Chapter 15

INFORMATION TECHNOLOGY AND TELECOMMUNICATION

Information Technology (IT) plays a dynamic role in the evolving knowledge economy by establishing itself as a powerful instrument for fostering economic development. It enables innovations in different sectors of the economy, such as agriculture, manufacturing, services, education, health, and government, by increasing productivity, efficiency, and competitiveness and hence economic growth. The sector has great potential to create employment opportunities, enhance human capital, improve governance, facilitate social inclusion, attract investment, and make markets and institutions more efficient. IT can also enhance social welfare and environmental sustainability by easy access to information relating with education, healthcare, and public services as well as reducing energy consumption and carbon emissions.

The Government of Pakistan (GoP) recognizes the growth of IT and telecommunication industry as a vital lever for the mid- to long-term progress of the country. Therefore, government is working on 'Digital Pakistan Vision' to enhance digital economy footprint, to spur economic prosperity and public empowerment. The government is striving to improve the quality of life, economic, and social well-being by making IT services more accessible, affordable, and universal. The government is strengthening its digital economy which it views as an enabler of both social inclusion and economic growth.

The government has developed a comprehensive strategy that focuses on capacity building of public and private sector entities, besides providing an appropriate infrastructure and platforms in the field of IT. The key pillars of the strategy to achieve the vision include E-Governance, IT Infrastructure, Human Capital Development, Innovation and Entrepreneurship, Development and Export of IT and IT enabled Services (ITeS), Fintech, E-Commerce and Digital Platforms, Privacy and Security, Partnership and Collaboration.

Information Technology

The Kearney's Global Services Location Index (2021) ranked Pakistan as the second most financially attractive location in the world for offshore outsourcing IT and ITeS. Likewise, the International Labor Organization (ILO) Flagship Report (2021) has ranked Pakistan as the second largest supplier of digital labor services, such as clerical and data entry services, creative and multimedia services, professional services, sales and marketing support services, software development and technology services and writing and translation services. In software development and technology services, more than 19,000 IT and ITeS companies are registered with SECP comprising of both domestic and export-oriented enterprises across 160 cities of the country.

There are 5,109 IT and ITeS companies registered with Pakistan Software Export Board (PSEB) as of March 2023 representing the exporters. Major Tech hubs of IT and ITeS industry are Lahore (36.4 percent), Karachi (28 percent), and Islamabad/ Rawalpindi (27 percent) of PSEB registered companies. The remaining 10 percent of registered companies spread all over the country. The relevant stakeholders are putting maximum efforts to increase the number of companies by increasing the number of Software Technology Parks (STPs) and enabling IT and ITeS industry to capitalize the countrywide talent.

The IT sector is providing a broad set of products and services to the world's largest companies. Pakistan's IT industry counts world's largest

entities among its regular clients. Several international companies including global enterprises like Bentley®, Ciklum®, IBM®, Siemens®, S&P Global®, Symantec®, Teradata®, and VMware® have established global consulting services centers, research and development facilities, and Business Process Outsourcing (BPO) support services centers in Pakistan. Thus, generating high paying job opportunities for the talented youth and attracting FDI.

IT industry comprises of youngest workforce with the highest proportion of women as company founders and startup owners. Women are working at technical, managerial, and executive level positions. There have been several startup success stories, such as Bykea, Careem, and Daraz. IGNITE has established National Incubation Centers (NICs) across major cities in Pakistan. In 2021, these centers supported 60 startups, generating US$ 373 million in capital, and reaching a valuation of US$ 2.1 billion. In 2022, 40 startups raised US$ 343 million in capital, reaching a valuation of $3.5 billion.

IT Exports

The government is providing dedicated support and attractive incentives to the IT industry. Currently, there are several projects under various stages of execution to facilitate and assist the IT Industry in its growth trajectory and to ensure continued upward momentum in domestic and export earnings. These include infrastructure development, international marketing and promotion, and capacity building through multiple technology training programmes, soft skill development programme, international certifications of companies, facilitation of freelancers, etc. PSEB maintains an active liaison with industry stakeholders in initiating projects for the growth of the IT industry.

i.   IT exports during July-March FY2023 reached US$ 1.94 billion compared to US$ 1.95 billion during the same period last year. IT exports have the highest proportion

among all services sector's exports constituting 35.1 percent of all services exports.

