

Space Policy and Law of India

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Historical Evolution

- **1962** **INCOSPAR & Establishment of Thumba Equatorial Rocket Launching Station (TERLS)**
- **1963** **First sounding rocket with sodium vapour payload launched (21 November 1963)**
- **1969** **Indian Space Research Organisation (ISRO) formed under DAE**
- **1972** **Space commission & Department of Space**
- **1975-76** **Satellite Instructional Television Experiment**
- **1977** **Satellite Telecommunication Experiment Project**
- **1979** **Bhaskara 1**
- **1981** **APPLE**

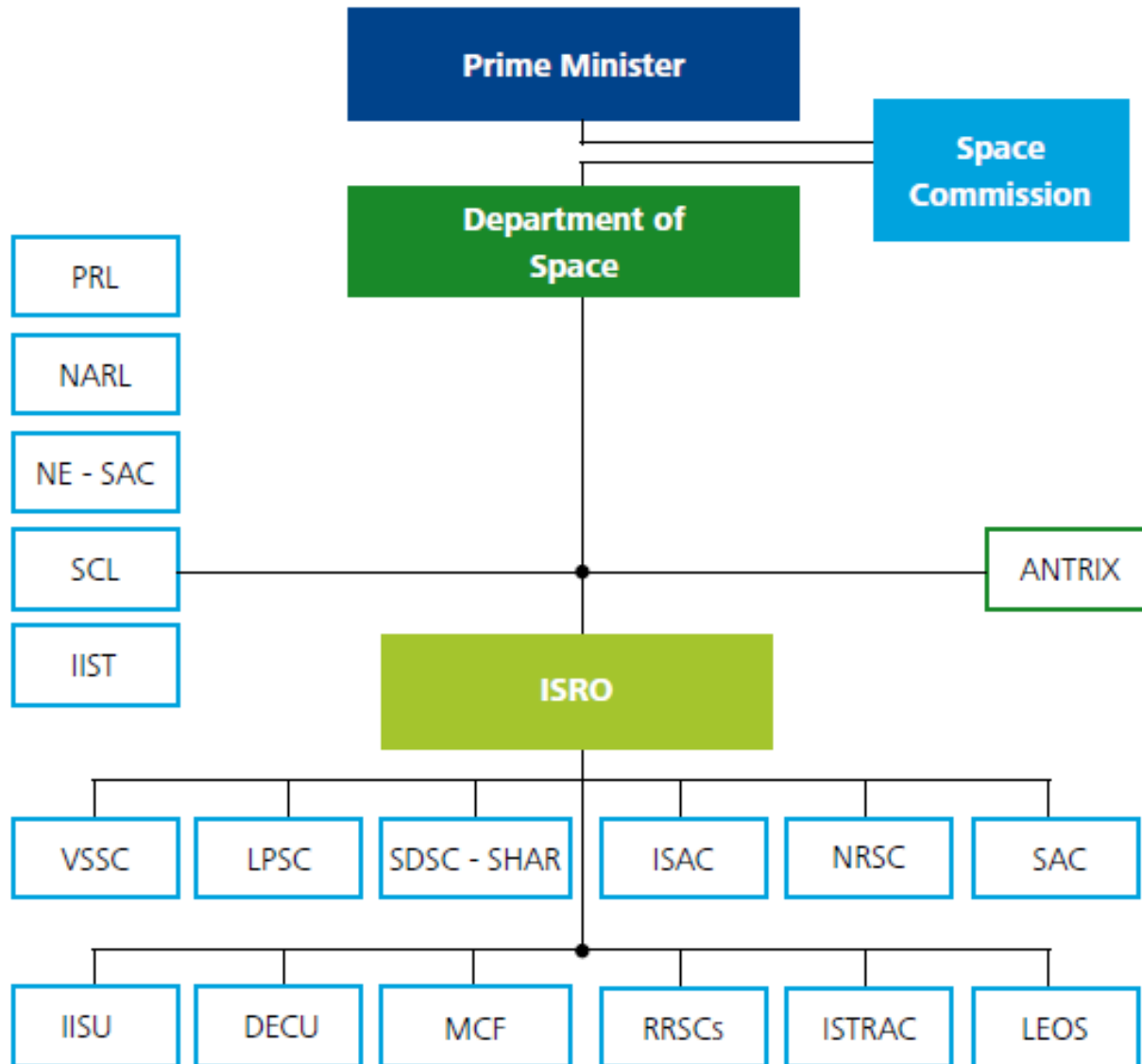
Space Focus

India's first space policy statement can be attributed to Vikram Sarabhai. On the occasion of the dedication of TERLS to the United Nations on 2 Feb 1968 he said:

“There are some who question the relevance of space activities in a developing nation. To us, there is no ambiguity of purpose. We do not have the fantasy of competing with the economically advanced nations in the exploration of the moon or the planets or manned space-flight. *But we are convinced that if we are to play a meaningful role nationally, and in the community of nations, we must be second to none in the application of advanced technologies to the real problems of man and society.*”



