SURVEY OF INDIA

About SoI and its Organizational Restructuring

1.   INTRODUCTION

Survey of India, a 250 years old organization, is the National Surveying and Mapping Agency under the Department of Science and Technology, Ministry of Science and Technology, Government of India. Survey of India (SOI) has played an invaluable role in the saga of India's Nation Building.

Today, digital geospatial information provides far more value than just a simple map. It is an essential national information resource with proven societal, economic and environmental value that enables government systems and services, and national development initiatives, to be integrated using 'location' as a common and underpinning reference frame.

The evolution of new geospatial ecosystem, the advancements in Geospatial and enabling Technology, the new Geospatial Policy Guidelines of Government of India, growing realization of the geospatial information across government, industry, academia, private and community sectors governments, have made it imperative for Survey of India to bring about transformational changes in itself in order to fully participate in the developmental journey of our nation.

2.   BACKGROUND OF ORGANIZATIONAL RESTRUCTURING

A meeting of Committee of Secretaries (CoS) was held on 14th January 2021 to consider the cadre review proposal of Survey of India Group A Service. It was decided, as the outcome, that the cadre review cannot be dealt with in isolation and the organizational structure has to be reviewed based on global best practices and in tune with the new policy and guidelines on geospatial data and mapping.

Accordingly a revised proposal of SoI Group A Service has been submitted with new organizational structure. The cadre restructuring proposal of Group B&C Cadres and Posts has been prepared on the lines of same organizational structure proposed in Group A proposal.

3.   CHANGING GEOSPATIAL SCENARIO

3.1.   Changing Trends in Geospatial Ecosystem

Changing nature of the map :   The traditional two-dimensional paper map has evolved. Today Geospatial information is presented in many forms and mediums including three-dimensional model of the real world. The geospatial information are further value-added with meaningful attributes from various sources and platforms to provide a digital version of our world in which all human, economic and environmental activity can be represented. NMAs all across the globe are forced to redefine their roles in this complex data landscape.

Technological Disruptions : NMAs have always experienced technical disruption to their activities. Especially, the last few decades have seen the introduction of technologies like GPS, Digital photogrammetry, Remote Sensing, LiDAR, IFSAR, CORS, Drones, ICT etc which have revolutionized the way survey and mapping is done. NMAs have continued to apply them to their business, within the constraints of limited budget and challenges associated with re-skilling their workforce. Today, Technologies like Artificial Intelligence, Machine Learning, Deep learning, Big Data analytics, Data Science are knocking at the door to redefine the rules of geospatial analytics. All these data-driven technologies need reliable foundation data from NMAs to underpin uncertain and very rich data world.

Policy Disruptions: Geospatial Policies have continuously evolved in all the countries of the world. For example the legislative interventions by European Union like the Open Data Directive, the INSPIRE Directive and the European Strategy for Data have impacted the business models of all the NMAs of European Countries. In India also, with the promulgation of recent Geospatial Policy Guidelines which have liberalized geospatial activities and democratized geospatial datasets, there is a need for SOI to redefine its Business Model and to strategically and operationally align itself accordingly.

Changing Use of Geospatial Data in Society and within Government: Today it is widely acknowledged that geospatial information and analysis are pre-requisite for proper planning, monitoring, evaluation, evidence-based policy and decision making. The increase in computer literacy in our country and advancements in Information & Communication Technologies (ICT) have generated increased awareness amongst the community heightened expectations to receive up-to-date geospatial information in a way that can be visualized and integrated anywhere, anytime and on any electronic device. Moreover, the NMAs have the challenge to work in an ecosystem, where there is digital divide amongst its user-base and where the geo-spatial standards are still evolving.

3.2. Evolving Role Of National Mapping Agencies (NMA)

Over the last 40 years, due to the changing trends in Geospatial Ecosystem, the role of NMAs have evolved in all parts of the world. Application of Geospatial Information was also recognized by Governments in many other areas as well. NMAs began to play increasingly important role in supporting the geospatial information requirements for Urban Planning, Water management, Agriculture, Infrastructure Development, Disaster Management, Environmental Protection, Forest management, Planning and land use, Address management, Statistics and demographics. The Address Management became a key role of many NMAs as it became a powerful means to link socio-economic data, most of which have a component of address/location in it.

