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Concerns, Implications and possible Barriers to Licencing: A Legal and Operational Analysis on setting up Starlink in India

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Starlink, a SpaceX company, announced back in 2021 that they would be expanding their service in India. Starlink is a satellite-based communication service that offers high-speed internet access at up to 1 gigabit per second and has global coverage with the ability to reach every corner of the earth. However, their attempt to make their service operational in India was thwarted in 2021 due to a lack of required licenses cited by the Government of India.¹ Starlink's CEO in India stepped down in late 2022, and the future of Starlink in India remains questionable.² This report examines the Starlink issue in India by tracing the timeline of events as well as two important Guideline requirements. The paper provides reasons and stipulates why Starlink did not secure the licenses and what Starlink's future in India will be. Starlink's future in India is questionable, as it must clear many major hurdles before making its services available. It also emphasizes the dangers and numerous other issues discussed in this study, as well as the guidelines and methods examined. Furthermore, Starlink must secure various other licenses, such as VSAT or INSAT MSS_R licenses, which may need the rebuilding of Starlink's operational approach. It is too early to predict what the future of Starlink will be in India, because space-based communication/Internet service is a newly emerging market, and

¹ Tola Onanuga, 'SpaceX's Starlink Has No Licence to Operate in India and the Public Should Steer Clear until It Does, Say Lawmakers' (*Business Insider*, 27 November 2021)

<<https://www.businessinsider.in/tech/news/spacexs-starlink-has-no-licence-to-operate-in-india-and-the-public-should-steer-clear-until-it-does-say-lawmakers/articleshow/87952448.cms>> accessed 10 April 2023

² 'Starlink India Head Resigns' (*The Hindu*, 05 January 2022)

<<https://www.thehindubusinessline.com/companies/starlink-india-head-resigns/article38123013.ece>> accessed 10 April 2023

the Indian authorities' views on Starlink are unclear. However, there is a chance that Starlink might join the Indian market in the future.

Keywords: *insolvency, cross border, ibc.*

INTRODUCTION

In 2021 Starlink a subsidiary of SpaceX an American Company, led by Elon Musk announced that they will be extending their service in India. Starlink services are satellite-based communication services but unlike any other satellite-based telecom services that already exist, Starlink is well known for providing high-speed internet access with speeds up to 1gbps, along with its vast constellation of satellites numbering more than 3000 thousand at low earth orbit, it also has global coverage with the potential to reach every corner of the globe. It also allows Starlink to provide its service at low latency, which makes them unique in comparison with traditional internet services. Being a highly attractive new age mode of internet services, it has gained popularity and has been able to provide its services over the American continent, along with some parts of Europe, most notably in Ukraine, where Starlink was a crucial mode of communication in the country after the traditional internet service in place failed due to the war. It has also planned of expanding its service in the African continent and parts of Asia as well. Their attempt to make their service operational in India came to an end in 2021 soon after they announced their arrival after the Government of India notified the company to stop taking pre-orders of their service citing the fact that they have not obtained the proper licenses. In the latter part of 2022, Starlink's CEO in India stepped down from his position and so far, the future of Starlink in India remains uncertain.

This paper aims to analyze the issue of Starlink in India by tracing the chronology of the events that unfolded, in line with the concerns authorities and many organizations have with the system of Starlink services. The paper also analyses two key Guideline policies of India which are required to be followed for Starlink to be operational in India, although these two policies are among many other legal frameworks in India which would have barred Starlink from obtaining the relevant licenses. In making such analyzation, the paper draws conclusions and

stipulations as to why Starlink failed to obtain the licenses and what the future of Starlink will be in India.

STARLINK AND ITS APPLICATION

The need of having quick, dependable broadband Internet connectivity was highlighted during the global COVID-19 pandemic. Yet, many places lack access to terrestrial broadband Internet. High data rates and extensive coverage are provided through satellite communication. Several geostationary satellites cover Europe, and the new Starlink mega constellation in low Earth orbit has recently been operational. Findings indicate that quick and dependable Internet access is made possible by satellite communication by Space X naming it Starlink³ Virtual private networks and interactive applications are particularly hampered by the high latency of geostationary satellite communications. The low Earth orbit mega constellation Starlink can deliver performance comparable to terrestrial Internet connection methods.⁴

BACKGROUND AND HISTORY OF STARLINK

Starlink began in 2014 when SpaceX applied to Norway's telecom authority. Before SpaceX announced the start of this new Internet service, however, the public was unaware of this endeavor. Although Starlink is a service that SpaceX provides rather than a separate business, it has generated a lot of media attention and influenced the company's overall stock values.⁵ Elon Musk started building and launching into orbit the Starlink satellite Internet constellation in 2015. This constellation consists of thousands of mass-produced small satellites in low Earth orbit (LEO)⁶, which can be used for a variety of purposes, including satellite Internet access as well as military, scientific, and exploratory missions. The Starlink research, development,

³ Joerg Deutschmann et al., 'Broadband Internet Access via Satellite: Performance Measurements with different Operators and Applications' (2022) Broadband Coverage in Germany 16th ITG-Symposium <<https://ieeexplore.ieee.org/abstract/document/9861788>> accessed 10 April 2023

⁴ Gary D Kimura, 'A Structure Editor for Abstract Document Objects' (1986) 12(3) IEEE Transactions on Software Engineering <<http://dx.doi.org/10.1109/tse.1986.6312883>> accessed 10 April 2023

⁵ 'Elon Musk Develops the Starlink Satellite Internet Constellation' (*History of Information*, 01 January 2015) <<https://historyofinformation.com/detail.php?id=5052>> accessed 10 April 2023

⁶ 'What Is Low Earth Orbit (LEO) Satellite?' (*WhatIs.com*, 01 August 2019) <<https://www.techtarget.com/whatis/definition/low-earth-orbit-LEO-satellite>> accessed 10 April 2023

manufacturing, and on-orbit control operations were housed in the SpaceX satellite development facility in Redmond, Washington, where the project was based.⁷

Elon Musk has been instrumental in the growth of Starlink. The FCC authorized the business to begin launching satellites in 2018, and SpaceX reported that the design, construction, and deployment of the constellation had cost approximately US\$10 billion. After years of internal SpaceX development, Starlink accelerated in 2021. After over two years and numerous successful launches, Starlink now has over 2,000 operational satellites in geosynchronous orbit.⁸ Although the emerging broadband provider currently provides service in dozens of nations across all seven continents, there is still a backlog of potential consumers waiting to get equipment and begin service. Amid the continuing assault, SpaceX has deployed tens of thousands of receivers to Ukraine as well as tried to safeguard local communications against Russian military interference.⁹

WHAT IS STARLINK AND HOW IT WORKS?