Organisation of Space Activity

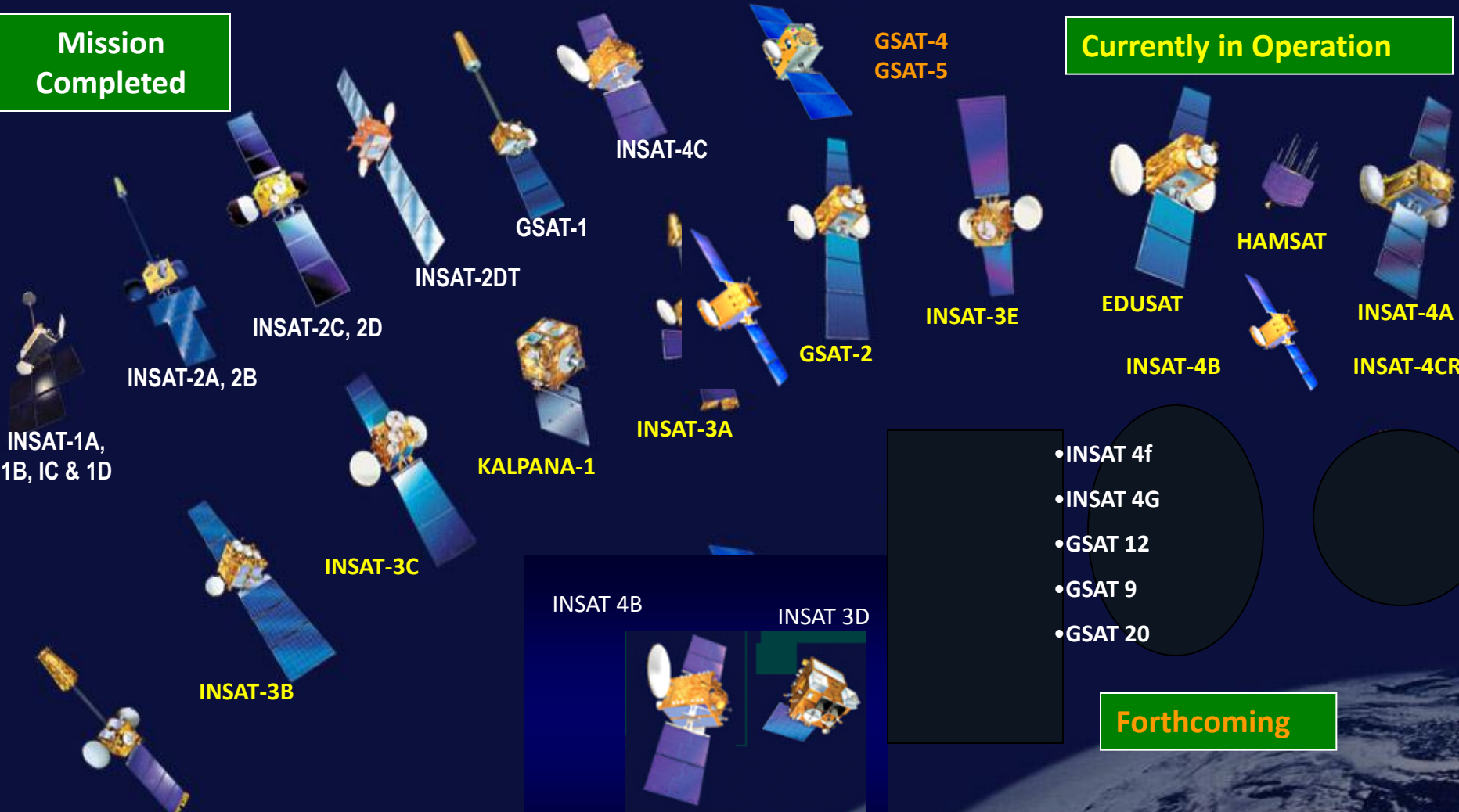


INSAT Satellites

Indian National Satellite (INSAT) System established in 1983, is a multipurpose system for telecommunications, television broadcasting and radio networking, meteorology and disaster warning.

