



सत्यमेव जयते

**PARLIAMENT OF INDIA
RAJYA SABHA**

**DEPARTMENT-RELATED PARLIAMENTARY STANDING COMMITTEE ON
SCIENCE & TECHNOLOGY, ENVIRONMENT, FORESTS AND
CLIMATE CHANGE**

THREE HUNDRED THIRTIETH REPORT

**DEMANDS FOR GRANTS (2018-2019) OF THE
DEPARTMENT OF SPACE
(DEMAND NO. 94)**

(Presented to the Rajya Sabha on 6th March, 2020)
(Laid on the Table of Lok Sabha on 6th March, 2020)



**Rajya Sabha Secretariat, New Delhi
March, 2020/ Phalguna, 1941 (Saka)**

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** To be appended at printing stage*

COMPOSITION OF THE COMMITTEE

(2019-20)

(Constituted on 13th September, 2019)

1. Shri Jairam Ramesh -- **Chairman**

RAJYA SABHA

2. Shri Anil Baluni
3. Shri R.S. Bharathi
4. Shrimati Vandana Chavan
5. Shri Hishey Lachungpa
6. Shri Parimal Nathwani
7. Shri Bhaskar Rao Nekkanti
8. Shri Ashwini Vaishnaw
9. Shri Ravi Prakash Verma
10. Shri Binoy Viswam

LOK SABHA

11. Shri Guharam Ajgalley
12. Shri Pradan Baruah
13. Shri E.T. Mohammed Basheer
14. Shri Jashvantsinh Sumanbhai Bhabhor
15. Shri Sudarshan Bhagat
16. Shri Rameshbhai Lavjibhai Dhaduk
17. Shri Anantkumar Hegde
18. Shrimati Jyotsna Charandas Mahant
19. Dr. Swami Sakshiji Maharaj
20. Shri Asaduddin Owaisi
21. Shri S.R. Parthiban
22. Dr. Ranjan Singh Rajkumar
23. Shri Kotha Prabhakar Reddy
24. Dr. Jayanta Kumar Roy
25. Shrimati Satabdi Roy (Banerjee)
26. Shri Mahesh Sahoo
27. Shri Francisco Cosme Sardinha
28. Shri Anurag Sharma
29. Shri Ram Shiromani
30. Shri Kirti Vardhan Singh
31. Dr. Ramapati Ram Tripathi

SECRETARIAT

Smt. Sunita Sekaran, Joint Secretary
Shri T. N. Pandey, Director
Shri S. Rangarajan, Additional Director
Shri Rajiv Saxena, Under Secretary
Shri Harish Kumar, Committee Officer

INTRODUCTION

I, the Chairman of the Department-related Parliamentary Standing Committee on Science & Technology, Environment, Forests and Climate Change, having been authorised by the Committee to present the Report on its behalf, present this Three Hundred Thirtieth Report of the Committee. This Report deals with the detailed Demands for Grants (2020-2021) of the Department of Space (Demand No.94).

2. In the meeting of the Committee held on 18th February, 2020, the Secretary and other officers of the Department of Space gave an overview of the various activities of the Department and the Members sought clarifications on various aspects of the performance of the Department to enable it to scrutinise the Demands for Grants.

3. The Committee expresses its thanks to the officers of the Department for replying to the clarifications sought by the Members and placing before it the required material to enable it to scrutinise the Demands for Grants of the Department of Space.

4. The Committee considered and adopted the draft report in its meeting held on the 4th March, 2020.

NEW DELHI;
March 4, 2020
Phalguna 14, 1941 (Saka)

(JAIRAM RAMESH)
Chairman,
Department-related Parliamentary Standing Committee on
Science & Technology, Environment, Forests and Climate Change,
Rajya Sabha.

REPORT

1. The Department-related Parliamentary Standing Committee on Science & Technology, Environment, Forests and Climate Change considered the Demands for Grants 2020-21 of the Department of Space in its meeting held on the 18th February 2020.

