An Overview of Geospatial Industry in India

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[**Abstract**: *The venture of gathering, storing, integrating, managing, mapping, analysing, displaying and distribution of information linked to a particular location of earth has grown into geospatial industry and its products have become essential tools of governance and resource management. The industry's special set of technologies ranging from Global Positioning System and Global Navigational Satellite Systems is devised to measure angles and distances. The applications of the products of this industry cover a wide variety of areas, for instance, in allocation and management of resources, and defence & public safety. The centre and the states are collectively spending around $3 billion on geospatial components of their programmes. The size of the Indian geospatial industry is of the order of $4 billion dollars and it is growing annually at the rate of 12–15 per cent, and which may grow to be of the size of $20 billion dollars by 2025. The government came out with National Geospatial Policy in April 2016, which was soon followed by the Geospatial Information Regulation Bill in May 2016. The aims and objectives of the policy are towards empowering people through geospatial technologies and recognising the potential of a vast market for the geospatial industry as geospatial data can be easily disseminated. However, the Bill is not compatible with the Policy and is rather regressive; it does not recognise the power and reach of emerging technologies as the mindset is stuck in the era of paper maps. As a result, the Bill can have a negative impact on the growth of the geospatial industry.*]

Geospatial denotes data that is associated with a particular location. This means that records in a dataset have location information tied to them such as geographic data in the form of co-ordinates, address, city or pin code. Geographic Information System (GIS) is a form of geospatial data. Geospatial technology consists of techniques used in visualisation, measurement and analysis of earth's features and connected instruments and equipment. Geospatial industry consists of individuals, private companies, non-profit organisations, academic and research institutions, and government agencies that research, develop, manufacture, implement, and employ geospatial technology to gather, store, integrate, manage, map, analyse, display, and distribute geographic information, i.e. information tied to a particular location on

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Earth. Geospatial technologies which have come in use include Global Positioning System (GPS) and other Global Navigation Satellite System (GNSS) devices to measure angles and distances, Light Detection and Ranging (LIDAR) for remote sensing and aerial photography, Location Based Services (LBS), Computer Aided Design (CAD), and GIS. The geospatial industry includes basic and applied research, technology development, and applications to address all types of planning, decision-making, and operational needs of the government, the private sector, science and individuals.[1]

India's geospatial market has been growing remarkably. In India, all levels of government, i.e. national, state and local, need data for governance. Geospatial data and aided applications are helping departments across sectors with the same. Many government departments in India use a variety of geospatial technologies like GIS, Remote Sensing, LIDAR, GNSS, Surveying and Mapping, etc. The Government of India has been interested in measures connecting space and location technologies with development and governance. The use of geospatial map data and applications is spread across a wide variety of areas, including legislative and policy development, allocation and management of natural resources, defence & public safety purposes, spatial planning and informed decision which are being arrived at throughout sectors of importance to economy. All flagship programmes, be it Smart Cities, Skill Development, Digital India, Start-up India, Make in India, the Clean Ganga Project, or the push to infrastructure, industrial development, energy, and smart agriculture, have substantial geospatial components. The estimated annual budget of government agencies for GIS services is $3 billion. At present, the size of the Indian geospatial industry is of the order of $4 billion, which is growing annually at the rate of 12–15 per cent, and which may become a market of $20 billion by 2025.[2] Such a transformation has been possible because during the 11th Five Year Plan, the use of geospatial technologies, with 8 per cent of total project budget, was mandated in several infrastructure segments like rural development, power, land and natural resources.

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[1] Luccio, M. (2008), "What is the Geospatial Industry," The MetaCarta Blog, August 7. Available at: https://metacarta.wordpress.com/2008/08/07/what-is-the-geospatial-industry/
[2] Chandel, K. (2016), "Four Facts You Need to Know About the Indian Geospatial Market," *Geospatial World*, June 17. Available at: https://www.geospatialworld.net/blogs/four-facts-indian-geospatial-market/

This initiative altered the geospatial ecosystem in the country. At the time of mandating project spend on infrastructure projects referred to above, all important components that were required for the growth of geospatial industry were in place in the form of comprehensive remote sensing programme, and institutional framework credit in the context of national natural resources management, with about 35 institutions providing degrees in geospatial technology and applications.[3] As a result of the aforementioned initiative, geospatial technology has come to be recognised as an effective tool for planning, management and decision-making. Such recognition has been gained not only at the local level, but also at the global level.

As of now, geospatial technology has made inroads into various sectors both in the public and private domains in India. The major sectors using this technology are agriculture, telecommunications, oil & gas, environmental management, forestry, public safety, infrastructure, and logistics. As the utility and cost effectiveness of this technology is being realised, the geospatial industry is on a healthy growth path.

Until a decade ago in India, government departments and their agencies were the only source of geospatial information. Opening up of mapping data and information by the state has enabled enhanced private participation in this sector.

The geospatial market comprises four identifiable components—data, software, hardware, and services. Of these, hardware and services segments have shown significant growth in India with players both in the public and private sectors.