ii. In IT and ITeS industry, trade surplus of US$ 1.72 billion (88.6 percent of total IT export remittances) was achieved during the period July-March FY2023 (an increase of 16.7 percent) as compared to trade surplus of US$ 1.47 billion for the same period last year. The services sector incurred a trade deficit of US$ 229 million during July-March FY2023.

iii. Pakistan's IT and ITeS sector posted the largest trade surplus among all services and become the second highest across goods and service sector after textile sector.

iv. Pakistani freelancers contributed foreign exchange earnings through remittances of US$ 269.8 million (IT: US$ 156.9 million and non-IT: US$ 112.9 million) during July-March FY2023.[1] Pakistani freelancers are earning valuable foreign exchange and impacting remote and rural communities.

v.   Over the past 5 years, a phenomenal upward growth of 178 percent in IT and ITeS exports has been witnessed at compound annual growth rate of 30 percent, the highest growth rate in comparison to all other local industries in services.

vi. Pakistan's IT and ITeS industry is exporting its services to 170+ countries/ territories. The USA is the largest market accounting for 54.54 percent of the export remittances receipts, followed by UK (7.99 percent), UAE (6.91 percent), Ireland (6.73 percent) and Singapore (4.95 percent), respectively. The top 20 IT and ITeS export destinations accounted for 97.05 percent of export remittances, while the rest only accounted for 2.95 percent only.

Major Achievements

a) Infrastructure Development

PSEB facilitates the IT industry by establishing state of the art Software Technology Parks (STPs) in public and private buildings. Setting

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[1] A freelancer is an individual who earns money on a per-job or per-task basis, usually for short-term work. Freelancers

can work from any location (urban or rural area), while earning a viable livelihood globally.

up an office is convenient and economical in these buildings and comes with many amenities including backup power facilities, high-speed internet, and central heating/cooling (subject to availability). Currently, PSEB is managing thirty-two STPs in different cities such as Karachi, Lahore, Islamabad, Rawalpindi, Faisalabad, Sialkot, Gujranwala, Gujrat, Abbottabad, Swat, Mansehra, Quetta,

Hyderabad, Khuzdar, Bannu, Jamshoro and Gilgit.

During July-March FY2023, PSEB has added seven STPs, listed in Table 15.1, to facilitate the IT industry by expanding the basic infrastructure facilities in secondary and tertiary cities of Pakistan.

Table 15.1: Details of Software Technology Parks

S. No.	STP	City	Space (Sq.ft)
1	Sitara Software Technology Park	Faisalabad	23,063
2	Euro-Heights Gujrat	Gujrat	13,565
3	Innovation & Entrepreneurship Center (Mehran UET Jamshoro)	Jamshoro	5,000
4	NASTP Karachi	Karachi	61,000
5	BZU Multan STP	Multan	5,000
6	Sarhad Software Technology Parks – SSTP	Peshawar	5,000
7	Alpha Techno Square NASTP Rawalpindi	Rawalpindi	40,000

Source: Ministry of Information Technology and Telecommunication

b) Human Resource and Skill Development

To develop a human capital talent pool for the ICT industry and increase the labour pool available for IT/ ITeS companies, PSEB has initiated various programmes to produce trained and certified professionals, which include certification of IT Professionals (550 graduates, IT professionals, and public sector employees have been trained and certified in emerging technologies); IT Industry Readiness Bootcamp Programme (2,108 candidates have been trained under this programme and the training of 1,134 candidates is in-progress); IT Industry Soft Skills Training Programme (250 candidates have been trained under this programme and the training of 250 candidates are in progress); IT Industry Academia Bridge Programme (a total of 1,600 candidates were enrolled and trained in this programme); ICT Internship Programme (780 interns placed in the ICT companies for the duration of 06 months)

c) Capacity Building of IT/ ITeS Companies Through International Certifications

PSEB offers technical and financial assistance to the selected IT companies to attain international certifications. These certifications improve company marketability in the international markets as well as the quality of the human resources in terms of skills. During July-March FY2023, financial and technical assistance has been extended to twenty software companies for ISO-27001 and ISO-27701 certification. To standardize the Call Center industry, PSEB has extended financial and technical assistance to 30 Call Centers to achieve ISO-18295 certification.

d) Providing an Access to Equity Capital

PSEB is working on listing Pakistani IT companies on the GEM Board of Pakistan Stock Exchange (PSX). The goal is to increase the number of listed technology companies on the PSX Main Board and GEM Board which would in turn help to strengthen the financial ecosystem for IT/ ITeS sector growth and contribute to efforts for building cloud strong brand image of Pakistan's IT/ ITeS industry in the international markets.

