

CHANGES IN TELECOMMUNICATION USAGE PATTERNS AMONG RURAL AND URBAN CONSUMERS DURING THE DIGITAL ERA

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Abstract: The telecommunication structure of India is a fascinating topic to investigate as it is a very integral part of any developed nation of this machine learning generation. We examined the telecom sector growth in India and its trend in urban and rural regions. The study is based on secondary data which was siphoned from the Telecom Regulatory Authority of India reports published from 2020 to 2024 on a year-to-year basis. A healthy and linear growth is seen on a year-to-year basis which is very promising for an emerging superpower. We also now get to know that we need to cover a lot of ground in rural and far off regions connectivity on all forms of communication technologies. On a positive note, people are being more aware and tech savvy and these numbers seem to go up in the near future.

Keywords: Telecom sector, wireless wireline subscribers, digital shift, tele-density.

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INTRODUCTION

Telecommunications, also known as telecom, is the interchange of information across large distances. It's a wide term that includes several sectors, but all contain a transmitter and a receiver. The means of signal transfer can be via various means fiber, electromagnetic fields, light, cable, etc. The telecom sector is a foundation stone of modern society, facilitating connectivity and innovation all over the world. With more than 8 billion mobile subscriptions worldwide by 2023, the widespread of mobile communications is noticeable. The ubiquity of smartphones has altered how we communicate, making immediate connectivity a universal norm. In India, the sector holds significant importance, with more than 900 million internet users. This industry is not just about smoothing personal and business communications; it also influences vital infrastructure, supports digital economies, and boosts access to education, healthcare, and government services. The speedy adoption of cutting-edge technologies such as 5G, fiber-optic broadband, and the Internet of Things (IoT) is revolutionizing the relations between people and devices.

The presence of a well-developed and effective telecommunication structure has been regarded as important for the development of all economies (Mbarika, Kah, Musa, Meso, & Warren, 2003). It is factual that the Indian telecom sector has displayed speedy improvement in many domains of telecom in recent times (Gopika, 2014).

Wireline technologies use traditional infrastructures like telephone and TV cables for internet access. Wireless technologies, including mobile and satellite internet, provide flexible and portable connectivity, vital for remote areas.

In rural India, telecommunication develops access to education, healthcare, government services, and supports local businesses. In urban areas, it lifts economic development, supports smart city initiatives, and enhances communication and high-speed internet access, improving quality of life.

Both telephone and broadband subscriptions underline the digital divide between urban and rural areas. The Digital India Initiative aims to bridge this gap, pushing digital inclusion and economic development. Broadband connectivity significantly influences digital literacy, education, and access to information.

REVIEW OF LITERATURE

(Sridhar, 2011) Riding on the benefits unleashed by market-driven policies of expansion and the consequent support of the flow of foreign direct investment, the Indian telecom sector has been fortunate with a favourable atmosphere for its advancement. This, coupled with the initiation of mobile and internet technology on a vast scale is said to have reformed the telecom sector in India.

(Gupta, 2018) The related aspect is the shrinking number of competitors in the field of the telecom sector in India, which is downcast to just 4 in 2022 from around 12 in 2008, rising the doubt that the Indian telecom sector may have become an oligopoly market of a different type.

(Enrico and Marcello, 2011) India is amongst the prime and speediest growing economy in the world today. With population more than one billion, and in past the country has a rich and long history, making them global leader until the 19th Century.

(PTI, 2007) The telecom industry is an inspiring industry to study, not only due to its random nature in terms of technological

revolution and its policies, but also due to the excessive growth rate of this industry over the former few decades and the important contribution of the industry to the economies of these nations. India is now with the world's largest telecom market and according to analysts' numbers, there are more than 1 billion cellular subscribers signing up every week. Indian telecom industry is one of the firmest growing industries with an estimated growth rate of over 26% and generated employment chances for about 10 million people.

(Kate and Leila, 2012) The number of subscribers were improved at a rapid pace as which improves to the growth and position of the industry. However it has made the telecom one of the most profitable sectors today, it has also had a negative outcome on the other hand. For instance, India recently viewed an outrage in the telecom ministry that has altered the nature and environment of foreign investment flowing into the country.

OBJECTIVES

1. Examining the growth of telecom sector in India after 2020.
2. Comparing the telecom trends in urban and rural regions of India.

RESEARCH METHODOLOGY

For this study secondary data has been explored. These data have been pulled together from the reports of the Telecom Regulatory Authority of India. The data has been collected for 5 years from 2020 to 2024 from the month of May each year. The study compares the progress made by India in telecommunication field in namely broadband subscribers, telephone subscribers, tele-density and total share of subscribers, they are further classified into wireless wireline and their total for comparison. Relationship is examined based on rural and urban on year-on-year basis with the help of bar diagram.

