सत्यमेव जयते

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

"SPACE IN PARLIAMENT"

WINTER SESSION OF PARLIAMENT 2021
(DECEMBER 2021)

COMPILATION OF REPLIES GIVEN IN PARLIAMENT DURING 2021

Government of India
Department of Space
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PARLIAMENT QUESTIONS – WINTER SESSION OF PARLIAMENT 2021
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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 565

TO BE ANSWERED ON WEDNESDAY, DECEMBER 01, 2021

SCIENTISTS OF INDIAN ORIGIN

565. MS. RAMYA HARIDAS:

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 organizations theses 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) Nil.

(b) Nil.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 569

TO BE ANSWERED ON WEDNESDAY, DECEMBER 01, 2021

RECRUITMENT IN ISRO

569. SHRI V.K. SREEKANDAN:

Will the PRIME MINISTER be pleased to state:

(a) whether Indian Space Research Organisation (ISRO) has been directed to put on hold the recruitment of scientific and technical personnel until further orders and if so, the details thereof;

(b) whether the Government has initiated space sector reforms and if so, the details thereof;

(c) whether it is also true that ISRO Staff Associations have strongly denounced the move to privatise the space sector and if so, the details thereof;

(d) whether the recruitment ban is the second stage of the privatisation process in the ISRO and if so, the details thereof;

(e) whether a committee has been constituted to study the reassessment of manpower and the recruitment will be resumed as per its recommendations and if so, the details thereof;

(f) whether the said committee has submitted its recommendation; and

(g) if so, the details thereof?

(3)

ANSWER

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

(DR. JITENDRA SINGH):

(a) No Sir, no ban is imposed by the Government for recruitment of Scientific and Technical Support Staff (S&T) posts in ISRO. With the space sector reforms being implemented, greater emphasis is being laid on R&D activities, technology demonstration missions, Science & exploration missions, missions of national importance, human space programme & strategic missions realisation by ISRO. In line with this, to ensure optimal allocation/redeployment of the existing resources to these activities of the Centres/Units, a detailed exercise is being carried out. The recruitments will be made once this exercise is completed, only to ensure that right set of personnel are recruited suiting to the job requirements.

(b) Yes Sir. During June 2020, in order to enhance the diffusion of space technology, boost economy in the country and encourage private players in space activities, the Cabinet has approved Space Sector Reforms.

In this regard, the following reforms are proposed in the mode of execution of space activities in the country:

- **In order to enhance utilization and maximize benefits from the space assets, it is proposed to change the approach from**

"Supply Based Model" to "Demand Based Model". New Space India Limited (NSIL) will act as the aggregator of user requirements and obtain commitments.

- NSIL to take ownership from DOS for operational launch vehicles, commercialize launches, satellites and services.
- Permit NGPEs to carry out space activities through an Indian National Space Promotion and Authorization Center (IN-SPACe)
- ISRO to carry out capacity building in Space domain through development of new technologies and capabilities and enable sharing of facilities by NSIL and NGPEs.
- Announcement of Opportunities for NGPEs offering challenges in new domains of technology.

(c) Space reforms aims to create an enabling environment for private players to carry out space activities as detailed in para (b) above. The concerns expressed by the employees of ISRO regarding the reforms are addressed by the Department through appropriate briefing and its implication on ISRO. Further, it is clarified that the responsibilities of ISRO are intact with focus on R&D activities, technology demonstration missions, mission of national importance, human space programme, Science & exploration missions & strategic missions realisation.

(d) As detailed in para (a), recruitments to S&T posts are made to ensure that the resourses are optimally deployed across the Centres/Units. Further it is essential to ensure that right set of people recruited to meet organisation goals. Such exercises are

carried out periodically to ensure required corrections in the system suiting to meeting the organisational objectives.

(e) Yes Sir. A Departmental Committee has been constituted in the backdrop of shift in mandate towards R&D. The terms of references of Committee are:

- Recommending methodology for rightsizing and optimal utilization of the current S&T manpower.
- Assessment of future manpower requirements in all categories of S&T.
- Any other recommendations which may be appropriate in view of the renewed mandate of ISRO.

