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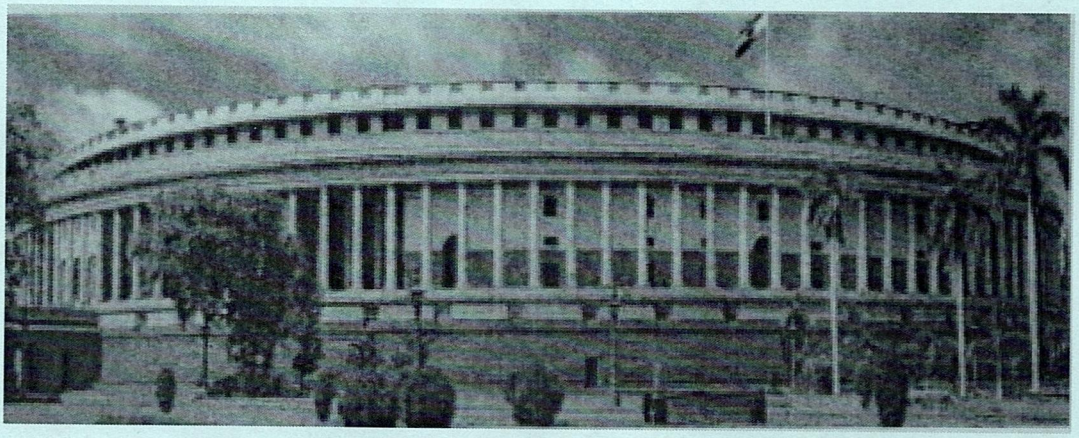
GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

"SPACE IN PARLIAMENT"



WINTER SESSION OF PARLIAMENT 2022
(DECEMBER 2022)

COMPILATION OF REPLIES GIVEN IN PARLIAMENT DURING 2022

Government of India
Department of Space
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PARLIAMENT QUESTIONS – WINTER SESSION OF PARLIAMENT 2022
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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

STARRED QUESTION NO. 9

TO BE ANSWERED ON WEDNESDAY, DECEMBER 07, 2022

LAUNCH OF VIKRAM-S ROCKET

***9. SHRI VINOD KUMAR SONKAR:**

SHRI BHOLA SINGH:

Will the PRIME MINISTER be pleased to state:

(a) Whether India has launched the first privately made rocket 'Vikram-S' recently and if so, the details thereof;

(b) Whether ISRO has successfully accomplished "Mission Prarambh" recently in the country, if so, the details thereof;

(c) Whether the successful launch of indigenously developed and built low-earth orbit launch vehicle is likely to propel private multi-billion space tech investments and accelerate delivery of constellations for new India, if so, the reaction of the Department thereto;

(d) Whether this is a precursor to commercial launch missions in the country, if so, the details thereof;

(e) Whether the Government has any plans to promote start up tech ecosystem in Space technology, if so, the details thereof; and

(f) The other steps being taken by the Department of Space to empower India's position in the space sector in the world?

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

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STATEMENT LAID ON THE TABLE OF THE LOK SABHA IN REPLY TO STARRED QUESTION NO. 9 REGARDING "LAUNCH OF VIKRAM-S ROCKET" ASKED BY SHRI VINOD KUMAR SONKAR AND SHRI BHOLA SINGH FOR ANSWERING ON WEDNESDAY, DECEMBER 07, 2022.

(a) Yes, Sir. India's first privately made rocket 'Vikram-S', developed by M/s Skyroot Aerospace Private Limited, Hyderabad was launched on 18th November, 2022. This was a sub-orbital mission to demonstrate and validate the design of launch vehicle indigenously developed by an Indian private entity.

(b) "Mission Prarambh" was accomplished by M/s. Skyroot Aerospace Private Limited, with authorization from IN-SPACe – Indian National Space Promotion and Authorization Centre – a single window agency under Department of Space to promote, handhold and authorize the space activities of Non-Government Entities. ISRO supported M/s. Skyroot Aerospace through sharing of technical facilities and necessary technical reviews.

(c) Yes, Sir. The successful demonstration of flight of an indigenously developed and built Launch Vehicle is likely to propel private space tech investment and is a step in the right direction towards developing small satellite launch capability intended to accelerate the delivery of satellites in orbit.

(d) Yes, Sir. The successful completion of "Mission Prarambh" demonstrates the positive impact of the space reforms, brought forth in 2020, in a short period of time and signifies onset of rapid expansion of the space ecosystem in the country. Several other Non-Government Entities (NGEs) have been engaging with IN-SPACe, with an intent to provide commercial launch services.

