

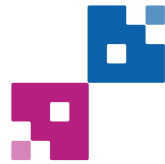


NATIONAL HUMAN
DEVELOPMENT REPORT
2023/2024 ON **DIGITAL
TRANSFORMATION** IN
PAKISTAN



Doing Digital for Development





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DEVELOPMENT REPORT
2023/2024 ON **DIGITAL
TRANSFORMATION** IN
PAKISTAN

Doing Digital for Development

Access > Adopt > Anticipate > Accelerate



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*Definition of 'Circuit'

“A path for an electric current to flow through”

- Cambridge Dictionary

“A circuit is a closed loop that allows electricity to flow. It is made up of electronic components, like resistors, capacitors, transistors, inductors, and diodes, that are connected by conductive wires.”

- Google Generative AI

“A circuit is a closed loop that electrons can travel in. A source of electricity, such as a battery, provides electrical energy in the circuit. Unless the circuit is complete, that is, making a full circle back to the electrical source, no electrons will move.”

- Qualitative Reasoning Group, Northwestern University

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Table of Contents

14	Abbreviations	46	SECTION TWO
18	Special message		Where is Pakistan on Digital? A Quantitative & Qualitative Baseline
20	Foreword	48	Pakistan's Rankings on Global Digital Transformation Indices
22	Executive Summary	49	Pakistan on Global and National Human Development Index (HDI)
28	SECTION ONE	55	Curating Pakistan's District-Level Digital Development Index (DDI)
	Political Economy of Digital Transformation in Pakistan	66	Age, Wealth, and Gender Considerations
30	Introduction	67	Gender Digital Development Index
31	Contextualizing Costs and Benefits of Doing Digital	69	Key Data Takeaways
33	A Fast Route to Human Development	69	How Pakistani People View Digital Transformation: The Four As through the Public Eye
36	Can Digital Enable Development?	77	Lives and Livelihoods
38	NHDR 2023/24: A Digital Transformation Framework for Pakistan	78	A Digital Divide of Genders
40	A 4As Framework for Digital Transformation: Access, Adopt, Anticipate, Accelerate	79	Those Least Developed and Left Behind
41	The NHDR's Methodological Approach		

82

SECTION THREE

Access: Fundamental to Channeling Pakistan's Social Capital

- 84 Beyond Physical Access
- 85 What Determines Access in Pakistan?
- 86 Access Across Districts: Computers, Mobile Phones, Internet
- 88 Does Access Equal Usage?
- 101 What Prevents Access and How Can it be Overcome?
- 128 Development Partners' Support for Digital Transformation
- 139 Adoption in the Social Sector
- 144 Adoption in Corporations and the Private Sector
- 146 Why is the Private Sector Lagging in Digital Adoption
- 147 Adoption amongst the People
- 149 What Prevents Digital Adoption Among People?
- 153 Barriers to Adoption
- 154 Enablers for Gainful Adoption

104

SECTION FOUR

Adopt: Harnessing the Gains of Access

- 112 Adoption Parameters and Differentiation from Access
- 112 Adoption for Development: Government, the Private Sector, and the People
- 113 Governance, Stakeholders, and Policy Instruments
- 117 Taxation
- 124 Provincial IT Policies
- 124 Adoption in Government

158

SECTION FIVE

Anticipate: Becoming Future-Ready

- 160 A Framework for Equitable Digital Transformation
- 161 Inclusive Digital Technology
- 161 Meaningful Digital Access
- 162 The Future of Work
- 162 The Moonshot Trend and Financial Inclusion
- 163 Digital Governance and Citizen Engagement



164

SECTION SIX Accelerate: Reaping the Low-Hanging Fruits

- 172 E-Government and E-Governance
- 175 Digital Economic Growth
- 182 Catalyzing Social Services
- 186 Resilience to Shocks: Digital Support for Climate Adaptation and Mitigation
- 191 Promoting Regional Equalization
- 193 Empowering People

200

ANNEXES

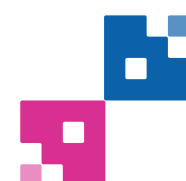
200 Annex 1: Digital Spotlights

- 200 Spotlight 1: From Adversity to Resilience: UNICEF supports Tahira Bibi's Journey to Digital and Financial Literacy
- 202 Spotlight 2: Amplifying Youth Voices through the Youth Engagement Platform on Misinformation and Disinformation
- 204 Spotlight 3: From Engineer to Freelancer: Touqeer's Journey to Success

- 205 Spotlight 4: Combating Misinformation in Pakistan through AI and Machine Learning
- 206 Spotlight 5: Transforming the Justice Sector in Khyber Pakhtunkhwa and Merged Districts through Virtual Courts and a Digitized Bar Council
- 208 Spotlight 6: Preparing for the Future of Work and Harnessing Digital Ecosystem
- 210 Spotlight 7: Transgender Political Candidates use Social Media to Claim their Political Space
- 211 Spotlight 8: Using Technology for Human Rights
- 212 Spotlight 9: Building Climate-Resilient Communities through Installation of Advanced Technology Early-Warning Systems in Gilgit-Baltistan and Khyber Pakhtunkhwa

213 Annex 2: Academic and Literature Influences

- 213 United Nations
- 214 Pakistan
- 215 International Digital
Transformation Frameworks
and Research Design
- 217 Digital Transformation and
Economic Development
- 217 International Case Studies
on Digital Transformation
- 219 Digital Transformation and
the Gender Divide



244 Statistical Annex

- 245 Reader's Guide
- 247 Statistical Tables
- 309 Technical Notes
- 322 Data Sources
- 323 Regional Classification
- 324 Statistical Annex
References

221 End Notes

230 Bibliography

BOXES

1.1	Digitalization – A Global Public Good	33
1.2	Definitions	37
1.3	The Digital Transformation Imperative in Pakistan	43
2.1	Promoting Regional Equalization through Digital Transformation	63
2.2	‘Digital’ in Pakistan’s Development Policy Research	80
3.1	Access to New Possibilities	86
3.2	What is Crypto Currency?	99
4.1	Digitalization as Enabler for the National Coordination Committee for COVID-19	127
4.2	PSDP Portal by Ministry of Planning, Development, and Special Initiatives	128
4.3	Trends in Development Partnerships for Pakistan’s Digital Transformation	139
4.4	Raising Public Health Awareness During the Pandemic using Ringtones and Behavioral Science	141
4.5	Telehealth Policy Frameworks in Pakistan: Navigating Current Realities for Future Success	142
4.6	Political Participation and Digital Rights	150
4.7	Digitalizing Law, Democratizing Justice	151
4.8	Pakistan’s First Digital Gender Inclusion Strategy	156
6.1	Fintech, E-Commerce and Digital Banking	177
6.2	Enabling Investments in Digital Technology and Communication	181
6.3	Telemedicine, Telehealth or Telecare – What’s the Difference?	185
6.4	Urban Challenges	187
6.5	Call for Critical Action by Major Players	196

FIGURES

1.1 Positive Correlation between Human Development in Districts with Digital Adoption	35
1.2 Pakistan's Digital Transformation Model	39
2.1 Level of Human Development in Pakistan 2020	52
2.2 Development Level of Districts Making Up the Provincial HDIs, 2020 (in percentages)	54
2.3 Conceptual Framework for DDI	55
2.4 Digital Development in Pakistan – A Geographical Analysis	56
2.5 Links Between Human Development and Digital Development, Pakistan	65
2.6 Level of Digital Development Index in Pakistan Across Geographical Regions by Wealth Quintiles, 2020	67
2.7 Gender Divide in Digital Development – Gender Digital Development Index	68
2.8 GDDI Decreases as Age Cohort Increases	68
2.9 Districts where Focus Group Discussions and Key Informant Interviews were conducted	70
3.1 Ability to use computer programs proficiently	89
3.2 Mobile Phone Ownership by Type	90
3.3 Who in Your Household Decides Whether You Should Have a Phone?	91
3.4 What Purposes Do You Use the Internet For?	91
3.5 Do You Feel That Social Media Has Made You More Politically Active in Any Way?	92
3.6 Have You Ever Taken Any Online Courses/E-Learning?	93
3.7 Barriers to Pursuing E-Learning	94
3.8 Reasons for Positive Rating and Negative Rating	94
3.9 Ways in which Online Learning Benefited	95
3.10 How Has Your E-learning Benefitted You?	95
3.11 Which Digital Skills Are Required in Your Workplace/Profession?	96
3.12 Have Any of Your Household Members Ever Availed Tele-Health Facilities?	97
3.13 Are you Aware of How to Avail Telehealth Facilities?	97
3.14 Barriers to Availing Telehealth by Gender?	97
3.15 Have You Ever Used Online Shopping Platforms?	98
3.16 Do You Know About Cryptocurrencies? If Yes, Have You Ever Traded or Mined Cryptocurrency?	98

3.17 Do You Use Mobile Wallets	99
3.18 Use of Mobile Wallets by Gender and Locality	100
3.19 Reasons for not Using Mobile Wallet Services	100
4.1 Mobile Wallet Services Used	146
6.1 Global Manufacturing Growth	176
6.2 Sectoral Share in GDP (per cent) – Industry and Services	176
6.3 Digitalization and Climate Change Awareness	188
6.4 9 High-Impact Technology uses that benefit the Energy, Materials, and Mobility Sectors	189
6.5 Have you ever received disaster warnings through telecom or digital media?	190
6.6 Did the warning help you mitigate the effects of the disaster?	190

TABLES

2.1 Pakistan lagging behind on digital transformation and human development	51
2.2 Digital Development Index – Punjab	57
2.3 Digital Development Index – Sindh	59
2.4 Digital Development Index – Khyber Pakhtunkhwa	60
2.5 Digital Development Index – Balochistan	61
3.1 The 5As of Access	85
3.2 Top Districts in DDI	90

MAPS

2.1 Pakistan Human Development Index (2005-2020)	53
2.2 Digital Development Index at District Level	57
2.3 20 Least Developed Districts	64

Abbreviations

2G	Second Generation
4As	Access, Adopt, Anticipate, Accelerate
4G	Fourth-Generation Wireless
4IR	Fourth Industrial Revolution
5G	Fifth-Generation Wireless
ADB	Asian Development Bank
AJK	Azad Jammu and Kashmir
AMA	Asaan Mobile Account
ARPU	Average Revenue Per User
AU	African Union
BISP	Benazir Income Support Program
BMGF	Bill and Melinda Gates Foundation
CAPI	Computer Assisted Personal Interviewing
CCTV	Closed-Circuit Television
CDO	Chief Digital Office
Chat GPT	Chat Generative Pre-trained Transformer
CNIC	Computerized National Identity Card
COVID-19	Coronavirus Disease
CPI	Corruption Perceptions Index
D4D	Digital for Development
DAI	Digital Adoption Index
DAP UK	Digital Access Program
DEF	Digital Ecosystem Fund
DEI	Digital Evaluation Index
DFS	Digital Financial Services
DGR	Directorate General of Registration
DPI	Digital Public Infrastructure
E-Commerce	Electronic Commerce
E-Court	Electronic Court
E-Government	Electronic Government
E-Justice	Electronic Justice
E.U.	European Union
EdTech	Education Technology
EGDI	Electronic Governance Development Index

EHRs	Electronic Health Records
eKYC	Electronic Know Your Customer
FBR	Federal Board of Revenue
FCDO	Foreign, Commonwealth and Development Office
FemaleDev	Female Developer
Fintech	Financial Technology
FIR	First Information Report
FMCG	Fast Moving Consumer Goods
G2B	Government-to-Business
G2C	Government-to-Consumer
GDC	Global Digital Compact
GDDI	Gender Digital Development Index
GGHS	Government Girls High School
GIGA	German Institute for Global and Area Studies
GIS	Geographic Information System
GoP	Government of Pakistan
GPS	Global Positioning System
GSMA	Global System for Mobile Communications Associations
GST	Goods and Service Tax
HCI	Human Capacity Index
HIES	Household Integrated Economic Survey
HR	Human Resources
IBA	Institute of Business Administration
ICT	Islamabad Capital Territory
ICT	Information Communications Technology
ID	Identity Document
IFC	International Finance Corporation
IFIs	International Financial Institutions
ILO	International Labor Organization
ITU	Information Technology University
ITU	International Telecommunication Union
IWITA	Indonesian Women Information Technology Awareness
KP	Khyber Pakhtunkhwa
KPESE	Khyber Pakhtunkhwa Elementary and Secondary Education

KPITB	Khyber Pakhtunkhwa Information Technology Board
MoITT	Ministry of Information Technology & Telecommunication
MoPD&SI	Ministry of Planning, Development & Special Initiatives
MSMEs	Micro, Small and Medium Enterprises
NAVTTTC	National Vocational and Technical Training Commission
NDO	National Database Organization
NEET	Not in Education, Employment, or Training
NFIS	National Financial Inclusion Strategy
NGO	Non-Governmental Organization
NIC	National Incubation Centre
NPS	National Payment System
NPSS	National Payment System Strategy
NITB	National Information Technology Board
NSTP	National Science Technology Park
NSW	National Single Window
NTC	National Telecommunication Corporation
OTS	Online Testing System
P&DD	Planning and Development Department
PBS	Pakistan Bureau of Statistics
PDNA	Post-Disaster Needs Assessment
PECA	Prevention of Electronic Crimes Act
PIDE	Pakistan Institute of Development Economics
PITB	Punjab Information Technology Board
PIU	Problematic Internet Use
PSCA	Punjab Safe Cities Authority
PSDP	Public Sector Development Program
PSLSMS	Pakistan Social and Living Standards Measurement Survey
PTA	Pakistan Telecommunication Authority
PTCL	Pakistan Telecommunication Company Limited
ROAM	Rights-based, Open, Accessible, and Multistakeholder Governance
R&D	Research and Development
RBAP	Regional Bureau for Asia and the Pacific
RHDR	Regional Human Development Report
SBP	State Bank of Pakistan
SME	Small and Medium Enterprises
SOEs	State-Owned Enterprises

STEM	Science, Technology, Engineering and Math
TVET	Technical and Vocational Education and Training
UAJ&K	University of Azad Jammu and Kashmir
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
USD	United States Dollar
USF	Universal Service Fund
USSD	Unstructured Supplementary Service Data
VC	Venture Capitalist
WB	World Bank
WDI	World Development Indicators
WEF	World Economic Forum
WHT	Withholding Tax
WJP	World Justice Project
WUAJK	Women University of Azad Jammu and Kashmir

Special message



H. E. Ahsan Iqbal Chaudhary

Federal Minister of Planning, Development,
and Special Initiatives

As the custodian of Pakistan's development planning, I am delighted to introduce the UNDP Pakistan National Human Development Report 2023/24 on Digital Transformation. The Ministry of Planning, Development, and Special Initiatives is pleased to be the permanent anchor for UNDP's seminal NHDRs that continue to serve as highest quality development policy evidence and knowledge resources for policy planners. The NHDR 2023/24 has been a crucial need for our country, as it sheds light on the significance of digitalization for our nation's progress.

Inequality, in its myriad forms, remains a formidable barrier to progress and prosperity. It shackles the dreams of millions, stifles innovation, and corrodes the very fabric of our society. Bridging the chasm between the haves and have-nots has long been the cornerstone of our national ethos. From the corridors of power to the farthest reaches of our rural heartlands, we have waged an unwavering battle against the scourge of inequality.

Yet, as we march forward, the contours of our struggle have evolved. In the new digital age, access to technology is the new frontier of equality. Digital transformation is more than just a trend; it's a necessity for Pakistan's development. The NHDR 2023/24 contributes significantly by highlighting the correlation between digital adoption and development. It represents a bold exploration of this paradigm shift. It serves as a guide for policymakers, businesses, and individuals to understand the role of digitalization in shaping Pakistan's future. It delves into the very essence of our digital aspirations, probing the depths of opportunity, as well as the specter of exclusion.

In the labyrinth of cyberspace, access is the currency of empowerment. The Report lays bare the stark realities of internet penetration in Pakistan, illuminating the fault-lines that fracture our digital landscape. From the bustling metropolises to the far-flung corners of our nation, it charts the uneven contours of connectivity, casting light on the disparities that plague our digital ecosystem.



But access alone is not enough. Adoption, the second pillar of our digital journey, stands as a testament to our resilience in the face of change. From the hallowed halls of government to the bustling bazaars of commerce, digitalization is permeating every facet of our existence. The NHDR 2023/24 unveils the transformative power of technology, showcasing the myriad ways in which digital adoption has reshaped our lives and redefined our future.

For all its promise, however, digitalization remains divided across socio-economic exclusion, inequalities, and vulnerabilities that crisscross our country. Women, youth, religious, ethnic and gender minorities, especially abled, and other marginalized communities bear the brunt of the digital divide caused by lack of access and education. The Report is a pertinent call for a renewed commitment to inclusivity and equality in all

spheres of national progress, and particularly in the digital domains.

The stakes could not be higher. Along with the challenges, opportunity also beckons. The NHDR 2023/24 charts a course towards a more equitable future, one where digitalization serves as a catalyst for change towards Pakistan's sustainable development. I appreciate the UNDP Pakistan Country Team for their unwavering efforts to bring the SDGs Agenda 2030 vision to fruition in our country, for which digital transformation will now be a lynchpin, which has changed the way we live, we work and we learn. We need to proactively embrace the change so that we become its beneficiaries. This report presents a roadmap for adoption of digital technology in Pakistan. Government of Pakistan will put all its resources for implementation of NHDR 2023/24.

H. E. Ahsan Iqbal Chaudhary

Federal Minister of Planning, Development, and Special Initiatives
On behalf of the Prime Minister, Chair of the NHDR 2023/24 Advisory Council

Foreword



Dr. Samuel Rizk

Resident Representative, UNDP Pakistan

The 2024 National Human Development Report (NHDR) for Pakistan comes at a time when there appear to be more challenges than opportunities for effective, inclusive, and transformational development. Launched only weeks after the global Human Development Report, aptly-titled 'Breaking the Gridlock: Reimagining Cooperation in a Polarized World,' both reports cast a clear sense of alarm around what and how development practice can and should do in the face of uneven development progress, intensifying inequality and political polarization.

Pakistan is no stranger to these pressures, especially over the past few years. The country has been dealing with a deep macroeconomic challenge to its fiscal and monetary health, political transitions, lingering consequences of the COVID pandemic, and, of course the devastating impacts of climate change in the form of the August 2022 floods -- the recovery from which remains incomplete and uneven. All of the above should be cause for concern for the federal and provincial Government and civil society, development partners and the private sector alike.

In Pakistan, and globally, one of the key takeaways from the post-COVID era is the

emerging new social contract, one where the resilience of the most vulnerable needs to be at the center, where social safety nets go beyond income support and more towards a care society, and where quality of services is just as important as access to services. Another key takeaway, and a lingering consequence of the pandemic, coupled with the economic crisis and the floods, is a reenergized reflection on the meaning of 'inclusive development' and the spaces in which this should be happening. This reflection is urgent and timely because after years of an upward trajectory, global human development indicators have dropped in two consecutive years followed by an all-time high albeit with very uneven progress and high inequality, particularly between OECD and other countries. These disparities risk to become permanent. If ever there was a time to reconsider what inclusive development is, and where this should be happening, the digital space has emerged as one such critical space, perhaps 'the' critical space, now and in the future.

There is no doubt that Pakistan's emerging social contract must be digital and must aim to find solutions that reshape and improve traditional service delivery through



technology, reaching millions. The country has made great achievements on the digital front: According to our NHDR, 58 per cent of respondents use mobile wallets – many of them women – as their primary bank account, which is bringing rural and vulnerable populations into the formal financial net. In 2023, Pakistan conducted its first ever Digital Census, recording the national population at 241.9 million. According to the Pakistan Bureau of Statistics, this was the largest digitization exercise of South Asia planned in the shortest span of time of only 18 months. There are many firsts to note in this exercise: For the first time in the country's history, the national population was counted digitally using computer tablets; a digital facility of self-enumeration was provided to the citizens; all the structures were geo-tagged and online monitoring dashboards were provided to stakeholders. But more work remains.

Even though some gains were made, areas of lingering exclusion in digital spaces remain, often impacting the most vulnerable in society. While overall access to technology appears to increase in Pakistan, and forty per cent of households interviewed report online engagement of some sort, significant disparities stand out in digital access and usage across different social groups. For example, households in rural areas are less likely to have access to the internet or to own digital devices than households in urban areas. Women are fifty per cent less likely than

men to use technology because they often require family permission to do so. Hence, this Report also reinforces the findings of our previous NHDR on Inequality (2021) and how it manifests digitally. We find here that wealth inequalities are deepening the digital divide, as the richest 20 per cent of the national population have a Digital Development Index value that is 15 times higher than the poorest 20 per cent.

The NHDR 2024 stresses the importance of a collaborative 'doing digital for development' approach in which the Government, civil society, private sector, and development partners must come together to create a more holistic and accessible digital ecosystem for everyone. The Report frames and emphasizes a 4As analogy of 'Access, Adopt, Anticipate, and Accelerate' for channeling and leveraging digital transformation as an enabler for improving Pakistan's HDI ranking. Without equitable access to digital technology, Pakistan's human development outcomes will remain low and under-served. In an increasingly interconnected world, the integration of digital technologies has the power to bridge gaps, empower communities, and drive economic growth. By launching this Report, our ambition is to contribute to a future-oriented Pakistan where digital transformation becomes a hallmark of its inclusive development, and a cornerstone for its prosperity.

Dr. Samuel Rizk

Resident Representative, UNDP Pakistan

Executive Summary

Technology has changed the world and every aspect of the way we live our lives. Its pace and scale is unprecedented in history. In just two decades, digital technology has reached 50 per cent of the developing world's population.

Pakistan ranks low on the Human Development Index (HDI), at 164th out of 193 countries, according to the global Human Development Report (HDR) 2023-2024. Pakistan also ranks low on all global digital indices. For example, it ranks 45th out of 52 countries in the World Internet Development Index (2023). Pakistan performs poorly compared to most countries, but better than countries in Sub-Saharan Africa.

The U.N. Secretary-General's Roadmap for Digital Cooperation convened in 2018-2019 has mandated that every person should have safe, affordable and meaningful access to technology by 2030. While Pakistan has demonstrated a strong policy commitment to the Roadmap in achieving equitable digital transformation, it is still early in its digital transformation. Without having better governance and regulation, technology will exacerbate current deprivations, vulnerabilities, and inequalities.

The National Human Development Report (NHDR) 2023/2024, '*Doing Digital for Development: Access, Adopt, Anticipate, Accelerate*', presents a comprehensive exploration of digital transformation as a critical lever for uplifting the socio-economic fabric of Pakistan. Anchored in the ethos of human-centered development, this report navigates the intricate interplay of technology, governance, and socio-economic well-being, charting a course for a future where digital

empowerment is a right, not a privilege.

Pakistan's journey towards digital transformation is articulated against a backdrop of formidable challenges, including economic volatility, governance inefficacies, and pronounced socio-economic disparities. The Report explores how, despite these challenges, digital technology stands as a transformative force capable of bridging the gap between existing human development deficits and a future of prosperity and growth. It presents digital technology as a 'democratizing' force that connects communities, districts, institutions, businesses, and governments, and qualitatively advances their interplay through digital instruments and processes. This does not ignore that digital access is highly unequal, with deep-set barriers to affordability and availability for excluded cohorts. These can be overcome through interventions that 'level' the digital playing field.

Digital technology has allowed countries to leapfrog traditional pathways to development, in spite of their challenges, and the NHDR 2023/24 advocates a course of action for governments, businesses, and most importantly, people, who are the real wealth of any nation. Across Pakistan's districts, people are already expanding their opportunities, exposure, and choices through digital usage. As discovered through NHDR's field research, digital usage has brought profound changes in livelihoods, political participation, entrepreneurship, commercial transactions, work cultures, and even social relations. People have embraced digital technology voluntarily, and recognize its transformative potential for improving lives.

Hypothesis and Theory of Change

Districts in Pakistan with higher levels of digital adoption, this includes usage of computers,

digital devices, internet, and a modicum of digital literacy, show a direct correlation

with higher human development outcomes, including higher learning, better health and quality of life.

This finding emerged clearly from the data available in Pakistan's Social and Living Standards Measurement (2019-2020). This finding became the basis of NHDR's research on whether digital technology can be leveraged to enhance human development outcomes. Acknowledging that districts have uneven HDI, how can digital transformation lead to qualitative improvements in human development?

The Report's **Theory of Change** is: *If Pakistan enables digital capabilities, innovation, investments, and policy reform across prioritized sectors, then, it will achieve improved outcomes in digital access, infrastructure, rights, governance, job creation, growth and resilience, which will accumulate to improve and enhance the country's human development indicators.*

The NHDR's **Digital Transformation Model** was developed in light of this. Key sectoral

domains including Governance; Basic Social Services, Climate Change; Economic Growth; and Human Security, which can undergo transformation if four critical enablers are brought to bear on them. These enablers include a) Policy Reform; b) Innovation; c) Investments; and d) Digital Capabilities. These sectors can experience inclusive growth, improved service delivery and qualitative upgrades in rights for all with the aid of these enablers. The aggregate of these outcomes can lead to an increase in Pakistan's human development indicators and Human Development Index (HDI) ranking, as experienced in other developing countries.

The **Theory of Change** underpinning the NHDR 2023/2024's Digital Transformation Model is: *If Pakistan enables digital capabilities, innovation, investments, and policy reform across prioritized sectors, then, it will achieve improved outcomes in digital access, infrastructure, rights, governance, job creation, growth and resilience, which will accumulate to improve and enhance the country's human development indicators and HDI ranking.*

Fieldwork and Research

NHDR 2024 is informed by global, regional, and national literature on digital transformation, as well as contemporary sector specific insights in the aftermath of COVID-19 that saw an accelerated usage of digital platforms. It also carries the valuable lessons of previous NHDRs themed on Pakistan's youth and inequality. In addition, several recently introduced governmental policy documents, frameworks and strategies, that are relevant to digital transformation, have guided the research.

The NHDR's research undertook a household-level survey of 5,500 respondents conducted across 15 districts in all four provinces, Pakistan-Administered Kashmir and Gilgit-Baltistan regions. The survey

was supplemented by 30 focus group discussions with 296 participants, and 35 key informant interviews. These interactions spanned diverse cohorts including educators, IT industry workers, students, housewives, adolescents, informal workers, urban professionals, marginalized communities, influencers, activists, businesspersons, etc. In addition, a digital sentiment analysis was held in major urban centers as a 'digital listening' tool that helped collect thousands of digital sentiments on social media. Furthermore, NHDR also incorporated data from a profiling of Pakistan's 20 least developed districts.

Data and perspectives from these multiple sources have been invaluable in producing District Digital Development Index (DDI).

Digital Development Index (DDI)

The DDI has been developed in a similar fashion to the HDI, using the micro-data set of Pakistan Social and Living Standards Measurement Survey (PSLM) for the year 2019-2020. DDI has four dimensions namely, access, usage, attainment, and transformation that denote a cumulative rank for each district. The DDI has been constructed at national and provincial levels with urban/rural breakdowns, and at the district level. The Index is also decomposed by wealth quantiles. The dimensions of DDI were carefully selected as under:

1. *Access*, or measuring digital penetration at the household level through gauging (1) access to computers (2) access to mobile phones; and (3) access to internet.
2. *Usage*, or measuring digital usage at the individual level through gauging (1) usage of computers; (2) usage of smart phones;

and (3) usage of internet.

3. *Attainment*, or measuring computer skills at the individual level through gauging ability to undertake a number of computer-based commands (including copy paste tools, sending emails with attached files; downloading, installing and configuring software).
4. *Transformation*, or measuring the percentage of people using the internet for education, research, business, banking etc.

A **Gender Digital Development Index (GDDI)** was also developed to measure gender inequalities in achieving the above mentioned four dimensions of District Digital Development Index.

