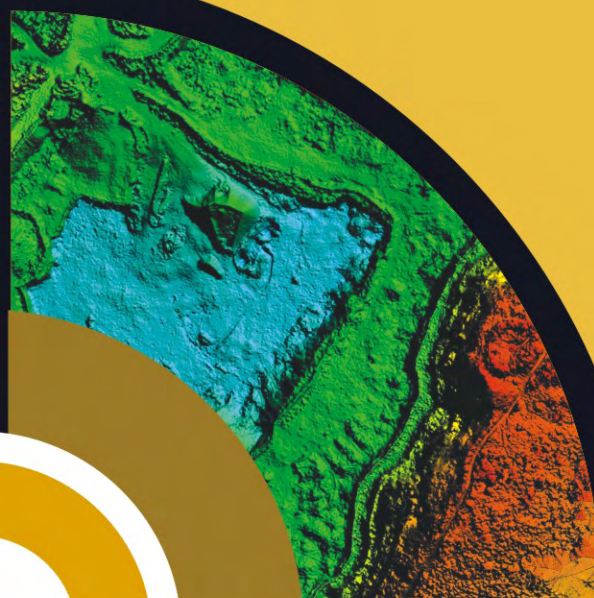




भारतीय सर्वेक्षण विभाग SURVEY OF INDIA



वार्षिक रिपोर्ट
ANNUAL REPORT
2018 - 2019



विज्ञान एवं प्रौद्योगिकी विभाग
(DEPARTMENT OF SCIENCE & TECHNOLOGY)

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भारत के महासर्वेक्षक के आदेश से प्रकाशित
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संरक्षक

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FOREWORD

Survey of India is the oldest scientific department of the Govt. of India established in 1767. Survey of India has to pioneer un-trodden lands for others to follow and build upon. They have to go to the deepest forests, deserts and the highest snowy mountains; in fact they are the first to reach virgin and uninhabited areas. There they ceaselessly, faithfully and unobtrusively toil to produce the maps so essential for development, defense and administration. Topographical maps have played an invaluable role in the saga of India's nation building and were pivotal in the foundation of almost all major development activities of the modern India.

The topography of the Indian subcontinent varies from the snow-covered Himalayan peaks of the world's highest mountains to the rich and fertile plains of the Ganges, with large undulating areas, thick jungles, deserts, mighty rivers, swamps and a long coastline. The area of independent India (3.8 million sq. kilometers) is largely inhabited by the descendants of migrants from across the Himalaya and, today, it consists of a mixture of various races, cultures, languages and religions.

The early history of surveys in India followed the East India Company's expanding areas of influence and conquest. Fortunately, this quest to explore, expand and conquest more and more areas in India lead to the establishment of a regular government survey organization, one of the earliest country in the world to do so and commence systematic and scientific surveys.

Forerunners of army of the East India Company and Surveyors had an onerous task of exploring the unknown. Bit by bit the tapestry of India terrain was completed y the painstaking efforts of a distinguished line o Surveyors such as Col Lambton and Sir George Everest. Foundation for the scientific survey and mapping of the country was laid with The Great Trigonometric Survey (GTS) in 19th century, by these noted surveyors.

After Independence, there was an upsurge of development all over the country which has continued till today. With planning for economic development, hundreds of schemes required survey data for scientific planning and execution. The survey of India had to divert most of its potential for developmental projects, the normal topographical surveys being relegated to a secondary place.

Apart from geodetic, topographical, SOI caters for the survey needs of all developmental projects in the country. Numerous developmental surveying & mapping tasks for small/Medium/Large projects as detailed under were carried out by the SOI for various Central/State Government agencies, Central/State PSUs and other organizations.



The Department has met the challenges of surveying the indomitable Himalaya, blazing deserts and disease and animal infested jungles. The Department is continuously striving to keep abreast of modern technology and has successfully entered the era of Digital Mapping and Geographic Information Systems.

Presently, Survey of India is organized into 08 zones, 23 Geo-spatial Data Centers/Regional directorates, 06 specialized directorates and 01 Training directorate covering 29 States and 09 UTs. The manpower resource consists of total + 5500 personnel. Each Zone office has several regional directorates under it, each regional directorate is responsible to cater for all topographical and developmental surveying & mapping requirements of that State or group of small States.

The Specialized Directorates are the Geodetic and Research Branch, International Boundary Directorate, GIS & Remote Sensing Directorate, National Geo-spatial data centre, Digital Mapping Centre and Map Archival & Dissemination Center.

The Training directorate i.e. Indian Institute of surveying and mapping (IISM) runs Basic, Refresher, Specialized and Advanced courses in Photogrammetry, Geodesy, Cartography and GIS domains.

National Map policy (NMP) 2005 has mandated SOI to prepare National Topographic database (NTDB) and provide Dual series Maps viz DSM (Defence series Maps) to cater the need of defense forces and OSM (Open Series Maps) for all other users.

I appreciate the efforts put in by Sh. Pankaj Mishra, Deputy Surveyor General (Tech.), Sh. Pardeep Singh, Technical Secretary, and Sh. Vinaik Bist, Survey Assistant for preparing "ANNUAL REPORT 2018-19" which gives a bird eye view of the achievements of the department during 2018-19.

Lt General Girish Kumar, VSM
Surveyor General of India



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INTRODUCTION:

Survey of India, under the Department of Science & Technology, Govt. of India, has been engaged in production and maintenance of various types of Topographical, Geographical and many other public series maps on various scales covering India, for the defence and development of the nation. Besides, being grouped under 'Scientific Surveys' the Govt. of India business rule, it has also been called upon extensively to deploy its expertise in the field of geodetic and geophysical surveys, study of seismocity and seismotectonics, environmental and disaster management, participation in Indian scientific expeditions to Antarctica, glaciology programmes and other projects related to digital cartography and digital photogrammetry etc. to provide basic data for Science & Technology requirements.

1. CHARTER OF DUTIES:

National Map Policy (NMP) – 2005 mandates Survey of India (SoI) to provide, maintain and allow access and make available the NTDB (National Topographical Data Base). NTDB comprises the following data sets:

A. National Spatial Reference Frame:

- i. Continuously Operating Reference Stations (CORS) network.
- ii. National Ground Control points (GCPs) Library: At 25-30 kms across country.
- iii. Precision Bench marks (BMs): At 35-40 kms across country.
- iv. Geodetic Surveys for precision controls (Horizontal & Vertical)
- v. Collection of tidal data along the coast line and islands and publication of Annual Tide Tables giving prediction of Tides one year in advance for 44 ports (30 Indian ports and 14 foreign ports) in the Indian Ocean, Arabian Sea and the Bay of Bengal including ports in Myanmar, Iran, Sri Lanka and Sultanate of Oman in the interest of good Neighborly relations.
- vi. Geo- physical or Gravity surveys across country.
- vii. Geo- magnetic surveys across country.

B. National Digital Elevation Model (DEM):

- i. National DEM of ± 10 metre accuracy of the country is available for use
- ii. High Resolution DEM of $\pm 3 - 5$ metre accuracy covering areas mapped under various projects.
- iii. Ultra high Resolution DEM of ± 50 cm accuracy covering areas mapped under various projects in the country.

C. National Topographical Template:

- i. Preparation of Topographic maps on all scales.
- ii. Compilation/ mapping and production of geographical maps e. g. Railway Map, Road Map, Political Map, Physical Map etc.
- iii. Surveys for development projects, e.g., power and irrigation, mineral exploration, urban and rural development etc.
- iv. Preparation/Updation of Aeronautical charts including special purpose surveys for Airports /Air fields of AAI/ Navy/ Coast guard.



- v. Preparation of Maps for Indian Air Force on 1:0.5/1/2/10 Million scales and Flip-Book Part-II.
- vi. Disaster mitigation maps & high resolution data for NDMA (NDMA plans- 2016 as per DMACT-2005).
- vii. Mapping of river topology.
- viii. High resolution or large scale GIS datasets.

D. Administrative Boundaries:

- i. International Boundary (IB) Survey/Demarcation/Relocation, Preparation of IB Strip Maps, Depiction of correct external boundaries of India on maps, Scrutiny and Certification of correct external boundaries /Coastlines of India on maps published by other agencies including Private publishers, advice on IB matters to MEA.
- ii. Inter-State Boundary (ISB) Survey/Demarcation/Relocation, Preparation of ISB Strip Maps
- iv. Advice on ISB matters to MHA/Hon'ble Supreme Court/High Court/Other Courts.
- iv. Preparation of Administrative boundaries data up to village level.
- v. Demarcation of Hazard line along the Indian coasts as per (Coastal Regulation Zone Notification dated 02 July, 2018, MoEF&CC)

E. Toponymy (Place names):

SoI is responsible to provide Standardized Geographical names i.e New or change of place including names Railway station names to MHA, Govt. of India. These names are field verified to ensure correct linguistic phonetics in spellings followed with transliteration as per Govt. approved system.

Other Important Activities:

- SoI is responsible to promote the use of Geospatial knowledge and intelligence through partnerships and other mechanism by all sections of the society and work towards a knowledge based society.
- Allowing access of data through Geospatial Services, Portals, Mobile Apps etc. apart from printed / digital maps.
- Training of officers and staff of SoI, Central / State Govt.
- Support to Third World countries e.g., Nigeria, Afghanistan, Kenya, Iraq, Nepal, Sri Lanka, Zimbabwe, Indonesia, Bhutan, Myanmar and Mauritius etc. by providing technical know how and expertise in various disciplines of surveying and survey education.

Besides above activities, the Surveyor General of India is associated with the under mentioned Expert Groups/ Committees/ High Level forums.

- As delegation leader/Member of Indian representation in all United Nations Groups, High level forums, Committee, Divisions, Sessions and conferences on Cartography, Geo- information management & Surveying and Toponymy.
- Surveyor General of India spearheads the matter related to Inter State Boundaries (ISB) disputes resolution as forwarded by Ministry of Home Affairs, Supreme Court, High Court and other Courts.
- Surveyor General of India heads the International Boundary meetings as under :
 - Heads of Survey Departments (HOSD) : India and Myanmar.
 - Boundary Working Group (BWG) : India and Nepal
 - Joint Boundary Conference (JBC) : India and Bangladesh



2. NATIONAL MAP POLICY (NMP) - 2005:

Preamble:

All socio-economic developmental activities, conservation of natural resources, planning for disaster mitigation and infrastructure development require high quality spatial data. The advancements in digital technologies have now made it possible to use diverse spatial databases in an integrated manner. There responsibility for producing, maintaining and disseminating the topographic map database of the whole country, which is the foundation of all spatial data vests with the Survey of India (SOI). Recently, SOI has been mandated to take a leadership role in liberalizing access of spatial data to user groups without jeopardizing national security. To perform this role, the policy on dissemination of maps and spatial data needs to be clearly stated.

National Map Policy (NMP), 2005 mandates SOI to prepare, maintain and update the National Topographic database (NTDB) of the country comprising the following datasets:

1. National Spatial Reference Framework (NSRF).
2. National Digital Elevation Model (DEM).
3. National Topographic Template.
4. Administrative boundaries.
5. Toponymy (Place names).

SoI prepares two series of maps out of NTDB as per National Map Policy 2005 (NMP-2005):

Open Series Map (OSM):

OSMs are brought out exclusively by Survey of India, primarily for supporting development activities in the country. OSMs are published in UTM Projection on WGS-84 datum. OSMs hard copy and digital data are classified as “Unrestricted” as one-time security vetting has been done by the MOD. No civil and military Vulnerable Areas and Vulnerable Points (VA’s/VP’s) are shown on OSMs.

- Hard copy of OSMs are sold through Map Sales office of SOI and authorised sales agents across the country.
- Digital data is sold under digital licence through MA & DC Dehradun,
- OSM maps in pdf (watermarked) form have been made available as free download for all users in MANCHITRAPORTAL: <http://soinakshe.uk.gov.in>.
- OSM data can be procured by any user through MTR application in MANCHITRA PORTAL: <http://soinakshe.uk.gov.in>.

SOI also offer various licences to enable users to publish value add and develop products based on SOI maps and data product. Users are allowed to publish OSMs on hard copy and on website with or without GIS database, with due permission under appropriate agreement with Survey of India. However, if the international boundary is depicted on a map, being published as paid of any publication certification by Survey of India is necessary. In addition, Survey of India is currently preparing City Maps. These City Maps are on large scales in WGS-84 datum and in public domain. The contents of such maps are decided by Survey of India in consultation with Ministry of Defence.



Defence Series Map (DSM):

Maps of this series are based on WGS-84 Datum and LCC projection on various scales. These contain full features of map with grid, height, contours and other classified information without any dilution of accuracy. These are being published for defence force of India and national security agencies.

This series of maps (in an analogue or digital forms) for the entire country is classified, as appropriate, and the guidelines regarding their use are being issued by the Ministry of Defence (MoD)

3. NATIONAL DATA SHARING AND ACCESSIBILITY POLICY (NDSAP) -2012:

Preamble:

Asset and Valuable potential of data are widely recognised at all levels. Data collected or developed through public investments, when made publicly available and maintained over time, their potential value could be more fully realised. There has been an increasing demand by the community, that such data collected with the deployment of public funds should be made more readily available to all, for enabling rational debate, better decision making and use in meeting civil society needs.

A large quantum of data generated using public funds by various organisations and institutions in the country remains inaccessible to civil society, although most of such data may be non-sensitive in nature and could be used by public for scientific, economic and developmental purposes. The National Data Sharing and Accessibility Policy (NDSAP) is designed so as to apply to all sharable non – sensitive data available either in digital or analogue forms but generated using public funds by various Govt. of India. The NDSAP policy is designed to promote data sharing and enable access to Govt. of India owned data for national planning and development.

Objective:

The objective of this policy is to facilitate the access to Govt. of India owned sharable data and information in both human readable and machine readable forms through a network all over the country in a proactive and periodically updated manner, within the framework of various related policies. Acts and rules of Govt. of India, thereby permitting wider accessibility and use of public data and information.

4. CITIZEN CHARTER:

Survey of India, under the Ministry of Science and Technology, Government of India, is the national survey and mapping organization and has mandate to take a leadership role in liberalizing access of spatial data to user groups without compromising with the national security. The responsibility for producing, maintaining and disseminating the topographic map database of the whole country, which is the foundation of all spatial data vests with Survey of India (SOI). In order to improve the delivery of our services, Survey of India has decided to formulate this Citizens' Charter.



This Charter is the declaration of our vision, values and standards to achieve excellence in the formulation and implementation of National Map Policy for the benefit of Public, Govt. / Private organizations and other stakeholders. This Citizens' Charter will also be the benchmark to determine our efficiency and would be a dynamic document, which would be reviewed at least once in five years.

Our Strategy:

The strategy for achieving our mission shall comprise the following:

- Bench marking of products / data.
- Enhancing the use of information technology.
- Measuring conformance to service delivery standards.
- Evolving cooperative initiatives with other government and private agencies.

