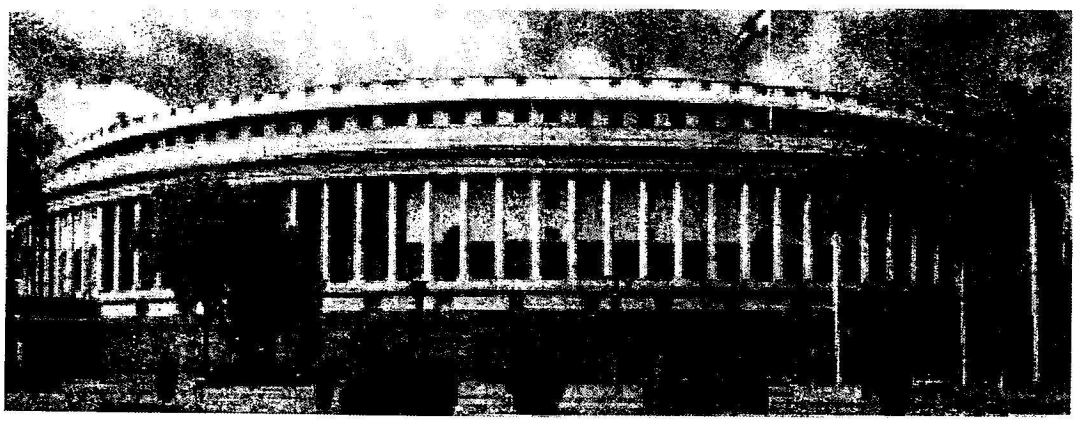
सत्यमेव जयते

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

"SPACE IN PARLIAMENT"



MONSOON SESSION OF PARLIAMENT 2023
(JULY – AUGUST, 2023)

COMPILATION OF REPLIES GIVEN IN PARLIAMENT DURING 2023

Government of India
Department of Space
*****

PARLIAMENT QUESTIONS – MONSOON SESSION OF PARLIAMENT 2023
****

INDEX

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

STARRED QUESTION NO. 199

TO BE ANSWERED ON WEDNESDAY, AUGUST 02, 2023

SETTING UP OF SPACE CENTRE

***199. SHRI SAUMITRA KHAN**

Will the PRIME MINISTER be pleased to state:

(a) whether the total number of space centres set up across the country;

(b) whether the Government proposes to set up an ISRO space centre in West Bengal especially in the Rarh Bengal region under the private sector keeping in mind the interests of young entrepreneurs and students in the field of space science; and

(c) if so, the details of the facilities likely to be provided to the youths under the said scheme?

STATEMENT LAID ON THE TABLE OF THE LOK SABHA IN REPLY TO STARRED QUESTION NO. 199 REGARDING "SETTING UP OF SPACE CENTRE" ASKED BY SHRI SAUMITRA KHAN FOR ANSWERING ON WEDNESDAY, AUGUST 02, 2023.

(a) Department of Space has 31 space centres across the country, comprising of Centres/Units of Indian Space Research Organisation, Autonomous Bodies and Public Sector Enterprieses.

(b) & (c)

Regional Remote Sensing Centre (RRSC) [East] is operational in Kolkata, West Bengal in order to meet the various Remote Sensing Tasks specific to the eastern region.

Keeping in mind, the interests of young entrepreneurs and students in the field of space science, ISRO has set up the Regional Academic Centres for Space (RAC-S) at 6 locations across the country.

RAC-S for the eastern zone has been set up at NIT-Patna, which also caters to the requirements of West Bengal region as well.

RAC-S enables advanced research in the areas of relevance to the future technological and programmatic needs of the Indian Space Programme and acts as a facilitator for the promotion of space technology activities in the region.

Also, under the Sponsored Research (RESPOND) programme of ISRO, projects are taken up by Universities/academic institutions across the country, including West Bengal region, in the areas of relevance to space programme.

****

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.

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 2182

TO BE ANSWERED ON WEDNESDAY, AUGUST 02, 2023

ISRO FACILITY IN POLLACHI

2182. SHRI SHANMUGA SUNDARAM K.:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has any plans to establish any ISRO facility in Pollachi constituency; and

(b) 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):

****

(a) There is no specific proposal to establish a ISRO facility in Pollachi in Tamil Nadu.

(b) Does not arise.

****

O.I.H.

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 2279

TO BE ANSWERED ON WEDNESDAY, AUGUST 02, 2023

CENTRES OF ISRO

2279. SHRI NIHAL CHAND:

Will the PRIME MINISTER be pleased to state:

(a) The number of centres of Indian Space Research Organisation (ISRO) in the country at present, State/UT-wise;

(b) India's position in the field of space research as compared to other countries;

(c) Whether the Union Government is contemplating to open new space research centre in other parts of the country also;

(d) If so, the details thereof, State-UT wise; and

(e) The progress made by India in the field of space research during 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):

****

(a) Indian Space Research Organization has its Centers/Units spread throughout the country with following distribution:

Centres/Units/Liaison Office	State	Number
Regional Remote Sensing Centre [RRSC] (West)	Rajasthan	3
Solar Observatory		
Infrared Observatory		
Space Application Centre	Gujarat	2
Physical Research Laboratory		
Delhi Earth station	Delhi	2
Regional Remote Sensing Centre [RRSC] (North)		
Indian Institute of Remote Sensing	Uttarakhand	1
ISTRAC Ground Station	Uttar Pradesh	1
Regional Remote Sensing Centre [RRSC] (East)	West Bengal	1
North Eastern Space Application Centre (NESAC)	Meghalaya	1
Regional Remote Sensing Centre [RRSC] (Central)	Maharashtra	1
Master Control Facility (Bhopal)	Madhya Pradesh	1
National Remote Sensing Centre [NRSC]	Telangana	1
Satish Dhawan Space Centre [SDSC]	Andhra Pradesh	2

Centres/Units/Liaison Office	State	Number
National Atmospheric Research laboratory [NARL]		
U R Rao satellite Centre [URSC]	Karnataka	6
Human space flight Centre [HSFC]		
Laboratory for Electro optics systems [LEOS]		
ISRO Telemetry , Tracking and command network [ISTRAC]		
Regional Remote Sensing Centre [RRSC] (South)		
Master Control Facility [MCF]		
Vikram Sarabhai Space Centre [VSSC]	Kerala	4
Liquid Propulsion Systems Centre [LPSC]		
ISRO Inertial Systems Unit [IISU]		
Indian Institute of Space Science and Technology [IIST]		
ISRO Propulsion Complex [IPRC]	Tamil Nadu	1
Down range Station	Andaman & Nicobar Islands	1

(b) India is the fifth amongst spacefaring nations having end-to-end capabilities in space research and development, including

(5)

the capability to launch from our own land and operate programs of earth observation, satellite communication, meteorology, space science & navigation and ground infrastructure. Now, NewSpace industries are also emerging at fast pace after space sector reforms.

(c) No, Sir.

(d) Does not arise.

(e) During the last five years, significant progress has been made in the Indian Space Research sector. Some of the major achievements are listed below:

- 27 satellites and 22 Launch Vehicle missions have been successfully accomplished during the period (July 2018 – July 2023), besides the successful Pad Abort Test (PAT) to qualify the Crew Escape System (CES) in July 2018 and the Reusable Launch Vehicle autonomous landing mission in April 2023.
- In June 2018, India announced a capacity building training programme UNNATI (UNispace Nanosatellite Assembly & Training by ISRO) on Nanosatellites development through a combination of theoretical coursework and hands-on training on Assembly, Integration and Testing (AIT). A total of 90 participants from 45 countries benefitted from the program across three batches. (Two in 2019 and 1 in 2022).
- India's second mission to Moon, Chandrayaan-2 was successfully launched on July 22, 2019 on-board GSLV Mk

III-M1. Chandrayaan-2 Orbiter is providing valuable science data for the research community.

