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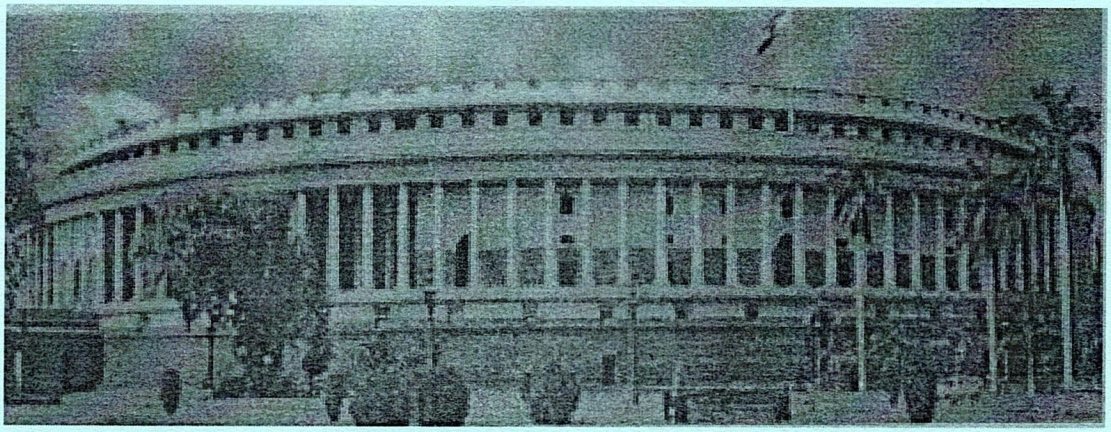
GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

"SPACE IN PARLIAMENT"



BUDGET SESSION OF PARLIAMENT 2018
(FEBRUARY – APRIL 2018)

COMPILATION OF REPLIES GIVEN IN PARLIAMENT DURING 2018

Government of India
Department of Space
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PARLIAMENT QUESTIONS – BUDGET SESSION OF PARLIAMENT 2018

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O.I.H.

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.730

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 07, 2018

SOCIAL UPGRADATION IN RURAL AREAS

730. SHRI JANARDAN MISHRA:

Will the PRIME MINISTER be pleased to state:

(a) whether the Indian space programme has some importance in social upgradation of rural areas;

(b) if so, the details thereof and the manner by which it is important; and

(c) the efforts made through Indian space programme for the rural and backward areas so far?

ANSWER

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

(a) Yes, Madam.

(b) Indian Space Programme plays a key role in enabling social upgradation of rural areas through space based inputs towards development of wastelands, identification of degraded lands for suitable reclamation measures, assessment of fodder crops

for dairy industry, monitoring developmental activities under rural employment guarantee scheme & integrated watershed development programme, space based inputs for ground water, targeting surface waterbodies for tribal districts and monitoring irrigation infrastructure.

(c) The efforts made by Indian Space Research Organisation benefitting rural and backward areas so far include:

i. Mapping of wastelands (1986-2000, 2005-06, 2008-09 & 2015-16) for enabling prioritisation of watersheds, identification of areas for renewable energy projects and industrial corridor development.

ii. Mapping of land degradation (2005-06 & 2015-16), help in prioritisation of development in the rural areas.

iii. Prepared and deployed National level groundwater prospects maps, including locations for planning recharge structures, as a support for drinking water requirements for Ministry of Drinking Water & Sanitation.

iv. Geospatially enabled monitoring of developmental activities under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), for Ministry of Rural Development.

v. Generation of sustainable land and water resources development plans in 180 districts for soil and water conservation and satellite data based monitoring

and evaluation of about 86,000 microwatersheds, under Integrated Watershed Management Programme (IWMP) for Ministry of Rural Development.

vi. **Mapping and monitoring of village water bodies for suitability to adopt aquaculture development in the tribal districts as a possible alternative livelihood support.**

vii. **Assessment of fodder crops in Gujarat, Rajasthan and Haryana for enabling sustainability of dairy industry, relevant in rural and backward areas.**

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.783

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 07, 2018

VILLAGE RESOURCE PROGRAMME

783. **SHRIMATI MEENAKSHI LEKHI:**
Will the PRIME MINISTER be pleased to state:

(a) **the details of the Village Resource Programmes that have been launched by ISRO in collaboration with local NGOs; and**

(b) **the details of funds that have been allocated for such programmes?**

ANSWER

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

(a) **To demonstrate the potential of satellite technology for development of rural areas, ISRO established Village Resource Centres (VRCs) on a pilot scale, in association with selected NGOs, Trusts and State Government Departments.**

VRCs have provided various space technology enabled services such as tele-healthcare, tele-education, natural resources information, advisories related to agriculture, career guidance to rural students, skill development and vocational training etc.

(b) **About ₹18 Crores was spent for establishing 473 VRCs.**

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
STARRED QUESTION NO.279

TO BE ANSWERED ON WEDNESDAY, MARCH 14, 2018

SATELLITE LAUNCHING STATIONS

***279. SHRI VENKATESH BABU T.G.:**

Will the PRIME MINISTER be pleased to state:

(a) the names of places in the country where satellite launching stations are located and the performance thereof;

(b) whether the Government has any proposal to set up another satellite launch station at Kulasekarapattinam or Kanyakumari in Tamil Nadu which are close to the equator; and

(c) if so, the details thereof and the time by which the new satellite launching stations are likely to be set up?

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.

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STATEMENT LAID ON THE TABLE OF THE LOK SABHA IN REPLY TO STARRED QUESTION NO.279 REGARDING "SATELLITE LAUNCHING STATIONS" ASKED BY SHRI VENKATESH BABU T.G. FOR ANSWER ON WEDNESDAY, MARCH 14, 2018.

(a) India has one satellite launching station with two launch pads at Satish Dhawan Space Centre, Sriharikota located in Andhra Pradesh State. So far, 65 launches have taken place from this launching station.

(b) As of now, the Government has no proposal to set up another satellite launching station in the country.

(c) Does not arise.

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(7)

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.3032

TO BE ANSWERED ON WEDNESDAY, MARCH 14, 2018

FAILED LAUNCH

3032. ADV. M. UDHAYAKUMAR:

Will the PRIME MINISTER be pleased to state:

(a) whether after 39 successes the launch of PSLV failed recently;

(b) if so, the details thereof;

(c) whether this was the PSLV's first failure; and

(d) if so, the corrective measures proposed by ISRO to ensure that future launch will be a successful one?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Yes, Madam.