A 4 As Framework: Access, Adopt, Anticipate, Accelerate

Central to the NHDR 2023/2024's discourse is the innovative 4As Framework — Access, Adopt, Anticipate, Accelerate — which encapsulates the sequential pillars crucial for realizing the full spectrum of digital transformation's potential in Pakistan. This framework serves as a strategic blueprint, guiding the nation's journey from enhancing digital access to fostering widespread adoption, anticipating future technological shifts, and ultimately accelerating the integration of digital initiatives across the government, social service delivery, and economic domains.

1. Access:

Access as the foundation, underscores the necessity of dismantling digital divides and democratizing the benefits of technology. It calls for policy interventions, infrastructure development, and collaborative efforts to ensure that digital tools are accessible and affordable for all Pakistanis, thereby laying the

groundwork for inclusive digital empowerment.

NHDR's research found that 47 per cent of the country was unable to use the internet in any way for reasons due to poor digital infrastructure, and affordability challenges. *A second-level digital divide occurs beyond physical access* when those who have access to the internet and digital devices are unable to utilize them because of deficient digital skills, aptitude or hesitance. This research found that basic phones had near universal penetration across Pakistan at 93.15 per cent; internet access was at 32.27 per cent and computer usage will likely remain low (11.75 per cent), even if access increases.

Pakistan's occupational profile determines internet usage patterns, in addition to affordability and accessibility. Among those who have internet access, the purpose of using the internet is undiversified — the majority of internet usage for entertainment at 93.2 per cent, whereas e-learning notches 11.9 per cent.

This is consistent with other countries where educational attainment is low, and communities are confronted with crisis and prolonged instability. Across the gender divide, digital literacy, phone ownership, familiarity with technology and diverse usage is extremely low. Pakistan's digital access challenge can be addressed through interventions that improve digital infrastructure, lower costs for phone ownership, and concerted efforts aimed at enhancing digital literacy among targeted cohorts.

2. Adopt:

The Adopt pillar delves into the practical integration of digital technologies across sectors, highlighting both successes and challenges in digital uptake. It emphasizes the transformative impact of digital adoption on governance, economy, and social services, advocating for a concerted effort to scale digital literacy, enhance user engagement, and streamline digital processes within public and private sectors. The Report illustrates how digital technology, when thoughtfully integrated, can catalyze improvements in service delivery, citizen engagement, and overall institutional efficiency.

Adoption is a challenge for governments, corporate sector and among people for a number of reasons. The largest impediment in adoption is an attitudinal one, not because people do not see purpose in digital adoption but because of an avoidance of conversion to new skill sets. Furthermore, the environment within which people upgrade their digital skills matters more than the technology. Forced learning often brings about negative consequences for productivity. Not everyone has accessed digital technology in their entire life, and adoption interventions must be sensitive to the digital divide. There has to be greater sensitivity in programing for digital uptake, so as not to render the experiences and insights of digitally 'disconnected' persons irrelevant. The digital divide is an active barrier among age groups and across the

gender divide, but it is the most evident between socio-economic groups. It must also be kept in mind that a specific political economy surrounds digital adoption; those threatened by increased transparency and accountability will prevent increased digitalization.

To meet the adoption challenge, digital capabilities have to be built through enhancing digital literacy and skills across population segments, particularly women, youth and marginalized communities. Policy reform is essential for fostering a thriving digital ecosystem and the government's recent policy framing is an important step in this regard. Investments in digital infrastructure are imperative, and public and private sector collaboration in this regard can mobilize resources. Innovation is the engine that drives digital transformation.

3. Anticipate:

Anticipate highlights the unprecedented reach of digital technology at a time when the world is going through a global polycrisis. Technological advancement is also fueling some of these challenges, and the global community is confronted by the need to harness technologies for greater good. Digital transformation requires new thinking, enhanced digital skills, cross-sectoral partnerships, as well as monitoring and analysis of solutions aimed at closing the digital divide. In doing so, practitioners must be wary of 'digital colonialism', or frameworks designed on 'Western' precepts and knowledge sharing. Digital platforms must be more participatory and inclusive of the voices of the Global South, and ensure that do no digital harm.

To close the digital divide, inequities between the Global North have to be considered. Inequalities within countries and within different social groups also have to be borne in mind. There are plenty of successful models that can be emulated in key areas. In anticipating the future of work, there are estimates that

50 per cent of all the world's employees will need reskilling by 2025 as adoptions of new technology increase. There is a big gap in digital skills between richer and poorer countries, of whom the latter are struggling to meet basic digital literacy, especially women. There needs to be an urgent new emphasis on digital skills in school curricula, as well as science, engineering, mathematics, and soft skills like resilience and critical thinking.

The rise of fintech solutions aimed at enhancing financial inclusion, including mobile banking and digital payments have become the moonshot initiative for the Global South. Mobile wallets have brought millions of unbanked cohorts into formal financial nets because they bypass commercial banks' requirements. More women than ever before are using mobile wallets in Pakistan, and digital payments have demonstrated the likelihood of lifting people out of poverty. Digital governance and citizen engagement also needs to be anticipated. Governments are providing everything from telehealth support to tax payments online. This needs more deliberate whole-of-government approaches, instead of isolated delivery by related ministries.

4. Accelerate:

This culminating pillar makes recommendations to scale up digital transformation efforts in Pakistan. The key intervention areas are: E-government and E-governance; resilience to shocks; economic growth; social service delivery; and empowering people.

- **E-government and E-Governance:** E-solutions in governance and government accelerates results in transparency and accountability within national and local public institutions. E-services that are human-centered allow for increased citizen participation with government, building a new digital social contract, that allows for agile and meaningful public services. Investments in human-centered E-Government and

E-Governance solutions is critical as they can increase institutional transparency, accountability and efficiency, as well as reach more citizens at scale. This should be supplemented by supportive policy environment for oversight and building institutional capacity.

- **Economic Growth:** For accelerating economic growth, there are opportunities in the recent growth in Pakistan's IT service exports, tech start-up funding, and increased demand for technology as a result of COVID-19. Pakistan's mobile ecosystem's \$16.7bn contribution to GDP should also be enhanced. Digital solutions for tax collection are a need, as less than one per cent of Pakistan's population is filing tax returns. It is recommended that government will need to ensure good quality connectivity for businesses.
- **Resilience to Shocks:** To accelerate resilience from shocks, digital ministries can invest in incorporating digital solutions in their disaster reduction strategies. For instance, satellite imagery of disaster-prone areas, Geographic Information Systems (GIS), digital twins (virtual models) can help develop simulations for disaster preparedness, as well as sending early warning messages through mobile applications.
- **Social service delivery:** Social service delivery through e-platforms catering to education, telehealth, justice and social protection need to be scaled at national levels in Pakistan. A lot has been done by government, but more sustained focus can be transformative.
- **Empowering people:** To accelerate investments in people, more targeted interventions are needed for women's digital literacy and to ensure their safety online. A supportive regulatory environment needs to be created for tech entrepreneurs that does away with

cumbersome registration procedures and compliance requirements that startups can neither fulfil nor afford. A much higher investment needs to be made in skills to match demand for skills domestically, and have young people absorbed in the

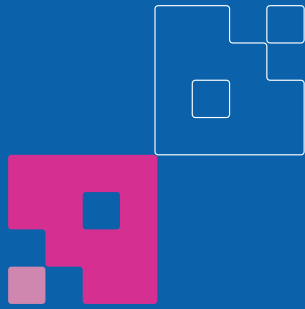
international labor markets. Digital skills in particular need to be imparted above and beyond the outmoded curricula approved by the Higher Education Commission.

Call to Action

The chief recommendations of this Report are to prioritize strategic investments in digital infrastructure, undertake policy reforms, build capacity of public institutions, and empower the private sector to take a lead in digital innovation and growth. These investments will deliver a cascading effect on people's economic, political, and social choices, whose results are already evident among digitally connected cohorts. By undertaking inclusive digital transformation, Pakistan will be able to achieve higher human development outcomes and ensure as best as possible that no one is left behind.

The Report's call-to-action focuses on major stakeholders that can shift the needle on digital change. The federal and provincial governments will need a comprehensive and integrated digital transformation agenda, investing in people-focused digital public services and making further investments in private sector and innovation. International development partners must make digital transformation a key priority in their funding in Pakistan. More collaboration between the private sector, international partners, and the government is required to co-design and co-finance digital initiatives. Finally, it is recommended that civil society, academia, and think-tanks form a key stakeholder working group to advocate for Pakistan's digital promise and mainstreaming technology in education.

As Pakistan stands at this critical juncture, the NHDR 2024 presents a vision and an actionable roadmap for overcoming its perennial challenges of low economic growth, exports crises, high exposure to climate related stresses, poor human capital, and deficits in governance. Through leveraging digital transformation, these challenges can be addressed and potentially overcome in short, medium, and long-term timeframes. In undertaking the recommended strategies outlined in this Report, Pakistan can fulfill the ambition of its own policy documents through making digital transformation the cornerstone of a sustainable development journey. In doing so, it will deliver on the global endeavor to achieve the SDGs, and build an inclusive and resilient future.



Section I

Political Economy of Digital Transformation in Pakistan



Introduction

Not every opportunity turns into a multiplier. In countries and societies whose pathways are steeped with unresolved challenges, opportunities holding transformative power are rare and offer a unique chance to prevail. About half a century has passed since the Information Age began. Among its chief dividends is the digitization of global society. It has transformed every process at scale. No country has the power to disrupt or contain the internet's pervasive reach. Digital technology is the instrumental force that is helping societies attain their developmental turning point.

Yet, although the internet is universal – in availability if not access – the promise of a digital end state remains elusive for most countries. It remains elusive for all the lessons driven home by the COVID-19 pandemic: that inequalities characterize the world we live in, and that our collective investment in overturning exclusion is far less than our pledge. The pandemic upturned our systems and called for targeted emergency overhauls.

The subsequent rollout of social protection programs and industrial bailouts, in Pakistan as elsewhere, saved millions of lives, homes and businesses, and proved that proactive executive resolve can avert the rapid onset of a catastrophe. However, the decades leading up to the pandemic have seen many forgone opportunities that could have enhanced the quality of life and built social resilience.

Pakistan, a lower-middle-income and developing country, stands at a crossroads of significant challenges and immense possibilities. With a population of 241.49 million people¹, approximately 64 per cent of whom are below the age of 30², the demographic dividend presents a unique opportunity for rapid socio-economic development. However, the reality of Pakistan's development landscape is nuanced, marked by disparities in economic, governance, and socio-

economic metrics that underscore the need for transformative policies and initiatives.

Economically, Pakistan grapples with modest growth prospects, exacerbated by global energy and commodity price inflation, constrained access to credit, and political transitions. The International Monetary Fund's (IMF) Stand-by Arrangement of \$3 billion in July 2023 provided the country a lifeline, preventing a balance of payments crisis³. Yet, the economic outlook remains cautious, with GDP growth for FY 2023-24 projected at 2.5 per cent based on IMF estimates⁴ and 1.8 per cent based on World Bank estimates and inflation at a staggering 29.2 per cent for FY 2022-23⁵, indicating an uphill battle against economic instability. Pakistan's debt burden continues to be a significant concern, with the total debt stock ballooning by 26 per cent to \$260 billion⁶, further straining fiscal sustainability.

The governance landscape in Pakistan is complex, marred by perceptions of corruption and challenges in the rule of law, which hinder the country's governance efficacy. Indices such as the Corruption Perception Index 2022 and the World Justice Project's Rule of Law Index 2023 highlight these challenges, underscoring the imperative for reforms aimed at enhancing transparency, accountability, and equitable justice. Effective governance is crucial not only for socio-economic development but also for nurturing an environment conducive to investment, innovation, and equitable growth.

Socio-economically, the Human Development Index (HDI) 2023-2024 ranks Pakistan 164th out of 193 countries⁷, placing it in the low human development bracket. Gender disparities are particularly stark, with the Gender Inequality Index 2022 positioning Pakistan at 135th out of 166 countries⁸. Women's labor force participation rate stands at a mere 24.5 per cent, compared to 80.7 per cent for men⁹, reflecting deep-rooted gender biases that

limit women's economic and educational opportunities. The digital divide further exacerbates these challenges, with limited access to the internet and digital services hindering inclusive growth.

Climate change poses an additional layer of complexity, with Pakistan being one of the top ten countries most affected by climate-induced disasters. The devastating floods of 2022 underscored the country's vulnerability to climate change, emphasizing the need for robust climate resilience and environmental sustainability measures.

On the brighter side, Pakistan's digital transformation presents an avenue for leapfrogging development barriers. With 87.35 million internet users and significant mobile connectivity, digital platforms offer a pathway to enhance economic participation, governance efficiency, and social inclusion¹⁰.

Ongoing public and private sector initiatives to leverage digital platforms for development point to the immense potential of technology in bridging socio-economic gaps, enhancing public service delivery, and fostering a more inclusive and resilient economy for Pakistan.

When we weave these threads together, Pakistan's narrative becomes one of resilience, potential, and aspiration. It is a narrative that calls for strategic investments in human capital with gender equality, governance reform, economic efficiency, digital infrastructure, and climate security. By addressing these critical areas, Pakistan can navigate towards a future marked by sustainable development, equitable growth, and resilience. Albeit challenging, this journey is lined with opportunities that, if seized, can transform the fabric of Pakistani society, making it more inclusive, prosperous, and resilient in the face of global challenges.

Contextualizing Costs and Benefits of Doing Digital

Not seizing opportunities has incurred a far greater cost for those pitted against survival; especially in a society where odds stacked against individuals and communities prolong cycles of intergenerational disadvantage. It is estimated that only 10 per cent of Pakistani children born in poverty will be able to transition out of it during their lifetime¹¹. To deny opportunity is to willfully jeopardize the right to a dignified life.

In getting accustomed to new the new normal, it becomes clear that the future is more uncertain than we can predict, and will render greater margins of error as we navigate the Anthropocene, which was extensively mapped by UNDP's Human Development Report 2021/2022 *Uncertain Times, Unsettled Lives*¹². An "uncertainty complex" has emerged from systemic collapses in the face of climate stress, pervasive socio-political upheaval, and

intensifying polarization and strife¹³. This is a global trend, yet coping mechanisms differ dramatically based on a country's context.

Before the pandemic, Pakistan had performed slightly better on the HDI score between the years 2015-2020¹⁴. The country experienced two decades of declined poverty rates, increased living standards, and improvements in sanitation, and child mortality¹⁵. These gains were offset by high vulnerability caused by the effects of an increased debt distress, the great flood of 2022, and a rising rate of climatic distress. In 2023 alone, Pakistan faced several extreme weather events, including a heatwave that lasted from March to June and resulted in 22 deaths¹⁶. Flooding in March and April caused 14 deaths in Balochistan¹⁷ and 11 deaths in Khyber Pakhtunkhwa¹⁸, with thousands displaced due to loss of habitat.

Pakistan's protracted economic crisis has gravely impacted households and industry. 37.2 per cent of the population was pushed below the poverty line¹⁹. At the time of this Report's writing, perception surveys show 60 per cent respondents fearing food inflation, inability to buy household goods, and unemployment in the next six months²⁰.

In Pakistan, 35 per cent of the population is food insecure, and some rural districts have 62 per cent food insecurity²¹. Reportedly, psychological onslaught of the pandemic made 60.9 per cent urban residents symptomatic of depression; 48.1 per cent struggled with anxiety; and 53.4 per cent experienced stress on account of earning losses and large household sizes²². This uncertainty complex gives new salience to socio-economic and governance challenges prevalent in the country for decades, saddled with an emotional and psychological surcharge that threatens individual agency and collective tolerance.

This is also captured in the rise of social media. The cracking open of socio-political fault-lines and reinforced extremisms have clear demarcations in ungoverned digital spaces that resource right-wing hate groups and regressive public debate. Social media has been blamed for masquerading as value-neutral "platforms" for self-expression and politicking, whereas they constitute a data superstructure that manipulates and reflects extreme social tendencies through platform-specific algorithms²³. The conditioned channels through which society interacts and interprets itself is a machine-imposed dynamic, privileging regressive clickbait content over progressive, humanitarian, or instructive material.

Conversely, social media has also emerged as a 'global common' for holding governments to account and advocating for policy change²⁴. Rights protests from Black Lives Matter, to the global #MeToo movement, to Pakistan's Aurat March have undertaken robust digital

campaigns that inform and engage audiences online and also channel their civic action off-line.

Inexact though it may be, soliciting decision-makers' attention on social media has proven far more effective than traditional routes to advocacy, as government representatives and departments are sensitive to public perception. The interface between state and society has transformed in fundamental ways, as digital entry points allow more effective policy support, absorption, and audit that engage actors and institutions in leaner configurations.

However, social media is just one powerful component of internet-based technology, whose de-merits must not detract from the opportunity waiting to be harnessed: a digital revolution. Digital technologies are transforming the world around us, even as we play catch up. Our means of production, transaction, and value derivation need digital overhauls in ways we have yet to master, but must reckon with to have a stake in a future of prosperity.

Pakistan's lethargic and uneven path to human development has followed erratic spurts of growth and investment in human capital. The country's greatest asset was, and still is, its dynamic youthful population. This appreciation became the theme of the Pakistan NHDR in 2017, which urged fundamental empowerment for millions of young citizens under 30 years of age through education, employment, and engagement. It argued for a people-centric approach that saw income growth as a means to development, rather than an end in itself. Furthermore, that "generational dividends" could be derived if freedoms were enhanced for people to live the lives they value, as the availability of choice is the ultimate benchmark of human development, in spite of poverty, pestilence, and climate stress²⁵. These conclusions have resonated with greater clarity since the pandemic.

The subsequent Pakistan NHDR 2020/2021 on the subject of inequality surmised that a low-income young person from rural Pakistan may be forced to ‘choose’ earnings over secondary education, or a woman from a religious minority will choose safety over freedom. Constrained choices represent

inequality, and constitute the “completely different countries” of choice and material well-being inhabited by Pakistanis. The 2020/2021 NHDR argued for addressing deep-set power disequilibria, through dismantling exclusive systems of benefit, and for revising policies that perpetuate disadvantage²⁶.

A Fast Route to Human Development

The NHDR 2023/24 on digital transformation builds upon and intertwines with the premise of the previous two research frameworks to posit that *leveraging digital transformation may well be Pakistan’s fastest route to human development*. This is in line with the findings of the UNDP Human Development Report

2023/24 *Breaking the Gridlock: Reimagining cooperation in a polarized world*, which describes digitalization as one of the ‘global public goods’ that can be leveraged to address the gridlock that is preventing human development (see Box 1.1).

Box 1.1 Digitalization – A Global Public Good

In the illuminating narrative of the Human Development Report 2023/2024, the phenomenon of global gridlock emerges as a formidable barrier to progress, underscoring the intricate challenges spawned by mismanaged interdependencies in our hyper-connected yet deeply divided world. This gridlock, characterized by an impasse in global cooperation, exacerbates existing inequalities, fuels insecurities, and deepens polarization, stymieing efforts towards sustainable development and peace. Against this backdrop of complex global challenges, the report compellingly advocates for *digital technology as a global public good, uniquely positioned to transcend the pervasive gridlock and catalyze a paradigm shift towards enhanced global collaboration and human development*.

Digital technology’s potential to dismantle the gridlock lies in its intrinsic capacity to bridge vast divides — geographical, economic, and social — by democratizing access to information and facilitating seamless and inclusive communication across borders. By enabling real-time data sharing and fostering collaborative platforms, digital technology can drive transparency and accountability, essential components for rebuilding trust in international cooperation and governance. Moreover, digital tools and platforms can amplify marginalized voices, ensuring a more diverse and representative dialogue in global discourse, thereby addressing one of the gridlock’s root causes: the feeling of disenfranchisement and lack of agency among vast swathes of the global population.

Furthermore, digital technology can accelerate the provision and equitable distribution of global public goods, such as education, healthcare, and environmental sustainability. For instance, digital education platforms can offer scalable solutions to bridge learning gaps worldwide, while e-health services can extend life-saving medical advice and support to remote areas, breaking down barriers imposed by the gridlock. Similarly,

digital innovations in renewable energy and climate monitoring can mobilize global action against environmental degradation, offering tangible pathways out of the gridlock towards a more sustainable future.

However, leveraging digital technology to effectively break through the gridlock and foster a more interconnected and equitable world necessitates a comprehensive approach to overcoming digital divides. This includes not only expanding access to digital infrastructure but also ensuring that digital literacy and the safeguarding of digital rights keep pace with technological advancements. It calls for a concerted effort among global stakeholders to craft policies that promote open access, protect user data, and ensure that the benefits of digital technology are universally accessible, thereby truly harnessing its potential as a global public good.

The HDI measures achievement in key dimensions of human development: a long and healthy life, being knowledgeable, and having a decent standard of living. Development can be tracked in multiple other ways, as prosperities and vulnerabilities transfigure within communities, and new social resources amend the tally of aspirations for different social cohorts. As used in this Report, the term 'development' is considered to include healthcare, education, and living standards.

Digital technology has emerged as the vanguard of development, where traditional pathways have been less effective in administering benefits and reducing inequalities. Traditional development relies on the integrity of governments to invest in the quality of people's lives, and for private sector actors to reinforce standards and address deficits. The quality of social services is largely derived from public sector budgetary allocations as well as the policy attention of decision-makers. The process is painfully incremental, and susceptible to reversals in governance, economy, or security.

Digital technology has disrupted this dynamic, and accelerated traditional development through digital modes of assessing needs, and responding to them. Across the world, governments that enable digital adoption for citizens are experiencing higher levels

of educational attainment, healthcare outcomes, and improved living standards. As this research also tested and confirmed, digital provision makes the delivery of public benefits easier. Digital adoption facilitates communities' willing subscription to social services. The benefit differential can be overcome via digital means, and communities have greater service options between private and public sector providers.

However, this conclusion must not obfuscate the political economy of benefit provision. Many governments may be egregiously out of touch with ground realities, unable to provide digital benefits, or unwilling to leverage the internet for service delivery. Just as well, private firms may not invest in digital infrastructure in regions where Average Revenue Per User (ARPU) is less profitable, thereby plunging large populations into disconnected obscurity. For their part, communities are also not consuming digital technology for the sake of development. The majority of internet use through smart devices in Pakistan is dedicated to entertainment, work, political updates, and communication.

So how does development come about within this scheme?

At its baseline, the well-publicized offshoots of digitization are known to include online

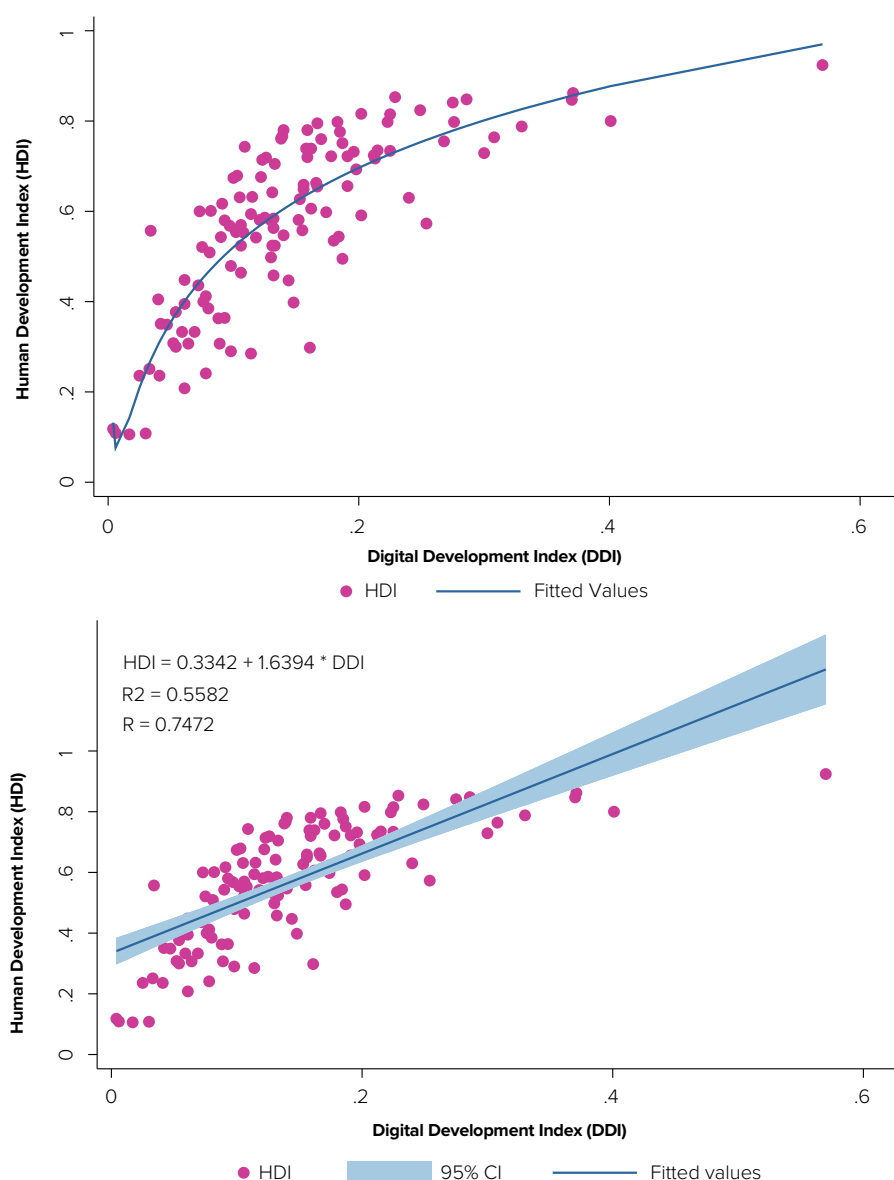
trading, social media, e-learning, blockchain, and artificial intelligence (AI). These areas have been mentioned in several of Pakistan's policy frameworks as skills worthy of export, but largely oblivious to the country's education crisis. The advertised merits of digitization are yet to be framed outside the skills-and-livelihoods debate, to converge with a broader set of benchmarks, such as the SDGs.

This NHDR finds that the usage of digital technology begets developmental outcomes, but without a direct causation between internet availability and increased living standards.

Rather, there is a very strong correlation between internet availability and people's usage of digital means to advance learning, health, and living standards, in addition to entertainment, political participation, social relations, and community safety.

Much of this depends on uninhibited access to the internet, and thereafter, voluntary as well as systemic uptake of digital technologies. As Figure 1.1 below demonstrates, the higher the availability of internet access, the greater the incidence of HDI indicators.

Figure 1.1 Positive Correlation between Human Development in Districts with Digital Adoption



The best advantage of digital technology for achieving traditional development outcomes is that it creates a self-propelled multiplier. Consumers want the internet for its own sake, and many consider it a basic necessity with

inelastic demand in many parts of the world²⁷. That makes the transaction of developmental responses for needs on the ground more efficient, as consumers meet it more than half way.

Can Digital Enable Development?

There are strong political tendencies across the world, particularly in the Global North, that unfavorably regard technology as it stands to make human jobs obsolete. The global economic downturn predating COVID-19, and prolonged turbulence in international markets following conflicts in Ukraine and more recently Palestine, have eroded growth trajectories in multiple regions. The employment crisis is genuine across the world, with political calls to protect jobs and uphold labor rights.

When confronted with digital technology, the fear is that AI will render several human competencies redundant, and may create other existential provocations we are not equipped to deal with. Technology projections notwithstanding, such scenarios can only be partially true for societies that have carried out deep digitization of their production function. For the vast majority of the globe – and this includes communities

within developed countries – the internet itself is not a guaranteed facility, and developing countries like Pakistan are struggling to create digital coverage for lack of finances and commercial optimization.