(e) Yes, Sir. In order to promote the involvement of Non-Government Entities, including Start-ups, IN-SPACe has been acting as a single-window agency to facilitate sharing of ISRO facilities and technical expertise, serving as a one-stop solution to foster and transform the innovations of Start-ups into full-fledged space products.

(f) The Department of Space is in the process of establishing a predictable, forward-looking, enabling regulatory regime for space activities in the country, through a comprehensive, well-defined policy for the entire gamut of such activities. Further, the NewSpace India Limited, a Public Sector Enterprise under Department of Space, has been empowered to bring a commerce-oriented approach to space activities. These initiatives shall go a long way in expanding the nation's share in global space economy and strengthen India's position as a leading space power.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 53

TO BE ANSWERED ON WEDNESDAY, DECEMBER 07, 2022

INDIAN REGIONAL NAVIGATION SATELLITE SYSTEM

53. SHRI LAVU SRI KRISHNA DEVARAYALU:

Will the PRIME MINISTER be pleased to state:

(a) whether the usage of Indian Regional Navigation Satellite System (NaviC system) has increased in India;

(b) if so, the steps taken to ensure that manufacturers of mobile phones add compatibility of the NaviC system in the devices so they can process the signals;

(c) whether the NaviC has been able to compete with Google Maps or other non-Indian Global Positioning Systems and if so, the details thereof;

(d) whether the current version of NaviC is only compatible with the L5 and S bands, if so, the details thereof;

(e) whether the current version has been able to penetrate the civilian sector, if not, the reasons therefor;

(f) the steps taken to add the L1 band into NaviC for civilian navigational use; and

(g) the other steps taken by the Government to launch more satellites in space to expand the reach of NaviC to the global level?

(6)

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) Yes, Sir. The usage of NavIC system has increased in India. NavIC finds utilisation in national projects like public vehicle safety, power grid synchronisation, real-time train information system, fishermen safety, etc. Other upcoming initiatives viz. common alert protocol based emergency warning, time dissemination, geodetic network, unmanned aerial vehicles, etc. are in the process of adopting NavIC system.

(b) Many mobile phone models in the country are already having NavIC compatibility. Department of Space is constantly engaged with the manufacturers of mobile phones and chipsets to support them technically for adding NavIC compatibility in their devices.

(c) NavIC system provides signals for positioning. Applications like Google Maps can utilise the position obtained through NavIC or other similar system and display it on a map or other user interface for easy visualisation. Signals provided by NavIC system are agnostic to the end-user application. Hence, a mobile phone which has NavIC compatibility automatically uses NavIC signals when showing position on maps. Performance of NavIC system is at par with the other positioning systems.

(d) Yes, Sir. The current version of NavIC is compatible with L5 and S bands. This is as per the international frequency coordination and compatibility.

(e) Yes, Sir. The current version has been able to penetrate the civilian sector. The addition of signal in L1 band will help in faster penetration in the civilian sector.

(f) The next satellites starting from NVS-01 onwards will have an L1 band for civilian navigational use.

(g) Government is working to launch replacement satellites NVS-01 onwards for the current seven satellite constellation. Simultaneously, studies are underway to work out suitable configuration to expand the reach of NavIC beyond its current coverage.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 121

TO BE ANSWERED ON WEDNESDAY, DECEMBER 07, 2022

AUTONOMOUS PRECISION LANDING OF SPACE ROCKETS

121. SHRI PARVESH SAHIB SINGH VERMA:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government is working on Autonomous Precision Landing of Space Rockets, if so, the details thereof;

(b) whether the Government has any plans to tap into the small satellite market, and if so, the details thereof; and

(c) the steps taken by the Government to manage the increasing space debris in lower earth orbit?

ANSWER

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

****

(a) Yes, Sir. The Department has initiated studies towards undertaking the development of critical technologies required to achieve Autonomous Precision Landing of Space Rockets and their

demonstration through Vertical Take-off & Vertical Landing (VTVL) of Test Vehicles.

(b) In order to become an active stakeholder in the small satellite market, ISRO/DOS has initiated development of Spacecraft buses for the small satellites, which includes nano-satellite and micro-satellites. Further to that, the development of Small Satellite Launch Vehicle (SSLV) is also underway to provide launch services catering to small satellite market.

(c) Department of Space has put in place appropriate measures to manage the increasing space debris in low earth orbit comprising of defunct satellites, discarded rocket stages and other orbital debris.

ISRO has been an active member of the Inter-Agency Space Debris Coordination Committee (IADC) and India has contributed immensely to the IADC and UN guidelines for safe and sustainable space operations.