(b) The launch of 41st flight of PSLV (PSLV-C39) that took place on August 31, 2017, from the Second Launch Pad, at Satish Dhawan Space Centre, Sriharikota, with Indian Regional Navigational Satellite (IRNSS-1H weighing 1425 kg) at 19:00 hrs IST, could not reach the designated orbit of 284 x 20650 km, due to non-separation of Payload Fairing (also known as heat shield) during the 2nd stage of the flight.

A detailed analysis of the flight data and ground test data of the PSLV-C39 Mission revealed that the root cause of the non-separation of Payload Fairing was due to the malfunctioning of the vertical jettisoning system. The cause for the malfunctioning was the non-initiation of detonation in the vertical jettisoning system.

(c) No, Madam. The recent failure of PSLV-C39 was the second failure. In September 1993, the first developmental flight of PSLV (PSLV-D1) was unsuccessful.

(d) Towards enhancing the robustness of the jettisoning system in future launches, certain changes have been incorporated in the vertical jettisoning system of the Payload Fairing, which were validated through extensive simulations including the full scale Payload Fairing separation test. The reliability of the system was demonstrated by the subsequent successful PSLV-C41/Cartosat-2 Series Mission on January 12, 2018.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.3068

TO BE ANSWERED ON WEDNESDAY, MARCH 14, 2018

COMPLAINTS BY RESIDENTS

3068. DR. SHASHI THAROOR:

Will the PRIME MINISTER be pleased to state:

(a) whether the residents near the Vikram Sarabhai Space Centre (VSSC) have complained about operations of the Centre which has caused air and water pollution and if so, the details thereof;

(b) whether the operations of VSSC are affecting the life of people, predominantly of the fishermen community, as rocket boosters used in the units are damaging fishing nets and if so, the details thereof;

(c) whether the Government has taken steps to address these issues without compromising the essential functions of the VSSC;

(d) if so, the details thereof; and

(e) if not, the reasons therefor?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Yes, Madam. The complaints received from the residents near Vikram Sarabhai Space Centre (VSSC) were examined by the Kerala State Pollution Control Board in 2012 and no adverse remarks were made by the Board. All activities of VSSC are carried out with all precautions without giving any scope for environmental pollution and the safety mechanisms are reviewed periodically.

(b) No, Madam. No incidents of rocket boosters damaging fishing nets were reported in the recent past. A mechanism has been established to compensate the fishermen community for the damages to the fishing nets, if any, on production of the damaged nets and rocket parts to VSSC officials.

(c) & (d)

Yes, Madam. A mechanism has been established to address and resolve issues raised by the local residents, as and when required, along with the State Government authorities.

(e) Does not arise.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.3094

TO BE ANSWERED ON WEDNESDAY, MARCH 14, 2018

VILLAGE RESOURCE CENTRES

3094. SHRI DUSHYANT CHAUTALA:

Will the PRIME MINISTER be pleased to state:

(a) whether the Indian Space Research Organisation has established Village Resource Centres with the aim of providing services such as tele-healthcare, tele-education, natural resources information, advisories related to agriculture, career guidance to rural students, skill development and vocational training, etc.;

(b) if so, the details thereof and the total number of villages identified by the Government for this purpose;

(c) whether the Government has constituted any mechanism to analyse the outcome of this plan;

(d) if so, the details thereof and whether the Government has also decided to expand the scheme all over the country; and

(e) if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Yes Madam.

(b) VRCs were set up to demonstrate the potential of satellite technology for development of rural areas. ISRO had established Village Resource Centres (VRCs) on a pilot scale, in association with selected NGOs, Trusts and State Government Departments. VRCs have provided various space technology enabled services such as tele-healthcare, tele-education, natural resources information, advisories related to agriculture career guidance to rural students, skill development and vocational training etc. 473 VRCs were established around the country.

(c), (d) & (e)

A study was conducted by Social Research Division, Development and Educational Communication Unit, ISRO through rapid sample survey during 2015 and it was observed that 70% of the participants found it useful. Department of Space is willing to consider if any proposals are received for VRCs, in the areas where other terrestrial connectivity are not available in the country.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.3115

TO BE ANSWERED ON WEDNESDAY, MARCH 14, 2018

UPGRADING THE CAPABILITY

3115. ADV. JOICE GEORGE:

Will the PRIME MINISTER be pleased to state:

(a) whether India lags way behind the USA, China, Europe, Russia and Japan with respect to launch capability;

(b) if so, the details thereof;

(c) whether the current tested capability of 4-5 tonnes is way lesser than China and if so, the details thereof;

(d) whether the Government intends to take any initiatives to upgrade the launch capability and if so, the details thereof;

(e) whether the research, development and innovation centres in the country are well funded and staffed and if so, the details thereof; and

(f) whether Indian private players are working and collaborating with the Government and if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) India has the Launch Vehicle system with a capability to put 4 - ton class of satellites to GTO, whereby meeting all the

national requirements. Even with such capabilities PSLV is able to offer spare capacity to commercial launches on a regular basis. While other countries have higher launch capabilities, ISRO is making its own plans to increase its launch vehicle capabilities, even upto 16 ton to GTO in the future.

(b) Presently, India has three launch vehicles, namely, Polar Satellite Launch Vehicle (PSLV) with a launch capability of 1.75 Ton to 600 km sun synchronous polar orbit, Geosynchronous Satellite Launch Vehicle (GSLV) with a launch capability of 2.2 Ton to Geosynchronous Transfer Orbit (GTO) and Geosynchronous Satellite Launch Vehicle - Mark III with a launch capability of 4 Ton to Geosynchronous Transfer Orbit (GTO). The maximum launch capability to GTO of other space agencies are: - USA: 14 Ton, China: 13 Ton, Europe: 10.5 Ton, Russia: 6.25Ton, and Japan: 8 Ton. Recently, SpaceX, a private company in USA, has demonstrated the launch of a heavy lift launch vehicle, Falcon Heavy, which can carry 26.7 Ton to GTO.

(c) Yes, Madam. China has a maximum launch capability of 13 Ton to GTO.

(d) The Government has already undertaken the development of Semi-cryogenic engine and intends to initiate development activities for Semi-cryogenic stage and the clustering of Semi-cryogenic engines in order to upgrade the launch capability.

