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Avinash Kumar

Avinash Kumar has completed his Ph.D. in International Investment Law from the Dept. of Law & Governance, Central University of South Bihar. His research work is on "International Investment Agreement and State's right to regulate Foreign Investment." He qualified UGC-NET and has been selected for the prestigious ICSSR Doctoral Fellowship. He is an alumnus of the Faculty of Law, University of Delhi. Formerly he has been elected as Students Union President of Law Centre-1, University of Delhi. Moreover, he completed his LL.M. from the University of Delhi (2014-16), dissertation on "Cross-border Merger & Acquisition"; LL.B. from the University of Delhi (2011-14), and B.A. (Hons.) from Maharaja Agrasen College, University of Delhi. He has also obtained P.G. Diploma in IPR from the Indian Society of International Law, New Delhi. He has qualified UGC – NET examination and has been awarded ICSSR – Doctoral Fellowship. He has published six-plus articles and presented 9 plus papers in national and international seminars/conferences. He participated in several workshops on research methodology and teaching and learning.

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"SATELLITE INTERNET AND INDIA'S FUTURE TELECOM LAWS"

AUTHORED BY - SAYAK KR. DUTTA & NISHTHA BHOSALE

ABSTRACT

India is on the edge of digital revolution and satellite internet has the capacity to be a game changer in perspective of connecting people across the vast and diverse regions. This paper examines how the upcoming satellite technologies are shaping and updating India's legal and regulatory framework particularly under the Draft National Telecom Policy 2025 (NTP-25) and the Satellite Communication Rules 2025. With the help of the International players such as Starlink and OneWeb entering the market, alongside domestic initiatives such as JioSpaceFiber, the government has come up with forward looking policies with emphasises data security, national interests, universal access and home-grown innovations.

A core of the study is on the current regulatory milestones like the Telecommunication Act 2023 which placed the satellite services rigidly within the vast telecom ecosystem and the approach to allocate spectrum for satellite services. Furthermore, the paper evaluates how these policies align with India's broader goals of Atmanirbhar Bharat (self-reliant India), digital sovereignty, and global leadership in 6G and quantum communication technologies.

This research brings together the policy and legal insights to showcase how satellite internet can transform to the digital future of India especially for rural and remote areas which still face poor connectivity. The study shows that in order to make this change truly effective, India need flexible policies and cooperation between different sectors and strong legal safeguard. This is how satellite internet can go beyond a new technology and become a real force for inclusive, safe and sustainable digital growth in the nation.

I. INTRODUCTION

India is entering a pivotal phase in its digital transformation where satellite internet is emerging as a game changer in rural, urban and underserved areas that have remained for long with persistent connectivity gaps in perspective of digital platform. Even though India has the second largest internet user base, a certain section of the population still does not have a reliable

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internet access. Due to geographical limitations and high cost of infrastructure, traditional ground-based networks have not been able to reach these areas completely. Therefore, satellite internet permits a viable substitute in this regard.

The rise in the low earth orbit (LEO) satellite constellations, led by global players like Amazon's Kuiper, Starlink, and Oneweb has introduced new possibilities of internet accessibilities. Recognising this potential, the Indian Government has come up with multiple regulatory reforms including the Telecommunications Act, 2023, Satellite Communication Rules 2025, and Draft National Telecom Policy 2025. These reforms aim to preserve economic independence, data privacy and national security while introducing satellite internet to the public at large.

The Telecommunication Act of 2023 has replaced the outdated laws and has officially recognised the satellite and internet-based services. The act has expanded the definition of telecommunication, introduced unified licensing systems, stronger consumer rights and enhances government oversights on foreign operators.

The satellite communication rules 2025 enhances India's focus in digital sovereignty and national security by local manufacturing, NavIC Compliance, data localization and real time oversight of foreign terminals. Meanwhile, NTP 25 outlines a robust and inclusive telecom visions aiming to provide complete 4G and widespread 5G by 2030 while fostering domestic innovations in emerging technologies like 6G, satellite systems and quantum communications. It provides flexible regulatory approach for non-terrestrial networks (NTN) to ensure smooth integration and with terrestrial infrastructure.