Growth inequalities still define the world we live in. While digital technology will amend many of the processes we see at work within governance, security, and economy, technological advance will remain out of reach for the majority of the world's population confronted with complex vulnerabilities. There is no question that digital can aid development. Rather development can and must leverage digital technology. Even the most traditional modes of governance have undertaken a modicum of digitization, and stand to gain a great deal from technologically upgrading systems and personnel. This NHDR advises how, and what is possible in Pakistan's context.



BOX 1.2 Definitions

It is important to make a distinction between digitization, digitalization, and digital transformation.

- **Digitization** is the conversion of paper-based formats (analog data) into digital formats, or replacing manual paperwork with digital counterparts. Among other things, digitization makes storage and transmission of data easier. For example, digital data can be compressed and stored on physical drives and cloud storage, or transmitted over digital channels with minimal loss of quality²⁸. Digitization has proven crucial for industries that manage big data, such as healthcare and finance.
- **Digitalization**, on the other hand, is a larger process of converting analog or manual procedures, data, and operations into digital formats. It integrates digital tools and technologies to streamline workflows, enhance efficiency, and improve overall management. In business or work-related settings, digitalization denotes document digitization, automation of manual tasks, integration of digital communication channels, and adoption of data-driven decision-making processes²⁹.
- **Digital Transformation** is utilizing digital technologies to develop new models of operation and value creation far greater than what governments, institutions, communities and sectors have previously produced. This entails revamping people's engagement with digital technology that upgrades their skills, knowledge, and capacities; creating institutions that generate digital workflows, efficiency and results; and, systems that digitally integrate, allocate benefits, and remedy deficits.



NHDR 2023/2024: A Digital Transformation Framework for Pakistan

Digital transformation can help achieve the SDGs through a rights-based approach. The UNDP's global Digital Transformation Framework sees inclusive digital transformation as a process whereby digital technologies are universally accessible, promote meaningful and safe internet use, and digital services for all. It addresses the needs of the marginalized, particularly those who are “not connected”, to build more open, transparent and sustainable communities that leave no one behind. It also encourages the use and development of digital technologies that are open, responsible, and more equitable³⁰.

This would need deliberate and evidence-based strategizing. If left to morph itself without a sustainable development philosophical and practical framework, digital usage runs the risk of aggravating the socio-economic and political disparities and exclusions that exist in Pakistan and accentuating negative impacts on human development. *The NHDR 2023/24 advocates for digital transformation to be inclusive, people-centered, rights-based, and tailored to Pakistan's unique country context*³¹.

Based on UNDP's global Digital Transformation Index, this Report presents a definition for digital transformation specific to Pakistan's context. It sees *digital transformation as 'a process that resets social functions utilizing digital means in ways that alter information and managerial inputs; productive outcomes; and capacities to learn, govern, sustain and*

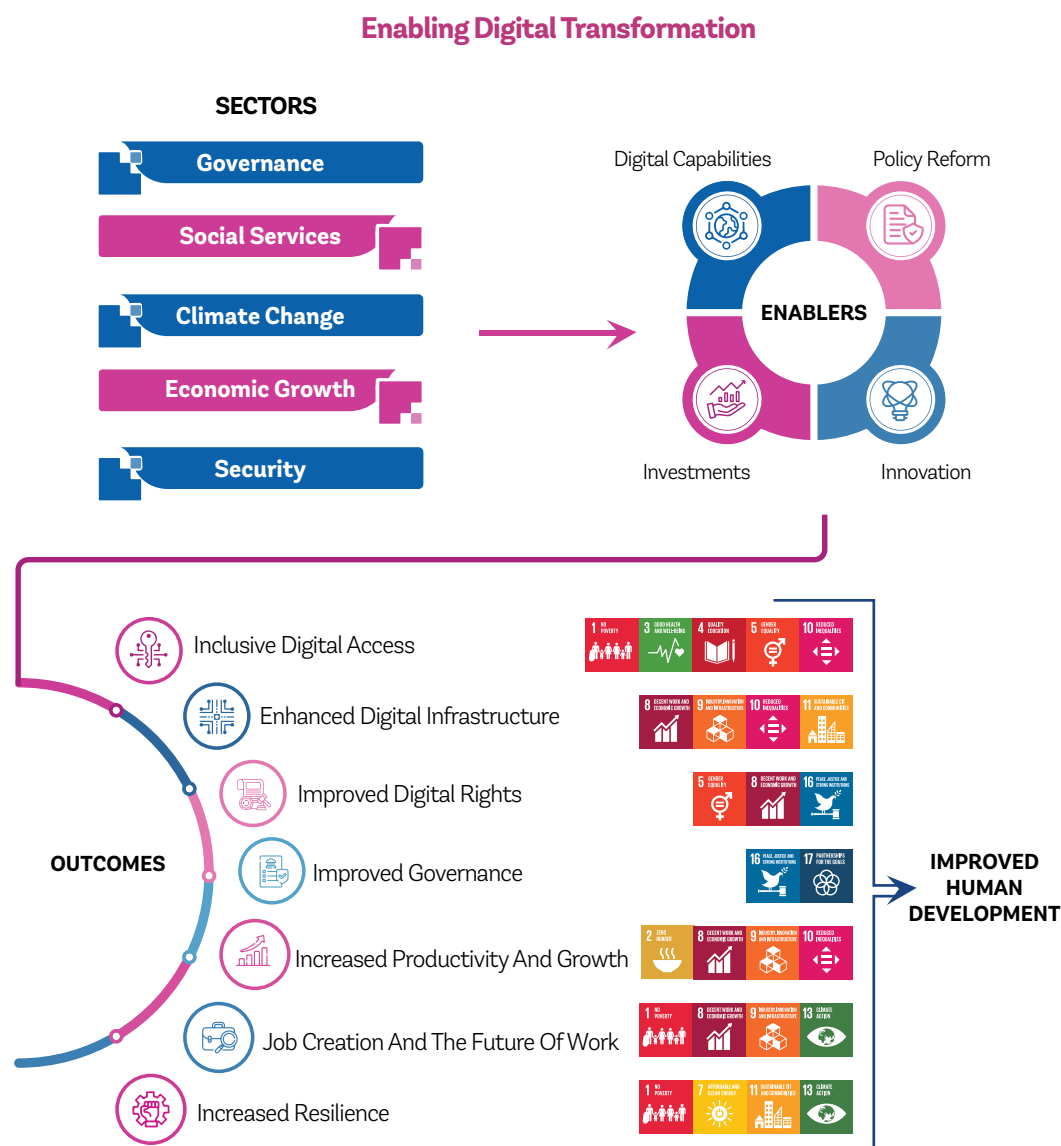
grow'. Without regulation and management, digital transformation left to itself will be uneven, where population cohorts and socio-economic and political institutions with higher digital attainment will win against and prevail over those yet to undergo basic digitalization.

The NHDR 2023/24 advocates for human development centered processes of digital transformation in Pakistan that enhance peoples' productive, economic, social, and political choices; increases institutional responsiveness and delivery of sustainable and inclusive benefits; and dynamism among businesses through innovation, profitability and growth.

The major development sectors in Pakistan comprising Governance, Basic Social Services, Climate Change, Economic Growth, and Human Security can undergo transformation if four critical enablers are brought to bear on them. This NHDR has identified the four enablers to be: a) Policy Reform; b) Innovation; c) Investments; and d) Digital Capabilities.

Powered by these enablers, these priority sectors can experience levels of development that are necessary to produce positive human development outcomes, resulting in inclusive growth, improved governance, and enhanced rights for all. This Report posits that the aggregate of these outcomes can lead to an increase in Pakistan's human development indicators and HDI ranking, as experienced in other developing countries (see Figure 1.2 Pakistan's Digital Transformation Model).

Figure 1.2 Pakistan's Digital Transformation Model



The Theory of Change underpinning the NHDR 2023/24's Digital Transformation Model is: **If** Pakistan enables digital capabilities, innovation, investments, and policy reform across prioritized sectors, **then**, it will achieve improved outcomes in digital access, infrastructure, rights, governance, job creation, growth and resilience, which will accumulate to improve and enhance the country's human development indicators and HDI ranking.

The NHDR 2023/24 is built on a straightforward hypothesis that increased digitalization leads

to improved human development outcomes in Pakistan. An examination of public and private sector data sets to examine this hypothesis have consistently revealed a positive correlation between internet penetration and human development across all districts of the country. To test this correlation, meticulous and mixed methods national research was undertaken as part of the NHDR 2023/24 that included a national household survey, a digital survey, as well as dozens of qualitative interactions with experts, practitioners, and communities in the field.

The NHDR 2023/24's fundamental research questions included:

- How is digitalization bringing about a transformation of Pakistani society?
- Where is this transformation most evident?
- To what extent does digital technology include marginalized communities?
- What needs to be done to maximize the delivery of public benefits through digital sources?
- How are public and private institutions coping with and responding to digitalization?
- How can the government leverage digital technology?
- How can the negative effects of digitalization be countered?

The answers gleaned by the NHDR 2023/24 are as encouraging as they are eye-opening.

Pakistani society is undergoing fundamental

transformations whose largest impact is evident on young people's lives, and especially the lives of women, girls, specially-abled, as well as the most marginalized and vulnerable segments of society. Digital technology is altering social interactions and social relations. It is adding depth to productivity, incomes, and creative enterprise, while deepening identity markers and political ethos. It is empowering political expression and a sense of community while also creating uncertainty, fear, and indifference. It is compelling institutional responses to new demographic stimuli, while reflecting new governance trends a directions.

These findings provide the script for a fascinating and still-evolving story of Pakistan's digital transformation, which the NHDR 2023/24 has attempted to capture, expound, and illustrate. The Report has conceptualized and organized its findings into four *action domains* of Access, Adopt, Anticipate, and Accelerate, called the 4As Framework that is explained below.

A 4As Framework for Digital Transformation: Access, Adopt, Anticipate, Accelerate

The 4As framework presents Access, Adopt, Anticipate, and Accelerate as affirmatives for digital transformation. Each of the 4As signify a building block towards achieving higher human development outcomes. People are at the heart of this dynamic, and determine the absorption and interplay of digital

technology into their daily lives, livelihoods, outputs, and aspirations. However, inequality among individuals and communities presents a challenge at the outset of this analysis. Unequal access to digital technology will mean uneven life choices and national development outcomes.

A1: Access

The first of the 4As is about levelling 'access'. Access is the primary lens to evaluate the presence of a resource, and determine whether a critical mass of usage will develop for benefits to accrue. As the NHDR 2023/24's Access section describes, this is frequently taken to mean *physical* access. Physical access is limited in Pakistan with roughly half the population simply unable to use the internet for lack of infrastructure and

affordability³². At the same time, a "second-level digital divide" occurs when those with physical access do not possess the skills to utilize the technology available. Differentials in skills and competencies arbitrate where people stand in relation to technology and each other in Pakistan. The section identifies ways in which access-related barriers can be overcome for people to advance their engagement with digital technology.

A2: Adopt

The second of the 4As, ‘adopt’ presents a practical, utilitarian, and sectoral interface with digital technology. Adoption realizes the actual power of digital transformation, whereby gains channeled through primary access and voluntary uptake convert into multipliers that benefit individuals, households, businesses, and the government. This transition is substantive and entails material and non-material upgrades of infrastructure and skills alike. The Report’s section on Adopt demonstrates how usage

and integration, training and education, user experience, and organizational culture are transforming across Pakistan in key sectors. The section also points out how and where the government should invest in upgrading digital systems that facilitate the working of line ministries and departments, and makes the delivery of social services more robust through digital tools. Some of this is underway, but at a fatigued tempo that cannot keep pace with Pakistan’s rapidly changing and growing developmental needs.

A3: Anticipate

As third of the 4As, ‘anticipate’ offers a global foresight map that is critical for every country to understand in order to be in a state of preparedness for harnessing digital technologies for development and growth. Digital transformation requires new thinking, enhanced digital skills, cross-sectoral partnerships, as well as monitoring and analysis of solutions aimed at closing the digital divide. As each country undertakes this journey, it is important for it to be cognizant of technology’s exclusionary tendencies (“digital

colonialism”), emerging digital platforms, institutions, and processes and how these are interfacing with the Global South. Inequities between the Global North and South must be anticipated as much as inequalities within countries and social cohorts. The future of work, financial inclusion, digital governance, and citizen engagement need careful follow through, utilizing whole-of-government approaches, and be participatory and inclusive at the same time.

A4: Accelerate

The fourth A of ‘accelerate’ prescribes a specific developmental pathway for Pakistan using Digital Transformation, which has helped many other countries leapfrog development milestones. Pakistan can course a similar trajectory. This requires a prioritization of sectors and domains that can quickly and successfully adopt and accelerate digitalization for tangible gains. Digital investments have been made across South Asia and the globe with results that have constructively altered social contracts in countries. Pakistan, too, needs

a radical change in its social contract, and digital transformation can be the driving force for it. Pakistan’s challenges are neither new, nor do they lack prescriptions for action. Yet, the instruments available in digital technology can help manage and even resolve these challenges with greater accuracy and speed. The Accelerate section offers a matrix for resolving these challenges, and realizing higher human development outcomes along the way. The NHDR’s Methodological Approach

The NHDR’s Methodological Approach

The research for the NHDR 2023/24 was undertaken through a mixed methods

approach that incorporated desk reviews, a digital sentiment analysis, a national

household survey, focus group discussions, key informant interviews, deep listening exercises, and rapid ethnography sessions.

The Report is also based on a comprehensive desk-based literature review of major national and international knowledge resources on technology and development (see Annex II for the complete digital transformation literature review). Several documents stand out from the research and have helped guide the framework for this Report. These include UNDP Pakistan's two previous NHDRs on Youth (2017)³³, Inequality (2020)³⁴, the global HDR 2021/22³⁵, global HDR 2023/24³⁶ and UNDP Montenegro's NHDR 2020³⁷ on digital transformation. Key policy and academic literature as well as public documents were extensively reviewed to develop background research on Pakistan's economic, governance, and developmental challenges.

The NHDR 2023/24's research framework was created through an iterative process spanning approximately six months. A number of design-thinking workshops helped formulate its Theory of Change, central hypothesis, and research methodology. The Report's key findings helped curate its key policy and public advocacy messages. Policy and industry consultations and advisory came from a two-tiered high-level committee structure: 1) a Technical Advisory Committee comprising members who are leading policy experts, thought leaders and peers, technologists, activists, and industrial captains; and 2) an Advisory Council comprising federal cabinet members, senior government stakeholders, and institutional heads representing federal and provincial tiers of government.

The NHDR 2023/24's central hypothesis became the foundation of its research, i.e., increased digitalization increases human development outcomes. This was derived from an examination of publicly available data from Pakistan Social and Living Standards Measurement (PSLSMS) – preferred over the Household Integrated Economic Survey (HIES) for district-wise breakdowns – and allowed an early

extrapolation of the NHDR's Digital Development Index (DDI) calculated at district levels.

Out of the 170 districts of Pakistan, the Report's HDI and DDI analysis was based on 121 districts covered under PSLSMS. This Report's research methodology also informed its national household-level survey of 5,500 respondents conducted across 15 districts in all four provinces of Pakistan, as well as the Pakistan-Administered Kashmir and Gilgit-Baltistan regions. The districts were carefully selected based on a reading of HDI indicators (high performing districts, middle ranking, and low performing) as well as other demographic considerations like size of population, urban/rural profile, relative level of industrialization, digital infrastructure, and district development history.

Out of Pakistan's total 170 districts, the survey took place in 15 provincial districts and with equal respondents in rural and urban sites, as per below:

- **Sindh:** Karachi (South), Thatta, Larkana
- **Punjab:** Lahore, Rawalpindi, Faisalabad, Multan, Bahawalnagar, Rajanpur
- **Khyber Pakhtunkhwa:** Peshawar, Bannu
- **Balochistan:** Quetta, Killa Abdullah
- **Federally Administered Regions:** Gilgit City, Muzaffarabad

The survey was supplemented by qualitative interactions in the field that took the form of 30 focus group discussions with 296 participants, and 35 key informant interviews. The aim of the research was to interact with diverse cohorts who differently utilized technology, including educators, IT industry workers, students, housewives, adolescents, informal workers, urban professionals, marginalized communities, influencers, activists, businesspersons, etc. Specific research instruments were developed for each qualitative interaction.

A digital sentiment analysis was also conducted in major urban centers to gauge how people behaved over social media, and

what major opinion trends could be gleaned, as well as quality of content shared by users. This ‘digital listening’ platform helped collect thousands of text-based data sources from X (formerly Twitter), Facebook, open web content, and an app-based citizen survey to create a ‘social risk monitor’ that could detect socio-political challenges as manifested online. The app-based survey devoted several questions to user’s digital preferences, and whose answers are included in this Report.

The NHDR 2023/24 also incorporates and leverages UNDP’s statistical and data research and profiling of Pakistan’s 20 least developed districts along with their corresponding district development and impact evaluation plans

produced for the Government of Pakistan’s Planning Commission and Federal Ministry of Planning, Development & Special Initiatives (MoPD&SI) to inform ongoing government national development strategies and plans. The UNDP’s 20 least developed district profiles and development plans identify local development challenges, and have prioritized a component on digital access, connectivity, digital skills, and infrastructure.

Data and perspectives from these multiple sources have been invaluable in producing the NHDR 2023/24, its analysis, recommendations, and especially the district-level Digital Development Index (DDI).

BOX 1.3

The Digital Transformation Imperative in Pakistan

By Tariq Malik

In the contemporary landscape of global development, the intersection of human progress and technological advancement has become increasingly apparent. The HDI offers insights into the well-being and quality of life of a nation’s citizens. Conversely, digital transformation, anchored in deployment of safe Digital Public Infrastructure (DPI) and characterized by the integration of digital technologies into various aspects of societal functioning, has emerged as a catalyst for economic growth and social change. In the context of Pakistan, the relationship between HDI and digital transformation presents a complex and multifaceted narrative, intertwining socio-economic dynamics with technological evolution.

Invented by the great Pakistani economist, Dr. Mahbub ul Haq (1934-1998), the HDI serves as a comprehensive metric evaluating a nation’s overall welfare, incorporating factors such as health, education, and income levels. Conversely, digital transformation signifies the integration of digital technologies across various sectors, influencing economic and social paradigms.

Pakistan, with its unique socio-economic landscape and demographic diversity, finds itself at a pivotal juncture where digital transformation plays a critical role in shaping the trajectory of human development. Despite notable advancements, Pakistan’s persistently low position in the HDI rankings underscores not only existing inequalities and developmental challenges but also governance issues. Yet, the swift adoption

of digital technologies offers promise in bridging these gaps and fostering a more equitable and prosperous society. This adoption must be people-centric and co-developed with the participation of society. It is only possible by taking a visionary approach of implementing DPI with safeguards.

During my days in NADRA, I spearheaded a co-development initiative in lieu of DPI framework for Pakistan (from what I learnt while working with UNDP), taking a leaf from DPI Safeguards Workbook by UN Office of Secretary General's Envoy on Technology. Hence, the emphasis was on four key building blocks: interoperability, extensibility, shared protocols, and data federation, to foster a robust and inclusive digital ecosystem that addresses societal needs while safeguarding privacy and security. Let's briefly reflect why these are necessary:

1. **Interoperability:** A well-designed DPI ensures that its components can seamlessly interact with each other and with other services. This necessitates the adoption of common standards and protocols to facilitate the integration of different technologies. For instance, various government systems, such as those related to social protection (e.g., the Benazir Income Support Program) and health and education, should be able to communicate effectively with each other to streamline processes and improve service delivery through a dynamic registry of BISP for cross-sectoral use.
2. **Extensibility:** DPI is structured to operate on a societal scale and to accommodate the evolving digital landscape. Its modular design allows for easy extension, reuse, and modification of components. This facilitates the swift adoption of new technologies and functionalities without the need for extensive system redesign. For example, updates to digital payment systems or enhancements in online service delivery can be seamlessly integrated into the existing DPI framework. Pakistan became the first country to implement an innovative contactless biometric onboarding and verification service. Though NADRA brought its office in your mobile phone by launching this app (PAK-ID), it can be extended for financial inclusion, provision of health and insurance services, enrolling in education programs and many more.
3. **Shared Protocols:** DPI thinking encourages the adoption of shared protocol-based models, enabling diverse stakeholders such as individuals, communities, startups, and the private sector to participate, compete, and innovate within the DPI ecosystem. This fosters a dynamic marketplace of digital services that cater to the needs and preferences of the population. Case in point: the game changer platform Nishan Pakistan of NADRA, a revolutionary digital technology stack, with a complete set of APIs (Application Protocol Gateway). Launched in May 2023, it facilitates MDAs, businesses, startups, and developers to utilize sandbox for developing digital public goods that need identity authentication, with seamless integration and positive user experience. Moreover, the protocol-based approach offers flexibility. Various stakeholders can develop innovative applications and services using shared protocols, contributing to the growth of the digital economy.
4. **Data Federation:** DPI facilitates the secure and privacy-conscious flow of data across different systems. By dispersing data storage across multiple locations and adhering to national regulations, DPI mitigates the risk of data breaches and misuse. However, it is crucial to balance data accessibility with privacy protection to prevent widespread surveillance within the digital ecosystem. For instance, healthcare data shared between hospitals and government health agencies should be managed in compliance with privacy laws to safeguard individuals' sensitive information.

The essence of digital transformation lies in its ability to dismantle bureaucratic silos, foster collaboration across government ministries, departments, agencies (MDAs) and streamline processes for enhanced service delivery. By breaking down barriers to evidence-based data sharing and adopting user-centered approaches, governments can bridge the gap between citizens and public services, fostering trust and engagement within communities.

Crucially, digitalization transcends mere process optimization; it is a catalyst for inclusive development and citizen empowerment. In Pakistan, where the public sector serves a diverse and sprawling population, the imperative to create systems that cater to all is paramount. Unlike private enterprises, governments cannot cherry-pick their clientele; they must serve every citizen equitably. Digital transformation, therefore, becomes not just a tool for efficiency but a means to ensure universal access to essential services and opportunities.

While private enterprises have often led the process of embracing digitalization, the public sector stands to reap the greatest rewards from comprehensive digital integration. The scale and scope of government operations, coupled with the imperative for rapid response and service delivery, make digital transformation indispensable for the well-being and survival of society.

Despite the promises of digital transformation, Pakistan confronts a host of obstacles hindering its widespread adoption and impact. The major challenge is that in the absence of a data governance regime, what are safeguards to protect users' rights? In early 2023, NADRA rolled out OTP based (One Time Password) consent management *Jazat Aap Ki* service to protect users' data. This service enables citizens to consent before verification of the CNIC, ensuring that their sensitive data is always protected.

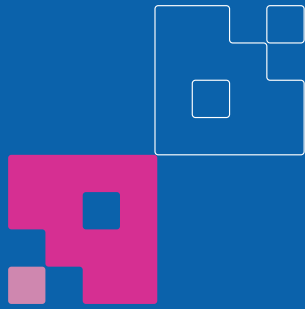
We had also developed a portal where citizens could audit their own data access, but we did not get the opportunity to roll it out. There is an opportunity to deploy it now, in public interest. But for all of these technological interventions to implement Privacy-By-Design (PbD) principle, Pakistan must conduct an extensive public review of Personal Data Protection Bill, 2023, which was approved by the cabinet in August 2023 rather hastily.

The inadequate internet infrastructure, particularly in rural areas, acts as a bottleneck to digital access and utilization. The digital divide is real. Moreover, disparities in digital literacy and cybersecurity concerns pose additional challenges to inclusive development. Nevertheless, within these challenges lie opportunities for innovative solutions and collaborative efforts.

In Pakistan, as in Denmark and other progressive nations, fostering public participation in governance is a cornerstone of digital transformation. By making government data accessible and creating platforms for citizen engagement, governments can promote transparency, accountability, and community involvement in decision-making processes.

As Pakistan charts its course towards digital transformation, it must heed the lessons of the pandemic and embrace innovation as a driver of progress. By cultivating a culture of change and collaboration, prioritizing the needs of its citizens, and harnessing the transformative power of digital technologies, Pakistan can unlock new pathways to human development and inclusive growth.

The author is former Chairman NADRA Pakistan, and former UNDP Chief Technical Adviser.



Section II

Where is Pakistan on Digital? A Quantitative & Qualitative Baseline



“The future is digital, defining how we will live, work, and interact with each other. Whether technology becomes an empowering force for good or a sower of more division and exclusion will depend on the choices we make now.”

Mr. Achim Steiner,

UNDP Administrator,
Address at First Regular Session of the UNDP Executive Board 2023¹

Pakistan's Rankings on Global Digital Transformation Indices

Digitalization offers a transformative opportunity for development with prospects for improved access to education, health, employment opportunities, expanded access to finance, improved efficiency and transparency, as well as greater means for engagement through mediums of social interaction and communication. However, much depends on the access to digital infrastructure as well as the landscape and potential to adopt and accelerate.

To what extent is Pakistan digital? The country has 87.35 million internet users, while internet penetration stands at 45.7 per cent². At this level of digital access, Pakistan is home to 71.7 million social media users, comprising 30.1 per cent of the total population³. There are 191.8 million (80.5 per cent of the total population) active cellular connections in Pakistan⁴.

A comparative analysis of leading global indices measuring countries' digital progress shows Pakistan lagging behind. The country ranked 45th out of 52 countries in the World Internet Development Index (2023)⁵ released by China, covering six matrices: information technology infrastructure, digital technology

and innovation capability, digital economy, digital government, cyber security, and cyberspace international management. Pakistan ranked 79th out of 120 countries on Inclusive Internet Index covering areas including availability, affordability, relevance, and readiness⁶.

In the E-Governance Development Index covering domains related to telecom infrastructure, human capital, and online services, Pakistan ranks 153rd out of 193 countries⁷. On the Digital Quality of Life Index 2022, it ranks 96th out of 117 countries on key indicators of internet affordability, internet quality, electronic infrastructure, electronic security, and electronic government⁸. Pakistan ranked 97th out of 113 countries on the Asian Index of Digital Entrepreneurship Systems (2021) that captures countries' general, systemic, and digital frameworks conditions for entrepreneurship⁹.

Overall, Pakistan's rankings on these indices demonstrate major gaps and weaknesses in digital accessibility, availability, and relevance; though, it fares relatively better on affordability¹⁰.

Pakistan on Global and National Human Development Index (HDI)

Human Development and Digital Transformation – A Conceptual Correlation and Why it Matters

The concept of Human Development pioneered by Dr. Mahbub ul Haq and complemented by Dr. Amartya Sen's Human Capability Approach aims to enlarge the set of choices available to people and their ability to live a healthy life, acquire an education, obtain a decent standard of living, and their overall right to a dignified life. Human Development pursues socio-economic development by identifying opportunities that have the potential for transformational change. On the other hand, it also seeks to mitigate challenges that may impede socio-economic development.

Throughout human history, technological innovation has demonstrated this transformative impact to drive improvements in living standards and human wellbeing. In the present era, digital transformation is impacting human development by improving people's education, health, and standards of living.

The COVID-19 pandemic in 2020-2021 adversely impacted countries' progress in human development. For the first time in the 32 years since UNDP has been calculating the HDI, the index declined for two years in a row. The decline has been consistent across the world with over 90 per cent of countries registering a decline in their HDI score in either 2020 or 2021. More than 40 per cent declined in both years, signaling that COVID-19 reversed the global progress in human development.

Pakistan was no different, with COVID-19 affecting everything, from public health systems, education, employment, economy, supply chains, and food insecurity. The country experienced a decline in its HDI rank from 154th out of 189 countries in 2019,

to 161st out of 191 countries in 2021¹¹. Based on comparable data, this reduction in Pakistan's HDI is explained mostly by the drop in life expectancy at birth, but other indicators on education and standard of living have been impacted as well.