Mission Completed

Currently in Operation



INSAT-1A, 1B, 1C & 1D

INSAT-2A, 2B

INSAT-2C, 2D

INSAT-2DT

GSAT-1

INSAT-4C

GSAT-4
GSAT-5

KALPANA-1

INSAT-3A

GSAT-2

INSAT-3E

EDUSAT

HAMSAT

INSAT-4A

INSAT-3C

INSAT-4B

INSAT-4CR

INSAT-3B

INSAT 4B

INSAT 3D

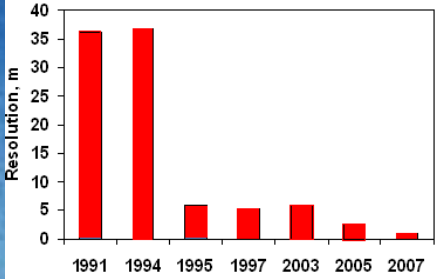
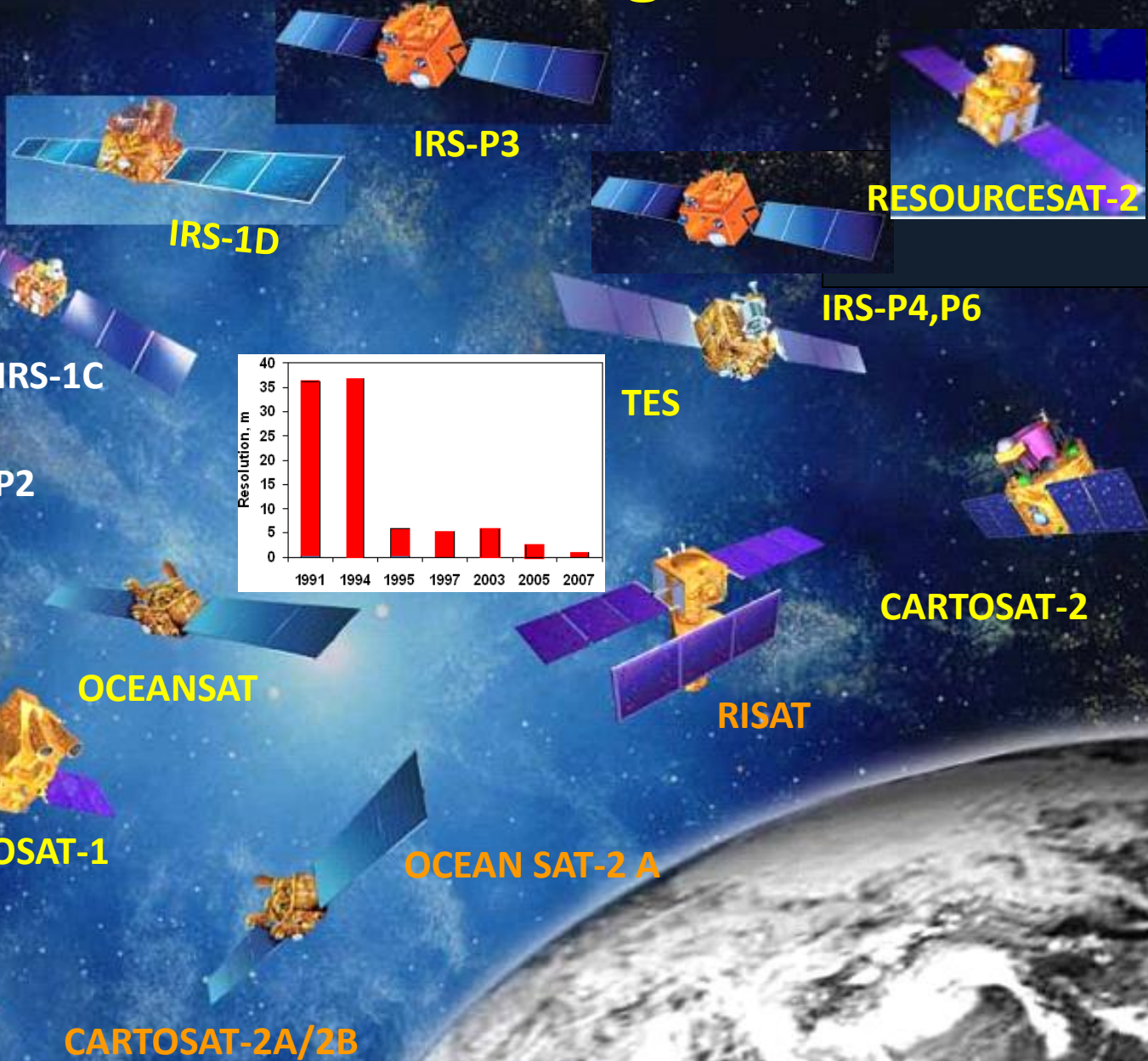
INSAT-2E

- INSAT 4f
- INSAT 4G
- GSAT 12
- GSAT 9
- GSAT 20

Forthcoming

Indian Remote Sensing Satellites

Mission Completed
























































ISRO LAUNCHERS



	PSLV	GSV	GSV MkIII
Weight (T)	294	400	629
Payload (Kgs)	1500 SSO	2300 GTO	4000 to 4500 GTO
Flights	17 (1993-2011)	7 (2001-2010)	--

Mission Profile 2007-14

MISSIONS	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
