

संचिति

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National Communications Academy-Finance
Department of Telecommunications
New Delhi

सर्वस्य मूलं संचारः
NATIONAL COMMUNICATIONS ACADEMY - FINANCE
NCA-F



HIGHLIGHTS OF OCTOBER, 2026

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DIVERSE SERVICES, ONE ETHOS: SPECIAL FOUNDATION COURSE 2026

OCTOBER 12-DECEMBER 18, 2026



The Special Foundation Course (SFC) 2026, the second such programme conducted by NCA-F, commenced with the participation of 116 Officer Trainees representing 11 All India and Central Civil Services.



Addressing the inaugural session, Shri Amit Agrawal, Secretary, Department of Telecommunications, emphasised the importance of critical and analytical thinking in an era of democratised knowledge and rapid technological advancement. Highlighting the transformative potential of Artificial Intelligence, he urged the Officer Trainees to combine technological understanding with sound judgement and core human values in public service.

The Oath of Allegiance was administered by Shri Sanjiwan Sinha, DG, NCA-F, marking the formal commencement of the Officer Trainees' journey in public service. Dr. Kamal Kapoor, Course Director, emphasised the foundational values of discipline, learning and camaraderie as guiding principles throughout the training, while Shri Amarnath Ojha, Course Coordinator, provided an overview of the course structure and its key components.



The Balanced Civil Servant: Competence, Character & Personal Equilibrium

16 October 2026



In a masterclass for the Officer Trainees of Special Foundation Course 2026, Dr. B. Rajender, Director, Lal Bahadur Shastri National Academy of Administration (LBSNAA), explored the essential attributes of an effective and balanced civil servant. He highlighted four key competency domains: communication and interpersonal skills, getting work done, personal management, and problem-solving and learning agility, emphasising their importance in effective administrative leadership.



He emphasised the importance of neutrality, integrity, financial prudence and maintaining a healthy work-life balance. He also planted a sapling at the NCA-F campus, conveying a message of environmental responsibility and reaffirming the commitment to nurturing a greener and more sustainable future.



Renewing Expertise, Expanding Horizons: MCTP-I at NCA-F

October 26-November 06, 2026



The NCA-F component of the Mid-Career Training Programme-I (MCTP-I) for officers of the Indian P&T Accounts and Finance Service (IP&TAFS) commenced at NCA-F. Dr. Sanjiwan Sinha, DG, NCA-F, highlighted the importance of mid-career learning in updating professional knowledge, enhancing competencies and preparing officers for evolving responsibilities. Dr. Kamal Kapoor, DDG, NCA-F, underscored the role of MCTP in fostering the professional and personal growth of public servants.

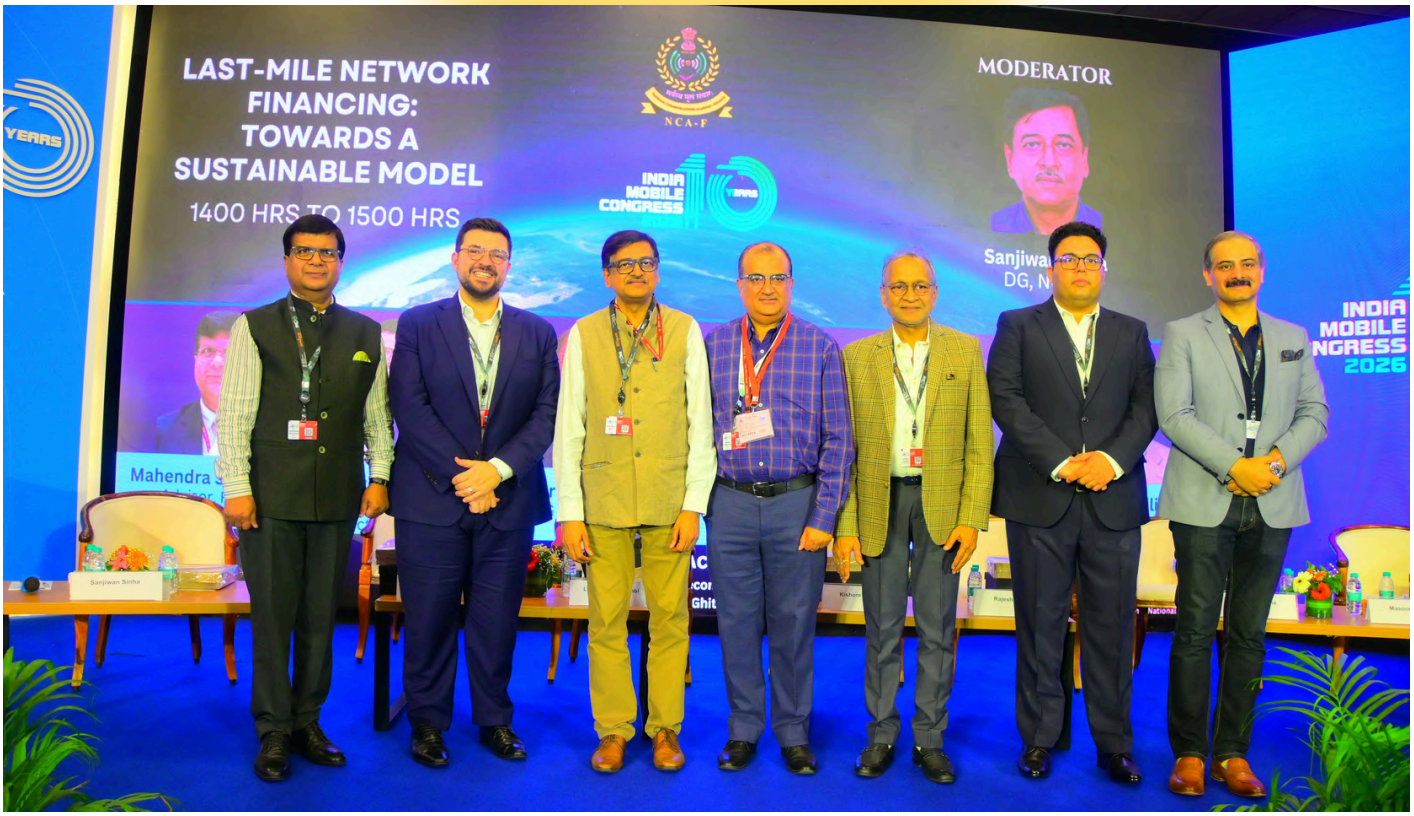




The first week of the Mid-Career Training Programme (MCTP-I) brought together diverse perspectives on leadership, public finance and organisational effectiveness through a series of expert-led sessions and interactive discussions. The sessions covered a wide range of themes, including workplace wellness, financial management, infrastructure funding, public procurement, Artificial Intelligence for public leaders, emotional intelligence, behavioural economics and organisational behaviour.

Industry Dialogue at IMC 2026: Towards Sustainable Last-Mile Connectivity

07 October 2026



National Communications Academy – Finance (NCA-F) organised a panel discussion on "Last-Mile Network Financing: Towards a Sustainable Model" during India Mobile Congress 2026 at Yashobhoomi, New Delhi. Moderated by Dr. Sanjiwan Sinha, DG, NCA-F, the discussion brought together perspectives from industry and government on the financial viability of last-mile connectivity providers.



The panelists—Mr. Rajesh Chharia (ISPAI), Mr. Mahender Srivastava (RailTel), Mr. Luiz Felipe Zoghbi (GSMA), Mr. Kishore Bhagtani (DoT), Mr. Sindhu Sharma (Bharti Airtel) and Mr. Masood Mallick (Re Sustainability)—shared insights on rural broadband expansion, spectrum availability, cost optimisation, sustainable business practices and circularity in telecom.