This paper examines the growth of legal and policy landscape that govern satellite internet in India and thus analyses the implications of these policies for competition in the market, innovation of technology and digital inclusion. It also expands to the geographical dynamics which influences the regulatory decisions and accesses on how India can balance global integration with that of the domestic priorities in order to become a leader in telecom infrastructure in the upcoming generation.

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II. LITRATURE REVIEW

The inclusion of satellite internet in the telecom ecosystem of India has compelled growing attention from both the policy makers and the researchers when it comes to digital inclusion new technologies and updated regulations. This literature review points out the existing studies and the policy discussions in order to provide a clearer picture of hoe the landscape is evolving.

Satellite Internet as a Tool for Digital Inclusion: Researchers have highlighted the role of satellite internet in providing connectivity to the citizens of rural and remote communities where traditional network falls short the rural and remote regions often remain unserved by terrestrial networks as stated by the reports from TRAI and NITI Aayog which makes the satellites the most practical option for last mile access. The researcher Singh et al. (2022) pointed out from his work that Low Earth Orbit (LEO) satellite constellations could provide low latency internet which is valuable in mountainous or disaster-prone areas.

Evolution of India's Telecom Regulatory Framework: The Telecommunication Act 2023 is currently a major focus of legal scholarship and the act replaces the old outdated colonial era laws and forms a updated unified licensing regime which now includes the satellite services. The analysis by Sharma (2023) and policy briefs from the Observer Research Foundation (ORF) noted that the act displayed the shift of India towards digital sovereignty and introducing provisions for data localisation, cyber security and stricter oversight of foreign players while also simplifying spectrum allocation and hence creating a governance model which can adapt to emerging technologies.

Satellite Communication Rules and Strategic Autonomy: The Satellite Communication Rules 2025 are linked to the vast economic and security goals of India. The studies by Indian Council for Research on International Economic Relations (ICRIER) and the Centre for Internet and Society (CIS) stated that these rules required satellites to work with coordination with India's own navigation system (NavIC), encouraging local manufacturing and ensuring real time checks of foreign equipment. These steps are a part of Atmanirbhar Bharat plan which aims to place India in more self-reliant in technologies and much stronger in terms of the security of the nation.

Global Comparisons and Best Practices: The United States Federal Communications Commission (USFCC) focuses on open markets and the EU focuses on privacy and interoperability whereas India blends economic growth with national security and self-reliance.

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This portrays that India's approach I distinct from other nations in perspective of comparative studies. Jain and Thomas (2024) suggested that India can draw on global best practices like flexible licensing and spectrum sharing while still prioritizing its own strategic needs.

Challenges and Future Research Directions: Despite of the promises of satellite internet, hurdles and challenges still exists. High terminal costs limited public awareness and regulatory complexity hinders this option. In order to accelerate development, the scholar advocates foe public private partnerships, targeted the subsidies and digital literacy programmes. There is a need for further research in order to access the long-term socio-economic impact of satellite internet and to update legal frameworks in accordance with the technological advancements.

III. GROWTH & RELEVANCE OF SATELLITE INTERNET IN INDIA

1. Global Context

The global satellite internet market is growing fast worldwide because of the Low Earth Orbit (LEO) satellite constellations by the companies such as SpaceX (Starlink), Amazon (Project Kuiper), and OneWeb. This satellites engage in low tenancy internet access with high speed across the globe even to areas where regular internet has no connectivity. The market worth about $5.1 billion in 2024, is expected to reach $24.6 billion by 2030, growing by nearly 30% each year.[1] The growth is as a result of increasing demand for resilient connectivity in sector like maritime, mining, aviation and emergency response where the traditional network falls short.

2. Indian Developments

India is moving quickly in adapting satellite internet as a strategic tool to upgrade the digital connectivity. JioSpaceFiber, OneWeb, and Starlink are the major players that have got regulatory approval and are planning for commercial rollout by the year 2025. Jio has already tested Gigabyte speed internet in remote locations such as Korba (Chhattisgarh), Gir (Gujarat) and Jorhat (Assam) portraying that satellite internet has ability to work across various landscapes of India. The Government of India has opted for administrative spectrum allocation for satellite services under Schedule I of the Telecommunication Act 2023 to avoid any auction-based delays for faster rollout and fair access especially in rural and urban areas.[2]

[1] Satellite Internet Industry Research 2025-2030: Emerging
[2] OneWeb, Starlink, Jio satcom launch likely only in 2025