Mechanisms are in place for ensuring that the space activities are conducted in a safe and sustainable manner, which include:

- Establishment of facilities for tracking and monitoring of space objects.
- Best practices such as passivation of launch vehicle upper stages, conjunction assessment and collision avoidance for satellites, post mission disposal of satellites and upper stages, etc.

- **Operationalization of ISRO System for Safe and Sustainable Space Operations Management (IS4OM) for safeguarding Indian space assets against space environmental hazards, to pursue the related R&D activities, and also to contribute to awareness raising on the long-term sustainability of outer space activities.**

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 153

TO BE ANSWERED ON WEDNESDAY, DECEMBER 07, 2022

INTEGRATION OF SYSTMES

153. SHRI KHAGEN MURMU:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government agrees with the view that for optimal utilization of facilities and resources, ISRO has to get industry to produce and integrate systems rather than be suppliers to ISRO, unlike in the past;

(b) if so, the efforts made/being made by the Government to put together systems for a higher level of integration during the past two years in order to create a model; and

(c) if not, the reasons therefor?

ANSWER

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

****

(a) Towards optimal utilization of facilities and resources, ISRO seeks enhanced participation of industries in producing and integrating end-to-end space systems, expanding their capabilities beyond the traditional supplier role.

(12)

(b) In this regard, the NewSpace India Limited (NSIL), a Public Sector Enterprise under Department of Space, has initiated the process of enabling Launch Vehicle Production through Indian Industries. NSIL has signed contract with M/s. HAL [Lead partner of M/s. HAL and L&T consortia] for end-to-end production of 5 nos. of PSLV.

(c) Does not arise.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 163

TO BE ANSWERED ON WEDNESDAY, DECEMBER 07, 2022

DEVELOPING NAVIGATION SYSTEM

163. SHRI MOHANBHAI KALYANJI KUNDARIYA:

Will the PRIME MINISTER be pleased to state:

a) whether the Government proposes to develop the Country's own navigation system;

b) if so, the details alongwith the salient features and its coverage thereof;

c) if not, the reasons and the time likely to be taken to develop the same; and

d) the details of time bound action plan of phasing out third party navigation system in all spheres of usage in the Country?

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) ISRO/DOS has established the country's own navigation system named NavIC (Navigation with Indian Constellation).

(14)

(b) NavIC is an independent regional navigation system covering Indian landmass and 1500 km from Indian boundaries. The system is designed as a constellation of seven satellites in GEO/GSO orbits. The signals broadcast by these satellites are available free-to-air for civilian use.

(c) Does not arise. The satellite constellation was established during 2013 to 2018 and the system is functional since then.

(d) The utilization of third party navigation system in the country is not controlled by ISRO/DOS. ISRO is putting efforts to popularise use of NaviC in more and more devices along with other systems.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 189

TO BE ANSWERED ON WEDNESDAY, DECEMBER 07, 2022

SPACE PROJECTS IN LADAKH

189. SHRI JAMYANG TSERING NAMGYAL:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has proposed detailed Space Projects in Ladakh, if so, the details thereof;

(b) whether the Government has details on the strength and weaknesses of space-related exploration in Ladakh and its impact on the development of Space related projects in India, if so, the details thereof; and

(c) whether the Government is planning to open space-related Institutions to pursue space related degrees and research in Ladakh 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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(16)

(a) Government of UT – Ladakh has approached the Indian Institute of Remote Sensing (IIRS), a unit of Indian Space Research Organisation (ISRO) for developing "Spatial Data Infrastructure geoportal 'Geo-Ladakh' for UT-Ladakh". The project encompasses spatial database generation (water resources, vegetation and energy potential) using remote sensing, geospatial techniques and the development of a Geo-portal for hosting this database. The project also aims towards training of UT-Ladakh officials on Geospatial techniques and applications. Portal provides geospatial data visualization and analytics for UT-Ladakh, consisting of Spatial viewer, Carbon Neutrality, Geospatial utlility mapping and Geo-Tourism. An MoU was also signed between IIRS (ISRO) and UT-Ladakh Administration on January 1, 2022 towards carrying out the above work.

(b) The potential of space technology could be used for generating the spatial database on time series snow cover, fresh water availability, sites for renewable energy potential (solar and wind), availability of alpine pastures/grazing lands for natural resource management and change assessment at periodic interval.

(c) Presently, ISRO is setting up an optical tele-scope at Hanle for tracking spacecraft and space objects.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 1265

TO BE ANSWERED ON WEDNESDAY, DECEMBER 14, 2022

RESEARCH PROGRAMMES IN SPACE

1265. SHRI SUNIL KUMAR MONDAL:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has set up any plan for new exploration and research programmes regarding space except Mars and Moon Mission during this year or in the future;

(b) if so, the details thereof along with the future plans in this regard; and

(c) if not, the reasons therefor?