Today in most developed economies, NMAs create and maintain a Foundation Data Framework. These foundation datasets have the ability to integrate both quantitative and qualitative information across multiple platforms and sectors to underpin an Integrated Geospatial Information System (IGIS).

Thus as a clearly discernible trend, role of NMAs have evolved over many years, from the development of topographic and cadastral maps for security and land administration purposes, to using technology to make this task more efficient and more effective, to obtaining data that is part of a national data infrastructure, and in particular a geospatial information framework.

3.3. Global Best Practices

Some of the Global best practices followed by NMAs in developed countries are as follows:

(i)   NMAs function in an open, unrestricted environment. Policy & Legal framework are put in place to enable the availability, accessibility, sharing, application and management of geospatial information.

(ii)   **Custodianship guidelines** upto attribute level, for best practice collection and management that is appropriate to cross sector and multidisciplinary collaboration, are in place.

(iii)   Conformance to standards by the NMA. In USA and Japan Public Money is prohibited for collection, acquisition, production, maintenance, distribution of data – which do not conform to standards.

(iv)   USGS has realigned the USGS Management and Budget structure, changing it from structure associated with scientific disciplines – Geography, Geology, Hydrology etc to issue-based organization in lines with their mission and strategy. After the realignment, the **Organization now focuses on 7 mission areas viz. Core Science Systems; Climate & land Use Change; Ecosystems; Energy & minerals; Environmental health; Natural Hazards; Water. NMAs like Geoscience Australia also work in mission**

(v)   NMA develop, manage, disseminate and actively promote the UTILIZATION/REUTILIZATION of geospatial data/services on a national basis. Essentially the data is OPEN & as per OPEN STANDARDS to promote use/reuse. In Japan, Basic Survey and Public Survey is carried out only by NMA. It is fully funded by government. As a general rule, the State provides the Fundamental Geospatial Data and others that it possesses through the Internet without compensation.

(vi)   In USA, Data is shared through online portal and Clearing House – which is a part of Clearing House Network of Member Agencies. Data custodians meet their data management, sharing and reuse obligations through the execution of well-defined data supply chains.

(vii)   **DIVISIONS FOR MANAGING DIGITAL INFRASTRUCTURE AND PLATFORMS, ICT SECURITY, DATA POLICY & INFORMATICS are in place in countries like US, UK, Australia. Private Players have very important role in managing such Platforms**

(viii)   National Foundation Dataset has been accorded the status of Infrastructure in US, UK, Japan, Australia & several other developed countries.

(ix)   Today this Infrastructure is being used to UNDERPIN Integrated Geospatial Information Framework.

In India, the **New Geospatial Guidelines issued by Government of India on 15th February 2021** have given clear policy guidelines for an open geospatial ecosystem for Atma-Nirbhar Bharat and provide an opportunity for SOI to adopt to re-organize and re-align its processes and systems with the best practices followed globally.

4. CHANGING ROLE OF SURVEY OF INDIA

4.1. Traditional Role and Activities

Survey of India has been carrying out different types of survey works and production of various types of maps. Traditional activities of SOI included Geodetic Surveys for accurate framework, topographical surveys for preparation of topographical maps on various scales, project surveys for various hydro-projects/ Tunnel Alignment and other need based surveys for various Central/State government organizations. All these activities were mainly directed towards establishment of horizontal and vertical control framework and publishing of topographical maps on 1:25K/1:50K and 1:250K scales. All the maps published by Survey of India are printed indigenously in Printing Directorates.

Geo-physical surveys for collection of geo-magnetic and gravity data, Tidal observations for Mean Sea Level determination, Joint survey with neighboring countries for   demarcation of International Boundary and preparation of IB Strip Maps etc. are some of the other key activities of SOI. SOI also acted as advisor to GOI on all geospatial survey matters. Before the digitization of topographic maps, these printed maps were the most popular form of dissemination of topographical information.