But COVID-19 also demonstrated how digital means enabled people to continue their education, access health services, continue working, and (in many cases) offer new ways of working, as well as participate in community and social life. Therefore, in digital transformation, there is an opportunity to expand human development through economic, social, health-related, educational, and e-government platforms, while addressing the challenges of inclusivity, affordability, and sustainability.

The UNDP Human Development Report highlights the importance of digital transformation after COVID-19¹². During the COVID-19 pandemic, while the flow of goods and people was significantly restricted, the exchange of digital information surged dramatically. Even amidst stringent lockdowns and border closures, cross-border digital interactions increased, showcasing the critical role of digital platforms in sustaining economic and social activities. This rise in digital technology use is part of a broader transformation of the global economy, where the value of services and knowledge is outpacing physical goods, fueled by a shift towards lower-carbon energy systems. According to the HDR 2023/2024, digital service exports in 2022 reached a staggering \$3.8 trillion, representing more than half of all global trade in commercial services.

The rapid proliferation of digital services, which includes sectors such as computer and information services, has multiplied fivefold since 2000, signaling a profound shift in global economic interdependence shaped by digitalization. This digital revolution facilitated

continuity in international trade, enabled small and medium enterprises to partake in global value chains more significantly, and increased the resilience of global systems against the backdrop of the pandemic.

The HDR 2023/2024 underscores that mismanagement of global interdependence has significant human costs, seen through the rise in conflicts and displacement, widening inequalities, and environmental pressures. Digitalization, as a facet of this interdependence, presents opportunities for human development but also requires careful governance to prevent exacerbating inequalities and to ensure it serves as a force for empowerment and equity.

Global interdependence, fueled by digital advancements, needs to be strategically managed to enhance human capabilities and to navigate the complex socio-economic and political landscapes. The interplay between digitalization and human development can be transformative if harnessed correctly, demanding inclusive policies and international cooperation to address digital divides and promote sustainable, people-centered progress.

The UNDP Regional Human Development Report (RHDR) for Asia-Pacific 2024 also articulates the transformative potential of digitalization in the context of human development¹³. It acknowledges the proliferation of digital platforms during the COVID-19 pandemic as a key element in sustaining economic and social activities in the region despite physical restrictions. It highlights the swift adoption of digital services in key areas such as trade, where digital service exports have soared. The report also contemplates the broader transformation of the global economy, where the value of knowledge and services is surpassing that of physical goods, largely due to a shift towards less carbon-intensive energy systems.

The RHDR 2024 suggests that digital

platforms and services could become a catalyst for a sustainable and inclusive growth model, provided that digital advancements are managed strategically to enhance human capabilities and address the complex socio-economic and political issues of the time. The potential for digitalization to maintain connectivity and operational functionality amidst challenges like pandemics exemplifies its critical role in contemporary human development strategies.

The strong link between digital transformation and human development is empirically proven in UNDP Montenegro Human Development Report 2020 *On the Verge of a Digital Future for All*¹⁴, which reports that countries doing better on World Bank's Digital Adoption Index (DAI) have on average scored better on UNDP's HDI. For example, Central Asian and European countries in general have both higher DAI and HDI values, compared to countries in Sub-Saharan Africa that have lower DAI and HDI values.

Pakistan with a DAI value of 0.399 is positioned somewhere in the middle, performing poorly than most countries in the Middle East, Europe, Central Asia, and Latin America and the Caribbean but better than countries in Sub-Saharan Africa¹⁵.

One of the factors for Pakistan's low performance on the global digital indices is linked to its poor human development outcomes, which highlights the country's incapacity to fully benefit from the potential of digital transformation. The global Human Development Report (HDR) 2023-2024 ranked Pakistan 164th out of 193 countries, classifying it as a low human development country¹⁶. Pakistan's global HDI value of 0.540 fell below many South Asian countries. In the South Asian region, Sri Lanka, Bangladesh, and India performed comparatively better with HDI scores of 0.780, 0.670, and 0.644, respectively. These countries are also doing better than Pakistan on global indices related to digital transformation (Table 2.1).

Table 2.1: Pakistan lagging behind on digital transformation and human development

Index	Pakistan	Sri Lanka	India	Bangladesh
Human Development Index (out of 193 countries)	164	78	134	129
Inclusive Internet Index (out of 120 countries)	79	59	50	64
E-governance Development Index (out of 193 countries)	153	95	105	110
Digital Quality of Life Index (out of 117 countries)	96	89	59	76
Asian Index of Digital Entrepreneurship (out of 113 countries)	97	82	75	96

Sources: UNDP. 2024. Human Development Report 2023-24: Breaking the Gridlock: Reimagining Cooperation in a Polarized World; Impact Economist. The Inclusive Internet Index. 2022, <https://impact.economist.com/projects/inclusive-internet-index/2022/country/Pakistan>; United Nations E-Government Knowledge Network. 2022, <https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/128-Pakistan>; Digital Quality Index. 2022, <https://surfshark.com/dql2022>; Asian Development Bank. 2021. Asian Index of Digital Entrepreneurship Systems 2021, <https://www.adb.org/sites/default/files/institutional-document/826606/adou2022bp-asian-index-digital-entrepreneurship-systems-2021.pdf>.

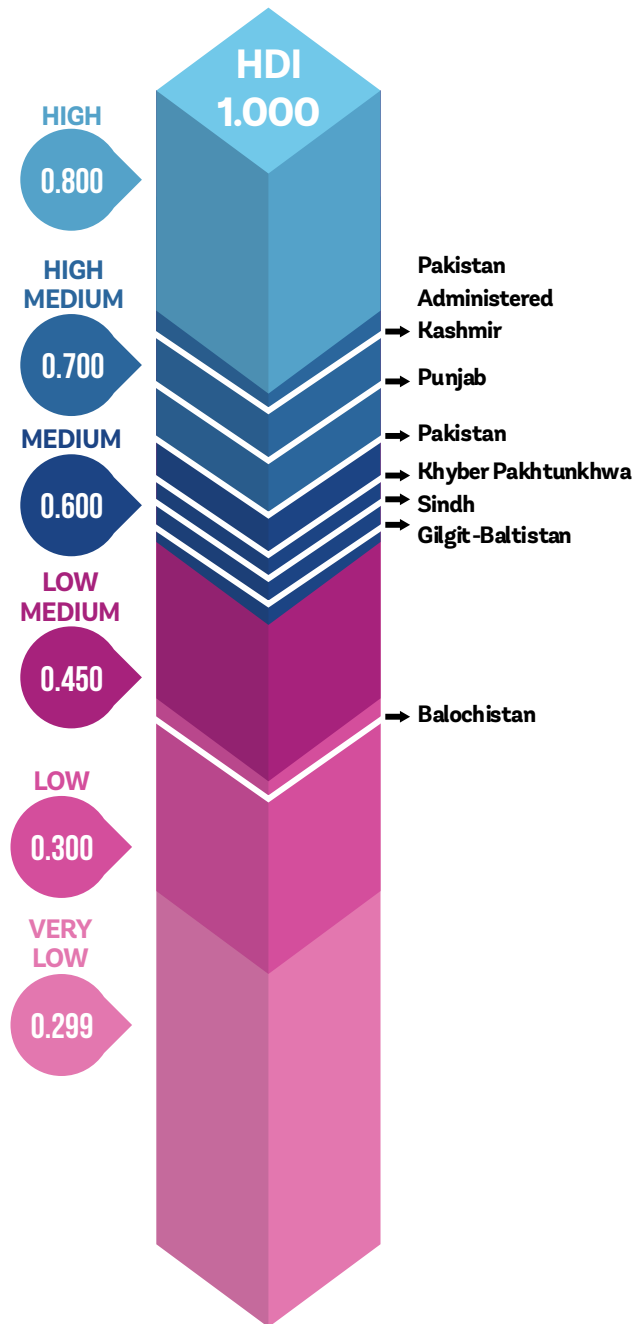
The HDI computed in the NHDR 2023/24 – based on the Pakistan Social and Living Standards Measurement Survey (PSLSMS) 2019-2020 – presents a richer and deeper analysis of Pakistan’s status on human development over the last decade and a half. It looks at dimensions of the HDI – education, health, and standard of living at the provincial and district levels – to identify which of the three dimensions are contributing to low HDI across provinces, districts, and regions.

Among Pakistan’s provinces and federally administered regions, Pakistan-Administered Kashmir has the highest HDI of 0.781, which represents improvement since 2017. Punjab comes next with an HDI of 0.762, followed by Khyber Pakhtunkhwa with 0.650, and Sindh with 0.645. Gilgit-Baltistan’s HDI value stands at 0.631. Pakistan-Administered Kashmir and Punjab fall in the high medium human development category. Khyber

Pakhtunkhwa, Sindh, and Gilgit-Baltistan are placed in the medium human development category. Balochistan sits in the low human development category with an HDI score of 0.444. For all of Pakistan’s four provinces and two special regions, these HDI scores must be seen in relation to the country’s national HDI of 0.699.

While all provinces and regions have marginally improved their HDI standing compared to HDI values in 2017, significant disparities persist between them, reflecting inequality in human development across Pakistan (Figure 2.1). Balochistan’s human development ranking is well below the national level, whereas Pakistan-Administered Kashmir and Punjab have surpassed the national HDI. Sindh, Khyber Pakhtunkhwa, and Gilgit-Baltistan also remain below the national average.

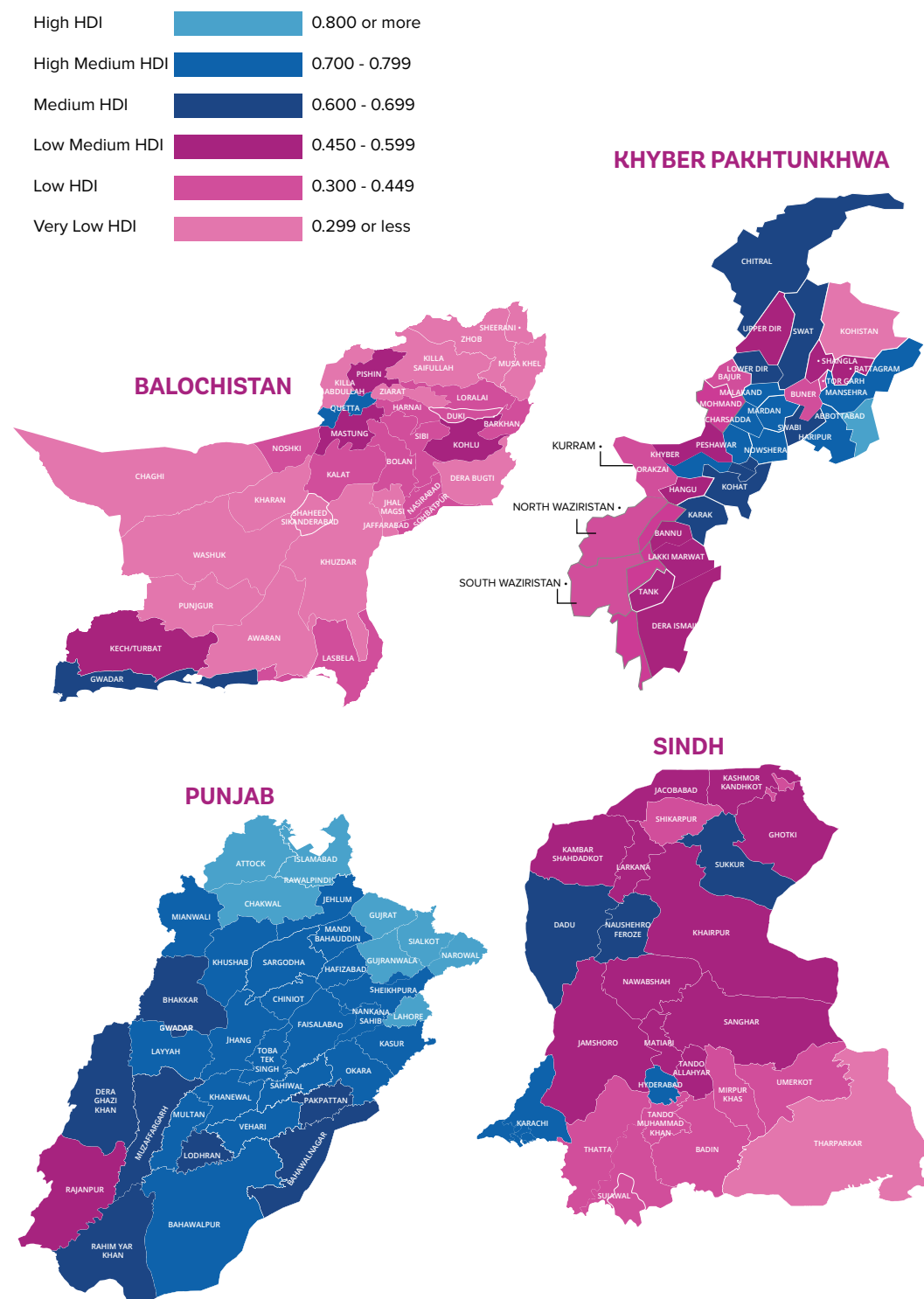
Figure 2.1 Level of Human Development in Pakistan 2020



Source: UNDP calculations based on micro data of PSLM survey for the year 2019-2020

Map 2.1 shows the extent to which human development varies between provinces and regions, and within provinces themselves. Punjab is the most developed province, with least disparities within the province in terms of

HDI. Most of the districts from Punjab fall into high, high-medium, and medium categories, with the only exception of Rajanpur, where low-medium human development persists.

Map 2.1 Pakistan Human Development Index (2005-2020)

Source: UNDP calculations based on PSLM district level micro data for the year 2019 - 2020

On the other hand, Khyber Pakhtunkhwa, Sindh, and Balochistan provinces demonstrate wider disparities in terms of district HDI. Districts

within these provinces range from high to high-medium, to very-low human development levels. In Khyber Pakhtunkhwa and Sindh,

districts vary from high-medium to very low categories with the exception of Abbottabad, which has progressed to high human development, on par with eight other districts from Punjab (Rawalpindi, Gujrat, Sialkot, Lahore, Chakwal, Gujranwala, Narowal, and Attock) and Islamabad Capital Territory (ICT).

One district each from Sindh and Khyber Pakhtunkhwa provinces – Tharparkar and Kohistan, respectively – sit in the very low development category.

Balochistan, the least developed of all the provinces, has most of its districts concentrated in low-medium, low, and very low development categories. The exceptions are Quetta and Gwadar districts, which rank medium on the HDI. The second highest ranked district of Balochistan is Gwadar, with an HDI of 0.606, jumping 23 places from its previous ranking in 2017. This increase in Gwadar's HDI may have linkages with the China Pakistan Economic Corridor (CPEC) infrastructure comprising Gwadar Port, Free Zone, and Technical and Vocational Institute providing skills and employment opportunities to the local youth, and a host of social services including water supply and treatment, and health facilities.

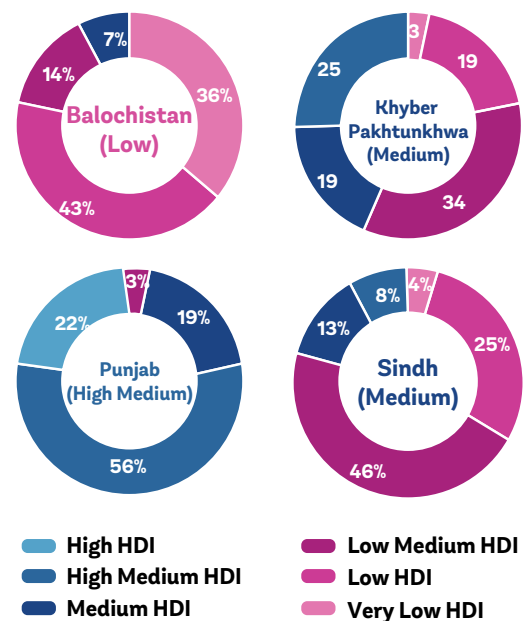
The NHDR 2023/2024's analysis reveals important differences in HDI scores of the 121 districts of Pakistan, for which the data is available. This is shown in Map 2.1 that cautions against the tendency to generalize across provinces based on overall levels of development. For example, both Sindh and Khyber Pakhtunkhwa are situated in a medium level of human development (Khyber Pakhtunkhwa scores 0.650, whereas Sindh is at 0.645). However, more districts in Khyber Pakhtunkhwa are outperforming those of Sindh, with seven districts (namely Peshawar, Malakand, Mardan, Mansehra, Nowshera, Haripur and Charsadda) having high-medium HDI as compared to two in Sindh, i.e., Karachi and Hyderabad.

In terms of percentages, 22 per cent of Punjab's districts fall in high HDI. Similarly, high-medium human development category

includes 56 per cent of districts from Punjab, and 25 per cent districts from Khyber Pakhtunkhwa; whereas only eight per cent of Sindh's districts fall in this category.

In the medium human development category, provinces are more evenly represented, with 19 per cent of districts from Khyber Pakhtunkhwa and Punjab, 13 per cent of Sindh's districts, and seven per cent of Balochistan's districts. The low-medium HDI category has 34 per cent of Khyber Pakhtunkhwa's districts, 46 per cent of Sindh's districts, and 14 per cent and three per cent of Balochistan and Punjab's districts, respectively. None of Punjab's districts fall in the low HDI ranking, leaving the table to be shared among 43 per cent districts of Balochistan, 19 per cent of Khyber Pakhtunkhwa, and 29 per cent of Sindh (see Figure 2.2).

Figure 2.2 Development Level of Districts Making Up the Provincial HDIs, 2020 (in percentages)



Source: UNDP calculations based on micro data of PSLM survey for the year 2019-2020

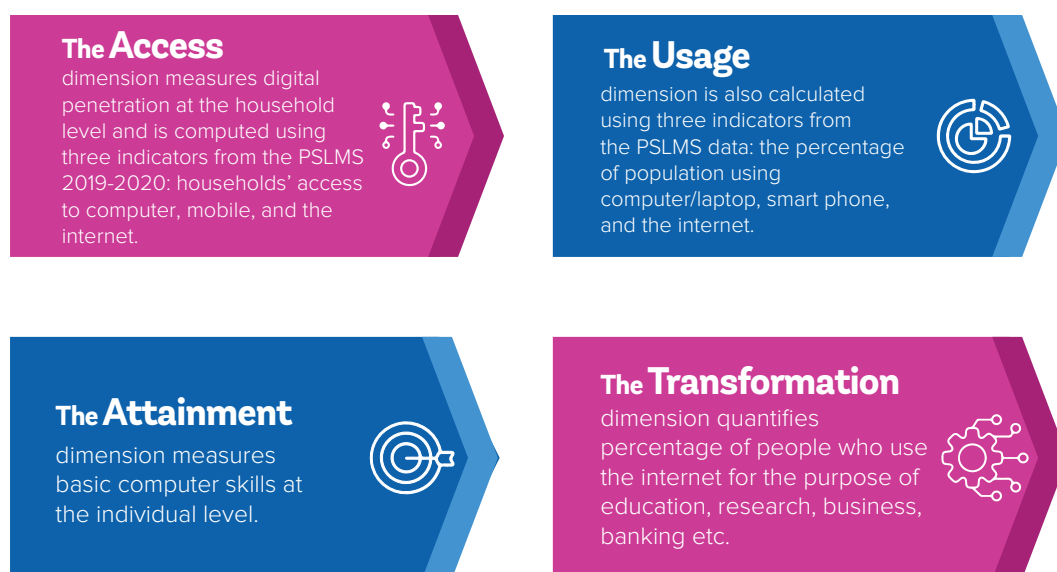
On the extreme end of the HDI, 36 per cent of Balochistan's districts fall in very low human development, followed by three and four per cent of Khyber Pakhtunkhwa and Sindh districts, respectively.

Curating Pakistan's District-Level Digital Development Index (DDI)

To better understand digital development and progress across provinces and districts of Pakistan, the NHDR 2023/2024 team replicated the HDI methodology to formulate a first-ever national district-level Digital Development Index (DDI) measuring all districts' digital profile using national

data sources. The DDI is structured on the NHDR 2023/2024's core normative framework of the four As of Access, Adopt, Anticipate, and Accelerate. It is based on four dimensions: Access, Usage, Attainment, and Transformation measured across the four As, per below specifics:

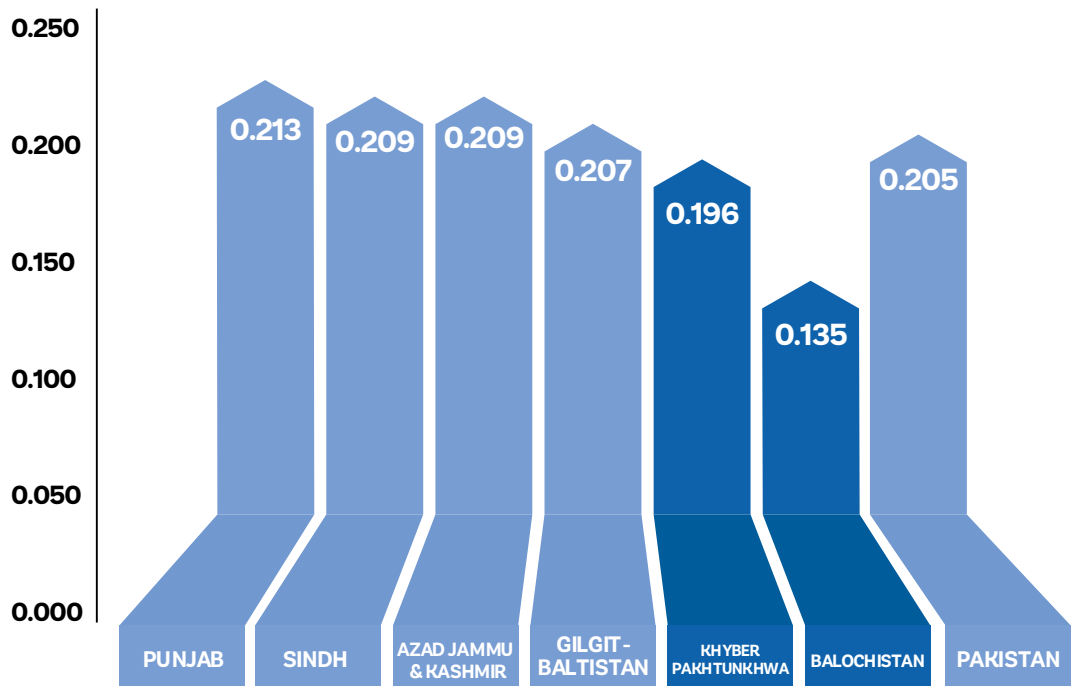
Figure 2.3 Conceptual Framework for DDI



Just like any other index, the DDI ranges between a minimum value of 0 and a maximum value of 1. For purpose of analysis, it is subdivided into categories ranging from very low digital development to very high digital development, with intermediate categories as low digital development, moderate digital development, and high digital development.

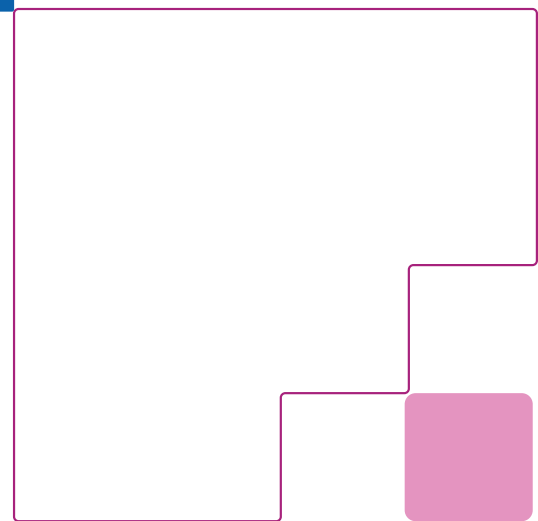
As reflected in Figure 2.4, Pakistan lies in

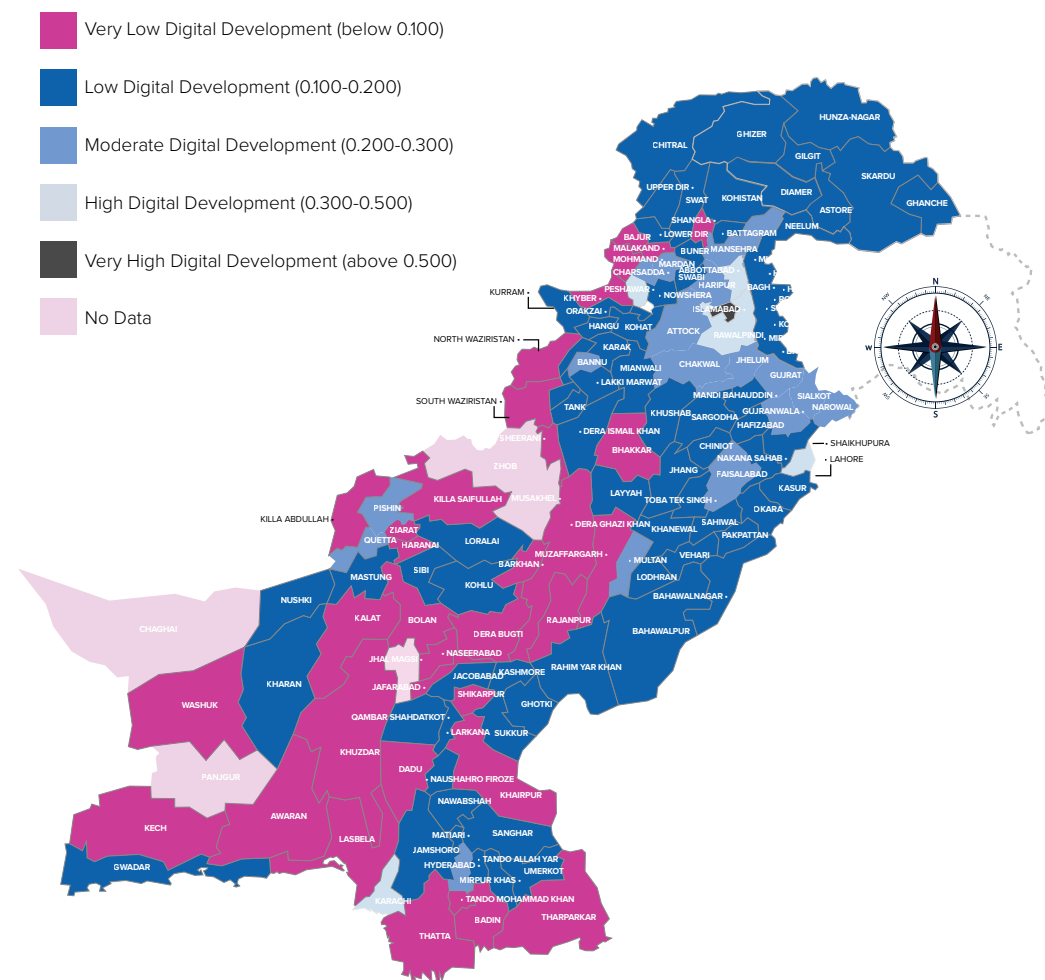
the moderate digital development category with a cumulative DDI of 0.205. Punjab with a DDI value of 0.213, Sindh (0.209), Pakistan-Administered Kashmir (0.209), and Gilgit-Baltistan (0.207) have moderate levels of digital development. Khyber Pakhtunkhwa and Balochistan, with values of 0.196 and 0.135 respectively, lie in the low digital development category.

Figure 2.4 Digital Development in Pakistan – A Geographic Analysis

Source: UNDP calculations based on PSLSMS (2019-20)

As depicted in Map 2.2, significant variations exist in the levels of digital development across provinces and districts of Pakistan. Punjab showcases a diverse range of digital development levels, from high to moderate, low and very low digital development, reflecting balanced and widespread levels of digital development. Out of the 36 districts of Punjab, two districts – Lahore and Rawalpindi – are in the high category, followed by nine districts at moderate levels, 21 districts at low levels, and four districts – Bhakkar, Dera Ghazi Khan, Muzaffargarh and Rajanpur – at very low levels of digital development (see Table 2.2).