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) Yes, Sir. ISRO has taken initiatives for feasibility studies on missions to Venus as well as Aeronomy studies.

(b) & (c)

Both these missions are being conceptualized. The scientific scopes are being deliberated nationally with participation of science community.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 1300

TO BE ANSWERED ON WEDNESDAY, DECEMBER 14, 2022

PRIVATE SECTOR PARTICIPATION IN SPACE SECTOR

1300. SHRI CHANDESHWAR PRASAD:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has started allowing external agencies to use ISRO facilities across the globe and if so, the details thereof;

(b) whether the Government allows private sector in space industry; and

(c) if so, the details of the benefits of private sector participation in space industry?

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) Usage of dedicated ISRO facilities by Non-Government Entities engaged in space activities is being enabled through a single window agency – Indian National Space Promotion and Authorization Centre [IN-SPACe]. Recent facilities used by external

agencies include the Sounding Rocket Launch Complex at SHAR by M/s. Skyroot for its mission PRARAMBH and the Vertical Test Facility at Thumba Equatorial Rocket Launching Station (TERLS), Thiruvananthapuram by M/s. Agnikul Cosmos Pvt. Ltd. for hot testing of its engine – Agnilet.

(b) & (c)

Yes, Sir. Government envisages enhanced participation of private sector in conducting end-to-end activities in the space sector. Participation of private sector including academic institutions, start-ups and industries in end-to-end space activities is expected to expand the national space economy, generate more employment opportunities and create a thriving space ecosystem.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 1305

TO BE ANSWERED ON WEDNESDAY, DECEMBER 14, 2022

PRIVATE PLAYERS IN SPACE RESEARCH

1305. PROF. SOUGATA RAY:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has any proposal to open the space research and technology to private players;

(b) if so, the details thereof;

(c) whether the Government has ascertained the security problems that are likely to be arise in future; and

(d) 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) & (b)

Yes, Sir. Government has already taken several steps towards enhancing end-to-end participation of private players in space research and technology, with far-reaching reforms in space sector brought forth in 2020. In this regard, a single window agency –

(21)

Indian National Space Promotion and Authorization Centre [IN-SPACe], has been created to promote, handhold and authorize space activities by private players. Sharing of technical facilities and technological support from ISRO is also enabled through IN-SPACe.

(c) & (d)

IN-SPACe has been mandated to grant authorization for space activities, keeping in mind safety and security considerations.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 2343

TO BE ANSWERED ON WEDNESDAY, DECEMBER 21, 2022

DELAY IN LAUNCH OF CHANDRAYAAN-3

2343. SHRI LAVU SRI KRISHNA DEVARAYALU:

Will the PRIME MINISTER be pleased to state:

(a) whether ISRO has carried out only four scientific missions so far;

(b) if so, the reasons for giving more priority to commercial launches over scientific missions;

(c) the reasons for the delay in launching the Chandrayaan-3 mission;

(d) whether the new space policy includes any specific provisions to promote scientific missions if so, the details thereof and if not, the reasons therefor;

(e) whether the scientific component of ISRO is struggling with a limited budget, if so, whether the Government plans to prioritize scientific missions in the next budget; and

(f) if so, the details in this regard?

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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(23)

(a) Yes, Sir. As on date, ISRO has carried out four dedicated scientific missions in the form of Chandryaan -1 & 2, Mars Orbiter Mission and ASTROSAT, catering to space science and planetary exploration.

(b) ISRO programs have been strongly rooted in the applications of space technology to the common problems of man and society. As such, priority has always been given to the development of space systems catering to applications of space technology viz. remote sensing, communication, navigation, etc. and associated launch vehicles that can put them in respective orbits. The commercial launches were taken up once the maturity of launch vehicles was established and as a response to the increasing demand for reliable, low-cost launch services.

(c) The onset of the COIVD-19 pandemic and subsequent lockdowns resulted in delays due to the non-availability of components, manpower and facilities. The industries were also not functional. Furthermore, additional tests and indigenous technology development such as Laser Doppler Velocimeter, to increase the robustness have been recommended.

(d) The Department of Space is in the process of framing a comprehensive, overarching policy for the space sector, that shall address various aspects of activities in space domain, including space science and planetary exploration as well.

(e) No, Sir. The scientific missions of ISRO are adequately funded.

(f) Does not arise.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 2382

TO BE ANSWERED ON WEDNESDAY, DECEMBER 21, 2022

SETTING UP NESAC

2382. MS. MIMI CHAKRABORTY:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has established North Eastern Space Applications Centre (NESAC) as a joint initiative of Department of Space (DoS) and the North Eastern Council (NEC) to provide advanced space technology support;

(b) if so, the details thereof;

(c) whether the Government proposes to setup such centre in West Bengal for national development and societal benefits as public-good space applications keeping in mind of different catastrophic tropical weather forcasts; and

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

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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(25)

(a) & (b) Yes Sir.