(f) & (g)

No Sir. The committee's deliberations are in progress and recommendations are not yet arrived. Detailed assessment of requirement for future activities is under progress in coordination with Centres/Units of ISRO.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 594

TO BE ANSWERED ON WEDNESDAY, DECEMBER 01, 2021

INDIAN SPACE PROMOTION AND AUTHORISATION CENTRE (IN-SPACe)

594. DR. A. CHALLAKUMAR:

Will the PRIME MINISTER be pleased to state:

(a) whether the 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 the Government intends to implement under this program to facilitate greater private participation; and

(d) the specific operations, within the space industry, that 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) Indian National Space Promotion and Authorization Center (IN-SPACe) is launched for handholding, promoting, authorizing and regulating private space activities. In order to promote private investment and innovation in the space

sector, access to ISRO technology, expertise and facilities which are capital intensive and otherwise not available elsewhere in the country will be given at free of cost wherever feasible or at reasonable cost to private entities. The existing sector specific policies in space domain will be revised and new policies will be brought in by government to bring in predictable policy and regulatory environment to private players. IN-SPACe will bring in promotional measures within ambit of the above policy and legal framework set forth by government. Apart from this, DOS will nurture Indian space industries by sharing its experiences on quality and reliability protocols, documentation and testing procedures. ISRO/DOS will also identify areas to offer challenges to industries in new domains of technology and Announcement of opportunity will be made for selected science and exploration missions to private industries.

(c) **The various space sector policies which are under consideration by the government together with the draft Space Activities Bill will together form the regulatory mechanisms. IN-SPACe will be the autonomous agency in Department of Space for enabling space activities as well as usage of ISRO/DOS owned facilities by private entities. Appropriate financial mechanisms will be put in place once regulatory and institutional mechanisms are fully established.**

(d) **Government will allow private players to participate in end-to-end space activities including building and launching satellites, launch vehicles, establishment and/or operation of ground infrastructure and space based services/applications.**

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 657

TO BE ANSWERED ON WEDNESDAY, DECEMBER 01, 2021

SPACE DEBRIS

657. SHRI SANGANNA AMARAPPA:

SHRI L.S. TEJASVI SURYA:

SHRI PRATHAP SIMHA:

DR. UMESH G. JADHAV:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has taken measures to secure the Indian satellites from space debris in the Earth's orbit, and if so, the details thereof; and

(b) whether the Government has systems in place to neutralize any attempts by Indian's adversaries to attack its space satellite systems, and if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Yes, Sir. DOS/ISRO has taken measures to secure the Indian satellites from space debris. The Directorate for Space Situational Awareness & Management is established at ISRO-

HQ to manage ISRO's space assets. The state-of-the-art Space Situational Awareness Control Centre is currently operational at Bengaluru for close approach analysis and assessment of threats to Indian satellites from space debris. It also designs and executes collision avoidance maneuvers whenever critical collision risk is identified.

ISRO has been following UN guidelines for the mitigation of space debris threats to safeguard Indian space assets.

(b) ISRO has implemented fortification measures like strong encryption of commands and authentication protocols in its older in-orbit remote sensing satellites to prevent access to the satellites. To deny information from the satellites (payload and satellite data), measures like directional transmission antenna, transmission of dummy data, switching off information over non-visibility area to Indian stations etc. have been implemented.

More advanced fortification measures like strong encryption of both command and information are planned for the future satellites. Apart from encryption, techniques to protect satellites against jamming and spoofing are under development for implementation in its future communication and navigation satellites.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 1750

TO BE ANSWERED ON WEDNESDAY, DECEMBER 08, 2021

SPACE WASTE

1750. SHRI PARVESH SAHIB SINGH VERMA:

Will the PRIME MINISTER be pleased to state:

(a) the details of the amount of Space waste that India produced on a yearly basis during the last three years;

(b) whether India follows any procedure to extract the Space waste from the orbit of the earth and if so, the details thereof; and

(c) 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) ISRO strives towards long term sustainability of the space environment by following all the UN guidelines for space debris mitigation as well as the guidelines of the Inter-Agency Space Debris Coordination Committee (IADC), an international governmental forum for the worldwide coordination of activities related to the issues of man-made and natural debris in space. The guidelines include post-mission disposal of satellites and rocket bodies efficiently

so that the space debris (space waste) produced by India does not stay in orbit. At the end of each mission, the space debris or the satellite/rocket at the end of its operational life is de-orbited quickly with a series of carefully planned maneuvers.

(b) Yes Sir. Due to the post-mission disposal activities carried out by ISRO, the only space debris (space waste) left after any mission is the final-stage rocket-body which is deorbited to a lower orbit to aid natural orbital decay due to atmospheric drag. The space debris later re-enters the Earth's atmosphere naturally within 20 years and burns due to aerodynamic heating caused by air friction. ISRO has also initiated research and development activities on active debris removal to extract space debris from space.