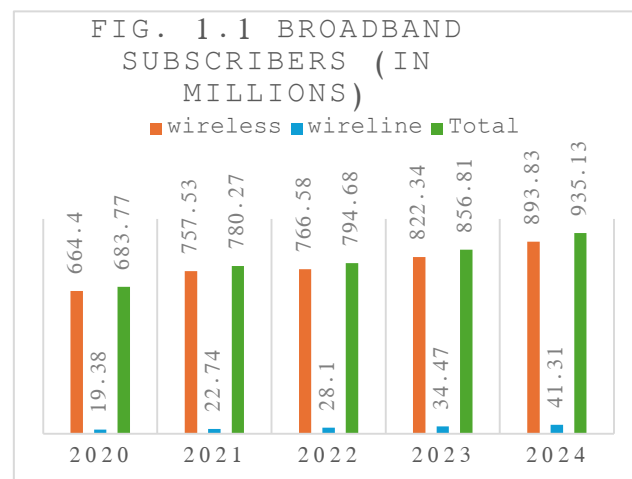
Broadband connection

A broadband connection indicates to a high-speed Internet connection that is constantly on and faster than traditional dial-up approach. Broadband connections are critical for modern communication and comprise some types of technologies, such as:

1. **Wireline broadband:** technologies like DSL, cable modem, fiber-optic, and BPL use standing physical infrastructures to deliver internet access, with fiber-optic offering the highest speeds.
 - **DSL (Digital Subscriber Line):** Uses existing telephone lines to deliver internet access.
 - **Cable Modem:** Employs cable TV lines to offer internet facilities.
 - **Fiber-Optic:** Delivers extremely high-speed internet consuming light via fiber-optic cables.
 - **BPL (Broadband over Powerline):** Uses prevailing electrical wiring to deliver broadband access.

2. **Wireless broadband,** including Wi-Fi, mobile broadband, and satellite, delivers resourceful internet access without the need for physical connections, essential for remote and mobile connectivity. Subscriber numbers in each domain reveal market penetration, access levels, and technological adoption trends.

- **Wireless:** Includes Wi-Fi, satellite, and mobile broadband using cellular networks.
- **Satellite:** Offers internet via satellites, useful in remote areas where other types of broadband are not available.

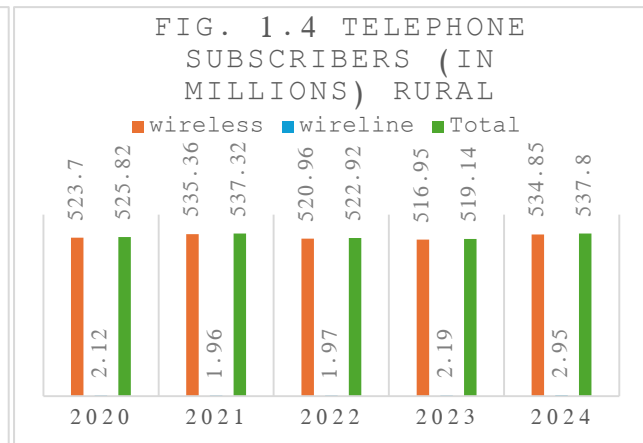
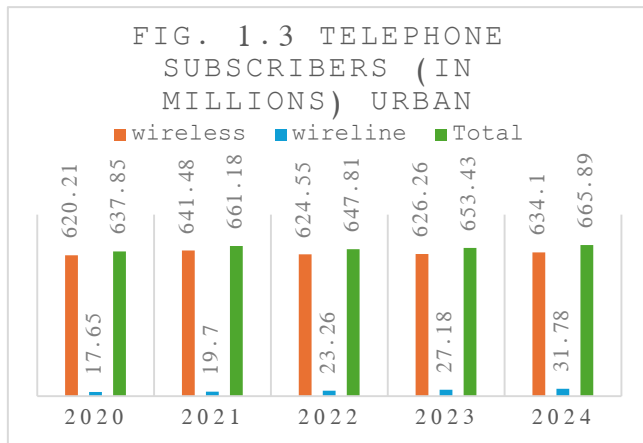
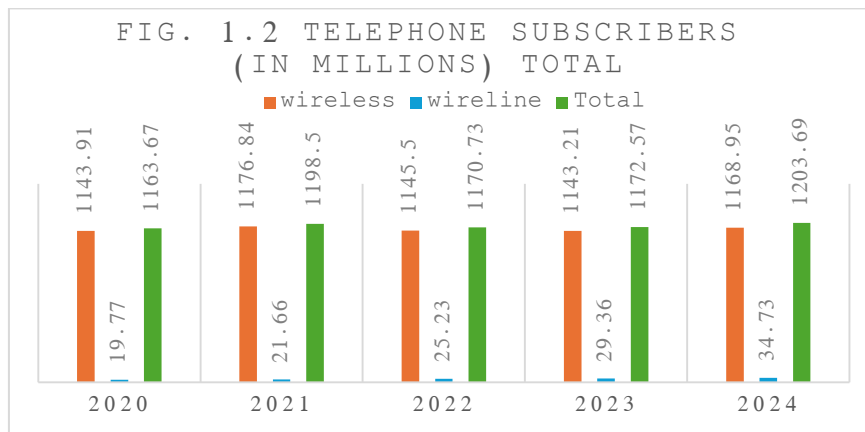