- The launch of PSLV-C48/ RISAT-2BR1 in December 2019 marked the 50th launch of PSLV, the workhorse launch vehicle.
- In 2019, ISRO launched an annual special programme called "Young Scientist Programme" or the *"YUva VIgyani KAryakram"* (YUVIKA), in line with the Government's vision "Jai Vigyan, Jai Anusandhan". A total of 603 students have attended the YUVIKA program spread over 3 years – 2019, 2022 and 2023.
- In 2019, the NewSpace India Limited (NSIL) got incorporated, as a wholly owned Government of India Undertaking/ Central Public Sector Enterprise (CPSE), under the administrative control of Department of Space (DOS).
- On June 26, 2020, the Government of India announced Space Sector Reforms – a major transformation of Indian Space Sector with enhanced participation of private players in Indian space programme and playing key roles to boost India's market share in Global Space Economy.
- Setting up of Indian National Space Promotion and Authorisation Centre (IN-SPACe) and enhancing the role New Space India Limited (NSIL) are the two major thrust areas in the Reform.
- The establishment of IN-SPACe was announced in June 2020 by Government of India, as an autonomous agency

under Department of Space, to create eco-system of industry, academia and start-ups and to attract major share in the global space economy, by authorizing and regulating activities of NGEs in space sector through detailed guidelines and procedures. IN-SPACe Headquarters at Ahmedabad was inaugurated by the Hon'ble Prime Minister in June 2022.

- The Hon'ble Minister of State (Department of Space) dedicated ISRO System for Safe & Sustainable Space Operations Management (IS^4OM) to the nation in July, 2022.
- LVM3 (GSLV MkIII) M2/OneWeb India-1 Mission was successfully accomplished on 23rd October 2022.
- Launch of Vikram-S (Prarambh mission), a suborbital launch vehicle from M/s Skyroot Aerospace Pvt. Ltd., Hyderabad, was accomplished successfully on 18th November 2022.
- First private launchpad & mission control center established by M/s Agnikul Cosmos Pvt. Ltd., Chennai in ISRO campus at SDSC, SHAR on 25th November 2022.
- On Feb 10th, 2023, the successful flight of Small Satellite Launch Vehicle (SSLV – D2) took place, launching three satellites – EOS-07, Janus-1 and AzaadiSAT-2 (a combined effort of about 750 girl students across India guided by Space Kidz India, Chennai).
- On March 7th, 2023, controlled re-entry experiment for the decommissioned Megha-Tropiques-1 (MT-1) satellite was

carried out successfully, with final impact in the Pacific Ocean, demonstrating the nation's continued efforts towards ensuring the long-term sustainability of outer space activities.

- LVM3 M3/OneWeb India-2 Mission was successfully accomplished on 26th March, 2023, placing 36 OneWeb satellites into their intended orbit. With this, NSIL successfully executed its contract to launch 72 satellites of OneWeb to Low Earth Orbit.
- Reusable Launch Vehicle Autonomous Landing Mission (RLV LEX) was successfully demonstrated at the Aeronautical Test Range (ATR), Chitradurga, Karnataka on 2nd April, 2023.
- GSLV-F12/NVS-01 mission was successfully accomplished on 29th May, 2023. GSLV deployed the NVS-01 navigation satellite, the first of the second-generation satellites envisaged for the Navigation with Indian Constellation (NavIC) service,into a Geosynchronous Transfer Orbit.
- LVM3-M4 successfully launched the Chandrayaan-3 Spacecraft on 14th July, 2023. Lunar orbit insertion activities are in progress and Moon landing is scheduled on 23rd August, 2023.

*****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 3282

TO BE ANSWERED ON WEDNESDAY, AUGUST 09, 2023

BUILDING A NEW SPACEPORT

3282. SHRI D.M. KATHIR ANAND:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has decided to build a new spaceport in Kulasekarapattinam in Tamil Nadu to be used by private companies to launch small satellites into orbit;

(b) if so, the details thereof and the time by which the spaceport would be established;

(c) whether it is a fact that the global small satellite market is projected to grow to reach $14 Billion by 2030; and

(d) if so, the details thereof and the measures taken by the Government to harness most of the potential global small satellite market?

(13)

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 government has approved the establishment of a new spaceport in Kulasekarapattinam, Tamil Nadu for carrying out the launches of the Small Satellite Launch Vehicles (SSLV) developed by ISRO and also the Government has announced the Indian Space Policy 2023 that has the provision for utilization of spaceport for carrying out launch activities by Non-Government Entities (NGEs), subject to technical feasibility and range safety constraints.**

(b) **Land acquisition by Government of Tamil Nadu is in progress. Currently, out of the 2350 acres of land identified, around 2000 acres of land have been acquired. Once the acquisition of land is completed, the launch pad at the new site is expected to be realized.**

(c) **The exact sizing of the global small satellite market including future projections, is a complex exercise and a matter of much debate, with several global consulting firms predicting varied current and future numbers, based**

on different underlying assumptions. However, such projections do indicate a general trend that the small satellite market is slated to grow in the coming years.

(d) The government has initiated various developments with regards to the potential global small satellite market. ISRO has successfully proven the Indian Mini Bus (IMS) and Indian Nano Satellite (INS) Bus which enable small satellite mission The IMS-1 Bus technology has been transferred to Indian Industries via NSIL.

Further, ISRO has also developed the Small Satellite Launch Vehicle (SSLV) to cater to the need for cost effective and on demand launch of small satellites. IN-SPACe has recently released the Expression of Interest for technology transfer of the Small Satellite Launch Vehicle (SSLV) for Indian Industries.

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 3293

TO BE ANSWERED ON WEDNESDAY, AUGUST 09, 2023

FDI IN SPACE SECTOR

3293. SHRI KURUVA GORANTLA MADHAV:

Will the PRIME MINISTER be pleased to state:

(a) whether Government intends to open the Space Sector to Foreign Direct Investment (FDI), in order to allow ISRO to focus more on new technologies, exploration missions and human spaceflight programmes and to promote technology transfer and research innovations in the Space Sector;

(b) if so, the details thereof; 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) Yes Sir.

(b) Currently, FDI in space sector is permitted under the heading "Satellites – Establishment and Operations" via the Government route upto 100 %.

Recently Government has approved the Indian Space Policy – 2023 which envisages a greater role for private sector across the entire value chain of space activities. The policy also envisages ISRO to work on new technologies, exploration mission, human spaceflight programmes and national prerogatives, while promoting technology transfer and research innovations in the space sector.

In order to facilitate the Non-Governmental Entities (NGEs) for their participation in the space sector activities in line with the Cabinet decision for Unlocking India's potential in Space Sector and Indian Space Policy, Department is in consultation with Department for Promotion of Industry and Internal Trade (DPIIT) for reviewing the sectoral guidelines pertaining to space in the FDI policy.

(c) Does not arise.