The discussion highlighted the importance of viable financing models and collaborative approaches to building an inclusive and sustainable connectivity ecosystem, particularly in underserved areas.

Beyond the Court:
Lessons in Discipline, Resilience & Excellence

14 October 2026



Ms. Saina Nehwal, Khel Ratna awardee, renowned badminton champion and Olympic medallist, interacted with the Officer Trainees of the Special Foundation Course 2026 at NCA-F, sharing insights from her sporting journey. She emphasised the importance of self-discipline, perseverance, resilience and sustained effort in the pursuit of excellence.





The interaction also highlighted the need for greater investment in sports, talent development and world-class infrastructure to strengthen India's sporting ecosystem. It inspired trainees to pursue excellence through determination and commitment, in pursuit of the vision of Viksit Bharat. Adding a meaningful green touch to her visit, Ms. Saina Nehwal nurtured the sapling she had planted during her previous visit to NCA-F under the “Ek Ped Maa Ke Naam” campaign, reaffirming the importance of environmental care and sustainability.

Dream Big, Rise Strong: Young Women in Sports

19 October 2026



Ms. Priya Ghanghas (Boxing, Commonwealth Games 2026) and Ms. Ishika Sabharwal (Hockey, Asian Games 2026) interacted with the Officer Trainees of Special Foundation Course 2026 at NCA-F, sharing their journeys of determination, discipline and sporting excellence.



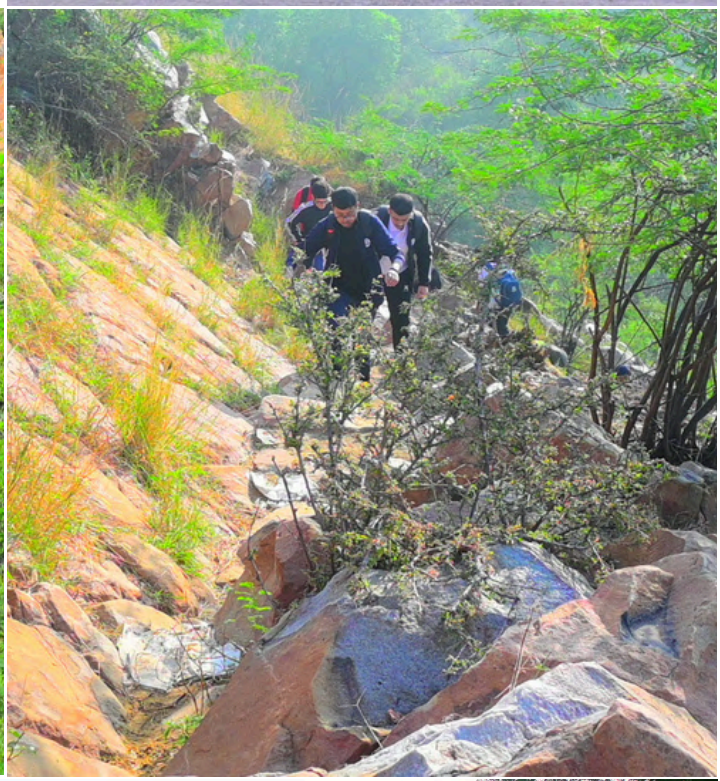
Drawing from their inspiring sporting journeys, they highlighted the importance of resilience, self-discipline and sustained effort, alongside the need to maintain mental and physical well-being. They also emphasised greater investment in grassroots sports infrastructure, wider opportunities for young talent and a supportive ecosystem to nurture future champions. The interaction encouraged Officer Trainees to face challenges with confidence, learn from setbacks and carry the values of determination, teamwork and excellence into public service, reflecting the spirit of Nari Shakti and the vision of Viksit Bharat.

Beyond the Classroom: Fitness, Adventure & Team Spirit

Officer Trainees of the Special Foundation Course 2026 participated in outdoor activities, including a 5 km Cross-Country Run under the Fit India Freedom Run 7.0 and an Aravalli Trek. The Cross-Country Run commenced with the Khelo India Pledge, administered by Dr. Sanjiwan Sinha, DG, NCA-F, encouraging trainees to embrace fitness and sportsmanship. Together, these activities promoted endurance, discipline, resilience and camaraderie, while offering opportunities to connect with nature and strengthen team spirit.









Celebrating Togetherness: A Night of Fete & Garba

The festive spirit of Dussehra came alive at NCA-F with a vibrant Fete and Garba Night, bringing together Officer Trainees and the NCA-F community in an evening of celebration and camaraderie.



The Officer Trainees set up stalls featuring a variety of fun activities, creating an atmosphere of lively engagement and friendly competition. The initiative encouraged teamwork, collaboration and active participation, adding to the festive spirit of the evening.



















Pledges of Purpose:
Promoting Social Responsibility & National Unity

October 01 & October 31, 2026



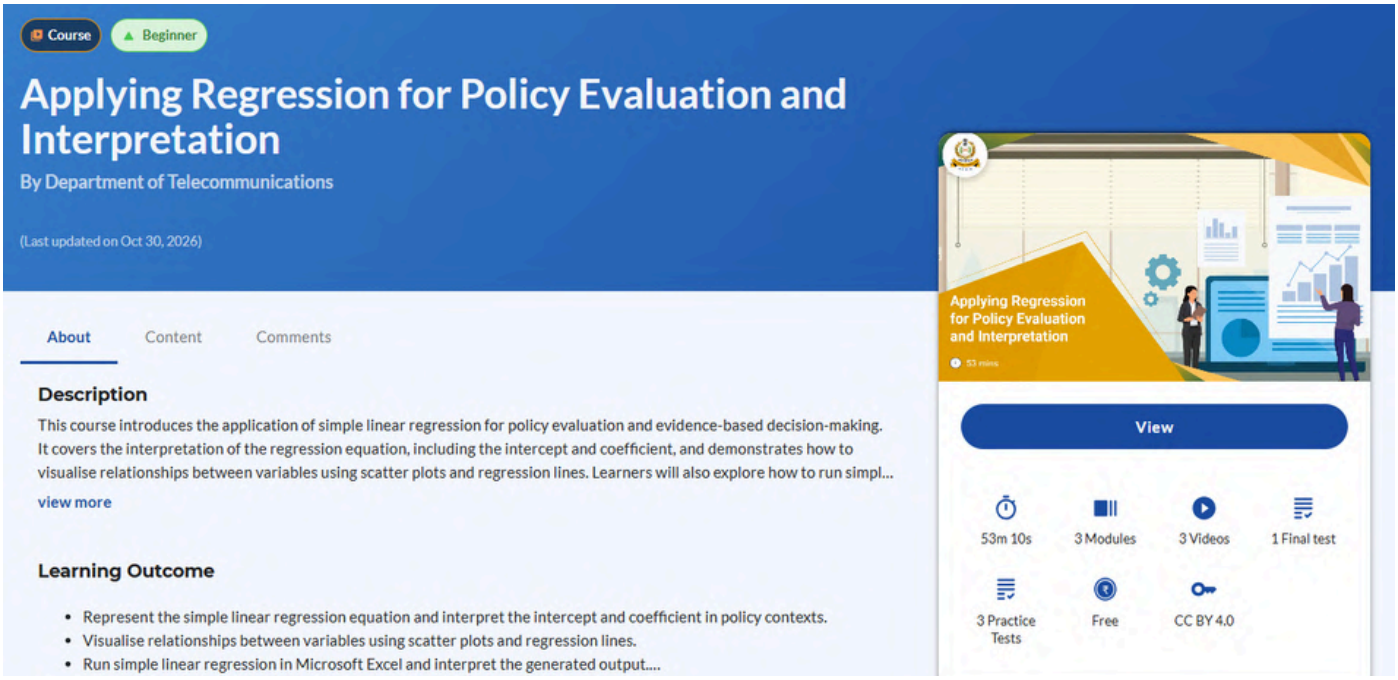
NCA-F observed National Voluntary Blood Donation Day 2026 by organising a pledge-taking ceremony to promote awareness of voluntary blood donation. Officers and staff members pledged their support for this life-saving cause, reaffirming their commitment to social responsibility and community welfare.



