

INFRASTRUCTURE DEVELOPMENTS IN INDIAN TELECOM INDUSTRY: CHANGING THE COURSE OF INDIA'S FUTURE

Abstract

Telecommunications (or telecom) infrastructure means physical medium by which connectivity flows. Globally, India is in the second position in the telecom industry with 1.17 billion subscribers as of July, 2022 (wireless and wireline). The performance of the telecom industry depends on its infrastructural support. Adequate infrastructural support ensures better telecommunication services. In India, innovative developments in the telecom industry are clearly observed during the last few years. To understand the developments of telecom infrastructure, different components of telecom infrastructure have been considered in this study. Accordingly, it provides a snapshot on the recent developments of different telecom infrastructure components of India.



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INTRODUCTION

At present, in digital world, for development of any emerging economy, the contribution of the communications sector, specifically telecommunications (or telecom) sector is essential. Telecommunication has become an integral part of an innovative and technologically driven economy. The quality of services of the telecom sector depends on its infrastructure. In general,

infrastructure is the combination of systems and facilities that serve as the basis for the growth and development of a country.¹ In the same way, adequate telecom infrastructure is required to render better telecom services. Telecom infrastructure ensures the connection of networks to villages, towns, cities, countries, and even overseas.

In case of India, the telecom

¹ <https://www.blackridgeresearch.com/blog/what-is-infrastructure-and-types-of-infrastructure-projects-for-economic-development>

industry is rapidly growing and witnessing many developments in recent times. After economic reforms, telecom sector has been playing an important part in India's infrastructure development (Agrawal and Garg, 2022).

India, like many other developing countries in the World, has reformed the telecom industry recently by selective investment and adoption of latest technology. India is one of the biggest data consumers in the World. Hence India is having huge scope to

develop its telecom industry.

As per report of IBEF², the Department of Telecommunications was allocated ₹ 84,587 crore (US\$ 11.11 billion) in the Union Budget 2022-2023. Revenue expenditure accounted for 36 per cent and capital expenditure accounted for 64 per cent. A significant development in telecom tower sector of India has been observed in the last few years. The number of cellular towers of India has increased from 400,000 in 2014 to 660,000 in 2021. Likewise, the number of cell sites has grown rapidly by 187 per cent, from 800,000 in 2014 to 2.3 million in 2021. At present, India's telecommunications market is in second position.

As mentioned in the report of SIRU³, the telecom sector of our country is the third largest sector in foreign direct investment (FDI) inflows, accounting for 6.44 per cent of all FDI inflows. It supports to create 2.2 million direct jobs and 1.8 million indirect jobs. In the telecom industry, FDI is currently 100 per cent permissible, out of which, 49 per cent can be carried out through the automatic route, in addition to the Government route. In recent times, innovative developments in the telecom sector are clearly observed in India. Now, the country is on the verge of enjoying 5G services..

For this study, 5G network, number of telephone subscribers (wireless and wireline), number of broadband subscribers, use of internet, number of IP-I, number of towers and BTSs are considered as indicators of telecom infrastructure sector.

ANALYSIS OF RECENT DEVELOPMENTS

With the help of secondary data collected from different reports, research papers and web-based materials, the following important components of telecom infrastructure have been identified and analysed.

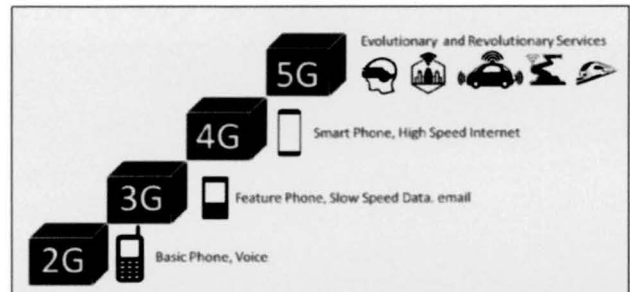
1. 5G Network

India has already moved for the big thing in telecom industry. The most significant development in Indian telecom industry is 'launching of 5G (Fifth Generation) network'. On 1st October 2022, our Prime Minister launched the first phase of 5G services (commercial) for 13 cities across India which will help in easier deployment of telecom infrastructure. 5G is the latest invention in wireless technology. It will help to meet the vision of development of telecom infrastructure services in an integrated way.

Fast and secure connections between devices aside from smart phones, such as sensors, vehicles, robots, and drones may be accessed through 5G network services (Ray et al., 2020). 5G technology can have a deep impact on all the industries. It will transform lives in the country and

boost India's economic growth. 5G will provide a new dimension to make the schemes like the Digital India, Smart Cities, Smart Villages missions, Make in India, and Startup India success. 5G must reach the economically backward people of rural areas. It will help our society by inclusive development of telecom infrastructure.