Incentives for the Industry Growth

i.   Reduced Income Tax (0.25 percent): PSEB registered companies to pay only 0.25 percent tax on export proceeds of IT and ITeS.

ii. 100 percent tax credit for IT startups: PSEB registered startups are allowed 100 percent tax credit including minimum, alternate corporate tax and final taxes for three years.

iii. 100 percent equity ownership allowed to foreign investors, 100 percent repatriation of capital and dividends allowed, and tax holiday for venture capital funds till June 2025.

IGNITE - National Technology Fund (NTF)

IGNITE - NTF is focused on funding and promoting technology innovation and entrepreneurship in Pakistan. For this purpose, IGNITE offer following funding programmes:

a. National Incubation Centers for Startups: IGNITE has established eight National Incubation Centers (NICs) in Islamabad, Lahore, Quetta, Karachi, Peshawar, Hyderabad, and two specialized incubators in Faisalabad (for agri-tech) and Rawalpindi (for Aerospace). Over the past few years, the NICs have incubated over 1,317 startups, with more than 660 graduating successfully so far. These startups have generated over 126,000 jobs; received the total investment of Rs 15.43 billion (US$ 74 million); and have generated a combined revenue of Rs 9.13 billion. To date, over 2,300 women entrepreneurs have been empowered through the programme. Many NIC startups have raised investments, such as BYKEA US$ 27 million, PakVitae US$ 17 million, Integry US$ 4 million, Vceela US$ 2 million, DigiKhata US$ 2 million, and Ezbike US$ 1 million.

b. Digiskills.pk 2.0 Training Programme for Freelancers: Digiskills.pk 2.0 was launched in January 2022 with the objective of providing the youth, freelancers, students, professionals, etc. with the knowledge, skills, tools, and techniques necessary to take advantage of international and local online job markets. The total trainees comprise 73 percent males and 27 percent females. The number of overseas Pakistanis trained in the program is more than 31,000. At present, exports generated through freelancing services are between 15-20 percent of total IT exports.

c. Challenge Innovation Fund (CIF): CIF identified eleven thematic areas and invited the participants from academia and industry to submit the projects in the form of consortia in multiple areas. The initiative is divided into three phases in which the first phase is completed. A total of 899 projects were received at the national level, out of which 451 projects were scrutinized for project outline evaluations. All evaluations have been completed and 114 projects have been shortlisted to submit full technical and financial proposals.

d. Digital Pakistan Cybersecurity Hackathon 2022: Second nationwide Digital Pakistan Cybersecurity Hackathon 2022 was held in Islamabad, Karachi, Lahore, Peshawar, and Quetta to enhance awareness about cybersecurity. A total of 903 teams were registered for the hackathon from all over the country out of which 315 teams were shortlisted for qualifying rounds. The top 33 teams from 5 regional qualifiers competed in the grand finale. Cash awards of Rs 1 million, 2 million, and 3 million were given to second runner-up, first runner-up, and winner, respectively.

e. National Grassroots ICT Research Initiative (NGIRI): The programme promotes research and development (R&D) and innovations at grassroots level by providing financial support to selected Final Year Projects (FYP) of undergraduate students, enrolled in public and private sector institutions. The programme started in 2012 and disbursements of Rs 315.18 million have been made against 5,899 approved FYPs.

Universal Service Fund (USF)

The USF has been mandated to provide access to telecommunication services in the unserved, underserved, rural and remote areas. To meet its objectives, USF has designed and launched various projects under different programmes each targeting deployment of specific infrastructure and provision of related services. These services are made available at affordable rates in the country which empower both men and women. All USF projects, focusing on provision of voice and high-speed data services, require operator(s) to power up their infrastructure through solar energy. USF programmes can be divided into two broad categories:

a. Voice and Highspeed Broadband Data Services (3G/4G) focuses on establishment of infrastructure and provision of voice and highspeed broadband data services to the unserved and underserved mauzas across the country. Under different variations of this programme coverage is also being extended on unserved road segments along National Highways and Motorways (NHMW) and to the various tourist destinations.

Since its inception till the end of Q2 of FY2023, USF has launched 90 projects worth approximately Rs 80.5 billion targeting 18,397 Mauzas having population of approx. 33 million, 2,650 Km of road segments on NHMW, and 27 tourist destinations across the country. Whereas 13,164 Mauzas with population of approximately 27 million, and more than 1,800 Km of road segments have been provided with voice and highspeed broadband data services. In the same period, approximately Rs 45.7 billion subsidy has been disbursed.