Our Clients:

Government and private organizations as well as private individuals associated with defence / security, information technology, education and research, navigation, tourism, disaster management, engineering and production, environment, mining, drilling, development, agriculture, fishing, utilities etc.

Our Expectations:

We expect citizens to:

- Uphold and respect the rules and regulations governing the geospatial data dissemination.
- Fulfill their duties and legal obligations in time.
- Be honest in furnishing information.
- Be co-operative and forthright in inquiries and verifications.
- Avoid unnecessary litigation.

This will enable us to serve the nation in an effective and efficient manner.

Our Commitment:

We shall strive to:

- Be at the service of our country
- Work to ensure the national security.
- Make our procedures and transactions as transparent as possible
- Carry out our tasks with:
 - integrity and judiciousness
 - impartiality and fairness
 - courtesy and understanding
 - objectivity and transparency
 - Promptness and efficiency



5. INTERNATIONAL BOUNDARY MATTERS:

(i) Boundary Survey Work:

Survey of India has been given the responsibility by the Ministry of External Affairs for all surveying works i.e. Boundary demarcation, relocation of boundary pillars of International boundary with Nepal, Bhutan, Bangladesh, Myanmar, Pakistan and China. SoI also advises State Govt. and Govt. of India on matters of International Boundary and State / UTs Boundaries and carries out Surveys as and when required to resolve the disputes as Extra- Departmental jobs.

Surveying tasks associated with the International Boundary were carried out as given below.

- **India - Myanmar International Boundary:** Detailed Survey work regarding establishment of huts inside Indian Territory between BP 96 & 97 along Manipur – Myanmar sector. Survey work for construction of four proposed bridges across Tiau and Kolodyne Rivers in Mizoram.
- **India -Bangladesh International Boundary:** Joint International Boundary Survey Work along Tripura & Mizoram sectors.
- **India - Pak International Boundary (Punjab and Rajasthan Sector):** Joint inspection / relocation / maintenance of boundary pillars.
- **India - Nepal International Boundary:** Indo- Nepal International boundary Survey work had been carried out by UK & WUP GDC during the field season 2018-19.



Picture from Indo-Nepal International Border

- **India - Bhutan International Boundary (Assam– Bhutan Sector):** Joint boundary survey work regarding inspection of missing / damaged boundary pillars is in progress.



(ii) Conference/Meeting:**(a) India - Myanmar Boundary:**

- 11th Heads of Survey Department (HoSD) and 3rd Joint Boundary Working Group (JBWG) meeting between India & Myanmar was held in Yangon (Myanmar) from 27th to 28th August, 2018. Lt. Gen Girish Kumar VSM Surveyor General of India, Sh. S.K. Sinha, Director, IBD (SGO) and Sh. Nirmalendu Kumar, Director, Meghalaya & Arunachal Pradesh GDC attended the conference.
- 22nd National Level Meeting NSM between India & Myanmar was held at New Delhi during 25th to 26th October, 2018. Sh. Rajiv Gauba, Union Home Secretary, Govt. of India led the Indian side while Sh. O.P. Tripathi, Addl. S.G. participated and represented the Department.

(b) India - Bangladesh Boundary:

- Lt Gen Girish Kumar, VSM, Surveyor General of India attended Joint Boundary Conference on International Boundary of India-Bangladesh at MEA, New Delhi on 2nd July, 2018.
- 2nd Joint Boundary Conference (JBC) between India and Bangladesh was held in MEA, New Delhi from 16 to 18 August, 2018. Indian delegation was led by Lt Gen Girish Kumar, VSM, Surveyor General of India while Mr. Matinul Haque, Director General of Department of Land Records Bangladesh represented the Bangladeshi side.
- 43rd Joint Boundary conference (Mizoram Sector) between India and Bangladesh was held at Aizawal (Mizoram) from 27th to 29th Sept, 2018. The Indian delegation was led by Sh. Sanjay Kumar, Director, Land Revenue & Settlement (Ex Officio) Mizoram While the Bangladesh delegation was led by Brig Gen Zakir Ahmed, PSC, Surveyor General of Bangladesh.
- 5th India Bangladesh Joint Consultative Committee JCC meeting was held on 8th February, 2019 at New Delhi. The meeting was co- chaired by Hon'ble External Affairs Minister of India & Bangladesh Foreign Minister. Lt Gen Girish Kumar, VSM, Surveyor General of India also participated as delegation member.



Indo- Bangladesh Joint Consultative committee (JCC) meeting



(c) India – Pakistan Boundary:

- Joint Surveyors / Engineers / Staff Officer Level meeting between India & Pakistan was held on 18th April, 2018 at Attari Joint check post (India side). Sh. V. Karuppaswamy, Superintending Surveyor, Punjab Haryana and Chandigarh GDC participated in the meeting.
- Joint Surveyors / Engineers / Staff Officer Level meeting between India & Pakistan was held on 11th July, 2018 at Wagha Joint check post (Pakistan side). Sh. V. Karuppaswamy, Superintending Surveyor, Punjab Haryana and Chandigarh GDC participated in the meeting.

(d) India – Nepal Boundary:

- The eighth meeting of Nepal- India Boundary Survey Officials Committee (SOC) was held in Kathmandu, Nepal from 17th- 19th June, 2018. The Nepali delegation was led by Mr. Suresh Man Shrestha, Deputy Director General of the Topographical Survey Division, Survey Department, Government of Nepal. The Indian delegation was led by Mr. Rajender Kumar Meena, Director, Uttarakhand & West Uttar Pradesh Geospatial Data Centre, Survey of India.
- The fifth meeting of India- Nepal Boundary Working Group (BWG) was held in Kathmandu, Nepal from 19th- 21st September, 2018. The Nepali delegation was led by Mr. Ganesh Prasad Bhatta, Director General, Survey Department, Government of Nepal. The Indian delegation was led by Lt Gen Girish Kumar, VSM, Surveyor General of India, Survey of India.



India- Nepal BWG, Kathmandu

- The Ninth meeting of India- Nepal Survey Officials Committee (SOC) was held at Dehradun, India from 11th – 13th October 2018. The Indian delegation was led by Mr. Rajender Kumar Meena, Director, Uttarakhand & West Uttar Pradesh Geospatial Data Centre, Survey of India and the Nepali delegation was led by Mr. Suresh Man Shrestha, Deputy Director General, Survey Department of Nepal.



(e) India – Bhutan Boundary

- Joint Technical Level Meeting between India & Bhutan was held from 22nd to 23rd November, 2018 at Shillong. Sh. Nirmalendu Kumar, Director, Meghalaya & Arunachal Pradesh GDC was the leader of Indian delegation.
- 13th Secretary Level Meeting between India and Bhutan on Border Management and Security at Thimpu, Bhutan from 14th to 15th February, 2019. Indian delegation was led by Sh. Rajiv Guaba, Home Secretary, MHA while Lt. Col Vivek Mallik, Deputy Surveyor General, IBD (SGO) represented the department.

6. TECHNICAL ACTIVITIES IN SOI:

Topographical Data Base (NTDB) plays very significant role in the planning for developmental activities of the Nation. Survey of India, the National Survey and Mapping Organisation of the country, under the Department of Science & Technology, Ministry of Science & Technology has the unique responsibility of providing timely, updated, cost effective and accurate Topographical Data Base for expeditious and integrated development and ensure that all resources contribute their full measure to the progress, prosperity and security of our country now and for generations to come. In this prominent role, the Department ensures that the country's domain is explored and mapped suitably to meet the emerging needs of the user community.

Survey of India is also responsible for Geodetic Control (Horizontal and Vertical) and Geodetic & Geophysical surveys, Production of Aeronautical Charts; undertaking specialised surveys for Developmental Projects, demarcation of the external boundaries of India, ensuring their accurate depiction on the maps published in the country and also advice on the demarcation of inter-state boundaries.

6.1 Departmental Activities:

6.1.1 Generation of National Topographical Data Base (NTDB):

- **On 1:50K Scale:** Survey of India has Completed generation of National Topographical Data Base (NTDB) on 1:50,000 scale for entire country.
- **OSM & DSM Maps:**

SoI prepares two series of maps viz Defence Series Maps (DSMs) for Defence uses and the Open Series Maps (OSMs) for public use as per National Map Policy (NMP-2005). DSM Maps are printed exclusively for defence uses as per defence requirements, where-as OSM Maps are printed strictly as per users requirements across the country and are prepared by State Geo-spatial data centres of SoI.

- **On 1:250K Scale:**

NTDB on 1:250,000 scale for entire country has been completed. New cycle of updation of DSM Maps has been started. 141 DSM Maps have been printed up to March 2019.

- **High Resolution National Topographical Data Base (HRNTDB):**

With the rapid development and industrialization in the country, there is a tremendous pressure on the resources which makes planning & utilization of resources more challenging. Effective planning for the development requires accurate resource mapping at optimum resolution. Survey of India has undertaken



preparation of HRNTDB for entire country by using High Resolution Satellite Imageries (HRSI) to cater for accurate high resolution data requirements/demands from various users and organisations.

- HRSI for approx. 1.26 million sq km area has been received from NRSC, DoS as per RSDP-2011 for HRNTDB activities. Provisioning of field Ground Control points has been carried out by field GDC for Geo-referencing, Feature extraction & field validation stages.

- **HRNTDB for Coastal areas (ICZMArea):**

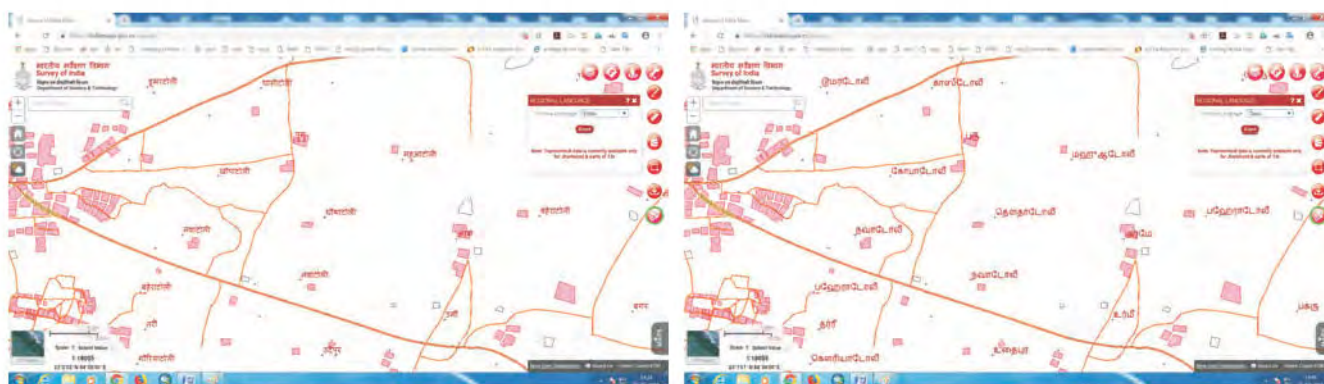
SoI had prepared large scale data on 1:10K scale using Aerial Photographs including digital elevation Model (DEM) under ICZM project for MoEF &CC. This GIS data is based on year 2012-13 Aerial Photographs, hence this data needs to be updated and migrated to HRNTDB as per its schema. SoI has undertaken the work to ingest updated ICZM data into HRNTDB. Updation is being carried out using latest sub-meter resolution HRSI. Preparation of HRNTDB is being carried out strictly as per Spatial Data Model Structure (SDMS) of the NTDB.

- HRSI for ≈ 1.06 lakh km² area has been received from NRSC, DoS for Coastal areas and provided to SoI Coastal GDCs for preparation of HRNTDB.

6.1.2 Toponymy database:

National Map Policy (NMP) - 2005 mandates Survey of India to prepare Toponymy (Place Name) data layer as one of the fundamental dataset. Toponymy layer comprises standardised Geographical names as per Topographical Maps of the country. Place name data as collected during field data collection is used while preparing Toponymy data layer. SoI has generated the Toponymy layer in English/Hindi/Bengali/Gujarati/Kannada/Telugu/Malayalam/Tamil/Punjabi and Marathi languages and the same has been made available for public in SoI public portal i.e. www.indiamaps.gov.in.

New names/Change names request received for 72 place names / Railway Station names were processed for Standardised /Romanized spelling as per Indian System of Transliteration. These requests are duly verified in the field by State Geo- spatial data centres before submission to the MHA.



6.1.3 Administrative Boundary Database (ABDB):

Administrative boundaries database comprises data of the administrative set-ups across districts & states in the country. First cycle of preparing ABDB data up to village level had been completed in past, however next cycle of preparing latest up-to-date ABDB data is under process. ABDB data of Madhya Pradesh, Gujarat, Kerala and Delhi has been completed and rest is under progress.



6.1.4 National Spatial Reference Frame (NSRF):

a) Indian Vertical Datum:

Heights are positional attributes of all geo-related data and are essential for a wide range of engineering and scientific activities, which are measured with reference to Indian vertical datum (IVD). The present IVD was realized over a century ago in 1909, and was based on Mean Sea Level (MSL), the approximated surface of Geoid and is physically represented on ground with Bench-Marks (BMs). Since 1909, BMs have either been destroyed/disturbed due to developmental /tectonic activities.

In this backdrop; the modernization of Indian vertical reference system was started in the past decade by Geodetic & Research Branch (G&RB) in year 2006 and is now completed as Indian Vertical Datum (IVD2009). In IVD2009 Geoid has been used as reference in place of Mean Sea level (MSL)

Implementation of new height system will bring out a qualitative change in geospatial products and services across the country. These heights will serve as the basic quantities for all engineering and developmental activities. Introduction of these heights will be vital for the implementation of the projects of national and international importance directly benefitting the citizens of this country.

SoI has launched new Indian Vertical Datum (IVD-2009). A Technical Report was also published on IVD-2009 by SoI and the same was released by the Hon'ble Cabinet Minister Dr. Harshvardhan in presence of Hon'ble President of India on 11th May, 2018.

b) Geoid Model:

Mean Sea level (MSL) based heights had only been used in India and most of the countries across world for all Developmental/Engineering projects and Topographical mapping purposes. Theoretically, heights are measured w.r.t. Geoid as reference surface and in past it was difficult to compute the actual Geoid surface, so MSL was used as reference surface. MSL is the closest matching surface determined practically using sea level observations at ports over a certain period of time.

SoI has prepared the β -version of the Geoid Model of India. SoI proposes to use Geoid as reference for height in country in place of MSL to update the Vertical Reference System (VRF) of the country. Upgradation from MSL to Geoid based height system would drastically reduce the Surveying & Mapping project timelines and costing by eliminating the levelling work, With Geoid model in place, GNSS heights would be directly converted to orthometric heights. A Technical Report was also published on Geoid Model by SoI and the same was released by the Hon'ble Cabinet Minister Dr. Harshvardhan in presence of Hon'ble President of India on 11th May, 2018.