The National Map Policy 2005 formally vested the responsibility for producing, maintaining and disseminating the topographic map database of the whole country with SOI. These datasets include :

a) National Spatial Reference Frame,
b) National Digital Elevation Model,
c) National Topographical Template,
d) Administrative Boundaries, and
e) Toponomy (place names).

In all these activities SOI has primarily been in the role of passive Spatial Data Producer.

4.2. Survey of India in a New Role

4.2.1. New Role and New Activity Domains

Geospatial information provides the integrative platform for all digital data that has a location dimension to it. All the sectors in our country need geospatial information for national development and decision-making. Thus, in accordance with the new Mission SOI will be in mission mode to create and maintain a Foundation Data Framework and pro-actively collaborate with other stake-holders to support the development of Integrated Geospatial Information System. This will assist our country to move towards e-economies, e-service and e-commerce to

improve services to citizens, build capacity for using geospatial technology, enhance informed government decision and achievements of Sustainable Development Goals. In implementation of these frameworks SOI will strengthen its organizational structure to strengthen all the nine strategic pathways that will anchor the framework viz. Governance, Policy & Legal, Finance, Data, Standards, Innovation, Capacity Building , Collaborative Partnerships and Community Engagement, in accordance with the globally best practices endorsed by United Nations.

Also, in accordance with global best practices, SOI will make a transformational change from being a passive provider or supplier of map data, to one in which it proactively partner others as an integrated part of public administration, supporting the delivery of public services and government policy priorities, and delivering value for the wider public good while continuing the Surveying & Mapping services which it provides to the citizen of India.

In the new role, SOI will have to cater to many new activity domains like
- SDI creation and maintenance
- CORS network creation and maintenance
- Geoid Model development and maintenance
- Foundation Data Framework creation and maintenance
- Supporting the development and maintenance of Integrated Geospatial Information Framework (IGIF)
- Functioning in Cloud Environment with various models of service
- Creation and maintenance and integration of On-premises ICT Infrastructure with Cloud as per Requirement
- Providing data as a service (DAAS) and through API
- Web-portal development
- Research & development and piloting.
- Supporting domains of Capacity Development, project management, e-procurement will assume more importance than ever before.

The new organizational structure will cater for adopting the Institutional arrangements for assimilating these activities in its business process through capacity development and collaborative partnerships. To cater to the domain specific geospatial needs of new mission areas, the Missions are proposed viz. Water Resources Management, Flood Management, Mineral Resource Management, Disaster Mitigation, Coastal Zone Management, Urban and Rural Mapping, Transport Infrastructure and North East Infrastructure Development.

This will immediately make SOI more relevant to our countrymen. It would make it much easier for those outside SOI to navigate through our organizational structure to find where within SOI they would find solution to their problems. It would also open up new and exciting areas of collaboration/cooperation/co-ordination with other Government Agencies and industry in activities focused towards the higher Government Initiatives.

4.2.2. <u>Role as a Facilitator:</u>

Most of the developed countries like USA, Canada, UK, France, and Australia etc. had already liberalized the geospatial sector many decades ago. A number of private companies are preparing geospatial data in those countries. However, all those countries have National Mapping Agencies with important roles. All the sectors in our country need geospatial information for national development and decision-making. There is a growing and recognized consensus that Geospatial Information is a critical component of a national infrastructure and knowledge economy that provides a nation's blueprint of what happens where, and the means to integrate a wide variety of government services that contribute to economic growth, sustainable social development, environmental sustainability and national prosperity.

The Government of India issued new Geospatial Guidelines on 15th February 2021, which deregulates existing protocol and liberalizes the sector to a more competitive field. Now, the deregulation eliminates the requirement of permissions as well as scrutiny, even for security concerns. Indian companies now can self-attest, conforming to government guidelines without actually having to be monitored by a government agency.

