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Geospatial Data Regulations in India

In February, 2021, the Department of Science and Technology (DST) liberalised the heavily-regulated geospatial sector in India by issuing the 'Guidelines for Acquiring and Producing Geospatial Data and Geospatial Data Services Including Maps' ('the Guidelines'). The publishing of these guidelines was followed by the release of the Draft National Geospatial Policy (the 'Draft NGP') on 27th April, 2021, a more comprehensive plan to encourage the growth of the geospatial economy in the country. This TEAL Whitepaper delves into the significance of these steps by exploring the history of regulating geospatial data in India and provides suggestions for improvements to the draft policy.

Background

The Indian government's outlook on the sharing of geospatial data has undergone several changes over the years. Until the 1950s, maps prepared by the Survey of India (SoI) could be used only for official purposes, and their dissemination by "unauthorised persons" to the public was barred by the Official Secrets Act, 1923.[1] In the 1950s the chief mandate of the SoI was to provide the requisite geospatial data to the defence forces.[2] In 1965, the Defence Department permitted the public distribution of maps of scale 1:4 million by the SoI.[3] More recently, with the release of the National Map Policy of 2005, SoI was made the nodal agency for coordinating all the processes involving geospatial data. The new policy, however, continued to impose several prohibitions on the digitisation and sharing of geospatial data.

Generally, the Geospatial Information (GI) sector in India has been characterised by over-regulation, complicated compliance procedures and overriding national security concerns.

[1] R. Ramchandran (2000)- Public access to Indian geographical data

[2] The Centre for Internet and Society (2016)- Legal Challenges to Mapping in India #1 - Laws, Policies, and Cases

[3] Ibid

Piecemeal policy formulation

Since the pre-independence period, different agencies were entrusted with producing and sharing GI through relevant policies. For instance, in 1907, the SoI was first tasked with preparing an International Map of the World. The scope of its functions was gradually increased through a series of orders and guidelines such as the Map Policy formulated in 1947 through the Departmental Paper No. 17,[4] and most recently, the National Map Policy released in 2005. Similarly, the Geological Survey of India (GSI) which was established in 1851 to find coal reserves to power the Railways,[5] had the scope of its functions expanded through a series of orders. In 2008, GSI was entrusted with geological mapping and the assessment of mineral resources in the country through the National Mineral Policy.[6]

Till the issue of the 'Guidelines for Acquiring and Producing Geospatial Data and Geospatial Data Services Including Maps' ('the Guidelines'), there were broadly five policies[7] governing the Geospatial Information (GI) sector-

- The **Remote Sensing Data Policy (RSDP) (2001),** which deals with all activities pertaining to the operation of remote sensing satellites in India by ISRO and the procedure of obtaining a license from the agency to use satellite data
- The **National Map Policy (2005),** which deals with the restrictions on the preparation and sharing of maps by the Survey of India (SoI)
- The **National Data Sharing and Accessibility Policy (NDSAP) (2011),** which enlists provisions related to the sharing of publicly funded data
- The **Delhi Geographical Spatial Data Infrastructure (Management, Control, Administration, Security and Safety), Act (2011),** which enlists provisions related to the collection, digitisation, storage, and dissemination of geospatial data in Delhi
- The **Civil Aviation Requirement (CAR) (2012)**, which outlines the compliances that agencies must fulfil in order to undertake activities such as aerial surveys and cloud seeding

Restrictive conditions on the sharing of data

Prior to the issuance of the February 2021 guidelines, the prevailing regulations imposed considerable restrictions on the dissemination of different kinds of geospatial data in India. For

[4] Survey of India (2009)- Section I, Handbook of Topography
[5] Geological Survey of India Website
[6] Ibid
[7] National Institute of Advanced Studies (2012)- Perspectives for National GI Policy

instance, under the National Map Policy (2005), Open Series Maps[8] having a resolution finer than 1:1 million were required to be disseminated either through sale or via an agreement between SoI and the other transacting party. Similarly, under the RSDP (2001), only the government could produce and own satellite data through its nodal agency- the National Remote Sensing Data Centre (NRSDC) of ISRO. It was thus only possible to access satellite imagery above a certain resolution by obtaining special permission from the NRSDC.