(e) **ISRO being a research organisation, effectively deals with research, development and innovation as part of its activities. The funds and manpower allocated to DoS/ISRO is sufficient to carry out its current programs/projects. The total sanctioned manpower is 18095 and budget allocation for 2018-19 is ₹ 10,783 Cr.**

(f) **ISRO effectively utilises the industries in realising launch vehicle hardware and fabrication of other sub systems, currently. This has enabled to realise majority of manufacturing requirement of launch vehicles and satellites through Indian Industries. ISRO also envisages to have greater involvement of industries in the launch vehicle set up through joint venture initiatives in the future.**

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(16)

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.3117

TO BE ANSWERED ON WEDNESDAY, MARCH 14, 2018

SPACE APPLICATIONS

3117. SHRI G. HARI:

Will the PRIME MINISTER be pleased to state:

(a) whether the Asia Pacific Regional Space Agency Forum has recommended that the established space agencies in the region should promote space applications, including rice crop monitoring, global rainfall monitoring, fire hotspot, haze monitoring and disaster management;

(b) if so, the details thereof;

(c) the details of areas the ISRO has been concentrating so far as the above said areas are concerned;

(d) whether ISRO shares the information, it gathered, with other neighbouring countries; and

(e) if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) & (b)

Space Applications Working Group, one of the four Working Groups of Asia Pacific Regional Space Agency Forum

(APRSAF), has recommended to further promote space applications, including rice crop monitoring, global rainfall monitoring, fire hotspot, haze monitoring and disaster management, at the 24th session of APRSAF held at Bengaluru in November 2017.

(c) Indian Space Reseach Organisation (ISRO) is carrying out studies in the above said areas.

(d) & (e)

ISRO shares the information with other neighbouring countries, in the event of disasters, through many programmes including Sentinel Asia (APRSAF's initiative for disaster mangament support), International Charter 'Space and Major Disasters', United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP), United Nations Platform for Space based Information for Disaster management and Emergency Response (UNSPIDER), COSPAS-SARSAT system for search and rescue operations, "Severe Thunderstorms: Observations and Regional Modeling (STORM)" programme of SAARC and South Asian Satellite.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.3128

TO BE ANSWERED ON WEDNESDAY, MARCH 14, 2018

MILITARIZATION OF SPACE

3128. **SHRI J.J.T. NATTERJEE:**

SHRI C. MAHENDRAN:

SHRI R. PARTHIPAN:

Will the PRIME MINISTER be pleased to state:

(a) whether there is an increased threat perception from weaponisation or militarization of outer space around the world and if so, the details thereof;

(b) whether it is particularly of great concern with the development of anti satellite technologies that are being developed by a neighbouring nation of India and if so, the details thereof;

(c) whether India has a space command to co-ordinate between different actors in dealing with any contingencies;

(d) if so, whether it is sufficiently funded and staffed and if so, the details thereof; and

(e) whether India has a dedicated space programme and if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) There is a general threat perception from weaponisation or militarization of outer space for the whole world. It could have an impact on the security of space infrastructure.

(b) Development of Anti-satellite technology could pose two dimensional impact, first, the possibility of impacting satellites and second, creation of debris, which is a perennial problem to all operational space systems.

(c) Currently India does not have a Space Command.

(d) Does not arise.

(e) India has a dedicated space programme which addresses various developmental requirements of the country through Satcom, SatNav and Earth Observation related assets.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.3155

TO BE ANSWERED ON WEDNESDAY, MARCH 14, 2018

CHANDRAYAAN-II

3155. SHRI SUMAN BALKA:

Will the PRIME MINISTER be pleased to state:

(a) **whether Indian Space Research Organisation (ISRO) is planning to launch Chandrayaan-II Mission around April this year; and**

(b) **if so, the details thereof along with the achieved milestones in the recent years?**

ANSWER

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

(DR. JITENDRA SINGH):

(a) **Yes Madam.**

(b) **This mission involves many complex elements like soft-landing, Rover separation and movement on the lunar surface, in addition to operations of Orbiter. Several new technology elements have been developed indigenously and tests are being carried out for validation. Orbiter has completed Thermo-vacuum test which is one of the major milestones. Lander Sensors and Actuators are tested on ground to validate the performance and the results are satisfactory. Rover flight model is under assembly. Payloads are in various stages of delivery for Spacecraft integration.**

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.3162

TO BE ANSWERED ON WEDNESDAY, MARCH 14, 2018

FUND FOR SPACE TECHNOLOGY

3162. SHRI D.S. RATHOD:

SHRI PARESH RAVAL:

Will the PRIME MINISTER be pleased to state the details of the allocation of funds made for the development of space technology during the last four 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) **The details of the allocation of funds made under the Head "Space Technology" during the last four years and the current year are as given below:**

Financial Year	Allocation (RE) (₹ in crores)
2013-14	2822.06
2014-15	3268.26
2015-16	4150.83
2016-17	4586.05
2017-18 (current year)	5984.42

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
STARRED QUESTION NO.368

TO BE ANSWERED ON WEDNESDAY, MARCH 21, 2018

REHABILITATION OF FAMILIES

***368. DR. SHASHI THAROOR:**

Will the PRIME MINISTER be pleased to state:

(a) the steps taken by the Government to rehabilitate the 400 families that were displaced due to the creation of the Vikram Sarabhai Space Centre;

(b) whether ISRO had promised to recommend special recruitment of local people or provide alternative housing facilities;

(c) if so, the details thereof;

(d) whether these promises have been acted upon; and

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

ANSWER

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

(DR. JITENDRA SINGH):

(a) to (e) 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.368 REGARDING "REHABILITATION OF FAMILIES" ASKED BY DR. SHASHI THAROOR FOR ANSWER ON WEDNESDAY, MARCH 21, 2018.

(a) Rehabilitation is a subject matter of State, but ISRO has made ex-gratia payment to Kerala State Government as per procedure, for rehabilitation of the displaced families.

(b) ISRO has not promised any special recruitment and housing facility is a subject matter of State.

(c) Does not arise.

(d) ISRO has acted upon the commitment made.

(e) ISRO has acted upon its responsibilities by means of compensation and ex-gratia payment done through State and offered preferential consideration upto 3rd generation for the evicted families.