****

(17)

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 3345

TO BE ANSWERED ON WEDNESDAY, AUGUST 09, 2023

NEW SPACE POLICY

3345. SHRI THIRUNAVUKKARASAR SU.:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has approved NewSpace Policy;

(b) if so, the details along with its features thereof;

(c) whether the Government has set up an autonomous body, Indian National Space Promotion and Authorisation Centre (IN-SPACe) and also Laser Interferometer Gravitational Wave Observatory – India (LIGO-India);

(d) if so, the details thereof along with the estimated cost and proposed functions thereof; and

(e) whether the Government has recently launched Chandrayaan-3 successfully 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):

(16)

(a) & (b)

Yes, Sir. The Indian Space Policy – 2023 has been approved and released in the public domain, The Policy opens up the sector for enhanced participation of Non-Government Entities(NGEs) across the entire value chain of the space economy, while clearly delineating the roles of various stakeholders viz. IN-SPACe, ISRO, NSIL and DOS.

(c) & (d)

Yes Sir.

Indian National Space Promotion and Authorization Centre (IN-SPACe)

The Government has set up the Indian National Space Promotion and Authorization Centre as a single-window agency for promotion and authorization of space activities. The budget allocations for IN-SPACe:

2021-22	Rs. 10 Cr
2022-23	Rs. 33 Cr
2023-24	Rs. 95 Cr

Laser Interferometer Gravitational Wave Observatory - India (LIGO-India)

The LIGO-India project has been approved by the Government of India at an estimated cost of Rs. 2600 Crore, with Department of Atomic Energy as the Lead Agency. After completion of the project, the LIGO-India will be operated as a national facility for

detecting Gravitation Waves and Research in related areas of Astronomy.

(e) Yes, Sir. Chandrayaan-3 spacecraft was successfully launched onboard LVM-3 on 14th July 2023 at 14:35hrs from the Satish Dhawan Space Centre, SHAR. Currently, the spacecraft is in the translunar orbit, with the Lunar-Orbit Insertion (LOI) planned on August 5, 2023.

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 3358

TO BE ANSWERED ON WEDNESDAY, AUGUST 09, 2023

ENCOURAGING THE GROWTH OF STARTUPS

3358. SHRI S. JAGATHRAKSHAKAN:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has taken necessary steps to make India's space agency more business friendly by encouraging the growth of startups;

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

(c) whether the Government has taken note of the fact that the country's success rate in recent years of about 70% compares poorly to rates in the 90s for rockets from the US, Europe, Russia or China; and

(d) if so, the details of the remedial steps that are proposed to be taken by the Government keeping in mind that the value of India's satellite launch services?

ANSWER

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

(a) & (b)

Yes, Sir. With the reforms in the space sector undertaken in 2020 and the recently released Indian Space Policy – 2023, Government has taken several steps to enable Non-Government Entities (NGEs), including Start-ups, to take up end-to-end activities in space domain.

Necessary support in this regard is being extended through the Indian National Space Promotion and Authorization Centre (IN-SPACe), which has been created as a single window agency to promote, handhold and authorize space activities of NGEs. In this regard, necessary technical support, usage of dedicated facilities and mentorship is being extended through the National Space Agency, ISRO,

The initiatives taken by IN-SPACe for encouragement of Start-ups include:

- **IN-SPACe seed fund scheme**
- **Price support for utilization of ISRO facilities**
- **Technical support for NGEs in terms of handholding, transfer of technology, etc.**

- **Establishment of software design lab**
- **Frequent meets/roundtable with national and international industries for potential business opportunities.**

(c) & (d)

Country's success rate in recent years (between 2017-2022) for rocket launches is nearly 90% which is comparable with success rate of other space faring nations during the same period i.e. Europe (90%), USA (97%), Russia (98%), China (94%) and Japan (91%).

During last ten years (2013-2022), India has conducted 52 launches of which only 3 were failures that corresponds to a success rate of 94.3%.

In order to enhance India's share in the launch service market, Government, through NSIL (Public Sector Enterprise under DOS) offers commercial launch services through ISRO's launch vehicles viz. PSLV and LVM3.

NSIL, has also executed contract with private consortium for realization of PSLV through Indian Industry. Further, INSPACE has also recently released Expression of Interest (EOI) for Technology Transfer of the Small Satellite Launch Vehicle (SSLV) for interested Indian Industries, to provide commercial launch services, thus catering to the small satellite market.

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

STARRED QUESTION NO. 90

TO BE ANSWERED ON THURSDAY, JULY 27, 2023

INDIAN SPACE STATION

*90. SHRI DHIRAJ PRASAD SAHU:

Will the PRIME MINISTER be pleased to state:

(a) whether India is planning its own Space Station, if so, the details thereof;

(b) the steps taken and the progress so far in this direction;

(c) by when India is expected to established its own International Space Station; and

(d) by when India is expecting to send their astronauts in the Indian Space Station?

ANSWER

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

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

*****

(24)

STATEMENT LAID ON THE TABLE OF THE RAJYA SABHA IN REPLY TO STARRED QUESTION NO. 90 REGARDING "INDIAN SPACE STATION" ASKED BY SHRI DHIRAJ PRASAD SAHU FOR ANSWER ON THURSDAY, JULY 27, 2023.

(a) & (b)

India has embarked on human spaceflight programme 'Gaganyaan' for development of various technologies which are essential building blocks for human space missions including Space Station. These technologies include Human Rated Launch Vehicle, Crew Module, Environment Control and Life Support System, Crew Escape System etc. Initial studies have also been taken up for development of technologies required for sustained presence in space including rendezvous and docking and habitable modules.

(c) & (d)

The objective of Gaganyaan programme is demonstration of human spaceflight capability to Low earth orbit. Accomplishment of Gaganyaan mission will bring the country closer to sustained human spaceflight including an Indian space station. Follow-up missions for long duration stay will be taken up along with development of required technologies.

***

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 893

TO BE ANSWERED ON THURSDAY, JULY 27, 2023

REVENUE GENERATION BY LAUNCHING OF FOREIGN SATELLITES

893. SHRI KANAKAMEDALA RAVINDRA KUMAR:

Will the PRIME MINISTER be pleased to state:

(a) details of foreign exchanges earned by Government by launching satellites belonging to foreign countries;

(b) details, if any, of the target fixed by Government to earn foreign exchange by launching foreign satellites; and

(c) details of the percentage earned as foreign exchange by launching foreign satellites in Research and Development activities so far?

ANSWER

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

****

(26)

(a) Starting from May 1999 till June 2023, a total of 425 Foreign Satellites have been successfully launched on commercial basis. Through launching of this foreign satellites, country has earned a total Foreign Exchange revenue of 175 Million USD and 256 Million Euros.

(b) & (c)

NewSpace India Limited (NSIL), a Government of India Company under Department of Space and the Commercial arm of ISRO, is responsible for commercial marketing of launch services to foreign satellite customers. NSIL through its marketing efforts is striving towards securing more foreign satellite launch service contracts, year-on-year, onboard SSLV, PSLV and GSLV-MkIII (LVM-3) rockets. Also, the plans of NSIL to produce more number of these rockets through Indian Industry, would enable increase in Foreign Exchange revenue through Launch services.

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 924

TO BE ANSWERED ON THURSDAY, JULY 27, 2023

DELAY BETWEEN CHANDRAYAAN MISSION II and III

924. DR. ASHOK KUMAR MITTAL:

Will the PRIME MINISTER be pleased to state:

(a) the reasons for long delay between Chandrayaan Mission II and the Chandrayaan Mission III;

(b) whether other space research initiatives have been undertaken by ISRO since 2014;

(c) the details of funds allocated for space research to ISRO in the last four years;

(d) the details of funds allocated which has been utilised so far and details of the projects thereof; and

(e) whether any steps can be taken to catalyse the speed of research in the domain of space for India?