2. BUDGETERY DETAILS FOR THE FINANCIAL YEAR 2019-20 AND ALLOCATION FOR 2020-21

2.1 The following table presents the budgetary details for the year 2019-20 and BE 2020-21 of the Department of Space:-

(Rupees in crore)					
Sl. No.	Name of Organisation/Programme/Project/Centre/Unit	Budget 2019-20			Budget 2020-21
		BE	RE	Actuals (January, 2020)	
I	Establishment Expenditure				
1.	Department of Space - Secretariat	35.00	53.00	35.17	36.17
2.	ISRO Headquarters	332.00	220.48	177.96	194.00
	Total - Establishment Expenditure (I)	367.00	273.48	213.13	230.17
II	Central Sector Schemes				
3.	Space Technology	8407.49	8991.13	7509.40	9761.50
4.	Space Applications	1885.45	1862.77	1586.31	1810.00
5.	Space Sciences	285.80	281.88	207.67	265.00
6.	INSAT Satellite Systems	884.42	1008.56	872.49	750.50
	Total - Central Sector Schemes (II)	11463.16	12144.34	10175.87	12587.00
III	Other Central Expenditure				
a	Autonomous Bodies				
7.	Indian Institute of Space Science & Technology (IIST)	80.00	90.00	71.00	90.00
8.	Semi-Conductor Laboratory (SCL)	300.00	350.00	300.00	316.00
9.	North-Eastern Space Applications Centre (NE-SAC)	40.00	34.00	31.80	40.30
10.	National Atmospheric Research Laboratory (NARL)	50.00	51.10	51.10	38.50
11.	Physical Research Laboratory (PRL)	145.00	180.00	180.00	172.00
	Total-Autonomous Bodies (III.a)	615.00	705.10	633.90	656.80
b	Others				
12.	New Space India Limited	10.00	10.00	10.00	--
13.	International Co-operation	18.00	6.34	3.51	5.50
	Total - Other Central Expenditure (III)	643.00	721.44	647.41	662.30
	Grand Total	12473.16	13139.26	11036.41	13479.47

2.2 The Committee in its meeting held on 18th February, 2020 with the Secretary, Department of Space on the subject 'Examination of Demands for Grants 2020-21 of the Department of Space' noted that the Department of Space had projected a demand of Rs.24,686.20 crore for BE 2020-21, against which an amount of Rs.13,479.47 crore has been allocated. It has been brought to the notice of the Committee that the Department has accordingly reprioritised its programmes. Secretary, Department of Space assured the Committee that the on-going programmes of the Department will not be affected and the Department would seek additional funds at RE/supplementary demand for grants stage.

2.3 Responding to a query of the Committee about the Gaganyaan Programme, budgetary allocation and impact of reduction in the demand of funds, it was submitted that the Gaganyaan Programme envisages sending a crew of astronauts

to space and bring them back safely to earth before the 75th Independence Day of India i.e. August 2022. It was brought to the notice of the Committee that towards realising the Gaganyaan Programme, the Department had projected an amount of Rs.4,256.78 crore in BE 2020-21, against which an amount of only Rs.1,200 crore has been allocated. **The Gaganyaan Programme is a very prestigious national endeavour with global significance. But the budgetary allocation for 2020-21 does not reflect this importance. The Committee, therefore, recommends that the allocation under the Gaganyaan Programme must be enhanced by another Rs.3000 crore at the RE stage, as originally envisaged by the Department.**

BUDGET ALLOCATION FOR CENTRAL SECTOR SCHEMES

3. SPACE TECHNOLOGY

3.1 The Committee notes that under this head, provision has been included for the activities of various ISRO Centres, namely Vikram Sarabhai Space Centre (VSSC), ISRO Inertial Systems Unit (IISU), Liquid Propulsion Systems Centre (LPSC), ISRO Propulsion Complex (IPRC), U.R.Rao Satellite Centre (URSC), Laboratory for Electro-Optics Systems (LEOS), Satish Dhawan Space Centre-SHAR (SDSC-SHAR), ISRO Telemetry, Tracking and Command Network (ISTRAC), Master Control Facility (MCF) & Human Space Flight Centre (HSFC), and also for various space technology projects undertaken by the Department, which consists of launch vehicle & satellite projects, including development and operations.