"Starlink," but it's also known as a "UFO on a Stick" or a "Dishy McFlatface" in normal conversation, is a satellite constellation project that will launch thousands of small satellites into low Earth orbit (LEO), approximately 550 kilometers above the Earth. The array will direct internet signals from satellites to ground transceivers, which will then broadcast locally or wire directly to your Starlink router.¹⁰ A Starlink signal is not the same as a mobile signal or a 5G network. It connects a home, business, or remote area to the internet via satellite.¹¹

By sending and receiving signals from ground stations and other satellites in the constellation, the Starlink satellites are intended to provide internet access. Each satellite weighs around 260

⁷ 'Starlink: An Elon Musk Space Exploration Project' (*Techslang*, 25 May 2021)

<<https://www.techslang.com/starlink-an-elon-musk-space-exploration-project/>> accessed 10 April 2023

⁸ Ry Crist, 'Starlink Explained: What to Know About Elon Musk's Satellite Internet Service' (*CNET*, 15 April 2023)

<<https://www.cnet.com/home/internet/starlink-satellite-internet-explained/>> accessed 10 April 2023

⁹ Heather, 'Starlink – Complete Guide: History, Products, Founding, and More' (*History-Computer*, 04 January 2022) <<https://history-computer.com/starlink-history/>> accessed 14 April 2023

¹⁰ Tong Duan et al., 'Starlink Space Network-Enhanced Cyber-Physical Power System' (2021) 12(4) IEEE

Transactions on Smart Grid <<http://dx.doi.org/10.1109/tsg.2021.3068046>> accessed 11 April 2023

¹¹ Gavin Phillips, 'What Is Starlink and How Does Satellite Internet Work?' (*Make Use Of*, 05 November 2020)

<<https://www.makeuseof.com/what-is-starlink-satellite-internet/>> accessed 11 April 2023

kg and is roughly the size of a table, measuring 1.1 meters by 0.7 meters by 0.7 meters. They can deliver high-speed, low-latency internet to consumers on the ground because of their single solar panel and four high-performance antennae. A Starlink User Terminal, which can be located indoors or outdoors and connects to the internet through an Ethernet cable or a Wi-Fi router, is required for users to access the internet via Starlink. Launch and Deployment: SpaceX's Falcon 9 rockets, which can carry up to 60 satellites each launch, are used for launching the Starlink satellites into orbit.¹²

Most satellite internet services are provided by single geostationary satellites that orbit the Earth at 35,786 kilometers. As a result, the round-trip data time between the user and the satellite – also known as latency – is high, making streaming, online gaming, video calls, and other high data rate activities very difficult.¹³ Starlink is a network of thousands of satellites that orbit the planet at a much closer distance, around 550 kilometers, and cover the entire globe. Due to the low orbit of Starlink satellites, latency is significantly lower – around 25 ms vs 600+ ms.

Further by managing the delivery of thousands of radio frequencies ("RF") beams across the satellite fleet, Starlink provides service to customers by dynamically allocating connections between users on the ground and satellites in orbit. The initial generation of SpaceX satellites was able to produce these incredibly small spot-size beams, which provide faster speed and lower latency by operating satellites that are 65 times closer to the planet than geostationary satellites.¹⁴

According to recent reports by Ars Technica, once powered on, the self-pointing antenna immediately scans the sky and locks onto the closest overhead satellite (provided that the

¹² Umair Akbar, 'Breaking down the Mechanism of SpaceX's Starlink Satellite Internet' (*Medium*, 10 March 2023) <<https://akbu.medium.com/breaking-down-the-mechanism-of-spacexs-starlink-satellite-internet-14b276872503>> accessed 11 April 2023

¹³ Tereza Pultarova, 'Starlink Satellites: Everything You Need to Know about the Controversial Internet Megaconstellation' (*Space.com*, 14 April 2022) <<https://www.space.com/spacex-starlink-satellites.html>> accessed 11 April 2023

¹⁴ Simon Alvarez, 'Starlink Services LLC ETC Designation Application PDF' (*Scribd*, 14 Feb 2021) <<https://www.scribd.com/document/494490767/Starlink-Services-LLC-ETC-Designation-Application-pdf>> accessed 11 April 2023

surrounding temperature is below 122 degrees Fahrenheit, of course).¹⁵ The connection is thus effortlessly maintained while each new Starlink satellite appears and the old one disappears over the horizon.¹⁶ Through constant development, they came up with a method or technique where rather than connecting people to a nearby ground station, the lasers would allow satellites to communicate directly at the speed of light, which is faster in space than in fiber optic cables.¹⁷ Before being replaced by newer, more sophisticated ones, the Starlink satellites are intended to function for five to seven years.¹⁸

1.3. STARLINK AS A SATELLITE-BASED COMMUNICATION SERVICE

Many of us find it difficult to picture a world without instant, unrestricted internet access. Others have even claimed that it ought to be included in the list of fundamental human rights, along with access to power and clean water. Yet, as of January 2023, only 64.4% of people worldwide were internet users. The majority of those connections are from Asia and Europe.¹⁹ In January 2023, the US business SpaceX stated that Rwanda and Nigeria would be receiving its Starlink service. Later this year, it will be implemented elsewhere on the continent, including in Kenya, Tanzania, and the Democratic Republic of the Congo (DRC).²⁰ Inadequate digital infrastructure, expensive investment costs for fiber optic cables or mobile phone masts, and other factors have led to connectivity gaps across Africa. This could be a significant approach to closing those gaps. The UN has a plan to provide universal access throughout Africa by 2030, but this won't be possible without new ideas and an open-minded approach.²¹ Fast, reliable internet service is made possible by the ability of Starlink's Low-Earth Orbit satellites to connect

¹⁵ Jon Brodtkin, 'SpaceX Starlink Has Some Hiccups as Expected, but Users Are Impressed' (*Ars Technica*, 12 November 2020) <<https://arstechnica.com/information-technology/2020/11/spacex-starlink-has-some-hiccups-as-expected-but-users-are-impressed/>> accessed 11 April 2023

¹⁶ Eric Betz, 'How Do SpaceX's Starlink Satellites Actually Work?' (*Discover*, 28 June 2021) <<https://www.discovermagazine.com/technology/how-do-spacexs-starlink-satellites-actually-work>> accessed 11 April 2023