From the start of FY2023 till the end of Q2 of FY2023, USF has launched 9 projects worth approximately Rs 14.3 billion targeting 0.28 million population residing in 341 Mauzas, and 622.7 Km of road segments on NHMW. Whereas 796 Mauzas have a population of approximately 0.18 million, and 72.6 Km of road segments have been provided with voice and highspeed broadband data services. In the same period, approximately Rs 4.69 billion subsidy has been disbursed.

b. Backhaul Services focuses on laying Optic Fiber Cable (OFC) up to the unserved Tehsil Headquarters (THQs)/ Union Councils (UCs) and major towns and to establish points of connectivity (Nodes) which can be utilized by telecom operators for expansion of their services.

Since its inception till the end of Q2 of FY2023, USF has launched 25 projects worth approx. Rs 35.71 billion targeting the deployment of 18,575 Km of OFC by establishing 1,272 Nodes in unserved THQs /UCs/ Towns across the country. Whereas, more than 12,800 Km of OFC has been deployed with the establishment of 745 Nodes.

In the same period, approximately Rs 19.93 billion subsidies have been disbursed.

Since the start of FY2023 till the end of Q2 of FY2023, USF has launched 2 projects worth approximately Rs 5.49 billion targeting the deployment 1,339 Km of OFC by establishment of 143 Nodes. Whereas, more than 950 Km of OFC has been deployed with the establishment of 87 Nodes. In the same period, approximately Rs 3.44 billion subsidy has been disbursed.

National Telecommunication Corporation (NTC)

NTC is performing its core function of providing and maintaining ICT infrastructure / services comprising of state-of-the art country-wide NGN-based Core and Access Switching, Optical Fiber based DWDM/SDH Transmission, OSP (OFC/UGC) networks and allied power equipment. The core set-up is monitored (24/7) and managed centrally through subject matter experts in each domain. Adherence to preventive and corrective measures is ensured at all levels. NTC, being a state-owned entity and fully aware of its role, has always been on the forefront on many occasions of national emergencies like earthquakes, pandemics, or floods.

Major endeavors of NTC in FY2023

NTC annual development plan 2022-23 consists of 71 development projects amounting to Rs 1,264.98 million. During FY2022 and July-December FY2023, NTC made a before-tax profit of Rs 399.51 and Rs 398.78 million, respectively.

Data and Call Centre for the First Digital Census in Pakistan

NTC has been assigned to establish a call centre to provide data centre infrastructure for recent digital census by PBS. The state of art call centre facility has been established at the premises of PBS by Ministry of Information Technology and Telecommunication for census facilitation. The call centre has one hundred call agents serving the enumerators and field offices at all districts of Pakistan for census round the clock.

Public Key Infrastructure (PKI)

Establishment of PKI is a national level initiative to implement a national PKI capable of supporting present and future e-government initiative in 2022. Electronic Certification Accreditation Council (ECAC) is the owner of national PKI while NTC implemented and built the infrastructure at its data centers. National PKI is planned as two separate PKI domains (government and commercial) under the National Root CA managed by ECAC under ETO 2002. NTC will operate as a Certification Services Provider (CSP) accredited by ECAC and will provide certification services to all government entities.

Electronic Certification Accreditation Council (ECAC)

ECAC provides a legal framework to recognize and facilitate documents, records, information, communications, and transactions in the electronic form enabling digital signatures to be accepted at par with handwritten (wet) signatures. ECAC is mandated to grant accreditation to any Certificate Service Providers (CSPs) who intend to work as an Accredited Certificate Service Provider (ACSP) in the public and private sectors. The Certificate of Accreditation aims to make electronic transactions more secure, more reliable, and worldwide acceptable enabling a conducive environment for electronic transactions through trust, legal and stringent policy framework in the country.

Establishment of Public Key Infrastructure (PKI) for National Root Certification Authority (NRCA)

ECAC has established National Root Certification Authority PKI on 7th December 2022. ECAC has entered a new phase in the digital world after the deployment of PKI for NRCA. This ECAC initiative shall relieve the burden on our foreign exchange reserves and will make reliance on our own national setup which will reduce chances of security risks allied with outside hosted PKIs as currently digital certificates are procured either from foreign certification service providers or their resellers.