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3. Potential Benefits for Rural and Urban India

Satellite internet can face Geographical barriers by providing stable and reliable connectivity in mountains, forests and island areas to bring internet for telemedicine, government services, smart farming and online learning. This will help in improving living standards of the people and also create new opportunities.[3] While urban areas already have proper mobile network and strong fibre so in this case satellite internet acts as a backup during disasters and outages. It can also support advanced needs in logistics, defence and infrastructure. The EY reports stated that satellite internet users could grow 6-folds by the year 2025 in India, reaching around 2 million having rural areas accounting for the majority.[4]

4. Integration with Digital India & Bharat Net

In case of Digital India, the satellite internet helps bring government services, promote digital literacy, provides financial inclusion to the "last mile".[5] Originally BharatNet focused on fibre optic development however it currently incorporates satellite communication to reach out to 600,000 villages. ISRO's GSAT satellites and partnerships with private companies are encouraging and enabling rapid growth and development in regions where fibre is impractical.[6] Satellite connectivity ensures scalability, cost effectiveness and disaster resilience making it a major component of rural broadband strategy of India.

Satellite internet in India is not just a backup solution but it is turning into a core driver of digital growth which is bridging the rural-urban gap and powering the vision of a truly connected nation.

IV. EXISTING TELECOM REGULATORY FRAMEWORK IN INDIA

1. Overview of the Telecom Regulatory Authority of India (TRAI)

The telecom authority of India was established under the TRAI Act 1997. During the liberalization era to regulate the telecom sector in India, ensuring fair competition and consumer protection as by then private players entered in the market.[7]

The core objective of TRAI includes monitoring compliance with telecom compliance

[3] Government's Satcom Solution for Rural Connectivity ... - Inventiva
[4] Satellite internet: The next big wave - EY
[5] From Sky to Screen: Satellite Communications – India's Next Digital Leap
[6] Government's Satcom Solution for Rural Connectivity ... - Inventiva
[7] Telecom Regulatory Authority of India - Wikipedia

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recommending penalties for violation, advising the government for licensing, spectrum allocation and policy matters. It promotes fair competition amongst all service providers and ensures consumer protection through quality-of-service standards and tariff regulations.

Although TRAI operates independently, it also works closely with the Department of Telecommunication (DoT) under the ministry of communications. It also works jointly with Telecom Dispute Settlement and Appellate Tribunal (TDSAT) that regulates adjudicatory functions which was previously under TRAI's purview.[8] Trai has played a vital role in shaping and reforming telecom landscape of India over the years including the rollout of mobile number probability, net neutrality guidelines and digital broadcasting regulations. Its evolving nature has currently included the oversight of emerging technologies like the satellite internet, 5G and OTT services.

2. Satellite Communication Under Existing Licensing Regimes

In India satellite communications is regulated and governed by multi-tier licencing framework managed by DOT with reference to policy inputs provided by TRAI. The licencing regime includes:

a. **VSAT & GMPCS Licences**

The Very Small Apertures Terminal (VSAT) Licences are issued for closed user group (CUG) services which are often used by oil companies, banks and government agencies. The Global Mobile Personal Communication Satellite (GMPCS) licences allow mobile satellite services using hand held terminals.

b. **Satellite Earth Station Gateway (SESG) Licensing**

TRAI provided recommendations for new licencing framework for Satellite Earth Station Gateway in the year 2022 which act as hubs that connects satellite networks to terrestrial infrastructure.[9] The recommendations given by TRAI aims to allow SESG licensees to provide all satellite resources to any DoT licenced entity. It also provides simplifies licencing procedures and promote interoperability and reduce regulatory bottlenecks.

c. **Unified licencing or Satellite Services**

TRAI introduced unified licence by merging separate licenses like VSAT, GMPCS, etc into a single authorisation for satellite-based telecommunication services in order to

[8] Telecom Regulatory Authority of India (TRAI) - Next IAS
[9] Recommendations on Licensing Framework for Establishing and Operating ...

