

2. Digitalizing India's Dairy Sector – Economy

India is increasingly using digital tools to enhance productivity, transparency, and support for farmers in Dairy Sector

Digitalising India's Dairy Sector – An Expanded Analysis

Background and Context

India is the world's largest milk producer, contributing around 25% of global milk output, reflecting the scale and strategic importance of the dairy sector. The sector supports over 8 crore rural households, largely small and marginal farmers, making it a critical pillar of rural livelihoods, nutrition security, and inclusive growth. Traditionally, India's dairy ecosystem suffered from –

1. Fragmented data systems
2. Manual record-keeping
3. Leakages in procurement and payments
4. Limited traceability and quality assurance

Digitalisation aims to address these structural inefficiencies by integrating technology, cooperatives, and governance frameworks.

Institutional Leadership and Governance Framework

The transformation is spearheaded by the National Dairy Development Board (NDDB), leveraging India's cooperative model.

NDDB acts as –

1. A technology integrator
2. A capacity-building agency
3. A national data custodian for the dairy value chain

Implementation is aligned with national priorities such as Digital India, rural digitisation, and financial inclusion. Key collaboration with the Department of Animal Husbandry and Dairying (DAHD) ensures policy coherence and nationwide rollout.

Major Digital Initiatives in the Dairy Sector

National Digital Livestock Mission (NDLM) – Bharat Pashudhan Ecosystem

NDLM represents a paradigm shift from fragmented livestock records to a unified national digital architecture.

Core features –

1. Creation of "Bharat Pashudhan", a comprehensive digital livestock ecosystem.
2. Digital recording of –
 1. Breeding history
 2. Artificial insemination
 3. Vaccination schedules
 4. Disease diagnosis and treatment

Pashu Aadhar (12-digit unique ID) – Enables individual animal traceability across its lifecycle. Over 35.68 crore livestock IDs issued by November 2025, reflecting massive scale.

Farmer access – Via 1962 mobile app and toll-free helpline, improving last-mile service delivery.

Facilitates access to veterinary care, insurance, and government schemes.

Significance – Enhances animal productivity, disease surveillance, and genetic improvement programmes.

Automatic Milk Collection System (AMCS)

Digitises milk procurement at Dairy Cooperative Societies (DCS).

Functional components -

Automated measurement of -

1. Quantity
2. Fat and SNF (quality parameters)

Instant digital payment to farmers' bank accounts.

Benefits -

1. Eliminates human discretion and malpractices.
2. Improves farmer trust and income predictability.

Current coverage -

1. Operational in 12 States/UTs.
2. Covers 26,000+ societies, 17.3 lakh farmers, and 54 milk unions.

Strategic value - Provides real-time procurement data for planning and price stabilisation.

NDDB Dairy ERP (NDERP)

A customised, web-based ERP solution tailored for dairy and edible oil cooperatives.

Covers end-to-end operations -

1. Procurement
2. Processing
3. Inventory
4. Finance and accounting
5. Sales and distribution

Significance -

1. Enhances operational efficiency, cost control, and managerial decision-making.
2. Strengthens institutional capacity of cooperatives.

Semen Station Management System (SSMS)

A specialised digital platform for scientific breeding and genetic improvement.

Core functions -

1. Bull lifecycle and pedigree management.
2. Frozen Semen Dose (FSD) production tracking.
3. Quality assurance as per Minimum Standard Protocols (MSP) and Standard Operating Procedures (SOPs).

Integrated with -

INSPRM – national semen production portal.

INAPH – field-level animal productivity and health database.

Developed under National Dairy Plan I (NDP-I) with World Bank support.

Impact - Improves conception rates, genetic quality, and long-term milk productivity.

Internet-based Dairy Information System (i-DIS)

A national data aggregation and analytics platform for the dairy sector. Participating entities include -

1. 198 milk unions
2. 29 dairies
3. 54 cattle-feed plants
4. 15 federations

Functions -

1. Tracks milk procurement, sales, production, and input supply.
2. Enables benchmarking and performance comparison.

Policy relevance – Supports evidence-based planning, pricing decisions, and national dairy policy formulation.

Milk Route Optimisation Using GIS

Application of Geographic Information Systems (GIS) to logistics planning.

Key outcomes –

1. Reduced transportation distances.
2. Lower fuel consumption and operational costs.
3. Improved delivery timelines and milk freshness.

Pilot regions –

1. Vidarbha–Marathwada
2. Varanasi
3. West Assam
4. Jharkhand
5. Indore

Broader significance – Enhances environmental sustainability by lowering carbon emissions.

Technological Significance of Digitalisation

Integration of –

1. AI for predictive health analytics.
2. IoT sensors for cattle health and milk quality monitoring.
3. Blockchain for end-to-end traceability and export credibility.
4. Mobile platforms for farmer services and grievance redressal.

Outcomes – Strengthened food safety and consumer trust. Enhanced export readiness and compliance with global standards.

Key Challenges in Digitalising the Dairy Sector

Structural and Social Constraints

1. Dominance of smallholder farmers complicates standardisation.
2. Low digital literacy limits effective utilisation of platforms.
3. Resistance to change from traditional practices.

Infrastructure Bottlenecks

Inadequate –

1. Internet connectivity in rural areas.
2. Cold chain infrastructure.
3. Reliable electricity supply.

Digital divide between regions and states.

Financial Constraints

High initial costs of –

1. IoT devices
2. Sensors
3. Automated systems

Limited affordability for marginal and landless dairy farmers.

Conclusion and Way Forward

India's dairy sector is witnessing a systemic digital transformation, not merely technological adoption. NDDB-led initiatives demonstrate how cooperative institutions can leverage digital public infrastructure for inclusive growth.

Way forward strategies -

1. Strengthen rural digital infrastructure under Digital India.
2. Expand digital literacy and farmer training programmes.
3. Promote public-private partnerships to reduce technology costs.
4. Integrate dairy digital platforms with broader agri-stack initiatives.

Overall impact -

1. Creation of a transparent, efficient, traceable, and globally competitive dairy value chain.
2. Empowerment of rural households, particularly women, and enhanced food and nutritional security.

Source - <https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=156873&ModuleId=3®=3&lang=2>