ANSWER

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

****

(a) Chandrayaan-3 configuration has been worked out considering the experience gained from Chandrayaan-2 performance and also the detailed post flight data analysis. The mission configuration incorporates necessary corrective actions emerged from the expert committee findings and recommendations; enhanced robustness with exhaustive

(28)

ground simulations and extensive testing. Subsequent to the aforementioned aspects and detailed reviews by various committees, the Chandrayaan-3 spacecraft was launched onboard LVM-3 on 14th July 2023 at 14:35 hrs from Satish Dhawan Space Centre, SHAR.

(b) Yes, Sir. Several space research initiatives have been undertaken by ISRO since 2014. These include

1. Development and operationalization of Launch Vehicles such as LVM3 and SSLV
2. Realization and launch of several satellites catering to Earth Observation, Satellite Communication and Satellite Navigation.
3. Use of the PS-4 stage as an experimental platform for scientific experiments and technology demonstration
4. Space Science and exploration Missions such as
    a. Mars Orbiter Mission (Orbit insertion in 2014; leading to several first-of-its kind of observations in Mars)
    b. AstroSat (Launched in 2015)
    c. Chandrayaan-2 (Launched in 2019)
    d. Chandrayaan-3 (Launched in 2023)
    e. Aditya-L1 mission (getting ready for launch)
    f. XPoSat mission (getting ready for launch)
5. Development of technologies related to indigenous human spaceflight program viz. Gaganyaan.

(c) & (d) The details of the funds allocated in BE and the expenditure incurred under the major head – "Space research" is as given below:

(Rs. in Crores)

FY	BE Allocation	Actuals
2019-20	12438.26	12982.22
2020-21	13443.30	9468.35
2021-22	13922.59	12447.68
2022-23	13667.00	10045.05

Under "Space Research", provision is made towards (i) Launch vehicle development programmes such as PSLV, GSLV, LVM-3, SSLV (ii) Satellite development programmes in the areas of remote sensing, communication and navigation (iii) Space science and planetary exploration (iv) Gaganyaan programme (v) Research infrastructure and R&D activities at various ISRO Centres / Units (vi) Grants-in-aid to the autonomous bodies under the Department (vii) Support to R&D in academia.

(e) Government has already taken several steps to catalyze the speed of Research in the domain of Space for India.

ISRO, under Department of Space, has been working in a project-oriented mode towards the development of all-round capabilities across all the verticals of space domain viz. space transportation, space infrastructure, space applications and human spaceflight.

Besides, several mechanisms to enable research via academia & industries have also been created to augment R&D in space sector. Under the sponsored research programme of ISRO called "RESPOND", several research and development projects are going on involving different academic institutions in the country.

Further, the sector has also been opened up for enhanced participation of private enterprises in the space sector by allowing them to conduct end-to-end activities across all verticals of space domain.

In this regard, IN-SPACe has been created for the promotion and handholding of Non-Government Entities for their space activities, which includes enabling the usage of ISRO facilities, setting up the IN-SPACe technical Centre, mentorship support, seed fund scheme and industry meets.

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 926

TO BE ANSWERED ON THURSDAY, JULY 27, 2023

OPENING SPACE RESEARCH AND TECHNOLOGY TO PRIVATE PLAYERS

926. Shri S. Kalyanasundaram:
Shri M Mohamed Abdulla

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 Government has ascertained the security problems that are likely to arise in the future including privitisation and weaponization of space system; 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):

****

(a) Yes Sir, with the announcement of the Indian Space Policy 2023, Private sector of India is encouraged to take up end to end space activities including research, innovation and technology development for long-term sustainability of space activities.

(b) Department has taken initiatives for technology development by private sector such as

(31)

1. IN-SPACe seed fund scheme
2. EOI by ISRO for development of 100 technologies
3. Creation of Spacetech Innnovation Network (SPIN)

(c) & (d)

Yes Sir, Standing Committee for Inter-Ministerial Coordination (SC-IMC) has been formed by IN-SPACe represented by DOS, MHA, MEA, DPIIT, DOT, MIB and authorization to NGEs for space activities are provided after critical review and scrutinization.

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 927

TO BE ANSWERED ON THURSDAY, JULY 27, 2023

ENCOURAGEMENT TO SPACE SECTOR

927. DR. SUDHANSHU TRIVEDI:

Will the PRIME MINISTER be pleased to state:

(a) the steps being taken to encourage participation of private companies in the space sector;

(b) the steps being taken for enhancing India's capabilities in the space sector and achieving self-reliance in space technology; and

(c) the steps being taken to promote research and education in the space sector?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Government has taken several steps to encourage participation of private companies in the space sector. The sector has already been opened up for enhanced participation of private enterprises in the space sector by allowing them to conduct end-to-end activities across all verticals of space domain.

In this regard, IN-SPACe has been created for the promotion and handholding of Non-Government Entities for their space activities, which includes enabling the usage of ISRO facilities, setting up the IN-SPACe technical Centre, mentorship support, seed fund scheme and industry meets.

Besides, New Space India Limited (NSIL] has taken steps towards realization of PSLV through Indian Industries and transferring technologies to Indian Industries.

Further, Department of Space has released a comprehensive, overarching space policy that encourages the participation of private sector in end-to-end space activities.

(b) Several steps have been taken to enhance India's capabilities in the space sector and towards achieving further self-reliance in space technology. These include sustaining and augmenting

project-oriented R&D in ISRO, towards development of all-round capabilities across all the verticals of space domain viz. space transportation, space infrastructure, space applications and human spaceflight.

The technology elements in this regard include:

- Development and operationalization of indigenous space transportation systems;
- Manufacturing and operating space assets comprising of fleet of satellites catering to the needs of earth observation, satellite communication, meteorology, space science & navigation;
- Towards development of indigenous human spaceflight capability;
- Setting up and operations of ground infrastructure, and
- Implementation and institutionalization of operational programs related to the applications of space technology to the common problems of man and society.

Further, several capacity building initiatives have been undertaken to strengthen the ISRO-industry-academia triad, besides the reforms in the space sector that envisage private sector as a co-traveler in the exploration of outer space.

(c) Government has taken several initiatives to promote research and education in the space sector. Eight numbers of Space Technology Cells (STCs), Six numbers of Regional Academic Centre for Space (RAC-S) and Six numbers of Space Technology Incubation Centres (S-TIC) have been set up across the country for carrying out focused research and development activities. Apart from this, research activities have been initiated in association with Centre for Nano Science and Engineering (CeNSE) at Indian Institute of Science (IISc), Bengaluru; Satish Dhawan Centre for Space Sciences at Central University of Jammu, Jammu and Veer Surendra Sai University of Technology (VSSUT), Burla, Sambalpur, Odisha.

Further, under the sponsored research programme of ISRO called "RESPOND", several research and development projects are going on involving different academic institutions in the country. Indian Space Research Organisation (ISRO) also encourages industry for joint development of focused technologies as a part of developmental activities

Besides, IN-SPACe has also been undertaking different promotional activities to encourage academia for further research and education in space sector.

***

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

STARRED QUESTION NO. 165

TO BE ANSWERED ON THURSDAY, AUGUST 03, 2023

GAGANYAAN MISSION

*165. SHRI MASTHAN RAO BEEDA:

Will the PRIME MINISTER be pleased to state:

(a) the details of the Gaganyaan Mission which aims to send a three member crew to space in the 75th year of Independence;

(b) the progress made in this regard;

(c) the issues faced till now; and

(d) the details of other such proposed manned missions to space?