North Eastern Space Applications Centre (NESAC) was established on 5th September, 2000 as a joint initiative of the Department of Space (DoS) and the North Eastern Council (NEC), at Shillong in Meghalaya, and is a society registered under the Meghalaya Societies Registration Act, 1983.

NESAC provides Space based support to the eight states of the North Eastern Region (NER) on the use of space science and technology for Natural resources management; infrastructure & developmental planning; disaster management support and satellite communication applications in education, health care and disaster management. NESAC is also engaged in research on space & atmospheric science and in establishing necessary instrumentation hub, and networking with various academic institutions of NER. Capacity building in the field of geospatial technology is also carried out by NESAC, benefiting officials, professionals, students, and researchers.

(c) & (d)

Regional Remote Sensing Centre- East (RRSC-E), one of the regional arms of National Remote Sensing Centre; Hyderabad (NRSC; Hyderabad)/ DoS, established at Kolkata, West Bengal, supports the eastern region, including West-Bengal, through space applications as public-good service for societal benefits in the domains of natural resources management, governance, sustainable development and disaster risk reduction. Space based inputs are also enabled by ISRO/ Department of Space for weather forecast/ advisory services by India Meteorological Department (IMD)/ MoES.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 2421

TO BE ANSWERED ON WEDNESDAY, DECEMBER 21, 2022

FIRST TEST FLIGHT GAGANYAAN

2421. SHRI A. RAJA:

SHRI A. GANESHAMURTHI

Will the PRIME MINISTER be pleased to state:

(a) the details of launch of Indian's first test-flight Gaganyaan;

(b) whether India's maiden human space-flight mission is likely to be launched in the near future, and if so, the time by which by it is likely to be launched;

(c) whether the astronaut crew for the human space-flight mission have been identified and being trained; and

(d) 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 first uncrewed flight of Gaganyaan programme i.e. 'G1' mission is aimed at validating the performance of Human rated launch vehicle, Orbital module propulsion system, mission

management, communication system and recovery operations. The mission will carry a humanoid as payload.

In view of the paramount importance of crew safety, two Test Vehicle missions are planned before the 'G1' mission to demonstrate the performance of crew escape system and parachute-based deceleration system for different flight conditions.

(b) Yes, Sir. The uncrewed 'G1' mission is targeted to be launched in the last quarter of 2023 followed by the second uncrewed 'G2' mission in the second quarter of 2024. India's maiden human space flight 'H1' mission is targeted to be launched in the fourth quarter of 2024.

(c) & (d)

Yes, Sir. The astronaut designates for human space flight mission are identified and are currently undergoing their mission specific training at Bengaluru. First semester of Astronaut training has been completed wherein they have undergone course modules on Theoretical basics, Space medicine, Launch vehicles, spacecraft system and ground support infrastructure. Regular physical fitness sessions, aeromedical training and flying practice are also part of crew training. Corresponding evaluation and assessment activities have also been completed. The second semester of crew training is currently in progress.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 2476

TO BE ANSWERED ON WEDNESDAY, DECEMBER 21, 2022

CONSTRUCTION OF SPACE LAUNCH CENTRE

2476. SHRIMATI KANIMOZHI KARUNANIDHI:

Will the PRIME MINISTER be pleased to state:

(a) the present status of Kulasekarapattinam Space launch centre which is being constructed in Thoothukudi district of Tamil Nadu;

(b) the current status of land acquisition for the project;

(c) the details of funds allocated and released for the construction of Space centre infrastructure;

(d) whether any expected timeframe is available for the space centre to be completed and made functional; and

(e) 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) & (b)

Land acquisition is under progress by Government of Tamil Nadu. Till date, acquisition of land to an extent of 1946.44 acres (out of

(29)

2376 acres) is completed by Government of Tamil Nadu and the same is taken over by Department of Space. The remaining land is in advance stage of acquisition.

(c) A total of Rs. 980.56 Cr. has been sanctioned for the 'Acquisition of Land and establishment of space Launch centre infrastructure at Thoothukudi district of Tamil Nadu'.

Till date, an amount of Rs. 210.20 Cr. has been remitted to Government of Tamil Nadu towards land acquisition. Only on completion of entire land acquisition, the construction activities will be initiated.

