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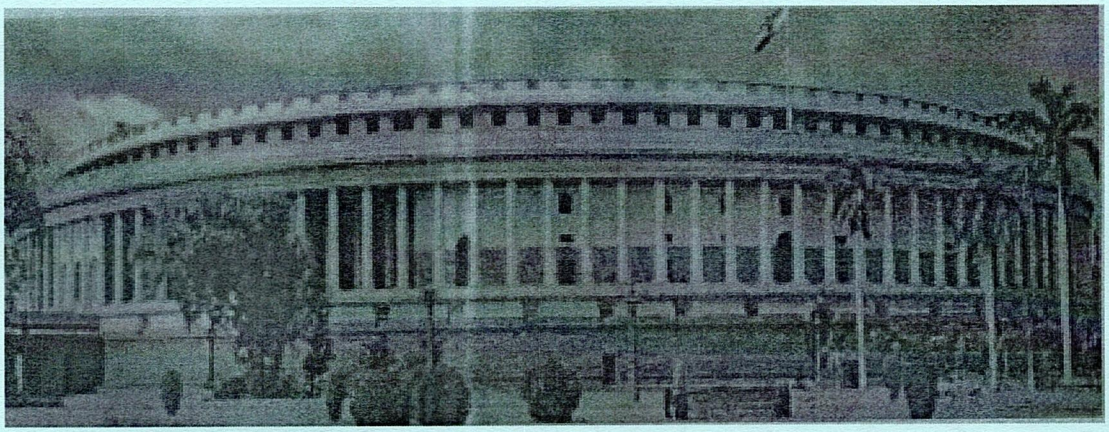
GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

"SPACE IN PARLIAMENT"



MONSOON SESSION OF PARLIAMENT 2020
(SEPTEMBER 2020)

COMPILATION OF REPLIES GIVEN IN PARLIAMENT DURING 2020

Government of India
Department of Space
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PARLIAMENT QUESTIONS – MONSOON SESSION OF PARLIAMENT 2020

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 636
TO BE ANSWERED ON WEDNESDAY, SEPTEMBER 16, 2020

PRIVATE SECTOR PARTICIPATION IN SPACE

636. SHRI MAGUNTA SREENIVASULU REDDY:

SHRI KURUVA GORANTLA MADHAV:

DR. BEESETTI VENKATA SATYAVATHI:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has approved certain reforms to boost private sector participation in Space;

(b) if so, the details thereof;

(c) whether the Government is aware of the concerns of the members of the scientific community towards such a move and if so, the details thereof;

(d) whether any steps are being taken to alleviate the concerns and if so; the details thereof;

(e) the details of the role of New Space India Limited (NSIL) in the post reformed space sector; and

(f) the number of private companies that partner ISRO and a broad area/ sector-wise break up thereof as on date?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) & (b)

Yes Sir, Government has created Indian National Space, Promotion & Authorisation Centre (INSPACe), under Department of Space to encourage, promote and hand hold the private sector for their participation in Space Sector. Private players will also be able to use ISRO infrastructure through INSPACe.

(c) & (d)

The decision of Government was conveyed to the Members of the scientific community elaborately, and scientific community welcomed the Government decision.

(e) **The role of NSIL in the post reformed space sector would be to build launch vehicles, providing launch services, build satellites, providing space based services, technology transfers, etc.**

(f) **There are more than 500 companies that partner with ISRO in carrying out space activities. The broad areas/sectors covered by private companies are; providing materials, mechanical fabrication, electronic fabrication, system development, integration, etc.**

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 640

TO BE ANSWERED ON WEDNESDAY, SEPTEMBER 16, 2020

SPACE TECHNOLOGY

640. SHRI P.P. CHAUDHARY:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government is planning to leverage India's outstanding space technology capabilities for expanding its diplomatic initiatives of assisting other countries in the world; commercially non-commercially; and

(b) if so, the details thereof and the efforts made during the last three years, country-wise, year-wise and if not, the reasons therefor?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Yes, Sir.