Hon'ble Cabinet Minister Dr. Harshvardhan at the launch of Indian Vertical Datum (IVD-2009)



Secretary, DST Inaugurating Tech. Report on Geoid Model

6.1.5 Geodetic Activities:

SoI has provided both vertical and horizontal Geodetic control for departmental and various extra departmental projects of national importance, such as:-

- Dam Deformation Studies
- Crustal Movement Studies
- Control Surveys and Tunnel Alignment Surveys for various Hydroelectric and River Valley Projects.
- Verticality of the minarets of historical monuments / Stability of various Engineering Structure etc.

a) Tidal Observations:

Survey of India has been carrying out Tidal observations at all major ports of the country since Year 1878. Tidal Data generated from these Tidal observatories is used for the tidal data analysis to derive latest harmonic constituent needed for the accurate Tidal predictions. These Tidal predictions are essential for the harbour development and safe navigation. Tidal Prediction and Tide Tables are published by SoI every year. Presently SoI is recording Tidal data through series of the gauges located at 36 places across Eastern & Western Coasts of India. Publication of Indian Tide Table-2018 and Hugly River Tide Table-2018 has been completed and was made available to all Port authorities, Indian Navy and other users.

b) Geomagnetic observations:

Geomagnetic observations are being recorded continuously at Digital Geomagnetic observatory at Sabhawala, which is the only observatory of its kind located in the region for determination of horizontal forces (HF), Vertical forces (VF) and declination (D). These observations are aimed to monitor and record different components of Geo-magnetic variations and are necessary to control the baseline values of the magnetograms. In addition a study to analyse Geo-magnetic data for identifying earthquake precursors is underway.

6.2 Extra Departmental Activities:

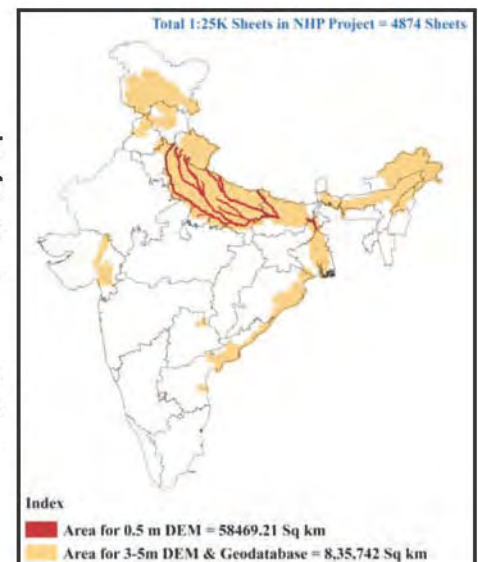
6.2.1 National Hydrology Project (NHP):

This project is very important for national interest in which Survey of India (SoI) is a Central Implementation Agency in execution of National Hydrology Project (NHP). This Project aims to improve the planning, development and management of water resources as-well-as flood forecasting and reservoir observations in real time.

SoI has been entrusted with the responsibility to generate high resolution DEM (Digital Elevation Model) and GIS data base under the project for flood modeling and river basin management purposes under

Component B: Water Resources Information System (WRIS)

Component D: Institutions Capacity Enhancement.



Through this Survey of India provides infrastructure and communication equipment, capacity building and extensive training programs. Advance training have been provided to 68 Officers/ staffs on various courses (i.e. 3D Geo Information from Imagery, Advance Image Analysis & Laser Scanning at ITC Netherland, Summer Course of Geodesy on Geoid Modeling International at Denmark Technical University (DTU) Space, World Bank Procurement procedure at NWA Pune & ASCI Hyderabad, Training at IIM Ahmadabad and training on Control & Detail Survey by using GPS & Total Station, creation of DEM at IISM, Hyderabad.

Project Deliverables:

- High Resolution DEM of 3-5m Resolution
- Ultra High Resolution DEM of 0.5m Resolution
- Establishment of CORS Network
- Updated GIS Database

Status: Project is under execution

6.2.2 Mapping and Delineation of Hazard Line:

The objective of the project is to delineate, map and benchmark the coastal hazard line all along the mainland coast of India under World Bank Assisted “Integrated Coastal Zone Management” (ICZM) project. Survey of India has completed generation of a 0.5 meter elevation contour map on 1:10,000 scale (Total Mapping Area approx. 75,000 Sq. Km) which required as base map to delineate the Hazard Line for the entire mainland coast of India upto the maximum width of 7 km from shore line on the landward side and to fulfill the main objective of project which is to ensure effective protection of shore lines, coastal infrastructure, livelihoods and lives through improved coastal management a "Coastal Management Program" undertaken by Ministry of Environment & Forest (MoEF)

Status: This project has been completed and final deliverable has been handed over to SICOM, MOEF & CC

6.2.3 National Mission for Clean Ganga (NMCG) Project:

This project is an integrated conservation mission, approved as flagship programme by the Union Government to accomplish the twin objectives of effective abatement of pollution and conservation and rejuvenation of the national river Ganga. SoI is responsible to generate High Resolution DEM (0.5 metre resolution) and GIS ready database for the part of River Ganga covering up to 10 km extent on both sides of the river using latest Technology. The project is under progress with various activities outsourced and procurement being made through Open e-tendering as per Government of India public procurement guidelines.



- Data acquisition component comprises Generation of 0.5m DEM and Ortho-Rectified Image (ORI) has been prepared for 22,892 Sq. Km.

Status: Project is under execution

6.2.4 Central Mine, Planning & Design Institute (CMPDI) Project:

The main objective of the project is Preparation of Large Scale Updated Topographical Maps/Data of 27 Major Coal Fields covering ≈ 30488 sq. Km. based on remote sensing technique. GIS database of the coal fields and Large scale maps covering all 27 coal fields on 1:5,000 scale (with contours) have been prepared for the indenter. It was a challenging task to carry out the ground survey as the area of work had many difficulties like treacherous terrain, area was infested with Naxalites and other anti-social elements, very poor approach or access to the areas under survey being coal field areas.

Status: Project is in final stages slated for handing over of deliverables in June, 2019.

6.2.5 Map the Neighbourhood in Uttarakhand (MANU) Project:

Mapping project was undertaken under MANU programme by Survey of India. “Map the Neighbourhood in Uttarakhand (MANU)” programme was conceptualized and sponsored by the DST post Year 2013 disaster in Uttarakhand. First of its kind of mapping project in country using Airborne LIDAR technology in challenging Himalayan terrain. MANU programme involved several Centre/State Govt departments, organizations, Institutes and Universities.

Survey of India has completed DEM (Digital Elevation Model) and Map on 1:10K scale by using Modern Techniques of Air - Borne LiDAR and digital Aerial Photography for part of disaster affected area approx. 3650 Sq. km. out of 8092 sq.km. of “Char Dham and Pindar Valley”, Uttarakhand. The data can be used for macro & micro level planning and post disaster scientific application by other agencies. The following deliverables has been completed.

Status: This project has been completed and final data may be supplied to Uttarakhand Govt. as well as to other states/indenter for their use/purpose to analyse the data or any other research/development work.

6.2.6 LSM Project for the state of Karnataka:

Memorandum of Understanding has been signed on 28th Feb, 2019 with Revenue Department, State Govt of Karnataka for undertaking the large scale mapping of rural and urban land and properties (nearly 51,000 km²) area using UAV/Drone. Prior to MoU a pilot project was carried out by Survey of India at Jayanagar in Bengaluru city and Ramanagar town separately.

Inauguration of Drone Survey for land parcels in Karnataka was done by Hon'ble CM of Karnataka Shri H.D. Kumaraswamy on 16th July 2018 at Ramanagar, Karnataka.

Status: Project is under execution





MoU with Govt. of Karnataka

6.2.7 LSM Project for the state of Haryana:

Memorandum of Understanding (MoU) has been signed between Survey of India, Govt. of India and Revenue and Disaster Management, Govt. of Haryana on 8th March, 2019 for undertaking the large scale mapping project which include to generate up-to- date digital topographical map of entire state of Haryana for 44,212 km² area using Professional Survey Grade Unmanned Aerial Vehicle / Drone for Large Scale Mapping and field measurements, Continuous Operating Reference System (CORS) and Differential Global Positioning System (DGPS) survey.

Status: Project is under execution



MoU with Govt. of Haryana



6.2.8 LSM Project for the state of Maharashtra:

Survey of India has signed a Memorandum of Understanding (MoU) on 3rd March, 2019 with Revenue department, State Govt of Maharashtra (GoM) for undertaking the large scale mapping of the Village Gaothan (Abadi) areas of \approx 0,000 villages in the state of Maharashtra using Professional Survey Grade UAV/Drone consisting of onboard kinematics GNSS and IMU. A pilot project was carried out to check the accuracy, output and results of drone based survey at Sonari village of Pune district of Maharashtra. It was successfully completed and accepted.

Status: Project is under execution



SGI with Hon'ble Chief Minister of Maharashtra

6.2.9 LSM Project for Indian Railways:

SOI has signed a Memorandum of Understanding with Indian Railways (IR), Ministry of Railways (MoR) on 27th March, 2019 for providing Topographic Data as web services for various web applications of the IR. SoI will also undertake the UAV/Drone based corridor mapping work for asset mapping of the resources/asset of the Indian Railways for about 70,000 lin. km. A pilot project for UAV/Drone based mapping was carried out using UAV/Drone for Indian Railways on Agra to Bhopal section.



MoU with Indian Railways

6.2.10 LSM for Kumbh Mela Area (Uttar Pradesh):

SOI has completed a project of creation of 2D GIS and 3D mapping of Prayagraj city including KumbhMela Notification area – 2019 using Drone/UAV Authorities in efficiently planning, organizing and managing the



mega event. The same data may be used to showcase utility of this new geospatial technology of integrating 3D panoramic imagery with UAV imagery in managing various open drains polluting the river Ganga.

6.3 OTHER SPECIAL SURVEY PROJECTS:

6.3.1 Special Survey for Indian Air Force:

Survey of India also prepared IAF-OGM, PGM, JGM, Landing Approach charts LAC, LNC etc. and carried out abstracting survey work for Indian Air Force. SOI has completed the following maps and data for IAF.

IAF Work	Work completed
IAF (OGM) - 5000 Series, scale 1:1M	12 sheets
IAF (PGM) - 5014 Series, scale 1:1/2M	20 sheets
IAF - JGM 1080 Series scale, 1:2M	5 sheets
IAF- Landing Approach Charts (LAC) Series, scale 1:50K	320 charts
IAF- LNC Series, scale 1:2M 14th Edition	08 parts
IAF- LNC Series, scale 1:2M 15th Edition	08 parts
Special Maps for IAF Airfields	60 Airfields
Post field updation of IAF Airfield	14 Airfields

6.3.2 The following projects were continued / undertaken / carried out during the year 2018 – 2019

Sl.No.	Name of GDC/Centre	Name of Special Survey
1.	PH & Chandigarh	Inter State Boundary between Punjab and Haryana
2.	Assam & Nagaland	Dum Dum project
3.	G&RB	NPCIL (Kovvada) Visakhapatnam project
	-do-	Qutb Minar, Delhi project
	-do-	Vehicle Assembly Building (VAB) ISRO, Sriharikota
	-do-	Hindustan Aeronautical Ltd. (HAL), Bengaluru
	-do-	Oil India Ltd. (OIL), Dhuliajan, Assam
4.	Himachal Pradesh	Bilashpur - Manali- Leh BG Railway Line
	-do-	Mapping of Morni, Panchkula
5.	NGDC	Conversion of .dgn to Arc geo-database and .shp file for Ground Water Department.
6.	S(Air) & DGDC	Field Survey of Ratnagiri Airfield

6.4 STATUS OF PRINTING:

The following maps/specials products were printed during the period under report:

STATUS OF PRINTING OF MAPS

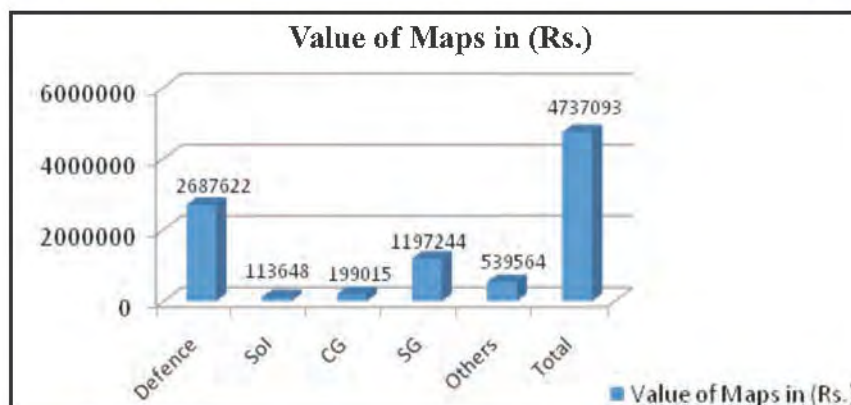
Sl.No.	Name of Job	No of Maps
1.	OSM on 1:50K scale	994
2.	DSM on 1:50K scale	1941
3.	DSM on 1:250K scale	136
4.	IAF(PGM,OGM,OLM,LAC etc.)	43
5.	Railway 1:10M 16th Edition	02



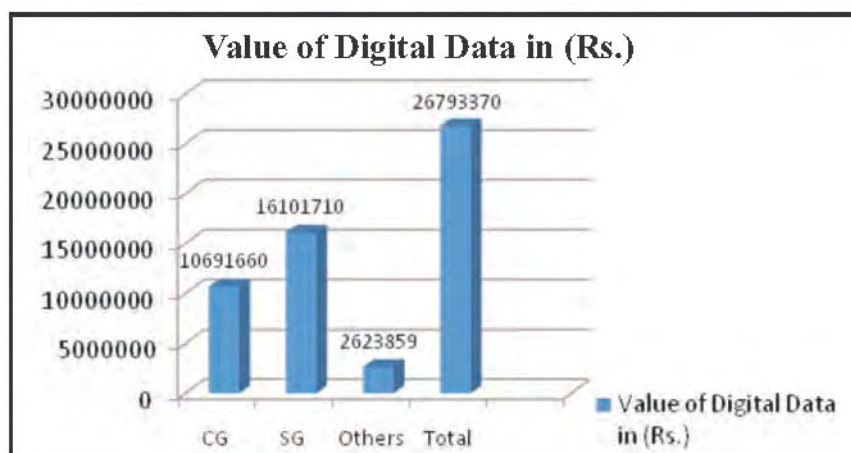
Name of Publication	Status
Hugli River Tide Table, 2019	Published
Indian Tide Table, 2019	Published
Annual Magnetic Bulletin 2017 of Sabhawala observatory	Under progress
Geo magnetic bulletin 2016.0	Published
Magnetic Declination epoch Chart 2020.0	Under progress

6.5 SALE OF MAPS AND DIGITAL DATA:

Sl. No.	Name of Organisation	Value of Maps in (Rs.)
1.	Defence	2687622
2.	SoI	113648
3.	CG	199015
4.	SG	1197244
5.	Others	539564
	Total	4737093



Sl. No.	Name of Organisation	Value of Digital Data in (Rs.)
1.	CG	10691660
2.	SG	16101710
3.	Others	2623859
	Total	26793370



7. COLLABORATIVE SCIENTIFIC ACTIVITIES:

Following collaborative scientific activities in the field of Geodesy and Geophysics were continued:

- (1) Magnetic data has been supplied regularly to IIG, Mumbai and also supplied to World Data Centre whenever it required.
- (2) Supply of Mean Sea Level data of 18 Indian ports to International Permanent Service for Mean Sea Level (IPSMML), U.K. for various scientific studies by the International Geodetic Community.
- (3) Collaborative R&D Project between IIRS (ISRO) and G&RB (SoI) "**Mapping Modelling and Impact Assessment of Land Subsidence in Northern India**" (Delhi & Chandigarh). Reports of IInd & IIIrd epoch had been forwarded to IIRS. Field work of IVth epoch is in progress.