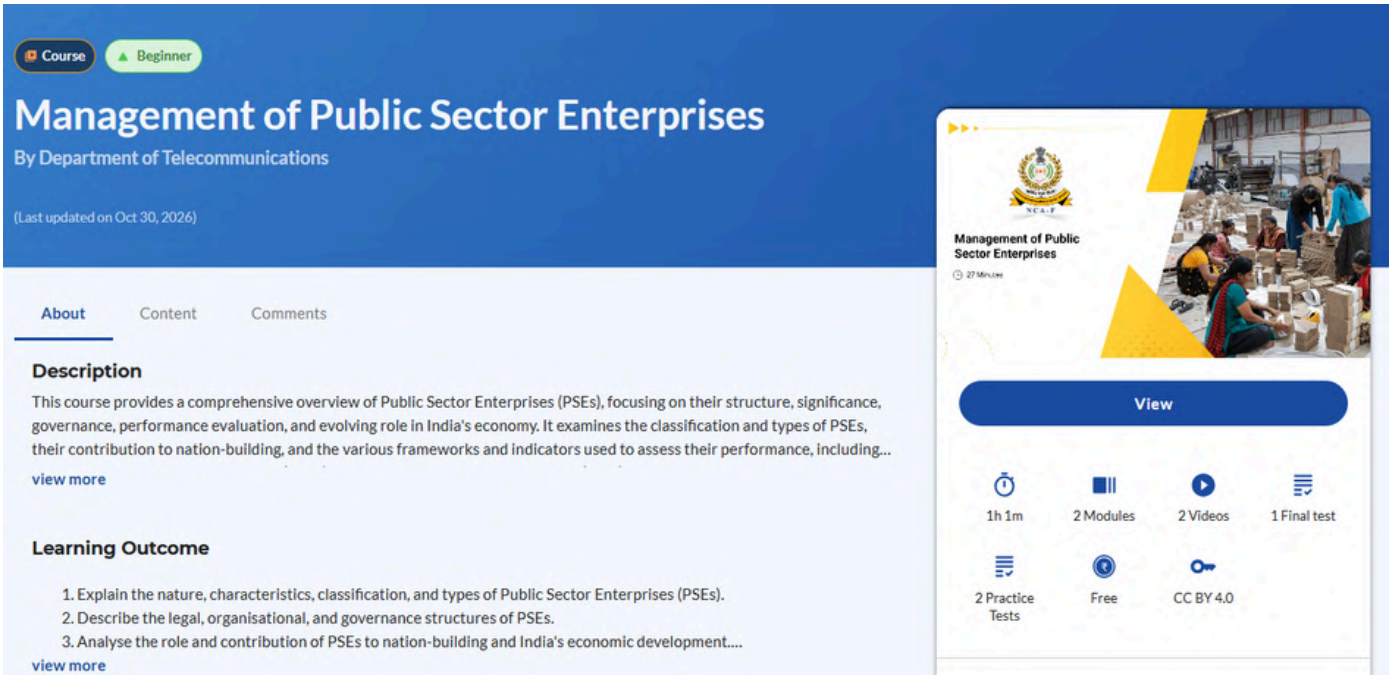
On Rashtriya Ekta Diwas, Officer Trainees of SFC 2026, IP&TAFS 2025 Batch, participants of MCTP-I, and officers and officials of NCA-F took the pledge to uphold the unity, integrity and security of the nation, inspired by the ideals of Sardar Vallabhbhai Patel.



New iGOT Courses by NCA-F



NCA-F has published a new iGOT course on "Applying Regression for Policy Evaluation and Interpretation", introducing simple linear regression for evidence-based policymaking. The course covers regression analysis and its practical application in Microsoft Excel, demonstrating how statistical insights can support budget planning, policy monitoring and evaluation, while highlighting the distinction between correlation and causation.



NCA-F has published a new iGOT course on "Management of Public Sector Enterprises", offering insights into the structure, governance and evolving role of PSEs in India's economic development. The course explores performance evaluation frameworks, including MoU, KPIs, Balanced Scorecard and ROCE, with BSNL as a case study. It also covers disinvestment, government responsibilities and key policy reforms shaping the future of public sector management.

संविधान से सुशासन तक:
राजभाषा हिंदी का संवैधानिक आधार और समकालीन पहल

भाषाई विविधता का सम्मान, प्रशासनिक संवाद का विस्तार

भारत की भाषाई विविधता उसकी सांस्कृतिक विरासत, सामाजिक एकता और लोकतांत्रिक परंपरा का महत्वपूर्ण आधार है। देश के विभिन्न क्षेत्रों में प्रचलित भाषाएँ हमारी सामासिक संस्कृति को समृद्ध बनाती हैं। इस विविधता का सम्मान करते हुए भारतीय संविधान में राजभाषा संबंधी विस्तृत प्रावधान किए गए हैं। इनका उद्देश्य संघ के राजकीय कार्यों में हिंदी के प्रगतिशील प्रयोग को प्रोत्साहित करना, भाषाई समुदायों के अधिकारों का संरक्षण करना तथा प्रशासनिक कार्यों में भाषाई समन्वय स्थापित करना है।

संवैधानिक प्रावधान: एक समावेशी भाषाई व्यवस्था

भारतीय संविधान के भाग XVII (अनुच्छेद 343 से 351) में राजभाषा से संबंधित प्रावधानों का उल्लेख है। अनुच्छेद 343(1) के अनुसार, संघ की राजभाषा हिंदी तथा उसकी लिपि देवनागरी है। संघ के राजकीय प्रयोजनों के लिए अंकों का रूप भारतीय अंकों का अंतरराष्ट्रीय रूप निर्धारित किया गया है। यह स्पष्ट करना आवश्यक है कि संविधान में किसी भाषा को 'राष्ट्रभाषा' घोषित नहीं किया गया है अपितु हिंदी को संघ की राजभाषा का संवैधानिक दर्जा प्रदान किया गया है।

अनुच्छेद 343(2) में संविधान के प्रारंभ से पंद्रह वर्षों तक अंग्रेजी के प्रयोग को जारी रखने का प्रावधान था। इसके पश्चात संसद द्वारा पारित राजभाषा अधिनियम, 1963 की धारा 3 के माध्यम से संघ के राजकीय प्रयोजनों तथा संसद के कार्यों में हिंदी के अतिरिक्त अंग्रेजी के प्रयोग को भी जारी रखा गया। इस व्यवस्था में संघ और राज्यों के बीच संचार के लिए भी विशेष प्रावधान किए गए हैं।