NTC will operate as a CSP accredited by ECAC and will provide certification services to all government entities relating to Email Protection Certificates, SSL/TLS Certificates, Authentication Certificates, eSeal Certificates, Digital Signing Certificates, Digital Time Stamping Certificates, Code Signing Certificates, etc.

National Information Technology Board (NITB)

NITB specializes in automation, design, development, and implementation of robust IT technologies to promote the e-governance culture in all public departments and holistically develop plans, technologies, and infrastructures to boost the performance of the public sector.

Programmes for FY2023

Government to Citizen (G2C) Services: NITB offer various services such as 'National Jobs Portal' through which citizens may apply for any federal vacancies, 'Islamabad City App' by which citizen of the city can avail the online services like issuing of birth/death certificates, payment of excise and taxation taxes and fees, 'citizen portal', and 'NIP Ba-Ikhtiyar Naujawan Internship Programme'.

Government to Government (G2G) Services: These services are typically not directly accessible to individual citizens and are focused on internal operations of government agencies. NITB offer many G2G services to federal and provincial government, e.g., Think-Tank Portal, which is used for communicating and getting idea/ information from the designated think-tanks of Pakistan.

Government to Employee (G2E) Services: G2E services are provided by the government to its employees and are aimed at improving the efficiency and effectiveness of human resource management within government. NITB offer PMS used for daily attendance of teachers of Sindh Government, Ministry of Human Rights, Ministry of Finance, HumRaaz mobile app, etc.

Government to Business (G2B) Services: G2B services are provided by the government to

businesses and other organizations that aim to facilitate and regulate business activities within an area. NITB offers trade change portal for Capital Development Authority (CDA) by which businesses can change their trade online.

Telecommunication

Broadband Subscribers and Penetration

Pakistan's journey towards high-speed mobile broadband services started in 2014, when Pakistan Telecommunication Authority (PTA) conducted spectrum auction for NGMS and initiated the deployment of 3G and 4G infrastructure in the country. PTA further strengthened the uptake of 4G services with additional spectrum auctions of 1800 MHz, 2100 MHz, and 850 MHz bands in the years 2016, 2017, and 2021. The simultaneous launch of 3G and 4G mobile technologies, coupled with the creation of a competitive environment and continuous supply of the required spectrum for advanced technologies, paved the way for achieving the 128 million broadband mark in just eight years, compared to an insignificant two million subscriptions were observed in 2014. Approximately, 54.1 percent broadband penetration has been achieved in eight years (52.8 percent constitutes mobile broadband and 1.3 percent fixed broadband penetration). As such, 97.6 percent of the broadband penetration is contributed by mobile services. With the expansion of broadband services in the country, most handsets are smartphones (3G/4G handsets). Information pertaining to the uptake of 4G, 3G and 2G is presented in Table 15.2.
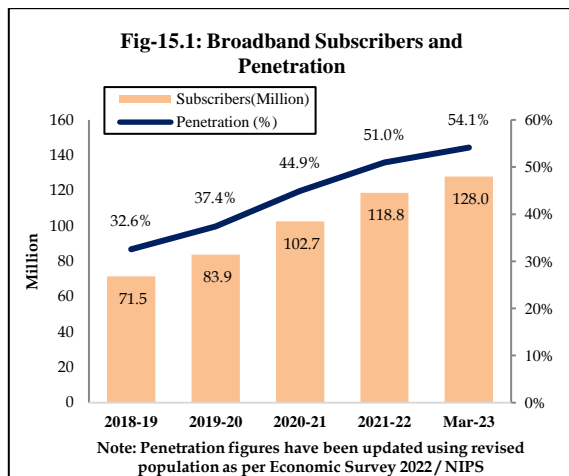

Fig-15.1: Broadband Subscribers and Penetration

Note: Penetration figures have been updated using revised population as per Economic Survey 2022 / NIPS

Table 15.2: Uptake of 4G, 3G, 2G (% of IMEIs on Local Mobile Networks

| Year	4G	3G	2G
Dec 2019	32	13	56
Dec 2020	39	9	52
Dec 2021	47	5	48
Dec 2022	52	4	44
Mar 2023	53	3	44

Source: PTA

Increased penetration of broadband services has propelled active use of data services. In FY2022 mobile data usage of 8,970 petabytes was reported, indicating a 31 percent increase from the previous year. Based on the figures from July-December 2022, it is projected that mobile data usage will reach 10,633 petabytes during FY2023.