In this new liberalized geospatial environment, different government and private agencies will be free to generate geospatial data as per their requirements, either themselves or through outsourcing. However, very few agencies have the required technological knowhow to generate the data or control the quality of data generated through outsourcing. Survey of India will have to work as a facilitator for generation of data for such agencies.

Moreover, the country should essentially maintain a foundation geospatial dataset as an aid to various central and state government agencies for planning, fast decision making and quick implementation of various government schemes. Further, it is far easier to add domain specific geospatial data to the foundation data. The foundation dataset has been given the status of infrastructure in many developed countries. SoI has to play lead role in generation of geospatial foundation dataset.

In addition, SoI has to play major role in capacity building, supporting government programmes and to contribute in development of Integrated Geospatial Information Framework (IGIF).

SoI is expected to act as a facilitator for geospatial mapping in the country. As a facilitator, the SoI will have to play the following role:

i)   Facilitator for the evolution of the geospatial ecosystem in the country. Facilitator in Geospatial enablement of various sectors.
ii) Facilitator in providing geospatial information for various government programmes.
iii) Facilitator in generation, management, use and reuse of the standard based quality geospatial data. SoI will facilitate the availability of foundation data and entail the data curing, data QA/QC, Supervision, data handling etc.
iv) Facilitator between demand side mainly government agencies and supply side i.e. industry.
v)   Facilitator in implementing the new geospatial guidelines objectives.

vi) Facilitator in IGIF implementation viz Data Management, Promoting the use of standards, to act as facilitator for development/evolution and enforcement of national standards.

vii) Consultancy and advisory role in geospatial domain.

4.2.3. Changes in Functioning:

In the role of facilitator, the functioning of SoI will change:

i) For the data acquisition and processing for generating foundation dataset and also for domain specific data, the following sources may be used:

a. Data acquisition and processing by SoI personnel in various GDCs.

b. Data acquisition and processing through outsourcing by various GDCs of SoI.

c. Data acquired from other government and private agencies.

All the data collected by various GDCs and through other agencies will have to be integrated to generate a National Foundation Dataset. Before data integration, SoI will require to perform quality check of data of outside sources. Thereafter, the data curing will be required and finally the data integration will be done. Considering the size of the country, even the quality check, data curing and data integration in itself will be a huge task.

ii) Execution of the Geospatial activities at field office level will change significantly to ensure the outsourced work completion as per contractual obligations and Service Level Agreements (SLAs).

iii) Director level officer in SoI having Area of Responsibility of state will have to bear the responsibility to ensure the Foundation Dataset creation, updation availability, accessibility etc. and acting as facilitator for meeting user demands in the state. He will have to ensure that the contracts are given in time and as per the required standards so that the targets are achieved.

iv) With change in SoI primary role from Executor to Facilitator will have significant changes in the working of SoI cadre at Group 'B' and 'C' levels. They will have to carry out the quality check/quality control and supervision of the outsourced work.

5. SCOPE OF WORK

In the changed role the Survey of India will facilitate the generation of geospatial data and contribute in establishment of IGIF. It will also play important role in capacity building. The scope of work is broadly discussed below:

5.1. Generation of Foundation Geospatial Dataset

Survey of India will continue to generate the foundation geospatial dataset including but not limited to the following major datasets with coordination with govt. agencies and widespread outsourcing involving industry:

i) **National Spatial Reference Frame (NSRF):** The NSRF is the Horizontal and Vertical Datum realized through and using ground control points, Bench Marks, CORS, Geoid Model, Gravity points, tidal data etc. Accuracy of all surveys depends on the NSRF. The realization and maintenance of NSRF is the prime responsibility of SoI.

ii) **Digital Elevation Model:** Digital elevation models including terrestrial elevation, bathymetry and shoreline.

iii) **National Topographic Template:** This includes all the geospatial data and maps in various scales/resolutions. To generate the topographic data, extensive outsourcing will be done. The data will also be acquired from other agencies wherever available to avoid duplication of tasks.