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streamline operations, reduce compliance burdens and encourage investment in satellite infrastructure.[10]

d. Role of the Satellite Services Division (DoT)

The Satellite Services Division within Dot coordinates spectrum allocation, policy developments for satellite networks and licensing. It works jointly with Department of Space (DoS) and other agencies to ensure compliance with international standards (ITU) evaluate technical feasibility and manage the demands of projects like USOF and BharatNet.[11] This division also looks into licensing for commercial and captive VSAT services, spectrum pricing and satellite bandwidth planning and co-ordination for new satellite technologies. Together TRAI and DoT are providing the groundwork for a modernized satellite regime that aligns with digital ambitions and global best practices of India. The shift towards administrative spectrum allocation, ease of doing business reforms and unified licensing portrays a strategic plan to accelerate satellite internet development across the nation.

V. INTERNATIONAL LEGAL OBLIGATION & COORDINATION

1. India's Commitment under the International Telecommunication Union (ITU)

The International Telecommunication Union (ITU) is a specialised agency of the united nation where in India is a founding member. The ITU is responsible for coordinating global telecommunication standards, satellite orbital assignments and spectrum management. India is legally bound to the principles of fair access to spectrum, avoid harmful interference and promote international corporation in telecommunication as it is a signatory to the ITU Constitution and convention.[12] The obligations of India under ITU includes the following:

- India must register its orbital positions and satellite frequency assignment with the Radiocommunication Bureau of ITU in order to ensure that there is no interference of the satellite operations with those of other nations and also facilitates global harmonisation of spectrum use.
- India completely and actively participates in the standard setting processes of ITU in order to ensure proper interoperability of the satellite systems and its compliance with the global norms.

[10] TRAI recommendations are a landmark step in India's satcom landscape
[11] Satellite Services Division | Department of Telecommunications ...
[12] ebat-18-00332_Basic_Texts-E.pdf - ITU

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- India coordinates with the initiatives of ITU to help the developing nations in building telecom infrastructure and regulatory frameworks.
- India has currently increased its engagement with ITU by signing a Letter of Intent (LOI) in order to collaborate on the upcoming technologies like IMT-2030, AI driven digital twins in cyber security frameworks.[13] India is also planning to host the ITU Plenipotentiary Conference 2030 which aims to signal its ambition to legal global telecom policy disclosure. This commitment reflects the strategic intend of India to align domestic satellite internet policies with international standards while affirming its leadership in shaping the future of global digital connectivity.

2. Cross-Border Interference & Cyber Threats

The satellite signals can easily travel and cross-national boundaries which makes them prone to signal spoofing, international jamming and unauthorized access. India has previously reported some incidents of smuggled satellite terminals being used by rebel groups in border areas.[14] In order to counter these incidents, the government has introduced the following:

- Special Monitoring Zones which exceed 50KM inland from borders and 200 nautical miles into Exclusive Economic Zones (EEZ) of India where satellite activities are constantly and closely monitored.
- Mandatory Real-Time Reporting proves that satellite service providers must report unregistered or foreign terminals operating within Indian territory and provide Geolocation data upon request.[15]

There is an increase threats from state sponsored cyber attacks to India which is targeting the telecom networks and satellite infrastructure. Some of these incidents are the 2022 power grid attack which is allegedly linked to Chinese threat actors, the APT41 campaign in 2023 which targeted Indian telecom, manufacturing and IT sectors[16] and over 2 million cyber incidents were recorded in 2024 which portrays the urgency of securing the digital infrastructure of India.[17] India currently is finalizing a National Cyber Security Strategy to address these threats. These includes Lawful Interception Protocol that mandates the satellite providers to implement real time surveillance and data access for lawful enforcement, data localization which ensures that the user data is processed and stored efficiently within India to prevent any foreign

[13] Press Release:Press Information Bureau
[14] Satellite Internet in India - Vajiram & Ravi
[15] Satellite internet push hots up with Starlink entry
[16] ADJUDICATING AND INVESTIGATING CROSS-BORDER
[17] Defending Digital India: Strategic responses to cross-border state ...