(b) During the last three-year period India has shared space expertise through signing of cooperative documents, training on nano satellite building and training on space technology applications. The details are given below:

Non- Commercial Activities:-

Cooperative documents signed with	Training on nano satellite building	Training on space technology applications
Year: 2017 (September – December)		
USA, Japan, Afghanistan.	NIL	Bangladesh, Bhutan, Egypt, Ethiopia, Fiji, Indonesia, Kazakhstan, Kenya, Kyrgyzstan, Lao PDR, Malaysia, Malawi, Mauritius, Mongolia, Myanmar, Namibia, Nepal, Nigeria, Philippines, Sierra Leonean, Singapore, South Sudan, Sri Lanka, Tajikistan, Tanzania, Uganda, Uzbekistan, Vietnam, Zimbabwe.
Year: 2018		
Algeria, Brazil, Brunei Darussalam, Europe (EC), France, Indonesia, Israel, Japan, Morocco, Oman, Russia, Sao Tome and Principe, Singapore, South Africa, Tajikistan, Uzbekistan, Vietnam.	NIL	Bangladesh, Bhutan, Botswana, Egypt, Ethiopia, Kazakhstan, Kenya, Kyrgyzstan, Lao PDR, Lesotho, Malaysia, Maldives, Mauritius, Mongolia, Mozambique, Myanmar, Namibia, Nepal, Niger, Nigeria, Philippines, Peru, Singapore, , Sri Lanka, Syria, Tajikistan, Tanzania, Thailand, Tunisia, Uzbekistan, Venezuela,Vietnam.

Year: 2019		
Bahrain, Bhutan, Bolivia, Europe (ESA and EUMETSAT), Finland, France, Germany, Japan, Mongolia, Netherlands, South Korea, Tunisia, United States.	Algeria, Argentina, Azerbaijan, Bahrain, Bangladesh, Belarus, Bhutan, Bolivia, Brazil, Brunei Darussalam, Chile, Colombia, Egypt, Indonesia, Kazakhstan, Kenya, Malaysia, Mauritius, Mexico, Mongolia, Morocco, Myanmar, Nepal, Nigeria, Oman, Panama, Peru, Portugal, Republic of Korea, Sri Lanka, Thailand, Tunisia, Vietnam.	Algeria, Bangladesh, Bhutan, Botswana, Cote D'ivoire, Cuba, Democratic Republic of Congo, Egypt, Ethiopia, Ghana, Honduras, Indonesia, Jamaica, Laos, Kazakhstan, Kenya, Kyrgyzstan, Malawi, Maldives, Mauritius, Mongolia, Myanmar, Nepal, Niger, Nigeria, Oman, Philippines, Sri Lanka, Tajikistan, Tanzania, Thailand, Uganda, Uzbekistan, Vietnam, Zimbabwe.
Year: 2020 (till now)		
France, Israel, Japan, Nigeria, United States.	NIL	Angola, Zambia, Zimbabwe, Ethiopia, Indonesia, Kyrgyzstan, Madagascar, Mauritius, Niger, Peru, Sierra Leone, Sri Lanka, Syria, Tanzania, Trinidad &

		Tobago, Democratic Republic of Congo.

Commercial Activities:-

International Customer Satellites launched on-board PSLV during 2017-19		
Year	No. of International Customer Satellites launched	Countries to which satellite belongs
2017	130	Austria; Belgium; Chile; Czech Republic; Finland; France; Germany; Israel; Italy; Japan; Kazakhstan; Latvia; Lithuania; The Netherlands; Slovakia; UAE; UK; USA.
2018	60	Australia; Canada; Columbia; Finland; France; Malaysia; The Netherlands; Republic of Korea; Spain; UK; USA.
2019	50	Israel; Italy; Japan; Lithuania; Spain; Switzerland; USA.