*****

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.4261

TO BE ANSWERED ON WEDNESDAY, MARCH 21, 2018

PERFORMANCE OF REMOTE SENSING SATELLITES

4261. SHRI RADHESHYAM BISWAS:

Will the PRIME MINISTER be pleased to state:

(a) whether the performance of three, out of seven remote sensing satellites, has been below their maximum capacity;

(b) if so, the details thereof;

(c) whether the revenue generated from these seven satellites in operation has been below expectations;

(d) if so, the details thereof and the reasons therefor; and

(e) the measures taken for the optimum utilization of the said satellites and realization of maximum revenue?

ANSWER

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

(DR. JITENDRA SINGH):

(a) & (b)

At present, there are 19 Remote Sensing satellites (including Meteorological satellites) operational in orbit. These satellites are being utilised to their capacity to meet the requirements of resource monitoring, infrastructure planning, enabling weather forecasting, disaster management support including host of

societal applications. The services derived from these satellites are being used by various Ministries/Departments in agriculture, water resources, forest and environment, urban and rural development, ocean and meteorology.

(c) & (d)

Indian Remote Sensing satellites are meant for meeting national needs for public good services. These satellites are not meant for revenue generation. The benefits are accrued through applications derived from these satellites.

(e) In order to accelerate the use of satellites and its services, the Department has taken following measures - (i) conduct of user interaction meets and utilisation programmes; (ii) capacity building for space applications; (iii) creation of an outreach facility.

*****

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.4336

TO BE ANSWERED ON WEDNESDAY, MARCH 21, 2018

BUILDING IGLOOS ON MOON

4336. SHRI SUMAN BALKA:

Will the PRIME MINISTER be pleased to state:

(a) whether the Indian Space Research Organisation (ISRO) has started working on building igloo-like habitats on the lunar surface for potential future missions and is planning to use the Moon as an outpost, like missions in Antarctica; and

(b) if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) ISRO along with academic institutions is doing experimentation on potential structures for lunar habitation.

(b) Various options are being studied about the requirements and complexities of habitats. The study is more towards futuristic developments.

*****

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.5337

TO BE ANSWERED ON WEDNESDAY, MARCH 28, 2018

MISSION ON MOON AND MARS

5337. SHRIMATI SANTOSH AHLAWAT:

Will the PRIME MINISTER be pleased to state:

(a) whether ISRO is working on any new mission to the Moon and the Mars;

(b) if so, the details thereof; and

(c) the benefits likely to accrue from the said missions along with the amount of expenditure likely to be incurred thereon?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Yes Madam.

(b) Chandrayaan-2 is a totally indigenous mission with Orbiter, Lander and rover configuration. Orbiter is to be placed in 100 km orbit around the Moon. After reaching the 100 km lunar orbit, the Lander will be separated from the orbiter and it will soft land on the lunar surface and deploy a Rover. The Rover will then move around the landing site. The Orbiter will continue to orbit around the Moon and perform remote-sensing observations of the lunar surface.

ISRO has formed a study team to formulate plans to explore solar system bodies. The study team has recommended a future mission to Mars. Scientific proposals for payloads are selected by an expert committee.

(c) The Orbiter will study the Moon for its topography, elemental and mineralogical distribution and extent of subsurface water ice. The lander will land on the lunar surface and demonstrate ISRO's capability for landing on Moon. Subsequently, the Rover will roll out of the Lander and move around the landing site. The lander and rover payloads will conduct observations on the elemental composition and study the lunar ionosphere. The Chandrayaan-2 mission will definitely expand the scientific knowledge on Moon by remote-sensing from Orbiter and in-situ studies from lander/rover. Total expenditure on the mission is around ₹ 800 Cr. Mission planning for next MARS mission is under progress.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.5360

TO BE ANSWERED ON WEDNESDAY, MARCH 28, 2018

SATELLITE LAUNCHING

5360. SHRI D.K. SURESH:

Will the PRIME MINISTER be pleased to state:

(a) the details of total number of satellites launched in the country till date;

(b) whether the Government has set any target to launch satellites for the benefit of various sectors of the country;

(c) if so, the details thereof;

(d) whether the targeted objectives have been achieved successfully till date and if so, the details thereof and if not, reasons therefor; and

(e) whether the Government is taking any effective measures to ensure better performance of the satellite programmes in the country and if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) As on date, total satellites launched by ISRO are as follows:

Experimental/Technology Demonstrator Satellite	**8**
Remote Sensing Satellite	**31**
Meteorological Satellite	**3**
Communication Satellite	**35**
Navigational Satellite	**8**
Science Satellite	**8**

(b) **Yes, Madam.**

(c) **ISRO has planned to launch state-of-the-art satellites in the areas of earth observations, meteorology, communication, navigation and space science. The data and services through the synergistic use of these satellites are intended to benefit various sectors, which include - (i) Socio-economic Security viz. food, water, energy, health, shelter, infrastructure; (ii) Sustainable development; (iii) Disaster Risk Reduction; (iv) Weather & Ocean state forecast and (v) Governance and development.**

The target of communication satellites is to meet the transponder requirements. Today we have 15 operational satellites and 105 foreign leased transponders to meet the demand. In order to address growing demand, additional satellites are scheduled for the launch.

In the area of navigation, with 7 in-orbit IRNSS satellites and another satellite, IRNSS-1I, scheduled for launch in April 2018, the targeted accuracy of less than 20 m is also available over India and 1500 Km beyond region.

(d) Yes, Madam. Earth Observation (EO) data, in conjunction with field information, have been supporting a host of applications in the areas of land, water & ocean resources, weather & climate, environment & eco-system, urban & rural development, disaster risk reduction and Governance. Many of the applications have been effectively adopted by stakeholder Departments for operational use. A few of such applications include: Potential Fishing Zone Forecast & Ocean State Forecast (by Indian National Centre for Ocean Information Services, MoES), Crop Acreage and Production Forecasting & National Agricultural Drought Assessment and Monitoring System (by Mahalanobis National Crop Forecast Centre, MoA&FW), Biennial Forest Cover Assessment (by Forest Survey of India, MoEF&CC), Irrigation Infrastructure Assessment (by Central Water Commission, MoWR, RD&GR), Weather forecasting (by India Meteorological Department, MoES), Integrated Watershed Management Programme & MGNREGA (by MoRD). In addition, tele-medicine and tele-education services are also in place.