8. RESEARCH AND DEVELOPMENT:

The main thrust of the research and developmental activities of the SoI during the period under report has been focused towards:

(1) 38th Indian Scientific Expedition to Antarctica:

A team of two members departed for participation in 38th Antarctica Expedition (Maitri & Schurnachar Oasis) on 19th November, 2018. It was the first time in the history of Survey of India that a female member from the Department joined the expedition. Detail Survey of 1.5 sq. km. for Schurnachar Oasis on scale 1:10,000 with contour Interval 5 meters has been completed. Total 21 central points provided along with one week campaign of GNSS observation from 16th to 23rd January, 2019.

- (2) Processing / analysis of GPS data of Antarctica with respect to Indian permanent station was carried out for crustal deformation, seismotectonic and plate motion studies with respect to Indian plate.
- (3) Backup and archival of data received from permanent GPS/GNSS stations.
- (4) Downloading of precise ephemeris of IGS stations from web sites has been continued.
- (5) Adjustment of Second Level Net in India (data compilation).
- (6) As a sequel to above programs, the following activities were initiated / completed.
- (7) Data acquisition with Global Positioning System in static relative mode to obtain transformation parameters between the Everest Spheroid and WGS-84.
- (8) Gravity data acquired for equal crustal movement studies across faults / thrust zones as well as for Geodetic and Geophysical studies for International Geodynamics projects is being restructured and formatted, so as to meet the requirements (of redesigned mathematical model).
- (9) Research & Development Programme in Sea level studies, Glaciology, Earthquake prediction etc.



Surveying work in Antarctica



9. CONFERENCES / SEMINARS / WORKSHOPS / MEETINGS:

- (1) Sh. K.K. Soni, Director, Admn. & Finance deliver lecture in training programme at DRDO Training Centre, Jodhpur from 4th to 5th April, 2018.
- (2) Dr. S.K. Singh, Director, G&RB participated in workshop "Geomatics in Civil Engineering" to mark celebration of 170 year's of Civil Engineering Education at IIT, Roorkee from 5-6 April, 2018
- (3) Sh. S.K. Sinha, Director, International Boundary Directorate (SGO) attended meeting on National Mission for Clean Ganga (NMCG) "Generation of DEM/DTM using suitable sensor on airborne platform for a corridor along the main stem of river Ganga" at MDC, New Delhi on 27th April, 2018.
- (4) Sh. D.N. Pathak, Director, Lt. Col Pawan Pandey, Deputy Surveyor General and Sh. Pardeep Singh Superintending Surveyor attended Drone Conference "Drone Acharya" – The Future of Indian Unmanned Systems Market at New Delhi on 3rd May, 2018.
- (5) Sh. Pankaj Mishra, Deputy Director attended UNGGIM Co- ordination Cell meeting at DST, New Delhi on 21st May, 2018.
- (6) Lt Gen Girish Kumar, VSM, Surveyor General of India participated in Brainstorming Session on "Coastal Hazard and Risk Assessment (CHRA) at Anna University, Chennai from 25th to 26th May, 2018.
- (7) "11th Annual Conference and Exhibition – Geo-intelligence Asia 2018" was organized by Geospatial Media and Communications Pvt. Ltd. at Manekshaw Centre, Dhaula Kuan, New Delhi from 4th to 5th June, 2018. Lt General Girish Kumar, VSM, Surveyor General of India along with senior officers of SoI participated in the conference. SGI also expressed his views / knowledge in the field of Go-intelligence by use of latest technologies regarding impact on planning and execution of operations, both Military and in aid to civil authorities.



Surveyor General of India at Geo-intelligence Asia 2018

- (8) Lt. Gen Girish Kumar V.S.M Surveyor General of India attended meeting with Chief Secretary, Govt. of Manipur at Imphal and also visited to BP No. 81 & 82, recently in Controversy over the construction of a boundary pillar in the border village of KwathaKhunou, Moreh subdivision of Manipur, along the India-Myanmar border with officials of MEA during 24th to 25th July, 2018.





Surveyor General of India visiting border areas of Manipur

- (9) Lt. Gen Girish Kumar V.S.M Surveyor General of India, Lt Col Pawan Pandey Deputy Surveyor General and Sh. Pankaj Mishra, Deputy Director, attended Inter – State Boundary meeting with officials of State Govt. of Karnataka & Andhra Pradesh in Bangalore on 11th August, 2018.
- (10) Sh. Prashant Kumar, Director, HPGDC visited New Delhi from 13 – 14 August, 2018 to attend the Permanent Co- ordination Framework meeting regarding regional Final Location Survey (FLS) of Bilaspur- Leh BG Railway Line.
- (11) Dr. S.K. Singh, Director, G&RB made a presentation on CORS System of Survey of India, Indgeoid of Survey of India to JS (IC& GW) MoWR at NPMU, New Delhi on 24th August, 2018
- (12) Smt. Bindu Manghat, Director, Western Printing Group attended 193th meeting EAC Infrastructure Development Industrial & National Highways Project at New Delhi on 26th July, 2018
- (13) Lt. Gen Girish Kumar VSM, Surveyor General of India held discussion with Hon'ble Chief Minister of Haryana along with Revenue Minister and other top officials of Haryana Govt. regarding Large Scale Mapping of Haryana State using Drone (UAV) at CM's committee room, Chandigarh on 27th September, 2018.



SGI with Hon'ble Chief Minister of Haryana



- (14) 38th INCA International Congress was organized at NRSC, Hyderabad during 29th to 31st October, 2018 by Indian National Cartographic Association (INCA). Lt Gen Girish Kumar, VSM, Surveyor General of India participated and addressed the inaugural session of 38th INCA International Congress at Hyderabad. Survey of India also put up a display stall exhibiting various activities and projects being undertaken /completed by Survey of India.



Lt. Gen Girish Kumar, VSM at 38th INCA International Congress, Hyderabad

- (15) Lt Gen Girish Kumar, VSM, Surveyor General of India and Dr. S.K. Singh, Director, participated in Brainstorming Session on “World GIS Day 2018” organized by NMCG with the theme “E- Governance of Namami Gange Programme on 14th November, 2018 at New Delhi.



- (16) Sh. K. K, Soni, Director, Admn. & Finance and Sh. S.V. Singh, Director attended training programme on Project Management at IIM, Ahmedabad from 17th to 22nd November, 2018.
- (17) Lt Gen Girish Kumar, VSM, Surveyor General Of India attended meeting with Settlement Commissioner, Govt. of Maharashtra and Hon’ble Minister of State for Defence, MoD on 30th November, 2018 at New Delhi.
- (18) Lt Gen Girish Kumar, VSM, Surveyor General Of India, attended ISG-ISRS Symposium at Space Application Centre, Department of Space, Ahmedabad on 5th December, 2018.



- (19) Sh. S.V. Singh, Director attended “International Conference on Conference on Sustainable Water Management Board”(SWMB) at Chandigarh from 10th to 11th December, 2018.
- (20) Lt Gen Girish Kumar, VSM, Surveyor General Of India attended Capacity Building Programme (CBP) on E- Office at NICSI Development Centre, DMRC IT Park, New Delhi from 17th to 19th December, 2018.
- (21) Sh. S.K. Sinha, Director, International Boundary Directorate (SGO) attended 4th meeting of the Governing council for NCSCM at Prithvi Wing, Ministry of Environment & Climate Change, New Delhi on 20th December 2018.
- (22) A workshop between India & Thailand on Geo-Spatial cooperation was organized from 19-22 June, 2018 in Survey of India, Dehradun to deliberate and discuss the future Co-operations areas in the field of Geo-spatial technology. In the workshop, delegates from Survey of India, NATMO, GISTDA (Thailand), participated.



SGI inaugurating workshop on Indo-Thai Geo-Spatial Cooperation Project in Sol, Dehraun

In the past, under Indo-Thai co-operation an Atlas was published jointly by GISTDA & NATMO. Large Scale Mapping (LSM) on 1:4,000 scale of Uthong town of Supanburi province of Thailand along with training of 7 Thai officials in Photogrammetry & LSM at IISM, Hyderabad including one field visit to high hill town at Namchee, Sikkim was completed jointly by SoI & GISTDA.

- (23) Sh.S.K. Sinha, Director attended Board meeting at IISM, Hyderabad regarding preparation of Expression of Interest (EoI) for “Data Collection, Updation, Hosting and Dissemination Using Latest Technologies on 21st January, 2019.
- (24) Sh. S.K. Sinha, Director, International Boundary Directorate (SGO) attended 2nd meeting of the Authority Committee for framing the Design and Standard for application of Drone / UAV technology in Formulation of GIS based master plans at T&CPO, New Delhi on 11th January 2019
- (25) Col B. Sareen Chander, DSG and Sh. Mahesh R, Deputy Director, IIS&M participated in the "NRSC User Meet 2019" held at NRSC, Hyderabad from 22nd to 23rd January, 2019.
- (26) Sh.S.K. Sinha, Director participated in fourth meeting of monitoring & Task Groups of the committee to collect / compile metadata of all springs in hilly states Pan- India at Dehradun on 25th January, 2019.



- (27) Sh. Pankaj Mishra, Deputy Director attended Geo- HUB meeting at GIS & RS, Hyderabad on 25th January,2019.
- (28) Sh. Pankaj Mishra, Deputy Director made a presentation to Joint Secretary, Army, MoD at New Delhi on 15th February,2019.
- (29) Sh. Nitin Joshi, Deputy Surveyor General attended DST sponsored 8th Training Programme on “Science Technology and Emerging Trends in Governance” at IIPA, New Delhi from 18th to 22nd February,2019.
- (30) Lt Col Suman Sarkar, Deputy Surveyor General attended Operational Training on CPGRAMS at Department of Administrative Reforms & Public Grievances Sardar Patel Bhawan, Sansad Marg, New Delhi on 28th February,2019.
- (31) Lt Gen Girish Kumar, VSM, Surveyor General Of India attended meeting with Honb’le Finance & Revenue Minister, Govt. of Haryana on MoU of Large Scale Mapping from 7th-8th March, 2019 in Chandigarh.
- (32) Sh. Pankaj Mishra, Deputy Director attended meeting regarding UP- Bihar Inter State Boundary (ISB) dispute at Balliya (UP) on 16th November,2018.
- (33) Lt Gen Girish Kumar, VSM, Surveyor General Of India and Lt. Col Pawan Pandey, Deputy Surveyor General attended workshop on “Rejuvenation of Springs for Water Security through spring shed development in hilly areas of the country ” at Dharamshala, Himachal Pradesh organized by Central Land Water Board on 14th March, 2019.
- (34) Sh. S.K.Sinha, Deputy Surveyor General, Sh. Ravinder Kumar, Deputy Surveyor General and Sh. R. Mahesh, Deputy Surveyor General attended a meeting at DST, New Delhi under the chairmanship of the secretary DST on 28th March,2019.

10. TECHNICAL PAPERS:

1. Dr. S.K. Singh, Director, G&RB presented a paper titled **E- Governance of Namami Gange programme through Geospatial Technology** at World GIS day -2018 organised by NMCG at New Delhi on 14th November,2018.
2. "FIG Congress 2018" was held from 6th to 11th May,2018 at Istanbul Congress Centre, Istanbul, Turkey with the theme of **Embracing our smart world where the continents connect: Enhancing the geospatial maturity of societies**. Dr. S.K.Singh, Director, G&RB and Sh. R. K. Srivastava Deputy Director, EUP GDC participated in the conference and also presented the technical papers title : "Towards A New Vertical Datum for India"and "Development of Geoid Model-A case study on western India" respectively.



FIG Congress 2018, Istanbul (Turkey)

11. FOREIGN VISITS / STUDY TOURS / DEPUTATION:

- (1) Eighth Session of the **United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM)** was held from 1- 3 August, 2018 at the United Nations Headquarters in New York (USA). Lt Gen Girish Kumar V.S.M Surveyor General of India and Sh. Pankaj Mishra, Deputy Director, attended the session to promote international cooperation in the field of global geospatial information management, and as the relevant body on geospatial information management in the United Nations, to report on all matters relating to geography, geospatial information and related topics. It was a historic moments for India when a Surveyor General of India not only represented the country but also made a statement on 02 August, 2018 at prestigious forum.



SGI at UN-GGIM Session (New York)

- (2) United Nations World Geospatial Information Congress (UNWGIC) and 7th plenary meeting of UN-GGIM-AP and the annual meeting of the UN- GGIM Expanded Bureau was held in Deqing Zhejiang Province, China from 19th to 23rd November, 2018. Lt. Gen Girish Kumar V.S.M Surveyor General of India, attended United Nations World Geospatial Information Congress (UNWGIC) in **Deqing Zhejiang Province, China** from 19th to 23rd November, 2018.



- (3) Sh. S.V. Singh, Director participated and presented presentation on Fundamental Geographic Data Set (FGDS) in a workshop at GISTDA in connection of Indo- Thai Geospatial Cooperation Project at **Bangkok, Thailand** from 15th to 17th February, 2019.



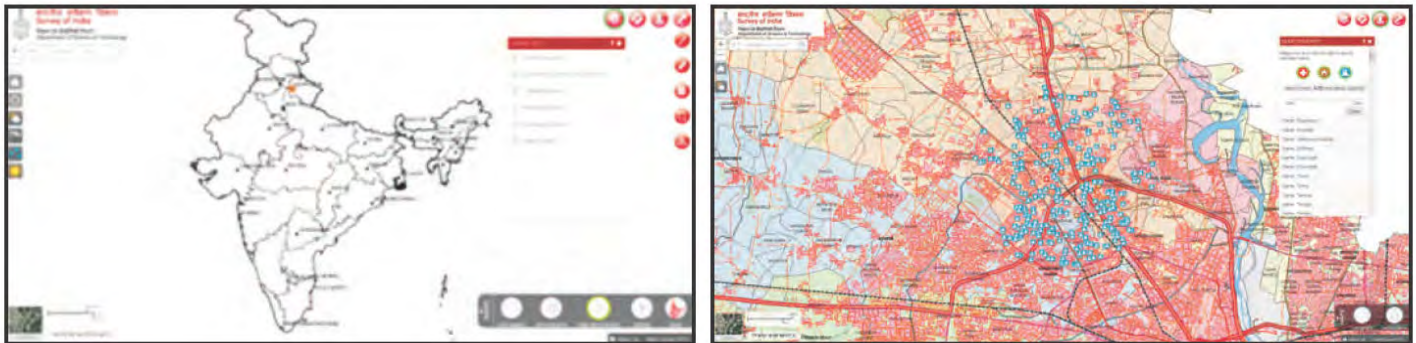
12. IMPOTANT ACTIVITIES DURING THE PERIOD:

A) Survey of India Portal:

SoI as a National Mapping Agency (NMA) has developed a web – based Geo- Portal offering NTDB as service to carter for Government to citizen (G2C) and Government to Government (G2G) needs and applications or information systems. This Geo- Portal has been developed in compliance to all applicable Government polices and guidelines. 11.05.2018

SOI Public Portal (G2C) i.e. www.indiamaps.gov.in is being monitored for necessary rectification of data and services. Nodal officers have been nominated by all SOI offices for accessing the portal and giving feedback fortnightly. Based on the feedback data and service is being continuously improved.