In addition, ISRO shared more than 150 Indian Remote Sensing satellite data sets to support more than 50 international disaster events in 18 Countries through various mechanisms including International Charter "Space and Major Disasters". India is also member of COSPAS-SARSAT (Satellite Aided Search and Rescue Programme) which provides operational

services to the users in India and seven neighboring countries (Nepal, Bhutan, Bangladesh, Sri Lanka, Maldives, Seychelles and Tanzania) for the last 23 years. The programme has supported rescue of 83 lives in 19 incidents during 2018 and 2019.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 664

TO BE ANSWERED ON WEDNESDAY, SEPTEMBER 16, 2020

SPACE LAUNCH CENTRE IN TAMIL NADU

664. SHRIMATI KANIMOZHI KARUNANIDHI:

Will the PRIME MINISTER be pleased to state:

(a) the present status of Kulasekarapattinam Space launch centre in Thoothukkudi District of the State of Tamil Nadu;

(b) whether the land acquisition for the project has started; and

(c) if so, the expected timeframe for the completion of the same and further infrastructure building for the space launch centre?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Land acquisition by Government of Tamilnadu is in progress at Madhavankurichi, Padukkapathu and Pallakurichi villages of Thoothukkudi district, Tamilnadu.

(b)

- **As per the request of Department of Space, Government of Tamil Nadu vide GO number 175 dated 09.10.2019 has identified 961.66.90 Hectares (904.24.65 hectares of Patta dry land and**

57.42.25 hectares of Government Poramboke land) in Tiruchendur taluk, Thoothukudi District.

- Out of the above, Land survey completed for 431.87.74 hectares of land and preliminary notification under section 11(1) of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCTLARR act) was issued vide G.O.No.167 dated 30.07.2020.
- Survey works for the balance area is in advanced stage.

(c) It is expected that Government of Tamil Nadu may handover the land within a period of six months.

Normally, on taking over the land, realisation of such infrastructure may take 02 to 03 years time.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 1710
TO BE ANSWERED ON MONDAY, SEPTEMBER 21, 2020

ROCKET LAUNCHING PORT

1710. SHRI P. RAVEENDRANATH KUMAR:

Will the PRIME MINISTER be pleased to state:

(a) the status of setting up of our country's second space rocket launching port by ISRO in Kulasekarapattinam, located in Tamil Nadu;

(b) the details of number of launch pads that are being proposed at the said space port; and

(c) the steps taken by the Union Government to increase India's share in the global space sector market size keeping in view the policy decision by the Union in opening up the space sector to the private sector?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) As per the request of Department of Space, Government of Tamil Nadu has identified 961.66.90 hectares in Thoothukudi district. Land survey is completed for 431.87.74 hectares and preliminary notification has been issued. Survey work for balance area is in advance stage.

(b) At present, one Launch Pad is being proposed at the second launch port at Kulasekarapattinam, Tamil Nadu.

(c) Center's policy decision of opening up of space sector for private players enables them to develop various space qualified subsystems and systems along with building of satellites and launch vehicles. They are also permitted to establish facilities and provide launch services and other space based services. Many of these services and products will definitely find global customers, which will increase India's share in the global space sector market.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 600

TO BE ANSWERED ON THURSDAY, SEPTEMBER 17, 2020

FUNDS FOR SPACE EXPLORATION PROGRAMMES

600. DR. SASMIT PATRA:

Will the PRIME MINISTER be pleased to state:

(a) total funds sanctioned for the space exploration programmes by the country over the past three years; and

(b) total funds expected to be sanctioned for the space exploration programmes in the next one year?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Total funds sanctioned for space exploration programmes during the past three years i.e. 2017-18, 2018-19 and 2019-20 are given below:

Financial Year	Allocation in BE (₹in Crore)
2017-18	188.12
2018-19	230.10
2019-20	285.80

Space exploration has been given special priority in the last six years by the Government. This has resulted in the success of Mars Orbiter Mission, Astrosat and Chandrayaan-2 missions. Vital qualifications tests related to Gaganyaan mission have also been carried out during this period.