FIGURE 1: PHASES OF MOBILE NETWORKS IN INDIA



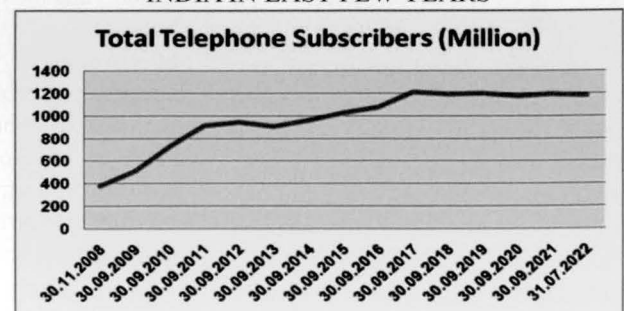
Source: Making India 5G Ready, Report of the Steering Committee, 5G High Level Forum, Published on 23.08.2018

From Figure 1 it can be observed that 5G network is the latest invention in wireless technology which will be used commercially.

2. Telephone Subscribers

In earlier days, telecom infrastructure was mainly based on wired telephone connections. But now, for our country, this is the right time for switching over from wired network to wireless network. India's telecom network secures second position in the Globe based on the total number of both fixed telephone and mobile phone users. As per TRAI,⁴ the telephone subscribers (in number) in India was 1,173.66 millions in July end (2022) and month-wise increase rate was 0.06 per cent (as shown in Figure 2). The growth rate was not so remarkable after 2016 – 2017 in India because that was the right time to move towards wireless connectivity.

FIGURE 2: TOTAL TELEPHONE SUBSCRIBERS OF INDIA IN LAST FEW YEARS



Source: The TRAI, GoI and representation made by authors.

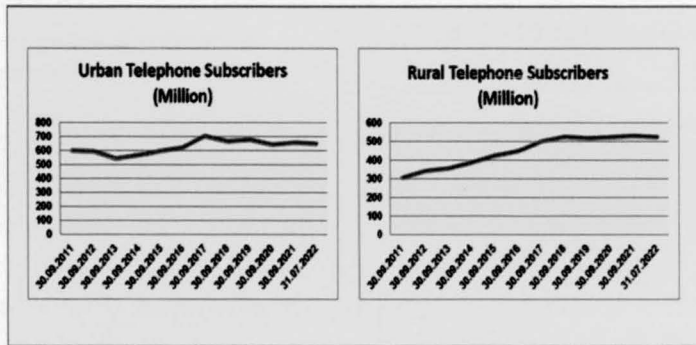
⁴www.trai.gov.in

² <https://www.ibef.org/industry/telecommunications>

³ <https://www.investindia.gov.in/team-india-blogs/telecom-industry-india-crosses-milestone>

As per TRAI, the total number of telephone subscribers in India fell by 0.24 per cent to 117.7 crore users in June, 2022. After that, the researchers considered urban and rural telephone subscription separately as shown in Figure 3. Both urban and rural telephone subscription increased slowly during the last five years and that ensures switching over from wired network to wireless network.

FIGURE 3: URBAN AND RURAL TELEPHONE SUBSCRIBERS OF INDIA IN LAST FEW YEARS

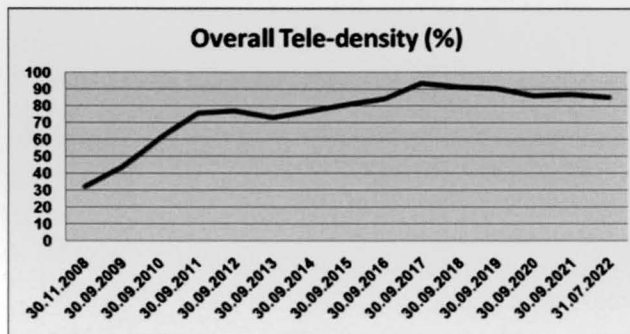


Source: The TRAI, GoI and representation made by authors.

3. Tele-density

As per World Bank definition⁵, tele-density may be measured by telephone connections (in number) for every hundred people living within a SPECIFIED area. As per Figure 4, the overall tele-density in India is 85.11 PER CENT at the end of July, 2022.