(e) In order to ensure better performance of the satellite programmes, the Department has taken following measures - (i) conduct of user interaction meets and utilization programmes; (ii) capacity building for space applications; (iii) creation of an outreach facility; (iv) development of geospatial tools and information systems, (v) Proof of Concept demonstration and (vi) Institutionalisation of space applications.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.5388

TO BE ANSWERED ON WEDNESDAY, MARCH 28, 2018

ATOMIC CLOCK

5388. SHRIMATI K. MARAGATHAM:

Will the PRIME MINISTER be pleased to state:

(a) whether Indian Space Research Organisation (ISRO) will soon launch a replacement navigation satellite fitted with corrected atomic clocks to make up for the crippled satellite IRNSS-1A and if so, the details thereof;

(b) whether the move became imperative after all three rubidium atomic clocks on IRNSS-1A failed in mid 2016 and if so, the details thereof;

(c) whether the clocks for ISRO's NavIC and the European Space Agency's first 18 Galileo satellites came from the same Swiss company and had developed similar problems around the same time; and

(d) if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Yes Madam. A navigation satellite, IRNSS-1I is scheduled for launch using PSLV launch vehicle in April 2018.

(b) Atomic clock of IRNSS-1A has become non-functional, but the satellite is being used for providing messaging services like disaster alerts, potential fishing zones information dissemination to fishermen, etc. IRNSS-1I will be added to NavIC constellation for providing intended navigation services.

(c) Yes Madam.

(d) The atomic clocks used in NavIC and Galileo satellites are manufactured by M/s SpectraTime, Switzerland. Some of these clocks have failed in NavIC and Galileo. The reason for the failures has been analyzed and understood and the corrective actions have accordingly been taken on remaining clocks for upcoming satellites including IRNSS-1I.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.6013

TO BE ANSWERED ON WEDNESDAY, APRIL 04, 2018

CHANDRAYAAN-II

6013. SHRI KIRTI VARDHAN SINGH:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government is in the process of sending/launching Chandrayaan-II in the near future;

(b) if so, the details thereof;

(c) the time when Chandrayaan-I was launched and whether the objective of that mission has been fulfilled; and

(d) if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Yes Madam.

(b) Chandrayaan-2 mission is an indigenous mission with Orbiter, Lander and rover configuration. After reaching the 100 km lunar orbit, the Lander will soft land on the lunar surface and deploy a Rover, while the orbiter will continue to orbit around the moon. The mission is planned to be launched during 2018 by GSLV Mk-II from Sriharikota.

(c) ISRO launched Chandrayaan-1 on October 22, 2008 by PSLV C-11 from Sriharikota and inserted it in the lunar orbit on November 08, 2008. Payloads studied the Moon from different perspectives and generated good quality data. The mission discovered the presence of hydroxyl and water molecules on the lunar surface.

(d) The details on the achieved objectives is provided below:

(i) Chandrayaan-1 was ISRO's first mission with a spacecraft orbiting moon. All technological advances for navigating to the moon, placing the spacecraft in a 100 km polar orbit, and enabling instruments to observe the moon were accomplished.

(ii) Chandrayaan-1 was the first mission which provided confirmation of presence of water on Moon. Systematic topographic mapping of the Moon and Mineralogical mapping of the moon was also done with very good coverage in the Polar Regions.

(iii) Chandrayaan-1 has used state-of-the-art miniaturized technologies to accommodate eleven scientific experiments.

(iv) A 32 m dish antenna was established near Bengaluru, as part of the Indian Deep Space Network to receive signals and data from the satellite.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.6083

TO BE ANSWERED ON WEDNESDAY, APRIL 04, 2018

SATELLITE LAUNCHED BY ISRO

6083. PROF. K.V. THOMAS:

Will the PRIME MINISTER be pleased to state:

(a) the number of satellites launched by the Indian Space Research Organisation (ISRO) during the last four years; and

(b) the salient features of these satellites?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Satellites launched by ISRO in the last four years and the current year are as follows:

Communication Satellite	8
Navigational Satellite	7
Remote Sensing Satellite	5
Meteorological satellite	2
Science Satellite	1
Technology Demonstration/ Student Satellite	9

(b) **Communication satellites carried communication transponders in different frequency bands of C, Extended C, Ku, Ka and S-band for telecommunication, broadcast and mobile communication services.**

Navigation satellites were part of the indigenous constellation NavIC, India's own regional navigation system. Navigation satellites carried navigation payloads in L and S-bands for providing position, navigation and timing services.

Earth Observation satellites are used for deriving inputs for Natural Resource Management, Disaster Management, Cartographic Applications, Weather, Climate and Ocean Studies.

Astrosat (Science payload) is a unique multi wavelength observatory in space. It provides an opportunity for observation of celestial sources in Ultra-Violet, Optical and X-ray wavelength bands.

ISRO has launched satellites for Technology demonstration and student satellites to encourage young generation to work in the field of space.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 773

TO BE ANSWERED ON THURSDAY, FEBRUARY 08, 2018

UPGRADING OF AEROSPACE TECHNOLOGY

773. SHRI K. RAHMAN KHAN:

Will the PRIME MINISTER be pleased to state:

(a) the reasons for the failure of PSLV C-39 mission on the 31st August, 2017;

(b) what steps would the Department proposes to constantly upgrade the aerospace technology;

(c) what is the budgetary allocations for the Research and Development Programme of ISRO;

(d) where it stands when compared to the R&D of other countries which are in space programmes; and

(e) what efforts the Department is making for obtaining certification for the products developed by our aerospace scientists?

ANSWER

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

(a) The 41st flight of PSLV (PSLV-C39) that took place on August 31, 2017 with Indian Regional Navigational Satellite (IRNSS-1H weighing 1425 kg) could not reach the designated orbit, due to non-separation of Payload Fairing (also known as heat shield) during the 2nd stage of the flight. The root cause of the failure was understood after analysing the various flight and ground test data in more detail. For the Payload Fairing separation to happen successfully, the horizontal and vertical jettisoning system needs to function. Based on the flight data, it was observed that the command for horizontal and vertical jettisoning system was successfully issued. Though the horizontal jettisoning system functioned normally, there was malfunctioning of the vertical jettisoning system, due to which the Payload Fairing did not separate.

The cause for the malfunctioning was the non-initiation of detonation in the vertical jettisoning system.

