



INDIA'S TELECOMMUNICATIONS ACT 2023

OPTIMIZING THE UTILIZATION OF SATELLITE SPECTRUM

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ABOUT THIS POLICY PAPER

On December 24, 2023, the Indian Government notified the Telecommunications Act, 2023 (Telecom Act). This Act amends and updates several dated telecommunications laws and introduces a unified authorization regime to streamline telecom licensing. It also introduces the provision for spectrum assignment through administrative allocation for fixed satellite services (FSS) and mobile satellite services (MSS). Based on the provisions in the Act, the Telecom Regulatory Authority of India (TRAI) will draft the administrative guidelines for spectrum assignment. Given India's experience with administrative spectrum assignment and the 2G controversy, judicious spectrum assignment places a responsibility on TRAI to ensure that the guidelines ensure transparency and a level playing field. This paper analyzes the various issues involved, lessons learnt, and makes recommendations for the TRAI guidelines.

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ACKNOWLEDGEMENTS

This paper draws from discussions and interviews with several members of academia and industry. CSDR and the authors are grateful to Dr Subba Rao Pavuluri and Ananth Technologies for supporting this project. The authors thank Kaushik Moitra, Karnika Vallabh, and Shashank Venkat of Bharucha Partners for their legal advice. They especially thank Ashok GV of Factum Law for graciously providing his input and reviewing early drafts. Finally, the authors extend their gratitude to the members of SatCom and the space industry for taking the time to provide their input.

FOREWORD

The Indian space economy is entering a new era, driven by a significant increase in private industry participation in space activities. Over a hundred space startups offering services ranging from rocket launches to geospatial analytics have emerged in the last five years. In response to these changes, the Union government has boldly reformed the country's regulatory landscape. This aims to foster a vibrant space ecosystem that leverages the core competencies of the private and public sectors, respectively.

Two key initiatives have been instrumental in shaping the transformation of India's space sector. First, the establishment of the Indian National Space Promotion and Authorization Centre (IN-SPACe) in 2020. This entity serves as a single-window agency, regulating all space activities in India and, most importantly, creating a level playing field for the space industry. Second, the Indian Space Policy - 2023 (ISP-23), released in April 2023, and the subsequent Implementation Guidelines published in May 2024, are documents that not only clarify the role of the relevant government agencies but also lay down a predictable policy framework for the private sector, empowering them to thrive in this new era of the Indian space sector.

This policy paper by the Council for Strategic and Defense Research (CSDR) on optimizing the utilization of the space spectrum is part of a series of five policy papers that aim to create a legal knowledge base on India's space policy, existing space laws, and laws and regulatory guidelines that intersect with private sector space activities.

The Telecommunications Act of 2023 permits the assignment of satellite spectrum through the administrative process, marking an essential step in bringing India's regulation of the space sector in line with globally recognized norms. This paper's recommendations for assigning satellite spectrum go one step further by proposing critical measures that the government must take to ensure that satellite spectrum assignment takes place fairly and transparently.

Ananth Technologies is pleased to support CSDR in making these policy-oriented research papers available to the public. I hope these research papers will stimulate a robust discussion among all stakeholders in the Indian space ecosystem, including government policymakers, IN-SPACe, the private space industry, policy experts, and civil society members.

Dr. Subba Rao Pavuluri

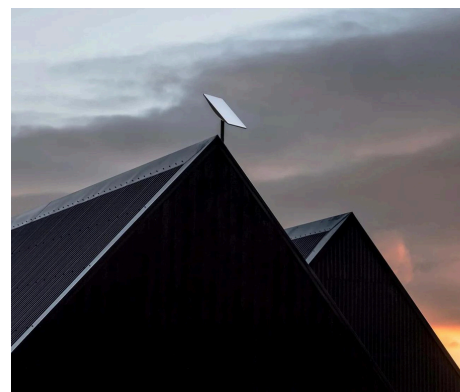
President, Satcom Industry Association (SIA-India) and CMD, Ananth Technologies

Introduction

On December 24, 2023, the Union Government notified the Telecommunications Act, 2023 (Telecom Act). This Act amends and updates several dated telecommunications laws and introduces a unified authorization regime to streamline telecom licensing. It also introduces the provision for spectrum assignment through administrative allocation for fixed satellite services (FSS) and mobile satellite services (MSS).[i] Based on the provisions in the Act, the Telecom Regulatory Authority of India (TRAI) will draft the administrative guidelines for spectrum assignment.