Fig-15.2: Cellular Mobile Data Usage (PB)

Note: 2022-23 projection is based on 5317 Petabytes during Jul-Dec 2022
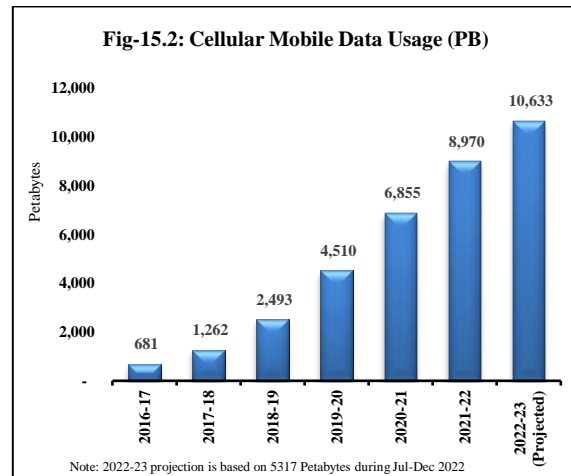
Telecom Subscribers and Tele-density

During FY2022, mobile subscriptions registered a healthy annual growth of 6 percent. The cellular mobile segment was the main contributor towards overall growth in subscribers and teledensity. At the end of March 2023, the total telecom subscriptions (mobile and fixed) were 197 million and total teledensity in the country reached 83.2 percent. Due to the economic slowdown a slight decline in cellular mobile subscribers and teledensity has been witnessed during July-March FY2023.

Fig-15.3: Teledensity

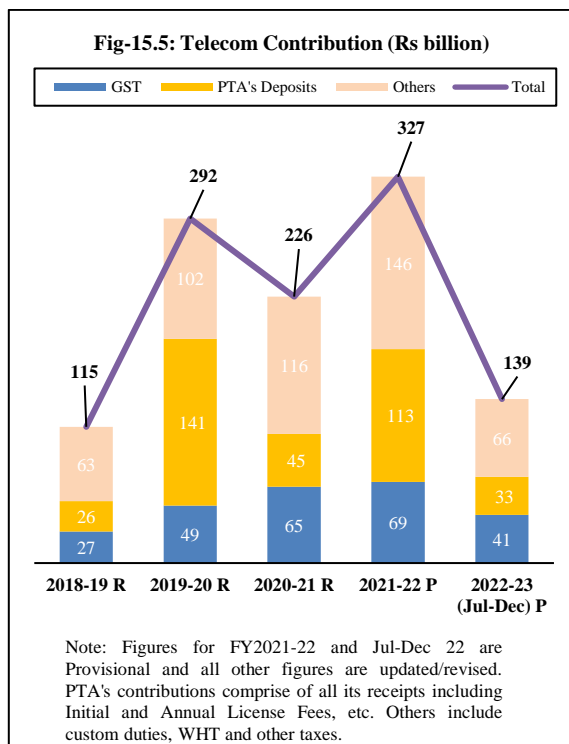Fig-15.4: Telecom Subscribers
(Mobile and Fixed)
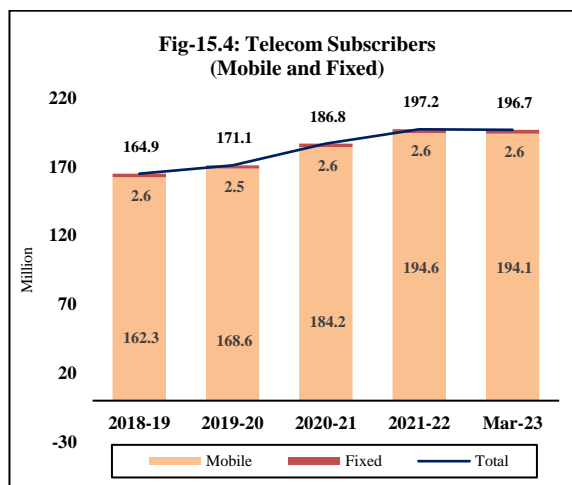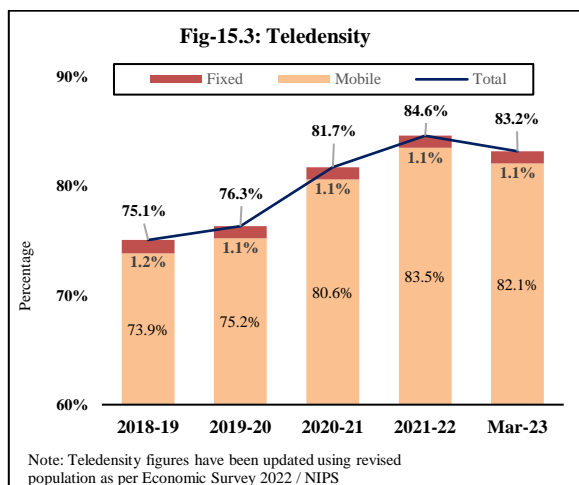
Telecom Investment

