

AGRICULTURE SUMMIT

GeoSmart India- 2025

Theme- Farmers First: Ensuring Farmer-Centric Digital Transformation

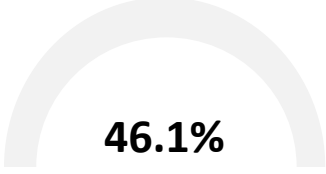
3-4 December 2025, Bharat Mandapam, New Delhi

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Consulting Division, Geospatial World



India's Agriculture Scenario – Where we stand

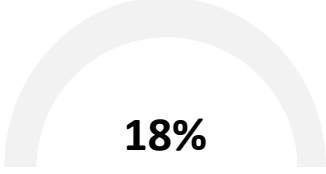
“Agriculture remains the backbone of India's economy, livelihood, and food security.”



46.1%

As of 2023-24, about 46.1% of India's workforce is employed in agriculture.

High Employment Dependency



18%

Nearly half the workforce being in agriculture, the sector contributes about 18% of GDP.

GDP Contribution



65%

With over 65% of India's population living in rural areas are dependent on farming.

Rural Dependency on Farming



8th Largest Agricultural Exporter

Agricultural exports were valued at approximately \$51 billion, representing about 2.2% of the global market share.



Vulnerable to External Factors

Highly dependent on the monsoon, climate, soil and water conditions, making it vulnerable and risky for farmers.



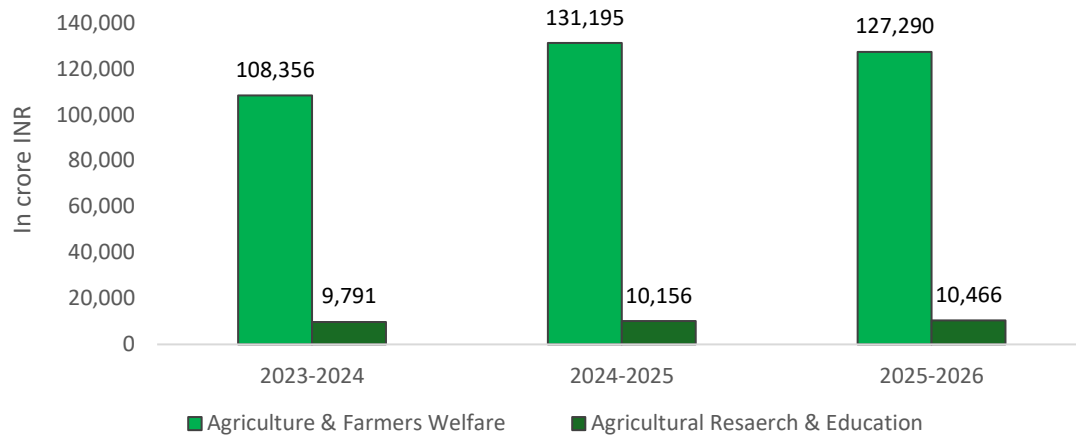
Technology Transformation

Huge potential to improve agriculture through better practices, mechanization, and data-driven technologies.

Agriculture's Dominance in India's Economy

Accelerating Shift towards Space and Geospatial Technology

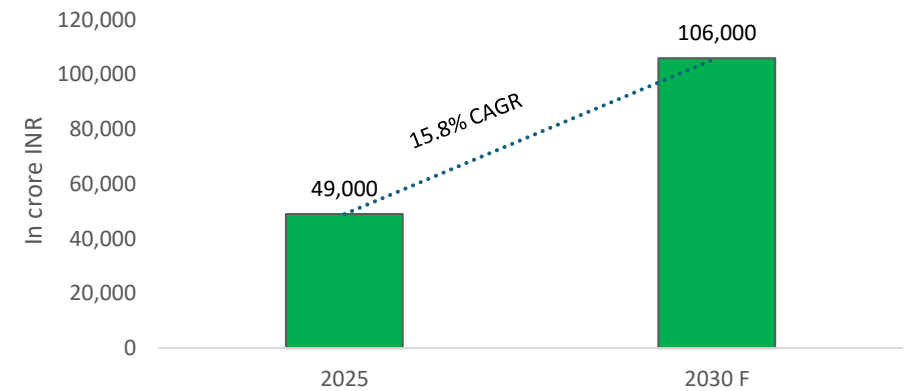
Budget allocation towards Ministry of Agriculture and Farmers' Welfare