(d) & (e)

Generally, realization of such space launch centre infrastructure would take about 2 to 3 year time to become functional after the land acquisition and obtaining all statutory clearances.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 291

TO BE ANSWERED ON THURSDAY, DECEMBER 08, 2022

SETTING UP OF PERMANENT STATION ON THE MOON

291. SHRI KARTIKEYA SHARMA:

Will the PRIME MINISTER be pleased to state:

(a) whether Indian Space Research Organisation (ISRO) has started the Mission to set up permanent station on the Moon;

(b) if so, the details thereof and its objectives;

(c) the major constraints to set up permanent station on the Moon;

(d) the status of the proposal to take human beings to Mars and beyond;

(e) whether ISRO is capable to use rockets for multiple use; and

(f) if so, the details thereof and if not, the hurdles for multiple use?

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) & (b)

As on date, ISRO is gearing up for Chandrayaan -3 mission for demonstrating soft landing on the moon.

(c) Major constraints in setting up permanent station on the moon are of technological, scientific and budgetary nature, with sustained efforts required in indigenous development of

various associated technology elements such as economical heavy-lift launch vehicles, crew & cargo transportation capabilities in outer space, landing and sustenance in lunar environment, etc.

(d) As on date, ISRO does not have any proposal to take human beings to Mars and beyond.

(e) & (f)

The Reusable Launch Vehicle (RLV) Project is under progress at ISRO, under which the Technology Demonstrator (RLV-TD) was successfully flight tested on May 23, 2016 from SDSC-SHAR, Sriharikota, validating the critical technologies such as autonomous navigation, guidance & control, reusable thermal protection system and re-entry mission management. The next test planned under the project is the First runway landing experiment [RLV-LEX], which is scheduled early next year from Aeronautical Test Range, Chitradurga, Karnataka.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 292

TO BE ANSWERED ON THURSDAY, DECEMBER 08, 2022

NEW SPACE POLICY FOR PRIVATE PLAYER'S PARTICIPATION

292. SHRI JAGGESH:

Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that Government proposes to allow private sector participation, with commercial activities to be driven by Indian Space Research Organisation's (ISRO) marketing arm, New Space India Ltd. (NSIL);

(b) whether Government has prepared a policy to define commercial activities of space that are available for private sector handled by NSIL and ISRO; and

(c) if so, details and the time frame for launching the proposed New Space Policy?

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) Yes, Sir. Government proposes to widen the participation of private players in space domain, by allowing them to undertake end-to-end space activities. A single-window agency, INSPACe – Indian National Space Promotion & Authorization Centre, has been created in this regard to promote, handhold and authorize space activities of Non-Government Entities(NGEs).

(33)

In parallel, NewSpace India Limited (NSIL), a Central Public Sector Enterprise under Department of Space mandated to carry out operational and commercial activities, so far largely conducted by ISRO.

(b) & (c)

Yes, Sir. The Department of Space is in the process of formulating a comprehensive, overarching space policy, that shall bring clarity on roles of various stakeholders. The Policy has undergone extensive deliberations with industry groups, inter-ministerial consultations and is under further approval process.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1091

TO BE ANSWERED ON THURSDAY, DECEMBER 15, 2022

SPACE TECHNOLOGY STARTUPS

1091. SHRI DEREK O' BRIEN:

Will the PRIME MINISTER be pleased to state:

(a) whether Government has any record of the number of space-tech related startups in India currently;

(b) if so, the details thereof; and

(c) whether Government plans to bring forth a policy in order to enhance support to such startups?

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) & (b)

Yes, Sir. The creation of IN-SPACe as a single-window agency for the promotion and handholding of Non-Government Entities in conducting end-to-end space activities has resulted in a remarkable interest in the Start-up community, with 111 space-startups registered, as on date, on the IN-SPACe digital platform.

(c) Yes, Sir. The Department of Space is in the process of formulating a comprehensive, overarching space policy, that shall bring clarity on roles of various stakeholders, with a thrust on enhanced participation and handholding of Non-Government Entities in space sector, that includes Start-ups. The Policy has undergone extensive deliberations with industry groups, inter-ministerial consultations and is under further approval process.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1092

TO BE ANSWERED ON THURSDAY, DECEMBER 15, 2022

SPACEPORT IN TAMIL NADU

1092. SHRI P. WILSON:

Will the PRIME MINISTER be pleased to state:

(a) the details of the developments regarding the construction of India's second spaceport in the State of Tamil Nadu;

(b) whether Government has any dates regarding information on the Mars Orbiter Mission of India; and

(c) if so, the details thereof, if not, the reasons therefor?

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) Government of Tamil Nadu has accorded administrative sanction for acquisition of 2234 acres of patta dry lands and alienation of about 142 acres of Government Poramboke land in favour of DOS/ISRO.