Map 2.2 Digital Development Index at District Level:

Source: UNDP calculations based on PSLMS 2019-2020

Table 2.2: Digital Development Index – Punjab

Districts	DDI categories
Bhakkar	Very Low Digital Development
Dera Ghazi Khan	Very Low Digital Development
Muzaffargarh	Very Low Digital Development
Rajanpur	Very Low Digital Development
Bahawalnagar	Low Digital Development
Bahawalpur	Low Digital Development
Chiniot	Low Digital Development
Hafizabad	Low Digital Development

Districts	DDI categories
Jhang	Low Digital Development
Kasur	Low Digital Development
Khanewal	Low Digital Development
Khushab	Low Digital Development
Layyah	Low Digital Development
Lodhran	Low Digital Development
Mandi Bahauddin	Low Digital Development
Mianwali	Low Digital Development
Nankana Sahib	Low Digital Development
Okara	Low Digital Development
Pakpattan	Low Digital Development
Rahimyar Khan	Low Digital Development
Sahiwal	Low Digital Development
Sargodha	Low Digital Development
Sheikhupura	Low Digital Development
Toba Tek Singh	Low Digital Development
Vehari	Low Digital Development
Attock	Moderate Digital Development
Chakwal	Moderate Digital Development
Faisalabad	Moderate Digital Development
Gujranwala	Moderate Digital Development
Gujrat	Moderate Digital Development
Jhelum	Moderate Digital Development
Multan	Moderate Digital Development
Narowal	Moderate Digital Development
Sialkot	Moderate Digital Development
Lahore	High Digital Development
Rawalpindi	High Digital Development

Source: UNDP calculations based on PSLSMS (2019-20)

In Sindh, only one district, Karachi, stands out as highly digitally developed, followed by Hyderabad, which is classified at a moderate

level. Fourteen districts are at low levels of digital development, while eight districts are classified as very low (see Table 2.3).

Table 2.3: Digital Development Index - Sindh

Badin	Very Low Digital Development
Dadu	Very Low Digital Development
Khairpur	Very Low Digital Development
Shikarpur	Very Low Digital Development
Sujawal	Very Low Digital Development
Tando Muhammad Khan	Very Low Digital Development
Tharparkar	Very Low Digital Development
Thatta	Very Low Digital Development
Ghotki	Low Digital Development
Jacobabad	Low Digital Development
Jamshoro	Low Digital Development
Kamber Shahdadkot	Low Digital Development
Kashmore	Low Digital Development
Larkana	Low Digital Development
Matiari	Low Digital Development
Mirpurkhas	Low Digital Development
Naushehro Feroze	Low Digital Development
Nawabshah/ Shaheed Benazir Abad	Low Digital Development
Sanghar	Low Digital Development
Sukkur	Low Digital Development
Tando Allahyar	Low Digital Development
Umerkot	Low Digital Development
Hyderabad	Moderate Digital Development
Karachi	High Digital Development

Source: UNDP calculations based on PSLSMS (2019-20)

In Khyber Pakhtunkhwa, two districts – Abbottabad and Peshawar – are ranked at high levels of digital development, followed

by five districts – Haripur, Bannu, Charsadda, Mansehra and Mardan – at moderate levels. The success of these districts is largely due

to engineering, education, infrastructure and the presence of digital markets located in them. However, a majority of 17 districts of Khyber Pakhtunkhwa fall into the low

digital development category, followed by eight districts in very low levels of digital development, reflecting massive regional disparities (see Table 2.4).

Table 2.4: Digital Development Index – Khyber Pakhtunkhwa

Bajur	Very Low Digital Development
Khyber	Very Low Digital Development
Mohmand	Very Low Digital Development
North Waziristan	Very Low Digital Development
Shangla	Very Low Digital Development
South Waziristan	Very Low Digital Development
Tank	Very Low Digital Development
Tor Ghar	Very Low Digital Development
Battagram	Low Digital Development
Buner	Low Digital Development
Chitral	Low Digital Development
Dera Ismail Khan	Low Digital Development
Hangu	Low Digital Development
Karak	Low Digital Development
Kohat	Low Digital Development
Kohistan	Low Digital Development
Kurram	Low Digital Development
Lakki Marwat	Low Digital Development
Lower Dir	Low Digital Development
Malakand	Low Digital Development
Nowshera	Low Digital Development
Orakzai	Low Digital Development
Swabi	Low Digital Development
Swat	Low Digital Development
Upper Dir	Low Digital Development
Bannu	Moderate Digital Development

Charsadda	Moderate Digital Development
Haripur	Moderate Digital Development
Mansehra	Moderate Digital Development
Mardan	Moderate Digital Development
Peshawar	High Digital Development

Source: UNDP calculations based on PSLSMS (2019-20)

In Balochistan, two districts -- Quetta and Pishin -- stand out with moderate digital development. However, other districts generally fall in the low (seven districts) and very low (nineteen districts) category of digital development, indicating a need

for increased focus on digital infrastructure in this province (see Table 2.5). The low performance of Balochistan in digital development is largely due to low levels of digital infrastructure, including cellular and broadband connectivity.

Table 2.5: Digital Development Index – Balochistan

Awaran	Very Low Digital Development
Barkhan	Very Low Digital Development
Bolan/Kachhi	Very Low Digital Development
Dera Bugti	Very Low Digital Development
Duki	Very Low Digital Development
Harnai	Very Low Digital Development
Jaffarabad	Very Low Digital Development
Kalat	Very Low Digital Development
Kech/Turbat	Very Low Digital Development
Khuzdar	Very Low Digital Development
Killa Abdullah	Very Low Digital Development
Killa Saifullah	Very Low Digital Development
Lasbela	Very Low Digital Development
Naseerabad	Very Low Digital Development
Shaheed Sikandar abad	Very Low Digital Development
Sherani	Very Low Digital Development
Sohbatpur	Very Low Digital Development
Washuk	Very Low Digital Development
Ziarat	Very Low Digital Development

Sibi	Low Digital Development
Gawadar	Low Digital Development
Kharan	Low Digital Development
Kohlu	Low Digital Development
Loralai	Low Digital Development
Mastung	Low Digital Development
Noshki	Low Digital Development
Pishin	Moderate Digital Development
Quetta	Moderate Digital Development

Source: UNDP calculations based on PSLSMS (2019-20)

Amongst all of Pakistan's districts, Islamabad (with a DDI value of 0.570) is the country's only district with very high digital development (DDI value greater than 0.500); followed by Karachi in Sindh; Lahore and Rawalpindi in the Punjab; and Peshawar, Haripur and Abbottabad in Khyber Pakhtunkhwa, achieving high digital development (DDI value between 0.300 and 0.500).

Interestingly, with a DDI of 0.401, Abbottabad in Khyber Pakhtunkhwa ranks better than traditionally richer districts of Karachi and Lahore. Out of a total of Pakistan's 121 districts for which DDI was computed, only 16 have moderate levels of digital development, with a majority of nine districts (Sialkot, Jhelum, Chakwal, Gujranwala, Gujrat, Attock, Faisalabad, Multan, Narowal) in Punjab, followed by four districts (Mansehra, Mardan, Charsadda, Bannu) in Khyber Pakhtunkhwa,

two districts (Pishin, Quetta) in Balochistan, and one (Hyderabad) in Sindh.

Almost half (60) of all the districts of Pakistan lie in low digital development category with a DDI value between 0.200 and 0.100. Thirty-eight districts of Pakistan have a very low DDI value of less than 0.100, and almost half of them are in Balochistan.

It is important to note that most of the top-performing districts in Pakistan are major urban centers with high economic activity, indicating a strong correlation between urbanization, economic prosperity, and digital development.

Furthermore, the presence of educational institutions, including universities and research centers, proximity to major transportation routes, airports, and developed infrastructure, presence of government institutions, military establishments, and focus on industries, trade,

and entrepreneurship are key enablers that help districts achieve higher levels of digital development.

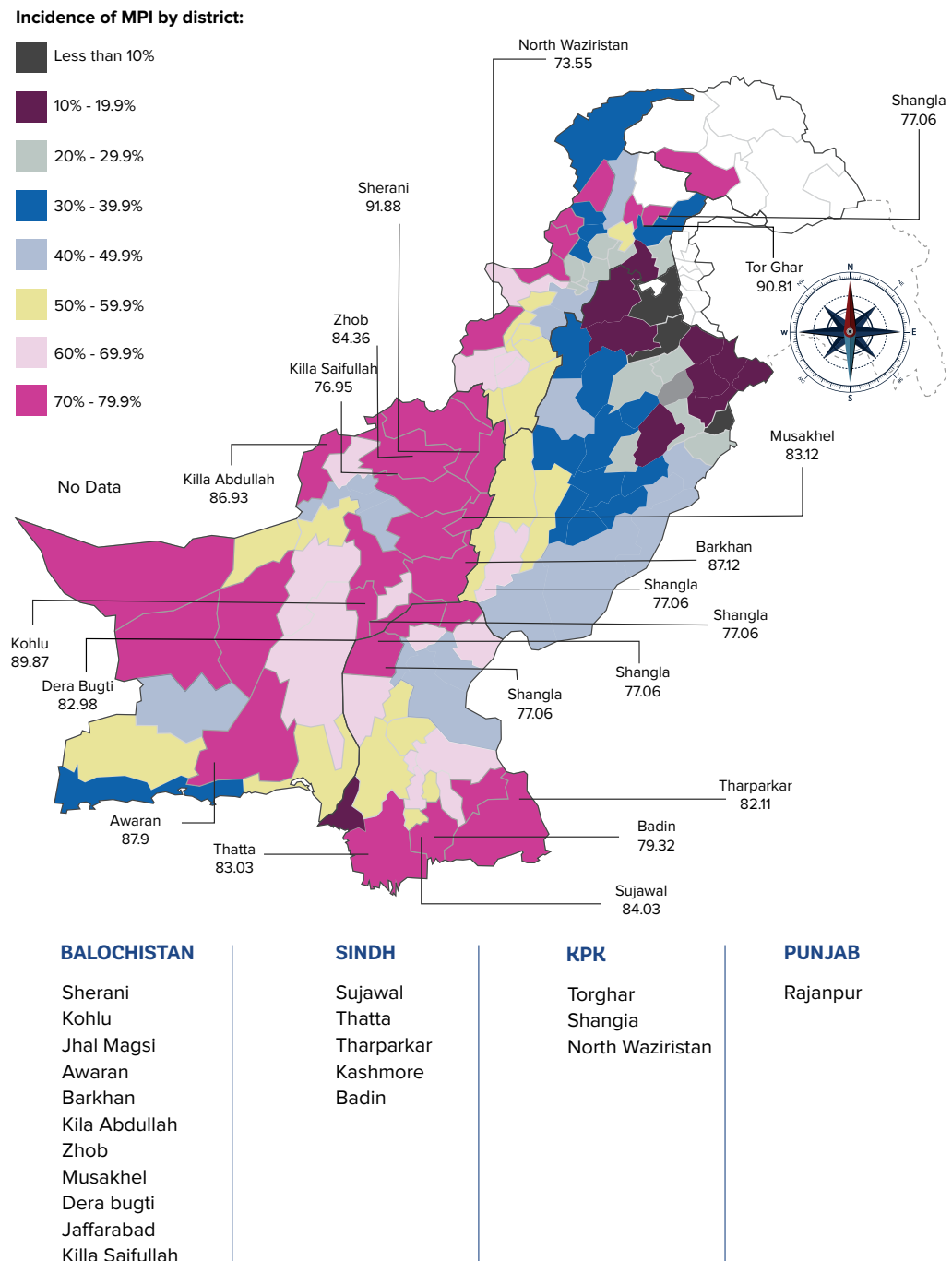
In contrast, districts that exhibit rural characteristics, including limited infrastructure, lower economic activity, challenges in accessing educational resources, and infrastructure deficiencies, including limited access to high-speed internet and technology hubs, have low levels of digital development.

Therefore, targeted district-level development interventions and investments must address regional disparities and ensure balanced digital development across provinces. Similarly, collaboration between the public and private sectors, as well as community stakeholders, is crucial for the successful implementation of digital development strategies (see Box 2.1).

BOX 2.1 Promoting Regional Equalization through Digital Transformation

The Government of Pakistan has planned a new Special Development Package for the country's 20 least developed districts (as ranked on the Multi-Poverty Index¹⁷) for improving their health, education, and standard of living outcomes. This initiative prioritizes digital connectivity (comprising access to broadband and internet facilities, access and ownership of mobile) as an important intervention area for the socio-economic uplift of the lagging districts.

A detailed analysis by UNDP based on review of national datasets and qualitative field consultations in corroborates the linkage between low levels of human development and digital transformation in the 20 least developed districts. Almost all of these districts have limited broadband connectivity, and low levels of internet access. Analysis reveals that by providing broadband/fiber optic and improving access to the internet, the population of these districts -- especially youth and women having technical and vocational skills -- can start online businesses and create work opportunities, not only for themselves but also for their communities. Access to digital means can also enable them to learn technical and vocational skills via the internet, especially the youth that are neither in education, employment, nor training (NEETs).

Map 2.3: 20 Least Developed Districts

Source: Planning Commission Pakistan

Amongst the four domains of the DDI -- access, usage, attainment, and transformation -- Pakistan does relatively better on access, defined by households having access to computer, mobile, and the internet. However, to achieve higher levels of digital

development, the country needs to improve significantly in the other three domains of usage, attainment, and transformation, which have very low index values of 0.197, 0.129 and 0.152, respectively.

Within provinces and regions, just like the national average, the domain of access is higher than the other three domains of usage, attainment, and transformation. Some of the positive aspects include relatively higher levels of attainment in Gilgit-Baltistan, compared to other provinces and regions.

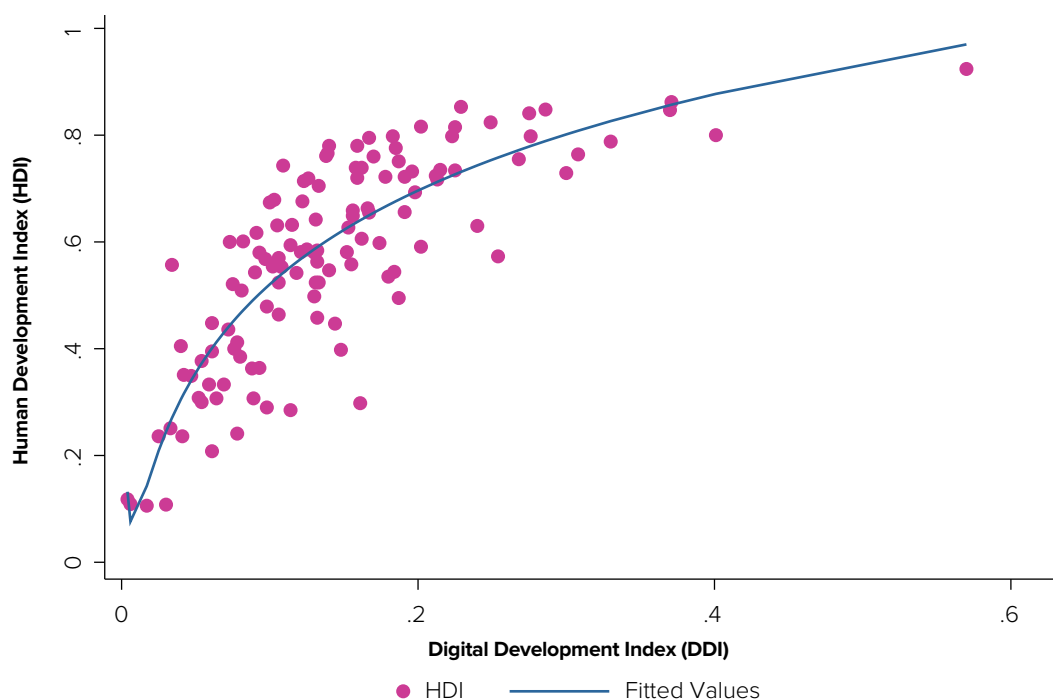
In Pakistan-Administered Kashmir, access and usage dimensions are relatively higher than the provinces of Sindh and Punjab. However, attainment and transformation domains are stymied in the region.

How is human development and digital

transformation increasingly interlinked in Pakistan?

Using PSLSMS 2019-2020, the NHDR 2023/2024 mapped the HDI and DDI to check the interlinkages between digital transformation and human development. Establishing the conceptual link between human development and digital transformation and replicating the global trends in the UNDP Montenegro Human Development Report 2020, a positive linkage exists between HDI and DDI. The districts that are performing better on digital transformation are, in general, also performing better on human development (Figure 2.5).

Figure 2.5 Links Between Human Development and Digital Development in Pakistan



Source: UNDP calculations based on PSLSMS (2019-20)

Islamabad, the best performing city in terms of DDI in Pakistan, is also doing better on HDI. Similarly, districts and urban centers that have better digital access – like Lahore, Rawalpindi, Karachi, and Peshawar – are also doing better on human development.

Interestingly, a few districts of Khyber Pakhtunkhwa – like Abbottabad and Haripur in addition to Peshawar – have better

rankings in DDI and are also doing better on HDI, compared to the province's other districts that have poor digital development and human development. Through field surveys including FGDs and KIs, it was corroborated that districts (Abbottabad, Haripur) having a greater presence of educational institutions focusing on engineering, telecom engineering, emerging technologies (like robotics and AI) and facilitated by digital markets, have done

better on digitalization contributing to better human development compared to the other districts of Khyber Pakhtunkhwa.

The same argument can be extended for the 20 least developed districts of Pakistan having low digital penetration, as they are doing poorly on human development. Districts like Awaran, Dera Bugti, and Sherani in Balochistan; Tharparkar in Sindh; Rajanpur in Punjab; and North Waziristan in Khyber Pakhtunkhwa are amongst the lowest in DDI and also amongst the twenty least developed districts of Pakistan. Kashmore (in Sindh) and Kohlu (in Balochistan) are two districts with relatively better DDI, and are also doing

relatively better on HDI amongst the 20 least developed districts.

These findings strengthen the NHDR 2023/2024's hypothesis that increased digitalization leads to higher human development. They further substantiate this Report's Theory of Change that *if* Pakistan enables digital capabilities, innovation, policy reform, and investments across prioritized sectors, *then* it will achieve improved outcomes in digital access, infrastructure, rights, governance, job creation, growth, and resilience, which *will* cumulatively enhance human development in the country.

Age, Wealth, and Gender Considerations

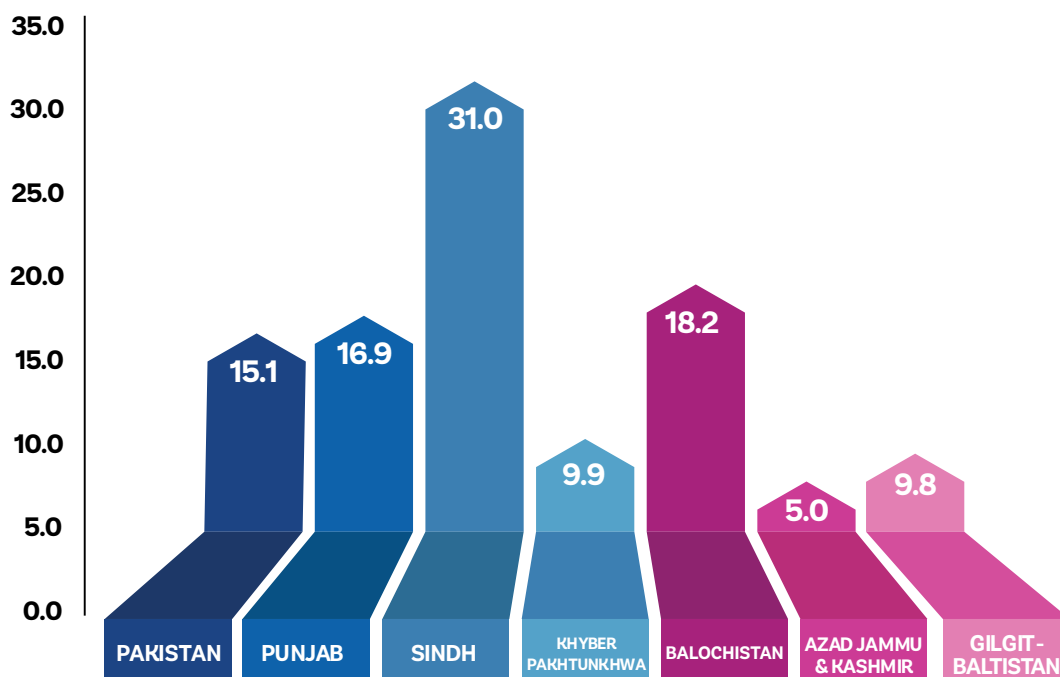
Similar to the analysis of NHDR 2020/2021 on Inequality, the NHDR 2023/2024 finds that a stark digital divide exists across the wealth quintile in Pakistan. While the wealthiest individuals enjoy advanced digital experiences, those in lower wealth quintiles face varying levels of digital development.

Comparing the digital experiences between the highest (Q5) and lowest (Q1) wealth quintiles, the Report finds that digital development in the highest quintile is fifteen times greater than that in the lowest quintile. The highest wealth quintile (Q5) leads with a substantial DDI of 0.492, signifying advanced

digital development, compared to the lowest wealth quintile, where the DDI stands at 0.032. This suggests that individuals in the lowest wealth quintile have relatively limited access to and utilization of digital resources.

A comparison of digital development across different wealth quintile amongst Pakistan's different geographical locations (see Figure 2.6) reveals that digital inequality is higher in Sindh, followed by Balochistan and Punjab provinces. In contrast, Pakistan-Administered Kashmir, Gilgit-Baltistan, and Khyber Pakhtunkhwa are more egalitarian in digital development.

Figure 2.6: Level of Digital Development Index in Pakistan across Geographical Regions by Wealth Quintiles, 2020



Source: UNDP calculations based on PSLSMS (2019-20)

Another interesting analysis coming from DDI is that digital development is greater in young aged population cohorts (20-29 years old), a value of 0.232, followed by (30-39 years old) a value of 0.164 compared with older age cohorts, indicating that the younger generation is more responsive to digital

development. Hence, timely investments in digital literacy, provision of access to technology, and promoting inclusivity in digital spaces will help improve Pakistan's human development outcomes in the coming years, as the younger population segments are rapidly able to leverage its dividends.

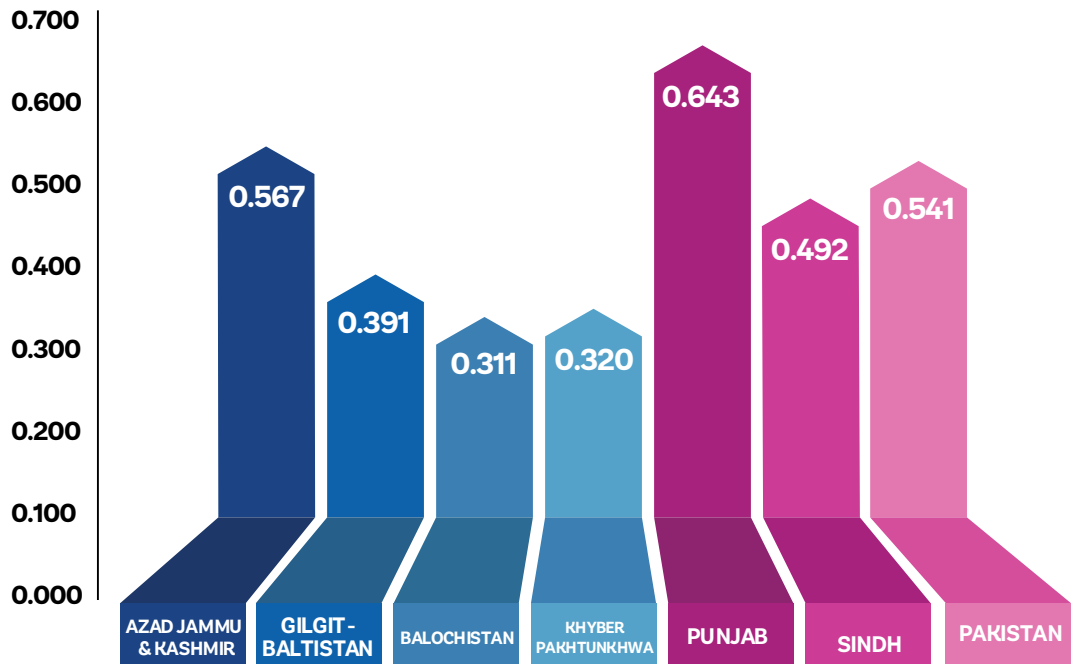
Gender Digital Development Index

The DDI analysis is further strengthened by the NHDR 2023/2024's especially curated Gender Digital Development Index (Gender adjusted district-level Digital Development Index) that measures gender inequalities in digital progress¹⁸ or simply to what extent do women lag behind men in digital development. A lower value of Gender Digital Development Index (GDDI) reflects greater inequality in digital progress.

In terms of digital development, gender inequality is higher in Balochistan with a GDDI value of 0.311, followed by Khyber Pakhtunkhwa

(0.320), Gilgit-Baltistan (0.391), and Sindh (0.492). Pakistan-Administered Kashmir (0.567) and Punjab (0.643) have less gender inequality than other regions (Figure 2.7). Interestingly, Gilgit Baltistan and Khyber Pakhtunkhwa do better on male DDI and their low score in GDDI is due to low DDI for females.

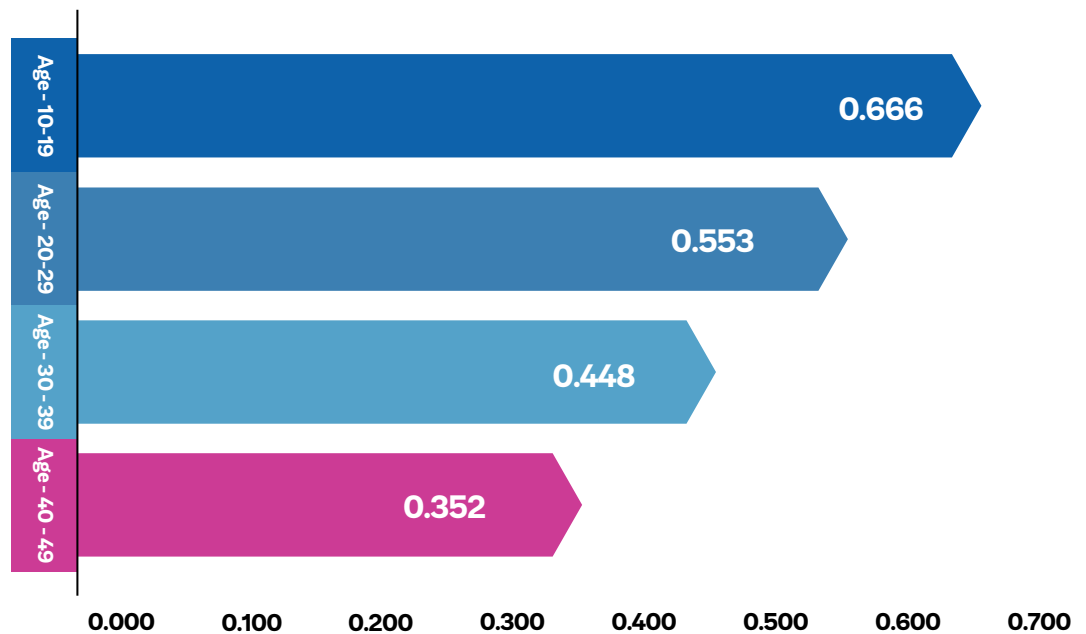
Reducing barriers to digital access for women in Khyber Pakhtunkhwa and Gilgit Baltistan, and in general across other geographical areas of Pakistan, will help pave way for improved digital and human development.