(b) The Department constantly undertakes various Research & Development activities, technology developments and experimental missions towards technological upgradation and achieve significant improvement in the performance of the launch vehicles, satellites and ground systems. The recent experimental missions that were successfully accomplished were the Reusable Launch Vehicle – Technology Demonstrator in May 2016 and the first experimental flight of a sub-scale Scramjet engine in August 2016, towards reducing the cost of access to space. The Department has also undertaken technology development and upgradation in the propulsion systems to increase the payload capability of the space transportation systems such as the development of a Semicryogenic engine, high thrust liquid engines and Cryogenic stages with increased propellant loading. The Department has also undertaken the development of high thrust electric propulsion systems towards an all-electric communication satellites to replace the relatively heavier Chemical propulsion system.

(c) The budget allocation of Department of Space during the FY 2017-18 is ₹ 9093.71 Crore. ~20% of the total allocation for Department of Space are deployed for R&D activities.

(d) As per the report "The Space Economy at a Glance 2014" published by OECD (Organisation for Economic Cooperation & Development), India stands at sixth position among the space faring nations, in terms of space budget as percentage of GDP.

(e) The products developed by the Department undergo rigorous design reviews, qualification tests and acceptance tests before they are inducted into the systems. ISRO has a well-defined Quality Assurance mechanism that certifies the products before they are inducted into the various systems for its space missions. The procedures for quality assurance and quality control are well documented and disseminated to the in-house and external work centres in order to ensure the product reliability.

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(40)

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 1555

TO BE ANSWERED ON THURSDAY, MARCH 08, 2018

INSTALLATION OF SECURITY GADGETS

1555. DR. V. MAITREYAN:

Will the PRIME MINISTER be pleased to state:

(a) whether Sriharikota Space Centre (SHAR) and other such vital installations in the country are adequately protected from any security threats;

(b) the safety and security measures that have been taken by Government to identify and thwart any threats emanating from the sea, air and ground;

(c) the funds allocated for carrying out the safety and security surveillance of these vital and strategically important installations during the last three years;

(d) whether Government has taken any steps to boost electronic security and surveillance to these vital installations and commissioned the installation of thermal cameras; and

(e) if so, the details thereof?

ANSWER

(a) Yes Sir, security and safety for all vital installations of ISRO in the country including Satish Dhawan Space Centre (SDSC), Sriharikota is provided by armed Central Industrial Security Force (CISF). All the extant orders and directives issued by MHA from time to time on security measures are being complied by the Department.

(b) All critical installations are provided with multi-layer security system, which includes access control system for entry/exit, surveillance and monitoring of vehicles, Visitor's Management, monitoring and control from single platform.

A strict authentication process is in place at all entry points on ground to prevent entry of any unauthorised person into the island. On the sea side, CISF provides security

coverage through watch tower and outpost on beach, foot and boat patrolling along the seashore. Additionally sea side security coverage is also provided by Marine police of Andhra Pradesh.

(c) Funds allocated for carrying out security, safety and surveillance in the last three years are as follows,

FY 2017-18	: Rs. 480.78 lakhs
FY 2016-17	: Rs. 379.52 lakhs
FY 2015-16	: Rs. 123.01 lakhs

(d)&(e) Yes Sir. security and surveillance is a continuous process. Based on the reviews conducted from time to time and directives issued by the concerned security agencies, various security/ surveillance gadgets viz. CCTV cameras, Thermal cameras, biometric systems, security power fencing etc., are installed/ being augmented in various ISRO Centres/ Units, including SHAR.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 1556

TO BE ANSWERED ON THURSDAY, MARCH 08, 2018

SELF RELIANCE IN SPACE TECHNOLOGY

1556. SHRI A. VIJAYAKUMAR:

Will the PRIME MINISTER be pleased to state:

(a) whether the country has become self-reliant in space technology;

(b) if so, the details thereof;

(c) whether Government has any proposal to develop reusable launch vehicle in future; and

(d) if so, the details thereof?

ANSWER.

(a)&(b) India has developed indigenous capabilities in all the three areas i.e. Space Transportation, Space Infrastructure and Space Applications. With the development of PSLV, GSLV and GSLV Mk-III launch vehicles, DOS/ISRO is capable of launching satellites for Remote Sensing, Communication and Navigational purposes ISRO Developed indigenous capability in Space infrastructure catering to Remote Sensing, Communication and Navigational Satellites; and achieved self-reliance in conceptualizing, developing, operationalizing space technology-based tools, techniques, supporting a host of applications in the areas of land, ocean, atmosphere, environment, and eco-system, urban and rural development, education and health, including disaster risk reduction on space applications front.

(c) Yes, Sir.

(d) Development of Reusable Launch Vehicles involves mastering of many cutting edge technologies, which require a series of technology demonstrator tests. ISRO has successfully carried out first flight test of RLV-TD (Reusable Launch Vehicle-Technology Demonstrator) to validate few critical technologies such as autonomous navigation, guidance & control, thermal protection system and re-entry mission management.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
STARRED QUESTION NO. 221

TO BE ANSWERED ON THURSDAY, MARCH 15, 2018

LAUNCHING OF SECOND ASTROSAT-2

*221. SHRI R. VAITHILINGAM:

Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that the Indian Space Research Organisation is planning to launch the second AstroSat-2 or space observatory;

(b) whether it is also a fact that the advantage of having such a space observatory in outer space is that it helps in observing distant planets, galaxies and other astronomical objects more clearly than from the earth;

(c) whether the first satellite launched in 2015 has helped in studying celestial bodies better; and

(d) whether the space telescopes avoid problems of ground based observatories, such as light pollution and distortion of electromagnetic radiation?

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.

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STATEMENT LAID ON THE TABLE OF THE RAJYA SABHA IN REPLY TO STARRED QUESTION NO.221 REGARDING "LAUNCHING OF ASTROSAT-2" ASKED BY SHRI R. VAITHILINGAM FOR ANSWER ON THURSDAY, MARCH 15, 2018.

(a) As a follow-on to AstroSat mission, the first Indian space astronomy observatory, Indian Space Research Organisation has initiated seeking proposals for the next astronomy mission.

(b) Yes Sir. An observatory in space is advantageous to observe the celestial sources in wavebands that are not accessible from ground.

(c) The AstroSat mission helped in studying the celestial sources in Ultraviolet and X-ray wavelengths. AstroSat instruments have better response in high energy X-ray band and in near and far Ultraviolet. Single exposure images of wide field sources like galaxies and globular clusters have been obtained with better resolution than so far achieved.