(b) An amount of ₹ 265 Crore has been sanctioned in BE 2020-21.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 601

TO BE ANSWERED ON THURSDAY, SEPTEMBER 17, 2020

PRIVATE INITIATIVE IN SPACE EXPLORATION

601. SHRI K J ALPHONS:

Will the PRIME MINISTER be pleased to state:

(a) whether Government would involve private initiative in space exploration;

(b) whether they would be allowed to utilise the infrastructure available with the ISRO; and

(c) whether there is going to be a revenue sharing formula for utilization of Government infrastructure?

ANSWER

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

(a) Yes, Sir. Government would involve and encourage private initiatives in space exploration.

(b) Yes, Sir. They would be allowed to utilize those infrastructure of ISRO which are otherwise not available elsewhere in India.

(c) Yes, Sir. There will be reasonable charges for utilization of Government infrastructure which will be varying depending on the requirement.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 602

TO BE ANSWERED ON THURSDAY, SEPTEMBER 17, 2020

SPACE APPLICATIONS

602. SHRI PRATAP SINGH BAJWA:

Will the PRIME MINISTER be pleased to state:

(a) the total number of advanced sensors available to provide space based information with advanced capability;

(b) the total number of Earth Observation (EO) satellites/communication payloads realised since 2018 till present;

(c) the total percentage of information support for major disaster events;

(d) the total number of value added data products disseminated to users since April 2020 till present, the details thereof; and

(e) total number of satellites launched by ISRO that are no longer operational and currently in orbit?

ANSWER

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

(a) There are 32 earth observation sensors with advanced capabilities, currently in orbit, providing space based information.

(b) Five earth observation satellites and five communication payloads were realised since January, 2018.

(c) Information support was provided for all the major disaster events viz. floods, cyclones and forest fires occurred since January 2020.

(d) About 2,51,000 value added data products were disseminated to users since April 2020. The value added products comprise of geophysical & remote sensing data products derived using the data from meteorological, oceanographic and land remote sensing satellites.

(e) The total number of satellites launched by ISRO that are no longer operational (life ended) and currently in orbit are 47 (26 satellites are in LEO/Low-Earth-Orbit and 21 are in GEO/Geosynchronous-Equatorial-Orbit).

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 603

TO BE ANSWERED ON THURSDAY, SEPTEMBER 17, 2020

PRIVATE SECTOR PARTICIPATION IN SPACE SECTOR

603. SHRI PARIMAL NATHWANI:

Will the PRIME MINISTER be pleased to state:

(a) whether Government has approved certain reforms to boost private sector participation in space sector;

(b) if so, the details thereof;

(c) whether Government is aware of concerns of the Members of the scientific community towards such a move;

(d) if so, whether any steps are being taken to alleviate the concerns;

(e) what will the role of New Space India Limited (NSIL) be in the post reformed space sector and the details thereof; and

(f) the number of private companies that partner the ISRO as on date and a broad area/ sector-wise break up thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) & (b)

Yes, Sir. Government has created Indian National Space, Promotion & Authorisation Centre (INSPACe), under Department of Space to encourage, promote and hand hold the private sector for their participation in Space Sector. Private players will also be able to use ISRO infrastructure through INSPACe.

(c) & (d)

The decision of Government was conveyed to the Members of the scientific community elaborately, and scientific community welcomed the Government decision.

(e) The role of New Space India Limited (NSIL) in the post reformed space sector would be to build launch vehicles, providing launch services, build satellites, providing space based services, technology transfers, etc.