Telecom sector drew over US$ 6.3 billion investment in Pakistan during 2018-2022. Telecom investments reported by telecom operators during FY2022 reached to a significant amount of US$ 2,073 million due to spectrum acquisition and network expansion, however, it remained low at US$ 422.0 million (Provisional) during first two quarters of FY2023 (Table 15.3).

Table 15.3: Telecom Investment (US$ million)

	FY2019 (R)	FY2020 (R)	FY2021 (R)	FY2022 (P)	FY2023 (P) (Jul-Dec 2022)
Telecom Investment	839.7	1,394.0	1,336.1	2,073.0	422.0

Source: PTA

Fig-15.5: Telecom Contribution (Rs billion)

Note: Figures for FY2021-22 and Jul-Dec 22 are Provisional and all other figures are updated/revised. PTA's contributions comprise of all its receipts including Initial and Annual License Fees, etc. Others include custom duties, WHT and other taxes.
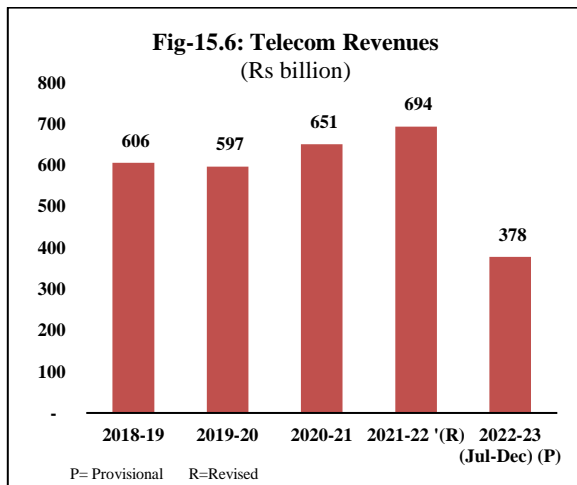
Telecom Sector Contribution

The telecom sector remained a significant source of revenue generation for the national exchequer during FY2022 and contributing Rs 327 billion in the form of general sales tax (GST), withholding tax, regulatory fees, initial and annual license fees, and other taxes. During July-December FY2023, the telecom sector contributed Rs 139 billion (Provisional) to the national exchequer.

Telecom Revenues

Increased activity in the telecom sector enabled telecom operators to generate revenues of Rs 694 billion in FY2022, registering a healthy growth of 6.6 percent. The economic slowdown and increased operational costs have resulted in the slower growth of the cellular mobile sector. As per provisional data, revenues from the telecom sector in the first two quarters of FY2023 stood at Rs 378 billion. (Provisional).

Fig-15.6: Telecom Revenues
(Rs billion)

	2018-19	2019-20	2020-21	2021-22 '(R)	2022-23 (Jul-Dec) (P)
	606	597	651	694	378

P= Provisional   R=Revised

Relief and Restoration of Telecom Services in Flood-affected Areas

Due to devastating flood, 3,386 sites went down in August 2022. Despite various allied issues including inaccessibility to damaged sites, the relentless efforts of PTA and operators ensured timely restoration of telecom infrastructure. The calamity also damaged the OFC network (primarily laid by PTCL and Wateen) in Balochistan and Sindh alongside N-25. Collaborative regulator-industry efforts resulted in 100 percent backhaul fiber optic connectivity.

Assistance to Government's Relief Efforts

In response to the Prime Minister's appeal for contributions towards the Flood Relief Fund, PTA activated short code (9999) on August 26, 2022, to receive donations from telecom consumers. About 1,514 million SMSs were disseminated and Rs 16 billion were collected. On July 5, 2022, PTA activated a Ring-Back Tone (RBT) alerting over 138.65 million mobile subscribers to adopt safety measures during monsoon and floods. The PTA, with the assistance of NHMP issued travel advisories to people traveling to and from the flood-affected areas. 84.5 million SMSs containing information on the flood were disseminated. The 911 emergency service short code was also made available for reporting of flood-related emergencies. Over 155 million SMSs were sent to make availability of 911 services in flood-affected areas. In August 2022, all CMOs started offering free voice calls in 59 flood-affected areas.