(d) Yes Sir. Observatories in space have several advantages because it is located above the Earth's atmosphere so that pollution, bad weather, image distortion, atmospheric windows will not affect the imaging of celestial sources such as stars and galaxies. The Universe can be observed in the entire electromagnetic spectrum and sharpest view of sources in great detail can be obtained from space observations.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 2379

TO BE ANSWERED ON THURSDAY, MARCH 15, 2018

LAUNCH PAD IN TAMIL NADU

2379. SHRIMATI SASIKALA PUSHPA:
SHRI A. VIJAYAKUMAR:
Will the PRIME MINISTER be pleased to state:

(a) whether any study has been conducted to establish launch pad at Kulasekarapattinam in Tamil Nadu;

(b) if so, the details thereof; and

(c) whether any target has been fixed for construction of launch pad there or at any other place in the State?

ANSWER

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

(a) & (b)

No, Sir. However, an expert committee was constituted to assess the need for a new launch site considering the capabilities of existing launch pads at Sriharikota, launch vehicles currently operational and the future launch requirements for the next decade. The committee concluded that there is no immediate requirement to establish a new launching site in the country.

(c) Does not arise.

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(47)

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 3168

TO BE ANSWERED ON THURSDAY, MARCH 22, 2018

FRAMING OF NATIONAL SPACE ACT

3168. SHRI MD. NADIMUL HAQUE:

Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that India is the only country which has indigenous launch capability, yet without a National Space Law;

(b) whether the Department has taken any steps to frame a National Space Act and if so, by when; and

(c) the manners in which the private companies, that manufacture satellite systems, follow a license protocol in the absence of a law?

ANSWER

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

(a) No Sir.

(b) Yes Sir. Department has framed a draft version of National Space Act. Presently the draft is undergoing the process of analyzing Public comments and Inter-ministerial consultations, after which it will be put up for Cabinet approval.

(c) Private companies that manufacture satellite systems, follow the established rules and regulations of Government of India for manufacturing sector.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 3169

TO BE ANSWERED ON THURSDAY, MARCH 22, 2018

POSTPONEMENT OF CHANDRAYAAN-2

3169. DR. T. SUBBARAMI REDDY:

Will the PRIME MINISTER be pleased to state:

(a) whether India's second lunar mission, Chandrayaan-2 scheduled for March is postponed;

(b) if so, the details thereof;

(c) what is the total cost of the mission and in what way, it would be different from other missions launched by various other countries, and

(d) whether ISRO has got the logistics, technologies etc. to take human beings to space and if so, when it would take human beings to space?

ANSWER

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

(a) India's second lunar mission, Chandrayaan-2 is scheduled for April 2018.

(b) The Chandrayaan-2 mission is an indigenous effort with Orbiter, Lander and Rover configuration. Lander and Rover are being attempted for the first time. Required tests, simulations and validation exercises are undertaken for several new technologies that are being developed.

(c) The total cost of Chandrayaan-2 mission is Rs. 800 Cr. When compared to the landing missions by other countries, Chandrayaan-2 attempts to soft land in the high latitude region of the Moon.

(d) ISRO has got Government approval only for development of critical technologies required for Human Spaceflight. After obtaining Government approval for Human Spaceflight Mission, ISRO will take up the project in phased manner.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 3170

TO BE ANSWERED ON THURSDAY, MARCH 22, 2018

'MAKE IN INDIA' IN SPACE TECHNOLOGY

3170. SHRI MD. NADIMUL HAQUE:

Will the PRIME MINISTER be pleased to state:

(a) the details of the steps taken by Government to bolster the 'Make in India' scheme in the space industry;

(b) the details of the steps taken by Government to expand its outreach activities just like 'The Space Place', a NASA outreach programme; and

(c) the details of the steps taken by Government to work with different colleges and universities to lure the best students towards a career in space and increasing job opportunities in space industry?

ANSWER

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

(a) ISRO has been transferring the technology and hand-holding several industries within the country. A consortium of six vendors has been engaged in assembly, integration and testing of two satellites, out of which one has been completed.

(b) ISRO Website (www.isro.gov.in) highlights all aspects of space activities in the country which includes all launch vehicle missions. The site also hosts an interesting archival, story of the week, Announcement of opportunities for Astrosat, live streaming of Launch along with a comprehensive timeline of ISRO's journey through decades and many more information.

(c) Department of Space (DOS) encourages young minds towards space science research through following measures:

(i) ISRO Space Science Promotion Scheme (ISRO-SSPS)

(ii) ISRO's Sponsored Research (RESPOND) Programme

(iii) The space science and planetary missions

(iv) ISRO encourages students by launching their satellites

(v) ISRO supports student to do their projects in all ISRO centers

(vi) An outreach facility at Jeedimetla, Hyderabad is created for students to carry out space based activities.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 4449

TO BE ANSWERED ON THURSDAY, APRIL 05, 2018

ROCKET LAUNCHES BY ISRO

4449. SHRI PARIMAL NATHWANI:

Will the PRIME MINISTER be pleased to state:

(a) the number of rocket launches undertaken by ISRO during the last three years;

(b) the number of foreign satellites launched, expenditure incurred thereon and revenue raised therefrom;

(c) the number of rocket and satellite launches proposed during the next three years; and

(d) the funds provided and the R&D activities undertaken by ISRO during the said period along with the new technologies developed?

ANSWER

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

(a) The number of rocket launches undertaken by ISRO during the last three years i.e. 2015, 2016 & 2017 are as follows:

2015: 5 launches (4 PSLV & 1 GSLV)

2016: 7launches (6 PSLV&1 GSLV)

2017: 5 launches (3 PSLV, 1 GSLV & 1 GSLV Mk-III)

(b) During the last three years, starting from January 2015 till December 2017, a total of 169 foreign satellites from 23 countries were successfully launched onboard Polar Satellite Launch Vehicle (PSLV). Revenue earned through these launches was approx. 95 Million Euros and 4.5 Million USD in Foreign Exchange.

(c) The total number of missions proposed during the ensuing three years i.e. 2018, 2019 & 2020 is 57 (26 Launch Vehicle missions and 31 satellite missions). In 2018, 4 missions (1 Launch Vehicle mission and 3 satellite missions) have already been completed till date.