EARTH OBSERVATIONS	 TECSAR (Commercial)	CARTOSAT-2A  IMS-1 	OCEANSAT-2  RISAT-2 	CARTOSAT-2B  RESOURCESAT-2 	MEGHA-TROPIQUES  RISAT-1  INSAT-3D (P)  SARAL 	CARTOSAT-2C  ASTROSAT-1 	SCATSAT  IMS (ATMOS)  IMS-1E + IMS-1F  INSAT-3DR  RESOURCESAT-2R  CARTOSAT-2D 
SATELLITE COMMUNICATIONS & NAVIGATION	 INSAT-4CR		 ANUSAT	GSAT-4  GSAT-5P  HYLAS (P) 	GSAT-12  GSAT-8(P)  GSAT-14 	GSAT-7(P)  GSAT-9 (P)  GSAT-10 (P)  GSAT-11(P)  GSAT-6  IRNSS-1 	GSAT-10R (P)  GSAT-11S (P)  GSAT-17 (P)  GSAT-11E  IRNSS-2 
SPACE SCIENCE & ENVIRONMENT	 AGILE (Commercial)	 CHANDRAYAAN-1		YOUTHSAT  STUDSAT 		SRE-2  IMS-1B (ENVIRON) 	 CHANDRAYAAN-2 ADITYA-1 
LAUNCH VEHICLES	C8;C10 F04  PSLV GSLV	C9;C11  PSLV	C12;C14  PSLV	C15;16 D3 F06  PSLV GSLV	C17-20 D4  PSLV GSLV	C21-24 D5  PSLV GSLV MkIII	C25-30 F05,07  PSLV GSLV MkIII