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surveillance, NavIC Integration which replaces the dependence on foreign GPS systems with Indigenous navigation systems of India in order to enhance sovereignty and reduce vulnerability.[18]

The legal framework of India such as Information Technology Act 2000 and the Bhartiya Nyaya Sanhita 2023 provides with extraterritorial jurisdiction which allows prosecution of cybercrimes that are originated outside of India. However, the enforcement of the same is challenging due to low international corporation and bilateral treaties.[19]

VI. KEY LEGAL & POLICY CHALLENGES

1. Ambiguities in the Legal Framework Regarding Satellite Internet

The satellite sector of India is governed by a patch work of overlapping and outdated regulations. The Department of Space (DoS) and ISRO administered the Satcom Policy of 1997 which was primarily designed for Geo stationary satellites and does not address the modern and updated technologies like Low Earth Orbit (LEO) and Medium Earth Orbit (MEO) satellites.[20] This led to the creation of legal uncertainty for global operations such as Starlink and OneWeb who are responsible for navigating complex approval processes that involves various agencies including DoT, ISRO and Antrix Corporation. While modernizing the telecom network the Telecommunication Act 2023 still faces lack of clarity on the procedure of how the satellite internet services must be licensed, monitored and integrated with terrestrial network.[21] The absence of fair licencing regime and unclear guidelines for non jio stationery satellite systems has resulted into regulatory bottlenecks and long delays.

2. Data Protection, Surveillance & Cross-Border Data Flow Concerns

The Digital Personal Data Protection Act (DPA) 2023 of India introduced a “blacklist” approach to cross border data transfer that allows data to flow from any nation except the nations that is specifically restricted by the government.[22] This leads to the creation of uncertainty for the satellite internet providers who rely on cloud infrastructure and global data routine The key concerns are lack of transparency in blacklisting decisions, no standard contractual clauses or formal adequacy assignments, mandatory data localization for data

[18] India’s New Satellite Communication Rules 2025 ... - InsightsIAS
[19] ADJUDICATING AND INVESTIGATING CROSS-BORDER
[20] Changing landscape of satellite communication laws in India
[21] Telecommunications Act, 2023: Key Aspects - Next IAS
[22] India’s Cross-Border Data Transfer Regulation | ITIF

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fiduciaries where there is a requirement for user data the control systems and DNS services to be hosted in India.[23]

These provisions increase the concern of surveillance overreach since satellite internet can bypass traditional telecom infrastructure. The Telecommunication Act 2023 provides the Government the power to intercept, decrypt and suspend services for reasons of national security without robust judicial oversight.[24] This affects the privacy of users and may also have an impact on foreign investment in satellite internet sector in India.

3. National Security Implications

Satellite internet displays unique national security risks because of its potential to operate independently of terrestrial infrastructure. Some of the recent incidents have highlighted concerns like Starlink devices that was found to be used by smugglers and insurgents in border areas such as Manipur and Andaman Islands which enabled secure and untraceable communication[25], the government's launch of high label probe into the unauthorized use of satellite terminals which raised alarm about data leakage and foreign services.[26]

In order to mitigate this risks the satellite communication rules 2025 of India mandated real time monitoring of foreign terminals, special monitoring zones within 50Km of border areas and coastal EEZs, and mandatory NavIC integration in order to reduce reliance on foreign GPS systems.[27] This measure not only enhances security but also increases compliance burden for operators and raise questions about the balance between control and connectivity.

VII. RECENT REFORMS & GOVERNMENT INITIATIVES

1. Indian Telecommunication Bill, 2022–23

The Indian Telecommunication Bill 2022 and The Telecommunication Act 2023 represents a measure reorganisation of telecom regulatory framework of India. The main purpose of this reform is to replace the outdated and colonial era laws like the Indian Telegraph Act 1885 and the Wireless Telegraphy Act 1933 with that of modern, technology neutral legal structure.[28]

[23] Cross-Border Data Flows and India's Digital Sovereignty
[24] Telecommunications Act, 2023 - Wikipedia
[25] Starlink India Controversy - Why Modi govt initiated probe into ...
[26] The National Security Implications of Starlink's Entry Into India
[27] India's New Satellite Communication Rules 2025 ... - InsightsIAS
[28] Draft Indian Telecommunication Bill, 2022 - PRS Legislative Research

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The key features are as follows:

- The Act aims to introduce a single authorisation framework for entire telecom services including satellite networks and replaces the fragmented licensing system in order to simplify compliance for the operators and encourage innovations.
- The Act provides administrative spectrum allocation rather than auctions in order to facilitate faster rollout of satellite internet services which would assist in aligning with global best practices.[29]
- The Act expands definition of telecom services which includes satellite, OTT, machine to machine (M to M) communications ensuring regulatory oversight of emerging technologies.
- The government preserves powers to intercept or suspend services in the interest of national security even though the concerns remain about the lack of judicial safeguards.[30]

These reforms are designed to assist the digital ambitions of India while balancing national security and regulatory efficiency.