¹⁷ *Ibid*

¹⁸ Umair Akbar (n 12)

¹⁹ HMVR Herath, 'Herath Starlink : A Solution to the Digital Connectivity Divide in Education in the Global South' (2021) *Computer and Society* <<https://arxiv.org/abs/2110.09225>> accessed 11 April 2023

²⁰ Bolo Abiodun, 'Do You Really Need Starlink in Nigeria?' (*TechPoint Africa*, 01 February 2023) <<https://techpoint.africa/2023/02/01/do-you-really-need-starlink-in-nigeria/>> accessed 11 April 2023

²¹ Aaron C Boley, 'Plaskett 1.8 m Observations of Starlink Satellites' (2022) 163(5) *The Astronomical Journal* <<https://iopscience.iop.org/article/10.3847/1538-3881/ac5599/meta>> accessed 11 April 2023

and relay signals between one another. Additionally, there are many of them: as of February 17, 2023, SpaceX reported having launched 3,981 satellites in total, 3,639 of which are still in service.²² Starlink hopes to solve the problem of the internet in remote areas and but as of now, they have a long way to go.

Another eminent role played by Starlink was the direct participant in the ongoing Russia-Ukraine conflict and a legitimate military target, Starlink has been actively involved in directing Ukrainian military drones and missiles against Russian military installations. Additionally, Russia had claimed that Starlink had assisted the Ukrainian forces in directing and modifying the firing of the two Neptune missiles, which had destroyed the Russian cruiser Moskva.²³ The commercial satellite system provided Ukraine with strategic and tactical information.²⁴ On both sides of the war, non-state actors are also supplying intelligence for targeting decisions,²⁵ by intercepting Russian radio communications to compile a database of Russian commanders' instructions, through the usage of Starlink, providing a searchable history of their strategies.²⁶ Insofar as customary international norms of armed conflict are concerned, Starlink's engagement in an international war without official US government authorization as a privately held organization based in the United States (US) has opened a Pandora's Box.²⁷

²² 'Starlink Launch Statistics' (*Jonathan's Space Pages*) <<https://planet4589.org/space/con/star/stats.html>> accessed 11 April 2023

²³ Alexander Freund, 'Ukraine is Using Elon Musk's Starlink for Drone Strikes' (*Made for Minds*, 27 March 2022) <<https://www.dw.com/en/ukraine-is-using-elon-musks-starlink-for-drone-strikes/a-61270528>> accessed 11 April 2023

²⁴ Alia Shoaib, 'Ukraine: Inside the Elite Drone Unit Founded by Volunteer IT Experts' (*Business Insider*, 09 April 2022) <<https://www.businessinsider.in/international/news/inside-the-elite-ukrainian-drone-unit-founded-by-volunteer-it-experts-we-are-all-soldiers-now-/articleshow/90743790.cms>> accessed 11 April 2023

²⁵ Matt Burgess, 'Their Photos Were Posted Online. Then They Were Bombed' (*Wired*, 26 August 2022) <<https://www.wired.com/story/wagner-group-osint-russia-ukraine/>> accessed 11 April 2023

²⁶ Will Knight, 'As Russia Plots Its Next Move, an AI Listens to the Chatter' (*Wired*, 04 April 2022) <<https://www.wired.com/story/russia-ukraine-war-ai-surveillance/>> accessed 11 April 2023

²⁷ Kaushik Ray and William Selvamurthy, 'Starlink's Role in Ukraine: Portent of a Space War?' (2023) 17(1) *Manohar Parrikar Institute for Defence Studies and Analyses Journal of Defence Studies* <https://www.idsa.in/system/files/jds/03_17-1-2023-Kaushik-Ray_William-Selvamurthy.pdf> accessed 11 April 2023

STARLINK IN INDIA

On January 4th, 2022, Sanjay Bhargava, the Country Director and Chairman of the Board of Starlink India announced that he would be stepping down from the position. The announcement came after the Indian Government (Dept. of Telecommunications) on November 26th of 2021 ordered SpaceX to stop taking preorders for the satellite broadband service and to refund the prospective consumers.²⁸ Before the intervention, preorders in India had crossed the 5000 targeted mark and the company had plans to activate 200,000 terminals in India by December 2022.²⁹ The intervention of the Indian authorities no doubt was a massive disappointment to SpaceX, and its plans to enter into one of the world's second-largest telecommunications markets. If the attempt had been successful, they would have access to 1.1 billion subscribers,³⁰ and Starlink being a broadband service like no other before, would have no doubt been a massive success even with their preorder price of 99 Dollarper subscription.

Pre-bookings were made in March 2021, making it available by Starlink in several locations throughout the globe, including some regions of India. In rural areas, the company claims to offer internet speeds of 50 to 150 Mbps, with plans to increase that to 300 Mbps by the end of the year.³¹ However, in April, The Broadband India Forum (BIF)³² wrote to the Telecom Regulatory Authority of India (TRAI) and the Indian Space Research Organization (ISRO) to block the pre-selling of the beta version of Starlink. BIF is a body that represents Amazon, Facebook, Google, Hughes, and Microsoft. It alleged that SpaceX does not have the license to offer such services in India. Following the complaint, DoT started scrutinizing Starlink's beta phase in India.³³ Aside

²⁸ 'Get Licence before Offering Satellite-Based Services': Telecom Dept. to 'Star link Internet Services' (*Press Information Bureau*, 26 November 2021) <<https://pib.gov.in/PressReleaseDetailm.aspx?PRID=1775425>> accessed 15 April 2023

²⁹ Jason rainbow, 'Starlink's Head of India Resigns as SpaceX Refunds Preorders' (*Space News*, 04 January 2022) <<https://spacenews.com/starlinks-head-of-india-resigns-as-spacex-refunds-preorders/>> accessed 12 April 2023

³⁰ 'Largest Telecom Company in India, Top Telecom Companies in India' (*India Brand Equity Foundation*, 01 December 2022) <<https://www.ibef.org/industry/telecommunications>> accessed 12 April 2023

³¹ Rohit Ranjan Praveer, 'Govt. Says Starlink Has Applied for a Trial License, Lists Required Licenses' (*My Lawrd*, 16 December 2021) <<https://www.mylawrd.com/govt-says-starlink-has-applied-for-a-trial-license-lists-required-licenses/>> accessed 12 April 2023