(c) Does not arise.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 1797

TO BE ANSWERED ON WEDNESDAY, DECEMBER 08, 2021

ASSISTANCE TO SMALL ISLAND STATES

1797. SHRI T.R. BAALU:

Will the PRIME MINISTER be pleased to state:

(a) whether ISRO has geared up to provide assistance and support to small island states to help them protect from inundation due to rising temperatures;

(b) if so, the details of the Scheme announced by the Hon'ble Prime Minister in the 26th Conference of Parties held in Glasgow, UK by United Nations, including technical and financial assistance;

(c) the details of countries to be benefitted from this assistance and the financial assistance committed by India at the Glasgow meet; and

(d) whether low lying coastal areas and islands in various State within India will also be offered similar support by ISRO and if so, the details thereof?

(13)

ANSWER

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

(DR. JITENDRA SINGH):

(a) **ISRO has the requisite technologies and expertize to provide information on advance warning of cyclones, monitoring of coast lines and coral reefs using space based inputs. ISRO is gearing up to provide such information to some of the Small Island Developing States (SIDS) in the Indian Ocean Region.**

(b) **India, UK, Australia, Fiji, Jamaica and Mauritius jointly launched an initiative, Infrastructure for Resilient Island States (IRIS) to provide technical support on disaster resilience of infrastructure systems to SIDS, during the 26th Conference of Parties held in Glasgow, UK by United Nations. IRIS, will also support SIDS by facilitating access to existing financial mechanisms for resilient infrastructure development. Through Coalition for Disaster Resilient Infrastructure (CDRI), IRIS will deliver the following three outcomes:**

i. **Improved resilience of SIDS infrastructure to climate change and disaster risks**

ii. **Strengthened knowledge and partnerships for integrating resilience in SIDS infrastructure**

iii. Gender equality and disability inclusion promoted through resilient SIDS infrastructure.

(c) IRIS will extend its support on demand basis to 58 Small Island Developing States (SIDS) across geographic regions.

(d) ISRO carries out prediction of track, intensity, landfall time and location of all cyclones originated in Indian Oceans using space based inputs. While India Meteorological Department (IMD) is the mandated agency to provide the Cyclone forecast advisories, ISRO supports IMD in improving the prediction methodologies and publish the R&D outputs for the help of all.

ISRO has carried out vulnerability assessment of the selected states along the Indian coastal region and has identified coastal stretch that are susceptible due to sea level rise. ISRO provides near real time prediction of storm surge and surge induced inundation for Indian coast during cyclone using satellite observations and numerical model.

Maps of coral reefs of Indian Ocean, Red Sea and Gulf of Aden have been published and are updated regularly. A region-specific Coral Bleaching Monitoring System based on sea surface temperature data is hosted on ISRO's VEDAS geoportal.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 1816

TO BE ANSWERED ON WEDNESDAY, DECEMBER 08, 2021

IN-SPACe

1816. SHRIMATI RITA BAHUGUNA JOSHI:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has taken decision to create an independent body named "Indian National Space Promotion and Authorization Centre (IN-SPACe) to give various permissions/approvals to the private players and startups in the country to take participation in the Space activities;

(b) if so, the details thereof;

(c) whether the Government has fixed some timeline to complete the creation of IN-SPACe;

(d) if so, the details thereof; and

(e) the details of requests received from various private players in the current financial year to take participation in the Space activities?

ANSWER

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

(DR. JITENDRA SINGH):

(a) **Yes.**

(b) **Government of India constituted Indian National Space Promotion and Authorization Centre (IN-SPACe) as an autonomous agency in Department of Space (DOS) for enabling space activities as well as usage of DOS owned facilities by private entities.**

(c) & (d)

Constitution of IN-SPACe Board has been approved and the establishment of various directorates to support the activities of IN-SPACe is under process.

(e) **24 companies requested for support from IN-SPACe for their space activities in the current financial year.**

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(17)

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 2979

TO BE ANSWERED ON WEDNESDAY, DECEMBER 15, 2021

MANNED SPACE MISSION

2979. SHRI RAMESH BIDHURI:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has taken any steps or fixed any timeline/target for launching a manned spaced mission in the near future;

(b) if so, the details thereof;

(c) whether the Government has made new plans/projects/ programmes for the development of space science, space research and Satellite technology in the country; and

(d) if so, the details thereof for the last five years?

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, the targeted launch for crewed space mission (Gaganyaan) was before 75th anniversary of Indian Independence in year 2022. This is to be preceded by two uncrewed missions.

The launch of first uncrewed mission is delayed due to the first and second wave of COVID pandemic lockdowns which resulted in supply disruptions in raw material supply and delays in realization of hardware across various industries.

Test vehicle flight for the validation of Crew Escape System performance and the 1st uncrewed mission of Gaganyaan (G1) are scheduled during the beginning of 2nd half of 2022. This will be followed by second uncrewed mission and first crewed mission.