iv) **Administrative Boundaries:** The new geospatial guidelines provide that SoI published maps or digital boundary data are the standards to be used. Therefore, Survey of India will continue to Survey/Demarcate the boundaries, Relocate the missing pillars, Prepare of IB Strip Maps, depict the correct external boundaries of India on maps and advice on IB matters to MEA. Similar tasks for Inter-state boundaries and other administrative boundaries will be carried out.

v) **Toponomy (Place Names):** Survey of India as the NMA has this important role in providing the standardized and duly verified geographical names. It cannot be left open for various agencies to give different names to places or spell them differently.

vi) **Addresses:** The geo-tagged addresses will also form the part of foundation dataset.

vii) **Ortho-imagery:** Geo-referenced image data of the Earth's surface, from satellite or airborne sensors will also form part of foundation dataset.

5.2. Capability/Skill Development

In the coming years, as a result of liberalization of geospatial data, the government and private sector will need huge number of trained manpower. Survey of India will have an important contribution in skill development through the training institute National Institute for Geoinformatics Science & Technology (NIGST).

5.3. Supporting Geospatial Needs of Government Programs/schemes

SOI will have to make a transformational change from being a passive provider or supplier of map data, to one in which it proactively partners with other agencies for supporting the geospatial needs for government policy priorities, and delivering value for the wider public good while continuing the Surveying & Mapping services which it provides to the citizen of India.

SoI will be a facilitator in providing geospatial support for the flagship Government programmes like Digital India, Smart Cities, Namami Gange, SVAMITVA scheme, Urban Planning , Disaster

Management, Flood Plain Management (NHP Project), Integrated Coastal Zone Management, Swatchh Bharat, Skill India, Start-up India etc.

5.4. Major Contributor in the Integrated Geospatial Information Framework (IGIF)

In implementation of Integrated Geospatial Information Framework (IGIF), SOI will transform its organizational structure to adopt all the nine strategic pathways that will anchor the framework viz. Governance, Policy & Legal, Finance, Data, Standards, Innovation, Capacity Building, Collaborative Partnerships and Community Engagement, in accordance with the globally best practices endorsed by United Nations.

6. NEW MODEL OF SURVEY OF INDIA- ORGANIZATIONAL SET UP

6.1. Adaption of SoI to Rapid Technological Advancement and Changes

The technological and policy changes pose a great responsibility on SOI, as the premier National mapping Agency, to change , adapt, collaborate, put forward collective efforts, resources and capabilities with industry and other government agencies to increase the Geospatial Readiness of our country for unlocking the power of Geospatial Information for contributing to nation building .

Following steps are being taken to adapt to technological and policy changes which have given opportunities for adoption of new business and operational strategy:

A)   STRATEGIC ALIGNMENT

i)   The Missions of SOI have been Harmonized to support Initiatives of Higher Government **:** This will enable long-term engagement with other government agencies and improve the delivery of government priorities. SAG level Offices will be dedicated to pro-actively support the flagship Government programmes like Digital India, Smart Cities, Namami Gange , Swamitva Yojna, Urban Planning , Disaster Management, Flood Plain Management (NHP Project), Integrated Coastal Zone Management, Swatchh Bharat, Skill India, Start-up India etc.

ii)   Transform from a passive supplier of Data/Services to proactively partner with others as Integrated Part of Public Administration:

   a. SOI will create and maintain Foundation Data Framework Infrastructure for the country and make it openly available to all citizens of our country, that would be appropriate to ensure integration of cross-sectoral and multidisciplinary data for a reliable decision support system.

   b.   SOI will create and maintain infrastructure for Real Time Positioning (CORS Network) and make it available to various stakeholders for tremendous benefits to all sectors

   c. SOI will create and maintain Geoid Model and make it available to various stakeholders for tremendous benefits to all sectors

iii)   SOI will put in place an ICT Policy and Digital Data Policy to tap Market Potential & Link it to Business Strategy. SOI will partner with other government organizations and industry to

meet the current gaps in ICT skills for managing the ICT Infrastructure and utilization of various Cloud Services offered by Government of India and those available in the market – in pursuance of its mission.