3.2 The following table indicates the BE, RE allocations and actual expenditure (upto January, 2020), year-wise, for the years 2018-19 and 2019-20 and BE allocation for the year 2020-21 under the Space Technology programme as provided by the Department:-

(Rupees in crore)

Sl. No.	Name of Organisation/ Scheme	2018-19			2019-20			2020-21
		BE	RE	Actuals	BE	RE	Actuals*	BE
Space Technology								
1	Vikram Sarabhai Space Centre (VSSC)	1395.70	1385.51	1316.96	1390.00	1463.09	1317.62 (90.05%)	1400.00
2	ISRO Inertial Systems Unit (IISU)	74.00	65.00	63.23	75.00	60.00	49.55 (82.58%)	70.00
3	Liquid Propulsion Systems Centre (LPSC)	559.52	520.00	464.15	649.51	686.68	551.37 (80.29%)	830.00
4	ISRO Propulsion Complex (IPRC)	499.00	440.00	449.32	550.00	565.06	386.42 (68.38%)	676.00
5	Human Space Flight Centre (HSFC)				24.60	30.00	20.78 (69.26%)	45.00
6	U.R.Rao Satellite Centre (URSC)	718.85	700.00	692.14	720.00	827.05	715.25 (86.48%)	840.00
7	Laboratory for Electro-Optics Systems (LEOS)	70.00	72.00	69.06	80.00	80.00	62.20 (77.75%)	100.00
8	Satish Dhawan Space Centre - (SDSC-SHAR)	866.40	820.00	850.18	850.00	1005.13	875.75 (87.12%)	940.00
9	ISRO Telemetry Tracking & Command Network (ISTRAC)	248.05	260.00	236.03	270.00	284.04	225.28 (79.31%)	330.00
10	Master Control Facility	145.25	140.00	122.50	150.00	150.01	130.81	170.00

	(MCF)						(87.20%)	
11	Polar Satellite Launch Vehicle - Continuation Project (PSLV-C)	750.00	750.00	416.59	350.00	600.00	529.38 (88.23%)	650.00
12	GSLV-Operational	125.00	160.00	160.00	180.00	180.00	134.16 (74.53%)	150.00
13	GSLV Mk III Development	22.00	10.00	9.67	0.00	0.00	0.00	0.00
14	Cryogenic Upper Stage Project (CUSP)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	Space Capsule Recovery Experiment (SRE-I&II)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	Manned Mission Initiative/Human Space Flight Programme (HSP)	2.50	2.59	2.57	1000.10	1000.10	857.17 (85.70%)	1200.00
17	Trisonic Wind Tunnel Facility Project (TWT)	96.00	87.62	88.13	100.00	100.00	43.65 (43.65%)	90.00
18	Semi-Cryogenic Engine Development	220.00	200.00	225.48	200.00	210.00	146.37 (69.70%)	210.00
19	Semi-Cryogenic Engine Clustering	0.10	0.00	0.00	0.10	0.00	0.00	0.00
20	Semi-Cryogenic Stage Development	0.10	10.00	3.54	80.00	45.00	22.78 (50.62%)	85.00
21	Advanced Launch Vehicle Development	0.10	0.00	0.00	0.10	0.00	0.00	0.00
22	PSLV Continuation Programme (Phase-6)	0.10	300.00	240.00	200.00	200.00	178.48 (89.24%)	250.00
23	GSLV Mk-III Continuation Programme (Phase-1)	0.10	150.00	50.00	250.00	125.00	107.44 (85.95%)	230.00
24	RLV-TD Orbital Re-entry Experiment	0.10	10.00	0.65	55.00	11.75	9.59 (81.61%)	35.00
25	Small Satellite Launch Vehicle (SSLV)	0.10	25.00	13.50	40.00	54.00	46.48 (86.07%)	40.00
26	PSLV Integration Facility (PIF)	50.00	68.88	60.00	100.00	115.00	88.28 (76.76%)	110.00
27	GSLV Continuation Programme (Phase-4)	0.00	0.00	0.00	0.05	7.00	0.00 (0.00%)	60.00
28	Launch pad for SSLV				0.05	56.00	55.27 (98.69%)	100.00
29	Network for Space Object Tracking & Analysis (NETRA)				0.40	20.00	12.41 (62.05%)	35.00
30	Geo-Imaging Satellite (GISAT)	50.00	40.00	46.76	60.00	60.00	48.87 (81.45%)	29.00
31	Resourcesat-2A				0.00	0.00	0.00	0.00
32	Cartosat-3	70.00	60.00	72.83	80.00	97.50	88.21 (90.47%)	65.00
33	Scatsat				0.00	0.00	0.00	0.00
34	RISAT-1A	127.35	60.00	109.92	100.00	98.90	92.45 (93.47%)	37.50
35	OCEANSAT-3 & 3A	78.70	80.00	97.51	140.00	138.85	132.64 (95.52%)	100.00
36	Cartosat-2E	34.00	29.00	28.95	0.00	0.00	0.00	0.00
37	RISAT-3			9.93	0.00	0.00	0.00	
38	Navigational Satellite Systems (NSS)	50.00	60.00	43.67	150.00	165.00	138.86 (84.15%)	200.00
39	NASA-ISRO Synthetic Aperture Radar Mission (NISAR)	87.20	70.00	66.86	80.00	80.00	66.77 (83.46%)	90.00
40	Resourcesat-3S & 3SA	40.00	30.00	39.77	80.00	92.05	73.23 (79.55%)	90.00
41	Resourcesat-3 & 3A	25.00	40.00	32.92	70.00	63.40	55.51	90.00