³² 'Broadband India Forum - Think Tank for Digital Transformation' (*Broadband India Forum*) <<https://broadbandindiaforum.in>> accessed 12 April 2023

³³ Rohit Ranjan Praveer (n 31)

from the type of license, the department is likely to inquire about the precise nature of services that will be offered in India, the spectrum band that will be used, and the foreign satellite capacity that will be used to supply high-speed internet services.³⁴

Not long after that, the Indian government emphasized that Starlink does not have a license to operate its Satellite-based internet services in India.³⁵ The Ministry of Communications Department of Telecommunications (DoT) has also stated that satellite-based services in India require licenses and advises the public not to subscribe to the service because Starlink is not a licensee, even though the company is registered.³⁶ This statement confirms two major aspects: that Starlink is being withheld due to its inability to meet the regulatory standards and that they are still looking to expand its services in India in the future. Devusinh Chauhan, the minister of state for communications, has just informed the legislature that Starlink had requested a trial or experimental license. He added that the DoT issues various authorizations for satellite-based internet services under the Unified License. He further explained that Starlink "has also informed that it intends to apply for all the applicable licenses and authorizations required for commercial launch in India" in the written response to his request.³⁷ Yet it's been almost two years and they are completely quiet about their progress on the licensing procedure.

Before we analyze the regulatory standards, which is likely the cause for the intervention, it is pertinent to understand what the contributions of Starlink would have been in the world's most populated country. At the same time, it is important to weigh the shortcomings of allowing a foreign satellite broadband service in the country to operate. Therefore, the following entry to this chapter shall analyze the positive as well as negative aspects of permitting Starlink service in India.

³⁴ *Ibid*

³⁵ 'As Elon Musk's Starlink Offers Internet Services in India, Govt Issues Warning' (*Hindustan Times*, 27 November 2021) <<https://www.hindustantimes.com/india-news/as-elon-musk-s-starlink-offers-internet-services-in-india-govt-issues-warning-101637983184977.html>> accessed 12 April 2023

³⁶ Shashank Maheshwari, 'Starlink Has No License to Offer Satellite-Based Internet in India: DoT' (*My Lawrd*, 03 December 2021) <<https://www.mylawrd.com/starlink-has-no-license-to-offer-satellite-based-internet-in-india-dot/>> accessed 12 April 2023

³⁷ Rohit Ranjan Praveer (n 31)

IMPLICATIONS OF STARLINK SERVICE IN INDIA

The most important implication of Starlink in India would be the reach it will have over areas that are typically difficult to provide broadband or internet services too. More than 909 million people live in rural areas in India and more than 400 million people are living in urban areas, this speaks to the fact that most of the telecommunications (internet/broadband) market in India is in rural and remote areas. However, the present scenario of Internet services in rural areas is highly underdeveloped, the reasons being expensive and difficult infrastructures, lack of potential customers and applications, unclear government policies on Internet service mapping, and obsolete technology.³⁸

Apart from the cost factor, what Starlink provides is an easy method to extend internet services to remote and rural areas, this is one key aspect to bypassing the difficulties faced by conventional telecommunications service providers in providing internet or broadband services to remote and rural areas. The next implication Starlink would have been the cost factor. Starlink was taking preorders for their services at 99\$³⁹ which roughly amounts to a little over 8000 rupees, although they have recently increased their monthly fee to 110\$. All in all, the price of Starlink service in India per month would be roughly 9 to 10 thousand per month. This is a high-cost expenditure according to Indian standards, where the average cost of broadband services ranges from 1100 rupees to 3999 rupees per month. Plus, India is ranked the 5th lowest internet data rate in the world, with an average price of 13 rupees per 1 GB.⁴⁰

At the same time, India is ranked 69th as per the global average internet speed ranking at 50.02 Mbps.⁴¹ Meanwhile, the average internet speed of Starlink ranges from 65 Mbps to 100 Mbps depending on the location of the user. This can be interpreted as having an edge over

³⁸ Shrijan Soni, 'Reasons for Slow Internet Services in Rural Areas' (*TelecomTalk*, 17 May 2021) <<https://telecomtalk.info/reasons-for-slow-internet-services-rural-areas/361450/>> accessed 12 April 2023

³⁹ Jason rainbow (n 29)

⁴⁰ Singh Rahul Sunilkumar, 'India Has 5th Lowest Mobile Data Prices in the World. Check Pak, Sri Lanka Rates' (*Hindustan Times*, 27 July 2022) <<https://www.hindustantimes.com/technology/india-has-5th-lowest-mobile-data-prices-in-the-world-check-pak-sri-lanka-rates-101658920262973.html>> accessed 12 April 2023

⁴¹ 'India Jumps 10 Spots in Median Mobile Speeds Globally' (*The Economic Times*, 20 February 2023) <<https://economictimes.indiatimes.com/industry/telecom/telecom-news/india-jumps-10-spots-in-median-mobile-speeds-globally/articleshow/98082470.cms?from=mdr>> accessed 12 April 2023

conventional internet service providers by providing high-speed internet service at a significantly higher price. Even though the population in the urban areas might be able to subscribe to such a cost-intensive service, it is questionable whether the services would be feasible in rural and remote areas. Owing to the same question, Starlink had planned to provide 100 devices for free to schools in Delhi and nearby rural areas and then target 12 rural districts across India.⁴²

Another implication Starlink has had is the kick-starting of competition regarding satellite mobile internet service providers in India. In late 2022, Reliance's Jio announced its plan to launch Jio Space Technology Ltd, a joint venture with SES, a Luxembourg-based company, to provide satellite internet services in India which has been approved by the Indian authorities.⁴³

Furthermore, Tata Group Company Nelco in partnership with Canada's Telesat has done trials and is in the process of making its service publicly available and is awaiting approval of license by the Indian Authorities.⁴⁴ At the same time, Bharti-backed Company Oneweb became the first major Indian telecom to offer terrestrial and satellite broadband service, they have launched a total of 618 satellites which completes their satellite constellation system.⁴⁵ Although Starlink is not the pioneer of Satellite mobile internet services, the technology they have developed, the method of providing its service, and the pace at they are operating at, has made all other competitors pick up their own pace to compete with Starlink, which by far is at the lead of this

⁴² 'Elon Musk's Starlink Hits a Wall in India' (*Al Jazeera*, 05 January 2022) <<https://www.aljazeera.com/economy/2022/1/5/elon-musks-starlink-hits-a-wall-in-india>> accessed 12 April 2023