iv) SOI will Collaborate/Co-operate/Co-ordinate proactively with various Public Organizations with shared vision and stakes, opening new avenues while closing some existing ones. SOI will Collaborate proactively with Industry to tap their strengths for Operational Alignment of our Systems & Processes to meet our Business Goals.

v) Become a Key Member of the Integrated Information Framework & Provide Foundation Spatial Dataset to underpin the IGIF

B)   OPERATIONAL ALIGNMENT

i) In the new structure, an ICT Division headed by SAG level officer has been proposed for modernization of supportive ICT Infrastructure and its continual maintenance. Collaborative partnerships with industry and government agencies will meet the current gaps in ICT capabilities and strengthening of Organizational capacity and would be critical for geospatial information activities to flourish and adapt to a rapidly changing landscape. The recent Geospatial Guidelines give an opportunity to use various models of Cloud Services like Infrastructure as a Service (IAAS)/Platform AAS/ Software AAS / Storage AAS/High Performance Computing AAS etc . The scalability offered for dynamic workloads, ease in manageability and maintainability, desktop virtualization options, policy based services including tiered storage, pay as you use models, will bring in reduction in capital and operational expenditure, efficiency and cost-effectiveness in business processes. This will enable SOI to focus on its core competence area (Geospatial) while minimizing involvement in core/routine ICT tasks. Migrating to cloud environment will also be key for development/maintenance of Foundation Data framework and supporting Integrated Geospatial Information Framework.

ii) Restructuring of National Institute for Geo-Informatics Science and Technology (NIGST) is under process with active collaboration with academia and industry. Apart from SOI officers, members   from IIT Kanpur and IIIT, Hyderabad and Association of Geospatial Industries are part of Board of Studies and Board of Governors of NIGST. It is proposed to continue heading of NIGST by SAG level officer. Apart from capacity development of SOI officers/staff, it will play pro-active role in demand-driven approach to build "transformational geospatial capacities" in other government organizations and in developing the geospatial skills of private individuals. NIGST will support the Skill India initiatives of GOI – which are aimed at training students for various roles in Geospatial Sector.

Education and Research go together in all renowned Institutions in India as well as abroad. In line with above best practice, a Research and Development Directorate is proposed to be opened under NIGST, to give boost to innovations, start-up and entrepreneurial initiatives in the Geospatial Sector. The Research and Development Directorate shall work in relevant research areas for continual identification and understanding of potential technology

options having direct uses in core mandated activities, improvement of processes and incubation of right technology.

6.2. <u>Working in Mission Mode</u>

To cater to the geospatial needs of the nation as discussed in previous paragraphs, Survey of India will work in Mission mode. The existing Zonal Offices will become the Mission Divisions. Each of the Mission Division will have following Missions:

A. Foundation Data Infrastructure:
   i)   National Spatial Reference Frame
   ii)   National Digital Elevation Model
   iii)   National Topographic Template
   iv)   Administrative Boundaries
   v)   Toponomy
   vi)   Geo-tagged Address

B. Domain Specific Mission Areas (one or two domains in each Division)
   i)   Water Resources Management
   ii)   Flood Management
   iii)   Mineral Resource Management
   iv)   Disaster Mitigation Data
   v)   Coastal Zone Management
   vi)   Urban and Rural Mapping
   vii)   Transport Infrastructure
   viii) North East Infrastructure Development

These Missions will be assigned to the present Zonal Level offices. Each Mission Division will act as Nodal Office for one or two Mission Areas. For data generation for any particular mission area, all the offices will follow the procedures prescribed by the respective nodal office/mission office. Objective of each mission will be to create and maintain mission specific Geospatial Data Infrastructure, to pro-actively support the geospatial requirements of schemes and programmes of Government and Local Bodies by partnering with government and private sector.