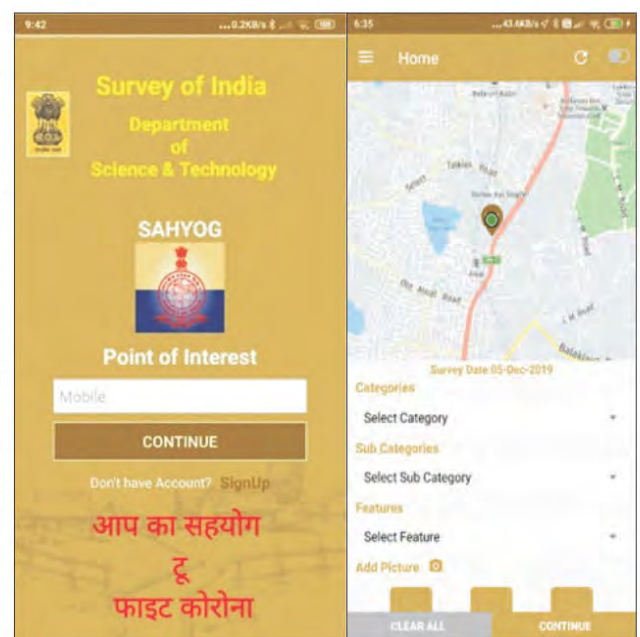
SOI G2G Portal i.e. www.g2g.indiamaps.gov.in is being improved for use by Government agencies. SGI has informed central government agencies including Defence forces and paramilitary forces about the utility of SOI portals through D.O letters. A nodal officer has been nominated for user management of G2G portal and user access is being provided to all Government agencies, Defence forces and paramilitary forces based on their request.



B) "SAHYOG"- Mobile Application by Survey of India (SoI) (β-version):

Survey of India (SoI) has developed a Mobile application "Sahyog" for its users viz Government (Centre/State) departments, Organisations, Institutions, Govt. employees, Academic Institutions, Students and Citizens of India, to voluntary support and contribute in preparing, updating and enriching the national database of the country.

- Points of interest (POI) data collected using application will be used for creating various applications for everyone's usage.
- Survey of India has sought active support from the people of India in this endeavor to serve the people and the country.
- SOI has collaborated with Tom Tom India Pvt. Ltd. For collection of POIs using SOI mobile Application.



C) Map Transaction Registry (MTR) Application:

MTR application “*Manchitra*” developed by SOI and launched on 14 Dec, 2019 to facilitate the dissemination of free .pdf maps through “*Manchitra*” application. Apart from free .pdf maps in SOI also facilitates Indian citizens to buy maps in other formats (DGN, DEM, ARC, SHAPEFILE, GEOTIFF) through MTR Application. User can order and make payment online through NTRP Portal (Bharatkosh).



SGI with his team at the launch of MTR Application

D) Release of Karnataka State Map:

A triangular series of the state map of Karnataka in Kannada, English and Hindi was released by Lt. Gen Girish Kumar, VSM, Surveyor General of India in Bangalore on 11th August, 2018. The updated spatial database of the state covering the road, railway network, information of tourism, historical importance, hydrological features & the relevant forest and administrative boundaries serves as a potent tool for good governance.



Surveyor General of India releasing the state map of Karnataka in three languages



E) E-Office Training:

As per Govt. of India guidelines, Survey of India (SOI) has initiated to migrate completely on E-Office by 01 January 2019. For that purpose Training (E- Office implementation) of SOI officers of Dehradun was conducted by Video conferencing at NIC, Dehradun. This is the first training being conducted at the Collectorate studio for more than 50 Officers of SOI Dehradun.



Sol officers at NIC, Dehradun

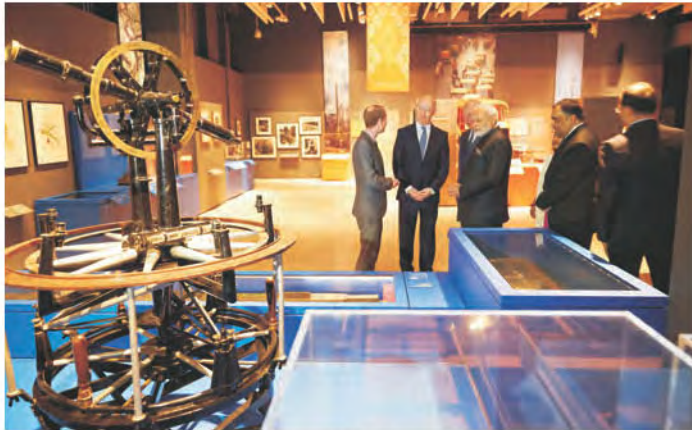
F) Establishing Video Conferencing setup:

On successful completion of P2P lease line connectivity between SOI offices in Dehradun & NIC node, the SOI Wide Area Network (WAN) was established. The Video Conferencing (VC) was done between Surveyor General of India and the heads of different GDCs / Centres in presence of all officers of SGO on 27th November 2018 using the established WAN. The VC setup procured with mesh network was installed and the same would be continued for all other locations too.



G) Government Achievement & Schemes Expo 2018:

Survey of India had Participated in the "Government Achievement & Schemes Expo 2018" which was held at Pragati Maidan, New Delhi from 27-29th July 2018 being organized by NNS Media Group, New Delhi. Survey of India had been awarded 1st prize for best display.



HRH the prince of Wales and Hon'ble Prime Minister at Illuminating India, London



SGI lighting the lamp at FICCI, New Delhi



FA, DST's visit to SGO, Dehradun



Secretary, DST's visit to Sol offices at Dehradun



Ambassador of Norway Mr Nils Ragner Kamsveg at Surveyor General Office, Dehradun



SGI inaugurating 1st CTP Machine with Green Technology in WPG



13. VISIT TO SOI OFFICES:



Personnel of IAF Garud Regimental Training Centre, Bagpat(UP) at NGDC

(1) Indian Institute of Surveying & Mapping:

- (i) 30 students and 2 faculty members of St. Pious X Degree & PG College for women, Hyderabad.
- (ii) 2 officers from National Institute of Hydrology, Goa.
- (iii) 50 students and 2 faculty members of Symbiosis Institute of Geo-informatics, Pune.
- (iv) 30 students and 4 faculty members of Veeramal Engineering College, Tamilnadu.
- (v) 12 scholars and 2 faculty members from Department of Geography, Utkal University
- (vi) 30 students and 2 faculty members of National Institute of Technology, Warangal.
- (vii) 62 students and 2 faculty members of St. Peter,s Engineering College, Medchal, Hyderabad.
- (viii) 32 students and 2 faculty members of Gandihgram Rural Institute, Tamilnadu.
- (ix) 58 students & 2 faculty members of Vignan Institute of Technology and Science, Bhongir.

(2) National Survey Museum (G &RB):

- (i) 37 Post Graduate students along with one faculty member and one research student of Shivaji University, Kolhapur.
- (ii) Ambassador of Norway Mr Nils Ragner Kamsveg.
- (iii) 95 students along with 05 staff of Banaras Hindu University, Varanasi.
- (iv) Mr Edward Alan Brady and Mrs Janet Margaret Brady, Australia.
- (v) 61 students and 02 faculty members of Banaras Hindu University, Varanasi.
- (vi) Lt. Col Rao Murli Sridhar, Tech. officer with 13 trainees of 501 Field. Survey Engineer group, Dehradun.
- (vii) Prof. Tashi Ladawa, tour in-charge, Eliezer, Joldan Memorial College, Leh (Laddakh).
- (viii) Mr. Bossan Scotts, Disapat, Sawadisukhitkal, Boon Yasith Komkhun, Dedsada Kerdsrilek, Karuna Pimprasan and Titiya Chventragun of Thailand.
- (ix) Mr. Herman Margenthaler and Mr. Darren Walford of Australia.

- (x) 60 students (Civil Engineering) and 05 faculty members of DCRUST, Murthal, Sonapat (Haryana).
- (xi) Lt. Cdr. HMRLK Herath, Lt. Cdr. HMNM Herath Sri Lankan National and Mr. KapildeoGopaul, Senior Technician, Mr. Devender Kumar Ramjee, Senior Cartographer, Mauritius National.
- (xii) 40 students alongwith 03 staff members of Gandhi SmarakTriveni P.G. College, Ajamgarh(UP).
- (xiii) Sh. Ajay Panwar, Programme Officer, HIMCOSTE, Shimla.
- (xiv) 22 students and 04 teachers / faculty members of PDM university, Bahadurpur, Haryana.

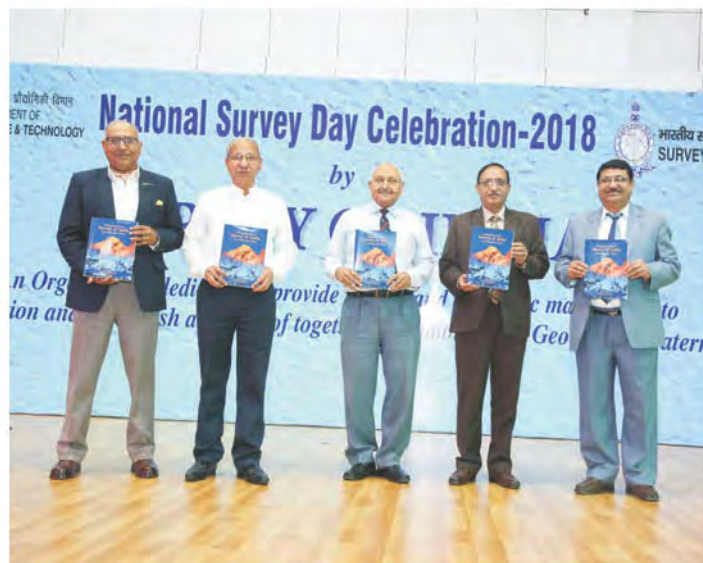
14. CULTURAL AND EDUCATIONAL ACTIVITIES:

(i) National Survey Day:

National Survey Day was celebrated on 10th of April, 2018 at Survey of India, Dehradun. The main function was organized at Brig Gambhir Singh Auditorium, Survey of India Campus, Dehradun. Joint Secretary, SMP, Govt. of India, Sh. B.S. Rawat attended and inaugurated the function as a Chief Guest. Heads of Defence forces /Central/ State Government offices of Dehradun and former officers of Survey of India, Zonal heads, Directors, Staff of SoI from all over the country were also invited. Lt General Girish Kumar, VSM, Surveyor General of India also addressed the invitees Guests and the people of SoI. A book was also released at this moment written by Maj Gen K.G. Behl former SoI officer.



SGI addressing the audience at National Survey Day



(ii) Swachh Bharat Pakhwara:

Different programmes on Swachh Bharat Abhiyan were conducted in Survey of India office premises to propagate the Swachhta message among the staff. Poster competition was also organized in nearby schools to make aware regarding Swachh Bharat Mission. observed from 16.05.2018 to 31.05.2018. Officers / Staff participated and took oath to keep India clean and all the staff did the work to clean the Survey of India complex and its surroundings.





Sol officials at Swachta Mission

(iii) International Yoga day:

4th International Yoga day was celebrated on 21.06.2018 in Survey of India offices located at all over the country, as a part of International Yoga day. Sol officers and staff attended the programme with great interest and enthusiasm. The importance of Yoga and its mental, physical and spiritual benefits to human life has been conveyed to the staff of Sol.





Performing Yoga at Yoga Divas

(iv) Independence Day:

Independence day was celebrated in SoI offices on 15th Aug, 2018 with great spirit in all over the country. Offices were decorated in tri colour flags and balloons which gives the feelings of Nationalism. National Anthem Jan Gan Man and patriotic songs were song by the people presented in the occasion.



SGI addressing the staff on the eve of Independence day

(v) Hindi Pakhwada:

Hindi Pakhwada was celebrated at various offices in Survey of India, located in different cities from 14.09.2018 to 30.09.2018. During this period various activities: Hindi essay writing, Good hand writing, Noting – drafting, General knowledge, Poem and quiz competitions were organized to encourage the officers and staff to work more and more in our "Rajbhasha Hindi".





Pictures of Hindi function at Surveyor General's office, Dehradun

(vi) Republic Day:

Republic day was celebrated on 26th January, 2019 in SoI offices in all over the country with great national spirit. The main programme was organized in Surveyor General's Office, Dehradun. Surveyor General of India hoisted the national flag and address the officers and staff of SoI.



SGI hoisting the National Flag and addressing the officers and staff of SoI



(vii) National Science Day:

National Science Day was celebrated on 28th February, 2019 at various offices of Survey of India located in different places of the country. The Theme on this National Science Day was “Science for the people & people for the science”. A number of activities like Display of Instruments, latest technologies used by the department, Essay writing competition, sports quiz, contest etc were organized for the general public. Students of various schools, colleges and institutions located in various regions visited the National Survey Museum and offices of the department. An open day was observed on this day. Instruments historical as well as modern were displayed for the benefit of visitors to understand the changes that have taken place in the terms of technology transformation and their application to multidisciplinary activities of the Survey of India.



Students visiting Sol Offices

15. USE OF HINDI IN OFFICIAL WORK:

In accordance with the Official Language Rules, 1976, 15 Geo-Spatial Data Centres/Directorates/Printing Groups including Headquarter of Survey of India are located in Region ‘A’ while 6 Geo-Spatial Data Centres in Region ‘B’ and 20 Geo-Spatial Data Centres/Training Institutes/ Printing Groups are in Region ‘C’. The position regarding the use of Hindi in the Department for the year 2018-2019 remained as under.