(d) Funds allocated to Department of Space during last three years is given below:

Financial Year	Allocation (RE) (₹ in crores)
2014-15	5826.00
2015-16	6959.44
2016-17	8045.28

Major achievements of ISRO along with new R&D missions accomplished during last three years are detailed below:

2014-15:

(i) Mars Orbiter Mission

(ii) An experimental mission of GSLV-Mk III (with passive cryogenic stage)

(iii) Launch of three navigation Satellites viz. IRNSS-1B, 1C and 1D.

(iv) Launch of GSAT-16 communication satellite

2015-16:

(i) GSAT-6 communication satellite

(ii) Launch of first observatory in space "ASTROSAT"

(iii) Launch of communication satellite "GSAT-15",

(iv) Launch of two navigation satellites viz. IRNSS-1E and 1F.

2016-17:

(i) India's GSLV-F05 with indigenous Cryogenic stage

(ii) Augmented Indian Earth Observation capability with four remote sensing satellites viz. Resourcesat-2A, Scatsat-1 and two Cartosat-2 series.

(iii) Successfully conducted two technology demonstrator missions viz. Reusable Launch Vehicle-Technology Demonstrator (RLV-TD) and Scramjet Engine, an Air Breathing Propulsion System.

(iv) Successful testing of indigenously developed Cryogenic Upper Stage "C25" for GSLV MkIII for full flight duration of 640 seconds.

(v) Successfully launched 104 satellites in a single go, onboard PSLV C37.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 4450

TO BE ANSWERED ON THURSDAY, APRIL 05, 2018

INDEPENDENT VOICE AT INTERNATIONAL SPACE FORA

4450. SHRI RITABRATA BANERJEE:

Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that India does not have an independent voice at the International Space Fora;

(b) if so, the details thereof and the reasons therefor; and

(c) whether Government believes that India must have a strong and independent voice at the International Space Fora as space is becoming more congested, contested and competitive?

ANSWER

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

(a) No Sir.

(b) India is participating in international space events regularly including United Nations Committee on Peaceful Uses of Outer Space (UNCOPUS), International Astronautics Congress, organised by International Astronautics Federation (IAF) alongwith International Academy of Astronautics (IAA) and International Institute of Space Law (IISL). Indian experts are members of various technical committees of IAF and IAA. Indian Representative has chaired the Scientific and Technical Sub-Committee (STSC) of UNCOPUS in 2016. In addition, India has been taking active participation in the international agencies, such as, Inter Agency Space Debris Coordination Committee IADC, International consultations on Code of Conduct for Outer Space activities under the auspices of UN.

(c) Does not arise.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 4451

TO BE ANSWERED ON THURSDAY, APRIL 05, 2018

FUNDS FOR SPACE TECHNOLOGY DEVELOPMENT

4451. MAHANT SHAMBHUPRASADJI TUNDIYA:

Will the PRIME MINISTER be pleased to state:

(a) whether Government has any data about the funds allocated for the Space Technology Development during the last three years; and

(b) if so, the details thereof, year-wise?

ANSWER

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

(a) & (b)

The details of the allocation of funds made under the Head "Space Technology" during the last three years and the current year, year-wise are as given below:

Financial Year	**Allocation (RE) (₹ in crores)**
2014-15	3268.26
2015-16	4150.83
2016-17	4586.05
2017-18	5984.42

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 4452

TO BE ANSWERED ON THURSDAY, APRIL 05, 2018

LAUNCHING OF SATELLITES BEFORE LUNAR MISSION

4452. SHRIMATI VIJILA SATHYANANTH:

Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that ISRO is gearing up to launch two satellites before the lunar mission in April, 2018;

(b) if so, the details thereof;

(c) whether it is also a fact that the ISRO had launched IRNSS-1H which got struck in the heat shield of the rocket and the mission failed; and

(d) if so, the details thereof?

ANSWER

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

(a) & (b) ISRO plans to launch two satellites before April 2018, out of which one has been launched (GSAT-6A) on March 29, 2018 and another (IRNSS-1I) is slated for 12th April, 2018 by the Polar Satellite Launch Vehicle (PSLV).

(c) Yes, Sir.

(d) The 41st flight of PSLV-C39, which was carrying IRNSS-1H Satellite, failed due to non-separation of Heat Shield. A detailed analysis of the mission flight data and ground test data revealed that the root cause of the non-separation of Heat Shield was due to the non-ignition of detonation in the vertical jettisoning system.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 4453

TO BE ANSWERED ON THURSDAY, APRIL 05, 2018

PROJECT TO SUPPORT ASEAN COUNTRIES

4453. SHRI NARAYAN LAL PANCHARIYA:

Will the PRIME MINISTER be pleased to state:

(a) whether Government has taken any decision to pursue a project to support Association of South East Asian Nations (ASEAN) countries to receive and process data from IRS satellites;

(b) if so, the details thereof;

(c) the details regarding ASEAN countries which are likely to benefit from this decision;

(d) whether ISRO proposes to launch more new products and services for different countries; and

(e) if so, the details thereof?

ANSWER

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

(a) Yes Sir.

(b) As announced by Hon'ble Prime Minister of India in the India-ASEAN (Association of South East Asian Nations) Summit in October 2010, ISRO is pursuing a proposal to support Association of South East Asian Nations (ASEAN) countries to receive and process data from Indian remote sensing satellites (RESOURCESAT-2 and OCEANSAT-2) and also to provide training in space science, technology and applications.

(c) All the 10 members of ASEAN, viz., Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam, will get benefitted from this project.

(d) Yes Sir.

(e) India pursues international cooperation in peaceful uses of outer space with space agencies of 43 nations and 5 multilateral bodies. As part of this, ISRO keeps developing new products and services, jointly with partnering agencies, through joint missions, scientific instruments accommodation, data sharing and exchange of expertise. ISRO has built and launched 'South Asia Satellite' on May 5, 2017 to provide satellite communication services to individual South Asian nations and also across the region. India participates in international disaster management mechanisms including International Charter "Space and Major Disasters", Sentinel Asia programme of Asia Pacific Regional Space Agency Forum (APRSAF), UN Economic and Social Commission for Asia and Pacific (UNESCAP) and UN Platform for Space based Information for Disaster management and Emergency Response (UNSPIDER). India, as a member of the International COSPAS-SARSAT system for search and rescue operations, provides distress alert and position location services to India and seven neighbouring countries. India has also been providing training programmes on space technology applications to officials from other countries.

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