अनुच्छेद 344 में राजभाषा आयोग तथा संसद की समिति की व्यवस्था है। आयोग को संघ के राजकीय प्रयोजनों में हिंदी के प्रगतिशील प्रयोग सहित विभिन्न भाषाई विषयों पर राष्ट्रपति को सिफारिशें प्रस्तुत करने का दायित्व दिया गया है। आयोग की सिफारिशों पर विचार करने के लिए संसद की समिति का भी प्रावधान है। इन सिफारिशों में देश की औद्योगिक, सांस्कृतिक एवं वैज्ञानिक प्रगति तथा अहिंदी भाषी क्षेत्रों के हितों को ध्यान में रखने की अपेक्षा की गई है।

अनुच्छेद 345 से 347 राज्यों की राजभाषा, संघ एवं राज्यों तथा विभिन्न राज्यों के बीच संचार की भाषा और किसी राज्य की जनसंख्या के एक वर्ग द्वारा बोली जाने वाली भाषा को विशेष परिस्थितियों में मान्यता देने से संबंधित हैं। इस प्रकार संविधान राज्यों को अपनी भाषाई आवश्यकताओं के अनुरूप राजभाषा निर्धारित करने की व्यवस्था प्रदान करता है।

अनुच्छेद 348 के अनुसार, संसद द्वारा अन्यथा व्यवस्था किए जाने तक उच्चतम न्यायालय और उच्च न्यायालयों की कार्यवाहियों तथा विधेयकों, अधिनियमों, अध्यादेशों, नियमों एवं विनियमों के प्राधिकृत पाठ के लिए अंग्रेजी का प्रावधान है। इसके अंतर्गत राष्ट्रपति की पूर्व सहमति से राज्यपाल उच्च न्यायालय की कार्यवाही में हिंदी अथवा राज्य की राजभाषा के प्रयोग को प्राधिकृत कर सकते हैं। उच्च न्यायालय के निर्णयों, डिक्री और आदेशों के लिए राजभाषा अधिनियम, 1963 की धारा 7 में अलग से प्रावधान किया गया है। अनुच्छेद 349 ने संविधान के प्रारंभ से पहले पंद्रह वर्षों की अवधि के दौरान अनुच्छेद 348 से संबंधित भाषा विषयक विधेयकों के लिए एक विशेष प्रक्रिया निर्धारित की थी।

संविधान भाषाई अधिकारों के संरक्षण पर भी विशेष बल देता है। अनुच्छेद 350 प्रत्येक व्यक्ति को अपनी शिकायत के निवारण हेतु संघ या राज्य में प्रयुक्त किसी भी भाषा में अभ्यावेदन प्रस्तुत करने का अधिकार देता है। अनुच्छेद 350-क राज्यों और स्थानीय प्राधिकारियों से भाषाई अल्पसंख्यक समुदायों के बच्चों को प्राथमिक स्तर पर मातृभाषा में शिक्षा की पर्याप्त सुविधाएँ उपलब्ध कराने का प्रयास करने की अपेक्षा करता है। वहीं, अनुच्छेद 350-ख भाषाई अल्पसंख्यकों के लिए राष्ट्रपति द्वारा विशेष अधिकारी की नियुक्ति तथा उनके संरक्षण संबंधी मामलों की जाँच और प्रतिवेदन की व्यवस्था करता है।

इन प्रावधानों में अनुच्छेद 351 विशेष महत्त्व रखता है। इसके अनुसार, संघ का कर्तव्य है कि वह हिंदी के प्रसार एवं विकास को बढ़ावा दे और उसे भारत की सामासिक संस्कृति के सभी तत्वों की अभिव्यक्ति का प्रभावी माध्यम बनाए। इसके लिए हिंदी की प्रकृति में हस्तक्षेप किए बिना हिंदुस्तानी तथा आठवीं अनुसूची में उल्लिखित अन्य भारतीय भाषाओं के रूप, शैली और अभिव्यक्तियों को आत्मसात करने तथा शब्द-भंडार को मुख्यतः संस्कृत और गौणतः अन्य भारतीय भाषाओं से समृद्ध करने की परिकल्पना की गई है।

संवैधानिक संकल्प से प्रशासनिक कार्यान्वयन तक

संविधान के प्रावधानों को व्यवहार में लागू करने के लिए राजभाषा अधिनियम, 1963 तथा राजभाषा (संघ के शासकीय प्रयोजनों के लिए प्रयोग) नियम, 1976 महत्वपूर्ण आधार प्रदान करते हैं। राजभाषा अधिनियम की धारा 3(3) के अंतर्गत संकल्पों, सामान्य आदेशों, नियमों, अधिसूचनाओं, प्रशासनिक एवं अन्य प्रतिवेदनों तथा प्रेस विज्ञप्तियों के अतिरिक्त संसद के समक्ष रखे जाने वाले राजकीय कागजात, संविदाओं, करारों, लाइसेंस, परमिट, नोटिस और निविदा प्रपत्रों में हिंदी एवं अंग्रेजी दोनों भाषाओं का प्रयोग अपेक्षित है।

राजभाषा नियम, 1976 के अंतर्गत तमिलनाडु राज्य को छोड़कर देश के राज्यों एवं संघ राज्य क्षेत्रों को हिंदी के प्रचलन के आधार पर क्षेत्र 'क', 'ख' और 'ग' में वर्गीकृत किया गया है। इन क्षेत्रों के आधार पर विभिन्न कार्यालयों के बीच पत्राचार के लिए भाषा संबंधी प्रावधान निर्धारित किए गए हैं।

इसके अतिरिक्त, राजभाषा अधिनियम की धारा 4 के अंतर्गत वर्ष 1976 में संसदीय राजभाषा समिति का गठन किया गया। इसमें लोकसभा के 20 तथा राज्यसभा के 10 सदस्य शामिल होते हैं। समिति संघ के राजकीय प्रयोजनों में हिंदी के प्रयोग की प्रगति की समीक्षा कर राष्ट्रपति को अपनी सिफारिशें प्रस्तुत करती है। यह समिति अनुच्छेद 344 के अंतर्गत उल्लिखित संवैधानिक समिति से अलग, अधिनियम के तहत गठित व्यवस्था है।

1968 के राजभाषा संकल्प ने हिंदी के प्रसार एवं प्रगतिशील प्रयोग के लिए व्यापक कार्यक्रम तथा वार्षिक प्रगति आकलन की व्यवस्था को दिशा प्रदान की। साथ ही, आठवीं अनुसूची में उल्लिखित अन्य भारतीय भाषाओं के विकास के लिए समन्वित प्रयासों पर भी बल दिया गया। संघ की राजभाषा नीति का कार्यान्वयन प्रोत्साहन, प्रेरणा और सद्भावना के माध्यम से आगे बढ़ाने की परिकल्पना करता है।

वर्तमान सरकारी पहल: प्रशिक्षण, प्रोत्साहन और प्रौद्योगिकी

राजभाषा विभाग, गृह मंत्रालय द्वारा प्रत्येक वर्ष हिंदी के प्रगतिशील प्रयोग को प्रोत्साहित करने हेतु वार्षिक कार्यक्रम जारी किया जाता है। वर्ष 2026–27 का वार्षिक कार्यक्रम भी जारी किया गया है, जो केंद्र सरकार के मंत्रालयों एवं कार्यालयों में राजभाषा संबंधी लक्ष्यों और गतिविधियों को दिशा प्रदान करता है।