							(87.55%)	
42	High Resolution Satellite Constellation (HRSAT)	40.00	55.00	56.81	80.00	79.50	68.66 (86.36%)	100.00
43	RISAT-1B	0.10	10.00	0.00	30.00	29.70	22.39 (75.29%)	100.00
44	Realization of Second Vehicle Assembly Building (SVAB)	65.60	90.00	73.00	16.12	16.12	7.78 (48.26%)	10.00
45	Solid Propellant Space Booster Plant (SPROB)	45.00	170.00	154.99	180.00	180.00	137.43 (76.35%)	80.00
46	Third Launch Pad	0.10	0.00	0.00	0.10	0.00	0.00	0.00
47	Development of Space Materials & Components	20.00	22.00	15.20	26.36	15.20	10.11 (66.51%)	15.00
48	Development & Supply of Aluminium alloy tankages (Pre-investment)							100.00
49	Capacity Building Programme (CBP)							9.00
	Total	6576.02	6992.60	6382.82	8407.49	8991.13	7509.40 (83.52%)	9761.50

*upto January, 2020

3.3 The Committee notes the overall progress made by the Department of Space under Space Technology, including the fiscal performance, with satisfaction. The Committee, however, would like to point out the unsatisfactory fund utilisation of the Department under the component ‘Trisomic Wind Tunnel Facility Project (TWT)’, where the Department has fallen short of the given budgetary support. Likewise, the Department should also be equally concerned over its financial performance under the component ‘Realization of Second Vehicle Assembly Building (SVAB)’.

4. SPACE APPLICATIONS

4.1 The Committee notes that under the head Space Applications, provision has been included for the activities of various ISRO Centres, namely Space Application Centre (SAC), Development and Education Communication Unit (DECU), National Remote Sensing Centre (NRSC) & Indian Institute of Remote Sensing (IIRS), and also for different Space Application Projects undertaken by the Department consisting of National Natural Resources Management System (NNRMS), Earth Observation Applications Mission (EOAM) and Disaster Management Support (DMS).

4.2 The Committee also enquired about the BE, RE allocations and actual expenditure for the years 2018-19, 2019-20 (upto January, 2020) and BE allocation for 2020-21 under the Space Application programmes. In its written response, the Department provided the following information:-

Rupees in crore)								
Sl. No.	Name of Organisation/ Scheme	2018-2019			2019-2020			2020-21
		BE	RE	Actuals	BE	RE	Actuals*	BE
Space Applications								
1.	Space Applications Centre (SAC)	1124.25	1084.19	1267.47	1311.45	1320.07	1139.32 (86.30%)	1250.00

2.	Development and Educational Communication Unit (DECU)	20.00	20.00	18.99	22.00	18.60	15.59 (83.81%)	20.00
3.	National Remote Sensing Centre (NRSC)	494.50	400.00	439.93	450.00	427.09	351.88 (82.39%)	445.00
4.	Indian Institute of Remote Sensing (IIRS)	66.00	57.00	57.15	62.00	70.01	61.89 (88.40%)	65.00
5.	Earth Observation Applications Mission (EOAM)	5.00	2.00	1.66	1.00	1.00	0.45 (45.00%)	0.50
6.	National Natural Resources Management System (NNRMS)	11.50	13.50	9.87	14.00	8.00	6.43 (80.37%)	11.50
7.	Disaster Management Support (DMS)	25.00	18.50	16.39	25.00	18.00	10.75 (59.72%)	18.00
	Total	1746.25	1595.19	1811.46	1885.45	1862.77	1586.31 (85.15%)	1810.00

* Upto January, 2020

4.3 The Committee takes note of various activities being undertaken by the Department under its Space Applications programme with satisfaction. At the same time, it wishes to point out that it is essential that all the Ministries/Departments of the Union Government and the respective State Governments should make full and timely use of the data being collected and disseminated by the Department of Space. The Committee, accordingly, is of the opinion that synergy between the Department of Space and other government agencies, both at the Centre and in states, needs to be further strengthened. In this connection, the Committee is pained to point out that the use of the ISRO-developed Bhuvan has not become as widespread as the use of Google. This needs immediate attention at the highest level.