(c) Yes, Sir. Department of Space has charted out short-term and long-term plans in the areas of Space Transportation Systems, Satellite Communication & Navigation, Earth Observation, Space Sciences & Planetary Exploration, Capacity Building and Space-based applications.

(d) During the last five years (i.e., April 2016 – March 2021), a total number of 27 satellite missions and 25 launch vehicle missions were successfully accomplished. This includes first operational flight of India's heavy lift launch vehicle GSLV Mk-III which placed India's second lunar mission, Chandrayaan-2 into orbit; Advanced Cartography satellite, Cartosat-3; completion of NavIC constellation; launch of South Asia Satellite; launch of heaviest and most-advanced high throughput communication satellite, GSAT-11 and launch of record 104 satellites in a single PSLV flight. Apart

from these, three technology demonstrators namely Scramjet engine, Re-Usable Launch Vehicle and test for Crew Escape System were also successfully demonstrated during this period

In addition, 286 commercial satellites from domestic as well as foreign customers and 8 student satellites from Indian universities were also launched during the aforementioned period.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1412

TO BE ANSWERED ON THURSDAY, DECEMBER 09, 2021

INVOLVEMENT OF PRIVATE SECTOR IN INDIA'S SPACE PROGRAMME

1412. SHRI K.J. ALPHONS:

Will the PRIME MINISTER be pleased to state:

(a) whether Government is aware that private sector plays a key role in space technology globally;

(b) Government's policy of involving private sector in India's space programme, the details thereof;

(c) the investment of the private sector in space programmes during the last five years, the details thereof; and

(d) whether Government would handed over some of the functions of ISRO 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) Yes.

(b) The Union Cabinet of Government of India (GoI) has announced space reforms for "Unlocking the space potential of India". As part of space sector reforms, Government of India has created a national level autonomous nodal agency namely Indian National Space Promotion and Authorization Centre (IN-SPACe) under Department of Space (DOS) for promoting, handholding, authorising and licencing private players to carry out Space Activities. To facilitate private sector participation

in Space activities, the existing policies in space domain has been revised and new policies are being drafted and processed. Department of Space is in the process of implementing space sector reforms announced by Government of India.

(c) No data is available with the Department.

(d) The space sector reforms were made with the intention to provide level playing field for private companies and enable them to carry out end-to-end space activities. Hence, private sectors will be enabled to carry out the functions being undertaken by DOS including building and launching satellites, launch vehicles, establishment and operation of ground infrastructure, space based services and applications. Further, it is to state that the responsibilities of ISRO are intact with focus on R&D activities, technology demonstration missions, mission of national importance, human space programme, Science & exploration missions & strategic missions realisation.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1411

TO BE ANSWERED ON THURSDAY, DECEMBER 09, 2021

PLAN TO DEVELOP REUSABLE SPACECRAFT

1411. SHRI M. MOHAMED ABDULLA:

Will the PRIME MINISTER be pleased to state:

(a) whether ISRO/ANTRIX have plans to develop reusable spacecraft similar to the ones used by SpaceX the details thereof and, if not, the reasons therefor;

(b) the Steps taken by ISRO to remain competitive in low cost space launches;

(c) whether Government has any plans to allow the private sector to develop spacecrafts and associated technologies; and

(d) the steps taken by Government to boost the participation of private players in the Space Industry and the details thereof?

ANSWER

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

(a) Any such proposal or studies for achieving the reusability of spacecraft could be taken up, after successful demonstration of Gaganyaan Programme.

(b) ISRO is developing the Small Satellite Launch Vehicle (SSLV), which is a cost-effective, three stage, all-solid launch vehicle with a payload capability of 500 kg to 500 km planar orbit or 300 kg to Sun Synchronous Polar Orbit and is ideal for on-demand, quick turn-around launch of small satellites. ISRO is also working on the critical technologies towards the realisation of a fully reusable space transportation system, in which the vehicle and its stages are recovered, refurbished and reused, that is expected to bring down the cost of the space missions.

Subsequent to the first successful experimental mission of a Technology Demonstrator version of a winged body Reusable Launch Vehicle (RLV-TD) on May 23, 2016, technology demonstration missions are planned in the coming years to demonstrate runway landing & orbital flight. ISRO is also working on the critical

technologies for Scramjet propulsion which will be useful during the atmospheric phase of the flight of launch vehicle as the oxidizer for the fuel is derived from the atmosphere itself. This reduces the need for carrying the oxidizer along with the fuel and will benefit in bringing down the cost of access to space.

(c) Yes, Sir. Government has plans to allow the private sector to develop spacecraft and associated technologies.