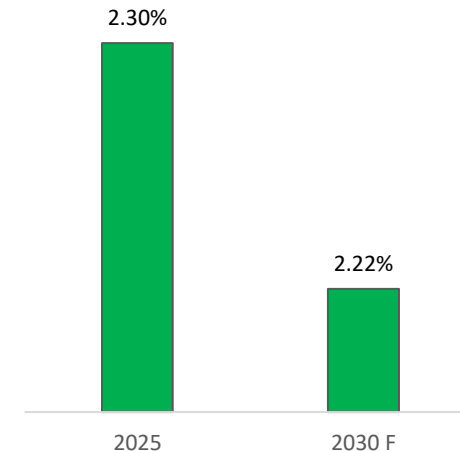
- In 2025-26, Rs 1,37,757 crore has been allocated to the Ministry (2.7% of the union budget).
- The allocation towards the Ministry is estimated to decrease by 2.5% over the revised estimates of 2024-25.
- According to the revised estimates of 2024-25, the expenditure of the Ministry has increased by 6.8% over the budget estimate.

Note: Data source- Expenditure Budget, Ministry of Agriculture and Farmers Welfare, Union Budget 2025-26; PRS.

Agriculture Sector Market Size in India's Space and Geospatial Technology



Sectoral Market Share



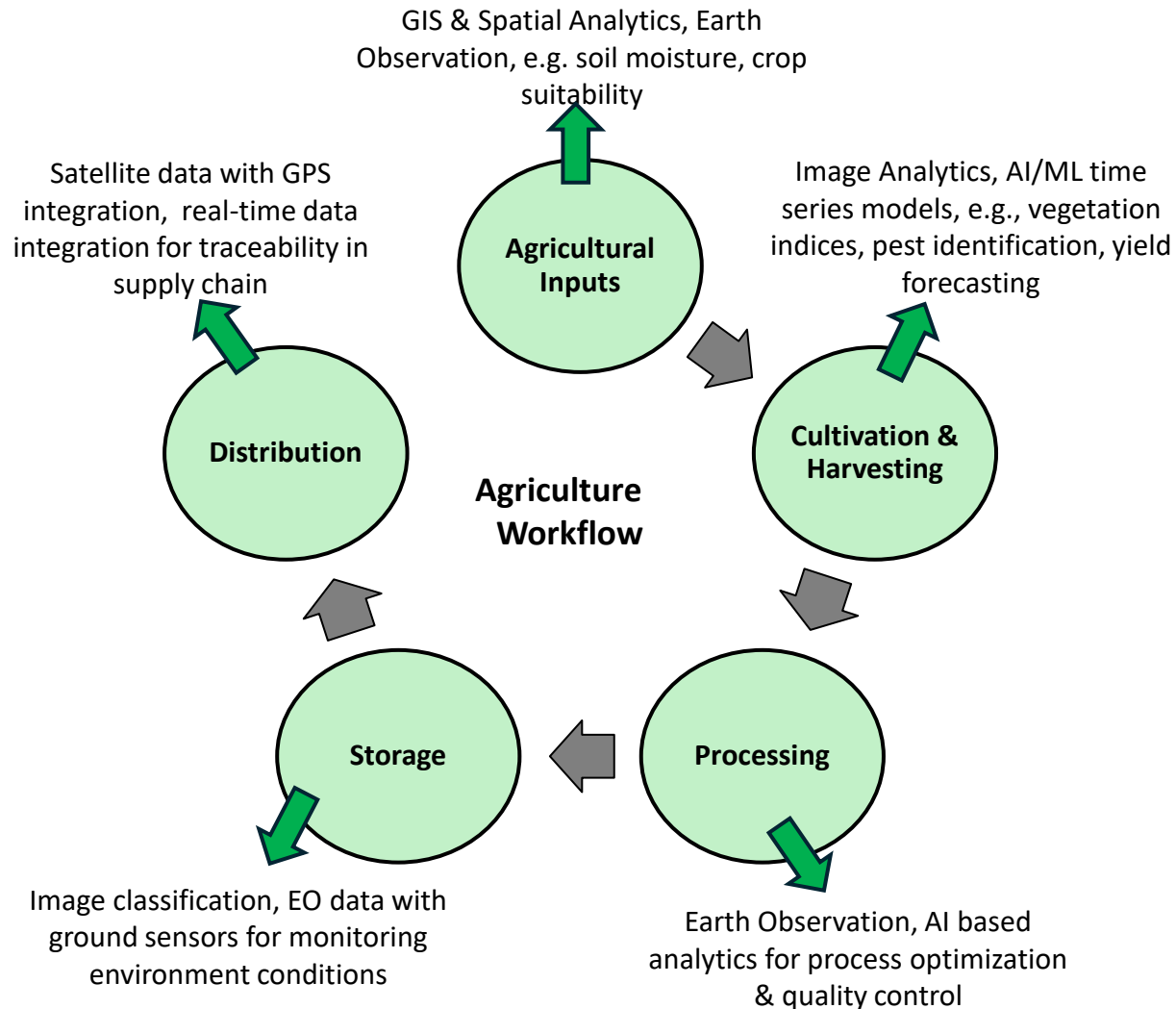
- India's agri-geospatial market is projected to grow from ₹49,000 Cr in 2025 to ₹1,06,000 Cr by 2030.
- The sector accounts for 2.3% of the total space & geospatial market in 2025, slightly moderating to 2.2% by 2030.