(a) Correspondence:

During the year 2018-19 intensive measures were taken for transacting the official work of the union in Hindi by the various offices of the department. 6407 documents were issued bilingually under section 3(3) of the Official Languages Act, 1963. Letters received in Hindi were replied to in Hindi. Regionwise position regarding correspondence in Hindi remained as under.

i) Correspondence in Hindi by the offices located in Region ‘A’

With ‘A’ and ‘B’ Region	-	86.2%
With ‘C’ Region	-	53.8%

ii) Correspondence in Hindi by the offices located in Region ‘B’

With ‘A’ and ‘B’ Region	-	95%
With ‘C’ Region	-	66.7%



iii) Correspondence in Hindi by the offices located in Region 'C'

With 'A', 'B' Region and 'C' - 41.5%

(b) Training:

During the period under report 08 officers/employees passed Hindi Prabodh, Praveen and Pragya examination and 10 LDC's passed Hindi Typing examination, under Hindi Teaching Scheme.

(c) Hindi workshop/seminar/conference:

With a view to acquaint with the Official Language orders / rules and the target laid down in the Annual Programme Hindi workshops were organized in Surveyor General's Office, Dehradun, Eastern Printing Group, Kolkata, Madhya Pradesh GDC, Jabalpur, Central Zone, Jabalpur, Gujarat Daman & Diu GDC, Gandhinagar, Northern Zone, Chandigarh, Indian Institute of Surveying & Mapping, Hyderabad, Andhra Pradesh and Telangana GDC, Hyderabad. 139 officers/employees received training in these workshops.

(d) Incentive scheme:

During the year 2018-2019 incentive schemes for noting and drafting for doing Official work in Hindi, Hindi typing and Hindi stenography remained continued.

(e) Hindi day/fortnight/function:

During the year Hindi day/Hindi fortnight/Hindi functions were organized in the month of September in various offices of the Department. To encourage the use of Hindi various competitions pertaining to Hindi were organized on this occasion and the winners were awarded.

Chal Vijayanti Running Shield was given to the LAP Section for doing maximum work in Hindi in Surveyor General's Office, Dehradun. On the occasion of Prize distribution Ceremony Hindi quiz competition was also organized besides recitation of poems in Hindi.

(f) Publication of in-house magazine in Hindi:

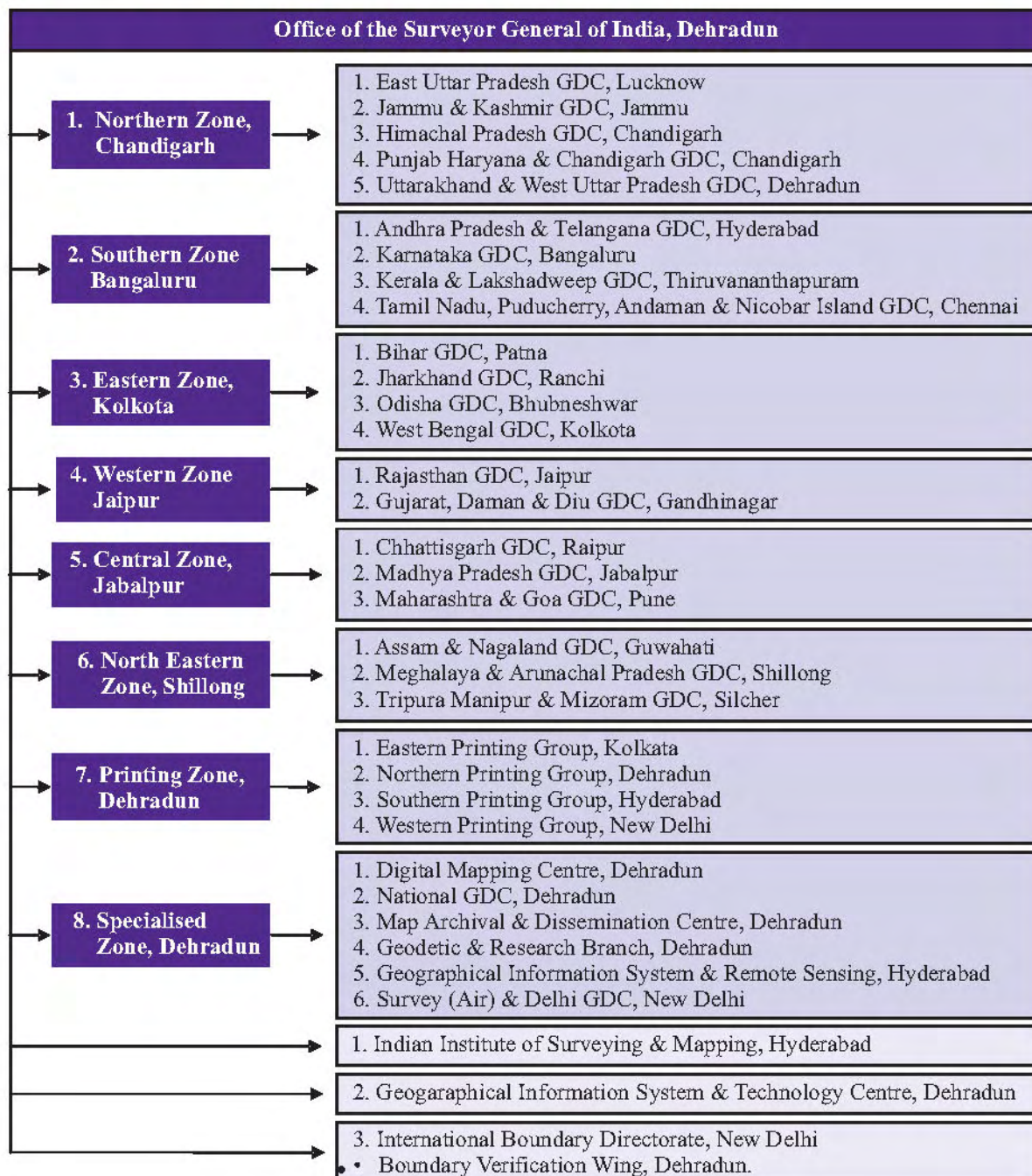
The following offices published in-house magazines in Hindi during the period under report.

Sl. No.	Name of Office	Magazine Name
1.	Surveyor General's Office, Dehradun	SarvekshanDarpan
2.	Town Official Language Implementation Committee, DDun	Doonvani
3.	Geodetic & Research Branch, Dehradun	Jhalak
4.	National GDC, Dehradun	Ujau
5.	Andhra Pradesh & Telangana GDC, Hyderabad	Kalakal
6.	Southern Printing Group, Hyderabad	Prerna
7.	GIS & Directorate Remote Sensing, Hyderabad	Pushpanjali
8.	Rajasthan GDC, Jaipur	NayaPrayas
9.	Indian Institute of Surveying and Mapping, Hyderabad	Pratibimb
10.	Eastern Printing Group, Kolkata	SarvekshanPariver

(g) Meetings:

Quarterly meetings of the Official Language Implementation Committee were held during the year 2018-2019 in almost all the Geo-Spatial Data Centres / Directorate etc. of the department located in Region 'A', 'B' and 'C'. In these meetings discussions were held to achieve the targets given in the Annual Programme issued by the Govt. for transacting the Official work of the union in Hindi.

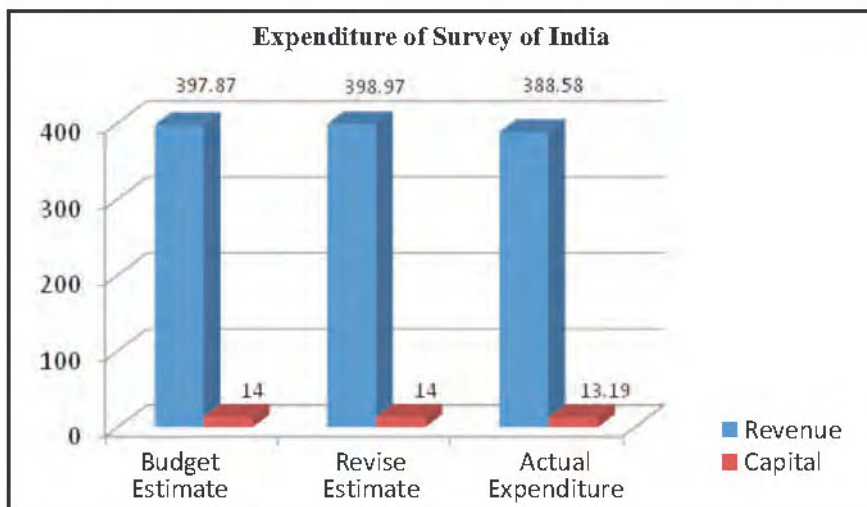
During the year half yearly meetings of the Town Official Language Implementation Committee, Dehradun were held in the chairmanship of Surveyor General of India.

16. ORGANOGRAM OF SURVEY OF INDIA

17. EXPENDITURE OCCURRED DURING THE PERIOD:

Expenditure of Survey of India

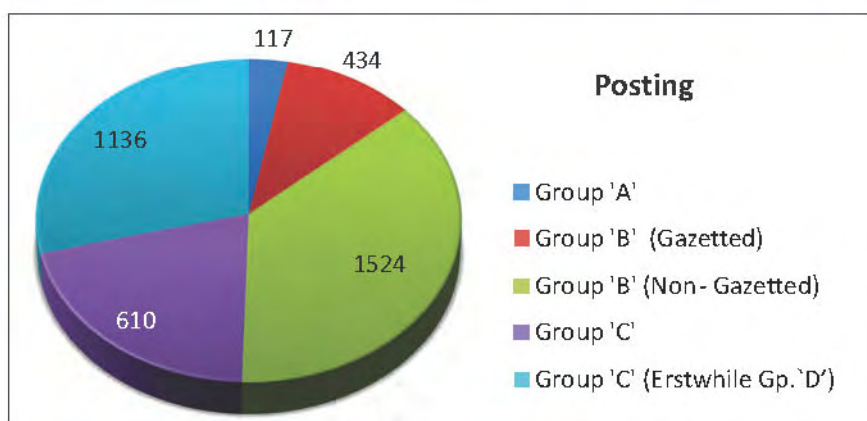
Expenditure Type (In Crores)	Financial Year 2018-19	
	Revenue	Capital
Budget Estimate	397.87	14
Revised Estimate	398.97	14
Actual Expenditure	388.58	13.19



18. MAN POWER RESOURCES:

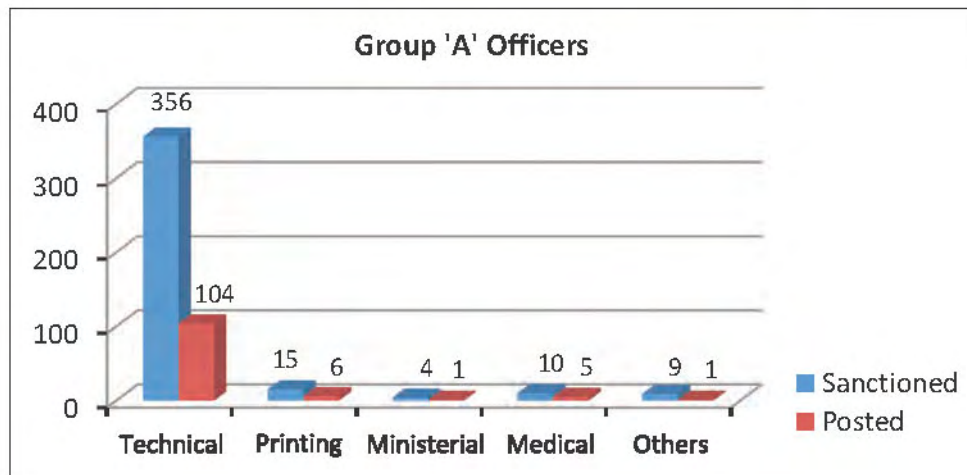
Strength as on 01-01-2019

Service Groups	Sanctioned	Posted
Group 'A'	394	117
Group 'B' (Gazetted)	611	434
Group 'B' (Non - Gazetted)	1897	1524
Group 'C'	3834	610
Group 'C' (Erstwhile Gp. 'D')	4454	1136
Total	11190	3821



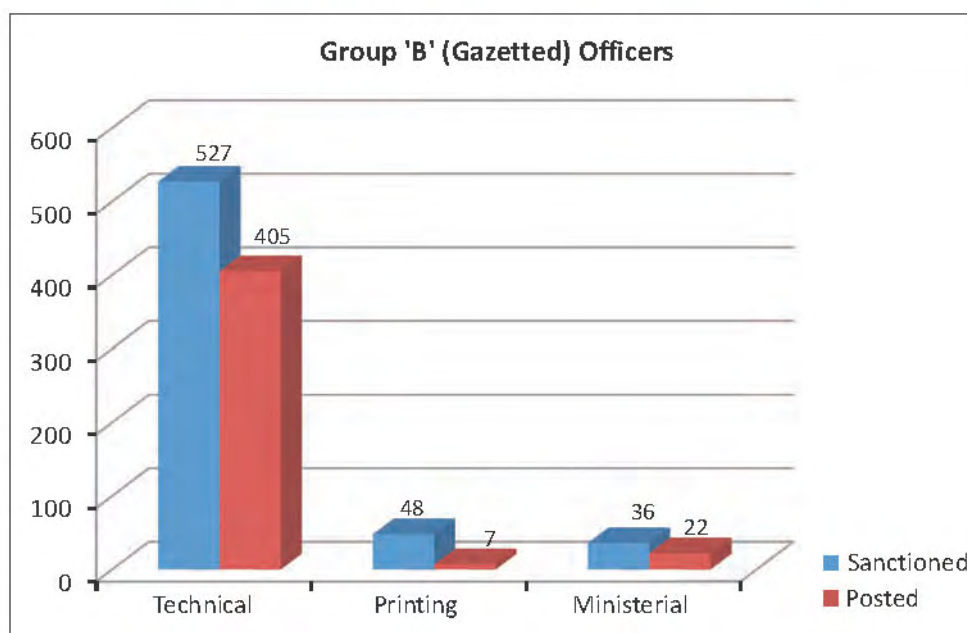
Group 'A' Officers

	Sanctioned	Posted
Technical	356	104
Printing	15	6
Ministerial	4	1
Medical	10	5
Others	9	1
Total	394	117



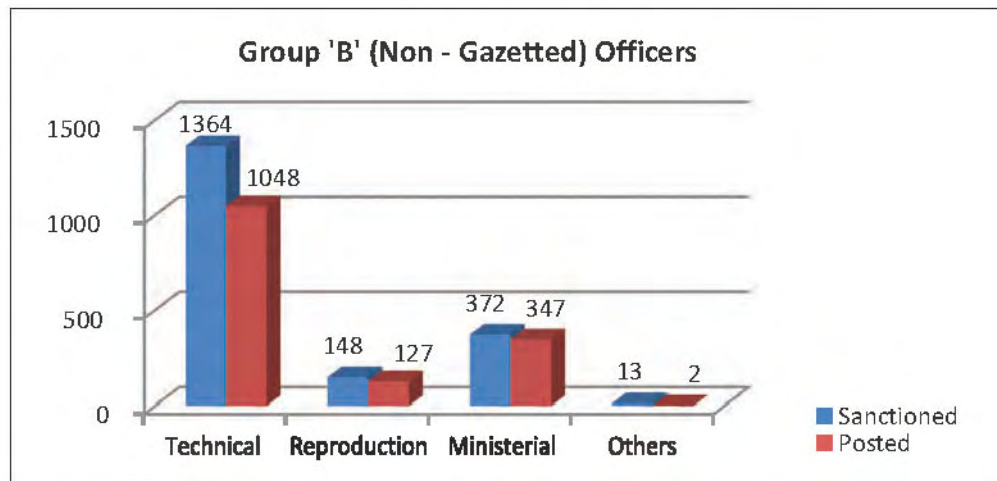
Group 'B' (Gazetted) Officers

	Sanctioned	Posted
Technical	527	405
Printing	48	7
Ministerial	36	22
Total	611	434



