

NRSC USER INTERACTION MEET - 2022

Indian scenario of Geospatial Services



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Technical Session - I

Indian Missions and Geospatial Services

Geospatial Eco-System : Policies, Guidelines & Regulations

Geospatial mapping is an integral part of almost all developmental planning activities from National level to Local level

Geospatial Guidelines 2021: Dept. of S&T

- Promote mapping industry and Indian companies to excel in global geospatial arena.
- Self-certification: No prior approval, security clearance, or license for Geospatial Data & Maps within India
- Ensure updated data on time with utmost ease and no restrictions.
- Enable more e-governance applications, citizen-centric services, promote ease-of-doing-business and enrich national repository of digital data.

National Geospatial Policy (Draft), Dept. of S&T

- Strategy for holistic development of geospatial infrastructure
- Democratize the datasets generated using public funds.

Drone Rules 2022, DGCA

- Remote Pilot Certificate required only for bigger drone or for commercial purposes.

Indian Space Policy (Draft): Dept. of Space

- Based on space sector reforms on unlocking the India's potential in space
- Towards Atmanirbhar Bharat

Geospatial Guidelines and proposed Indian Space policy will build a forward looking Geospatial ecosystem in the country and bring in new avenues for Research, innovative solutions and employment generation.

Indian Space Policy - 2022 (proposed)

Highlights of Remote Sensing

- Building & orbiting satellites
- Establishing ground station for tele-command & data reception
- Satellite data dissemination

✓ Promote Non-Governmental Indian Entities to carry out remote sensing activities within & outside India

✓ Strengthen R&D and augment RS system to address national needs

Timely & responsive regulatory mechanism for Indian entities (IN-SPACe)

✓ Adopt open data access of remote sensing satellites of DOS

✓ Enable easy access to space based remote sensing data.

Open, Liberal, Forward Looking & More Inclusive Policy to build a stakeholder friendly ecosystem

Indian Space Policy - 2022 (proposed)

Highlights of Remote Sensing Data

1. Adopting Open data access from IRS satellites of DoS:

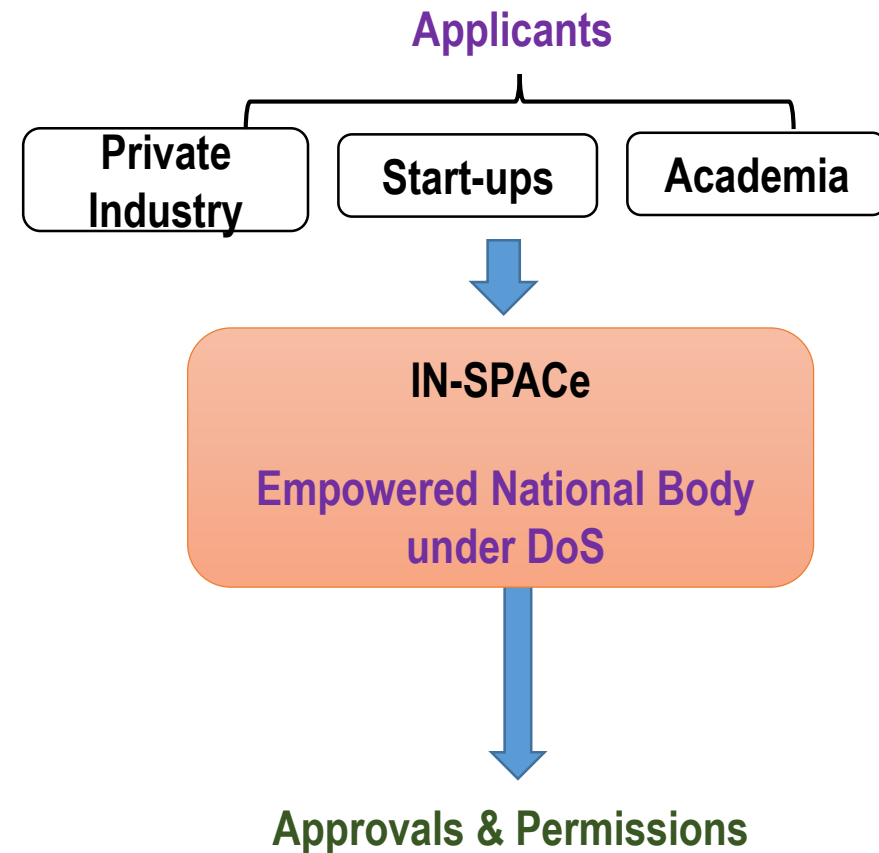
- 5 m & coarser resolution data : On 'free and open' basis to ALL. Threshold will be revisited time to time.
- Better than 5 m resolution data : Free of charge to Government and with Fair & transparent pricing to others.
- All archived satellite data & satellite derived thematic data shall be made available on 'free and open basis' on 'as is where is' condition.

