-plus-digital models remain mandatory.

7. Implications for Advisors and Investors

- **Underwrite infrastructure, not apps.** The defensible moats are storage, collateral, data and distribution — not point solutions.

- **Follow the state.** With BIRAC and DBT anchoring early-stage risk, co-investment and grant-leveraged structures materially de-risk entry.
- **Localisation is the arbitrage.** ~90% input import dependence in alternative protein is a five-year build opportunity in fractionation, fermentation capacity and food-grade media.
- **Diligence the denominator.** Market-size claims differ by an order of magnitude; insist on scope definitions before sizing any opportunity.

METHODOLOGY & SOURCES

Compiled from public sources: Ministry of Agriculture & Farmers' Welfare and PIB (production estimates); Union Cabinet / PMIndia (PMGKAY); Union Budget 2025–26 and PRS India (missions, KCC, allocations); ICRIER and EPW (budget analysis); DBT / BioE3 (bioeconomy, biofoundries); GFI India × Deloitte (smart protein); Inc42 × StarAgri, Tracxn, Entrackr, Decentro (agritech market and funding); NABCONS / MoFPI (post-harvest losses); FCI (storage).

Figures are indicative and dated; definitions differ across sources, so comparisons are directional rather than like-for-like. Scenarios in Section 5 are analytic, not forecasts. This is independent analysis only — no proprietary, client-confidential, or research intellectual property. Not investment advice.

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