(d) Government of India has announced reforms in June, 2020, in the space sector towards enabling the private players to provide end to end services and subsequently the following steps were taken.

i. A national level autonomous Nodal Agency namely Indian National Space Promotion and Authorization Centre (IN-SPACe) under DOS for promoting, handholding, authorising and licensing private players to carry out Space Activities.

ii. Access to ISRO facilities and expertise are extended to private entities to support their space activities. Apart from this ISRO will also nurture Indian space industries by sharing its experiences on quality and reliability protocols, documentation, testing procedures etc.

iii. Announcement of Opportunities are being done offering challenges in new domains of space technology.

iv. New Space India Ltd (NSIL), the CPSE under DOS will transfer the matured technologies developed by ISRO to Indian industries.

v. To facilitate private sector participation in Space activities, the existing policies in space domain has been revised and new policies are being drafted. 10 sector specific policies are under various stages of processing viz; SpaceCom Policy, Remote Sensing Policy, Technology Transfer Policy, Navigation Policy, Human in Space Policy, Space Transportation Policy, Space exploration policy, Space Situational Awareness policy, Overall National space policy and Space FDI policy.

vi. In order to address the necessary legal framework, the department is also in the process of enacting a National legislation and the draft Space Activities Bill has completed Public and Legal consultations and the draft Bill will be processed for further approvals for inter-ministerial consultations.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1410

TO BE ANSWERED ON THURSDAY, DECEMBER 09, 2021

COST OF GAGANYAAN PROGRAMME

1410. SHRI M.MOHAMED ABDULLA:

Will the PRIME MINISTER be pleased to state:

(a) the current status and estimated cost of the Gaganyaan Programme;

(b) the estimated date of launch and cost of India's first Manned space launch;

(c) whether are there any proposals to send a manned mission to the moon;

(d) if so, the details thereof and if not, the reasons therefor; and

(e) the estimated date of launch and cost of India's first manned Lunar Landing?

ANSWER

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

(DR. JITENDRA SINGH):

(a) & (b)

The approved budget for Gaganyaan Programme is ₹ 9023.00 crores. The current status of Gaganyaan programme is as follows:

i. The astronaut training facility is getting established at Bengaluru and in advanced stage of completion. Basic Aeromedical training and flying practice completed as part of Indian leg of training.

ii. The design of all systems of Gaganyaan has been completed. Realisation of various systems are in different stages of progress. Ground qualification tests of human rated launch vehicle propulsion stages have been already commenced and successfully progressing.

iii. The configuration and design of ground infrastructure has been completed and modifications needed are being implemented.

iv. The MoU, contracts and Implementation arrangement (IA) related activities with both national and international agencies are progressing well. Receipt of deliverables has commenced against contracts with M/s Glavkosmos (Russian Space Agency) for space suit, crew seat and View port. Also receipt of deliverables under various work packages of CNES (French Space Agency) IA has commenced.

v. The activities related to development of microgravity experiments have commenced, the conceptual design for experiments is under review.

vi. The major missions viz., Test vehicle flight for the validation of Crew Escape System performance and the 1st Uncrewed mission of Gaganyaan (G1) are scheduled during the beginning of 2nd half of 2022. This will be followed by second uncrewed mission and first crewed mission.

(c) & (d)

Currently, there is no proposal to send a manned mission to moon. Any proposal or studies for extending human presence beyond Low earth orbit could be taken after demonstration of Gaganyaan programme.

(e) Does not arise

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
STARRED QUESTION NO. 125

TO BE ANSWERED ON THURSDAY, DECEMBER 09, 2021

GAGANYAAN MISSION

*125. SHRI RAM SHAKAL:

Will the PRIME MINISTER be pleased to state:

(a) whether Government is running various types of programmes though Gaganyaan Mission; and

(b) if so, the details thereof?

ANSWER

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

(a) to (b) A Statement is laid on the Table of the House.

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STATEMENT LAID ON THE TABLE OF THE RAJYA SABHA IN REPLY TO STARRED QUESTION NO.125 REGARDING "GAGANYAAN MISSION" ASKED BY SHRI RAM SHAKAL FOR ANSWER ON THURSDAY, DECEMBER 09, 2021.

(a) to (b)

No Sir. The Gaganyaan Programme is the name of maiden human space program approved by Government of India.

The objective of Gaganyaan programme is to demonstrate the capability to send humans to low earth orbit (LEO) onboard on Indian Launch Vehicle and bring them back to earth safely.

As part of the Gaganyaan programme two uncrewed missions will be undertaken prior to crewed mission to LEO.

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O.I.H.