During the last five years, new space companies have demonstrated the utility of low-latency broadband and telecommunication services by deploying constellations of small satellites in low-earth orbits (LEO). Given India's size and geographical diversity, domestic and international companies are interested in utilizing this technology to serve India's burgeoning demand for such services. However, some existing terrestrial service providers already invested in terrestrial 5G networks felt that satellite-based services could emerge as competitors. They proposed that spectrum assignment must remain technology-neutral since terrestrial and space-based technologies deliver the same service to the people.[ii] The new Act seeks to address their apprehensions without restricting the government's freedom to exploit the benefits offered by the new technology.

From the government's perspective, space-based services allow for inexpensive, high-speed internet access, especially in remote locations that have otherwise remained unserviceable due to terrestrial infrastructure costs.[iii] Access to inexpensive internet and voice services from space aligns with the government's Digital India campaign.[iv] Further, compared to terrestrial networks, these services provide additional military applications, especially at high altitudes.[v]



Source: Starlink

Given India's experience with administrative spectrum assignment and the 2G controversy, judicious spectrum assignment places a responsibility on TRAI to ensure that the guidelines ensure transparency and a level playing field. This paper analyzes the various issues involved, lessons learnt, and makes recommendations for the TRAI guidelines.

The troubled history of spectrum assignment in India

Radio frequency spectrum is a finite resource as multiple electronic transmission and receiver devices must coexist without leading to interference. To manage this finite resource, countries coordinate its use and management through the International Telecommunications Union (ITU), a specialized agency within the United Nations (UN).[vi] The ITU's Radio Regulations govern spectrum utilization and are amended every four years at the World Radiocommunications Conference (WRC), where countries negotiate spectrum distribution based on the latest technological developments and national requirements.

At the national level, countries exercise sovereignty over spectrum regulation by allocating it to individual operators. Methodologies adopted are "auctions" or "administrative assignment" based

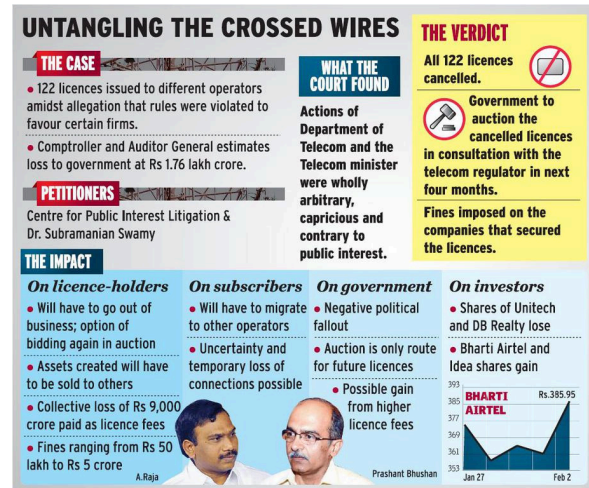
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on the domestic political and economic landscape. Globally, since the 1990s, terrestrial spectrum has been auctioned as it allows governments to assess the financial capabilities of bidders as it is a capital-intensive industry.[vii]

India began the spectrum assignment process to private entities after the liberalization of the economy in the early 1990s[viii], in keeping with the National Telecom Policy (1994). The government adopted the auction methodology and the first auctions began in 1995.[ix]

The auction model allowed the Department of Telecommunications (DoT) to control the number of entrants into the Indian telecom sector while maximizing revenue generated from the auctions. In 2003, the DoT switched to a model of administrative assignment on a first-come, first-served basis (FCFS). This decision was justified, and the number of players needed to increase, since the country had a rising demand for cellular services.[x]

In 2008, the cabinet minister for telecommunications, Andimuthu Raja, issued 122 licenses of the 2G spectrum through the FCFS basis at fixed prices which favored select group entities. The decision was soon mired in controversy. Government losses were estimated at \$24 billion and the subsequent judicial proceedings, known as the 2G spectrum case, led the Supreme Court (SC) to declare the 2008 policy of administrative assignment of licenses on basis of FCFS, “arbitrary”, leading the DoT to revert to “auction methodology.”[xi] Since 2012, the frequency spectrum has been assigned through the auction route.