नगर राजभाषा कार्यान्वयन समितियाँ (नराकास) इस दिशा में महत्वपूर्ण भूमिका निभा रही हैं। राजभाषा विभाग की आधिकारिक वेबसाइट पर वर्तमान में 572 नराकास सूचीबद्ध हैं। इनके माध्यम से विभिन्न सरकारी कार्यालयों, सार्वजनिक उपक्रमों एवं संस्थानों में राजभाषा संबंधी गतिविधियों, कार्यशालाओं, प्रतियोगिताओं और अनुभवों के आदान-प्रदान को प्रोत्साहित किया जाता है।

कर्मचारियों की भाषाई दक्षता विकसित करने के लिए राजभाषा विभाग के अधीन केंद्रीय हिंदी प्रशिक्षण संस्थान द्वारा हिंदी भाषा, हिंदी टंकण एवं हिंदी आशुलिपि का प्रशिक्षण उपलब्ध कराया जाता है। प्रबोध, प्रवीण, प्राज्ञ एवं पारंगत जैसे पाठ्यक्रमों के माध्यम से कर्मचारियों को हिंदी में कार्य करने की क्षमता विकसित करने का अवसर मिलता है। इसी प्रकार, केंद्रीय अनुवाद ब्यूरो सरकारी अधिकारियों एवं अनुवादकों के लिए अनुवाद प्रशिक्षण, कार्यशालाओं और क्षमता निर्माण कार्यक्रमों का संचालन करता है।

राजभाषा के प्रयोग को सुविधाजनक बनाने में प्रौद्योगिकी की भूमिका भी निरंतर बढ़ रही है। राजभाषा विभाग के पोर्टल पर भारती बहुभाषी अनुवाद सारथी सॉफ्टवेयर, हिंदी शब्द सिंधु (संस्करण 3), लीला हिंदी स्वयं-शिक्षण, लीला हिंदी प्रवाह तथा ई-सरल हिंदी वाक्यकोश जैसे डिजिटल संसाधन उपलब्ध कराए गए हैं। इनके माध्यम से अनुवाद, शब्दावली, हिंदी प्रशिक्षण और कार्यालयीन अभिव्यक्ति में सहायता प्राप्त की जा सकती है। विभाग की ऑनलाइन तिमाही प्रगति रिपोर्ट प्रणाली राजभाषा संबंधी कार्यों की समीक्षा एवं निगरानी को भी सुगम बनाती है।

हिंदी में मौलिक पुस्तक लेखन को प्रोत्साहित करने के लिए राजभाषा गौरव पुरस्कार तथा सरकारी कार्यालयों में राजभाषा के उत्कृष्ट कार्यान्वयन और गृह-पत्रिकाओं को प्रोत्साहित करने के लिए राजभाषा कीर्ति पुरस्कार जैसी योजनाएँ संचालित हैं। इसके अतिरिक्त, 14–15 सितंबर 2026 को नवी मुंबई में आयोजित हिंदी दिवस एवं छठे अखिल भारतीय राजभाषा सम्मेलन ने राजभाषा के प्रचार-प्रसार, संस्थागत सहभागिता और अनुभवों के आदान-प्रदान को व्यापक मंच प्रदान किया।

राजभाषा: दैनिक प्रशासन का स्वाभाविक माध्यम

राजभाषा का प्रभावी कार्यान्वयन केवल निर्धारित लक्ष्यों की पूर्ति अथवा औपचारिक आयोजनों तक सीमित नहीं होना चाहिए। इसका वास्तविक उद्देश्य सरकारी कामकाज को अधिक सरल, स्पष्ट, सुलभ और जनोन्मुखी बनाना है। इसके लिए कार्यालयों में टिप्पणियों, प्रारूपों, पत्राचार, प्रतिवेदनों, प्रशिक्षण सामग्री एवं जनसंचार में सरल और सहज हिंदी के प्रयोग को बढ़ावा देना आवश्यक है। अधिकारियों एवं कर्मचारियों को उपलब्ध प्रशिक्षण और तकनीकी संसाधनों का उपयोग करते हुए अपनी भाषाई दक्षता भी विकसित करनी चाहिए।

संविधान की भावना का वास्तविक सम्मान तभी होगा, जब हिंदी का प्रयोग प्रशासनिक औपचारिकता से आगे बढ़कर दैनिक कार्य-संस्कृति का सहज हिस्सा बने। हिंदी का विकास अन्य भारतीय भाषाओं के सम्मान, सहयोग और समन्वय के साथ ही सार्थक हो सकता है। यही भाषाई समरसता, संवैधानिक मूल्यों और सुशासन की भावना के अनुरूप राजभाषा नीति का व्यापक उद्देश्य है।

हिंदी की मिठास

शब्दों में हो मिठास भी, बातों में हो धार,
हिंदी से संवाद हो, सरल बने व्यवहार॥
बोली-बोली रंग है, भाषा सबकी शान,
सबको लेकर साथ चले, हिंदी की पहचान॥

India's Digital Connectivity Landscape: Telecom Growth and Its Association with Economic Development

Abstract

The telecommunications sector plays a vital role in India's economic development by facilitating digital inclusion, improving access to information and supporting economic activities. The present study examines the growth of telecommunications and digital connectivity in India and its association with economic development. Based on data from Telecom Regulatory Authority of India (TRAI), the Department of Telecommunications (DoT) and the World Bank, the study employs descriptive statistics, trend analysis and graphical comparisons to analyse telephone subscriptions, tele-density, broadband penetration and internet usage alongside GDP per capita. The findings indicate that while overall telephone subscriptions have remained relatively stable, broadband connectivity and internet usage have increased substantially. However, a significant urban–rural gap in tele-density persists. The analysis further reveals a positive association between expanding digital connectivity and rising GDP per capita. The study highlights the importance of strengthening digital infrastructure, improving rural connectivity and ensuring affordable and equitable access to promote inclusive economic development

Keywords: Telecommunication Services, Digital Connectivity, Economic Development, Broadband Penetration, Internet Usage, GDP per Capita

1.Introduction

Telecommunications have emerged as one of the most significant components of modern economic infrastructure, facilitating communication, information exchange, financial transactions, business operations and access to essential services. In the contemporary digital economy, the expansion of telecommunications networks is no longer limited to providing connectivity; it has become an important enabler of productivity, innovation, investment and economic transformation. The development of mobile networks, broadband infrastructure and high-speed internet has substantially changed the way individuals, businesses and governments interact and conduct economic activities. By reducing information and transaction costs, improving market access and facilitating the delivery of digital services, telecommunications infrastructure can contribute to economic efficiency and productivity growth. Consequently, the expansion of digital connectivity has increasingly become an important dimension of economic development, particularly in developing economies.

2.Review of Literature

The relationship between telecommunications development and economic growth has received considerable attention in recent empirical research. Timilsina, Stern and Das (2024), findings also indicate that the contribution of communication infrastructure is relatively greater in developing economies than in industrialised countries. This suggests that investment in telecommunications networks can generate long-term economic benefits by improving connectivity, facilitating economic transactions and strengthening productive capacity. Makkar and Rajpal (2023) findings indicated a positive impact of mobile cellular subscriptions on economic growth, whereas fixed telephone subscriptions had a negative relationship. Fixed broadband subscriptions demonstrated a significant short-run impact but an insignificant long-run relationship. The study highlights the varying contributions of different telecommunications indicators and suggests that the economic implications of digital infrastructure should be assessed separately rather than treating connectivity as a single aggregate measure.