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2226

TO BE ANSWERED ON THURSDAY, DECEMBER 16, 2021

AGREEMENT WITH FOREIGN COUNTRIES TO LAUNCH SATELLITE

2226. MS. SAROJ PANDEY:

Will the PRIME MINISTER be pleased to state:

(a) the number of countries with which the Indian Space Research Organisation (ISRO) has made agreements to launch their satellites into the space;

(b) the revenue which is expected to be earned through this; and

(c) the total number of satellites, indigenous and foreign, that have been put into the Earth's Orbit?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Indian Space Research Organisation (ISRO) through its commercial arm, NewSpace India Limited (NSIL), a Govt. of India company under Department of Space (DOS), has been launching satellites belonging to other countries on-board Polar Satellite Launch Vehicle (PSLV), on a commercial basis.

NSIL as on date has signed six Launch Service Agreements with customers from four countries for launching foreign satellites into space on-board PSLV during 2021-2023.

(b) Foreign Exchange revenue of approx. 132 Million Euros would be earned through launching of these foreign satellites on a commercial basis.

(c) A total number of 124 indigenous satellites have been put into Earth's orbit including 12 student satellites. The total number of foreign satellites that have been put into Earth's orbit is 342 satellites (for 34 countries) by indigenous launch vehicle

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2225

TO BE ANSWERED ON THURSDAY, DECEMBER 16, 2021

SINGLE WINDOW CLEARANCE IN SPACE EXPLORATION

2225. DR. VIKAS MAHATME:

Will the PRIME MINISTER be pleased to state:

(a) steps that Government has taken and proposes to take for participation of start-ups and private companies in the space exploration;

(b) steps that Government has taken to provide a single clearance window in case of overlapping jurisdiction of the Department of Space and Department of Communications for satellite applications; and

(c) the timeline by which Government proposes to implement the same and the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) The Government has unlocked the space sector for larger participation of start-ups and private companies. New policies are being rolled out in specific areas such as space based communication, remote sensing etc.

(b) & (c)

Establishment and operations of space based systems are under the purview of Department of Space. The autonomous body Indian National Space Promotion & Authorisation Centre (IN-SPACe), under Department of Space (DOS), acts as a single window mechanism to promote, permit, monitor and accord necessary permissions for space based activities. Use of space based systems for communication applications is under the purview of Department of Telecommunications (DoT) under Ministry of Communications. Currently there is no proposal for single window clearance.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2224

TO BE ANSWERED ON THURSDAY, DECEMBER 16, 2021

SATELLITES LAUNCHED BY INDIAN LAUNCH VEHICLE

2224. SHRI K.R.N. RAJESHKUMAR

Will the PRIME MINISTER be pleased to state:

(a) number of foreign satellites launched via Indian Launch Vehicle, Country-wise;

(b) types of satellites that have been launched through Indian Launch Vehicle, and

(c) revenue generated by the country through these Indian Launch Vehicles during the last three years?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Starting from 1999 till date, a total of 342 foreign satellites belonging to 34 countries have been successfully launched onboard Indian Polar satellite Launch Vehicle (PSLV) on a commercial basis.

Country wise breakup of the number of satellites that were launched is indicated below:

Sl. No	Country Name	No. of Satellites Launched
1.	Algeria	4
2.	Argentina	1
3.	Australia	1
4.	Austria	3

Sl. No.	Country Name	No. of Satellites Launched
18.	Japan	5
19.	Kazakhstan	1
20.	Latvia	1
21.	Lithuania	4

Sl. No	Country Name	No. of Satellites Launched
5.	Belgium	4
6.	Brazil	1
7.	Canada	12
8.	Chile	1
9.	Colombia	1
10.	Czech Republic	1
11.	Denmark	2
12.	Finland	3
13.	France	4
14.	Germany	11
15.	Indonesia	3
16.	Israel	3
17.	Italy	5

Sl. No.	Country Name	No. of Satellites Launched
22.	Luxembourg	5
23.	Malaysia	1
24.	Netherlands	3
25.	Norway	1
26.	Republic of Korea	6
27	Singapore	8
28.	Slovakia	1
29.	Spain	2
30.	Switzerland	4
31.	Turkey	1
32.	UAE	1
33.	United Kingdom	12
34.	USA	226

(b) The type of foreign satellites that were launched through Indian Launch Vehicle includes satellites primarily for Earth Observation, Scientific and Technology demonstration purposes.

(c) Through launching of foreign satellites on-board Indian launch vehicle, India has earned a Foreign Exchange revenue of approx. 35 Million USD and 10 Million Euros during last 3 years (i.e., 2019- 2021).