2. Enabling easy access to space based remote sensing data

- Indian entity can disseminate remote sensing data of Indian territory, in India or outside, from Indian or foreign satellites.

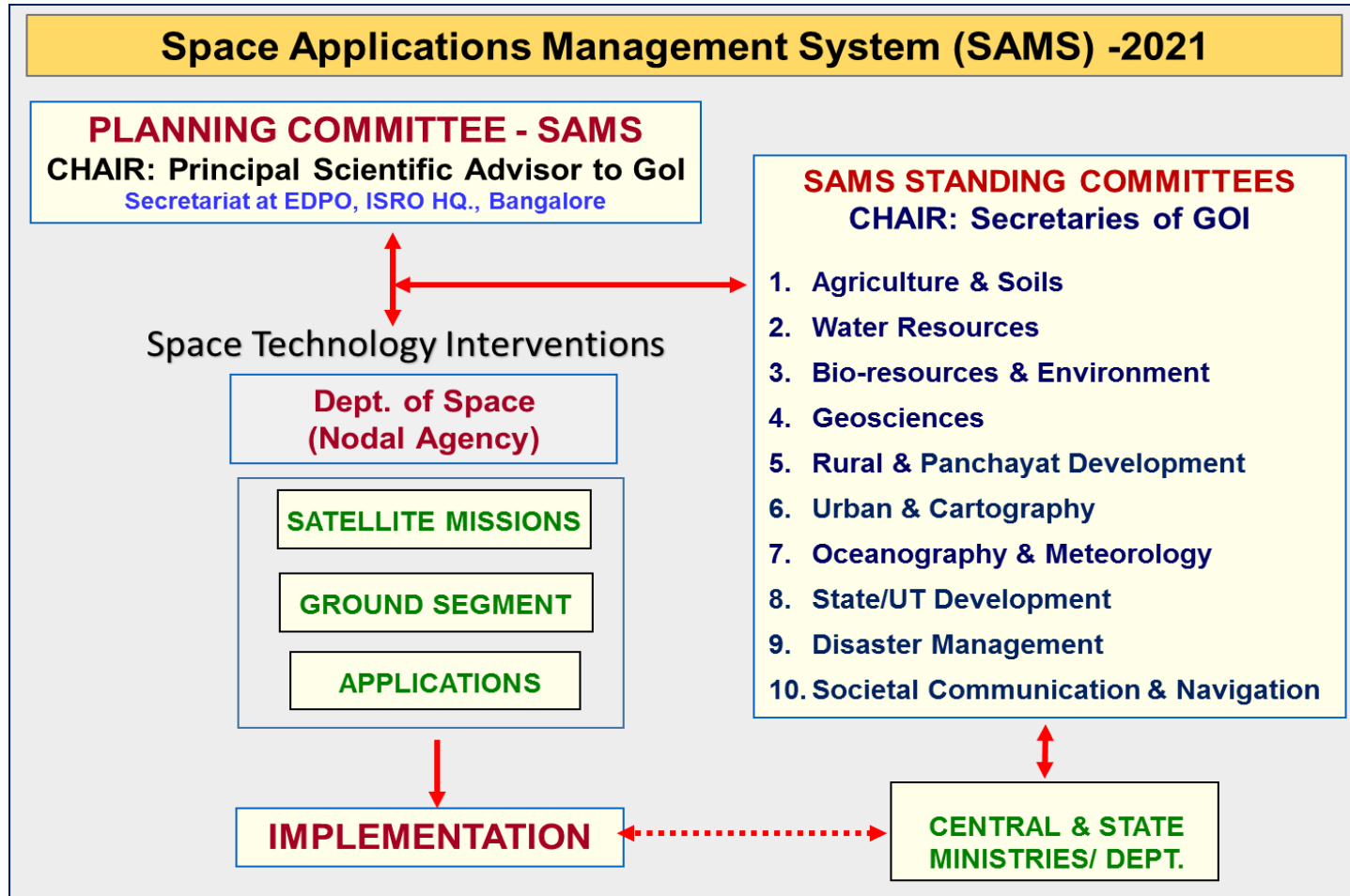
Mechanism for Private & Academia Space activities