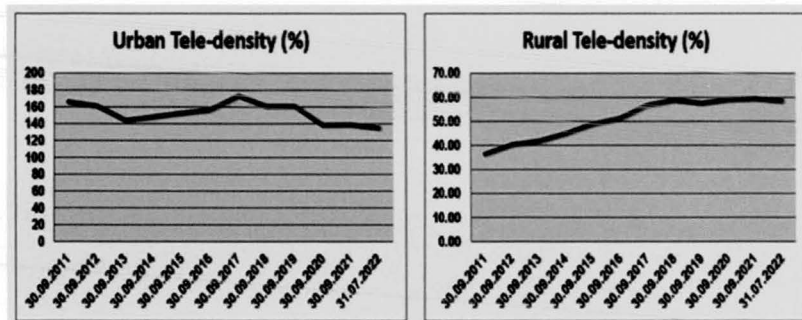
FIGURE 4: OVERALL TELE-DENSITY OF INDIA IN LAST FEW YEARS



Source: The TRAI, GoI and representation made by authors.

The urban tele-density is 134.78 per cent at the end of July 2022, though, tele-density in rural areas is 58.37 per cent during the same period (Figure 5). It indicates that certain policies have forced Internet Service Providers (ISP) to enhance their investment level in rural telecom infrastructure during last few years.

FIGURE 5: URBAN AND RURAL TELE-DENSITY OF INDIA IN LAST FEW YEARS



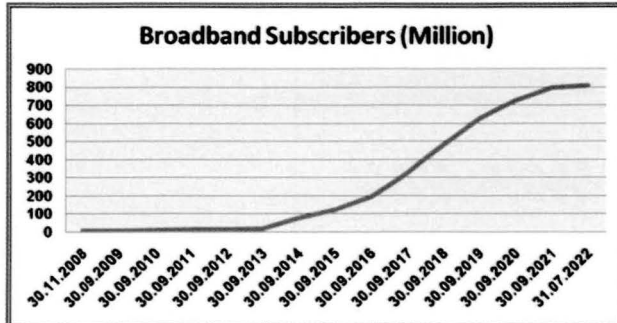
Source: The TRAI, GoI and representation made by authors.

⁵ <https://www.worldbank.org/en/news/feature/2014/10/20/how-telecommunications-changed-the-lives-of-herders-in-mongolia>

4. Broadband Subscribers

As per the information received from 694 operators in July, 2022, the total number of broadband subscribers is 807.42 million at the end of July, 2022 and month-wise growth rate was 0.81 per cent (as observed in Figure 6).

FIGURE 6: TOTAL BROADBAND SUBSCRIBERS OF INDIA IN LAST DECADE



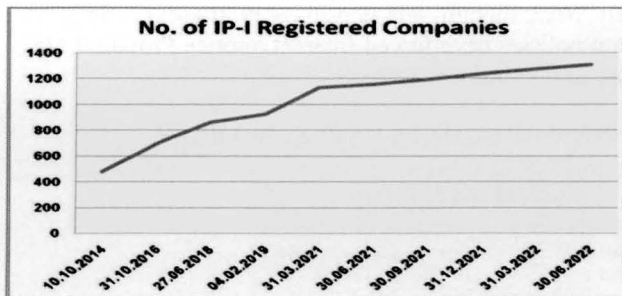
Source: The TRAI, GoI and representation made by authors.

To make India a digital economy, huge investment in telecom infrastructure has been made by Government of India. Actually, broadband connection in India has got its momentum after 2013.

5. Infrastructure Provider Category- I (IP- I)

As per TRAI, the IP-I are the suppliers of assets such as Dark Fibre, Tower etc. for telecom industry. DoT, GoI invited applications for IP – I registrations in the year of 2000 for the first time. Figure 7 shows the increasing trend of IP-I registered companies in India which clearly establishes the development of Indian telecom infrastructure.

FIGURE 7: NUMBER OF THE INFRASTRUCTURE PROVIDERS (CATEGORY-I)

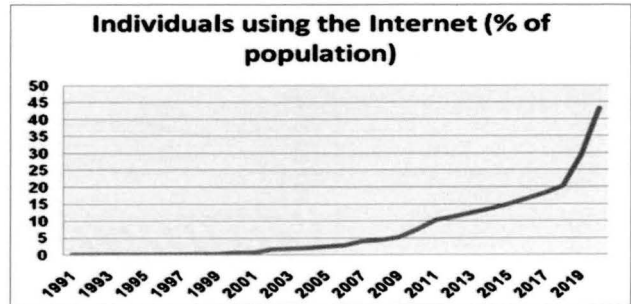


Source: The TRAI, GoI and representation made by authors.