6.3. <u>Roles of Various Offices:</u>

The roles of various SoI offices are described below:

Sl. No.	Offices/ Mission / Divisions	Offices under Missions / Divisions	Main Roles
A	**Administrative Layer**		
i)	SGI Chairman of Board	Board	The organization headed by SGI will have a Board at Headquarters with SGI as chairman and two HAG level officers (Senior Addl SG) as Members. The board will decide the annual action plan for all the Missions.

ii)	Member-1 (HAG level) Senior Addl SG (Infrastructure)	i) Adm Division, ii) Geospatial Services and ICT Infrastructure Division, iii) NIGST	HAG officer will look after Infrastructure i.e. Geospatial Services, ICT Infrastructure, Adm & HR matters and Capacity Building (NIGST).
iii)	Member-2 (HAG level) Senior Addl SG (Production and Consultancy)	i) Planning, Policy Coordination and Technical Support Division ii) Data Integration & Management Divison iii) Boundary Division	HAG officer will look after the Production and Consultancy i.e. Technical matters, Data integration and Management and Boundaries.
B	**Management Layer**		
i)	**Administration Division**	Administration	General administration, Capital Works etc, administrative approvals etc.
		Finance	Financial matters, budget allocation, expenditure monitoring
		Legal	Court cases, legal matters
		HR / Personnel	Recruitment, Service matters, promotions, postings/ transfers, recruitment rules etc.
ii)	**Planning, Policy, Coordination and Technical Support Division**	Technical / Planning & Policy, Coordination	Coordination in facilitating the implementation of Govt. policies on geospatial domain, ICT and Digital Data Policy, departmental policies, matters pertaining to Products & Services. Coordination and support in planning of technical tasks undertaken by SoI. Coordination among GDCs/Directorates of different Missions.
		GISTC	This technical cell of HQ will take up testing of new software for their suitability and usefulness in SoI work. It also works as quick response team for decision support in issues requiring processing and interpretation of geospatial data.
iii)		Vigilance	Vigilance administration, Disciplinary matters
iv)	**Data Integration and Management Division**	i) G&RB	Establishment and Maintenance of the National Spatial Reference Frame consisting of Ground Control Points, Levelling Bench Marks of Zero Order (most accurate control) and 'First Order accuracy' on which accuracy of all subsequent surveys depends, Tidal observatory network, CORS network, gravity network and geomagnetic points network. Development and updation of Geoid Model. Monitoring Tectonic plate movements and developing crustal deformation model, Preparation and updation of National standards for GNSS Control Survey.

		ii) NGDC iii) GIS&RS	Scrutiny, Integration and Management of foundation dataset of entire country as generated by State GDCs. Integration of Domain specific data from Missions. The huge amount of data has to be stored, so there has to be a Data Centre (DC). As per standard practice, there should be a Disaster Recovery (DR) centre at another part of the country so that the data remains safe even if main DC is affected by some disaster. NGDC will act as Data Centre (DC) for GDCs of Northern part of India and will also act as Disaster Recovery (DR) for the GDCs of Southern part of India. Similarly GIS&RS will be DC for GDCs of Southern part of India and DR for GDCs of Northern Part of India.
v)	**Geospatial Services and ICT Infrastructure Division**	i) Web Geospatial Service Centre	Provide geospatial data generated by SoI to users through web geospatial services, G2G/G2C web portals, mobile apps, APIs etc. as per the new guidelines. Liaison with Central/State Government departments/agencies for exchange of location based services. Geospatial web services (GWS) include like Web Map Service (WMP), Web Coverage Service (WCS), Web Feature Service (WFS), Web Processing Service (WPS).
		ii) ICT Infrastructure Support Centre	Maintain and regularly update/upgrade the ICT infrastructure and associated software required for web services, ICT infrastructure support to all the offices of SoI.
		iii) MA&DC	Archival and Dissemination of Maps and Geospatial Data of SoI. Work related to maintenance of Survey of India Estate at Dehradun.
vi)	**Boundary Division**		Demarcation of International Boundary as mandated by MEA. Preparation of Boundary strip maps, coordination of the boundary survey works carried out by concerned GDCs. Boundary division will act as a Nodal office for all the correspondence between SOI/ its offices with MEA. Demarcation of Inter State Boundaries. Integration of all boundary data pertaining to Inter-State Boundary, District Boundary and all Administrative Boundaries upto Village Level. Coordinating the work of GDCs on administrative boundaries related issues.
vii)	**NIGST**	Faculties	Impart training and conduct courses in respective specialized subjects, Collaboration with various agencies & academic/research institutions.
		R&D Directorate	Research & Development in the geospatial field, Collaboration with various agencies &