- ❖ IN-SPACe will act as single window clearance for all Space Based Applications to Non-Governmental Indian Entities
- ❖ Allow usage of DOS owned facilities to Non-Governmental Indian Entities for realization of space based remote sensing systems.
- ❖ Sharing of DOS expertise for Space based services
- ❖ Clearance for dissemination of Remote Sensing data



Geospatial Eco-System : Institutional Linkages

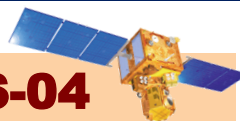
National Natural Resources Management System (NNRMS)



- User Demand Aggregation & Demand-Gap Assessment
- Realization of Satellite and associated Ground Segment
- Evolve Application programmes and Science Plans

Space Based Geospatial Data Acquisition & Generation System

RESOURCESAT- 2 & 2A, EOS-04



Natural Resources & Disaster Management

Three tier imaging : 56 m / 23 m / 5.8 m

Revisit Capability : 03 / 11 / 03 days

C-Band SAR (3-50m resolution) / 17 to 24 days repeativity

CARTOSAT-2E & CARTOSAT-3



Cartography & Large Scale Mapping

60 cm PAN & 1.5 m Multi-spectral

28 cm PAN & 1 m Multi-spectral

SARAL, OCEANSAT, SCATSAT



Ocean State Forecast ; Ocean Altimetry, Wind Vector

INSAT-3D & 3DR, MEGHA-TROPIQUES



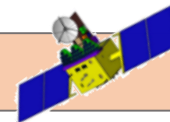
Weather Forecasting; Atm. and Climate studies

- Aerial, UAVs & Terrestrial
- Data Reception Ground Stations
- IMGEOs Data Processing



Forthcoming

EOS-6



Ocean Color, SST & Winds

OCM (13 bands: 407 to 1020 nm) : 360 m

Scatterometer-3 (Ku Band - 13.51GHz)

SSTM-1 (2 Bands: 11 & 12 μ m) : 1080 m

NISAR



L & S band SAR

3 to 10m resolution, Swath Up to 200 km

INSAT-3DS

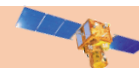


Meteorological satellite

6 channel Imager

19 channel Sounder

Resourcesat - 3 & 3A



Advanced wide coverage medium resolution

Multi-spectral satellite

5 MX Bands, 10 m resolution with swath 280 km,

20m resolution with swath 925 km

Present Capabilities for Usage of Geo-spatial Data in **Central Ministries/ Departments**

- Institutionalization of Operational Applications in 20 Ministries
- Space technology cells in stakeholder Departments
- Handholding with Ministries/ Dept. viz. DoLR for Watershed Monitoring, DoRD for Wasteland status, MoEF&CC for Snow & Wetland maps; MHA - Disaster preparedness
- Support to Government geospatial initiatives viz., NSDI, GATISHAKTI...
- Association of Geospatial Industry, Indian Space Association, Academia, CII