ANSWER

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

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

*****

(35)

STATEMENT LAID ON THE TABLE OF THE RAJYA SABHA IN REPLY TO STARRED QUESTION NO. 165 REGARDING "GAGANYAAN MISSION" ASKED BY SHRI MASTHAN RAO BEEDA. FOR ANSWER ON THURSDAY, AUGUST 03, 2023.

(a) The objective of the Gaganyaan mission is to demonstrate the capability of conducting human space flight mission to Low Earth orbit (LEO) on-board Indian Launch vehicle. The Orbital module consists of a Crew module and a Service module. Crew module, which is a pressurized module, acts as living quarters for the crew. The orbital module will be positioned in ~400 km circular orbit around earth for 1 to 3 days & the Crew module will return back at the designated location in sea.

(b) The progress made for Gaganyaan programme is as follows:

i. The first Test Vehicle mission, for the validation of crew escape system, is planned in August/September 2023.

ii. All subsystems pertaining to Test Vehicle TV-D1 mission have been realized. Crew module integration is completed.

iii. Static tests of all Crew Escape System motors have been completed. Ground testing of Crew Module Propulsion system is completed.

iv. Training of crew (Astronauts) is nearing completion.

v. 2nd Crew Module sub-assembly identified for uncrewed mission is completed and delivered by industry.

vi. Orbital module preparation facility construction completed. Facility has been commissioned for integration activities of Test vehicle mission. Launch pad augmentation works for Gaganyaan are underway.

vii. Recovery training plan by ISRO and Indian Navy & recovery training program commenced at Naval Dockyard, Visakhapatnam.

viii. The delivery of human centric products for crew training commenced from various national labs. Testing of human centric products is underway.

(c) The major issue faced till now has been the COVID pandemic which led to inevitable delay due to disruption in raw material supply etc.

(d) Gaganyaan is the maiden human space flight mission of India. Further human space missions will be planned after the successful accomplishment of Gaganyaan mission.

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1729

TO BE ANSWERED ON THURSDAY, AUGUST 03, 2023

FDI IN SPACE SECTOR

1729. SHRI MASTHAN RAO BEEDA:

Will the PRIME MINISTER be pleased to state:

(a) whether Government intends to open the Space Sector to Foreign Direct Investment (FDI), in order to allow ISRO to focus more on new technologies exploration missions and human spaceflight programmes and to promote technology transfer and research innovations in the Space Sector;

(b) if so, the details thereof; 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) Yes Sir.

(b) Currently, FDI in space sector is permitted under the heading "Satellites – Establishment and Operations" via the Government route upto 100 %.

Recently Government has approved the Indian Space Policy – 2023 which envisages a greater role for private sector across the entire value chain of space activities. The policy also envisages ISRO to work on new technologies, exploration mission, human spaceflight programmes and national prerogatives, while promoting technology transfer and research innovations in the space sector.

(37)

In order to facilitate the Non-Governmental Entities (NGEs) for their participation in the space sector activities in line with the Cabinet decision for Unlocking India's potential in Space Sector and Indian Space Policy, Department is in consultation with Department for Promotion of Industry and Internal Trade (DPIIT) for reviewing the sectoral guidelines pertaining to space in the FDI policy.

(c) Does not arise.

****

(35)

O.I.H.

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1730

TO BE ANSWERED ON THURSDAY, AUGUST 03, 2023

SPACE TOURISM IN THE COUNTRY

1730. SHRI RAMBHAI HARJIBHAI MOKARIYA:

Will the PRIME MINISTER be pleased to state:

(a) the provisions made by Government to increase space tourism in the county, the details thereof;

(b) the purpose of G-20 related tourism track meeting; and

(c) whether this meeting is being organized for the first time itself in Gujarat's Rann of Kutch, 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) Through Gaganyaan, India's maiden human spaceflight programme, ISRO is engaged in development of various technologies, which are essential building blocks for human spaceflight missions. This mission will pave the way for future human missions, including space tourism in the country. ISRO has carried out preliminary feasibility studies for a sub-orbital space tourism mission onboard a liquid propellant stage booster, presently being developed for Gaganyaan.

(39)

(b) & (c)

No specific inputs from Department of Space.

However, as per the inputs received from Ministry of Tourism, the purpose of G20 related Tourism Track meeting is to collaborate with G20 member countries, guest countries and international organizations to develop tourism sector. Under G20 India's Presidency, Tourism Track meetings are conducted to reaffirm the importance of working towards the full recovery of tourism from the impacts of the COVID 19 pandemic and advancing the role of tourism in accelerating the implementation of the United Nations 2030 Agenda for Sustainable Development. The development of GOA Roadmap for Tourism as a vehicle for achieving the Sustainable Development Goals is the key deliverable of the tourism working group meetings which is based on the five tourism priority areas identified by India's G20 Presidency for the development of a resilient and sustainable tourism sector namely: 1) Green Tourism; 2) Digitalization 3) Skills; 4) Tourism MSMEs and 5) Destination Management.

The meeting of 1st Tourism Working Group under India's G20 presidency which was held at the Rann of Kutch, Gujarat from 7th – 9th February was organized for the first time in the state. More than hundred delegates from G20 nations, invited countries and international organizations have taken part in the meet. All the 5 key priority areas set for the deliberations were endorsed by all G20 Member countries, Invitee countries and international organisations in the Tourism Working Group sessions. The meeting also included two thematic discussions, 1) 'Rural Tourism for Community Empowerment and Poverty Alleviation' and 2) 'Promotion of Archaeological Tourism: Discovering shared Cultural Heritage'. During their stay at Dhordo Tent City, the delegates had an opportunity to attend a Yoga session at sunrise at White Rann. The delegates also visited the Harappan Site of Dholavira, a UNESCO World heritage site and the state-of-the-art Smritivan Earthquake Memorial Museum in Bhuj.

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1731

TO BE ANSWERED ON THURSDAY, AUGUST 03, 2023

STATUS OF CHANDRAYAAN-3 MISSION

1731. DR. DHARMASTHALA VEERENDRA HEGGADE:

Will the PRIME MINISTER be pleased to state:

(a) whether the Phase I of Chandrayaan-3 Mission by the Indian Space Research Organisation (ISRO) successfully lifted off from the Satish Dhawan Space Centre in Sriharikota recently;

(b) if so, the details of components, weight, mission life, the landing site and objectives of Chandrayaan-3;

(c) the approved cost of Chandrayaan-3;

(d) the number of days it will take for Chandrayaan-3 to reach the Moon;

(e) the benefits of Chandrayaan-3 and reasons why Chandrayaan-3 is important for India;

(f) the reasons for failure of Chandrayaan-2 and changes made in Chandrayaan-3; and

(g) the comparisons between Chandrayaan-3 and Chandrayaan-2?

ANSWER

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

(a) Chandrayaan-3 spacecraft was successfully launched onboard LVM-3 on 14th July, 2023 at 14:35 hrs from the Satish Dhawan Space Centre, SHAR. The spacecraft is currently undergoing a series of orbit maneuvers with the objective of reaching the moon's orbit and has two phases namely Earth Bound Phase and Lunar Bound Phase. The spacecraft is currently in the Earth Bound Phase.

(b) Chandrayaan-3 components include various electronic and mechanical subsystems intended to ensure safe and soft landing such as Navigation sensors, propulsion systems,

guidance & control among others. Additionally, there are mechanism for release of Rover, two way communication related antennas and other onboard electronics.

Chandrayaan-3 Lift off mass is nearly 3896 kg and the mission life of Lander and Rover is approximately one Lunar Day which is equivalent to 14 earth days. The planned landing site for lander is ~ 69^0S, South Pole.