⁴³ Kiran Rathee, 'Jio Satellite Gets DoT Nod to Start Broadband-from-Space Services' (*The Economic Times*, 12 September 2022) <<https://economictimes.indiatimes.com/industry/telecom/telecom-news/jio-gets-loi-for-satellite-communication-services-from-dot-sources/articleshow/94159675.cms?from=mdr>> accessed 12 April 2023

⁴⁴ Kalyan Parbat, 'Tata-Backed Nelco Eyes Consumer Satellite Broadband Foray, Says MD' (*The Economic Times*, 14 April 2023) <<https://economictimes.indiatimes.com/industry/telecom/tata-backed-nelco-eyes-consumer-satellite-broadband-foray-says-md/articleshow/99480641.cms?from=mdr>> accessed 12 April 2023

⁴⁵ Manish Pant, 'With ISRO's One Web Launch, Bharti Becomes First Major Indian Telco to Offer Terrestrial and Satellite Broadband Services' (*Business Today*, 26 March 2023) <<https://economictimes.indiatimes.com/industry/telecom/tata-backed-nelco-eyes-consumer-satellite-broadband-foray-says-md/articleshow/99480641.cms?from=mdr>> accessed 12 April 2023

tech race with 3660 active satellites in orbit, which is roughly 50% of all 7300 active satellites in orbit.

CONCERNS RELATED TO STARLINK SERVICES

Starlink has created significant light pollution, space trash, and chemical pollution in the atmosphere, and the burning of aluminum from deceased satellites may have undiscovered ozone layer side effects. SpaceX currently owns more than half of all active satellites in orbit, and their high reflectivity is flooding the sky with artificial light. Astronomers are concerned that the satellites will make it more difficult to detect asteroids near Earth due to the sheer quantity of gadgets and the light streaks they produce, which might interfere with telescope observations. As the number of SpaceX spacecraft grows, so will the disturbance.⁴⁶ A few of the threats will be further elaborated. Not to mention the world shows concern in the aspect of sustainability including India.

Potential collision risk

One major concern of Starlink is attributed to the constellation of satellites at Lower Earth Orbit (LOE) it requires which enables their service. The Indian Space Research Organization (ISRO) has raised concerns about such a constellation system at LOE, which is causing inconvenience to their activities. In 2021 alone ISRO had to reposition their satellites 19 times to avoid collision with Starlink satellites.⁴⁷ The issue was raised by ISRO at the February 10, 2022, meeting of the UN Committee on Peaceful Use of Outer Space held in Vienna. In the presentation made by ISRO at the meeting, they showed that Starlink satellites came into proximity with satellites at 550 km orbit at less than 1 km conjunction. The presentation also stated that satellites originally slated at 550 km were relocated to 574 km.⁴⁸

⁴⁶ Macaulay T, '4 Threats Posed by Elon Musk's Starlink Satellites' (TNW, 21 January 2022)

<<https://thenextweb.com/news/problems-with-elon-musk-starlink-satellites>> accessed 12 April 2023

⁴⁷ Srinivas Laxman, 'Starlink Satellites of SpaceX Posing Hazard for Isro Satellites' (*The Times of India*, 20 February 2022) <<https://timesofindia.indiatimes.com/india/starlink-satellites-of-spacex-posing-hazard-for-isro-satellites/articleshow/89692679.cms>> accessed 12 April 2023

⁴⁸ *Ibid*

The other concerns raised in this meeting included a reduction in the launch window for ISRO satellites due to the swarm of Starlink satellites, that there is an increased risk of collision between spacecraft already in orbit, and that the constellation at LOE is impeding observational capacities.⁴⁹ Other organizations such as NASA have also raised the same concerns. In a letter to the FCC, a federal commission of the US government, they mentioned the issue of increased risk of collision amongst many other issues. The letter further states that Starlink satellites could worsen the risk of interference with planetary defense surveys performed by ground-based telescopes, which NASA uses to scan the skies for potentially threatening asteroids.⁵⁰

As Quartz previously reported, the space world is concerned about the chances of collision with the expanding number of satellites in space in the lack of a global space traffic control system.⁵¹ Starlink alone will have thousands of users. Hugh Lewis, a space debris expert at the University of Southampton in the United Kingdom, says that Starlink satellites are currently responsible for 50% of all close encounters in low orbit, which are occurrences in which two spacecraft pass within one kilometer (0.6 miles) of one another. According to SpaceX, their satellites are programmed to avoid collisions on their own.⁵² SpaceX and NASA established an agreement in March outlining protocols and communications to avoid collisions. According to the agreement, SpaceX will move its spacecraft when evasive maneuvering is required, and NASA will not execute such maneuvers unless otherwise directed, to limit the danger of both parties acting at the same time, bringing the spacecraft closer together by accident.⁵³

⁴⁹ *Ibid*

⁵⁰ Elizabeth Howell, 'NASA is concerned about SpaceX's new generation of Starlink satellites' (*Space.com*, 11 February 2022) <<https://www.space.com/nasa-collision-risk-starlink>> accessed 12 April 2023

⁵¹ Tim Fernholz, 'SpaceX's New Satellites Will Dodge Collisions Autonomously (and They'd Better)' (*Quartz*, 24 May 2019) <<https://qz.com/1627570/how-autonomous-are-spacexs-starlink-satellites>> accessed 12 April 2023

⁵² Tereza Pultarova, 'SpaceX Starlink Satellites Responsible for over Half of Close Encounters in Orbit, Scientist Says' (*Space.com*, 18 August 2021) <<https://www.space.com/spacex-starlink-satellite-collision-alerts-on-the-rise>> accessed 12 April 2023

⁵³ 'NASA, SpaceX Sign Joint Spaceflight Safety Agreement' (*NASA*) <<http://www.nasa.gov/press-release/nasa-spacex-sign-joint-spaceflight-safety-agreement>> accessed 12 April 2023

Security Concerns

National Security became a big issue after Starlink was used in the Russian and Ukraine war by intercepting their radio communication while providing immensely useful tactics and important information. That created fear among countries in adopting Starlink. And there will be a bigger risk for India because all telecommunication networks are linked to personal information via Aadhar-card, which must be attached with other information to gain access to telecommunication or cell phone service. This issue is an ongoing privacy issue that India still couldn't figure out. With that, the US would soon be able to access the information of all Indian citizens via Starlink if they so desire. Apart from India, there have been other Nations that have publicly opposed the Starlink satellite system. Most prominent is the Chinese Government which has taken an aggressive stance against the widening of the Starlink satellite constellation system. Chinese military researchers have gone as far as to say that the Chinese must develop the ability to disable or destroy Starlink satellites if they ever pose a threat to the national security of the nation.⁵⁴ In a paper published in 2022 by Ren Yuanzhen, a researcher at the Beijing Institute of Tracking and Telecommunications, it was recommended that China develop anti-satellite capabilities, including a surveillance system to track and monitor every one of Starlink's satellites.⁵⁵

