GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 4168

TO BE ANSWERED ON WEDNESDAY, MARCH 18, 2026

SPACE-BASED INITIATIVES FOR AGRICULTURE

4168. SHRI TATKARE SUNIL DATTATREY:

SHRI JAGDAMBIKA PAL:

SHRI ANURAG SINGH THAKUR:

Will the PRIME MINISTER be pleased to state:

(a) the details of major initiatives and programmes undertaken by the Department of Space to support and improve the agriculture sector in the country along with their objectives, timelines, financial outlays and current status of implementation;

(b) whether space-based technologies, satellite data services and decision-support systems have been developed or deployed for crop monitoring, yield estimation, weather advisory and resource management and if so, the details thereof along with the manner in which these integrated with Central and State agencies;

(c) the measurable and expected impact of these initiatives/interventions on crop productivity, farmers' income, agricultural planning and forecasting and rural development; and

(d) whether any evaluation studies or impact assessments have been conducted in this regard and if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH):

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(a) The ISRO/DoS has undertaken several space-based programmes to support the agriculture sector. Major initiatives include the Forecasting Agricultural output using Space, Agrometeorology and Land-based observations (FASAL) programme, National Agricultural Drought Assessment and Monitoring System (NADAMS), Coordinated Horticulture Assessment and Management using Geoinformatics (CHAMAN) programme, Space technology Utilization for Food security AgricuLtural Assessment and Monitoring (SUFALAM) project, and various collaborative programmes with State and other agencies.

Details of some of the recent projects are given in Annexure-I.

(b) ISRO/DoS has developed and contributed in development of techniques & tools for crop monitoring, yield estimation and resources management. Details of recent techniques & tools developed are as follows:

- **Crop monitoring: An AI-based crop mapping tool named 'SASYA' has been developed for C-band SAR from EOS-04 (RISAT-1A) and integrated into BHOONIDHI geo-portal of NRSC/ISRO. This tool**

has been made open to operational agencies, including MNCFC, DoA&FW.

- **Agricultural productivity and Yield Estimation: ISRO/DoS has developed a Smart sampling technique for improving the Crop Cutting Experiment (CCE) locations to improve the crop yield estimation under Yield Estimation System based on Technology (YES-TECH) initiative of PMFBY. Further, ISRO/DoS has contributed in development of crop yield simulation models including semi-physical model and machine learning based model to reduce the dependence on manual CCEs in the process of crop insurance payouts under PMFBY. These techniques are transferred to MNCFC, DoA&FW for operational implementation.**
- **Yield Estimation: ISRO/DoS has developed an automated geospatial crop estimation system (GeoCrEST) for crop yield estimation. The GeoCrEST system is operationally implemented on VEDAS geoportal of ISRO for the utilisation by MoA&FW.**
- **Drought Assessment and Monitoring: ISRO/DoS in collaboration with the MoA&FW and State agencies has developed National Agricultural Drought Assessment and Monitoring System (NADAMS). The drought assessment and monitoring system is transferred to MNCFC, DoA&FW for operational implementation.**
- **Satellite Data-service: As per Indian Space Policy-2023 the remote sensing data from Indian satellite missions is made open and free for all government users. Further, remote sensing data coarser than 5m spatial resolution is provided free and open to all users.**

ISRO/DoS is providing the free services of C-band SAR data of EOS-04 missions to MNCFC, DoA&FW for operational crop mapping. Further, high-resolution satellite imagery for 13 States were provided, as part of the Agristack Project, to strengthen digital infrastructure in agriculture.

- **Natural Resource Management: As part of the National Agricultural Land Use Mapping programme, annual (1:250K) and quinquennial (1:50K) and decadal (1:10K) land cover and land use datasets for land use planning, food security, and environmental assessments are being generated by ISRO/DoS to support the natural resource management activities in the country.**
- **Value-added agro-meteorological products: ISRO/DoS operationally generates and disseminates through VEDAS geoportal (vedas.sac.gov.in), seven value-added agro-meteorological products to six Agro-Meteorological Field Units (AMFUs) covering more than 85 districts and 500 blocks under Gramin Krishi Mausam Seva (GKMS).**

(c) The use of space-based agricultural monitoring systems has shown positive impact in terms of:

- **Improved estimation of crop acreage and production**
- **Identification of suitable areas for crop and horticulture expansion**
- **Agriculture drought monitoring for timely reporting**
- **Improved risk assessment and claim settlement in crop insurance through objective satellite-based methodologies.**

- **Space technology intervention in YES-TECH of PMFBY led to decrease in premium rate from 17% to 12%. Moreover, the claims of more number of farmers were settled using space technology blend than with only CCEs, especially under natural calamities. The YES-TECH system also brought transparency in claim settlement through evidence-based decision making.**

(d) Evaluation and validation studies are periodically carried out for various space-based agricultural applications in collaboration with the MoA&FW, State Governments, and Research Institutions. These include accuracy assessments of crop acreage and validation of satellite-based yield estimates.