The objectives of Chandrayaan-3 are:

I. Safe and Soft Landing

II. Rover Roving on Moon Surface

III. In-situ Scientific Experiments.

(c) The approved cost of Chandrayaan-3 is Rs. 250 Crores (Excluding Launch Vehicle Cost)

(d) Chandrayaan-3 will take nearly 33 days from the launch date of 14th July, 2023 to reach the orbit of moon.

(e) The successful soft landing on the surface of the Moon would make India the fourth country in the world to achieve such a significant technological capability. The successful soft landing is envisaged to serve as fore-runners for future landing missions and other technological progress in planetary exploration.

(f) The soft landing of Chandrayaan-2 was planned to be carried out in multiple phases. Certain unexpected variations in performances of the Lander Module eventually resulted in higher velocities at touchdown, which was beyond the designed capability of the Lander's legs, resulting in a hard landing.

Chandrayaan-3 has been made more robust by improvements in Lander to handle more dispersion, improvements in sensors, software and propulsion systems, full level redundancies in addition to exhaustive simulations and additional tests being conducted towards ensuring a higher degree of ruggedness in the lander.

(g) Chandrayaan-3 in comparison to Chandrayaan-2 has been designed with the capabilities to autonomously handle wide range of dispersion in order to achieve soft and safe landing.

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1732

TO BE ANSWERED ON THURSDAY, AUGUST 03, 2023

LAUNCH OF CHANDRAYAAN-3

1732. SHRI VAIKO:

SHRI M. SHANMUGAM:

Will the PRIME MINISTER be pleased to state:

(a) the status of Chandrayaan-3 which was launched in the orbit recently;

(b) in what way, its lander and rover are different from that of Chandrayaan-2; and

(c) the details of activities and tests on the lunar surface like collecting data, series of scientific experiments to know about Moon's composition that are planned once the Lander successfully lands on the Moon?

ANSWER

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

(a) Chandrayaan-3 spacecraft was successfully launched onboard LVM-3 on 14th July, 2023 at 14:35 hrs from the Satish Dhawan Space Centre, SHAR. The spacecraft is currently undergoing a series of orbit maneuvers in order to reach the moon's orbit.

(b) Chandrayaan-3 has been made more robust by improvements in Lander to handle more dispersion, improvements in sensors, software and propulsion systems, full level redundancies in addition to exhaustive simulations and additional tests being conducted, towards ensuring a higher degree of ruggedness in the lander.

The Rover of Chandrayaan-3 and Chandrayaan-2 are identical.

(c) The Chandrayaan-3 spacecraft comprising of a propulsion module, lander and rover, collectively house seven scientific instruments.

The lander carries four instruments, namely.

i. ILSA (a seismometer)
ii. RAMBHA-LP (a Langmuir Probe)
iii. CHASTE (a thermal probe) and
iv. LRA (a Retroreflector from NASA).

The rover has two instruments viz.,

(i) APXS (an X-ray spectrometer) and
(ii) (ii) LIBS (a laser-based spectrometer)

The propulsion module has SHAPE (a spectro - polarimeter) instrument.

Major scientific experiments planned once the Lander successfully lands on the Moon include studying the (i) vibrations on the lunar surface due to seismic events, and / or due to the impact of meteorites, rover movement etc. (ii) near – surface plasma environment (iii) temperature and thermal conductivity upto the depth of 10 cm (iv) elemental composition in and around the landing site (v) spectral signatures of Earth from lunar orbit.

****

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1733

TO BE ANSWERED ON THURSDAY, AUGUST 03, 2023

SPACETECH STARTUPS

1733. SHRI V. VIJAYASAI REDDY:

Will the PRIME MINISTER be pleased to state:

(a) whether spacetech startups are looking at ISRO for their operations and ventures;

(b) if so, the details thereof;

(c) whether it is a fact that many experienced young and retired are being lured by private spacetech startups and resulting in leaving some of the young and retired talent from ISRO; and

(d) the impact of such brain drain on ISRO and in what manner the Ministry proposes to cope with the situation?

ANSWER

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

(a) & (b)

Yes Sir. Several Spacetech Start-ups have been receiving infrastructural and institutional support, including technical mentorship from ISRO. Such support is being enabled through IN-SPACe, which has been created as a single-window agency for promotion and handholding of Non-Government Entities in the space sector. Presently, ISRO is supporting a total of 99 startups in various domains of space science, technology and applications.

(c) ISRO, being a prime R&D organization of the country involved in space programs realization, has been capable of attracting and retaining talent. However, there are certain attrition in various levels and is very less comparable to Industry standards

(d) Does not arise.

***

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
STARRED QUESTION NO. 239

TO BE ANSWERED ON THURSDAY, AUGUST 10, 2023

FUNDS ALLOCATED TO IPRC, MAHENDRAGIRI

*239. SHRI R. GIRIRAJAN:

Will the PRIME MINISTER be pleased to state:

(a) whether ISRO Propulsion Complex at Mahendragiri, Tamil Nadu is responsible for the supply of Storable Liquid Propellants for ISRO's launch vehicles and satellite programmes,
if so, the details thereof;

(b) whether ISRO is adopting state of art technology and advanced innovations to undertake integration and testing of earth storable propellant engines, cryogenic engines
and stages for launch vehicles, high altitude testing of upper stage engines and spacecraft
thrusters at IPRC, Mahendragiri; and

(c) if so, the details thereof and the funds allocated to IPRC, Mahendragiri in the last three years, year-wise?

ANSWER

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

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

*****

STATEMENT LAID ON THE TABLE OF THE RAJYA SABHA IN REPLY TO STARRED QUESTION NO. 239 REGARDING "FUNDS ALLOCATED TO IPRC, MAHENDRAGIRI" ASKED BY SHRI R. GIRIRAJAN, FOR ANSWER ON THURSDAY, AUGUST 10, 2023.

(a) The storable liquid propellant used for ISRO's launch vehicle and satellite programmes include: (a) Dinitrogen Tetroxide (N_2O_4) as oxidizer and Unsymmetrical Dimethyl Hydrazine (UH25) as fuel; (b) Mixed Oxides of Nitrogen (MON-3) as oxidizer and Mono Methyl Hydrazine (MMH) as fuel.

- N_2O_4 propellant is produced at Rasayani plant, Mumbai and managed & operated by Satish Dhawan Space Centre (SDSC);
- UH25 & MMH are supplied by industries against contract by SDSC;
- MON-3 plant is operated & managed by Vikram Sarabhai Space Centre (VSSC) but located at ISRO Propulsion Complex (IPRC).

The ISRO propulsion Complex (IPRC) Mahendragiri, Tamil Nadu obtains storable liquid propellants from above sources to carry out engine & thruster hot tests for ISRO's launch vehicles and satellite programmes.

(b) & (c)

Yes, Sir. ISRO Propulsion Complex (IPRC), Mahendragiri is equipped with the state-of-the-art facilities necessary for realizing the cutting edge propulsion technology products for the Indian space programme.

Various technologies and advanced innovations have been adopted to carryout integration and testing of earth storable propellant engines, cryogenic engines and stages for launch vehicles; high altitude testing of upper stage engines and spacecraft thrusters.