On top of that, the aspect of Cyber security plays a crucial role in everyone's skepticism and hesitation in adopting a foreign satellite system to their jurisdiction. Leading SpaceX to encourage security researchers to attempt to hack the satellite internet infrastructure and disclose any flaws to the business. Security researchers who are interested in submitting their findings can do so through SpaceX's bug bounty program, which can pay up to \$25,000 per detected vulnerability.⁵⁶ The weaknesses can only be exploited if the attacker has physical access to a Starlink dish, excluding the possibility of a remote attack infecting a user's Starlink dish. Furthermore, the vulnerabilities cannot be utilized to attack a Starlink satellite in orbit, nor can

⁵⁴ Stephen Chen, 'China Must Be Able to Destroy Musk's Starlink If It Poses Threat: Scientists' (*South China Morning Post*, 25 May 2022) <<https://www.scmp.com/news/china/science/article/3178939/china-military-needs-defence-against-potential-starlink-threat>> accessed 12 April 2023

⁵⁵ Stephen Chen (n 54)

⁵⁶ 'SpaceX's Bug Bounty Program' (*Bugcrowd*) <<https://bugcrowd.com/spacex>> accessed 12 April 2023

they be used to reveal other users' information or to meddle with other Starlink dishes on the network.⁵⁷ Starlink tried to project a solid foundation and a safe network where it's nearly impossible to hack. Yet the development and advancement of technology, no one can guarantee its future of it.

In hindsight, India's concern with Starlink comes down to two major aspects. First, the issues raised by ISRO concerning space activities and the impediments to astronomical research, and two, the issue of allowing Starlink to have access to the second-largest telecom market in the world. The intervention by the Indian Government in not allowing Starlink to operate in India when looked alongside these two key aspects can be understood as their attempt to ensure that the Starlink system is safe and secure which can be achieved by close coordination with other parties and ensure that the Indian market is not monopolized by Starlink and to allow Indian Private Companies to come to a close par with Starlink before allowing them to enter into the billion-dollar market.

Economic Concerns

Starlink is known for not being cost-effective even though it claims over providing the internet to remote areas. As mentioned before in the paper, India is a country where the majority of the people lives in the rural area. And that makes the monthly subscription cost inexplicably expensive for many. Starlink became available in most African countries and the cost concern became one of the major issues despite lowering the prices. CNN reports that Starlink sent out an email inviting customers to try out the service. The email stated that the upfront cost of the ground infrastructure would be \$499 and that the monthly cost of the internet service would be \$99. While Hughes Net's 50GB high-speed internet service (at 25Mbps) may cost up to \$150 per month, it has terrible latency that prevents gaming and even streaming. In December, the Federal Communications Commission awarded SpaceX \$856 million. By the arrangement,

⁵⁷ Matt Burgess, 'The Hacking of Starlink Terminals Has Begun' (*Wired*, 10 August 2022) <<https://www.wired.com/story/starlink-internet-dish-hack/>> accessed 12 April 2023

Starlink will be able to connect rural areas in 35 different states to the internet.⁵⁸ The price of Starlink is one thing to be wary about. For instance, Nigeria's Fiber One, a broadband internet service provider, was offering internet with fast speeds of up to 500 Mbps at the beginning of February 2023. The monthly membership was roughly N100,000 (US\$220) and the installation price was N32,231 (almost US\$70). In contrast, Starlink in Nigeria charges a one-time kit and installation fee of approximately N276,000 (US\$599) and a subsequent monthly membership fee of approximately N198,000 (US\$43).⁵⁹

Many say that Starlink wasn't created to connect remote cybersecurity professors; SpaceX has made greater claims. It intends to offer high-speed satellite internet to many of the world's 3.7 billion people who now have no internet access at all. Many people simply rely on mobile phone connections, which is an expensive workaround in and of itself. However, the upfront cost of Starlink will be the most significant.⁶⁰ The cost of the satellite dish and router is a stunning \$499, and the equipment is sold to clients at a loss. Elon Musk, the founder of SpaceX, has previously stated that he hopes to reduce these prices to less than \$250, however, it is uncertain when or if this will occur. The price is simply too expensive for much of the rural world, both in America and elsewhere.⁶¹

STARLINK AND INDIAN LAWS

The notification of the "Department of Telecommunication" DoT, dated 26th November 2022 which prohibited Starlink from further operating in India mandated that Starlink ought to abide by the regulations in place and should not be operational until they acquire the necessary

⁵⁸ Matiur Rahman et al., 'Abundance of Heterocystous Blue Green Algae of Rice Field of Mangaldoi Sub Division, Darrang District Assam' (2021) 14(5) Bioscience Biotechnology Research Communications <<http://dx.doi.org/10.21786/bbrc/14.5/43>> accessed 12 April 2023

⁵⁹ 'SpaceX's Starlink Could Help Undo the Digital Divide in Africa' (*Boom*, 05 March 2023) <<https://www.boomlive.in/explainers/spacex-starlink-africa-internet-digital-divide-21261>> accessed 12 April 2023

⁶⁰ Akhtar Saeed et al., 'GHz-to-THz Broadband Communications for 6G Non-Terrestrial Networks' (2023) 4(1) ITU Journal on Future and Evolving Technologies <<http://dx.doi.org/10.52953/aoky1032>> accessed 12 April 2023

⁶¹ Neel V Patelarchive, 'Who Is Starlink Really For?' (*MIT Technology Review*, 06 September 2021) <<https://www.technologyreview.com/2021/09/06/1034373/starlink-rural-fcc-satellite-internet/>> accessed 12 April 2023

licenses⁶². For this reason, this paper shall analyse the legal provisions involved in this aspect and the regulations that Starlink ought to abide by. In doing so, a conclusion as to why Starlink was prevented from operating⁶³ in India shall be drawn and the possible reason as to why Starlink would have failed to satisfy the required regulations and criteria can be speculated upon.