A socio-economic survey in Parbhani, Maharashtra conducted by Space Applications Centre, ISRO for Kharif season of 2022-23 showed the usage of satellite products in the advisory improved the productivity soybean and cotton farms by 2-5% with reduction of input cost by 5-10%.

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Annexure-I

ANNEXURE REFERRED TO IN REPLY TO PART (a) OF LOK SABHA UNSTARRED QUESTION NO. 4168 TO BE ANSWERED ON 18.03.2026

SPACE-BASED INITIATIVES FOR AGRICULTURE

Project Information		Status
Title:	**Crop Intensification**	Completed
Objectives:	Mapping rice fallow in six eastern states	
Timeline:	2016-19	
Financial Outlay:	112 Lakhs funded by MoAFW	
Title:	**CHAMAN (Coordinated Horticulture Assessment and Management using Geoinformatics)**	Completed
Objectives:	Satellite based estimation of area of major horticultural crops in selected districts.	
Timeline:	Phase-I (2012–2016)	
Financial Outlay:	Implemented jointly with Ministry of Agriculture & Farmers Welfare under programme funding.	
Title:	**Bioenergy from Crop Residues (Remote Sensing Based Assessment)**	Completed
Objectives:	Assessment of crop residue generation and spatial availability for bioenergy applications using satellite data and geospatial modelling.	
Timeline:	2018-2021	
Financial Outlay:	21 Lakhs, Funded by DST	
Title:	**Crop Insurance Decision Support System – Odisha**	Currently operational at Odisha.
Objectives:	Development of geospatial decision support tools for crop insurance including crop area mapping, smart sampling for CCEs and yield estimation support using satellite data.	
Timeline:	2018–2020	
Financial Outlay:	Implemented through collaborative project funding with Government of Odisha.	
Title:	**Crop Insurance Support– West Bengal**	Operational in West Bengal under Bango Sasya Beema Yojna
Objectives:	Use of remote sensing and geospatial analytics for crop area mapping, yield estimation support and composite yield index development to strengthen crop insurance implementation.	
Timeline:	2017-2021	
Financial Outlay:	Supported through collaborative project with Government of West Bengal.	

Project Information		Status
Title:	**MahaAgriTech Project (Maharashtra)**	Operational decision support system developed; satellite-based crop information being generated
Objectives:	Development of geospatial platform for agricultural monitoring including crop mapping, crop condition monitoring, yield assessment and disaster impact assessment using satellite data and analytics.	
Timeline:	2021- Ongoing.	
Financial Outlay:	Implemented through collaborative project funding with Government of Maharashtra	
Title:	**MP-AgriGIS (Madhya Pradesh)**	System under operational implementation with generation of crop maps, sown area progression and analytical products for the state.
Objectives:	Development of a comprehensive geospatial agricultural information system including crop mapping, sown area monitoring, yield estimation and digital agriculture support for state-level planning.	
Timeline:	2023- Ongoing	
Financial Outlay:	Implemented through collaborative project funding with Government of Madhya Pradesh.	
Title:	**Space technology Utilization for Food security AgricuLtural Assessment and Monitoring (SUFALAM Phase-II)**	Ongoing
Objectives:	Crop Production and Price Forecasting, Precision Agriculture, Value-Added Decision Support Systems for advisory and drought assessment	
Timeline:	December 2024 to November 2027	
Financial Outlay:	15 Cr., Funded by DoS	
Title:	**India Potato Crop Monitoring (IPCM)**	Ongoing
Objectives:	To develop a geospatial India Potato Crop Monitoring System with a dashboard for automated potato yield estimation using the remote sensing and in-situ data.	
Timeline:	2026 - March 2028	
Financial Outlay:	258 Lakhs, Funded by MoA&FW	
Title:	**National System for Geospatial Crop Yield Estimation using Satellite Remote Sensing based Semi-Physical Model (FASAL 2.0)**	Ongoing
Objectives:	To develop a geospatial yield estimation system with a dashboard for automated crop yield estimation using the remote sensing based semi-physical model. Total number of targeted crops are 10.	
Timeline:	2024- March 2029	

Project Information		Status
Financial Outlay:	340.52 Lakhs funded by MoA&FW	
Title: Objectives: Timeline: Financial Outlay:	**Applications of Space Techniques for Agricultural Assessment in North Eastern Region (ASAAN)** Satellite-based crop acreage estimation and cropping pattern analysis, crop site-suitability and fallow area mapping. 2022–2025 260 Lakhs, Funded by MoDONER/NEC.	Completed: winter Rice acreage in NER estimated during 2022, 2023 & 2024
Title: Objectives: Timeline: Financial Outlay:	**Space-based Support for Integrated Development of Horticulture in NER (SSDIH)** Identification of suitable areas for expansion of horticultural crops (across NER), site suitability of post-harvest infrastructure (priority districts), geo-tagging of horticultural infrastructure (priority districts) and acreage estimation (priority crops and districts). 2022–2025 240 Lakhs, Funded by MDoNER/NEC	Completed: suitability analysis completed for 52 districts in NER.