			academic/research institutions, Development of Standard Operating Procedure & Standards for various Surveying & Mapping Activities, Analyzing the latest technology & technology disruption & their utility and incorporation in the work flow of SoI.
C	**Resource Layer**		
i)	**Urban Mapping Mission** (Erstwhile Western Zone)	i) Rajasthan GDC ii) G D&D GDC	Facilitating the generation of Foundation Dataset of Concerned States. Meeting the mapping demand of state & central agencies, supporting the other Missions of SOI. Generation of high resolution geospatial database of urban areas, preparation of digital 3D models of the urban areas wherever required to support the government programmes.
ii)	**Flood and Water Resources management Mission** (Erstwhile Northern Zone)	i) J&K and L GDC ii) PH & C GDC iii) HP GDC iv) Uk & WUP GDC v) East UP GDC vi) SA&D GDC vii) Western Printing Gp.	Facilitating the generation of Foundation Dataset of Concerned States. Meeting the mapping demand of state & central agencies, supporting the other Missions of SOI. To facilitate the generation and maintenance of high resolution topographic database, generate high resolution DEM and drainage pattern for the flood prone areas as per the Section 6(2)(b) and Section 11 of the DMA 2005 and National Disaster Management Plan (NDMP), 2016 issued by the National Disaster Management Authority (NDMA) wherein SoI has responsibility for mapping for Flood and Urban Flooding. Support the government programme for revival of springs in Himalayan region by facilitating the mapping of the springs and their recharge zone.
iii)	**Disaster Mitigation & Mineral Resources Mission** (Erstwhile Eastern Zone)	i) Bihar GDC ii) Jharkhand GDC iii) WB & Sikkim GDC iv) Orissa GDC v) Eastern Printing Gp.	Facilitating the generation of Foundation Dataset of Concerned States. Meeting the mapping demand of state & central agencies, supporting the other Missions of SOI. To facilitate the generation and maintenance of high resolution topographic database, DEM and drainage pattern for the Cyclone prone areas, make available the topographic data to the Disaster Management Authorities through various means including web portals and services.
iv)	**Coastal Zone Management Mission**	i) AP & T GDC ii) Karnataka GDC iii) Kerala & L GDC iv) TN, P & ANI GDC	Facilitating the generation of Foundation Dataset of Concerned States. Meeting the mapping demand of state & central agencies, supporting the other

	(Erstwhile Southern Zone)	v) Southern Printing Gp.	Missions of SOI. Generate and maintain high resolution topographic database of areas along the Indian Coastline, generate High Resolution DEM of coastal areas, demarcate the Hazard line along Indian coasts as per the notification of MoEF&CC. Provide to the users, the coastal geospatial data as products and services including web services (through Web Geospatial Service Centre).
v)	**Transportation Infrastructure & Forest Mission** (Erstwhile Central Zone)	i) MP GDC ii) Chhatisgarh GDC iii) Mah & Goa GDC	Facilitating the generation of Foundation Dataset of Concerned States. Meeting the mapping demand of state & central agencies, supporting the other Missions of SOI. Preparation of high resolution topographic database and 3D model for management of assets for Railways, highways, airports etc. To provide geospatial data to concerned authorities through various means including web portals and services.
vi)	**North East Infrastructure Development Mission** (Erstwhile NE Zone)	i) M & Ar P GDC ii) A & N GDC iii) T M Mz GDC	Facilitating the generation of Foundation Dataset of Concerned States. Meeting the mapping demand of state & central agencies, supporting the other Missions of SOI. Facilitate the generation of high resolution topographic database and geospatial data required for various schemes/programmes of central /state government on development of North eastern States.

The Existing Organizational Structure is shown in **Annexure-II** and Proposed Organizational Structure is shown in **Annexure-III**.