4.4 The Committee during the meeting held on 18th February, 2020 with the representatives of Department of Space on the issue of depleting ground water and recharge, has been informed that the Department has provided the Government of India with data of recharge locations in 256 distressed districts. It was further brought to the Committee's notice that the ground water maps of ISRO has recharge sites depending on the soil, landforms, etc. and these maps have been delivered to the respective district authorities, so that the information may be used optimally.

4.5 The Committee appreciates the efforts made by the Department on groundwater mapping. The Committee also appreciates the efforts made under the CHAMAN Programme by the Department, covering area assessment of seven horticultural and vegetable crops. However, the Committee is of the opinion that such an exercise should be undertaken in all the States and districts of the country.

4.6 The Committee is also of the opinion that the Department could have better utilised funds under the components 'Earth Observation Applications Mission (EOAM)' and 'Disaster Management Support (DMS)' with prudent financial planning.

5. INSAT SATELLITE SYSTEMS

5.1 The Committee notes that under the INSAT Satellite Systems provision has been made for the expenses of various INSAT/GSAT classes of satellites, including the expenses of launch service contracts and leasing transponders.

5.2 The Committee enquired about the BE, RE allocations and actual expenditure for the years 2018-19, 2019-20 (upto January, 2020) and BE allocation for 2020-21 under the head of INSAT Satellite Systems. In its written response, the Department provided the following information:-

(Rupees in crore)

Sl. No.	Name of Organisation/ Scheme	2018-19			2019-20			2020-21
		BE	RE	Actuals	BE	RE	Actuals*	BE
INSAT Satellite Systems								
1	INSAT - 3 Satellites	8.00	5.25	4.49	4.00	2.40	1.31 (54.58%)	1.50
2	INSAT - 4 /GSAT Satellites	82.00	65.00	72.14	0.00	0.00	0.00	0.00
3	Service Charges for Leasing INSAT/GSAT Transponders	100.00	100.00	126.79	100.00	95.68	95.68 (100.00%)	120.00
4	Advanced Communication Satellite (GSAT-11) including Launch Services	20.00	46.50	48.70	6.50	7.00	6.23 (89.00%)	0.00
5	GSAT-12R Satellite				0.10	50.00	32.64 (65.28%)	90.00
6	GSAT-17 & Follow-on Satellites	48.00	50.00	50.17	0.00	0.00	0.00	0.00
7	GSAT-17 & Follow-on Satellites- Launch Services	0.50	0.00	0.00	0.00	0.00	0.00	0.00
8	GSAT-18 Satellite				0.00	0.00	0.00	0.00
9	GSAT-18 Launch Services				0.00	0.00	0.00	0.00
10	GSAT-19 Satellite	6.50	8.00	9.09	0.00	0.00	0.00	0.00
11	GSAT-20 Satellite	50.00	30.00	59.14	200.00	259.00	204.98 (79.14%)	100.00
12	GSAT-21 Satellite	0.10	0.00	0.00	0.10	0.00	0.00	0.00
13	GSAT-22/23/24 Satellites	50.00	120.00	139.61	195.15	172.63	186.70 (108.15%)	140.00
14	GSAT 25 & 28 Satellites	0.10	0.00	0.00	0.10	0.00	0.00	0.00
15	GSAT 26 & 27 Satellites	0.10	0.00	0.00	0.10	0.00	0.00	0.00
16	GSAT-29 Satellites	45.70	100.00	124.55	38.00	38.00	32.92 (86.63%)	12.00
17	GSAT-30, 31 & 32 Satellites	0.30	80.00	144.12	200.00	210.00	185.28 (88.22%)	130.00
18	GSAT-30,31 Launch services	0.10	725.45	813.72	140.00	130.00	121.64 (93.56%)	6.00
19	India Data Relay Satellite Series (IDRSS)				0.17	43.75	5.11 (11.68%)	150.00
20	GSAT-20/24 Launch Services				0.00	0.10	0.00 (0.00%)	1.00
21	GSAT Follow-on Satellites including Launch Services		0.00	0.00	0.00	0.00	0.00	0.00
22	Augmentation of Capacity through Leasing of Transponders from Foreign Satellite	0.10	0.00	0.00	0.10	0.00	0.00	0.00