MINISTRY	CENTRE/ GEOSPATIAL APPLCIATION	DEPT .	GEOSPATIAL APPLCIATION
MoA&FW	• Mahalanobis National Crop Forecast Centre (Crop Production Estimation Forecasting & Agricultural Drought)	CWC	• Irrigation Infrastructure Progress & Potential utilization
MoJS	• National Water Informatics Centre	DoLR	• Integrated Watershed Development, Wasteland mapping
MoEF&CC	• Forest Survey of India (Biennial Forest Cover Mapping & Monitoring	DoRD	• GeoMGNREGA
MoES	• India Meteorology Department (INSAT Meteorological Data Processing System)	DoDWS	• National Rural Drinking Water Program; Jal Shakti Abhiyaan
MoES	• Indian National Centre for Ocean Information Services (Potential Fishing Zone Advisories)	DBT	• Biodiversity Information System
MoH&UA	• Town & Country Planning Organisation (NUIS and AMRUT)	MoPR	• Decentralized Planning
MHA	• Integrated Control Room for Emergency Response (ICR-ER)	NMPB	• Mapping of Medicinal Plants
MoM	• Geological Survey of India (Geomorphology, Mineral exploration, Landslides Hazard)	ONGC	• Hydrocarbon exploration
MoCulture	• Archaeological Survey of India / National Monument Authority (Heritage Site Management Plan & SMARAC)	CBHI	• National Health Resources Repository
MoSteel	• National Mineral Development Corporation (Iron Ore Exploration	AMUL	• Fodder acreage assessment
MoCoal	• Central Mine Planning & Design Institute (Coal Fire & Subsidence)	I&CAD	• Telangana Water Resources Information System

Present Capabilities for Generation and Usage of Geo-spatial Data in ISRO

Mobile Apps & Customized applications stakeholders



Petroleum Planning & Analysis Cell
Ministry of Petroleum & Natural Gas, Government of India
Har Kaam Desh Ke Naam

Present Capabilities for Generation & Usage of Geo-spatial Data in **States & Industry**

States:

- **Creation of Space Applications Centre in all the States under NNRMS and institutionalized.**
- **State Centers work with ISRO for execution of National projects.**
- **Some State Line departments have also internalised geospatial applications, e.g., TWRIS.**
- **Well equipped with facilities for data analysis and more than 1000 trained manpower.**

Outsourcing & Incubation



- **Two shift operations**
- **300 personal working**
- **Technical consultation / mentoring**
- **Infrastructure for outsourcing**
- **Thin Client Infrastructure**
- **Access to Application Software**
- **Access to Laboratories**

Geospatial Industries:

- **More than 100 Indian geospatial industries providing services to central/ state govt. & International projects.**
- **Industries are also major software providers & develop GIS applications.**
- **In Geospatial component of AMRUT mission of MoHUA - Consortium of 7 Pvt. industries (300 analysts deployed).**

Nature of works

- ✓ Base & GIS maps
- ✓ GIS customization & Data Conversion services
- ✓ Urban Planning ; Photogrammetry
- ✓ Drone based solutions
- ✓ Geo-intelligence ; Location Data Analytics
- ✓ Demographic data analysis
- ✓ Spatial Data Infrastructure ; Decentralization
- ✓ Navigation
- ✓ Autonomous Driving
- ✓ Blockchain & BIM

Conclusion

- **Proliferation of Geospatial Services, viz., healthcare, finance, logistics, education, advanced routing,....**
- **Indian Geospatial services will contribute significantly in global economy & provide global services.**

Indian geospatial economy is forecasted to rise to INR 63,100 crore in 2025 to INR 63,100 crore in 2025 from current (in 2021), it is valued at INR 38,972 crore. – a growth rate of 12.8%!.

Geospatial Artha by Geospatial World Analysis on Indian Geospatial Market, Economy and Industrial Development Strategy - 2021