Source: The Hindu

Nuances in SC judgment and presidential reference

In the 2G spectrum case, the Supreme Court examined the government’s right to distribute natural resources under an FCFS policy together with the principle of equality as stipulated by Article 14 of the Constitution.[xii]

The SC observed that natural resources like spectrum are owned by the State, but on behalf of the people. Accordingly, the distribution of such resources must be non-arbitrary, transparent, and not discriminatory towards equally placed private parties. In this context, the SC concluded that a policy based on FCFS is arbitrary, against public interest, and violated the right to equality.[xiii]

In view of the import of the SC judgment on assignment of other natural resources, the government presented the SC with a Presidential Reference. The reference requested the court to clarify if the auction of public resources is the only preferred and legal way of ensuring the judicious use of said resources. Subsequently, a larger Constitution Bench of the SC clarified that an auction is not a necessary condition and that the assignment of resources must be decided on a case-by-case basis. Further, the court argued that although an auction may be the best method to maximize revenue, it may not always be in the public interest. In such cases, the State may adopt an alternative method that better advances the public interest.

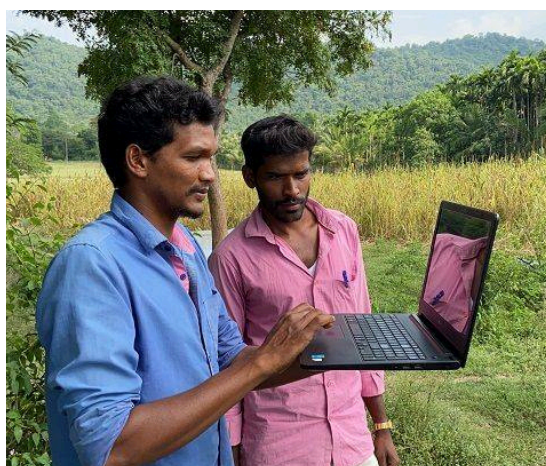
Therefore, the Court held that the only requirements are that the procedure adopted must:

- (i) maximize public interest and
- (ii) be just, transparent, reasonable (i.e., non-arbitrary), and non-discriminatory.

Provision of digital services in India: Maximizing public interest

Under the current government's Digital India campaign, providing public services (via the internet) requires enhanced internet penetration. Currently, 55% of Indians are connected to the internet. Access to inexpensive internet and voice services for rural populations in remote areas would help the Indian government achieve the goal of establishing mass connectivity as envisioned in the Digital India campaign. Geosynchronous orbit (GSO) communication satellites have traditionally provided relatively low-speed internet, message, voice, and video services. However, during the last five years, new space companies (such as SpaceX, OneWeb) began placing satellite mega-constellations in much lower non-GSO orbits (NGSO) to provide greater internet speeds and reduce latency in connectivity. These NGSO mega-constellations—which provide low-cost and low-latency connectivity services—have driven much of the recent revolutions in the SatCom industry and have significant implications for spectrum policy.[xiv]

First, NGSO constellations use spot-beam technology which allows a satellite to use the same set of radio frequencies in different geographic locations without causing interference with other telecommunication services. Further, technological innovations such as steerable beams allow spectrum to be shared between multiple operators without causing interference. Therefore, unlike terrestrial networks, satellites can use spectrum cooperatively. This allows several competing operators to exist and provide services that maximize public interest.