Some of the major technologies include

I. Automated robotic process for thermal barrier coating for thrust chamber of Vikas engine;

II. Automatic tube bending & orbital welding processes for stage components;

III. Co-ordinate measuring machine and non-destructive techniques for inspection;

IV. 3D manipulator to enable precision alignment of components during engine integration;

V. Diffusion ejector technology for high altitude testing of upper stage engines & spacecraft thrusters.

The funds allocated to IPRC, Mahendragiri during the last three years is as given below:

Sl. No.	Financial Year	BE allocations (Rs. in Crores)
1.	2021-2022	589.92
2.	2022-2023	506.00
3	2023-2024	480.00

****

O.I.H.

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 2535
TO BE ANSWERED ON THURSDAY, AUGUST 10, 2023

LAUNCHING OF CHANDRAYAAN-3

2535. SHRI AJAY PRATAP SINGH:
SHRI BRIJLAL:

Will the PRIME MINISTER be pleased to state:

(a) whether India is going to launch Chandrayaan-3 and if so, the details thereof;
(b) the aims and objectives of mission Chandrayaan-3;
(c) the manner in which the country would be benefited by the successful launch of Chandrayaan-3; and
(d) the total amount of funds spent by Government on this mission and the details of the future space programs initiated by Government

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. Chandrayaan-3 spacecraft was successfully launched onboard LVM-3 on 14th July, 2023 at 14:35 hrs from Satish Dhawan Space Centre, SHAR.

(b) Chandrayaan-3 spacecraft is configured with a Lander Module, a Propulsion Module and Rover Module. The objectives of the mission are (i) to demonstrate Safe and Soft

Landing on Lunar Surface: (ii) to demonstrate Rover roving on the moon; (iii) to conduct in-situ scientific experiments.

(c) The successful soft landing on the surface of the Moon would make India the fourth country in the world to achieve such a significant technological capability. The successful soft landing is envisaged to serve as fore-runners for future landing missions and other technological progress in planetary exploration. Some of the key benefits in terms of science are:

I. Study of lunar near-surface plasma environment.

II. Study of thermal conductivity in the top 10 cm of the regolith, which may provide clues to thermal model of lunar surface.

III. Measurements related to seismic or ground accelerations to study propagation of waves at the southern high latitudes.

IV. In-situ elemental composition using spectrometers for detection and abundance estimation.

(d) The expenditure incurred for Chandrayaan-3, including of the launch vehicle, as on June 2023 is Rs. 601.34 crores. Some of the major future space programme are given below:

I. Test Vehicle Demonstration (TVD-01) for validation of crew escape system for Gaganyaan.

II. Aditya-L1 for study of Sun

III. Xposat for Study of X-ray polarimetry

IV. Space Docking experiment (SPADEX) for demonstrating Spacecraft Docking in space.

V. Resourcesat series, HRSAT, INSAT-3DS, NISAR, RISAT-1B, OCEANSAT-3A satellite and TRISHNA for Earth Observation.

****

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 2536
TO BE ANSWERED ON THURSDAY, AUGUST 10, 2023

NORTH EASTERN SPACE APPLICATIONS CENTRE

2535. SHRI BIPLAB KUMAR DEB:

Will the PRIME MINISTER be pleased to state:

(a) whether the Ministry is operating a dedicated centre for augmenting the developmental process of the North-Eastern Region of the country;
(b) the details of the activities undertaken by the North Eastern Space Applications Centre (NESAC) during last three years, year-wise, State-wise; and
(c) the details of the funds utilized during last three years, year-wise, State-wise?

ANSWER

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

(a) The North Eastern Space Applications Centre (NESAC) was established in September 5, 2020 at Umiam, Shillong, Meghalaya as an autonomous institution under Department of Space (DOS), jointly with North Eastern Coucil (NEC), MoDONER to provide space technology inputs and services to the process of developmental planning of the North Eastern Region.

(b) & (c)

(51)

Since inception, NESAC has been carrying out a number of projects across the domains to natural resources management, monitoring of infrastructure development, disaster management support, governance, weather & atmosphere science and satellite communication services for education & health towards space based support for the development of the region.

The details of the activities undertaken by the North Eastern Space Applications Centre (NESAC) during last three years is given in Annexure-I.

The details of the funds utilized during last three years, year-wise, state-wise is given in Annexure-II.

****

Annexure referred to in reply to part (b) & (c) of the Rajya Sabha Unstarred Question No. 2536 for answer on 10.08.2023

Annexure-I

Details of the activities undertaken by the North Eastern Space Applications Centre (NESAC) during last three years

States covered	*Sl. No.*	*Details of projects/activities*
Regional level projects covering all 8 states of NER	1.	North Eastern Spatial Data Repository (NeSDR)
	2.	Tele-Education project in North Eastern States during 2020-21
	3.	Desertification and Land Degradation: Monitoring, Vulnerability Assessment and Combating Plans (excluding the states of Assam & Meghalaya)
	4.	Analysis of Vegetation Phenology of NER using Time Series Satellite Data in North Eastern India
	5.	Geotagging of assets created under NERTPS programme of CSB in NER
	6.	Geotagging and geo-monitoring of NEC/MDoNER sponsored project sites
	7.	Monitoring and Evaluation of IWMP watersheds for NE India
	8.	Analysis of forest cover change dynamics in North Eastern India
	9.	Mapping of shifting cultivation area at 1:10,000 scale and estimation of *Jhumia* population depending on shifting cultivation in the NER
	10.	Development of methodology for delineation of bamboo growing areas in North Eastern India
	11.	Development of a GeoTourism Dashboard Application for planning, management and monitoring tourism activity in the NE region
	12.	Development of Automated System for Monitoring of Deforestation in North Eastern India
	13.	Carbon Dynamics Assessment in Tropical Forests of Northeast India using Multi-Sensor Data
	14.	Identification and rejuvenation of depleted wetlands, oxbow lakes to utilize for occasional flood water diversion and development of tourism sites

	15.	Applications of Space Technology for Agricultural Assessment in NER (ASAAN)
	16.	Space-based Support for the Integrated Development of Horticulture in NER (SSIDH)
	17.	Flood Early Warning Systems (FLEWS) NER
	18.	River Atlas for NER
	19.	Identification of degraded forests/ forest gap areas in Reserve Forest areas of NER
	20.	Assessment of the malaria situation and role of Anopheles species in its transmission in selected International border areas adjoining the Districts of the North-Eastern States and North East Corridor
	21.	Gati Shakti Based Planning & Site Selection Using Geospatial Technology for 8 states of NER
	22.	Development of location based lightning nowcasting system for NE region of India
Arunachal Pradesh	1.	GIS based inputs for border fencing in Longding district of Arunachal Pradesh
	2.	RS and GIS inputs for preparation of forest working plan in Arunachal Pradesh
	3.	Rural Development action Plan for Model Villages (Kaho, Kibithoo and Meshai) of Arunachal Pradesh
	4.	Mapping forest fire prone areas at 1:10k in Arunachal Pradesh
	5.	Identification of suitable areas for kiwi & walnut cultivation in and around Kaho, Kibithoo& Mosai village of Arunachal Pradesh
	6.	Generation of rural development action plan for two village clusters in border districts of Arunachal Pradesh
	7.	Development of GIS based cadastral information system for Arunachal Pradesh
	8.	Capacity building on utility of Geo-spatial data and available data on NeSDR portal
	9.	Expansion of CHAMAN Project in 6 districts of Arunachal Pradesh