The legal provisions concerned can be broadly classified into two categories: legal regimes governing the use of satellite communication systems and legal regimes governing the regulation of satellite-based telecom services. The legal regime governing the use of satellite systems is essentially ruled by the: Norms, guidelines, and procedures for implementation of the policy framework for satellite communications in India as approved by the Government in 2000.⁶⁴ And on the other hand, Legal frameworks governing satellite-based telecommunications services include Legal regimes on the usage of satellite communication services and Legal Regimes regulating satellite-based telecom services.

LEGAL REGIME ON THE USAGE OF SATELLITE COMMUNICATION SERVICES: SATCOM

As per the norms, guidelines, and procedures for implementation of the policy framework for satellite communications in India as approved by Government in 2000, looking through the lens of Article 1, two major aspects can be interpreted, one foreign satellite service shall be allowed to operate, given that they possess the required licenses and two, that the Indian authority shall be biased in their treatment of proposals seeking a license for such activity.⁶⁵ This speaks to the effect that the Indian Authority gives priority to those who are using Indian satellites, highlighting their intention to promote homegrown satellite communication services. Being the

⁶² 'Govt Says Elon Musk's Starlink Not a Licensee; Asks to Refrain from Booking Satellite Internet Services' (*The Hindu*, 27 November 2021) <<https://www.thehindu.com/business/Industry/govt-says-elon-musks-starlink-not-a-licensee-asks-to-refrain-from-booking-satellite-internet-services/article37715795.ece>> accessed 12 April 2023

⁶³ 'Musk-Backed Starlink to Refund Pre-Orders in India after Govt Order' (*The Hindu*, 05 January 2022) <<https://www.thehindu.com/sci-tech/technology/musk-backed-starlink-to-refund-pre-orders-in-india-after-govt-order/article38123198.ece>> accessed 12 April 2023

⁶⁴ Indian Satellite Communication Policy 2000

⁶⁵ Indian Satellite Communication Policy 2000, art 1

second largest telecom market in the world, this decision is quite clear in asserting India's attitude towards opening its market to foreign companies and their underlying desire to retain much of the market share within the country.

Article 1 also clearly implies that those companies providing mobile internet services, whose license shall be issued by the Department of Telecommunication as per their rules and regulations.⁶⁶ This does not mean that foreign companies seeking to provide mobile internet service via satellite systems will not come under this policy. Starlink being a company seeking to provide mobile internet service via a satellite system shall be subjected to this policy plus the regulations of the Department of Telecommunications. The provisions of this policy framework that Starlink is subjected to are as follows.

Article-4 of the Guidelines approved by the government (2000) states the procedures regarding the use of foreign satellites. Where Article 4(a)⁶⁷ provides the three circumstances for using foreign satellites. In the case of overseas services using international inter-governmental systems, such as marine transportation or international aviation services. Systems owned and operated by Indian parties but registered in other countries. International private systems where there is substantial Indian participation by way of equity or in-kind contribution and where considered necessary reciprocal arrangements could be worked out with the country/countries of registration or ownership.⁶⁸ Starlink falls partly comes under the third categorization, although Starlink being a subsidiary of SpaceX does not have substantial Indian participation by way of equity or in-kind consideration. The provision of necessity stated wherein reciprocal arrangements can be made with the country/ countries of registrations or ownership, speaks to the effect wherein Starlink via the United States can come to terms with the Indian authorities and formulate a mode of operation in the country, given the Indian authority deems it necessary. Under Article 4(1), satellite communication service is categorized into International Communication service and Domestic Communication service.⁶⁹ Starlink being a satellite-based

⁶⁶ *Ibid*

⁶⁷ Indian Satellite Communication Policy 2000, art 4(a)

⁶⁸ *Ibid*

⁶⁹ Indian Satellite Communication Policy 2000, art 4(1)

service company that operated globally, they are subjected to both these categorizations. The following is an analysis of Starlink under the lens of the categorization given.

Sub-article 4.2 provides the guidelines for international communication services. It states that *“In so far as International communication is concerned the existing practice of using International Inter-Governmental Systems shall continue.”*⁷⁰ This speaks to the effect that the usage of Starlink in India shall be subjected to International Inter-Government systems such as the International Mobile Satellite Organization, whose primary purpose is the oversight of public satellite safety and security communication services provided by mobile satellite communication systems. Mobile Satellite System (Services) provides two-way voice data and data communications to global users who are on the go or in remote locations⁷¹. Starlink marketing strategy focuses on its ability to provide internet services to remote locations, in doing so it shall be subjected to the International Mobile Satellite Organization plus the Indian rules and regulations regarding Mobile Satellite Services (MSS) which will be analyzed further in the later part of this chapter.

Article 4.2 goes on to state that; *“The International Communications Services will include PSTN, GMPCS, Value Added Services, Programme Exchange, etc.”*⁷² This speaks to the effect that Starlink shall be subjected to Indian rules and regulations regarding the satellite system services mentioned, such as the GMPCS. Starlink announced that they will be providing PSTN services as well⁷³. Which extends the applicability of this policy framework to their operations.

Furthermore, all services given in the telecom sector that are not typical voice conversations or fax transmissions are referred to as value-added services (VAS).⁷⁴ VAS services include things like Mobile gaming, Streaming music, OTT services (like Netflix), and internet data storage. These are activities that may be accessed online, and as Starlink offers them, their operations are

⁷⁰ Indian Satellite Communication Policy 2000, art 4(2)

⁷¹ Raman, ‘Global Mobile Satellite System’ (*Geeks for Geeks*, 25 March 2019)

<<https://www.geeksforgeeks.org/global-mobile-satellite-system/>> accessed 12 April 2023

⁷² Indian Satellite Communication Policy 2000, Article 4(2)

⁷³ Simon Alvarez, ‘Elon Musk’s Starlink Filings Show Plans for Phone Service and Low-Income Web Access’ (*Teslarati*, 14 February 2021) <<https://www.teslarati.com/elon-musk-starlink-internet-phone-service-confirmed/>> accessed 12 April 2023