Note: Data source- GW Consulting Analysis

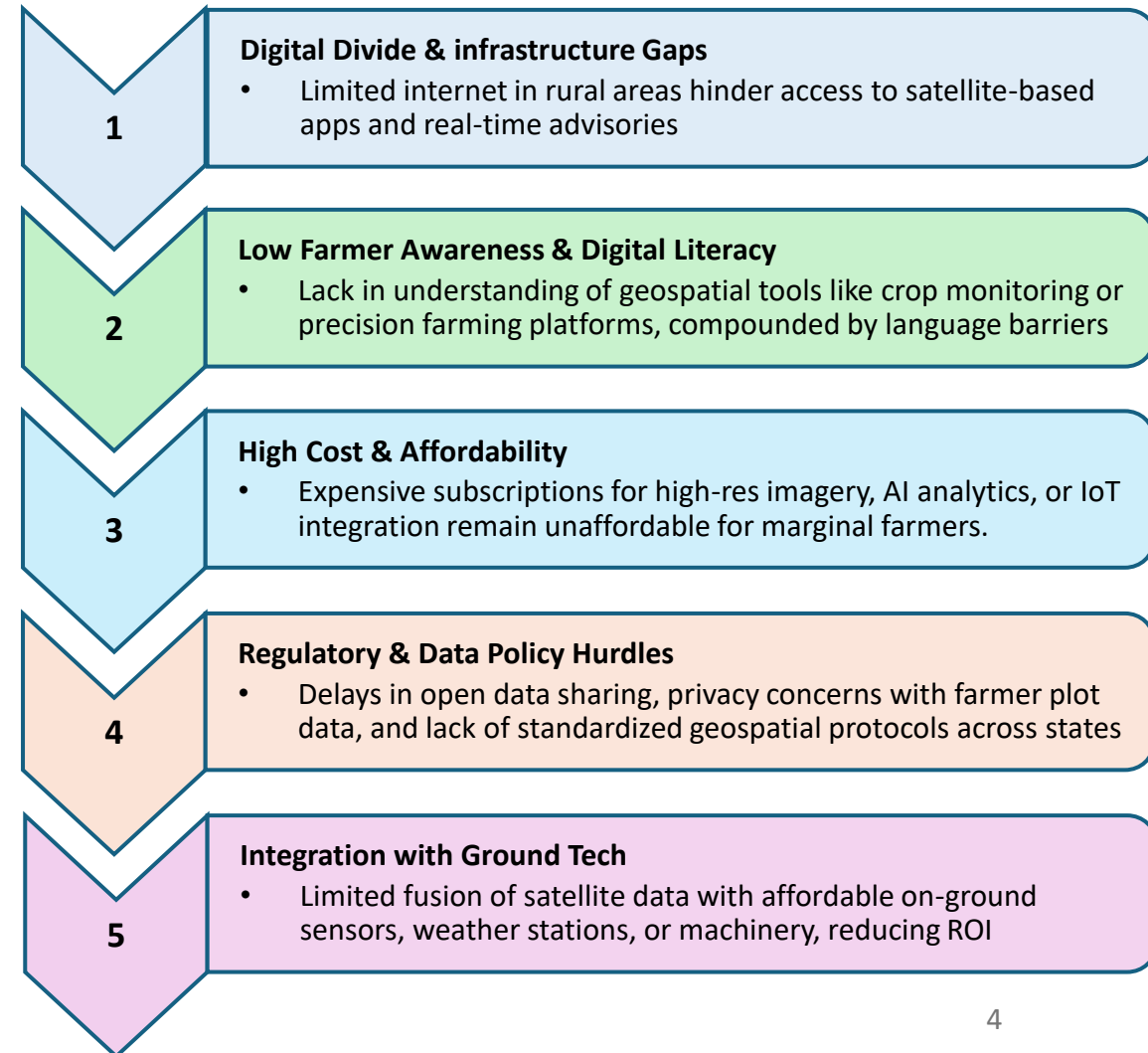
From Market Potential to On-Ground Reality