23	Procurement of Heavier Class Satellite	0.10	0.00	0.00	0.10	0.00	0.00	0.00
Total		411.60	1330.20	1592.52	884.42	1008.56	872.49 (86.50%)	750.50

* Upto January, 2020.

5.3 The Committee expresses its satisfaction on the performance of the Department under the head 'INSAT Satellite Systems'. However, the Committee highlights the sub-optimal utilisation of budgetary support for INSAT - 3 Satellites, even though the actual allocation amount is very small. The utilisation of budgetary support given for India Data Relay Satellite Series (IDRSS) is equally discouraging. The Committee urges the Department to pay attention to both these areas.

6. INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY (IIST)

6.1 The Department-related Parliamentary Standing Committee on Science and Technology, Environment, Forests & Climate Change during its study visit to Thiruvananthapuram, Chennai, Sriharikota, Bengaluru and Ahmedabad from 26th to 30th December, 2019, held detailed discussion with the Director, IIST on the activities and functioning of the Institute on 26th December, 2019 at Thiruvananthapuram. The Committee noted that the Institute is an autonomous body under the Department of Space, and was established in 2007 with the objective of offering high quality education in space science and technology to meet the demands of the Indian Space Programme.

6.2 The Committee learnt that the Institute offers undergraduate, postgraduate, doctoral and post-doctoral programmes in the broad areas of space science, technology and applications. It was brought to the notice of the Committee that the Institute carries out cutting edge research and development in space studies, and acts as a think-tank to explore new directions for the Indian Space Programme. It is also gratifying to note that an overwhelming majority of the graduates have joined ISRO itself. **The Committee is, therefore, of the view that given its mandate and its impact so far, the Institute must be immediately granted the status of 'Institute of National Eminence' through an act of Parliament.**

7. INTERNATIONAL CO-OPERATION

7.1 The Committee enquired about the BE, RE allocations and actual expenditure for the years 2018-19, 2019-20 (upto January, 2020) and BE allocation for 2020-21 under the head 'International Co-operation'. In its written response, the Department provided the following information:-

(Rupees in crore)

2018-19			2019-20			2020-21
BE	RE	Actuals	BE	RE	Actuals*	BE
4.90	4.26	2.47	18.00	6.34	3.51 (55.36%)	5.50

* Upto January, 2020

7.2 The Committee expresses its satisfaction over the progress made by the Department of Space in the field of International Co-operation.

8. CONCLUDING OBSERVATIONS

The Committee had visited a number of ISRO facilities in Thiruvananthapuram, Sriharikota, Bengaluru and Ahmedabad in December 2019. The visit was a great educational experience for all members, and the Committee would like to highlight the following:

- (i) Efforts to indigenise electronic components in our space programme must be intensified, if needed in Public Private Partnership (PPP) mode. An import dependence of more than 80% is unacceptably high.**
- (ii) The country's space programme depends on a single foreign company for the entire supply of carbon fibre and composites. This is an area that demands urgent attention of the government.**
- (iii) ISRO's R&D and academic outreach programmes are still heavily focussed in the southern part of the country and with elite institutions. Better coverage is needed in the eastern and north-eastern regions of the country as well.**
- (iv) ISRO's launch facility at Sriharikota needs substantial upgradation of access and logistics infrastructure, particularly since the number of annual launches is projected to double in the next five years. The launch facility has a coastline of around 50 kms, which requires the highest level of maritime security.**
- (v) It is recommended that Sullurpet should be developed as a smart city which will benefit the Satish Dhawan Space Centre at Sriharikota as well.**
- (vi) ISRO's takeover of the Semi-Conductor Laboratory at Chandigarh is a major step forward and while microprocessor design capabilities have now been proven, the marked absence of microprocessor fabrication and manufacturing facilities does no merit to our country, which is a world power in Information Technology. Such facilities must be established in PPP mode, if need be, with international collaboration.**