Similarly, Sanwal and Ismail (2024), examining lower-middle-income countries in South Asia over the period 2000–2022, found that internet and mobile penetration positively influence economic growth. Their analysis, based on ordinary least squares, fixed-effects and random-effects models, also indicated that internet penetration had the highest estimated output elasticity among the ICT indicators considered. These findings underline the importance of internet connectivity in facilitating economic participation and supporting growth in developing economies. In another cross-country study, Koh et al., (2024) established a positive contribution of broadband adoption to economic growth in both developed and developing countries. However, the magnitude of its contribution was greater in developed economies, indicating that the economic benefits of broadband connectivity may depend on the availability of complementary infrastructure and the capacity to utilise digital technologies productively.

More recent research has further strengthened the evidence concerning the relationship between digital connectivity and macroeconomic performance. Azam (2025), analysing India's ICT infrastructure, renewable energy consumption and foreign direct investment during 2000–2023, identified a long-run cointegrating relationship among the variables. The study also reported a causal relationship between ICT infrastructure and foreign direct investment, highlighting the potential role of digital infrastructure in supporting investment and economic activity. Extending the analysis to developing economies, Jamsheed et al., (2026) examined 90 countries over 2000–2023 and found that mobile subscriptions, internet penetration and 4G availability were positively associated with GDP and foreign direct investment. Their findings emphasise the growing importance of digital connectivity in strengthening economic performance, particularly in low- and middle-income economies.

Despite the growing body of empirical research, the relationship between telecommunications expansion and economic development remains multifaceted. An increase in mobile or internet subscriptions does not necessarily translate into an equivalent increase in economic output. The economic benefits of connectivity depend on several complementary factors, including affordability, network quality, digital literacy, electricity availability, investment in infrastructure and the productive utilisation of digital services. Furthermore, the relationship may operate in both directions: while improved telecommunications infrastructure can support economic growth, rising income levels and economic development can also increase demand for digital connectivity and encourage further investment in telecom networks. Therefore, it is important to distinguish between the expansion of telecommunications infrastructure and its actual contribution to economic productivity and development.

In this context, the present study, seeks to examine the trends in India's telecommunications sector and explore their association with economic development. The analysis focuses on key indicators of digital connectivity, including mobile subscriptions, internet penetration, fixed broadband subscriptions and data consumption, alongside relevant indicators of economic performance such GDP per capita. By examining these indicators over time, the study aims to understand the extent to which the expansion of India's digital connectivity has moved alongside economic development. It also seeks to identify the broader economic significance of telecommunications infrastructure in strengthening productivity, facilitating digital participation and supporting India's transition towards a digitally enabled economy.

3. Research Hypotheses

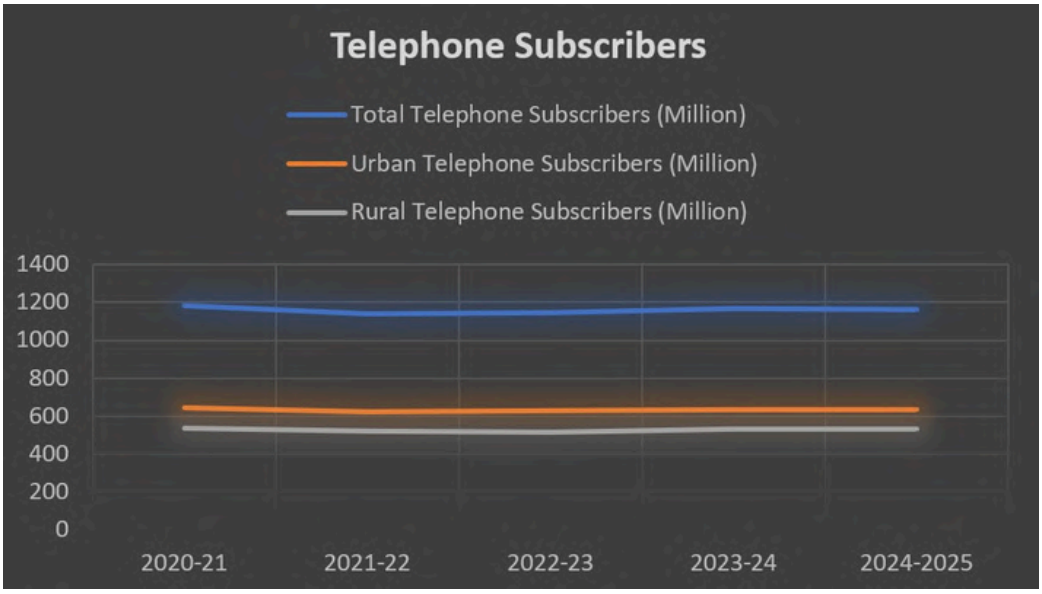
The study is based on the premise that the expansion of telecommunications infrastructure and digital connectivity represents an important dimension of India's economic development. Accordingly, the following hypotheses are formulated:

The expansion of digital connectivity in India, reflected in increasing broadband penetration and internet usage, is positively associated with improvements in economic development, as measured by GDP per capita.

This hypothesis is examined through descriptive statistics, year-wise growth rates, trend analysis and graphical comparisons of telecommunications and economic indicators.

4. Findings and Analysis

4.1 Analysis of Telephone Subscriber Trends in India



Source: Compiled by the author based on TRAI Annual Reports

India's telephone subscriber market appears to be at a relatively mature stage of development, with the overall subscriber base remaining broadly stable during the period under consideration. Total telephone subscribers declined from 1,180.96 million in 2020–21 to 1,142.09 million in 2021–22, representing a decline of approximately 3.3%. However, the subscriber base subsequently recovered, reaching 1,165.49 million in 2023–24, before slightly declining to 1,163.76 million in 2024–25. This pattern suggests that the market is no longer experiencing rapid expansion in terms of subscriber numbers.

The rural subscriber segment shows signs of gradual recovery. Rural telephone subscribers declined from 535.75 million in 2020–21 to 516.38 million in 2022–23, but subsequently increased to 531.18 million in 2024–25. This recovery indicates that growth opportunities are increasingly shifting towards rural and relatively underserved areas. Expansion of network coverage, improved infrastructure, greater availability of affordable smartphones and data services, and government-led digital connectivity initiatives have supported the gradual adoption of telecommunications services in rural regions.

In contrast, the urban subscriber market appears to have reached a plateau. Urban subscribers declined from a peak of 645.20 million in 2020–21 to 624.33 million in 2021–22, followed by a gradual recovery to 632.57 million in 2024–25. The limited increase in the urban subscriber base may reflect the maturity of the market, where most potential users already have access to mobile connections. Consequently, future growth in urban markets is likely to depend more on increased usage of data and digital services rather than a substantial increase in the number of subscribers.

Several factors may explain the changes in the subscriber base. The reduction in multiple-SIM connections may have contributed to the decline in total subscriptions, as users increasingly consolidate multiple connections. At the same time, the growing use of internet-based communication applications for messaging, voice and video calls has reduced dependence on traditional voice and SMS services. The continued expansion of mobile broadband networks, including the rollout of 5G, has further shifted the focus from basic connectivity towards data-intensive digital services.