Source: THOMSON REUTERS FOUNDATION

Second, NGSO satellites have blurred the distinction between terrestrial services and mobile satellite services (MSS). Traditionally, the delivery of MSS, which is used for remote connectivity, requires dedicated hardware incompatible with traditional cellular devices. However, advancements in chip technologies have enabled satellites to deliver mobile services directly to smartphones without requiring any modifications.[xv] These innovations could permit consumers to seamlessly access high-speed voice and internet services from any smartphone without requiring specialized hardware.[xvi]

Imagining an ideal administrative assignment process

As TRAI engages in consultations for spectrum assignment guidelines, it will have to consider the concerns of terrestrial service providers, the tumultuous history of spectrum assignment in India, and the need to maximize public interest. Guidelines perceived as unjust, opaque, or discriminatory risk being legally challenged by the stakeholders involved.

Currently, the Inter-Ministerial Committee for Satellite Network Clearance (IMC-SNC)—a body

established under the existing SatCom guidelines—is responsible for licensing satellite service providers. The IMC-SNC convenes members from the DoT, the Wireless Planning and Coordination (WPC) Wing of the DoT, the Department of Space (DoS), the Ministry of Information and Broadcasting, and the Telecommunication Engineering Centre (TEC).[xvii]

The IMC-SNC is responsible for licensing satellite service providers, where the approval for SatCom operations is granted within two months of the date of application.[xviii] It is, therefore, worth considering whether IMC-SNC should be entrusted with the role of administrative spectrum assignment under the Telecom Act, or if a new Empowered Committee should be established, taking into account lessons learned from the 2G spectrum case. The government's submission of a "miscellaneous application" to the Supreme Court before the bill was tabled in December 2023 [NR1] suggests that it seeks to involve the courts in order to ensure a smooth administrative allocation process, minimizing the risk of litigation. The government clarified in its application that it is not seeking an amendment to the 2012 judgment or permission for administrative allocation, as it believes the 2012 judgment already grants it the necessary authority.

Other issues—such as the fair and judicious sharing of frequencies between satellite constellations and other services—may also arise when dealing with spectrum assignment in space. The most recent spectrum disputes between SpaceX and other satellite service providers demonstrate that this could lead to long-drawn disputes that create suboptimal service delivery. It is imperative that these disputes are resolved promptly.[xix] Since arbitration of similar future disputes over spectrum allocation in India will follow the High Court and then Supreme Court trajectory—given the absence of a tribunal like the Telecom Disputes Settlement and Appellate Tribunal (TDSAT) under the TRAI Act, 1997—it is imperative that DoT guidelines ensure a process that minimizes legal challenges.

Therefore, the DoT could consider forming an Empowered Committee comprising technical members, but more crucially, individuals with legal expertise and experience in handling spectrum allocation matters. In addition, a former director of the TDSAT could be invited as one of the members. To establish this Empowered Committee, the issuance of a formal notification along with spectrum assignment guidelines could be considered. In the spirit of openness, it would be beneficial to share the proposed composition of the Empowered Committee, including the representation of institutions and expertise, with the Supreme Court.

The process introduced by DoT could unfold as follows. Once applications/bids are submitted:

The Empowered Committee:

(i) Determines if the application meets the basic eligibility criterion, such as:

- Financial resources,
- Reliability and investment in research,
- Speed of network rollout, geographical coverage, pricing,
- Quality, competitiveness
- Compliance with ITU regulations and guidelines.

(ii) Assigns spectrum based on the above criteria and maintains written records of the reasons for accepting or rejecting applications. These records should be open to the public on request.

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These recommendations will ensure that spectrum allocation is fair, transparent, non-arbitrary, and non-discriminatory. It will maximize the utilization of a public good that is clearly in public interest, and prevent the process from being tied up in extensive litigation.