INSAT System

A total of 160 transponders provide service to service to users in the Government sector, private entities and for societal missions. The services include:

- **Edusat** provides diverse educational delivery modes—one way TV broadcast, interactive TV, video conferencing and web based teaching
- **Telemedicine** provides digital connectivity between rural hospitals and the speciality hospitals in metropolitan areas to improve health care delivery. Presently 34 speciality hospitals are linked to 142 remote/rural health centres.

INSAT System

- **Television** covers 100% of the population and 100% area. 1416 digitised TV channels are working through the INSAT system
- **Telecommunication** services are provided for more than 100,000 VSAT's covering 9603 two way speech circuits.
- **Radio Networking** provides high fidelity programme channels for national and regional networking

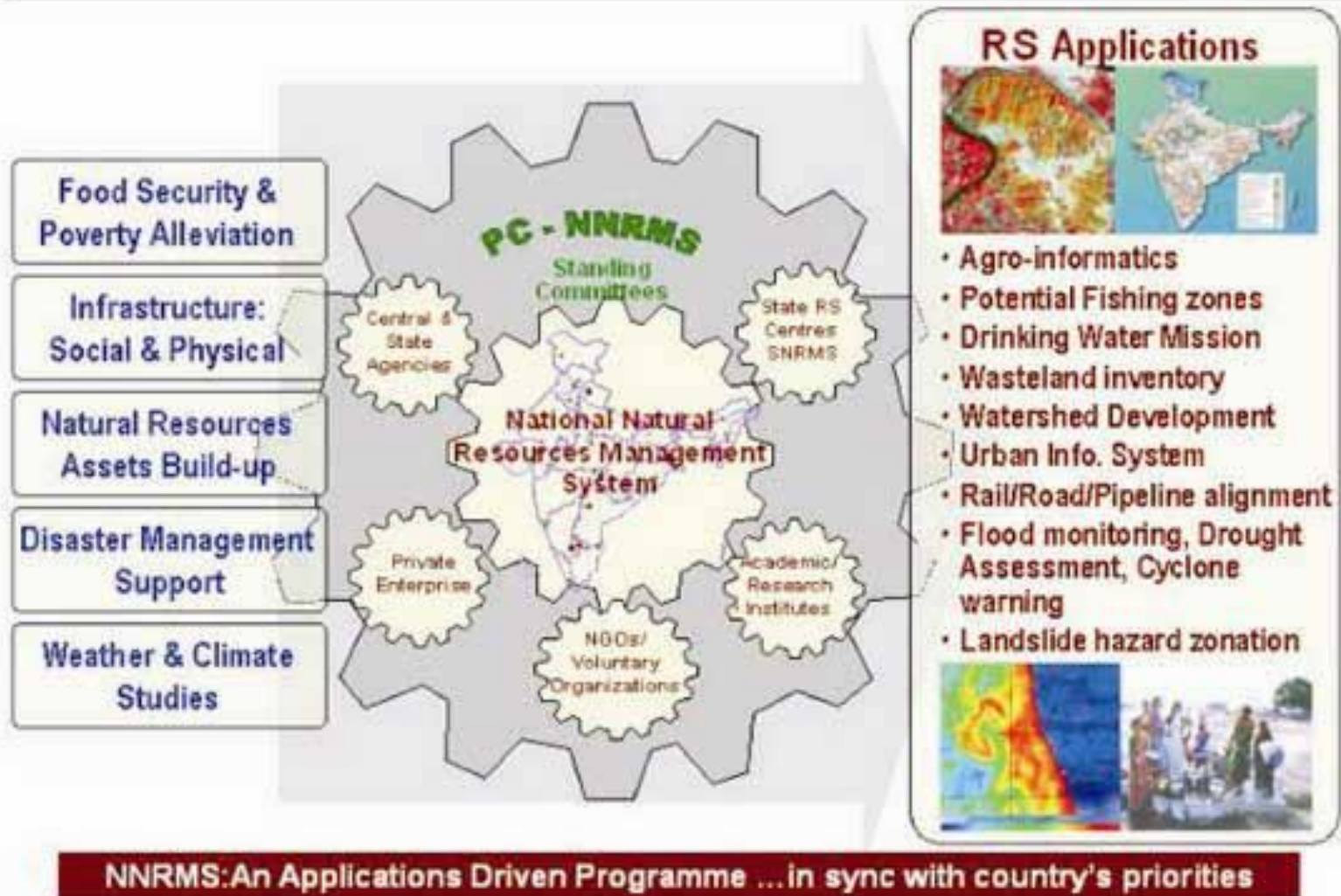
INSAT System

- **Meteorology** services provide information for weather forecast and include cloud images in the visible and IR bands, cloud motion vectors, water vapour winds etc.
- **Satellite Aided Search & Rescue** participation using two local user terminals for providing distress alert and position location through LEOSAR
- **Disaster Management Support** imaging and communication support

IRS System

- Sustainable agriculture—increased productivity and reduced environmental degradation
- Ocean colour and fishery—bio-geological character of the ocean around India
- Water security
- Environmental assessment and monitoring (biennial forest cover mapping, mangroves, coral reefs, land use)

Institutional Framework for EO utilisation



Military Space

- Space technologies are inherently dual use
- To that extent, INSAT and IRS systems do provide some limited military potential
- As of date, India has no military satellites in space

Beyond the application missions

In recent years, scientific and deep space missions, commercial launches and technology for reduced cost of access to space have figured in the space plans of the country. These include:

- ASTROSAT—space borne astronomy observatory
- SRE 2—recoverable space capsule
- Chandrayaan 2—with orbiter-lander-rover module to collect lunar sample and in-situ analysis
- ADITYA 1—Space based solar coronagraph
- RLV technologies—TSTO
- Human spaceflight