The Indian geospatial industry consists of two distinct but mutually supporting segments. The larger segment is international segment which is geared to provide geospatial data and software development services for international organisations. The other segment, i.e. the domestic segment, provides geospatial capabilities to the Indian data providers and users.[4]

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[3] Geospatial World (2010), "India – Geospatial Industry: Innovation for Growth," November 30. Available at: https://www.geospatialworld.net/article/india-geospatial-industry-innovation-for-growth/

[4] FICCI (Undated), Overview: Geospatial Technologies Sector Profile. Available at: ficci.in/sector/85/Project_docs/Sector-Profile-Geospatial-Technologies.pdf

Because of the support provided by the central and state governments as well as the creditable space and IT expertise, the geospatial industry in India has manifold advantages for its growth. There is excellent infrastructure and expertise for collection of geospatial data. Therefore, the development of geospatial industry in India has been significant with mature players having marketed the benefits of geospatial information over the past decades. Because of the availability of strong expertise in geospatial sector, many transnational geospatial companies have a strong presence in India.[5]

The Government of India came out with the National Geospatial Policy (NGP) 2016 in April 2016 which was followed by the Geospatial Information Regulation Bill 2016 in May 2016. The aim of the NGP is to empower people through geospatial technologies. The NGP recognises multiple sources through which geospatial data is made available, such as crowd-sourcing, surveying, remote sensing, mobile phones, location based services, and geospatial web services. The NGP also recognises mass markets of geospatial data that exist (e.g., Google Maps sourcing mapping data from third parties) and the likelihood of growth of actors involved in the creation, distribution and acquisition of such information. The NGP policy aims for easy availability of geospatial data and easy accessibility to anyone interested in using it. The policy stipulates open access to geospatial data to all users, including government departments and private sector, proposing a classification of geospatial data into three categories: data that can be freely accessed without registration or authorisation, data that will need simple registration and payment of a fee, and data that will need special access where clearances and permissions are necessary, which must be granted through a single window system within 30 days. The Policy further lays down that the classification of data would be based on features and not on the basis of requirement. For example, military installations will be blurred out. Government will issue guidelines making it permissible for collection and survey of ground based data.

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[5] *Ibid*.

The NGP encourages the involvement of private sector in all spheres of geospatial domain. Research and development by private sector would also be encouraged, including by start-ups.

The NGP does not talk about restricting the creation, use or distribution of geospatial data; rather, it talks of making it easily available. Restrictions would be put on restricted data only. For example, mapping of border regions and military or nuclear features has always been prohibited, and it will continue to be so. Likewise, high resolution satellite imagery will come under the restricted category. This leaves a huge amount of geospatial data free, such as low resolution images and ground based data, which can be used by people and various actors like Google Maps.[6, 7]

The NGP, however, even if finalised, will remain a mere policy and intent. The Geospatial Bill, if enacted, would become an enforceable law. The provisions of the Geospatial Bill—in sharp contrast to the NGP—are highly regressive to the extent of making even apps like Google Maps impracticable.[8] The Bill requires licensing for several acts which are very fundamental to the use of geospatial data today. For example, Google Maps creates maps by mapping data sourced from third parties. It also collects and uses this data for several purposes like providing information on traffic congestion, informing users of landmarks, etc. According to the Bill, it will become illegal if done without a licence.

1. Google's acquisition of geospatial data through Indian users, or the collection of Indian territorial data by every individual's smartphone for Google Maps is illegal. Everyone—be it Google, the third parties or individuals—will need a licence.

2. One would be required to apply for a licence even if geospatial data has been acquired in the past, i.e. every individual who has used internet previously.

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[6] GOI (2016), "National Geospatial Policy (NGP 2016)," draft policy paper released by the Department of Science & Technology, Ministry of Science & Technology, Government of India.

[7] Regidi, A. (2016), "Geospatial Bill Needs to Follow Approach of Daft National Geospatial Policy," *Tech 2*, May 16. Available at: https://www.firstpost.com/tech/news-analysis/geospatial-bill-needs-to-accept-approach-of-draft-national-geospatial-policy-3681799.html

[8] *Ibid*.

3. The mere possession of geospatial data is proposed to be punishable. For example, if one has stored Google Maps offline, then one cannot retain the same without a licence.

4. If one sends one's location on Google's Maps to another person, one is disseminating data requiring a licence. Further, with Google being outside India, the act will need prior permission.

5. Wrong picture on a map is proposed to be a punishable offense. For example, if Google does not update India's Map to reflect the creation of two states of Telangana and Andhra Pradesh, it shall be liable to punishment.

Thus, the intentions of the Bill are in sharp contrast to the objectives of the NGP. The latter incorporates the realities of an interconnected world where geospatial data is being created and spread every second whereas the Bill is reflective of the mindset being stuck in the world of paper maps. Not surprisingly, there has been an outcry against the Bill.[9] It is expected that the debate which has resulted following the Bill will put the exercise on the back burner and India's progress in geospatial industry will go ahead as optimistically as has been projected.

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[9] *Ibid*.