(f) There are more than 500 companies that partner with ISRO in carrying out space activities. The broad areas/sectors covered by private companies are; providing materials, mechanical fabrication, electronic fabrication, system development, integration, etc

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1389

TO BE ANSWERED ON TUESDAY, SEPTEMBER 22, 2020

SCIENTISTS OF INDIAN ORIGIN JOINING ISRO FROM FOREIGN SPACE AGENCIES

1389. DR. VINAY P. SAHASRABUDDHE:

Will the PRIME MINISTER be pleased to state:

(a) the number of scientists of Indian origin who have joined ISRO from foreign space agencies during the past five years; and

(b) the number of scientists from ISRO who have left India to join foreign space agencies during the past five years, if so, the details of the organisations these scientists have joined?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) & (b)

Nil.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1390

TO BE ANSWERED ON TUESDAY, SEPTEMBER 22, 2020

IN-SPACE AND PRIVATE SECTOR INNOVATION IN THE SPACE SECTOR

1390. SHRI MAHESH PODDAR:

Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that Government has launched the Indian Space Promotion and Authorisation Centre (IN-SPACe) to promote private investment and innovation in the space sector;

(b) If so, the specific measures through which IN-SPACe will be used to attract such investment;

(c) the regulatory, financial, and institutional mechanisms Government intends to implement under this program to facilitate greater private participation; and

(d) the specific operations, within the space industry, Government will allow private players to participate in?

ANSWER

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

(a) Yes, Sir.

(b) IN-SPACe will facilitate and support the Private Sector in the following ways:

(i) Provide technical support

(ii) Share cash intensive facilities

(iii) Allow to establish temporary facilities in DOS premises

(iv) Allow to bid for requirements coming from NSIL

(v) Partner in science and space exploration missions

(c) IN-SPACe is the Institutional and Regulatory mechanism established by Government to facilitate greater private participation. Financial provisions are not covered under this mechanism.

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(d) Private players can participate in:

(i) Building satellites

(ii) Building launch vehicles

(iii) Carry out launches

(iv) Develop Applications & provide space based services

(v) Develop subsystem and systems for space sector activities

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1391

TO BE ANSWERED ON TUESDAY, SEPTEMBER 22, 2020

STATUS OF SPACE APPLICATIONS PROGRAMME AT ISRO

1391. DR. SASMIT PATRA:

Will the PRIME MINISTER be pleased to state:

(a) The present status of the Space Applications programme at India Space Research Organisation (ISRO); and

(b) The history and background of this Space Applications programme since it was founded?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) ISRO's Space Applications programme encompasses applications in the area of Earth Observation, Communication and Navigation.

Earth Observation Applications:

Under earth observation, applications are being carried out in the areas of land, water & ocean resources, weather & climate, environment & eco-system, urban & rural development, disaster risk reduction and Governance. Some of the applications which have been operationalised and carried out by stakeholder Departments with handholding from ISRO include Potential Fishing Zone Forecast & Ocean State Forecast (by Indian National Centre for Ocean Information Services, MoES); Crop Acreage & Production Forecasting and National Agricultural Drought Assessment & Monitoring System (by Mahalanobis National Crop Forecast Centre, MoA&FW); Biennial Forest Cover Assessment (by Forest Survey of India, MoEF&CC); Irrigation Infrastructure Assessment (by Central Water Commission, MoWR, RD&GR); Weather forecasting (by India Meteorological Department, MoES); Integrated Watershed Management Programme & MGNREGA (by MoRD); Urban Geospatial Database preparation for AMRUT Cities (by

MoH&UA); Decentralised planning (by MoPR), Natural resources census (by DoS) and Disaster Management Support (by MHA). Periodic planning, monitoring and evaluation of developmental activities are also carried out using space technology applications.

Communication Applications:

ISRO has implemented unique societal applications like Satellite Instructional Television Experiment (SITE) during 1970s; Kheda Communications Project (KCP)during 1980s; Training& Development Communication Channel (TDCC), Jhabua Developmental Communication Project (JDCP) and GRAMSAT programmes during 1990s; Telemedicine, Tele-education, Village Resource Center (VRC) and Disaster Management Support Programme (DMSP) during 2000s. These programmes were focused on addressing some of the specific problems of the common man by providing end-to-end solutions using space-based applications.