Broadband subscribers in Figure 1.1 shows the total of wireline and wireless subscribers growth rate to 36.76% from 2020 to 2024. Whereas wireline subscribes increased at a linear pace although the number doubled with the growth of 113.17% from 2020 to 2024, major contributors seem to be commercial and official spaces as wireline is preferred for high internet speed. Wireless displays steady growth in all the years with growth of 34.5% from 2020 to 2024.

Telephone subscribers

Telephone connectivity is defined as the infrastructure and services that assist voice communication among individuals using telephones. This comprises both traditional landline phones and mobile phones. Telephone connectivity includes:

1. **Wireline Phones:**
 - Wired connections are used all through a network of physical cables and switching stations to transfer voice signals. In other words, it is called landline phone.
2. **Wireless Phones:**
 - These use wireless networks that transmit voice and data signals via cellular towers and satellites. In other words, it is called mobile phone.



There hasn't been much change in the total telephone subscription from 2020 to 2024 with a mere growth of 3.43%, the wireless telephone subscribers seem to stay stagnant on a year-to-year basis with 2.14% increment in 5 years, however there is a good growth in a wireless telephone subscriber base from 19.77 million in 2020 and 34.73 in 2024 43.07% increment.

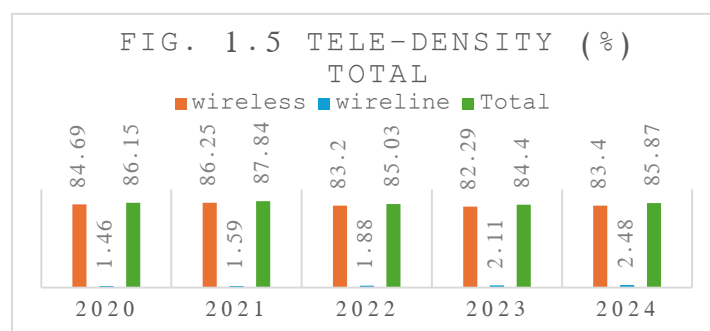
When we divide the telephone subscribers into urban and rural region then we see that the subscribers growth in the wireless section is stagnant in both rural and urban areas but the wireline subscribers in urban areas have the growth of 38.16% from 2020 whereas in the rural areas the wire line telephone subscribers the number hasn't changed much as it was 2.12 billion in 2020 to marginal increase to 2.95 million in 2024 with the growth of 28.13%.

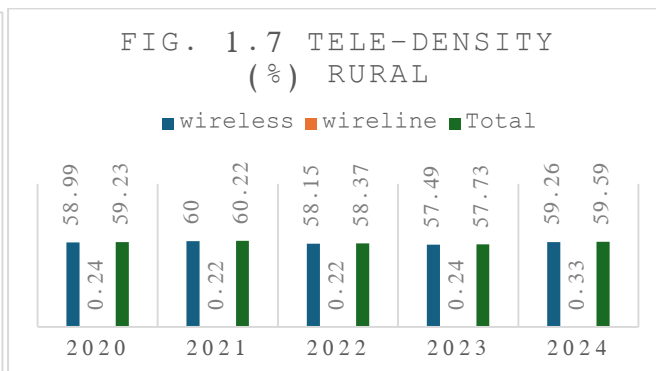
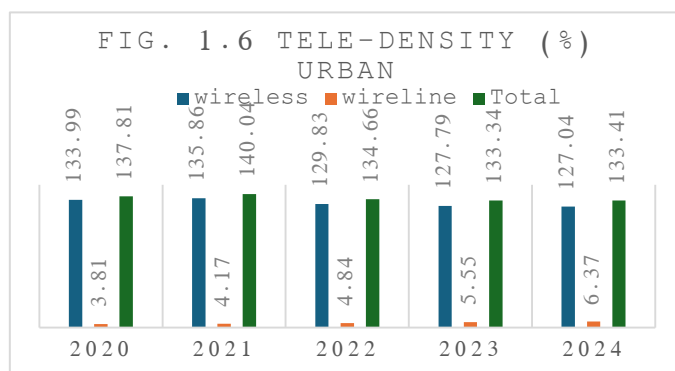
Tele-density