Figure 2.7 – Gender Divide in Digital Development – Gender Digital Development Index

Source: UNDP calculations based on PSLSMS (2019-20)

Additionally, gender inequality in digital development decreases as age increases, indicating that younger age groups tend to have higher gender digital development compared to older age groups. The GDDI for age 10-19 years is 0.666, and increases

gradually with higher age cohorts as reflected in Figure 2.8. As with the analysis of overall age distribution, an additional benefit of investing in digital development of young girls would help reduce overall gender disparities in development.

Figure 2.8 – GDDI Decreases as Age Cohorts Increases

Source: UNDP calculations based on PSLSMS (2019-20)

Key Data Takeaways

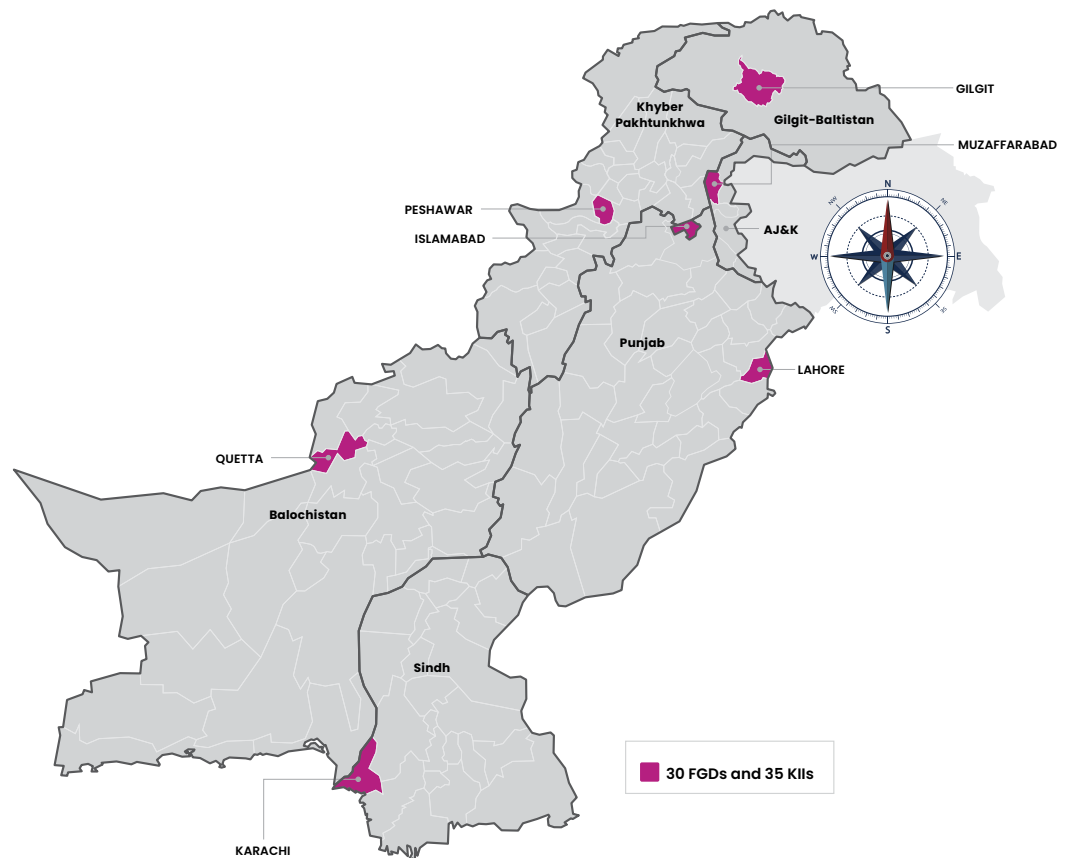
- *Leveraging digital transformation for human development.* Human development in Pakistan has tapered. Digital transformation – under the NHDR 2023/2024's 4As framework and through investments in access, usage, attainment, and transformation – offers the potential for Pakistan to spur progress in human development. However, this would require determined and focused interventions, policies, and strategies at provincial, regional, and district levels to increase access and adoption of digital means, as well as a conducive environment to accelerate digital development.
- *Reducing social divides in digital access to promote regional equalization and sustainable development.* Digital access is unevenly distributed in Pakistan and social divides are evident, not only in geographical terms but also in terms of age, gender, and income. Concentrated efforts, through policies, strategies, and targeted interventions are needed to ensure that the opportunities and potential envisioned through digital transformation for human development do not leave any group behind and that digital transformation helps everyone – regardless of age, sex, income, disability, or location.
- *Access and adoption of digital should be complemented by attainment and transformation.* Pakistan does relatively better on indicators contributing to access of digital means including access to mobile, computer and the internet, as well as in usage (including usage of mobile, computer, and the internet). In contrast, attainment and transformation measured by skills at the individual level and purpose of use, respectively, are relatively low. Furthermore, digital penetration in Pakistan is largely through mobile technology, which limits the true potential of digital transformation. To leverage Pakistan's full potential of digital for human development, investments in enhancing digital skills, especially greater investments in non-mobile devices, computer and software programing, improving digital literacy, and digital financial services are required.

How Pakistanis View Digital Transformation: The 4As through the Public Eye

In a particularly challenging country context, digitalization offers a unique story of hope for the people of Pakistan. During the summer of 2023, the NHDR 2023/2024 team embarked on a nation-wide journey across all four

provinces of Sindh, Balochistan, Punjab, and Khyber Pakhtunkhwa; the two special regions of Pakistan-Administered Kashmir and Gilgit-Baltistan; as well as the Federal Capital (Figure 2.9).

Figure 2.9 Districts where Focus Group Discussions and Key Informant Interviews were conducted



380 People
engaged for NHDR



340 People
reached through 30
Focus Group Discussions



40
Key informant interviews
conducted



176 men
204 women
engaged



The team spoke with 380 people from all walks of life in focused group discussions (FGDs) on various aspects of digital transformation in the country. The team listened to peoples' voices in the bustling halls of universities to cluttered government offices, and in brightly-lit corporate headquarters to cramped classrooms in government schools. The exercise aimed to understand how peoples' lived experiences have been impacted by increased digitalization.

Through 30 FGDs spanning diverse demographics and geographies, the NHDR 2023/2024 team engaged with 190 women and 150 men. Deep listening sessions were held with university students, school children, telecom companies, government ministers, gender rights activists, informal workers, business and industry professionals, e-commerce platforms, transgenders,

doctors, journalists, telehealth professionals, freelancers, IT boards, tech workers, academia, digital creators, teachers, and emergency service workers.

The team also held 40 Key Informant Interviews (KIIs) with sector leaders and technical experts from both public and private sectors, including 14 women and 26 men.

These discussions illuminated the potential, challenges, and complexities inherent in Pakistan's digital transformation story. Summarized below, the Report's 4As framework of Access, Adopt, Anticipate, and Accelerate served as the guiding framework to investigate the impact of digitalization on the lives and livelihoods of Pakistanis.

Access

A lot of the children we work with don't have phones. During COVID, we requested parents to share their phones with their children, so we could teach them on Whatsapp. Not everyone had a smartphone or internet packages though, so this did not work out as perfectly as we had hoped.

Dr. Aamna Pasha
Chief Academic Officer, Zindagi Trust¹⁹

and limited bandwidth can also impede tasks such as streaming educational videos, conducting online research, or accessing telehealth services.

But this is not just an issue in the remote regions of Pakistan. For instance, students from the University of Lahore spoke about the lack of internet signals at their university. "We have a state-of-the-art campus with many amenities, but we are still struggling to get decent 3G and 4G signals on campus. This makes it very difficult to access university portals and educational resources while we're on campus," said Sajid, a Computer Sciences student doing his Bachelor's at the university²⁰.

The lack of basic digital infrastructure in Balochistan was also cited many times in our FGDs, including limited access to online platforms, e-services, and platforms like Raast and digital payments. This inhibits widespread adoption of digital technology in the province.

There is also a notable digital divide between urban and rural areas in Pakistan, which is further exacerbated by non-uniform internet access as well as policy restrictions on access. One student also spoke about the 'frustration' of dealing with load-shedding when classes were shifted online during COVID. Many participants highlighted the need for governments and telecommunications companies to prioritize infrastructure development in underserved regions to ensure equal access to digital opportunities for all citizens.

Poor infrastructure and connectivity issues

pose a significant barrier to accessing technology, particularly in remote regions of the country. In such areas, individuals and communities may struggle to obtain reliable and high-speed internet connections, hindering their ability to access digital resources, participate effectively in online activities, and engage with digital platforms. Slow internet speeds, frequent disconnections,

The issue exists on the supply-side as well. Dr. Sara Saeed, CEO of Sehat Kahani, a digital healthcare platform in Pakistan spoke about how the platform faced significant infrastructure challenges in many areas of Pakistan, with little to no internet connectivity²¹. This is why they actively sought collaborations with organizations like Information Technology University (ITU), Universal Service Fund (USF), and Jazz, to improve internet connectivity in

remote areas, as well as with Telenor to ensure signal availability in others. This ensured that many more Pakistanis could benefit from their quality and affordable telehealth services. However, awareness about such services is a major impediment. Several respondents, such as domestic workers and home-based women workers, were simply not aware that such platforms existed.

In Pakistan, women face **societal pressures and cultural restrictions** that limit their autonomy and control over digital devices, such as smartphones. For example, we heard many stories of women being barred from owning or using mobile phones independently, with decisions regarding technology usage often controlled by male family members, including husbands and fathers. This lack of autonomy not only deprives women of the benefits of digital connectivity, it also perpetuates gender inequalities by reinforcing traditional power dynamics.

This was evident when we spoke with home-based workers in Lahore, courtesy of the Kashf Foundation. “My husband thinks smartphones are unnecessary, and doesn’t allow me to have one, even though he has one for himself,” said Sadia, who has been working as a cleaner for many years²². She has a ‘dumb phone’, which makes it difficult for her to organize her work schedule, as it is quite customary for employers in Pakistan to communicate with their domestic workers through Whatsapp, and especially its voice notes, which Sadia does not have access to. This is just one example of how limited access to technology can restrict women’s access to information, communication, and economic opportunities.

Affordability is another factor to consider. In Pakistan, as of 2023, 37.2 per cent of people are expected to survive on just \$3.65 a day²³. Many individuals and families face economic constraints that prevent them from purchasing essential devices such as computers, smartphones, or tablets, as well

as acquiring internet subscriptions. The high costs associated with acquiring and maintaining these technologies place them out of reach for a significant portion of the population. Many respondents mentioned the availability of affordable data plans offered by telecom companies, enabling more people to access digital services. But a lot more needs to be done.

Officials from the Khyber Pakhtunkhwa Elementary & Secondary Education Department spoke about how development partners can often invest in misplaced initiatives, before understanding the needs and wants of the people on the ground. Abdullah, who has been working there for many years, states: “An agency started a digital learning system in Buner, saying that the parents will buy their kids phones and teach them how to use them. I said if the parents could afford phones, they would have first sent their kids to school, where they would already have this information.”²⁴. Other officials agreed, saying that they did not find technology to be useful in all contexts, especially for people mired in poverty, for whom “even affording to buy shoes for their five children is a challenge.”

Bilal Munir is a famous Pakistani Youtuber who goes by the pseudonym ‘Video Wali Sarkar’ and makes engaging and accessible tech videos and tutorials. While talking to the NHDR 2023/2024 team, he emphasized: “Pakistan must support local innovation to provide affordable and diverse digital products to the market.”²⁵ This will enable all Pakistanis to benefit from the myriad opportunities afforded by the digital age, including educational resources, employment opportunities, and access to vital services such as healthcare and finance.

Fortunately, progress is being made in this area. NGOs such as Homenet Pakistan and Digital Rights Foundation have launched initiatives to bridge the digital divide, providing training programs and resources to marginalized groups, including home-based female workers and transgender

individuals. In Balochistan, participants noted government-sponsored projects aimed at expanding internet coverage to remote districts like Panjgur and Awaran, facilitating access to digital services and information. The EdTech Foundation has also set up digital learning centers in Karachi's towns of Lyari and Korangi, offering free computer classes and access to online educational platforms.

Many respondents noted the need to have more comprehensive and coordinated efforts at both the provincial and national levels to address the multifaceted challenges of accessing digital transformation. Advocacy for government interventions to prioritize digital infrastructure development, expand access to digital literacy programs to marginalized groups, and promote affordability and accessibility of digital technologies and services is crucial for fostering an enabling environment.

Adopt

Tech comes first in Pakistan, and regulations and laws come later.

Junaid Akram
Podcaster and Social Commentator²⁶

Digital Literacy, Language Proficiency, and Age were identified as important factors during the FGDs. A prevalent lack of basic digital literacy and awareness among the population hampers people's ability to effectively utilize digital tools and resources for education, entrepreneurship, and societal development.

Many individuals, particularly older generations and those residing in rural

areas, face challenges in navigating digital platforms, accessing online information, and understanding the implications of digital technology on their daily lives. For instance, elderly individuals often struggle with technology due to limited exposure and understanding of digital devices and applications. In Karachi, respondents spoke about how the older generation of teachers, who are not digital natives, will often push back on the use of digital technology, saying, "Why do I need to change my lesson planning technique? I've been doing it for years without any computers!". This is a significant roadblock for some educational institutions.

Language barriers exacerbate the issue, as a significant portion of the population cannot speak English, or even read Urdu. A domestic worker from Lahore said: "The lady I work for tells me you can see where your polling station is through SMS, or that the Government sends regular SMSs about the Benazir Income Support Program. I can't read, so there is no way for me to engage with that information."²⁷ The lack of access to timely and relevant information not only hampers individual decision-making but also contributes to broader societal challenges such as misinformation, exclusion, and inequitable access to opportunities.

An employee of Oraan, an online money-based committee platform for women in Pakistan, reiterated this when he said: "One of our biggest challenges is the lack of digital literacy. People don't even know how to use laptops in universities, so how are we going to tell the average Pakistani housewife to log into our platform to gain some financial independence?"²⁸

Participants in discussions on digital literacy and adoption unanimously emphasized the importance of implementing comprehensive digital literacy programs at all levels of education to bridge this gap and empower individuals with the necessary skills to navigate the digital landscape effectively.

By integrating digital literacy into school curricula, vocational training programs, and community initiatives, Pakistan can equip its citizens with the knowledge, skills, and confidence to harness the transformative power of digital technology for personal and societal development.

Attempts are being made to address this. Initiatives like the DigiSkills Training Program and Prime Minister's Kamyab Jawan Internship Program are empowering individuals with in-demand skills such as data science, cybersecurity, and digital marketing, fostering a culture of lifelong learning and continuous innovation. Public-private partnerships, online learning platforms, and vocational training centers are also democratizing access to digital education, enabling individuals from all walks of life to acquire the skills and knowledge needed to thrive in the Fourth Industrial Revolution.

Prevalent **Gender Norms** in most Pakistani households also impact women's digital experience or lack of. Women may technically have access to phones, as a lot of phones are considered 'household assets' in some parts of the country, with the patriarch usually being its owner. However, women often have limited adoption of that phone, only being 'allowed' to use it to make important phone calls, such as scheduling appointments or ordering groceries. As a result, women are often excluded from accessing critical information, educational resources, and economic opportunities available through digital technology, which perpetuates cycles of poverty and inequality.

Speaking to NHDR 2023/2024, the Digital Rights Foundation in Karachi informed about efforts in Pakistan to promote digital literacy among women²⁹. Initiatives like digital literacy training introduced since 2015 aims to enhance women's access to technology and financial services, indicating a proactive approach to digital skills development and adoption in the region. However, addressing

these barriers requires concerted efforts to challenge gender stereotypes, promote women's empowerment, and ensure equal access to technology and digital skills training for all members of society.

Safety, Security, and Privacy Concerns

represent significant barriers to technology adoption in Pakistan. With the increasing prevalence of cyber threats, including hacking, phishing, and identity theft, many individuals are hesitant to engage with digital platforms due to fears of privacy breaches and financial fraud. The perception of digital spaces as unsafe or hostile environments, particularly for marginalized groups such as women and minorities, further contributes to low technology adoption rates.

There are some clever ways around this. Some women in the NHDR 2023/2024 FGDs spoke about how they create anonymous Facebook accounts by using fake names and stock photos, so that they can talk with their friends online without the threat of being harassed. This was a major concern for students of the National Defence University in Islamabad, who spoke about the ills of the internet, because of which most of the women had experienced cyberbullying, unrealistic body standards, and harassment³⁰. Addressing these concerns requires comprehensive cybersecurity measures, public awareness campaigns, and regulatory frameworks to ensure the safety, security and privacy of individuals' digital engagement and promote trust in digital technologies.

Students from the Balochistan University of Information Technology, Engineering and Management Sciences (BUIEMS) in Balochistan also mentioned how they do not use online banking because of security concerns³¹: "Online banking is convenient, but the recent spate of public hacking incidents has made me cautious," said Imran, to the vehement approval of his classmates.

On this note, Mohammad Hussain, FMCG

Growth Lead at Daraz, spoke about the need to create policies governing online payment methods, transaction security, and financial regulations, as they play a vital role in ensuring a secure and trustworthy e-commerce environment³². Streamlining and improving these policies can enhance customer confidence and facilitate seamless transactions across the board.

Anticipate

Data is the main raw material for predictive analysis and data modelling for AI. Yet, Pakistan doesn't have any information privacy or data protection laws to help facilitate that ecosystem.³³

Dr. Ali Mahmud
Managing Director
Khyber Pakhtunkhwa Information
Technology Board (KPITB), Peshawar

Interestingly, in the 30 FGDs and 40 KIs conducted nationally, we came across very few instances of insights, reflections and examples of anticipatory thinking and working on digital transformation. Many respondents expressed a sense of disillusionment regarding the nation's readiness for digital transformation.

Dr. Faiza Yousuf, Founder of WomenInTechPK said: "We do see a lot of women coming in to learn how to code and take on tech jobs. But at the same time, we have so many different social issues that prevent their true progress. Making policies is fine, but if people don't have access to the internet in the first place, it won't really help. In that case, they might as well not have a policy at all."³⁴

There was a prevailing sentiment of

skepticism on the foresight and vision of public leadership in predicting the necessary steps for Pakistan's future growth in the digital era. Many respondents felt that there was a lack of clarity and direction regarding the actions needed to harness the potential benefits of digitization effectively.

Anila, a teacher from BUIEMS in Quetta, lamented the lack of gender focus when it comes to our understanding of the emerging trends and opportunities in Pakistan. "A dynamic and gender-sensitive future of work policy is necessary for Pakistan to succeed," she said³⁵. Teachers in Lahore's Quaid-e-Azam Academy for Educational Development echoed this view, with Farzana saying: "Lahore is far behind other cities. We urgently need to focus on future predictions, model building, and long-term cross-sectional studies to assess what works and what doesn't. Without this, we will not progress."³⁶

These sentiments convey a palpable sense of despondency among users and target groups. They also communicate the urgent need for visionary public leadership and proactive initiatives to ensure Pakistan's competitiveness in the digital era.

Accelerate

The success stories of women-led ventures inspire other women to pursue entrepreneurship fearlessly.

Sam Ali Dada
Activist and Former President of the
Women Chamber of Commerce, Lahore³⁷

A general perception may exist that Pakistanis are online mostly for entertainment – to exchange gossip on Facebook or share

political memes on Whatsapp. The reality is that people across the country are eager to unlock the full potential of technology through **Innovation, Tech Startup and the Gig Economy**.

In Peshawar, the acceleration of HealthTech innovations is revolutionizing healthcare delivery and accessibility. Telemedicine platforms connect patients in remote areas with qualified healthcare professionals, enabling timely diagnosis, treatment, and follow-up care, thereby improving health outcomes, and reducing healthcare disparities. With the onset of the COVID-19 pandemic, the education sector attempted to transition to online platforms, in many cases ensuring learning through virtual classrooms, educational content on platforms like YouTube, and digital assessment tools.

Similarly, the e-commerce landscape has witnessed significant growth in the country, with platforms like Daraz and Foodpanda offering convenient shopping experiences and doorstep delivery services. Digital financial services, including mobile wallets and payment platforms, have enhanced financial inclusion and transparency, while telemedicine platforms like Sehat Kahani have expanded access to healthcare services through virtual consultations.

Remote work and freelancing opportunities have surged because of the prevalence of platforms like Upwork, Fiverr and Freelancer, providing individuals with flexible employment options and global market access. Moreover, government services have undergone digitization, facilitating citizen-government interaction, streamlining administrative processes, and promoting transparency and accountability.

In Lahore, Shumaila told the NHDR 2023/2024 team how she started a small **Online Business** through Facebook, selling simple traditional clothes such as *shalwar kameez*³⁸. This business became a success,

allowing her to hone her sales skills over time and make a modest profit: "I learned so much through the process of marketing and selling my clothes, that I began to apply to different sales jobs throughout Lahore. Ultimately, I got accepted into a sales position as a salaried white-collar worker, making a lot more money than I ever had before." Shumaila benefited from the accelerated opportunity offered to her through the digital realm, something that would not have been immediately and easily available to her in her physical reality.

A lot of women have also been afforded other opportunities because of digital technology, enhancing their quality of life. They use the internet for entertainment – something that can be out of reach for some women in the country owing to their limited access to public spaces. At the same time, they use grocery delivery apps or e-services to save time, view recipes or skill-building tutorials on Youtube for their personal development, or engage with other women in contexts where they might feel isolated.

The Soul Sisters platform for Pakistani women on Facebook is a great example, where women meet digitally to confide in one another, **Create a Support System**, and receive advice on everything from fashion and job opportunities to traditionally taboo subjects such as sexual and mental health. Additionally, telemedicine services enable women to seek medical advice and consultations remotely, addressing healthcare needs while overcoming barriers related to mobility and social norms.

E-commerce platforms and digital marketplaces also provide women with opportunities for entrepreneurship and economic empowerment, allowing them to start businesses, sell products, and generate income from the comfort of their homes.

Many young people are also turning to **Online Courses and Digital Training Platforms** to be better prepared for the job market. To

enable this growth, the Khyber Pakhtunkhwa IT Board has signed an MoU with Google to provide 5000 scholarships to students for skills needed for the global market.

Of course, the school system itself leaves a lot to be desired. Moeed Yusuf, Vice Chancellor of the Beaconhouse National University, spoke to the NHDR 2023/2024 team: “Pakistan produces 30,000 IT graduates every year, but 90 per cent are unemployable. This is criminal. The Government keeps going on about bootcamps. Fix the education system, and you wouldn’t need bootcamps.”³⁹

Students use the internet for other things also. A student from BUIEMS in Quetta stated: “80 per cent of students have **Mobile Wallets** and utilize **Online Banking Services**.”⁴⁰ Despite concerns about security, many students actively use online banking, demonstrating the widespread adoption of digital financial services among young adults.

The government is also trying to keep pace. Key initiatives such as the Ehsaas Digital Program, Kamyab Jawan Digital Program, and Raast Instant Payment System are **Public Sector Efforts to Leverage Digital Means** for poverty alleviation, youth empowerment, and financial inclusion, respectively. The introduction of the Digital Pakistan Policy 2018⁴¹, led by the Ministry of IT and Telecom, and the then-Government’s Digital Pakistan Vision unveiled in 2019⁴² serve as policy instruments reflecting the government’s commitment to harnessing the power of digital technologies for development.

Lives and Livelihoods

Barriers to availing digitalization for economic resilience in Pakistan are multifaceted, encompassing various aspects of citizen engagement, business registration, financial access, and international transactions. Respondents highlighted the absence of a robust complaint system for businesses to

Arif Hussain Shah from the Balochistan Planning and Development Department (P&DD) shared with the NHDR 2023/2024 team Balochistan government’s efforts to promote acceleration across various sectors. Projects like the introduction of an Online Testing System (OTS) and geo-tagging for monitoring and accountability show the adoption of digital means for improving service delivery and governance processes in the province.

Pakistan is also looking into **Digital Governance and Policy Reforms**, leveraging advanced technologies such as blockchain, big data analytics, and digital identity solutions to drive efficiency, transparency, and citizen-centric service delivery across government institutions. Policy reforms and regulatory frameworks are being modernized to address emerging challenges and opportunities in the digital landscape, ensuring data privacy, cybersecurity, and regulatory compliance while fostering innovation, competition, and investment in the digital economy. Initiatives like the National Single Window (NSW) and e-Khidmat Centres are revolutionizing administrative processes, streamlining bureaucratic workflows, and enhancing the ease of doing business in Pakistan, laying the foundation for a digital-first government ecosystem.

The NHDR 2023/24 team also identified some cross-cutting trends about the experiences of Pakistanis as they relate to digital technology, as outlined below.

engage with local government, as well as difficulties in registering companies online.

Challenges in obtaining credit and opening bank accounts were also identified, along with concerns about the ease of doing business, particularly in digital ventures. Restrictions on international money transfers were

noted to impact startups, while transaction and payment outflow limits were seen as hindrances to business operations.

Freelancers and tech start-up founders in Peshawar expressed their frustration at the frequent internet shutdowns in the province – sometimes for two or three days at stretch – which severely hinders their workflow and makes it difficult for them to meet project deadlines and uphold their business reputation. In 2022, for instance, one million freelancers were affected by internet outages in Pakistan⁴³. “When the province experienced

a five-day internet outage, my reach fell from 100K to 50K, halving my expected income for the month,” said Ali, who runs a small Instagram business from his home in Peshawar⁴⁴.

To compete as a business, reliable and consistent internet access is a prerequisite for many of Pakistan’s small and medium business owners. These barriers underscore the need for comprehensive reforms and streamlined processes to facilitate the uptake of digitalization in business and foster an enabling environment for economic growth and innovation in Pakistan.

A Digital Divide of Genders

During the NHDR 2023/2024 team’s field engagement, the gendered aspects of digitalization highlighted a complex interplay between entrenched cultural, economic, and socio-political factors. Financial constraints, familial disapproval, and societal norms often hinder women’s access to digital technologies in Pakistan. The potential benefits of digitization remain elusive for many. Shared devices further limit women’s independent digital exploration, reinforcing traditional gender roles and restrictions.

Despite these challenges, digital technology has the potential to profoundly empower women in Pakistan. Through avenues such as education, increased mobility, and economic inclusion, digital tools can offer women newfound opportunities for self-expression and advancement. However, realizing this potential requires concerted efforts in technical training and digital literacy initiatives, alongside societal change to challenge norms and advocate for digital rights.

In some ways, this change has already

begun. The NHDR 2023/24 team learned that mobile phone access has been instrumental in empowering women, by providing access to information, markets, and financial services. It has enabled many women-led enterprises to succeed, while allowing women to work entirely from their homes.

Mobile wallets are also on the rise in the country, empowering women to have greater control over their finances. The NHDR 2023/2024 team’s discussion with the Growth Lead of e-commerce platform Daraz showed that women are increasingly participating in online purchasing, which signifies a positive trend towards gender inclusivity in the digital marketplace⁴⁵. There are other benefits, too. “Digital initiatives that address gender-based violence have made a significant impact in our city,” said women’s rights leader, Khawar Mumtaz in Lahore⁴⁶.

However, there is room for continuous and consistent improvement. According to the NHDR 2023/2024 team’s discussion with Careem, for example, only 1,800 captains in

Careem's national operations are women⁴⁷. In addition, privacy and safety concerns continue to serve as barriers for women to unlock the full potential of digitization. Advocacy efforts aimed at raising awareness and pushing for policy changes can help address disparities

and promote inclusivity in the digital sphere. Moreover, the intersection of gender disparities with other social markers -- such as religion, age, and class -- underscores the urgent need for targeted interventions to ensure digital equity for all.