⁷⁴ ‘VAS’ (*Telecom Regulatory Authority of India*, 05 November 2001) <<https://tra.gov.in/telecom/vas>> accessed 12 April 2023

subject to the VAS described in 4.3.3.⁷⁵ Starlink is subject to Land Mobile Satellite Services since they are seeking to provide internet services to mobile phones plus they have announced their plans to extend their services to private airplanes⁷⁶ etc. Considering this interpretation, it can be understood that Starlink is subject to the norms and guidelines regarding Domestic Satellite Service, which is given in sub-article 4.4,⁷⁷ which mainly talks about the procedural aspect. The key take away from this provision is that; Starlink shall be subject to the administrative ministry/department which provides the norms/procedure of issuing the license of the services mentioned in sub-article 4.3 and that the concerned department shall be adopting the norms/procedures provided in the Satellite Communication policy-framework.⁷⁸ It also clarifies that Starlink, whose services include Value added services and Land mobile satellite services, are subjected to the rules and regulations prescribed by the Ministry of Communications.⁷⁹

The Indian government emphasizes the value of domestic satellite systems and believes that licenses for foreign satellites should only be issued in the event of a capacity or capability gap. From a business point of view, this comes as a major deterrent to extending Starlink's services to India. If Starlink was to be given a license in India, being a foreign satellite system, they were compelled to limit their operations until similar Indian satellite systems were established. In speculation, this may very well be one of the reasons for Starlink's failure to obtain a license.

LEGAL REGIMES REGULATING SATELLITE-BASED TELECOM SERVICES

GMPCS Guidelines and Starlink

Global Mobile Personal Communication by Satellite Service ('GMPCS') is a telecommunications system that consists of a constellation of satellites and ground stations that provide direct telecom service to end customers. Subscribers can converse from any location on the planet

⁷⁵ Indian Satellite Communication Policy 2000, art 4(3)(3)

⁷⁶ 'SpaceX Rolls out Starlink Internet Service for Private Jets' (*The Hindu*, 20 October 2022)

<<https://www.thehindu.com/sci-tech/technology/spacex-rolls-out-starlink-internet-service-private-jets-starlink-aviation-satellite/article66034508.ece>> accessed 12 April 2023

⁷⁷ Indian Satellite Communication Policy 2000, art 4(4)

⁷⁸ Framework for Satellite Communication Policy 1997

⁷⁹ 'Ministry of Communications' (*National Government Services Portal*)

<https://services.india.gov.in/service/ministry_services?ln=en&cmd_id=344> accessed 12 April 2023

using hand-held terminals and a single phone number. Satellites can travel up to 1000 kilometers in Low Earth Orbit (LEO), 10,000 kilometers in Medium Earth Orbit (MEO), or 36,000 kilometers in Geostationary Earth Orbit (GEO).⁸⁰ The nature and functions of the Starlink satellite system are well within the meaning of GMPCS and require following these guidelines to obtain a GMPCS license. However, it must be noted that these guidelines are only for general information and do not constitute any legally binding commitment.

According to reports, Starlink requested GMPCS licensing; however, it is unknown whether they were granted the license before the notice dated November 26, 2022, ordering the closure of Starlink's business owing to a shortage of licenses for satellite-based services. Thus, after carefully interpreting the essence of the failure to obtain the license, and meticulously going through the GMPCS guideline, the following are the key guidelines that can be inferred as major barriers for Starlink to obtain a license. As per para 3⁸¹, the SIA clearance and the WPC licensing required are not known to have been satisfied, or the information is not made public. Hence it is assumed that this criterion was not met. The status of payment of rupees 1 crore before the license agreement as stated in para 4⁸² is not made public. Hence, it is assumed that this criterion was not met.

Starlink does satisfy the criteria under para 9⁸³, as they have been registered in India as a wholly owned subsidiary company of SpaceX.⁸⁴ Starlink does not meet or exceed the 49% foreign equity cap imposed during the time of licensing since it is wholly owned by SpaceX. The gateway facilities plus controlling and monitoring facilities as mentioned in Para 13 are assumed to have not been met. Operational GMPCS and mobile terminals requiring a separate license from the WPC wing of the Ministry of Communications under the Telegraph Act which is a pre-condition

⁸⁰ 'Guidelines For Issue of License For Global Mobile Personal Communication By Satellite (GMPCS) Service' (Government Of India, Ministry Of Communications Department Of Telecommunications Licensing Cell, 01 November 2001)

⁸¹ *Ibid*

⁸² *Ibid*

⁸³ *Ibid*

⁸⁴ Sethu Pradeep, 'Elon Musk's SpaceX Registers Starlink As Legal Entity In India' (INC42, 02 November 2021) <<https://inc42.com/buzz/elon-musks-spacex-registers-starlink-as-legal-entity-in-india/>> accessed 12 April 2023

to GMPCS licensing were not met.⁸⁵ The security concerns mentioned in para 27⁸⁶ are assumed to have not been met, possible difficulties in ensuring security measures since Starlink satellites are foreign satellites for which the control center is based in the United States.

The above-discussed procedures are only a few of the needed licenses. This article focuses on the aforesaid approach because Starlink applied for a trial license in 2021, implying the importance of nature. Successful acquisition of the necessary licenses is crucial for Starlink. Apart from the procedures discussed in the paper, Starlink must obtain additional licenses to operate its satellite-based communication service in India.

CONCLUSION

Starlink's future in India remains now uncertain, it is even possible that it might never be operational in India at all. However, that is unlikely because India is the second largest Telecom market in the world Starlink will not easily miss out on the opportunity to tap into such a huge market. This is evident from the fact that Starlink 2021 had plans for collaborating with Indian telecom companies to provide broadband services. However, Starlink has several major hurdles to go through before its services are made available in India. The several risks and concerns regarding Starlink mentioned in this paper must be addressed by the company before they open their services, those concerns are also key reasons for India in holding off on the approval of licenses for Starlink.

Furthermore, the guidelines and procedures analyzed in this paper are another set of challenges for Starlink, since the provisions of those legal frameworks are not in favour of Starlink and might require substantial alterations in the mode of service provided by Starlink. There are several other licenses apart from the ones mentioned in this paper such as VSAT or INSAT MSS_R license that Starlink requires to obtain and those too would come as a challenging task for Starlink, and it might require reconstruction of Starlink's operational method to avail their services in the Indian market.

⁸⁵ Indian Wireless Telegraphy Act 1933

⁸⁶ *Ibid*

In conclusion, *prima facie*, it is early to draw up a notion with certainty as to what the future of Starlink will be in India. Space-based communication/Internet service being a recently expanding market, we are yet to witness how far Starlink will go in its attempt to enter the Indian market. Plus, the attitude of the Indian authorities regarding Starlink is yet to be clarified at present. For these reasons Starlink does have a small window of opportunity in India, however, we can assume that there is a possible chance that Starlink will in the future enter the Indian market.