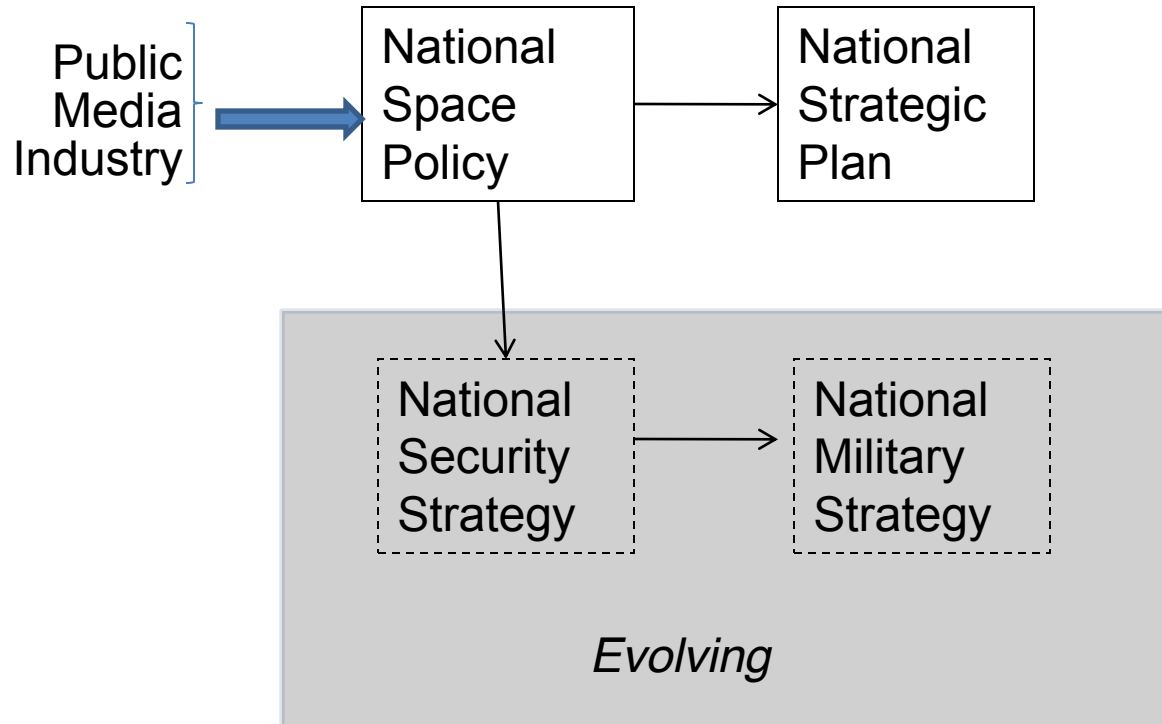
International Cooperation

- International cooperation—a strong point in the Indian space programme
- In the late 60's & early 70's TERLS operated as launch station open to UN members to fly their research payloads. Scientists from France, Japan, Russia, UK and USA used the facilities
- The Chandrayaan 1 mission of October 2008 is another example. Of the 11 payloads, 6 payloads come from international participants—3 from ESA, 1 from Bulgaria and 2 from the US
- Offers commercial launches on PSLV

International Cooperation

- Megha-Tropiques and SARAL—joint satellite missions with France
- Through ‘SHARing of Experience in Space’ (SHARES) ISRO provides training in applications of space technology
- The Centre for Space Science and Technology Education for Asia-Pacific (CSSTE-AP) set up by OOSA in India offers diploma courses in remote sensing and geographical information systems, satellite communications, satellite meteorology and global climate and space and atmospheric science
- A number of countries have ground stations for directly receiving IRS imagery
- Cooperative agreements and MOU’s with a number of space agencies

National Space Policy



India and the UN Treaties

Treaty On Principles Governing The Activities of States In The Exploration and Use Of Outer Space Including The Moon And Other Celestial Bodies (1967)	Ratified
Agreement on rescue of Astronauts and Return of objects launched into outer space (1968)	Ratified
The convention on International liability for Damage cause by Space Objects (1972)	Ratified

India and the UN Treaties

Convention on Registration of Objects launched into Outer Space (1975)	Ratified
The Agreement Governing the Activities of States on the Moon and other Celestial bodies (1979)	Signed
Active role in IADC	
India has ratified two related treaties: <ol style="list-style-type: none">1. Treaty banning nuclear weapons tests in the atmosphere, outer space and under water2. Convention on the prohibition of military or any other hostile use of environment modification techniques	

Ref: Status of international agreements relating to activities in outer space as at 1 January 2009

See http://www.oosa.unvienna.org/pdf/publications/ST_SPACE_11_Rev2_Add2E.pdf accessed on 28/03/2011

Space Law

- Indian space programme is guided by the Allocation of Business Rules for the Department of Space along with related legislations and regulations of the Government of India.
- Further policies such as Remote Sensing Data Policy, Satcom Policy, Mapping Policy etc, provide the relevant policy guidelines

Conclusion

- Indian space programme is a civilian initiative
- Major emphasis on societal and developmental aspects along with commercial interests
- No separate military space efforts or budget
- Has a good record of international cooperation. There is scope for further cooperation
- Is a member of the UN treaties relating to outer space

Thank you