Those Least Developed and Left Behind

In Pakistan, the stark realities of its less developed districts paint a concerning picture of digital inequity and its far-reaching consequences. Despite efforts to promote digitalization, these regions continue to suffer from inadequate infrastructure and support, which exacerbates existing regional disparities.

The lack of accessibility to digital resources is particularly evident in educational institutions. A student from the University of Azad Jammu & Kashmir stated that the digital courses offered by the Higher Education Commission (HEC) are predominantly in English, excluding non-English speakers and further marginalizing communities in backward districts⁴⁸. Educational institutions in far-flung regions and districts face additional hurdles due to disparity in the internet speeds, which renders certain educational software inaccessible. This further widens the gap in educational opportunities between urban and rural areas, perpetuating cycles of poverty and exclusion.

Digital skill-building opportunities are also sparse for the country's least developed districts and regions. Dr. Hassan Mahmood Warraich, Director, Institute of Continuous Education and Extension, University of Veterinary & Animal Sciences, said: "There are 35 million smallholder farmers in Pakistan and their knowledge on farming practices is negligible. There are so many messages in farming related to animal husbandry, animal nutrition, profitability, etc., but 90 per cent of farmers wouldn't know about these. Our research suggests that acting fully upon even one of these messages can lift the farmer out of poverty."⁴⁹ He sees digital platforms as a great opportunity for information dissemination for this group.

Prevalence of conservative socio-cultural norms in less developed regions has further deepened digital inequalities and disparities. The absence of comprehensive tech infrastructure in households in these areas means that access to digital tools is often limited to a single mobile phone, which is typically controlled by the patriarch of the family.

BOX 2.2 'Digital' in Pakistan's Development Policy Research

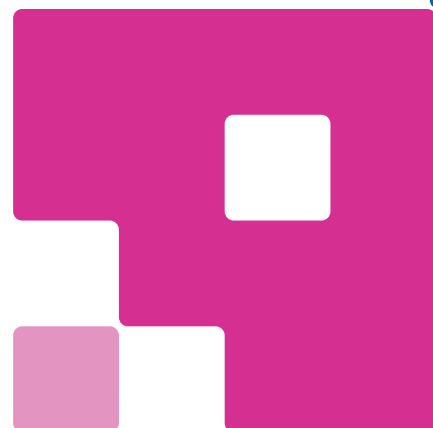
The NHDR 2023/2024 Team noted with interest a nationwide study conducted in 2022 by the Islamabad-based Pakistan Institute of Development Economics (PIDE). The PIDE *Beliefs, Attitudes, Social Capital, Institutions, Community, and Self (BASICS)*⁵⁰ Survey uncovers overlooked aspects of social capital in Pakistan, exploring how Pakistanis perceive themselves and others, their levels of trust in institutions, their aspirations and community engagement.

It is an individual-based Computer Assisted Personal Interviewing (CAPI) survey, conducted on a nationally representative sample drawn by the Pakistan Bureau of Statistics (PBS). Using the sampling framework of PBS, the survey covered 20,548 respondents aged 15 years and above, and 140 districts in the four provinces, Gilgit Baltistan (GB), Azad Jammu and Kashmir (AJK), and Islamabad Capital Territory (ICT).

The NHDR 2023/2024 observes that Pakistan's research ecosystem needs to prioritize and incorporate digital access and its impact as one of the fundamental and required indicators for measuring, monitoring, and evaluating the state of human development in the country. Understanding the transformative power of digitalization for Pakistan's progress will better tailor structural interventions and policies to leverage technology as a catalyst for inclusive development.

The survey findings report that a staggering 37 per cent of the population of Pakistan would leave the country if given the opportunity. This perception is strongest amongst the country's male youth (aged between 15 and 24 years). Seventy-eight per cent of this group wants to leave Pakistan for better opportunities that pays them more. Over 43 per cent of this group wants to move so that they have more 'respect', whilst 11 per cent in Khyber Pakhtunkhwa want to move for greater gender equality. Similar to the UNDP NHDR 2018 findings on youth, the PIDE survey shows two-thirds of Pakistanis do not have access to a library and only 60 per cent have access to a playground.

These grim findings reinforce the findings and insights of our NHDRs 2018 and 2021 on youth and inequality, respectively. They also add greater weightage to NHDR

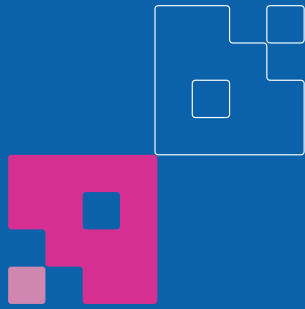


2023/2024 hypothesis and rationale for pushing the agenda for digital transformation as a great enabler and equalizer for Pakistan's social capital.

The PIDE-BASICS survey demonstrates the lack of investment in social capital, as there are no spaces for young Pakistanis to learn, play, and connect. This deprivation is layered with the fact that much of the population -- many of them being young people -- feels mistreated by society and does not see a prosperous future in the country.

A good example is Pakistani think-tank Tabadlab's report '*Digital Now: A Guide to Pakistan's Digital Transformation*', which outlines a comprehensive blueprint for advancing Pakistan's digital landscape⁵¹. It argues for a robust, progressive, inclusive, and equitable digital evolution, emphasizing the need for an enabling environment that goes beyond linear approaches. The document emphasizes the vast potential of digital technologies to create economic value, estimating a potential annual economic benefit of \$60 billion by 2030 from digital transformation, with agriculture and food sectors reaping significant benefits.

The NHDR 2023/2024 observes that Pakistan's research ecosystem needs to prioritize and incorporate digital access and its impact as one of the fundamental and required indicators for measuring, monitoring, and evaluating the state of human development in the country. Understanding the transformative power of digitalization for Pakistan's progress will better tailor structural interventions and policies to leverage technology as a catalyst for inclusive development.



Section III

**Access:
Fundamental to Channeling
Pakistan's Social Capital**



Pakistan is still far away from a universal provision for digital technology. There have been calls for universalizing access across the country. The U.N. considers the right to information a universal entitlement, specifically Article 19 of the Universal Declaration of Human Rights that recognizes the digital right to “seek, receive, and impart information through any media, regardless of frontiers.” Access is the first port of call

for the adoption of technologies that allow information to flow freely.

This section reviews what digital access is, where it exists, and how Pakistanis are utilizing it. These conclusions are derived from the NHDR 2023/2024’s household survey and qualitative interactions held across the country during the period of May-September 2023, involving about 6,000 respondents.

Beyond Physical Access

Access is often the primary lens to evaluate the presence of a resource, and determines whether a critical mass of usage exists for benefits to accrue. In digital terms, this can mean vastly different things for individuals with dissimilar starting points. The young owner of a smart phone in a city with faltering internet will express dissatisfaction about connectivity. Whereas, an elderly person in a tech-enabled household may find it confusing to use a new delivery app. Both individuals have specific limitations in access that illustrate the digital divide.

In this Report, we define access to include physical ownership or usage of hardware and software, as well as digital fluency that makes it possible to utilize technology.

Access is frequently taken to mean *physical* access, or acquiring the hardware and software needed to connect with and utilize the internet. This depends on individuals’ and households’ motivation, attitude, and expectation¹ of using digital technology, as much as the availability of digital infrastructure, such as fiber optic cables and cell phone towers in their vicinity. To be sure, physical access is limited in Pakistan, with 54.3² per cent of the country simply unable to use the internet in any way. Even in cities with dense digital usage, the uninterrupted supply of quality Internet is routinely cited as a concern by users. However, physical access is not a one-off occurrence of supply meeting demand. Rather, it is a continuous process whereby users upgrade their hardware and

software versions, peripheral equipment, and subscriptions³.

At the same time, those with physical access can experience a “second-level digital divide” when they do not possess the skills to utilize the technology available⁴. This is true for millions of users in Pakistan, as well as across the world, who find it challenging to operate the devices they use. Even if physical access were universalized, differentials in skills and competency will arbitrate where people stand in relation to technology and each other. Thus, the appropriation of digital technology is a question of capacities as they exist today, and how they can best be built for the future.

The exploration of the nexus between digitalization and enhanced human development outcomes is grounded in the logical foundation that digital devices and the internet, when harnessed effectively, possess transformative potential across diverse sectors. Online health and educational services serve as conduits for vital information and resources, particularly in communities facing accessibility challenges. Simultaneously, the acquisition of digital skills and the utilization of online platforms for work and business create avenues for income generation.

Some have argued in favor of a more expansive construct, seeing access as a composite of availability, affordability, accessibility, accommodation, and acceptability⁵ (see Table 3.1). The NHDR 2023/2024 evaluates

access in combination with other factors like digital usage, digital skills attainment, and transformative potential through the Digital

Development Index (DDI). This section shows that these qualifiers are steadily coming together in Pakistan.

Table 3.1 The 5 As of Access

The 5 As of Access	
Dimension	Description
Availability	Measures the extent to which service providers have the requisite resources, such as personnel and technology, to meet the needs of consumers.
Affordability	Measures how the service provider's fee relates to consumers' ability and willingness to pay for services.
Accessibility	Refers to geographic accessibility, determined by whether consumers can easily physically reach the service location, if at all.
Accommodation	Reflects the extent to which the service provider's operation is organized in ways that meet the consumer preferences, such as opening and closing hours, complaint management, trouble-shooting teams, etc.
Acceptability	Captures the extent to which the consumer is comfortable with the more immutable characteristics of the provider, and vice versa, including characteristics like age, sex, social class, language, religious and political affiliation, etc.

Source: McLaughlin and Wyszewianski 2022.

What Determines Access in Pakistan?

Official counts of digital penetration estimate 135 million broadband subscribers in Pakistan, of whom 132 million are mobile broadband users. Fixed broadband penetration stands at 56.21 per cent, whereas mobile broadband penetration is 54.82 per cent⁶. This is notwithstanding the impact of the 2022 floods that severely undermined infrastructure across Pakistan, especially at locations in Sindh and Balochistan provinces. Internet usage has grown at a reasonable pace over the years, aided by a growing tele-density that currently stands at 80.60 per cent⁷.

The high subscription to mobile broadband in Pakistan is explained by low mobile data rates – some of the lowest in the world – whereas fixed broadband charges are unaffordable for

most households. Internet-enabled devices also present an affordability challenge for the majority, and constitutes the most significant barrier in smart phone penetration.

There are quality and connectivity challenges as well. Quality issues persist because high-capacity fiber optic cable networks have not been spread widely across the country. Last mile network deployment is quite uneven, frequently taken over by private actors in major urban centers, and next to no deployment in second or third-tier cities. Market segments share infrastructure to a limited extent that, in turn, undermines international connectivity and raises network rollout costs. This has prevented new operators from entering the industry, and innovation in wireless broadband.

BOX 3.1**Access to New Possibilities**

“Where have I learnt so much about computers?” asked 12 year-old Asad from a Government Boys School in Quetta from our team of researchers. “I do part-time work at a computer shop after school, and they have taught me how to dismantle old laptops, and install softwares,” he explained. Asad’s computer skills stand out among his classmates from school, as well as other children his age across Pakistan, who predominantly use smart devices for games, social media or delivery apps. “I want to work as a freelancer when I grow up,” he says with conviction. All his classmates enthusiastically agree they want to become freelancers as well. Many of them work after school to supplement income at home. None of them own a smart phone, but know its many uses. “What is freelancing? I know, ofcourse. It’s earning money online with the skills I have,” Asad tells us.

Abdul Ahad runs a low cost private school in Azam Basti, Karachi. He’s keenly aware of the socio-economic challenges in his working class neighborhood that impact his young students. “There hasn’t been any political violence in this area since many years, although we have seen those days as well. Students who attend my school come from disadvantaged backgrounds. I don’t think all children have smartphones at home, but they certainly know how to use social media nowadays, and are aware of the latest trends,” he observed. “I don’t own a smart phone either, but I know it’s the way forward. It’s the only way I will be able to keep up with children, and understand how their minds are changing.”

These real life stories reveal how access to a social resource can profoundly revise the creative potential of individuals, groups, and communities. In both cases highlighted above, access to digital technology has delivered a host of transformations in the way individuals negotiate with their environment and articulate a future of new possibilities.

Access Across Districts: Computers, Mobile Phones, Internet

Access merits being seen on its own to help an understanding of where and how usage has been enabled in Pakistan. Pakistan’s digital access presents a checkered snapshot, and the discussion below presents highlights from the data⁸. Access to mobile phones shows exceptionally high percentages, and presents a key opportunity for accelerating digitalization. However, it is prudent to consider a wider variety of contextual indicators, like usage and level of digital skills, to evaluate whether there is actual transformative potential in the respective districts. It will be erroneous to zero in on access alone, as

other factors may have a greater bearing on people’s capacity and agency. The discussion below reviews access in complementarity with other factors.

Computer Access

Access to desktop computers, laptops, and tablets in Pakistan has a low national average of 11.75 per cent, slightly higher across urban contexts by 19.42 per cent, but lower in rural areas by 6.92 per cent. Punjab, the most populous province, has an average of 12.90 per cent (urban 21.60 per cent, rural 7.60

per cent). Whereas, Sindh stands at 10.18 per cent (urban 15.94 per cent, rural 3.04 per cent); Khyber Pakhtunkhwa at 12.37 per cent (urban 26.46 per cent, rural 9.72 per cent); and Balochistan trails behind at 6.45 per cent (urban 13.00 per cent, rural 4.03 per cent)⁹.

Low access to desktop computers, laptops, and tablets can be explained by an affordability challenge to an extent, especially across rural contexts. However, Pakistan's vocational profile provides a better clue to low usage.

The country's largest labor concentrations are in sectors that do not require high per capita usage of computers – 33.23 per cent are engaged in agriculture, forestry, and fisheries; 17.40 per cent in elementary occupations; 15.57 per cent in service and sales work; 13.70 per cent in craft and related trade work; and 7.42 per cent are involved in plant and machine operation. None of these sectors require accessing of computers outside managerial roles¹⁰. A staggering 67.95 per cent of Pakistan's labor is based in rural areas, and retains its original occupational skills even as it moves around the country¹¹.

To confirm whether computer usage is actually low, the NHDR 2023/2024's household survey asked respondents whether they had used a computer or tablet in the last week. A stunning 91.1 per cent stated they had not, although 77.7 per cent had access to it; 29.7 per cent used a computer only at their place of work; and 24.8 per cent used it at an educational institute. This drives home the conclusion that Pakistani households may not utilize computers even if access increases, as it is of limited usage outside professional contexts.

For transformation to occur digitally, the search has to be elsewhere. However, this must not ignore the genuine limitations in accessing desktop computers for those who are willing to obtain them for vocational, educational or other usage.

Mobile Phone Access

On the other hand, the 2019-20 PSLSMS data shows that mobile phone access is universally high across Pakistani households, with many districts showing 100 per cent usage¹². As mentioned above, Pakistan has one of the most affordable data rates across the world, making it easy to communicate through mobile technology. Mobile phones provide a lifeline for households, especially in underdeveloped areas that have recourse to few other social services.

The national average for mobile phone access is high at 93.15 per cent (urban 96.46 per cent, rural 91.06 per cent), and low district averages are an anomaly. Districts such as Rajanpur, Bannu, Chitral, Lower Dir, Malakand, Upper Dir, Awaran, Duki, Harnai, Kohlu, Mastung, Nushki, and Ziarat all have 100 per cent access to mobile phones¹³. Some of these districts have the lowest HDI in Pakistan, and the high prevalence of mobile phone access confirms their dependence on digital technology for benefits.

Only a few districts trail behind the rest of Pakistan in mobile phone access, largely on account of poor digital infrastructure. Districts like Badin (73.51 per cent), Matiari (79.22 per cent), Tando Allah Yar (77.39 per cent), Tando Muhammad Khan (77.52 per cent), Mohmand (79.58 per cent), Nasirabad/Tamboo (76.36 per cent) and Shaheed Sikandarabad (79.94 per cent) show trends below the 80 per cent threshold¹⁴.

Recognizing the lack of digital infrastructure in these districts, provincial governments have made recent attempts to upgrade digital facilities that assist livelihoods and human development. This has particular salience in the wake of the 2022 floods that severely undermined digital infrastructure across districts of Balochistan, Sindh, and Khyber Pakhtunkhwa.

The floods led to damages exceeding \$14.9 billion and economic losses around \$15.2 billion. The estimated needs for rehabilitation and reconstruction to rebuild in a resilient manner are at least \$16.3 billion¹⁵. This figure does not include additional investments required to support Pakistan's adaptation to climate change and enhance the country's overall resilience to future climate shocks.

The sectors that suffered the most significant damage include Housing, Agriculture and Livestock, and Transport and Communications, with damages estimated at \$5.6 billion, \$3.7 billion, and \$3.3 billion, respectively. Sindh emerged as the worst-affected province, accounting for nearly 70 per cent of the total damages and losses, followed by Balochistan, Khyber Pakhtunkhwa, and Punjab. The floods impacted 33 million people, causing over 1,730 fatalities and significantly affecting the poorest and most vulnerable districts. The aftermath has seen stagnant flood waters, the spread of water-borne and vector-borne diseases, and a health crisis among the more than eight million displaced people.¹⁶

Additionally, the PDNA Human Impact Assessment indicates a potential increase in the national poverty rate by 3.7 to 4.0 percentage points, which could push between 8.4 and 9.1 million more people below the poverty line. There's also a possibility of a 5.9 percentage point increase in multidimensional poverty, risking an additional 1.9 million households falling into non-monetary poverty¹⁷.

Does Access Equal Usage?

A clearer picture emerges when access is seen in combination with other critical indicators, such as usage. As mentioned above, increased access should not be taken to mean that usage will increase by the same degree. Individuals and groups take time familiarizing themselves with technology as they incorporate it into their lives, and utilize its benefits. There are socio-cultural inhibitors that prevent people from

Nationwide shutdowns of the internet have also been experienced due to extreme weather events¹⁸.

Internet Access

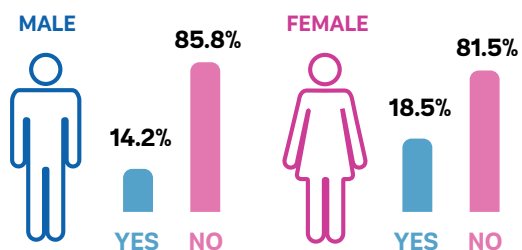
In terms of accessing the internet, Pakistan's national average is 32.27 per cent (urban 47.76, rural 23.32). Upon a closer reading of public data, several districts stand out for very high access. This is surprising in several cases as these districts do not have correspondingly high HDI. Districts with the highest internet availability in Pakistan include Abbotabad (urban) at 79.67 per cent, followed by Nushki (urban) at 77.20 per cent; Duki (urban), 73.33 per cent; Narowal (urban) at 73.31 per cent; Pishin (urban) at 72.13 per cent; Sialkot (urban) at 70.06 per cent; and Lower Dir (urban) at 70 per cent. The only other district that notches high internet access and has comparatively higher HDI is Islamabad, at 70 per cent (urban 74.79 per cent)¹⁹.

Barring Islamabad, all the districts named above have significant rural cohorts as well, which brings the overall district rating lower for aggregate internet access. However, these regions must be recognized for their transformative potential. What makes them 'outliers' is a high concentration of IT and engineering institutes, special industries that employ and engage IT personnel, and better digital infrastructure²⁰.

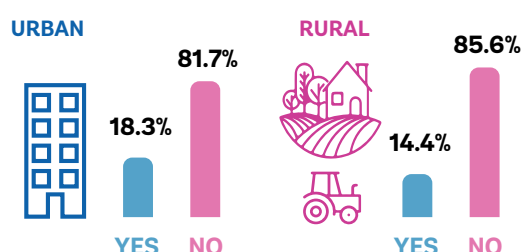
usage, particularly women.

Usage of computers is quite telling. The NHDR 2023/2024 survey asked respondents whether they could proficiently use a computer program, and 83.6 per cent stated they could not, whereas 16.4 per cent stated they could. The differentials across gender geographical locales were consistent.

Figure 3.1 Ability to use computer programs proficiently



Are You Able to Use Any Computer Programs Proficiently?



Geographical regions present both familiar and unexpected districts when it comes to digital usage. In usage of computers, Islamabad leads with 30.5 per cent, followed by Abbottabad with 19 per cent usage; Rawalpindi, 18.3 per cent; Lahore, 17.5 per cent, Haripur, 15.2 per cent; Gilgit Baltistan, 12.6 per cent; Mianwali, 11.5 per cent; Toba Tek Singh, 11.3 per cent; and Karachi, 11.2 per cent²¹.

In usage of smartphones -- which function as communication, management and entertainment devices -- another order of districts emerges. Islamabad leads with 60.6 per cent, followed by Sialkot at 50 per cent;

Kohlu at 46.2 per cent; Gujrat at 45.5 per cent; Rawalpindi at 45.3 per cent; Abbottabad at 44.4 per cent; Lahore at 42.5 per cent; Karachi at 39.3 per cent; Quetta at 37.7 per cent; and Gujranwala at 37.1 per cent²².

A number of factors explain why these districts have emerged at the top. For one, it is unmistakable that many of these districts have thriving industrial bases, and generate the majority of Pakistan's commercial activity, hence the high usage of smart phones. Second, these are districts where Pakistan's rapidly urbanizing population resides, with higher incomes and living standards. Third, these districts have young populations. Hence, the high preponderance towards smart phone usage.

In usage of internet, Islamabad leads with 55 per cent usage, followed by Rawalpindi at 41.2 per cent; Karachi at 40.7 per cent; Sialkot at 37.1 per cent; Gujrat at 36.5 per cent; Lahore at 35.6 per cent; Gujranwala at 35.3 per cent; Abbottabad at 31.3 per cent; Jhelum at 31.3 per cent; and Hyderabad at 29.9 per cent²³.

Seen against internet access or availability, usage shows a more realistic picture of districts putting digital resources to good use. According to the DDI, the following districts have the highest transformative potential due to high digital development. This is both a function of digital availability and infrastructure provided by public and private institutions, as much as the willingness of people to actively leverage digital resources available to them.

Table 3.2: Top Districts in DDI:

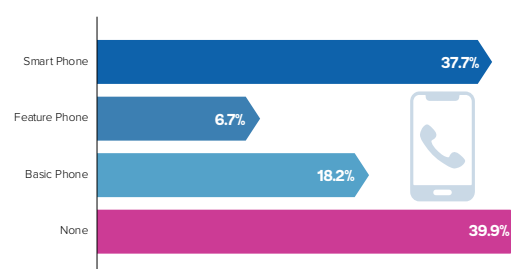
Islamabad	0.570
Abbottabad	0.401
Rawalpindi	0.371
Lahore	0.370
Karachi	0.330
Peshawar	0.308
Haripur	0.300

Source: NHDR 2023/24 Survey.

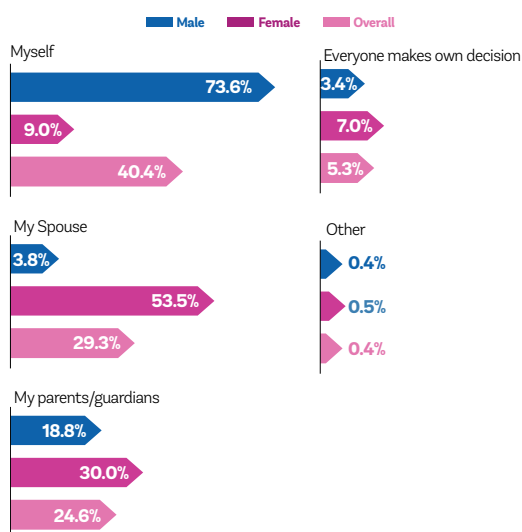
Ownership and Autonomy

The first set of questions in the NHDR 2023/2024 survey pertained to ownership of devices and individual autonomy over usage. A significant number of respondents (39.9 per cent) reported that they personally did not own any mobile phone; rather, it was a jointly owned asset for the household. Of the remaining 60.1 per cent who owned *at least one* phone, the most common kind were smartphones (37.7 per cent). It is worth noting that household members were almost equally as likely to own a smartphone as they were to not own any mobile phone. In contrast, feature and basic phones are relatively uncommon, likely due to their limited functionality and the fact that smartphones have become increasingly accessible in terms of price (see Figure 3.2).

The NHDR 2023/2024 survey further inquired about ownership and usage of smartphone devices by gender across the 15 districts. Rawalpindi district emerges at the top with highest ownership at 55.5 per cent, and Quetta at the bottom with 29.5 per cent.

Figure 3.2 Mobile Phone Ownership by Type

The survey reveals significant gender-based differentials regarding phone ownership. While 77.0 per cent of males assert independence in owning a phone, a mere 16 per cent of females share the same autonomy. A striking 83.5 per cent of women report that their spouse or parents dictate their phone ownership (Figure 3.3). In FGDs conducted across Pakistan, teenage girls reported that their parents monitored the content they accessed online, and curtailed their hours of usage. Teenage boys did not report the same level of content scrutiny, but had time limitations on phone usage as well, as they most usually accessed the internet through an elder family member's phone.

Figure 3.3 Who in Your Household Decides Whether You Should Have a Phone?

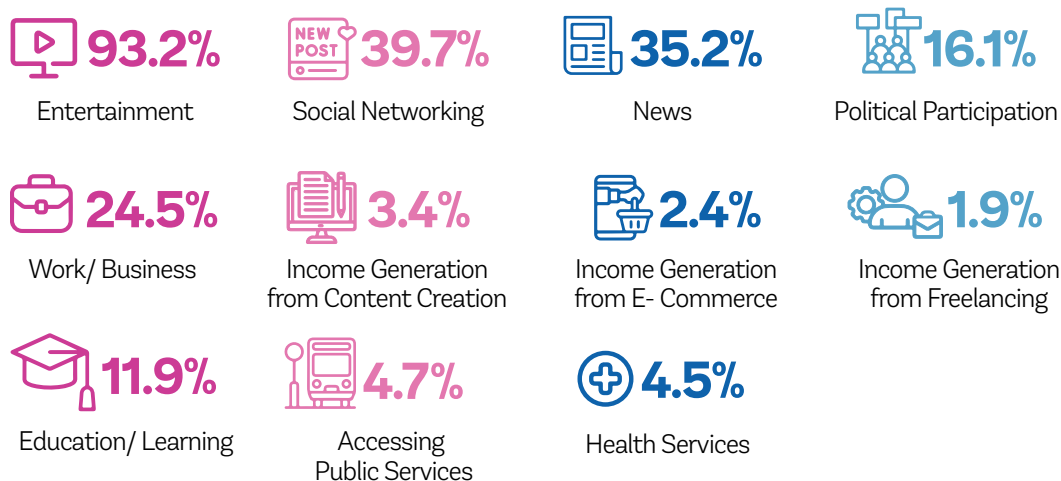
Purpose of Internet Usage

The landscape of internet usage in Pakistan is dominated by social media platforms. With a burgeoning population, particularly a youth demographic, social media has become an integral part of daily life. Facebook,

boasting a user base of about 50 million in the country²⁴, stands as the primary platform for personal connections, news consumption, and community engagement. Instagram, with its visually-driven content, appeals to the younger generation, fostering creativity and self-expression. X (formerly known as Twitter), known for real-time updates and public discourse, serves as a hub for news dissemination, activism, and conversations that influence public opinion.

Despite the transformative potential of the internet, the survey reveals that its full potential is unmet. Social media platforms like Facebook, Instagram, and TikTok are predominantly used for entertainment purposes by 93.2 per cent respondents. In comparison, work, or business notches 24.5 per cent usage; education or e-learning is given 11.9 per cent; and political participation or activism receives 16.1 per cent.

What explains such high subscription to entertainment through social media?