Till now, a total of 1947 acres of land is handed over by Government of Tamil Nadu to DOS/ISRO as against 2376 acres of proposed land to be acquired for the above project. Balance portion of land is in advance stages of acquisition and is expected to be handed over shortly to DOS/ISRO. After handing over of the total land, statutory clearances will be obtained to take up the construction activities. Design of the launch complex is completed and is ready for tendering.

(36)

(b) & (c)

ISRO has announced the end of Mars Orbiter Mission life on 27th September, 2022 during a national meet, when the eight years of MOM was celebrated. Following a long eclipse in April, 2022, the spacecraft lost communication with the ground station.

During the national meet, ISRO deliberated that the propellant must have been exhausted, and therefore, the desired attitude pointing could not be achieved for sustained power generation. It was declared that the spacecraft is non-recoverable, and attained its end-of-life.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1093

TO BE ANSWERED ON THURSDAY, DECEMBER 15, 2022

SUCCESSFUL LAUNCH OF FOREIGN SATELLITES

1093. SHRI GHANSHYAM TIWARI:

Will the PRIME MINISTER be pleased to state:

(a) the total number of foreign satellites successfully launched by the Indian Space Research Organisation during the last five years, the details thereof;

(b) the details of the efforts made by Government during the last five years to strengthen country's space program and make it successful; and

(c) quantum of revenue generated from launch of foreign satellites during the last five years, year-wise 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) During the last Five years, i.e., from January 2018 to November 2022, ISRO through its commercial arms, has successfully launched 177 foreign satellites belonging to 19 countries viz., Australia, Brazil, Canada, Colombia, Finland, France, Israel, Italy, Japan, Lithuania, Luxembourg, Malaysia, Netherlands, Republic of Korea, Singapore, Spain, Switzerland, United Kingdom and USA, on-board PSLV and GSLV-MkIII launcher's under commercial agreement.

(b) Over the last five years, Government has taken several steps to strengthen space program and take it to greater heights. Significant progress has been made in the development and realization of space systems catering to earth observation, satellite communication and space science. Multiple successful flights of operational launch vehicles, along with development, realization and testing of major technology elements of future launch vehicles, was seen during this period.

Gaganyaan program was announced in 2018, which aims to demonstrate indigenous human space flight capability and subsystem realization & testing for the same are under progress.

Further, far-reaching reforms in the sector were announced in June 2020, with an intent to enhance participation of Non-Government Entities [NGEs] in the sector and bring in a commerce-oriented approach to space activities – all steps towards enhancing the nation's share in the global space economy.

The result of these reforms was reflected with the heaviest commercial launch by India in the form of LVM3, carrying 36 Oneweb satellites and the recent suborbital launch by an Indian Private entity – M/s Skyroot Aerospace – which was the first such instance.

(c) The F.E. revenue generated through launching of these 177 foreign satellites from January 2018 to November 2022 is approximately 94 Million USD and 46 Million Euro.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1094

TO BE ANSWERED ON THURSDAY, DECEMBER 15, 2022

BUDGET FOR SPACE RESEARCH

1094. DR. V. SIVADASAN:

Will the PRIME MINISTER be pleased to state:

(a) the revised estimates in the Union Budget for Space research during the last five years;

(b) the amount of money allocated to Indian Space Research Organisation and Vikram Sarabhai Space Centre during the last five years, institution-wise and year-wise details thereof;

(c) the number of missions that have succeeded, year-wise figures for the last five years; and

(d) the total number of missions that have been launched, year-wise figures for the last five years?

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 allocation in revised estimates under the head "Space Research" during the last five years is given below:

Sl. No.	Financial Year	Revised Estimates (₹ in Crores)
1	2017-18	9,122.02
2	2018-19	11,155.00
3	2019-20	13,086.26
4	2020-21	9,478.20
5	2021-22	12,608.00

(40)

(b) The budget (revised estimates) allocated to Indian Space Research Organization and Vikram Sarabhai Space Centre during the last five years is given below:

Sl. No.	Financial Year	Revised Estimates (₹ in Crores)	
		Indian Space Research Organization / Department of Space	Vikram Sarabhai Space Centre
1	2017-18	9,158.92	1,368.90
2	2018-19	11,200.00	1,385.51
3	2019-20	13,139.26	1,463.09
4	2020-21	9,500.00	1,206.00
5	2021-22	12,642.00	1,458.00

(c) & (d)

The total number of missions launched and the number of successful missions during the last five years is as given below:

Sl. No.	Financial Year	Number of missions launched	Number of Missions Succeeded
1	2017-18	15	12
2	2018-19	14	14
3	2019-20	11	11
4	2020-21	5	5
5	2021-22	5	3

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

STARRED QUESTION NO. 174

TO BE ANSWERED ON THURSDAY, DECEMBER 22, 2022

SCIENTIFIC EVIDENCE TO INDIA'S HISTORY

*174. SHRI ANIL DESAI:

Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that history of India's ancient civilisation is not just a myth but there are some evidence available to prove it;

(b) if so, whether places like Ram Setu, submerged city of Dwarka etc., can also be scientifically proved by images taken by our remote sensing orbiting in space; and

(c) if so, whether the space programme may also include and complete such research on historical facts/evidence?