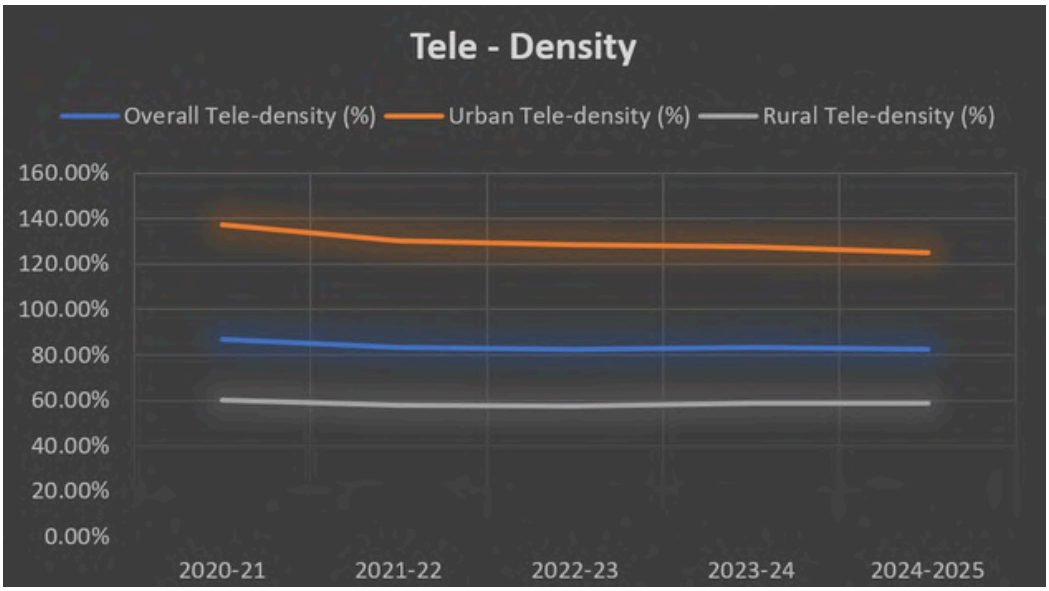
The overall trend therefore indicates a maturing telecommunications market accompanied by a gradual shift in the sources of growth. While the urban subscriber base has largely plateaued, rural connectivity continues to provide scope for expansion. Improvements in network infrastructure, wider coverage, affordable devices and data services, and government initiatives aimed at expanding digital connectivity are likely to remain important factors in extending telecommunications access to underserved populations and supporting broader digital participation.

4.2 Urban–Rural Distribution of Telephone Subscribers

The distribution of telephone subscribers between urban and rural areas remained broadly stable during 2020–21 to 2024–25, with urban areas consistently accounting for a slightly larger share. In 2024–25, 54.63% of total telephone subscribers were in urban areas, while 45.37% were in rural areas. The rural share of subscribers has remained remarkably stable over the period, changing only marginally from 45.64% in 2020–21 to 45.37% in 2024–25. This stability suggests that rural areas continue to represent a substantial component of India's overall telecommunications subscriber base, despite fluctuations in the absolute number of rural subscribers.

An important distinction emerges when subscriber distribution is compared with tele-density which is discussed in the next paragraph. Overall, the urban–rural composition of telephone subscribers has remained relatively stable, with urban areas accounting for approximately 55% and rural areas for 45% of total subscribers. At the same time, the substantially lower rural tele-density indicates that rural connectivity continues to have considerable scope for expansion, particularly through wider network coverage, improved infrastructure, affordability, and greater access to digital services.

4.3 Tele-density Trends in India



Source: Compiled by the author based on TRAI Annual Reports

India's overall tele-density declined during the period under consideration, falling from 86.68% in 2020–21 to 82.42% in 2024–25. This decline does not necessarily indicate a corresponding reduction in access to telecommunications services, as tele-density is influenced by the number of active subscriptions relative to population and can also be affected by the consolidation of multiple connections. The urban segment recorded a more pronounced decline. Urban tele-density decreased from 137.08% in 2020–21 to 124.83% in 2024–25, representing a reduction of 12.25 percentage points. Since urban tele-density remained above 100% throughout the period, the figures indicate that the number of telephone subscriptions exceeds the urban population, reflecting the presence of multiple connections or SIM subscriptions among users.

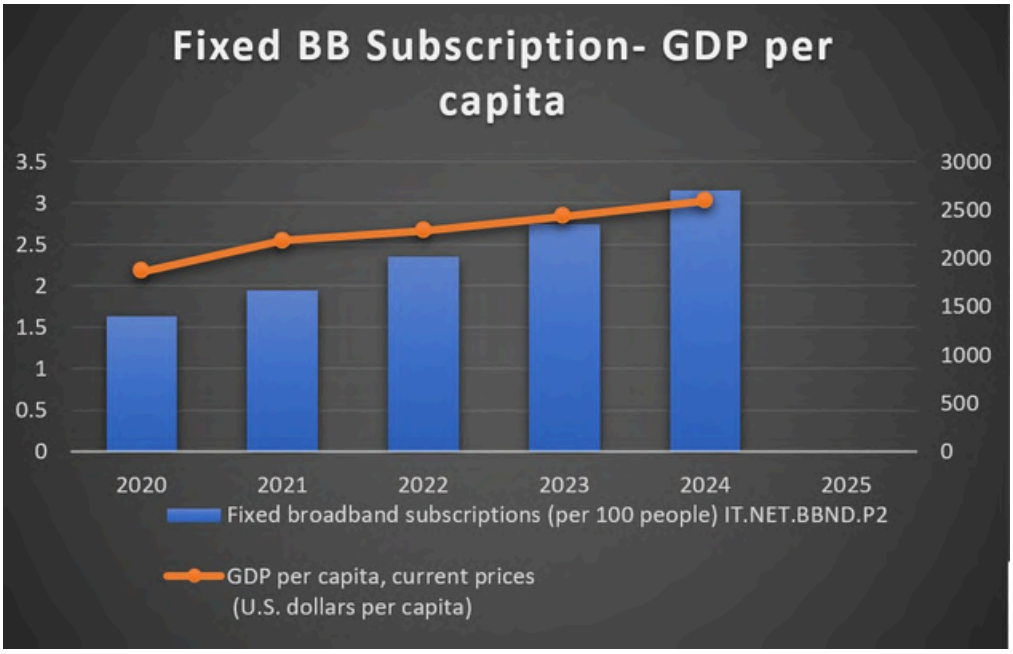
While the urban–rural subscriber shares in 2024–25 were relatively close at 54.63% and 45.37%, respectively, the corresponding tele-density figures showed a much wider gap, with urban tele-density at 124.83% compared with 58.67% in rural areas. This difference arises because the two indicators measure different aspects of connectivity. Subscriber share indicates how total subscriptions are distributed between urban and rural areas, whereas tele-density relates the number of subscriptions to the population of the respective area. Consequently, the relatively large rural population means that rural areas account for only 45% of total subscribers even when their tele-density remains substantially lower than that of urban areas. The comparison therefore highlights that subscriber share alone does not fully reflect the level of connectivity or penetration within a population.

Rural tele-density has remained considerably lower, declining from 60.08% in 2020–21 to 58.67% in 2024–25. However, the rural segment showed some recovery after 2022–23, with tele-density increasing from 57.00% in 2022–23 to 58.67% in 2024–25. This suggests that, despite fluctuations, rural connectivity has demonstrated

relative stability in the later part of the period. A significant urban–rural connectivity gap continues to exist. In 2024–25, urban tele-density stood at 124.83%, compared with 58.67% in rural areas. The difference highlights the substantially higher level of telecommunications penetration in urban areas and indicates that rural regions continue to have greater scope for expansion of connectivity.

Overall, the data indicates that India's telecommunications market is moving beyond a phase where growth is driven primarily by an increase in the number of subscriptions. The decline in overall tele-density has been influenced particularly by the urban segment, while rural tele-density remains lower but relatively stable. The trend underscores the continuing importance of rural network expansion, affordability, improved infrastructure, and digital inclusion in extending meaningful telecommunications access and supporting the next phase of connectivity growth.