Overriding National Security Concerns

Despite demands from geospatial experts and professionals to undertake the acquisition of the latest geospatial technology and improve India's operational capabilities, the government continues to restrict private investment in the GI sector, and prohibit the collection and sharing of several types of data by state agencies like the Indian Space Research Organisation (ISRO). As a result, experts assert that India's satellite imaging capability is below its potential and there is limited availability of high-resolution images for many regions in the country. This poses a challenge to the setting up of a national-level Geographic Information System (GIS); India will have to rely on a mix of Indian and foreign images to set it up, posing further challenges to GI processing in terms of issues related to data compatibility, usability, rationalisation and costs.[9] Moreover, rapid advancements in foreign mapping platforms like Google Maps, make it difficult for Indian companies to be globally competitive in the sector. **The challenges faced by India in addressing these issues can be largely attributed to prevailing concerns over state security.**

In 2016, in the aftermath of the Pathankot attack when terrorists infiltrated an Air Force base in Pathankot using information obtained from Google Earth and Google Maps, the government prepared a 'Draft Geospatial Information Regulation Bill' (GIRB) to tackle the threats being purportedly caused by the dissemination of geospatial data. Had the GIRB been enacted, wrongly depicting India's map would have attracted imprisonment up to seven years, and innocuous activities like taking photographs from aeroplanes would have been criminalised.[10] The GIRB also sought to impose additional restrictions on the dissemination of geospatial data; activities such as the sharing of location via WhatsApp would have been outlawed and platforms like Ola and Uber would have had to obtain special licenses from the government to service customers.[11, 12]

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[8] The National Map Policy (2005) classifies topographical maps prepared by the Survey of India into Defense Series Maps (DSMs) which are classified and may be used for security purposes only and Open Series Maps (OSMs) which may be disseminated after obtaining a clearance from the Ministry of Defense.

[9] National Institute of Advanced Studies (2012)- Perspectives for National GI Policy

[10] The Wire (2016)- Draft Geospatial Bill Criticised by Cyber Law Experts

[11] Ibid

[12] Foreign companies using satellites already possess high-resolution images of different countries including India and its military bases. Indian legislation cannot prohibit them from selling these images to other parties. A

However, after considerable opposition from industry experts such as online map-makers, GPS-providers and satellite-launchers, the GIRB was shelved by the Home Ministry.[13]

Draft National Geospatial Policy

The 'Guidelines for Acquiring and Producing Geospatial Data and Geospatial Data Services Including Maps' ('the Guidelines') and Draft National Geospatial policy released in 2021, mark a departure from the trend of imposing strict prohibitions on the collection, digitisation and sharing of geospatial data, barring some protectionist features contained in them. The Draft NGP, upon the release of its final version, will have to be followed up with supporting legislations and/or executive orders for it to be enforceable.

Key takeaways of the Draft NGP

Map-making liberalised for Indian entities

By adopting the provisions of the 'Guidelines for Acquiring and Producing Geospatial Data and Geospatial Data Services Including Maps' ('the Guidelines'), the Draft NGP has reiterated the importance of dismantling the prohibitory restrictions on map-making imposed by the National Map Policy (2005). Until now, gaining access to geospatial data for map-making was extremely difficult not just for the industry but also for academics who had a difficult time obtaining such data for research purposes or applications.[14] The Guidelines seek to do away with the requirement of obtaining a security clearance from government agencies for making maps. However, these restrictions are removed only for Indian entities and not foreign entities. Indian organisations are allowed to digitise, store and distribute geospatial data having a planimetric spatial accuracy of 1 metre and vertical accuracy of 3 metres ('the threshold value'), except data pertaining to certain sensitive 'negative attributes'.[15] The Guidelines are applicable to the sharing of high-resolution topographic data released by the Survey of India (SoI).

prohibitive geospatial policy would only impede the ability of the private sector operating in India to produce high-quality geospatial data without mitigating the threat of such data being used by entities seeking to harm India's national security.