Endnotes

- [i] Ministry of Law and Justice, “The Telecommunications Act, 2023,” December 24, 2023, <https://egazette.gov.in/WriteReadData/2023/250880.pdf>.
- [ii] Reliance Jio Infocomm Limited (RJIL), “RJIL’s Comments on TRAI’s Consultation Paper dated 06.04.2023 on “Assignment of Spectrum for Space-based Communication Services”,” July 1, 2023, https://www.trai.gov.in/sites/default/files/RJIL_02062023.pdf, 19.
- [iii] Saheli Roy Choudhury, “Super-fast internet from satellites is the next big thing in the space race,” CNBC.com, July 22, 2019, <https://www.cnbc.com/2019/07/22/fast-internet-via-satellites-is-the-next-big-thing-in-the-space-race.html>.
- [iv] Ministry of Electronics and Information Technology, “Digital India,” <https://csc.gov.in/digitalIndia#:~:text=Digital%20India%20is%20a%20flagship,Prime%20Minister%20Shri%20Narendra%20Modi>.
- [v] Amritha Jayanti, “Starlink and the Russia-Ukraine War: A Case of Commercial Technology and Public Purpose?.” Belfer Center for Science and International Affairs, Harvard Kennedy School, March 9, 2023, <https://www.belfercenter.org/publication/starlink-and-russia-ukraine-war-case-commercial-technology-and-public-purpose>.
- [vi] Joanne Wheeler, “Space Law Review: International Telecommunication Union and Access to Spectrum,” *The Law Review*, January 5, 2021.
- [vii] Myers, Geoffrey, *Spectrum Auctions: Designing markets to benefit the public, industry and the economy*, (London: LSE Press, 2023), 3–12.
- [viii] Rohit Prasad, Varadharajan Sridhar, and Alison Bunel, “An Institutional Analysis of Spectrum Management in India,” *Journal of Information Policy*, Vol. 6 (2016), 260-262.
- [ix] Varadharajan Sridhar, *The Telecom Revolution in India: Technology, Regulation, and Policy*, (New Delhi: Oxford University Press, 2012), 111.
- [x] Rekha Jain and Rishab Dara, “Framework for evolving spectrum management regimes: Lessons from India,” *Telecommunications Policy*, Vol. 41 (2017), 476.
- [xi] Indira Basu, “Bribes, Lies & Radia Tapes: The Full Rundown on 2G Spectrum ‘Scam’,” *The Quint*, December 21, 2017, <https://www.thequint.com/explainers/2g-spectrum-scam-a-short-history>.
- [xii] Presided over by Justices G.S Singhvi and Ashok Kumar Ganguly.
- [xiii] Paragraph 94, *Centre for Public Interest Litigation & Ors vs Union of India & Ors [(2012) 3 Supreme Court Cases 1]*.
- [xiv] For a non-technical overview of LEO broadband services, see Makena Young and Akhil Thadani, *Low Orbit, High Stakes: All-In on the LEO Broadband Competition*, (Washington D.C.: Center for Strategic and International Studies, December 2022).
- [xv] Karen L. Jones and Audrey L. Allison, “The Great Convergence and the Future of Satellite-enabled Direct-to-Device,” *Centre for Space Policy and Strategy*, September 2023.
- [xvi] Lucas Laursen, “Satellites Are Becoming the New Cellphone Towers,” *IEEE Spectrum*, 29 January 2024, <https://spectrum.ieee.org/satellite-cellphone-starlink>.
- [xvii] Department of Telecommunications, “Constitution of IMC-SNC, its scope and related procedure,” December 26, 2022.
- [xviii] Department of Telecommunications, “Satellite Communication Reforms - 2022,” <https://dot.gov.in/sites/default/files/Satellite%20Reforms%202022.pdf?download=1>.
- [xix] See, for example, Michael Sheez, “SpaceX ramps up FCC battle over broadband usage the company says poses an existential threat to Starlink,” CNBC, July 21, 2022, <https://www.cnbc.com/2022/06/21/spacex-fcc-battle-with-dish-michael-dell-affiliate-over-broadband-usage.htm>; and Joe Brodtkin, “Dish and Viasat’s fight against Starlink satellite deployment fails in court,” *Ars Technica*, August 29, 2022, <https://arstechnica.com/tech-policy/2022/08/dish-and-viasats-fight-against-starlink-satellite-deployment-fails-in-court/>.