Space and Geospatial Technology Adaptations and Challenges

Space and Geospatial Technology Adaptation in Agriculture Sector



Key Challenges in Technology Adaptation in Agriculture Sector



From Challenges to Real Impact

Space & Geospatial Technology Success Stories in Indian Agriculture

Case Study 1: Augmenting Crop Yield through Drone Imageries and Artificial Intelligence.

Project details: Bayer India and Asteria collaborated to enhance their seed development and production processes using drone technology. Asteria's drones captured farm and crop imagery, processed with AI/ML algorithms, provided fast, accurate, and transparent insights for decision-making.

Challenges:

- Integrating drone technology and AI/ML algorithms for AgriTech.
- Ensuring high accuracy in field boundary measurement, plant stand counts, crop growth evaluation, and tassel detection.

Solutions:

- UAVs were flown over acres of field.
- AI/ML algorithms were applied for data processing and analysis.
- The use of drones and Artificial Intelligence enhanced seed trials, hybrid selection, and seed variety quality assessment.
- Through drone imagery and plot-level accurate data, non-performing hybrid seeds could be eliminated from further study while bringing focus on the performing hybrids.



Technology Used

GIS and Spatial Analytics

- GIS
- Location Intelligence
- Map Content
- Spatial Analytics

Earth Observation

- Satellite - Downstream/VAS

Frontier Technologies

- AI/ML/DL



Sector Focus

Natural Resources and Environment

- Agriculture & Irrigation



Sustainable Development Goals



Case Study 2: Enhancing Farmland Transparency through Satellite Data Analysis for Paddy Crop Validation in Odisha

Project details: The Food Supplies and Consumer Welfare Department of Odisha faced a significant challenge in ensuring accurate food support distribution to its poorest citizens. To address this, a Geo-ICT solution was implemented using high-resolution satellite data from PlanetScope, integrated with land cadaster information.

Challenges:

- The primary challenge was the reliance on self-reported data by farmers, which often led to inflated or false claims of cultivated land.
- Encompassing over 50,000 villages and 1.5 million farmers, while operating under tight budget constraints.

Solutions:

- High-resolution satellite images were collected using PlanetScope's 2.4m Mx sensors.
- Cadastral mapping was done using GIS and analytics and farmer-reported croplands were mapped.
- AI-ML was used to identify paddy crops at the individual farmland level.
- Plots without paddy crops were flagged and suspected plots were verified using a Geo-ICT platform (Web GIS + Mobile GIS).