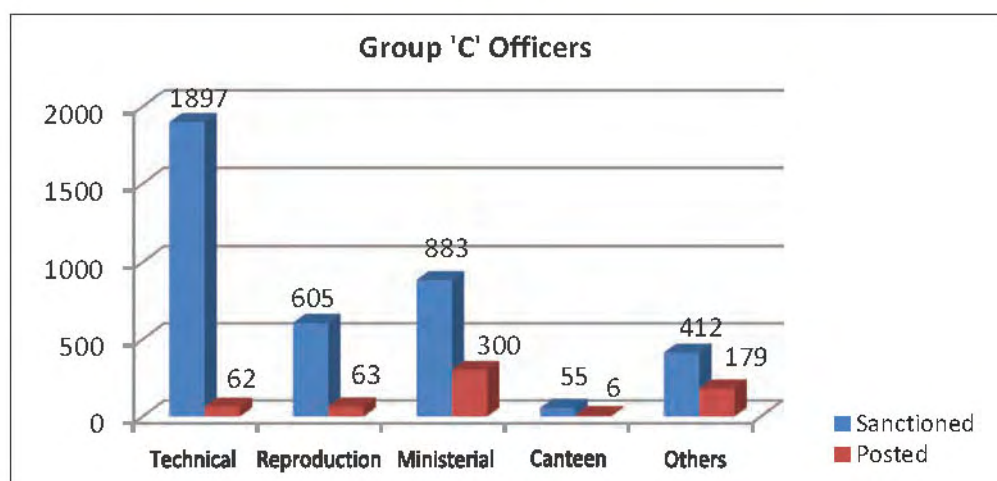
Group 'B' (Non-Gazetted) Officers

	Sanctioned	Posted
Technical	1364	1048
Reproduction	148	127
Ministerial	372	347
Others	13	2
Total	1897	1524



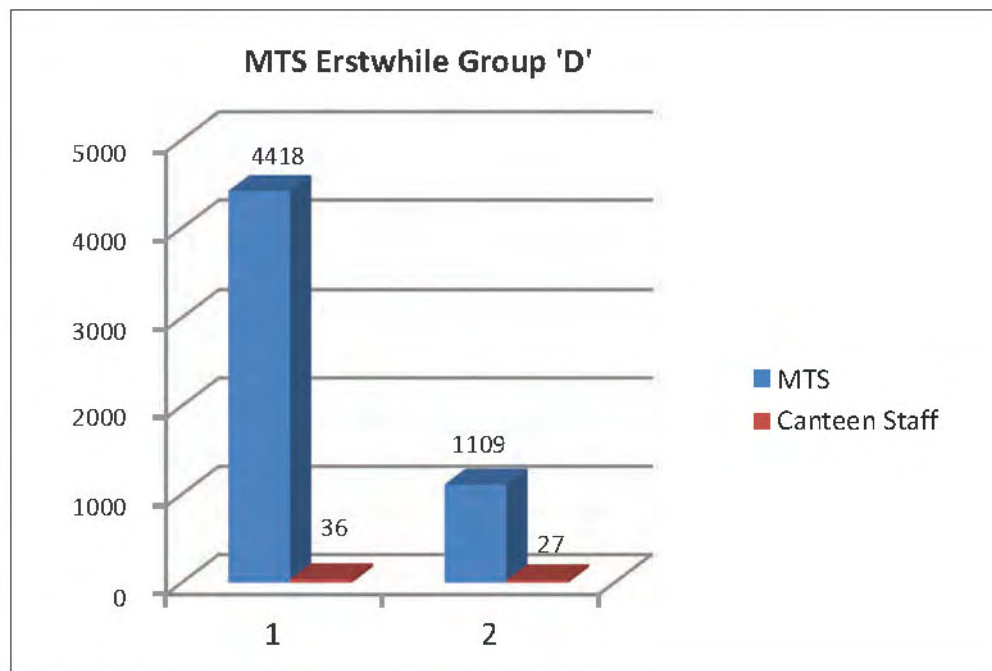
Group 'C' Officers

	Sanctioned	Posted
Technical	1897	62
Reproduction	605	63
Ministerial	883	300
Canteen	55	6
Others	412	179
Total	3834	610



MTS Erstwhile Group 'D'

	Sanctioned	Posted
MTS	4418	1109
Canteen Staff	36	27
Total	4454	1136



19. ACADEMIC AND CAPACITY BUILDING:

Indian Institute of Surveying & Mapping (IISM), Hyderabad is a premier institution providing training & capacity building in the field of Surveying, Mapping, Photogrammetry & GIS. Besides training to officers and staff of Survey of India, IISM also imparts training to other Government Organisations, Private Individuals and Scholars from various Afro-Asian countries.

Total 684 trainees including 7 foreign, 308 extra departmental and 33 private students have undergone training in IISM, Hyderabad during the year.



Regular/ Scheduled Courses

Sl. No.	Course No.	Nomenclature	Departl.	Extra Departl.	Foreign	Others	Total
1	110.19	Office procedure	17	0	0	0	17
2	112.03	Store Management	09	0	0	0	09
3	113.03	Record Management	07	0	0	0	07
4	125.06	Office Procedure - overview	11	0	0	0	11
5	150.85#	Surveying Technician	43	0	0	0	43
6	150.86#	Surveying Technician	09	0	0	0	19
7	150.87	Surveying Technician	23	0	0	0	23
8	170.05	Use of Total Station & GPS for beginners	04	0	0	03	10
9	170.05	Use of Total Station & GPS for beginners	0	0	0	06	06
10	315.16	Cadastral Survey & Land information system	0	04	0	0	04
11	340.52	Digitisation of cartographic documents	30	0	0	0	30
12	340.53	Digitisation of cartographic documents	03	0	0	0	03
13	340.53(A)	Digitisation of cartographic documents	45	0	0	0	45
14	340.54	Digitisation of cartographic documents	0	04	0	0	04
15	400.94(A)	Surveying Supervisor	03	0	0	0	03
16	400.94(C)	Surveying Supervisor	04	0	0	0	04
17	400.95#	Surveying Supervisor	04	0	0	0	04
18	440.27	Digital Cartography & GIS Application	0	01	0	0	01
19	465.07	GIS Application	10	0	0	0	10
20	480.46	Digital Photogrammetry & Remote Sensing	02	0	0	0	02
21	480.47	Digital Photogrammetry & Remote Sensing	0	06	0	0	06
22	485.06	Digital Photogrammetry & Remote Sensing	0	05	0	0	05
23	495.23	Refresher course for officer surveyor	06	0	0	0	06
24	500.75(B)	Surveying Engineer	06	0	0	0	06
25	500.77#	Surveying Engineer	04	0	0	0	04
26	500.78	Surveying Engineer	02	0	0	0	02
27	690.37	Control and Detail Survey by GPS & Total Station	0	0	0	04	04
28	690.38	Control and Detail Survey by GPS & Total Station	0	02	0	0	02
29	700.26#	Advance Geodesy	02	0	0	0	02
30	740.11#	Advance course on Digital Cartography & GIS	03	0	0	0	03
31	795.10	Digital Photogrammetry & Remote Sensing for Policy maker	02	0	0	0	02
Total			249	22	0	13	284

Special Courses For Specific Users

Sl. No.	Course No.	Nomenclature	Departl.	Extra Departl.	Foreign	Others	Total
1	Spl	Modern Survey Instruments & Techniques for officials from Dept. of Punduchery Land Records	0	15	0	0	15
2	Spl	AMRUT Sub- scheme on formation of GIS based master plans Tier II (Batch I)	0	04	0	0	04
3	Spl.	AMRUT Sub- scheme on formation of GIS based master plans Tier I.(Batch I)	0	23	0	0	23
4	Spl.	AMRUT Sub- scheme on formation of GIS based master plans Tier II (Batch II)	0	19	0	0	19
5	Spl.	Modern Survey Techniques for Bapatla Engineering College	0	11	0	0	11
6	Spl.	Capacity Building NHP (Control & Detail Survey using GPS & TS)	0	03	0	0	03
7	Spl.	AMRUT Sub- scheme on formation of GIS based master plans Tier I. (Batch II)	0	25	0	0	25
8	Spl	Geodesy for Aviation Research Centre officials	0	05	0	0	05
9	Spl.	AMRUT Sub- scheme on formation of GIS based master plans Tier I. (Batch III)	0	28	0	0	28
10	Spl.	GIS Mapping of Coal Mines for CMPDI Officials	0	10	0	0	10
11	Spl.	AMRUT Sub- scheme on formation of GIS based master plans Tier II (Batch I)	0	17	0	0	17
12	Spl.	Geo- spatial data base administration for NHP officials	0	04	0	0	04
13	Spl.	One day training for probationary IAS officers from Survey Training Academy, Hyderabad	0	13	0	0	13
14	Spl.	Use of GPS and Total Station in Cadastral Survey for officials from Revenue Dept. Uttarakhand, Batch I	0	20	0	0	20
15	Spl.	Use of GPS and Total Station in Cadastral Survey for officials from Revenue Dept. Uttarakhand, Batch II	0	20	0	0	20
16	Spl.	AMRUT Sub scheme on formulation of GIS based master plans Tier III Batch -II	0	19	0	0	19
17	Spl.	NTDB Generation using Arc GIS & SCMS (Batch I)	27	0	0	0	27
18	Spl.	NTDB Generation using Arc GIS & SCMS (Batch II)	48	0	0	0	48
19	Spl.	Geodesy for central water commission, New Delhi	0	22	0	0	22
20	Spl.	NTDB Generation using Arc GIS & SCMS (Batch III)	05	0	0	0	05
21	Spl.	Training on Surveying for the students of IIT, Hyderabad	0	0	0	20	20
22	Spl.	Photogrammetry for officials from Bangladesh	0	0	07	0	07
23	Spl.	Digital Photogrammetry & Remote Sensing for NATMO officers, Kolkota	0	11	0	0	11
24	Spl.	Global Positioning System Geodesy for officers of GSI Institute, Hyderabad	0	16	0	0	16
Total			80	285	07	20	392

Short Term Awareness Courses

Sl. No.	Course No.	Nomenclature	Departl.	Extra Departl.	Foreign	Others	Total
1	790.12	GPS and Total Station Concepts & Applications	02	01	0	0	03
2	800.14	Datum, Co-ordinates system & Map Projection Concept for Advanced Map user	05	0	0	0	05
Total			07	01	0	0	08

Besides regular courses at IISM, Hyderabad, SOI also conducted few special courses for different purposes as under.

- SOI has successfully conducted special course on Geodesy for officials of Survey of Bangladesh at Geodetic & Research Branch, Dehradun one of the specialized Directorates of SOI in Geodesy. Aim of the training is to share working experience in emergent trends of Geodesy. Survey of India has recently developed IndGeoid 2018 Beta version Geoid model for entire country. IndGeoid will fulfill the need of Geospatial community to provide the height and position information simultaneously at much faster speed using the GNSS technology, which will in result considerably reduce efforts and cost of surveying and mapping activity and ensure faster delivery of geospatial products.



Officials from Survey of Bangladesh attending training on Geodesy at SOI, Dehradun

- A Special course on Surveying for the B.Tech. students of IIT, Hyderabad, was conducted by IISM, Hyderabad.



- A special course on Land information system was designed and conducted for 40 Patwaris of Uttarakhand state revenue department at SOI, Dehradun.



SGI handing over the certificates to the trainees from Uttarakhand Revenue Dept.

- As a part of capacity building under AMRUT Scheme of Town Country Planning organisation, MoUD, Govt. of India, a special course was conducted by IISM, Hyderabad for 63 officials during the period.



- SOI is conducting “Surveying & Mapping Module” for IFS probationers at IGNFA, Dehradun every year and providing faculty support for module under induction course at Central Academy of State Forest Service (CAOFS), Dehradun.



20. REPRESENTATION OF SC/ST & OBCs:

SC/ST/OBC REPORT- I

Annual statement showing the representation of SC's, ST's and OBC's as on 01-01-2019 and number of appointments made during the preceding calendar year- 2018

Ministry / department / attached / subordinate office: **Survey of India, Dehradun**

Groups	Representation of SCs/STs/OBCs (As on 01-01-2019)				Number of appointments made during the calendar year 2018											
	Total no of Empls	SCs	STs	OBCs	By Direct Recruitment				By Promotion			By Deputation/Absorption				
					Total	SCs	STs	OBCs	Total	SCs	STs	Total	SCs	STs	OBCs	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Group A	125	11	8	13	6	1	0	3	0	0	0	0	0	0	0	
Group B	415	67	31	22	0	0	0	0	0	0	0	0	0	0	0	
Group C (Excluding Sweepers)	3285	791	209	318	0	0	0	0	450	11	4	435	0	0	0	
Group C (Sweepers)	60	52	1	2	0	0	0	0	0	0	0	0	0	0	0	
Total	3885	921	249	355	6	1	0	3	450	11	4	435	0	0	0	

SC/ST/OBC REPORT – II

Annual statement showing the representation of SC's, ST's and OBC's in various group 'a' services as on 01.01.2019 and number of appointments made in the service in various grade in the preceding calendar year - 2018

Ministry / Department / Attached / Subordinate Office: **Survey of India**

Level in Pay Matrix	Representation of SCs/STs/OBCs (As on 01-01-2019)				Number of appointments made during the calendar year 2018										
	Total no of Empls	SCs	STs	OBCs	By Direct Recruitment				By Promotion			By Other Method			
					Total	SCs	STs	OBCs	Total	SCs	STs	Total	SCs	STs	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
PB-3 5400	35	4	2	11	6	1	0	3	0	0	0	0	0	0	
PB-3 6600	25	3	2	1	0	0	0	0	0	0	0	0	0	0	
PB-3 7600	5	0	0	0	0	0	0	0	0	0	0	0	0	0	
PB-4 8700	49	2	3	3	0	0	0	0	0	0	0	0	0	0	
PB-4 8900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PB-4 10000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
HAG & above	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	117	9	7	15	6	1	0	3	0	0	0	0	0	0	

21. SC/ST/OBC&PERSONS WITH DISABILITIES:

PWD REPORT - I

Annual statement showing the representation of the persons with disability in services (As on 01-01-2019)