Now, after the Covid pandemic, internet connection has become the backbone of everyday life in India and the performance of telecom infrastructure depends (directly or indirectly) on internet connectivity. Though, India still has a long way to reach all with internet connections, the

Government of India has set the target for this. To establish large and effective telecom infrastructure, India needs to ensure that everyone has access to the internet.

FIGURE 8: USE OF INTERNET BY INDIVIDUALS OF INDIA



Source: The TRAI, GoI and representation made by authors.

Figure 8 shows that the Indian telecom industry has been experiencing a rapid growth in the use of internet during the last few years.

6. Wi-Fi Hotspots

In addition to the above developments, modern technology like Wi-Fi Hotspots connectivity has been explored a lot in India (Table 1).

TABLE 1: NUMBER OF PUBLIC WIFI HOTSPOTS (31.03.2022)

Region of Service	Public WiFi Hotspots (Nos.)	Access Points (Nos.)	No. of WiFi Users (Unique)	Total Data Used (GB)
All India	1,01,822	3,38,619	1,46,77,035	2,69,17,403

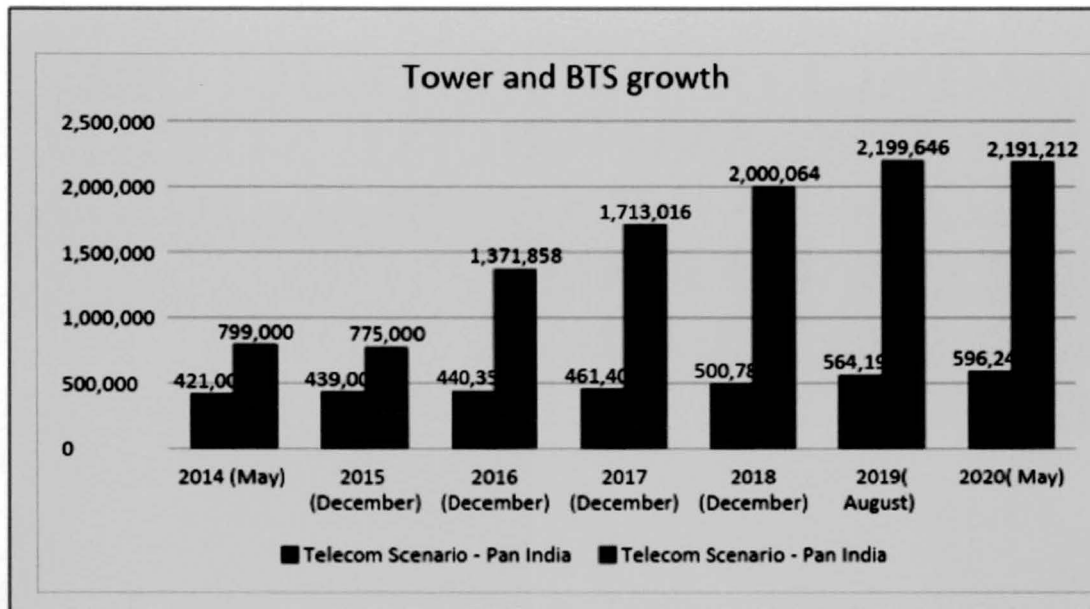
Source: Internet Service Providers (ISP) and TRAI⁶

7. Tower and Base Transceiver Station (BTS)

BTS may be considered as a telecom infrastructure (network equipment) component that facilitates wireless communication between a device and network. A robust infrastructure growth in BTS has been experienced in India, as evident from Figure 9. As of May, 2021, there were 5,96,243 towers and 21,91,212 BTSs, an increase from only 4,21,000 towers catering to 7,99,000 BTSs of May, 2014. Towers increased by 41.63 per cent and BTSs by 174.24 per cent.

⁶ https://www.trai.gov.in/sites/default/files/QPIR_26072022_0.pdf

FIGURE 9: GROWTH OF TOWER AND BASE TRANSCIEVER STATION (BTS) SINCE 2014



Source: <https://telecom.economictimes.indiatimes.com>

India's telecom network secures second position in the Globe based on the total number of both fixed telephone and mobile phone users

CONCLUSION

The telecom infrastructure sector has grown and developed rapidly in last few years. Through appropriate and transparent policies, the Government of India really developed the telecom sector and its markets across the country. Now, the people of rural India are getting access to telecom services. The Government of India has also taken right steps during and after the pandemic to boost the telecom infrastructure. The rapid growth witnessed by the telecom infrastructure components has led to the development of the overall telecom industry during the last few years. Now, the Indian telecom industry is having enormous scope of investment and definitely, it will

change India's future. **MA**

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