4.4 Fixed BB Subscription- GDP per capita



Source: Compiled by the author based on TRAI Annual Reports

Key Insights

1. Steady growth in fixed broadband penetration
Fixed broadband subscriptions increased from 1.64 per 100 people in 2020 to 3.15 per 100 people in 2024. This represents an increase of approximately 92.5% over the period.

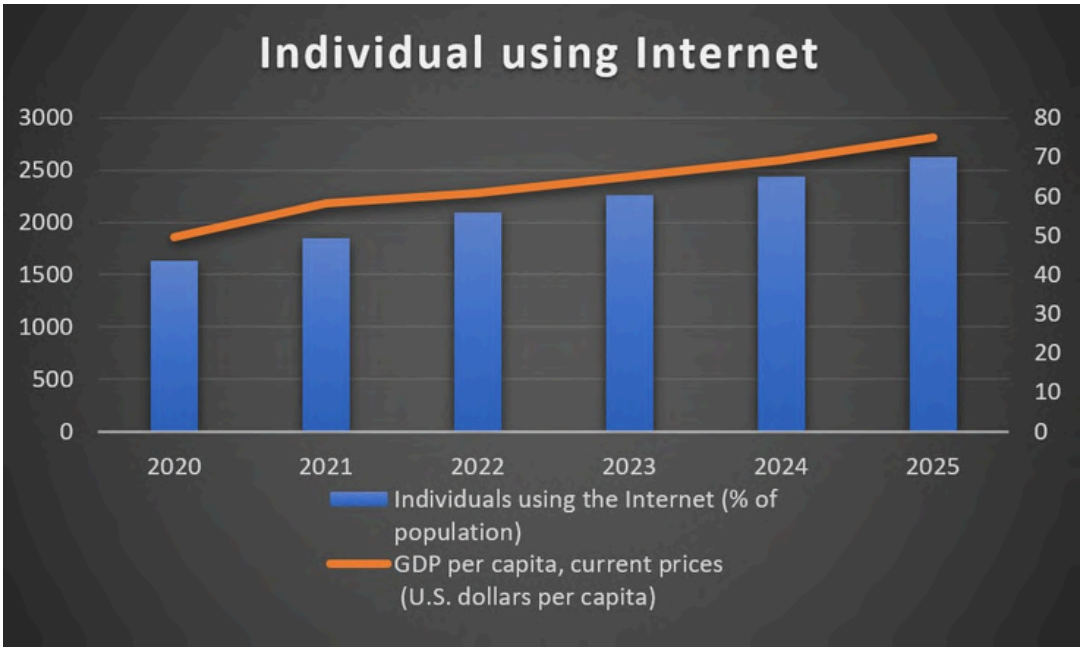
2. GDP per capita also increased consistently
GDP per capita increased from US$1,862 in 2020 to US$2,592 in 2024, an increase of approximately 39.2%.

3. Broadband growth was faster than GDP-per-capita growth
Fixed broadband penetration nearly doubled during 2020–2024, while GDP per capita increased by about two-fifths. This indicates a relatively rapid expansion of fixed broadband infrastructure compared with the increase in GDP per capita

4. Digital Infrastructure Expansion
The increase in fixed broadband subscriptions can be viewed as an indicator of expanding digital connectivity. Greater access to fixed broadband can support activities such as digital services, e-commerce, online education, remote work, financial services and business connectivity.

Between 2020 and 2024, India experienced simultaneous growth in fixed broadband penetration and GDP per capita. Fixed broadband subscriptions increased from 1.64 to 3.15 per 100 people, while GDP per capita increased from US$1,862 to US$2,592. The parallel upward movement indicates a positive relationship between broadband connectivity and economic performance. However, the data should be interpreted as an association rather than evidence of a causal relationship. The data show that each year of higher fixed broadband penetration coincided with higher GDP per capita. Other factors such as investment, productivity, employment, consumption and broader economic conditions may also influence GDP per capita.

4.5 Internet Usage and GDP per Capita



Source: Compiled by the author based on TRAI Annual Reports

The data shows a clear upward trend in both internet usage and GDP per capita from 2020 to 2025. The simultaneous increase indicates a positive association between digital connectivity and economic performance.

Key Insights

1. Rapid growth in internet usage
The share of individuals using the Internet increased from 43.41% in 2020 to 70% in 2025. This represents an increase of approximately 26.6 percentage points, or about 61.3% relative growth.

2. Continuous increase in GDP per capita
GDP per capita increased from US$1,862.20 in 2020 to US$2,812.62 in 2025, representing an increase of approximately 51.0%.

3. Internet adoption expanded considerably faster in percentage-point terms
Internet usage increased by more than half of the population share over the six years, moving from 43.4% to 70%. This indicates substantial expansion of digital inclusion and access to online services.

4. Digital connectivity and economic activity
Increasing internet access can facilitate e-commerce, digital payments, online education, remote work, access to information, digital public services and technology-enabled businesses. These channels can contribute to productivity and economic participation.

The data shows a clear upward trend in both internet usage and GDP per capita from 2020 to 2025. The simultaneous increase indicates a positive association between digital connectivity and economic performance. Both indicators increased every year during the period. As internet usage expanded, GDP per capita also increased.

Conclusion

The study examined the hypothesis regarding the growth of telecommunications and digital connectivity in India and its association with economic development. The descriptive analysis provide support for this hypothesis. The findings indicate that India's telecommunications sector is undergoing a gradual transition from subscription-led growth towards greater emphasis on broadband penetration, internet adoption and digital inclusion. While the overall telephone subscriber base has remained relatively stable during the period under study, the expansion of broadband connectivity and internet usage reflects the increasing importance of digital infrastructure in the country's economic landscape. The analysis highlights that urban areas continue to have higher tele-density than rural areas, indicating a persistent urban–rural connectivity gap. Although rural telephone subscriptions have shown signs of recovery, the relatively lower rural tele-density underscores the need for further investment in network infrastructure and affordable digital services. Furthermore, the substantial increase in fixed broadband subscriptions and internet usage demonstrates the growing adoption of digital technologies and the expansion of access to online services.

The comparison of telecommunications indicators with GDP per capita reveals a positive association between improved digital connectivity and economic growth. Increasing access to broadband and internet services can facilitate digital payments, e-commerce, online education, business operations and access to public services, thereby supporting productivity and wider economic participation. However, the observed relationship represents an association and does not independently establish a causal impact of telecommunications growth on economic development. Overall, the study concludes that telecommunications infrastructure has become an important enabler of India's digital and economic transformation. Sustained investment in broadband infrastructure, improved rural connectivity, affordability of digital services and equitable access will be essential to bridge the digital divide and ensure inclusive growth.

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NCA-F



Certificate No.
APP/22/N00004-2

CAPACITY BUILDING COMMISSION

Certificate of Accreditation

The training Institute **National Communications Academy - Finance** is accredited as **सर्वोत्कृष्ट/Outstanding** under the Capacity Building Commission's National Standards.

The Accreditation shall remain in force subject to continued compliance with the National Standards.The Accreditation needs to be renewed before the expiry date by the training institution following the due process of assessment.

The Accreditation granted on **14/11/2025** is valid until **13/11/2027**

S.P. Roy
Jt. Secretary
Capacity Building Commission

S. Radha Chauhan
Chairperson
Capacity Building Commission

National Communications Academy-Finance proudly secured the ***Sarvotkrisht*** (highest) rating from the **Capacity Building Commission (CBC)**, becoming one of the first institutes to receive this recognition under the National Standards for Civil Services Training Institutes 2.0 Framework.