Tele-density, or telephone density, refers to the number of telephone connections for every hundred individuals living within an area. Tele density is often used as an index to gauge the extent to which the telecom industry has pierced the population and regions of a country (Baraka, Elwany, EL-Gamily, & EL-Gamily, 2013). It is a significant indicator of telecommunications development in a country or region. Tele-density can be broken down into:

1. **Wireline tele-density:** The number of fixed-line telephone connections per 100 people.
2. **Wireless tele-density:** The number of mobile phone connections per 100 people.

High tele-density is typically associated with a well-developed telecommunications infrastructure, while low tele-density indicates less access to telephone services.

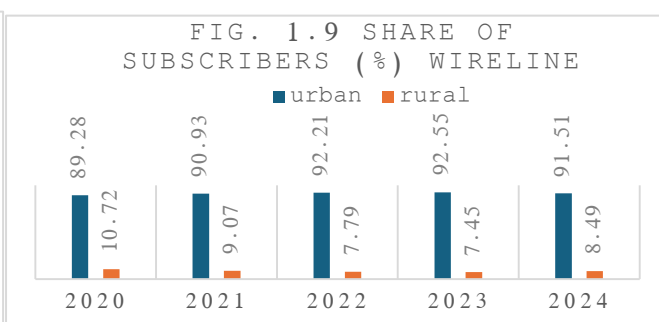
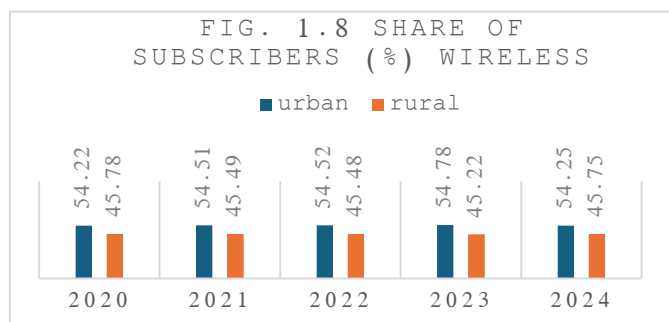




Tele density can also be fragmented into wireless/wireline density and rural/urban density. It is surprising that wireless density has shown a marginal decrease 84.69% in 2020 to 83.4% in 2024, whereas it was even less in 2023 with 82.29%. Wireline density in India has shown an incline from 2020 with 1.46% to 2024 with 2.48% (fig. 1.5). Urban total density shot down from 2020 to 2024 with 137.81% to 133.41%, whereas wireline density has shown good growth from 3.81 to 6.37% but wireless density has a downward trend because people are switching from wireless to wireline for internet connectivity mainly for their work purpose. However, rural density in both wireline and wireless density has been moving up although not as steep as in the case of wireline density in urban area.

Share of subscribers

The share of subscribers in telecommunications refers to the proportion of users subscribed to wireless or wireline services. Wireless (mobile) services use radio waves, allowing users to move freely, and rely on cell towers, while wireline (fixed line) services use physical cables, requiring users to stay stationary, and depend on an extensive network of cables and exchanges. Wireless services are more common for personal communication, whereas wireline services are often used for home and office internet connections. Wireless has lower installation costs but higher ongoing fees, whereas wireline has higher setup costs but offers more stable connections.



The share of subscribers can be analysed to understand market penetration and user preference with the help of fig. 1.8 and 1.9. The share of wireless subscribers is convenience and offer mobility by mobile devices but due to changing work culture, with passing years wireless share remain stagnant for both rural and urban area. Whereas wireline subscribers have a higher share in regions where stable and high-speed internet is crucial, such as business districts so urban areas show an upward trend because of established infrastructure and rural area shows a downward trend.

Understanding these shares helps in planning and developing telecom services to meet user needs and market demands.

CONCLUSION

As we surpass China in the largest population of the world the telecom sector growth also seems apparent. With a steady growth in total telecom subscribers overall we saw a decent rise in wired telecom subscriptions in urban areas. Major contributors seem to be commercial and official spaces as wireless telecom has overpowered the personal communication means. A steadfast growth in broadband subscriptions has also been seen which is again understandable as to how fast the nation is growing

technologically. We furthermore observed the urban total tele density is double that of rural areas, so India has a lot of ground to cover in that regard since total rural connectivity is the backbone of any developed nation.

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