[13] The Wire (2017)- How the Controversial Geospatial Bill Snowballed – And Was Then Shoved Into Cold Storage

[14] The Wire Science (2021)- The New Geospatial Data Guidelines Are Revolutionary – but Can Also Do More

[15] These negative attributes are to be notified by the Department of Science and Technology.

Restricted access continues for foreign entities

The Draft NGP prohibits foreign companies and foreign-owned/controlled Indian companies from digitising, storing and sharing maps that have a resolution finer than the threshold value unless they do so by obtaining a license from an Indian company. Additionally, these foreign entities may use such data only to service Indian clients within the territory of India.

NDSAP Policy for sharing publicly-funded data

Geospatial data produced by using public funds will be shared in accordance with the National Data Sharing and Accessibility Policy, 2012 (NDSAP). The NDSAP requires the relevant government departments to classify geospatial data into (1) 'Open Access Data' which is publicly accessible at all times, (2) 'Registered Access Data' which may be accessed after fulfilling certain compliances, and (3) 'Restricted Access Data' which is sensitive in nature and requires special authorisation by the relevant department for dissemination.

Pricing policy of Open Access Data

Under the National Data Sharing and Accessibility Policy, 2012 (NDSAP), the relevant government departments are entrusted with fixing the prices of Geospatial Data, Products, Services and Solutions (GDPSS) produced by using public funds. 'Open Access Data' will be provided to state entities free of charge, and to private entities either free of charge or at a fair and transparent price which will be fixed by the department.

Data storage to be machine-readable

At present, many government agencies store their data in pdf or other image formats. For instance, the maps given in the Master Plans of multiple cities are available only in a pdf format. The Draft NGP emphasises the need to store geospatial data in an interoperable and machine-readable format.

Creation of a National Data Registry

To prevent the duplication of efforts by multiple agencies while digitising and storing data, a National Data Registry (NDR) will serve as a unified platform for access to all geospatial data repositories in the country.

Focus on improving geospatial education

The Draft NGP emphasises the need for the development of a standardised curriculum for geospatial education at the university level. The policy envisages a three-tier classification of geospatial professionals who will work in the sector based on their educational qualification; (1)

GIS mapping and surveying professionals; (2) graduates having specialised knowledge and training of 9 to 12 months in specific topics within the geospatial sector; (3) geospatial experts having graduate or postgraduate degrees in Geospatial Science. For the training of professionals in the bottom and middle tiers, the Policy emphasises the role of skill development institutions such as the Industrial Training Institutes and the National Skill Training Institutes.

Geospatial Data Promotion and Development Committee

As required by the Guidelines, the Geospatial Data Promotion and Development Committee (GDPDC) will be constituted to govern the Geospatial sector. This includes notifying the negative attributes, supervising the updating of the High Resolution National Topographic Database produced by the SoI, and coordinating the efforts of State-level Lead Agencies which will be entrusted with resource and personnel management and the assessment of existing standards pertaining to the digitisation of geospatial data.

The Draft NGP also enumerates the 'National Foundation Geospatial Data Asset data themes' covering topics such as 'Administrative Boundaries', 'Geodetic Depth' and 'Land Parcels and Properties'. It entrusts the GDPDC with coordinating the practices and standards governing the collection, digitisation and storage of geospatial data pertaining to each of these themes.

Geospatial Sector Skill Council

The Draft NGP recommends the constitution of a Geospatial Skill Council to certify geospatial professionals in coordination with the National Skill Development Agency and by using the National Skills Qualifications Framework for reference.

Formulation of a Surveyors' Act

The Draft Policy recommends the enactment of a Surveyors' Registration Act along the lines of the Chartered Accountant Act and Advocates' Act, to govern the registration of surveyors and their practices.