Navigation Applications:

NavIC is being utilised in various domains of civilian applications like automotive sector (as part of vehicle location tracking devices), power sector (power grid synchronization), fisheries sector (broadcasting disaster alerts and potential fishing zone information), consumer sector (location based services on mobile handset platforms), etc.

(b) The history and background for Space Applications for various segments are as follows:-

Earth Observation Applications:

Space Application activities started with the detection of coconut root-wilt disease in Kerala in 1970 using colour-infrared aerial photography from a helicopter. This was followed by many studies using aerial data and also data available from Landsat series of satellites from 1972. Around 60 end-to-end remote sensing applications projects (Joint Experiment Projects-JEP), consisting of aerial data acquisition coupled with ground truth data collection were carried out by ISRO/DOS in collaboration with various users during mid-seventies to early eighties, which culminated in a National Symposium at Hyderabad in 1983, where the guidelines for the future Remote Sensing programme were formulated. This led to formation of a unique institutional framework, namely the National Natural Resources Management System (NNRMS) in 1985 under the aegis of erstwhile Planning Commission and with DoS as the nodal agency. NNRMS consisting

of all concerned Government user departments, helped in optimal integration of remote sensing inputs with the conventional data towards efficient management of India's natural resources on sustainable basis. This paved way for the operational Indian remote sensing satellite (IRS) programme in 1988.

Communication Applications:

- **Satellite Instructional Television Experiments (SITE)**
  The project made available informational television programme to rural India.
- **Kheda Communication Project (KCP)**
  A field laboratory in development and local communication was conducted between 1975 and 1990 in Kheda district in Gujarat.
- **Jhabua Developmental Communication Project**
  It was an effort towards the definition of satellite based communication systems dedicated to meet the requirements of the rural areas.
- **Training and Development Communications Channel (TDCC)**
  It provided 1-way Video and 2-way audio system of interactive training and education.
- **GRAMSAT**
  In Odisha, the GRAMSAT used for Interactive Training Programme (ITP) for disseminating information and for building capacities of the functionaries at the district, block and village level.
- **Tele-Education**
  ISRO/DOS established tele-education networks in association with various state and central departments/institutions, to reach the student community particularly in the remote/rural areas.
- **Tele-Medicine**
  Telemedicine programme of ISRO started as one of the societal applications of space technology and with a vision to extend technological support to provide access to quality medical services to needy patients living in remote and inaccessible locations of the country.

- **Village Resource Centre (VRC)**

  The VRC programme aims to promote a single window delivery of need-based services in the areas of agriculture, health, nutrition, water, weather, environment, non-formal education and alternate livelihoods to the rural population.

- **Disaster Management support (DMS) Programme**

  The Disaster Management Support (DMS) Programme was implemented to provide space based information and services to the State and Central Government Departments to strengthen the disaster management activities.

- **Satellite Aided Search and Rescue**

  Search & Rescue (SAR) programme is implemented in collaboration with international agency COSPAS-SARSAT. It aids to search the ships, aricrafts and persons in distress and take rescue actions.

- **Fishing vessel tracking system**

  A satcom based terminal fitted in a fishing vessel transmits its position, time and vessel identity information at fixed intervals. Such transmitted information is received at Central Hub and further accessed by concerned government agencies for tracking and safety of vessels & fishermen.

- **NAVIC alert Message Receiver (NMR) for Fishermen**

  Through this system the fishermen are able to receive the alerts on emergencies such as cyclone, high waves, tsunami, potential fishing zones and geo-fencing applications.

- **Distress Alert Transmitter (DAT)**

  DAT contains dedicated buttons for different types of emergencies such as "Fire", "Boat sinking", "Man overboard" and "Medical" including a test button.

Navigation Applications:

NavIC space segment, consisting of a constellation of IRNSS satellites, has been established and commissioned during the time-frame 2012 to 2016. NavIC ground segment has been established at various parts of the NavIC coverage area and is operational since 2012. To cater to NavIC applications, the user receivers are being developed as per the user requirements.

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