Ministry / Department: **Ministry of Science & Technology**

Attached / Subordinate Office: **Survey of India**

GROUP	Number of Employees				
	Total	In Identified Posts	VH	HH	OH
1	2	3	4	5	6
Group A	125	0	0	0	0
Group B	415	3	0	0	3
Group C	3285	31	0	2	29
Group D	60	0	0	0	0
Total	3885	34	0	2	32

- Note: (i) VH Stands for Visually Handicapped (persons suffering from blindness or low vision)
(ii) HH Stands for Hearing Handicapped (persons suffering from hearing impairment)
(iii) OH stands for Orthopaedically Handicapped (persons suffering from locomotor disability or cerebral palsy)

PWD REPORT – II

Annual statement showing the representation of the persons with disabilities in services (As on 01.01.2019)

Ministry / Department / Attached / Subordinate Office: **Ministry of Science & Technology**

Attached / Subordinate Office: **Survey of India**

Groups	Representation of of VH/HH/OH (As on 01-01-2019)				Number of appointments made during the calendar year 2018											
					By Direct Recruitment				By Promotion				By Deputation			
	Total	VH	OH	HH	Total	VH	OH	HH	Total	VH	HH	OH	Total	VH	HH	OH
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
GROUP A	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GROUP B	415	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
GROUP C (Excluding Sweepers)	3285	0	29	2	0	0	0	0	0	0	0	0	0	0	0	0
GROUP C (Sweepers)	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3885	0	32	2	0	0	0	0	0	0	0	0	0	0	0	0

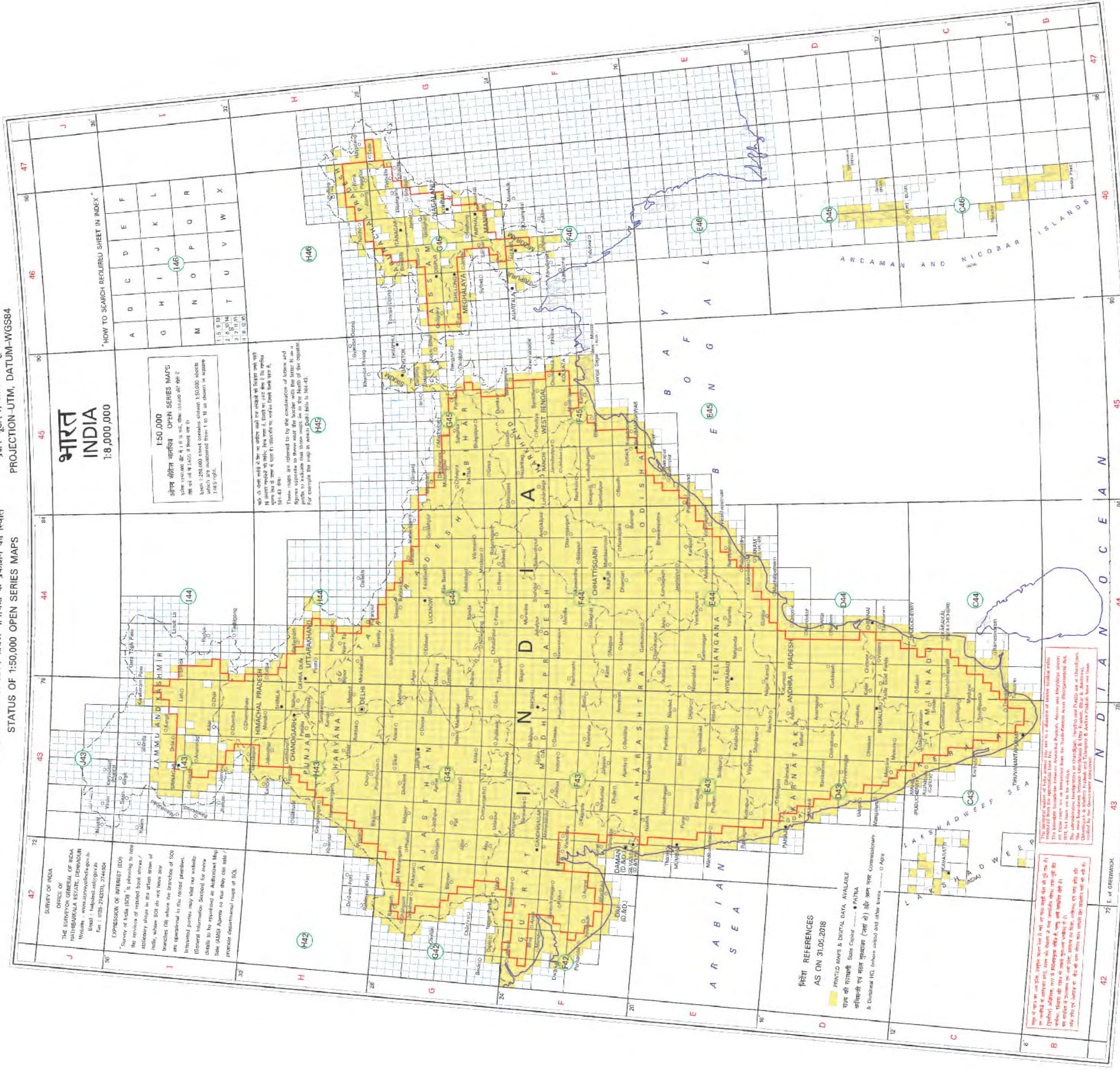
- Note: (i) VH Stands for Visually Handicapped (persons suffering from blindness or low vision)
(ii) HH Stands for Hearing Handicapped (persons suffering from hearing impairment)
(iii) OH stands for Orthopaedically Handicapped (persons suffering from locomotor disability or cerebral palsy)

भारतीय सर्वेक्षण विभाग के कार्यालयों की अवस्थिति



1:50,000 पैमाने पर ओपन सीरीज मानचित्रों के प्रकाशन की स्थिति
STATUS OF 1:50,000 OPEN SERIES MAPS

यूक्षेत्र-यूटीएम, आधार-इक्वैटोरियलB4
PROJECTION-UTM, DATUM-WGS84



भारत INDIA
1:8,000,000

HOW TO SEARCH REQUIRED SHEET IN INDEX -

A	B	C	D	E	F
G	H	I	J	K	L
M	N	O	P	Q	R
S	T	U	V	W	X

1:50,000 ओपन सीरीज ओपन सीरीज मानचित्रों
Scale 1:50,000 sheet contains details 1:50,000 sheets which are numbered from 1 to 28 as shown in separate 1:8.5 right.

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PRINTED MAPS & DIGITAL DATA AVAILABLE AS ON 31.05.2018

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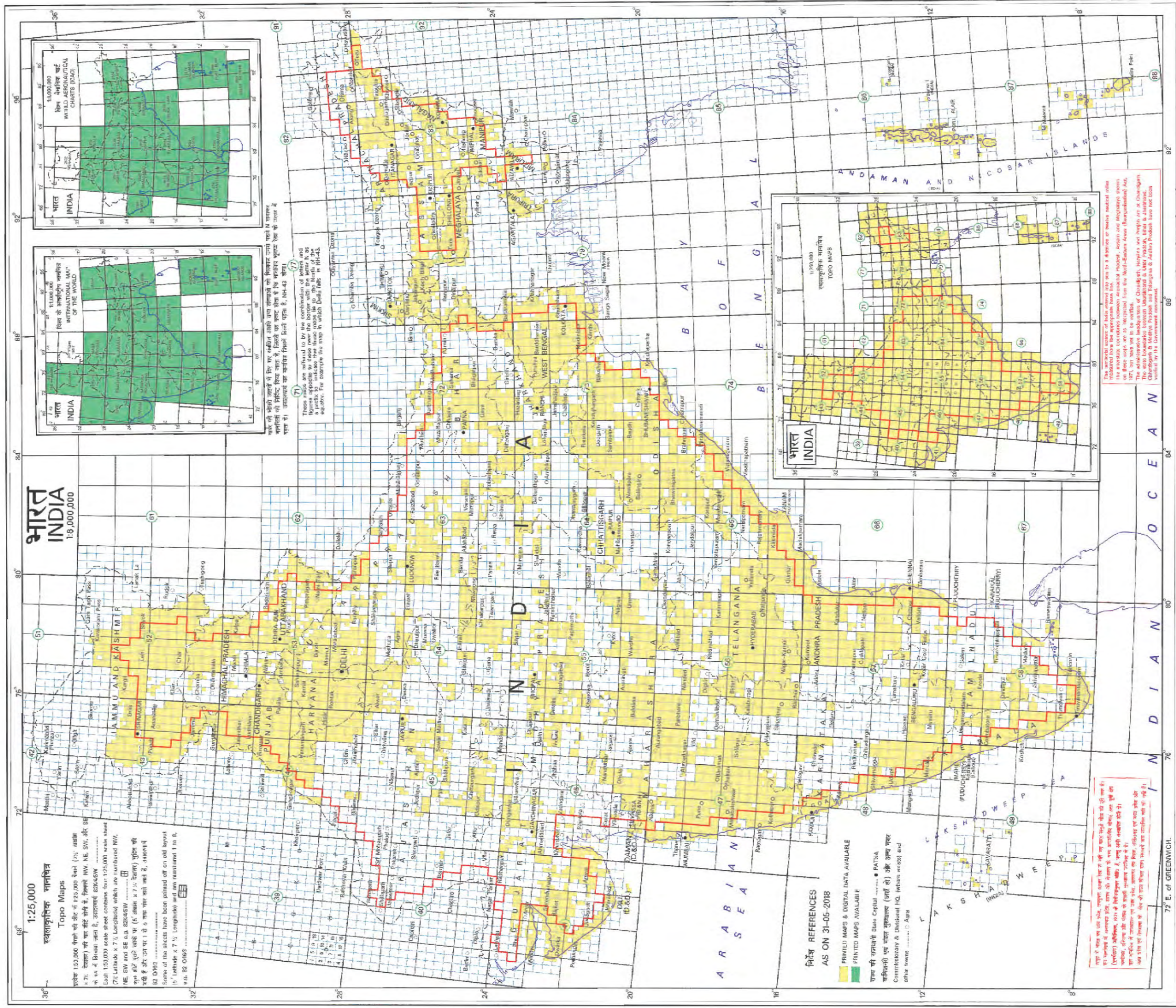
● PRINTED MAPS & DIGITAL DATA AVAILABLE AS ON 31.05.2018

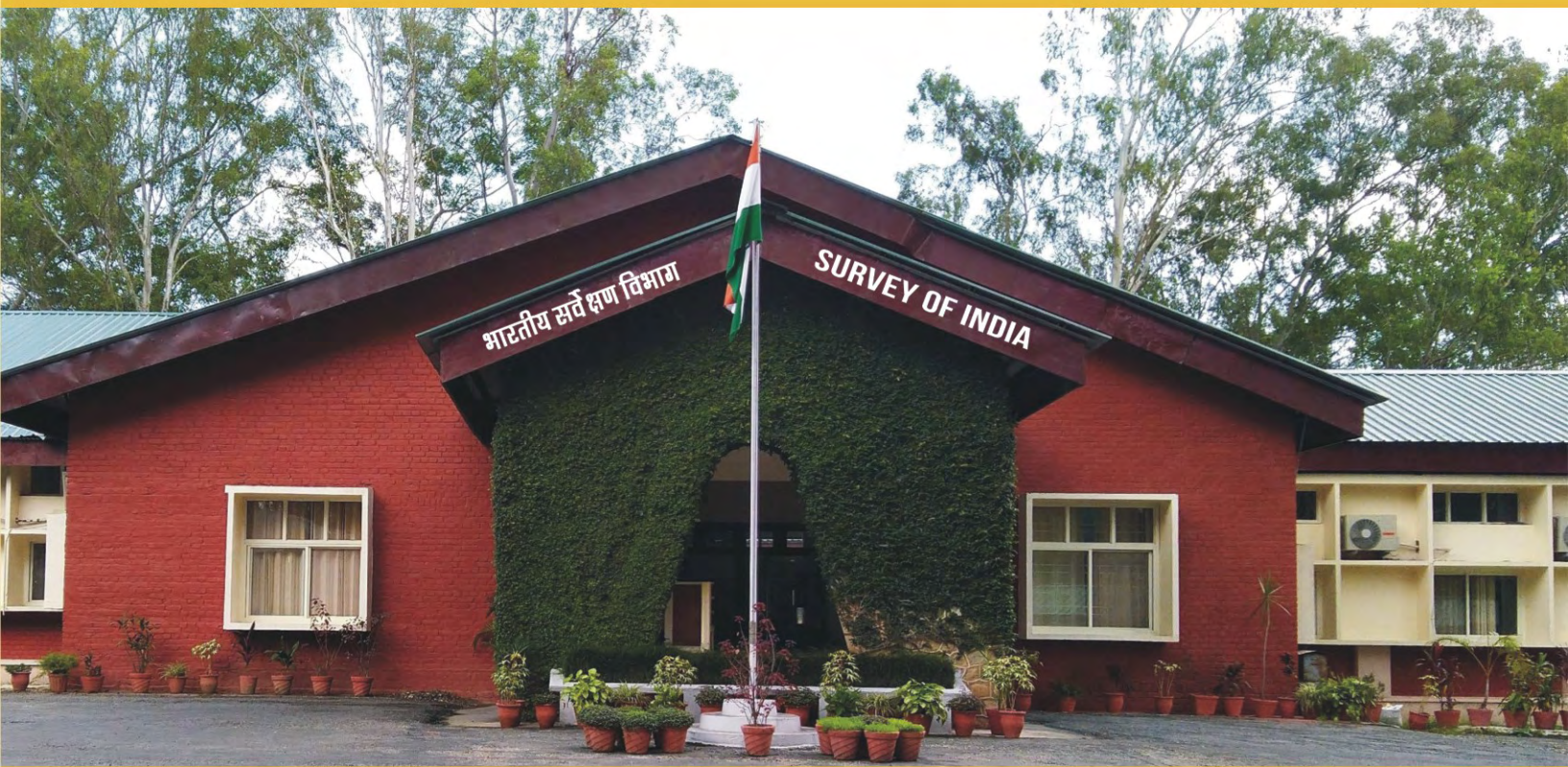
● PRINTED MAPS & DIGITAL DATA AVAILABLE AS ON 31.05.2018

1:25,000, 1:250,000 पैमानों पर स्थलाकृतिक मानचित्रों (प्रक्षेप - चोलिकोनिक, आधार - एक्स्टेट स्फीरॉइड) और 1:1 मिलियन पैमाने पर विश्व के अन्तर्राष्ट्रीय मानचित्र तथा विश्व वैमानिक चार्ट (अन्तर्राष्ट्रीय सिविल विमान संगठन) के प्रकाशन की स्थिति

STATUS OF 1:25,000, 1:250,000 TOPO MAPS

(PROJECTION - POLYCONIC, DATUM - EVEREST) AND 1:1 M, IMW & WAC (ICAO) CHARTS





SURVEY OF INDIA
Department of Science & Technology

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