Challenges and Recommendations

Removal of restrictions on foreign entities

Rather than imposing a blanket ban on foreign entities seeking to work with geospatial data finer than the threshold resolution, the government can restrict them from using data that is 'sensitive' from the viewpoint of protecting state security. The absence of robust competition

from technologically advanced foreign entities may hamper the ability of the Indian private sector to innovate in the geospatial technology sector and have an adverse impact on the ease of doing business in India. Lastly, such protectionism will curtail dialogue between Indian and foreign entities including universities, researchers, think tanks and companies, limiting valuable collaboration and knowledge exchange between them.

Institution of a fair pricing system

Although the Draft NGP requires the relevant government department to make the sharing of Open Access Data either free of charge or fair and transparent, it is silent on the pricing policy of Registered Access Data and Restricted Access Data. It is important that geospatial data is made widely available and affordable to realise the true potential of the sector. Prohibitive pricing of data would defeat this objective. Moreover, entrusting the government departments to come up with 'fair and transparent' prices for giving access to Open Access Data may not be adequate. Instead, the constitution of a system to review the prices fixed by the departments, and keep them affordable will be more helpful. Differential pricing may also be considered depending on the purpose of using the geospatial data acquired. Data usage for humanitarian and research purposes could be shared free of cost or at cheaper rates to users.

Machine-operability of raw data

The Guidelines plan to deregulate all kinds of geospatial data including aerial or satellite data such as RADAR, LIDAR, bathymetric data and street view.[16] It is important that this data is shared in machine-readable formats like raw imagery and shapefiles and not just made accessible through platforms for viewing like Indian Space Research Organization's Bhuvan.

Ease of access to geospatial data

The Draft NGP is silent on the format of the National Data Registry (NDR) and how users will interact with it. For instance, will users be redirected to the relevant geospatial repositories through the NDR? Additionally, will it be possible for users to not only access raw data repositories but also portals like Bhuvan or SoI's Nakshe portal through the NDR? The Department of Science and Technology should ensure that the establishment of the NDR makes access to geospatial data systematic and easy. It is also important to reduce, if not eliminate any manual requirements on the part of the user to access the relevant geospatial data. Digitising the payment process for using Open Access Data and the compliance process for accessing Registered Access Data will go a long way in improving the ease of using geospatial data.

[16] The Wire Science (2021)- The New Geospatial Data Guidelines Are Revolutionary – but Can Also Do More

Access to Census data on administrative boundaries

It is important that Census data digitised by the SoI and containing administrative boundaries is made available as shapefiles. The NGP should also state if this data is the authoritative data on India's administrative boundaries. This would reduce considerable confusion regarding boundary demarcation within the Indian territory and pave the way for the standardisation of map-making across sectors. At present, the map of India with its administrative boundaries is uploaded in pdf format on the Survey of India (SoI) website.

Geospatial policy in other countries

Several Western European countries, along with the United States and Japan which lead in geospatial innovation and data usage, have a fairly liberalised geospatial sector. Below are some key features of the geospatial policies in other countries-

- **Public access-** The United States, Japan and several European countries follow an open access policy for the sharing of most types of geospatial data. In the United States, federal agencies are not allowed to secure the copyright of their works. Barring nine exceptions, the US government is obligated to share publicly funded data.[17] Other countries in Europe have started opening up their geospatial sector; for instance, the government of Denmark in 2013 released digital mapping data under an Open License as part of its Basic Data programme.[18] A 2017 study estimated that the opening up of the sector led to approximately USD 495 million in socio-economic value in Denmark in 2016.[19]
- **Pricing-** Publicly funded data is generally free or priced very low in several countries. The United States and Japan make government data freely accessible to the private sector. Private sector agencies, however, charge for value-added services. In the United Kingdom and France, a minimal charge based on the cost of recovery principle is imposed.[20]

In many federal countries such as the United States and Australia, there are very few national-level GI policies that are applicable to the entire state. Typically, except for certain state-wide restrictions imposed in the interest of national security, the respective state governments formulate their own policies governing the production and dissemination of geospatial data.

[17] National Institute of Advanced Studies (2012)- Perspectives for National GI Policy
[18] Ibid
[19] PWC (2017)- The impact of the open geographical data: Follow up study
[20] Ibid