ANSWER

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

(DR. JITENDRA SINGH):

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

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(42)

STATEMENT LAID ON THE TABLE OF THE RAJYA SABHA IN REPLY TO STARRED QUESTION NO. 174 REGARDING "SCIENTIFIC EVIDENCE TO INDIA'S HISTORY" ASKED BY SHRI ANIL DESAI FOR ANSWER ON THURSDAY, DECEMBER 22, 2022.

(a) India has rich cultural heritage and hosts a large number of archaeological sites spread across the country. There have been some studies carried out in India to explore the potential of space based remote sensing for archaeology. Some of these studies include mapping the paleochannels in northwest India using multi-sensor satellite data and understanding its migration and evolution. These studies have shown evidences of a prominent river system, which had become defunct and buried under sand cover of Thar Desert. This has been identified as an ancient river mentioned in many ancient Indian texts and epics. Also, the locations of sites belonging to Harappan civilization, when overlaid, were found to be on the banks of these paleochannels.

High resolution Satellite images show surface impressions of ancient civilisations of Harrapan age sites viz., Dolavira (Gujarat), Kalibanga (Rajasthan), Lothal (Gujarat) and mounds associated with Nalanda. The satellite images along with other associated technologies like Ground Penetrating Radar (GPR) have also been used to search buried sites. ISRO has also brought out an atlas showcasing synoptic view of 37 important cultural heritage sites, as observed from remote sensing satellites.

(b) Remote sensing observation can help in understanding proxies for archaeological sites. They do not directly provide details of such ancient civilization, but some surface features like mounds, paleochannels, morphological anomalies, tonal anomalies etc. can be identified, which may be the proxies of buried archaeological sites. These observations need to be supported by ground investigations.

Indian satellites have acquired high resolution images over Ram Setu region connecting India and Sri Lanka. However, satellite images cannot provide direct information about the origin and age of this structure.

Submerged city of Dwarka cannot be seen by remote sensing satellites, as it cannot acquire images below the surface.

(c) The present and future earth observation data, both in optical and microwave domain, could be used for the study of surface signatures, if any, of buried archaeological sites of ancient civilization. Satellite data alone is not sufficient for such research, and it can be used only as supportive information.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1896

TO BE ANSWERED ON THURSDAY, DECEMBER 22, 2022

FOREIGN COLLABORATION IN SPACE EXPLORATION

1896. SHRI JOSE K. MANI:

Will the PRIME MINISTER be pleased to state:

(a) whether Government has made any agreement with any country or group of countries to collaborate in space exploration ventures over the last five years;

(b) if so, the details thereof;

(c) whether all countries are depending on India for space science related activities and satellites utilities, if so, the details of the amount of foreign exchange earned by space science during each of the last five calendar years;

(d) whether there is any gratuitous providing of space science related technology including satellite service to neigbouring small countries and poor countries of the world; and

(e) 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):

****

(a) Yes, Sir.

(b) Indian Space Research Organisation (ISRO) of Government of India has signed 04 (four) cooperative documents specifically to collaborate in space exploration with USA (for accommodating USA instruments in India's Chandrayaan-2 and Chandrayaan-3); Japan

(to conduct feasibility study for a joint lunar polar exploration mission) and UK (to conduct feasibility study for collaboration in future space science missions) in the last five years.

(c) Not all countries are depending on India for space science related activities and satellite utilities. As the data from India's space science and exploration missions are made available to the global scientific community at no-cost (as practiced globally) and thus no foreign exchange has been earned. This practice is reciprocated for missions done by others.

(d) Department of Space of Government of India provides training and capacity building in space science related technology including satellite services to neighbouring small countries and other space-aspiring countries of the world.

(e) India and Bhutan collaborated on the development of INDIA-BHUTANSAT Satellite carrying into payloads NanoMX, an optical imaging payload developed by ISRO and APRS-Digipeater, jointly developed by DITT, Bhutan and ISRO. The said satellite has been successfully placed in orbit on 26.11.2022.

A communication satellite 'South Asia Satellite' was dedicated by India to South Asian Countries in 2017.

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