2. New Space Policy, 2023

With the approval of the Cabinet Committee on Security the Indian Space Policy 2023 makes a transformative shift in approach of India to space governance. Its main purpose is to rise the share of India in the global space economy from less than 2 percent to 10 percent by allowing greater private sector participation.[31]

According to this policy the clear role of ISRO is to focus on research and development, the NewSpace India limited (NSIL) is to handle commercial operations, and IN-SPACE is to serve as single window regulator for private space activity. The non-governmental entities (NGEs) are currently allowed to build, launch and operate satellites for commercial services and can also lease, own orbital slots and frequency spectrum only after authorisation from IN-SPACE.[32] The private players are permitted to access ISRO's infrastructure like testing facilities, launch pads and satellite platforms at nominal costs which reduces entry of barriers.[33] This policy is designed to provide a competitive innovation driven space ecosystem in order to support both

[29] The Telecommunications Act, 2023 - India Corporate Law
[30] Draft Indian Telecommunication Bill, 2022 - PRS Legislative Research
[31] Indian Space Policy - 2023 - Indian Space Research Organisation (ISRO)
[32] Indian Space Policy - 2023 - Indian Space Research Organisation (ISRO)
[33] Explained: Key Features of the Indian Space Policy 2023

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commercial and strategic objectives.

3. Draft Spacecom Policy

The Draft Space Based Communication Policy (Spacecom Policy) was originally released in 2020 and is currently under revision, intends to regulate the commercial use of satellite communication assets such as orbital slots, ground stations and spectrum.[34] The key objective of this policy are as follows:

- The policy outlines and regulates the procedures for authorizing satellite-based communication services from India and Foreign satellites including those in geostationary (GSO) and non-geostationary (NGSO) orbits.
- The main purpose of this policy is to streamline the rules, norms and guidelines to facilitate private sector participation in simplified licensing and faster approvals.
- The policy focuses on the need for secure communication infrastructure and mandates the oversight of the government in strategic satellite assets.[35] The policy aims to place India as a global leader in space-based communications by encouraging Indian companies to participate in Indian Satcom markets.[36]

Altogether the policy reflects strategic pivot of India towards liberalised, innovation friendly and security conscious regulatory environment for satellite internet and space-based communication.

VIII. RECOMMENDATION FOR LEGAL & REGULATORY REFORM

In order to unlock the full potential of the satellite internet in India, reforms and policies are required across legal, licensing, spectrum and partnership domains. The current framework is segmented which creates uncertainty and delays for operators.

Firstly, a unified Satellite Communication Act should be incorporated to fuse existing policies, defining the roles of DoT, TRAI, ISRO and INSPACE addressing new and updated technologies like the LEO/MEO constellations and hybrid networks. This would assist in providing legal clarity, reduce inter-agency friction and align India with global practices.

Secondly, the existing GMPCS and Unified Licence categories are outdated for modern

[34] Microsoft Word - Draft Spacecom Policy 2020 - ispa.space
[35] Microsoft Word - Draft Spacecom Policy 2020 - ispa.space
[36] The Big Picture : Draft Spacecom Policy and India's Space Sector

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broadband. Thus, there is a need for satellite licencing regime for all satellite internet providers. Different category with tailored obligations, tiered licencing model for different services and flexible provisions for multi orbit system will provide streamline approvals and foster competition.

Thirdly, there must be a clear and consistent spectrum allocation reforms with transparent pricing, renewable spectrum blocks and dedicated satellite spectrum pool with major priority for rural and strategic services. Inter operator coordination and dynamic spectrum sharing would further reduce interference and optimise usage.

Last but not least, the public private partnership (PPPs) must be expanded to satellite broadband, extending the PPP model, offering subsidiaries under BharatNet and USOF, enabling ground infrastructure sharing and creating innovation for startups which will accelerate development and enhance sovereign capabilities.

These reforms altogether can place India as global leader in satellite connectivity while ensuring secure, inclusive and sustainable digital growth.