Technology Used

- GIS and Spatial Analytics**
 - GIS
 - Location Intelligence
 - Map Content
 - Spatial Analytics
- Earth Observation**
 - Satellite - Downstream/VAS
- Frontier Technologies**
 - AI/ML/DL



Sector Focus

- National Mapping**
 - Land & Cadastre Agency
- Natural Resources and Environment**
 - Agriculture & Irrigation



Sustainable Development Goals



Case Study 3: LiDAR-based Mapping for Restoring Citrus Groves under the National Resources Conservation Service Program

Project details: The Natural Resources Conservation Service (NRCS) requires precise geospatial data to design conservation and restoration strategies. Axim Geospatial provided these services for NRCS, gathering data such as property boundaries, easements, infrastructure, elevation, and aerial imagery. Axim (now NV5) supported restoration and conservation efforts spanning over 1000 acres of citrus farms in two remote and complex sites in southern Florida.

Challenges:

- The locations are vast and isolated, characterized by challenging topography and abundant vegetation.
- Long rows of citrus groves are cultivated alongside intricate irrigation systems and infrastructure.
- The areas are densely forested, with submerged regions and the presence of threatening species, such as alligators.

Solutions:

- Axim conducted site visits and preliminary courthouse research. In addition to gathering data for calculations, drawings, and descriptions, field crews conducted boundary and topographic surveys, installing over 500 survey monuments and witness posts with signage.
- Additionally, cross-sections of the ditches and dikes commonly found at the sites were obtained. Details regarding drainage structures, such as culverts, were also gathered, including pipe dimensions, length, composition, condition, and photographic documentation.
- Digital elevation models (DEMs) derived from LiDAR data were linked to benchmarks to generate topographic data capable of supporting one-foot contours.



Technology Used

GIS and Spatial Analytics

- GIS
- Map Content
- Spatial Analytics

Earth Observation

- Aircrafts/Flights

Sensors and Scanners

- LiDAR



Sector Focus

Natural Resources and Environment

- Agriculture & Irrigation

Government – Led Acceleration

Programs Driving Agriculture-Geospatial Adoption



Income & Finance Support

PM-KISAN: Provides ₹6,000 annual direct benefit transfer to over 11 crore eligible farmers, reaching ₹3 lakh crore disbursed to date for income stability.

PMFBY (Pradhan Mantri Fasal Bima Yojana): Crop insurance scheme covering 5 crore farmers annually, with premiums subsidized up to 90% for rainfed areas to manage yield risks.



Digital & Geospatial Infrastructure

Digital Agriculture Mission (2024): ₹2,817 crore outlay for AgriStack, Krishi DSS, soil digital maps, and 7+ crore Farmer IDs to enable data-driven advisories and DBT.

Bhuvan Krishi & FASAL: ISRO platforms for crop acreage estimation, health monitoring, drought assessment using satellite data integrated with ground surveys.



Market & Infrastructure Linkages

e-NAM (National Agriculture Market): Digital platform integrating 1,300+ mandis for transparent price discovery and interstate trade, serving 1.7 crore+ farmers.

Agriculture Infrastructure Fund: ₹1 lakh crore credit guarantee for post-harvest storage, processing, and logistics to cut losses estimated at 10-20%.

Summit Vision and Expected Outcomes

- **Promote a farmer-first digital agriculture ecosystem** where geospatial and space technologies directly improve decisions, resilience and incomes for India's farmers.
- **Build consensus on a National Agri Spatial Data Infrastructure (Agri-SDI)** to enable standardized, interoperable agri data across schemes and stakeholders.
- Showcase scalable, **real-world implementations of precision farming**, satellite crop monitoring and digital advisories that are ready to move from pilots to large-scale deployment.
- **Strengthen convergence between flagship programs** (Digital Agriculture Mission, PM-KISAN, PMFBY, e-NAM, Digital Crop Survey, Farmer FIRST, etc.) and geospatial platforms like Krishi DSS, Bhuvan Krishi and FASAL.
- **Enable practical pathways for inclusive agri-finance**, insurance and carbon/climate markets using geo-enabled DBT, risk assessment and value-chain mapping.



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