	10.	Mapping of cold and freshwater aquatic resources
	11.	Route Alignment input for construction of road along India -China Border
	12.	Web Based Livestock Information Management System (WBLIMS)
	13.	Route alignment mapping for proposed power transmission lines
	14.	GIS based Health Information and Management System (HIMS)
	15.	Site suitability analysis using geo-spatial technique for air traffic control in various locations in Arunachal Pradesh
Assam	1.	Feasibility study for the construction of roads of NH standard with major bridges over the river Brahmaputra
	2.	Study on wetland change detection in DeeporBeel, Guwahati, Assam
	3.	Flood Early Warning Systems (FLEWS) for Assam
	4.	Preparation of Assam River Atlas
	5.	UAV technology development under the project "UAVs (Drones) for Disaster Response Rescue & Relief Management (U-DRRRM)"
	6.	Integrated WebGIS Platform for Dissemination of Real-Time Early Warnings/Alerts and Enabling Analytics in Spatial Domain for Monitoring and Management of Disaster Events
	7.	Space-based land-use Intelligent System for Guwahati (SLIS-G)
	8.	Development of Decision Support System (DSS) for controlling and monitoring of all major Transboundary Animal Diseases (TADs) including African Swine Fever (ASF)
	9.	Space technology support for utilization of Brahmaputra River Islands (Chars) area for productive cultivation in Assam
	10.	Bank line migration studies of Brahmaputra, Barak and selected tributaries
	11.	Watershed delineation for the State of Dhemaji District (Assam) using high resolution DEM
	12.	Mapping & Monitoring of Embankments and its vulnerable reaches WRD
Manipur	1.	Election e-ATLAS for Manipur
	2.	Geospatial assessment of forest fire in different divisions of Manipur

	3.	Study on temporal dynamics of Loktak Lake with space based inputs or conservation planning, Manipur
	4.	RS &GIS based inputs for suitable route Alignment Planning for Construction of Mahadev-Toloi-Pfutsero road
	5.	Space based inputs for conservation of Loktak Lake
	6.	Setting up a new township near the Makhru river bank in Tousem subdivision, Tamenglong district, Manipur
Meghalaya	1.	Remote Sensing and GIS based Inputs for Hazard, Vulnerability and Risk Assessment for Tura, Williamnagar, Nongstion, Nongpoh and Jowai towns in Meghalaya
	2.	GIS based Masterplan under Atal Mission for rejuvenation and Urban Transformation (AMRUT), Shillong Planning Area, Meghalaya
	3.	Geodatabase creation of Shillong planning area, Meghalaya under AMRUT sub-scheme
	4.	Mapping of bamboo resources for the state of Meghalaya
	5.	Expansion of paddy in Umling block of Meghalaya using remote sensing and GIS
	6.	Expansion of Khasi Mandarin in Pynursla block of Meghalaya using Geospatial Technology
	7.	Geospatial mapping of forest fire in Meghalaya
	8.	Meghalaya Rice Information System (MeRIS)
	9.	Geospatial technology for acreage estimation of selected crops and development of a mobile app for planning and monitoring of CCE in Meghalaya
	10.	Assessment of socio-ecological vulnerability to climate change among agro-forestry managers along an altitudinal gradient in the eastern Himalayas
	11.	Integration & Application of Unmanned Aerial Vehicle (UAV) for Crop Health Monitoring with Integrated Information Dissemination System (IIDS)
	12.	Mapping of district wise soil fertility status of Meghalaya

	13.	Village Level Mapping for Garo Hills Districts of Meghalaya using High Resolution Geospatial Data
	14.	Space based inputs for planning and restoration of coal mining affected areas of South West Khasi, West Khasi, South Garo &Jaintia Hill District, Meghalaya (phase-1)
	15.	National Wetland Inventory and Assessment (NWIA) II- Meghalaya
	16.	DGPS and UAV surveying of Dalmia Cement Lease areas at Thangskai, East Jaintia Hills, Meghalaya
	17.	SISDP-Update
	18.	Surveying of the Mining Lease boundary pillars of Star Cement Limited, East Jaintia Hills, Meghalaya, using Differential Global Positioning System (DGPS) techniques
	19.	Geo-Tagging and Monitoring of Projects/schemes in Meghalaya State funded by Govt. of Meghalaya using Geospatial Technology and Tools
	20.	The role of the Dauki Fault in the evolution of the Shillong Plateau
	21.	Village Level Mapping for Khasi and Jaintia Hills Districts of Meghalaya using High Resolution Geospatial Data
	22.	Forest cover and associated land use/ land cover change analysis in Nokrek Biosphere reserve, Meghalaya
	23.	Vulnerability assessment and Prioritization of micro-watersheds for interventions to check degradation
	24.	Survey & Mapping for Umiam Reservoir
	25.	Mapping of water bodies- small multi-purpose reservoirs, ponds, jalkunds, etc and mapping of potential areas for creation of new rain water harvesting bodies/ water bodies in Meghalaya
	26.	Applications of geospatial technology for in-situ conservation of Muga Silkworm in Jaintia Hills district, Meghalaya
	27.	Preparation of Master Plan for Potential Small Multipurpose Reservoirs/ Water Harvesting Sites/Locations in the state of Meghalaya
Mizoram	1.	Preparation of Agro-climatic Atlas under "Fostering Climate Resilient Upland Farming Systems (FOCUS)" Project Mizoram

	2.	Forest growing Stock Assessment using geospatial techniques for preparation of Forest Working Plan for Mizoram (Funded by Forest Dept Mizoram)
	3.	Capacity building of line departments on applications of GIS techniques and promote utilization of NeSDR portal
Nagaland	1.	Preparation of Agro-climatic Atlas under "Fostering Climate Resilient Upland Farming Systems (FOCUS)" Project for Nagaland
	2.	Application of geo-spatial techniques for site specific Crop Planning in Nagaland
	3.	Generation of geospatial database for Tea, Coffee and Rubber growing areas, and Geodatabase updation of major agri and horticultural crop growing areas in Nagaland
	4.	Vegetation study using UAV based Multispectral Sensors
	5.	3D Printing, Visualization & Artificial Intelligence Training & Capacity Building, Awareness and Data Dissemination on space based technology
Sikkim	1.	Development of Sikkim Water Resources Atlas (SWRA)
	2.	Developing a Medical Emergency mobile application for telemedicine support in linkage with nearest Health centre, District Hospital as well as State Hospital
Tripura	1.	Development of SAR model for estimating Forest Above Ground Biomass (AGB) in Tripura
	2.	Operational Feasibility of additional intervention package for accelerated malaria control in areas with *jhum* cultivators in Tripura (funded by ICMR)
	3.	Election e-ATLAS for Tripura
	4.	Updation of Hazard Risk and Vulnerability assessment for Tripura
	5.	Estimation of Water Bearing Capacity (Storage Volume) of a Rainwater Harvesting Structure (Dam)
	6.	Siltation study of Dumbur Reservoir
	7.	Mapping of Embankment structures in Urban Local Bodies (ULB) of Tripura

Annexure referred to in reply to part (b) & (c) of the Rajya Sabha Unstarred Question No. 2536 for answer on 10.08.2023

Annexure-II

The details of the funds utilized during last three years, year-wise, state-wise, for the activities undertaken by the North Eastern Space Applications Centre (NESAC)

States covered	*Details of fund utilized (in lakhs)*		
	2020-2021	*2021-2022*	*2022-2023*
Regional level projects covering all 8 states of NER	512.22	185.99	418.76
Arunachal Pradesh	77.49	69.23	103.93
Assam	41.64	96.43	339.57
Manipur	5.84	5.91	29.6
Meghalaya	178.66	74.18	138.44
Mizoram	6.56	3.92	8.52
Nagaland	2.12	3.54	41.54
Sikkim	-	-	9.74
Tripura	35.65	26.29	54.15