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2223

TO BE ANSWERED ON THURSDAY, DECEMBER 16, 2021

PRIVATE PLAYERS IN SPACE SECTOR

2223. SHRI P. WILSON:

Will the PRIME MINISTER be pleased to state:

(a) whether Government's policy decision to open up Space sector to private players would demand more land from areas of the States of Tamil Nadu to set up new facilities for research;

(b) if so, what action has been taken till date and whether any tenders have been floated, the details thereof;

(c) whether Government has made any coherent action plan to fund and promote education in aerospace and aeronautical engineering and set up further facilities for students interested in space research and exploration especially in the state of Tamil Nadu, details thereof and the funds allocated in this regard; and

(d) 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) The major objective of space reforms through opening of the space sector is to enhance the diffusion of space technology, boost economy in the country and encourage private players in space activities. Through the reforms enacted, the private players will be allowed to carry out space activities duly regulated by IN-SPACe. As part of handholding and promoting the private players, ISRO will be sharing its expertise and existing facilities as deemed necessary. Further, ISRO would not be responsible for establishment of any new dedicated facilities towards meeting the requirement of private players. Hence no such requirement(s) for additional land area in Tamil Nadu or any other states has been generated by ISRO in this regard.

(b) Does not arise.

(c) ISRO being a core R&D organisation does nurture talent from multiple disciplines of Science, Technology, Engineering and Mathematics areas. In order to promote and kindle scientific temperament in the domain areas of space programme and as part of national capacity building programme, ISRO has established various schemes and the major ones are as detailed below:

- Space Technology Cells (STCs): Space Technology Cells established at reputed institutes of national importance to undertake research in emerging areas, wherein the joint research programmes are developed and PG/ doctoral students will also take part in the process.

  IIT-Madras, Tamil Nadu is one such institute out of total 9 institutes where ISRO has established STC and is operational since over three decades.

- Regional Academic Centres for Space: A regional initiative to pursue advanced research in the areas of relevance to future technological & programmatic needs of the Indian Space Programme and act as facilitator for the promotion of space technology activities in the region.

- Space Technology Incubation Centers [S-TIC]: Enable academia to realize innovative ideas aiding towards setting-up start-ups by outgoing students.

  ISRO has established S-TIC at NIT-Trichy (out of total 6 S-TICs established in the country) with a provision of maximum funding of Rs. 2.00 crores per start-up.

- The Indian Institute of Space Science and Technology at Thiruvananthapuram was established with the prime objective of generating high quality human resources for the Indian Space Programme through customized learning. The Institute which was started during the academic year 2007-08 offers undergraduate programme in Aerospace Engineering, Avionics and Physical Science and the curriculum for the programmes have been carefully designed to meet the high technology requirements of Indian Space Programme while keeping the basic engineering and science requirements intact. The Institute is presently meeting the requirements of Indian Space Programme fully.

Hence the efforts of ISRO in promoting education in all the disciplines is a continuous and comprehensive efforts channelized across the country, to inspire younger generation and support research component relevant to the Indian space programme fields.

(d) Does not arise.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2197

TO BE ANSWERED ON THURSDAY, DECEMBER 16, 2021

LAUNCH OF INDIAN SPACE ASSOCIATION

2197. SHRI K.C. VENUGOPAL:

Will the PRIME MINISTER be pleased to state:

(a) whether Government has launched Indian Space Association (ISpA) and if so, the details thereof and the aims and objectives behind the move;

(b) the details of reforms undertaken by Government in Space sector;

(c) whether the launch of ISpA will boost private participation in Space Sector and if so, the details thereof;

(d) whether India accounts for only 2 percent of the Space economy in the global market front though having huge potential; and

(e) if so, the steps taken by Government to increase the global market share?

ANSWER

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

(a) ISpA is a voluntary association of Indian space industries which will articulate industry views on space sector reforms and help them in guiding the reform process so as have a vibrant and thriving space industry in India.

(b) The Union Cabinet of Government of India (GoI) has announced space reforms for "Unlocking the space potential of India" in June 2020 for larger participation of non-governmental entities in space based activities.

Through the reforms, Department of Space will enable private players to carry out end-to-end space activities by providing a level playing field for the private sector in space.

A national level autonomous nodal agency called Indian National Space Promotion and Authorization Center (IN-SPACe) Board has been created for handholding, promoting, authorizing and regulating private space activities.

In order to promote private investment and innovation in the space sector, access will be given for private entities to ISRO technology, expertise and facilities which are capital intensive and otherwise not available elsewhere in the country.

In order to enhance utilization and maximize benefits from the space assets, the approach has been changed from "Supply Based Model" to "Demand Based Model". NewSpace India Limited (NSIL) will act as the aggregator of user requirements and obtain commitments.