Introduction of 5G

5G is a transformative technology that allows communities to avail socio-economic benefits of an advanced and data-intensive digital economy. PTA and FAB, alongside MoITT, are synergizing for the successful launch of 5G in Pakistan and FAB has already identified available spectrum in maximum bandwidth.

ITU Gen-5 Regulatory Benchmark

Pakistan has made considerable progress towards achieving an Advance Level – 5th generation regulation (G5). To achieve G5 level, there are quite a few pointers which require National Collaborative Action Plans and for this purpose PTA is closely following up with relevant stakeholders including public authorities.

Fixed Broadband Quality of Service Regulations, 2022

During FY2023, PTA issued the revised Broadband Quality of Service (QoS) Regulations, which shall apply to all broadband service providers with revised KPIs for broadband services. According to the new KPIs, fixed broadband internet speeds for downloading data should be at least 4 Mbps (up from 256 kbps) and 2 Mbps for upload. Fixed broadband consumers should always get a minimum of 80 percent of the advertised speed, compared to the previous value of 60 percent.

Frameworks for Infrastructure and Spectrum Sharing

To meet the growing demands of radio frequency spectrum, PTA has focused on latest trends in spectrum management to regulate the use of radio frequencies in an efficient manner to maximize the social, economic, and technological benefits. In this regard, PTA has published draft Spectrum Sharing Framework considering all recent international developments and market dynamics for industry consultation.

Export of Locally Manufactured Mobile Phones

Under the flagship of PTA's Mobile Device Manufacturing Authorizations, exports of

locally manufactured handsets have started from Pakistan. In the month of Dec 2022, 120,000 "Manufactured in Pakistan" mobile handsets of SEGO brand were exported to African market.

Gender Mainstreaming

To promote gender participation in Pakistan's socio-economic development, PTA launched its "Gender Inclusion in ICTs" initiative in collaboration with UNESCO, GSMA, and Alliance for Affordable Internet (A4AI) to reduce the digital gender gap in Pakistan. In this regard, the PTA inked accords with CMOs and Huawei for hosting projects, training sessions and initiatives to promote gender inclusion in ICTs.

Branchless Banking

PTA joined hands with SBP to launch Asaan Mobile Account (AMA) Scheme for provision of banking services in the country. After a soft launch in December 2021, the scheme was commercially launched on August 11, 2022, enabling customers of all four mobile operators to remotely open bank accounts and conduct digital financial transactions. Resultantly, AMA accounts have crossed the 7 million marks.

Cyber Security Framework

PTA released the National Telecom Cyber Security Framework in 2022 to define obligations for auditors and PTA licensees to perform gap assessment considering PTA's Cyber Security Regulations. The framework is a milestone towards improving the security landscape of the telecom industry in Pakistan and enabling organizations to better manage and control cyber security risks.

National Telecom Computer Emergency Response Team

PTA inaugurated the Telecom CERT portal for bilateral information sharing on emerging threats, with access restricted to its licensees only. However, due to rising public demand, the authority decided to launch the national Telecom CERT (nTCERT) website for awareness of telecom operators and the public. The nTCERT website, which enables PTA to safeguard the security interests of Pakistan's telecom sector, offers updated cyber security alerts, advisories, and awareness infographics.

Conclusion and Outlook

The IT and Telecommunication industry of Pakistan is one of the fastest growing and most promising sectors in the country, with a potential to contribute significantly to the national economy and social development. There is a huge opportunity for the country to boost and enhance its economy by focusing on digital and information technologies, especially IT and ITeS exports and the digital connectivity. This would create more jobs, increase productivity, and enhance innovation in various sectors. The outlook of the IT and Telecommunication industry of Pakistan is bright and optimistic, as the government and the private sector is committed to create a conducive environment for innovations, entrepreneurship, and digital transformation. The envisioned turnaround of Pakistan's economy in the medium-to-long-term is possible by utilizing the potential of IT and Telecom sector. Some of the key initiatives that are expected to boost the IT industry in the coming years include: the establishment of special technology zones, the expansion of broadband and 5G networks, the promotion of e-commerce and e-governance platforms, the enhancement of cybersecurity and data protection measures, and the facilitation of foreign investment and collaboration. These initiatives will enable the IT sector of Pakistan to tap into the global market opportunities as it offers high-quality and competitive solutions to various sectors such as education, health, agriculture, finance, and entertainment.