ISRO shall concentrate on Research & Development and capacity building in advanced space technologies.

The existing sector specific policies in space domain will be revised and new policies will be brought out by government to bring in predictable policy and regulatory environment to private players.

(c) The space industries in India has formed the Indian Space Association with the intended objective to boost private participation in Space Sector as mentioned in (a) above.

(d) As per 2020 data, the Indian space economy is around 2 percent of the global Space economy.

(e) Government of India brought in space reforms as mentioned in (b) above, to enable and promote private sector participation in space activities which is expected to help India to capture a fair share of the commercial space market.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2164

TO BE ANSWERED ON THURSDAY, DECEMBER 16, 2021

SATELLITE LAUNCH VEHICLE

2164. SHRI SANJAY SINGH:

Will the PRIME MINISTER be pleased to state:

(a) whether Indian Space Research Organisation (ISRO) is planning to have another Satellite Launch Vehicle due to heavy workload on the existing ones;

(b) if so, the expected timeline of completion of this new Satellite Launch Vehicle along with its expected cost;

(c) whether private players will also have a part to play in development of this project; and

(d) if so, the details thereof?

ANSWER

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

(a) ISRO is developing a Small Satellite Launch Vehicle (SSLV), which will provide a payload capability of 500 kg to a 500 km planar orbit. The development of SSLV has been primarily envisaged to realize a cost-effective launch vehicle with high launch frequency and quick turnaround capability in order to cater to the growing opportunity in the global launch services market for small satellites.

(b) The development of SSLV is in the final stages and the first developmental flight of SSLV is targeted during the first quarter of 2022. The Government has sanctioned a total cost of Rs.169.07 Crores for the development project including the development & qualification of the vehicle systems and the flight demonstration through three development flights (SSLV-D1, SSLV-D2 & SSLV-D3).

(c) Yes, Sir.

(d) The hardware & structures for the SSLV development project including the solid motor cases, nozzle sub-systems, mandrels for the casting of solid motors, inter-stage structures, actuator motors & fixtures are realized through private industry.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1413

TO BE ANSWERED ON THURSDAY, DECEMBER 09, 2021

CURRENT STATUS OF MISSION CHANDRAYAAN-3

1413. SHRI REWATI RAMAN SINGH:

Will the PRIME MINISTER be pleased to state:

(a) whether the current status of Mission Chandrayaan-3;

(b) by when the Chandrayaan-3 will be launched;

(c) whether all the required test have been completed before the launch of the Chandrayaan-3; and

(d) if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Chandrayaan-3 is in advanced stage of realisation. All the systems in both Propulsion Module and Rover Module have been realized, integrated and tested. In the Lander Module, most of the systems have been realised and tests are under progress.

(b) Chandrayaan-3 is targeted to be launched in the second quarter of financial year 2022 – 2023.

(c) & (d)

Integrated Sensors and Navigation performance test on the Lander have been completed and other tests are in progress. All the identified tests will be completed before the launch of Chandrayaan-3.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 619

TO BE ANSWERED ON THURSDAY, DECEMBER 02, 2021

COLLABORATION WITH OTHER COUNTRIES IN SPACE RESEARCH

619. SHRI SAMBHAJI CHHATRAPATI:

Will the PRIME MINISTER be pleased to state:

(a) whether Government is considering collaborations and co-operation in space research with some more countries;

(b) if so, the details thereof;

(c) the specific areas in which collaboration and co-operation could be the possibilities in future; and

(d) whether Government plans to expand Indian Space Research Organisation (ISRO) further in view of its increasing responsibilities in future?

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 proposals under consideration for collaborations and cooperation in space research with more countries with the objectives of enhancing the capacity of the Indian space programme by concluding cooperative documents for advancing programmatic priorities, augmenting space science and earth observation data base, widening ground station networks, bettering products and services through joint experiments and creating platforms for inflow of expertise.

(c) Building of satellites; development of science instruments for earth observation, space science and planetary exploration; new propulsion technologies; sharing of satellite data; human spaceflight support, space situational awareness, training and capacity building in space technology applications are some of the specific areas in which collaboration and cooperation could be possible in future.

(d) Yes, Sir. As part of the space sector reforms, the Indian National Space Promotion and Authorisation Centre (IN-SPACe) is created to ensure greater participation of private sector in space activities. While ISRO will largely focus on developing newer technologies, undertaking technology demonstrator missions, first-of-its kind satellites, space science missions, human space flights while ensuring continuity of missions to cater to national imperatives; NewSpace India Limited (NSIL) is entrusted with the realisation operational satellites, launch vehicles and services.

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