Figure 3.4 What Purposes Do You Use the Internet For?

Usage is highly subjective to users' preference. The vast majority of digital users spend their time on entertainment, and relatively far fewer avail online learning courses or conduct searches for knowledge and information. A search for why the internet is used predominantly for entertainment --

even where access allows a number of other uses -- leads to plausible explanations that signify the course of social transformation.

Studies around the world have identified a linkage between lower levels of educational attainment and greater time spent on

digital entertainment. Higher educational attainment corresponds with less time spent on the internet, and more diversified usage of websites and applications. There is also a correlation between lower levels of literacy and high consumption of digital content for entertainment²⁵. The increasing prevalence of smartphones makes entertainment easier, as smartphones come with simpler user interfaces that ensure convenience for users in accessing their desired applications, even without literacy.

High consumption of entertainment is also commonly seen in societies undergoing instability, strife, and conflict. Art assumes the form of cultural dialogue, representation, and resistance, appreciated for its aesthetic appeal and political wisdom²⁶. It also takes on 'softer' socio-cultural commentary as a counter to hard political analysis. In Pakistan's case, entertainment may be the obvious antidote to political uncertainty, economic crises, climatic change-induced as well as man-made disasters, and the resurgence of terrorism in parts of the country.

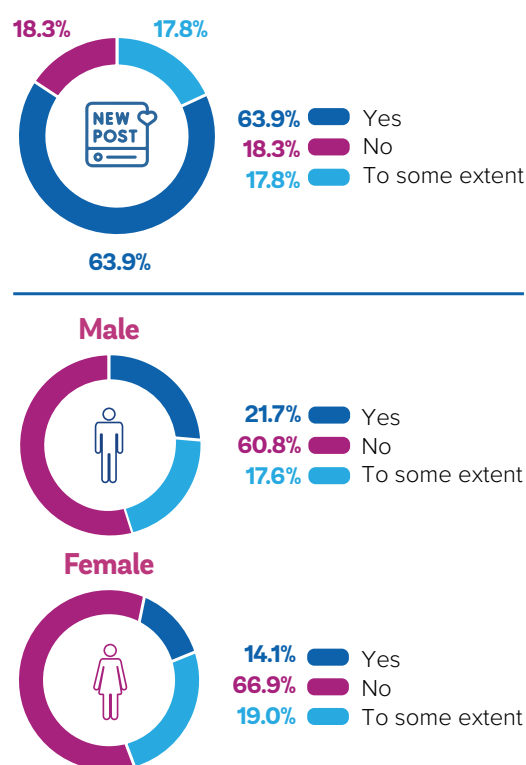
The 'flipside' of excessive social media consumption was pointed out in the NHDR 2023/2024's FGDs. In schools across the country, teachers pointed out that young people were absorbing problematic social attitudes through digital media, particularly adolescent boys who had had greater access to and regularly consumed content inappropriate for their age. They highlighted the prevalence of internet addiction among adolescent boys, observed through erratic academic performance, inclination towards anxiety, depression, and/or aggression.

Parents shared many of the same concerns as teachers, and stated that they did not understand digital technology as much, nor were they as adept at using digital devices as their children. The "moral crisis" confronting their children could not be resolved through prohibiting digital devices away or mistrust, they agreed. Instead, the digital age needed greater communication with children and

adolescents, and sharing a sense of ethics that could guide children in making ethical choices, and leveraging the many benefits of the internet.

Political Participation and Social Awareness

Figure 3.5 Do You Feel That Social Media Has Made You More Politically Active in Any Way?



While the majority of household respondents stated social media had no bearing on their political participation – only a minority of 17.8 per cent responded positively, and another 18.3 per cent stated “to some extent” – the majority of FGDs participants agreed that social media has impacted their political consciousness.

The paradox of political participation has been well documented in other contexts as well. Democratic backsliding is a global trend, and young people are evidently less engaged in local politics in both developing and developed countries. They have less faith in voting, political parties, public institutions,

mainstream media and the news; and in many cases, appear to be more attentive to global political developments than local politics²⁷. However, political disengagement must not be taken to mean lack of civic interest: citizens who appear “passive” can readily activate for demonstrations, social causes, and voicing their opinions in alternative forums²⁸.

With curbs on political rallies in the run up to Pakistan’s General Election 2024, there was extensive usage of digital tools to run alternative political campaigns, and generate social media commentary. This was delivered by Pakistan’s politically dynamic young people, who may not vote in large numbers, but whose dispositional interest in politics is unmistakable.

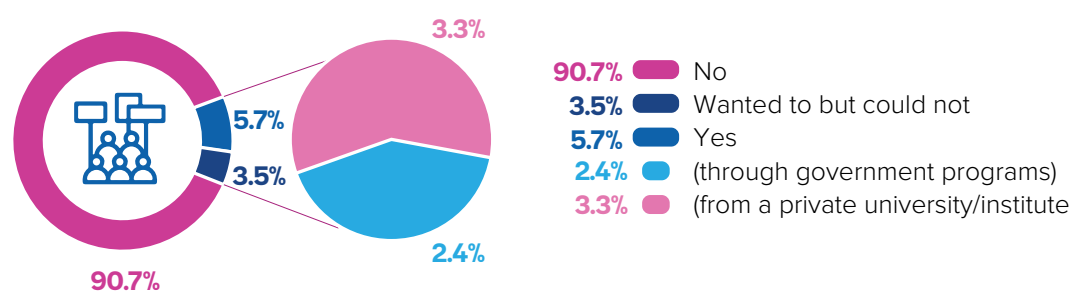
When questioned in the FGDs, many young participants shared that family WhatsApp groups are often ‘generational arenas’ for progressive or regressive debate. In a culture defined by social values of respect, and deference to elderly authority, voicing

alternate views on family groups comes with consequences, they shared. On the subject of fake news, it was evident that many older users were not digitally fluent; they could not discern AI-generated images, doctored images, or fake news, which are routine in contemporary public discourse.

Women participants shared that digital connectivity had enabled far better knowledge of community wellbeing, and it was easier to assist each other through social networks. Marginalized groups like the transgender community stated that digital platforms had not only created greater awareness about their challenges, but also mobilized help for them. Religious minority representatives shared that social media had deepened their identity markers, which they consciously tried to underplay to not attract attention from extremists. They, too, had received support and solidarity through social media, but online attacks against them had gone up manifold.

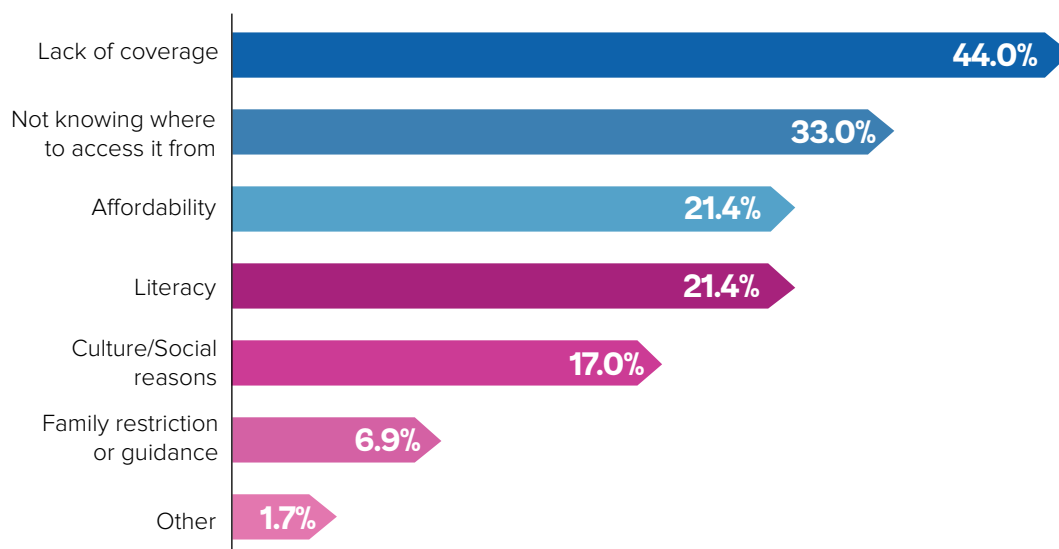
Less Uptake of Online Services

Figure 3.6 Have You Ever Taken Any Online Courses/E-Learning?



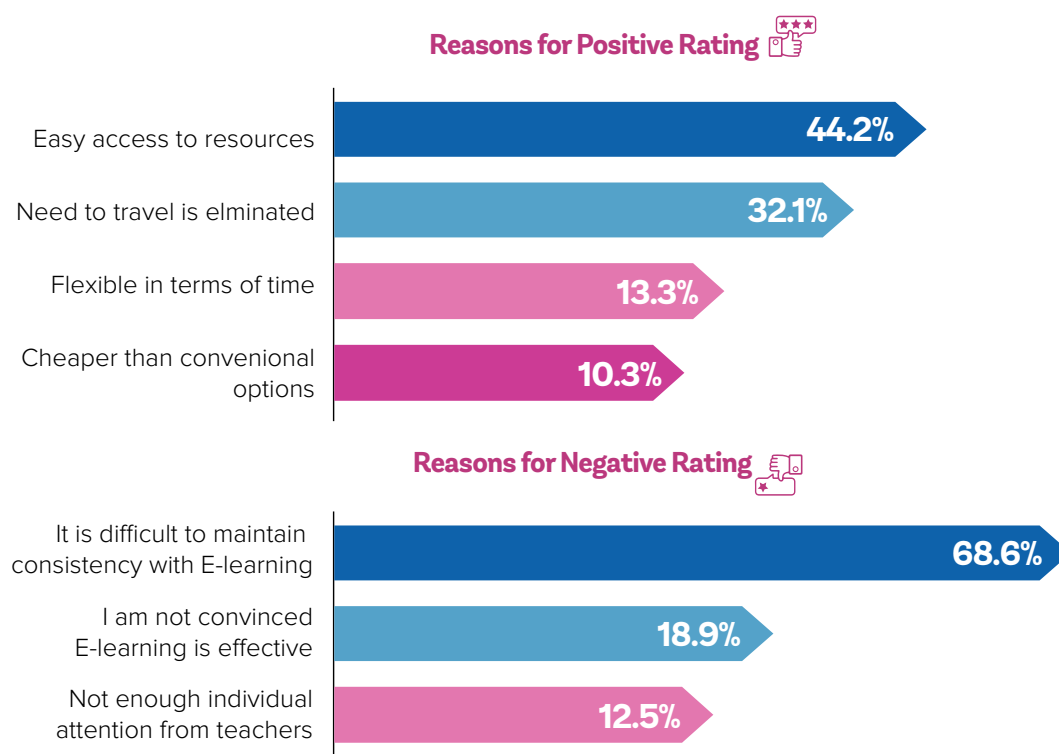
The NHDR 2023/2024’s household survey revealed that only 9.2 per cent respondents were keen on availing online courses, education or training. Out of the 9.2 per cent who expressed an interest in e-learning or online courses, 3.3 per cent had pursued it privately; 2.4 per cent pursued it through government programs; and 3.5 per cent were unable to pursue it due to the barriers they faced. When asked to identify the barriers that prevented them from pursuing e-learning,

the respondents’ cited lack of access, lack of awareness/information, and social barriers. While the lack of internet coverage (44.0 per cent) was the most commonly cited barrier, the second largest proportion of respondents (33 per cent) said they were unable to pursue e-learning because they did not know where to access it from. The latter group is significant because they are knowledgeable about e-learning and its potential benefits, but unaware of the options available to them.

Figure 3.7 Barriers to Pursuing E-Learning

Most respondents (75.3 per cent) positively rated their e-learning experience, citing ease of access to teachers and resources as the biggest advantage (44.2 per cent), followed by no need for travel (32.1 per cent). Those

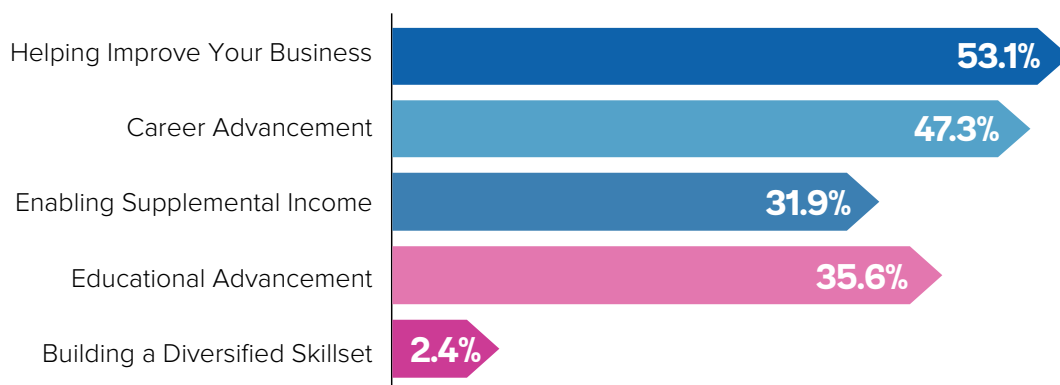
who rated negatively (2.2 per cent) felt the main reason for it was difficulty maintaining consistency (68.6 per cent), and that e-learning was ineffective (18.9 per cent).

Figure 3.8 Reasons for Positive Rating and Negative Rating

Respondents who expressed a positive opinion regarding their e-learning were further probed about ways in which online learning had improved their lives, as a way to gauge the demographics of e-learners and

their underlying motivations. The prevalence of responses centered around livelihoods and income growth suggests a substantial portion of e-learners comprise of working professionals and entrepreneurs.

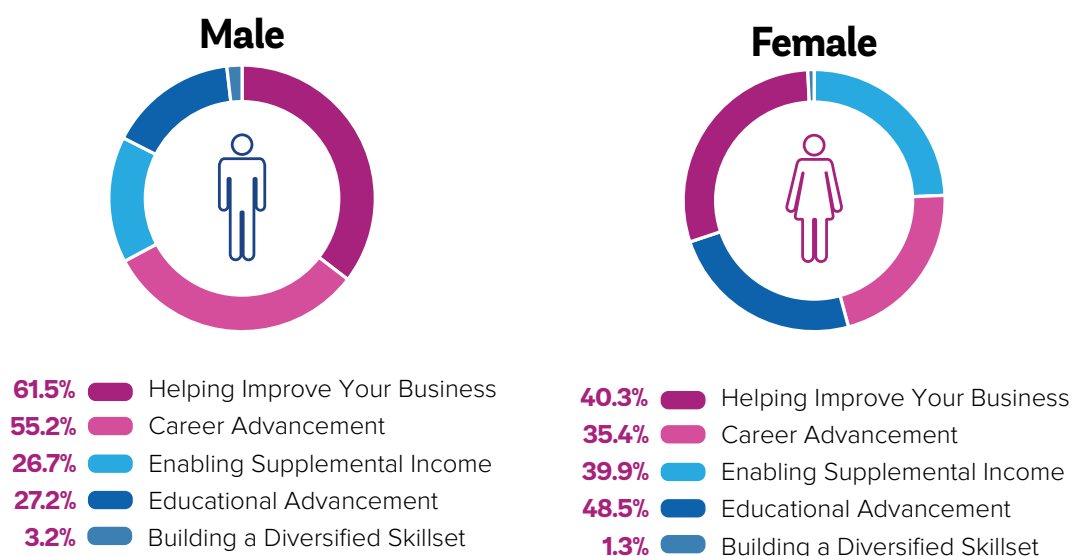
Figure 3.9 Ways in which Online Learning Benefited



There were also subtle differences in how men and women utilized e-learning. Male respondents were generally more likely to report that e-learning helped them improve their businesses or advance in their careers; whereas, female respondents cited an

improvement in supplementary income. Furthermore, female respondents showed a greater interest in using e-learning for educational goals, being almost twice as likely as males to identify educational advancement as the benefit of their experience.

Figure 3.10 How Has Your E-learning Benefitted You?



Respondents were also asked to specify any particular skills or digital tools they use in their line of work. The top skills cited included: marketing, e-commerce, and content creation.

In contrast, harder skills like data analyses, visualization, graphic design, and coding are further down the list.

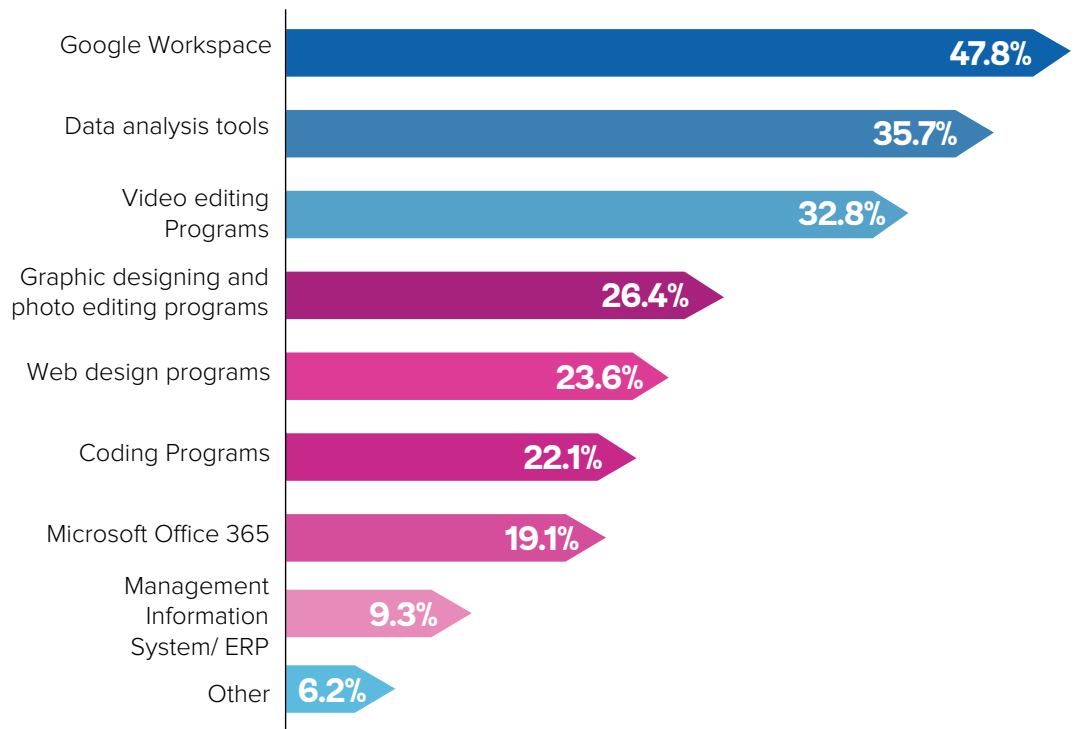
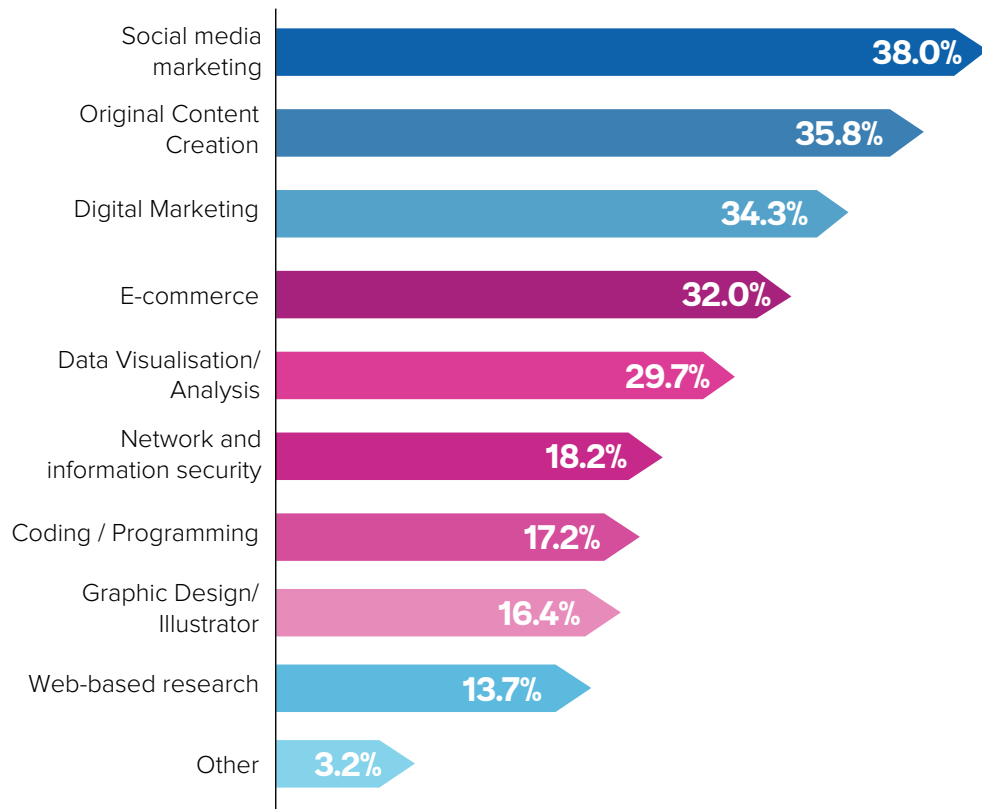
Figure 3.11 Which Digital Skills Are Required in Your Workplace/Profession?

Figure 3.12 Have Any of Your Household Members Ever Availed Tele-Health Facilities?

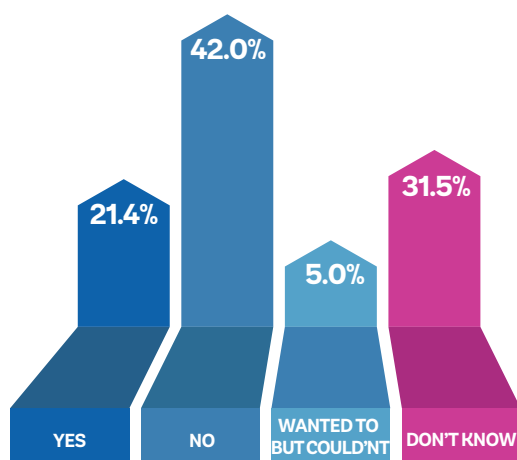
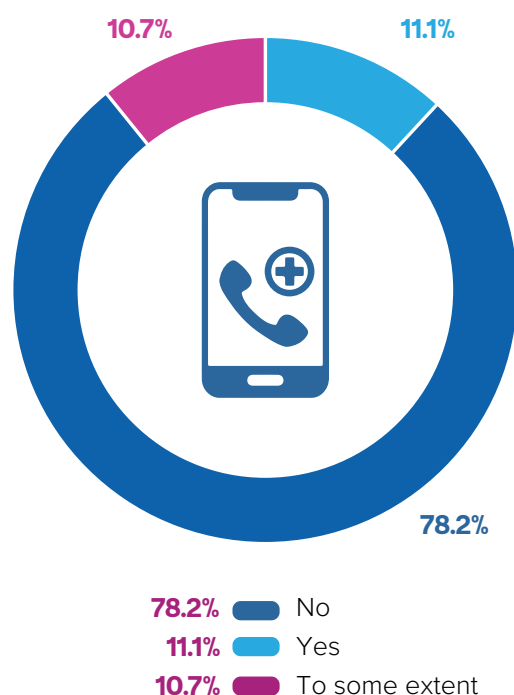


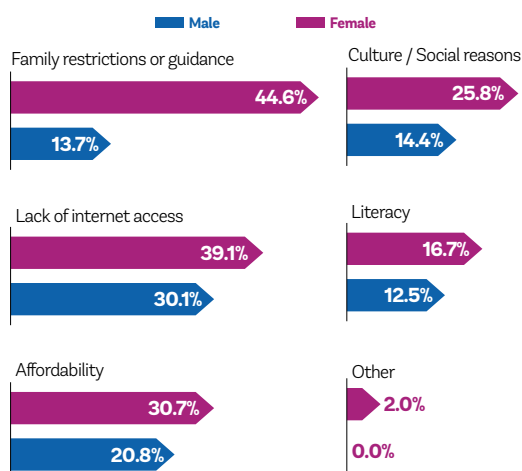
Figure 3.13 Are you Aware of How to Avail Telehealth Facilities?



For tele-health, respondents' uptake was low. Only 11.1 per cent respondents were aware of how to avail tele-health facilities; whereas, another 10.7 per cent were aware to some extent. Out of the respondents who felt they were (to some extent) able to avail tele-health services, only 21.4 per cent had done so; whereas, the proportion of respondents who could not do so was very low (5.0 per cent).

When combined, these figures strengthen the assumption that low utilization of such facilities is more due to lack of awareness than access.

Figure 3.14 Barriers to Availing Telehealth by Gender?



The respondents who expressed an interest in using tele-health services, but could not, were asked to identify the barriers they faced. Apart from physical accessibility, social barriers formed the most frequent inhibitor. For women, family restrictions was the most serious barrier in availing telehealth (44.6 per cent). Male respondents, on the other hand, were far less likely to identify family restrictions as a barrier, but cited each of the other reasons.

E-Commerce, Mobile Wallets, Crypto Currencies

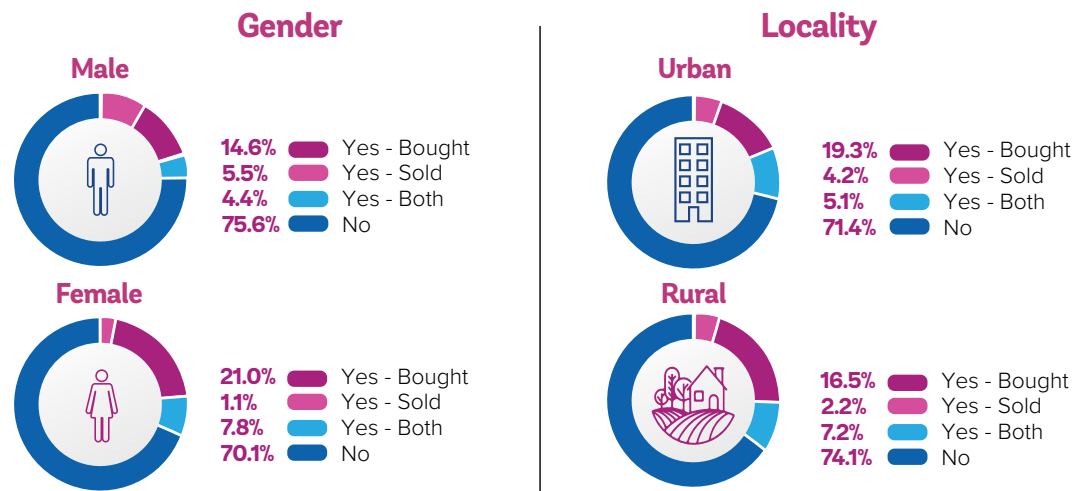
The NHDR 2023/2024 survey sheds light on the significant growth of the e-commerce sector in Pakistan, whose predicted revenue was above \$8 billion in 2023, making it the 51st largest market for e-commerce²⁹. The e-commerce sector in Pakistan has witnessed a remarkable surge, driven by the convenience of online shopping and the expansive variety of products available. Leading platforms like Daraz, Telemart, and AliExpress have become household names. Mobile wallets and digital payment systems facilitate seamless transactions, contributing

to the overall growth of the e-commerce ecosystem. The ease of browsing and purchasing through dedicated mobile apps has further fueled the adoption of online shopping habits among consumers.

However, only 27.2 per cent of respondents reported ever using online shopping platforms. This discrepancy suggests that, despite the substantial market size, the

e-commerce industry relies on a modestly sized consumer base, leaving a considerable portion untapped. This confirms a larger slowdown experienced in e-commerce since 2022, due to inflationary pressures that have kept sales down. Pakistan's e-commerce-to-GDP ratio stands at 1.63 per cent, lower than Bangladesh and Egypt³⁰.

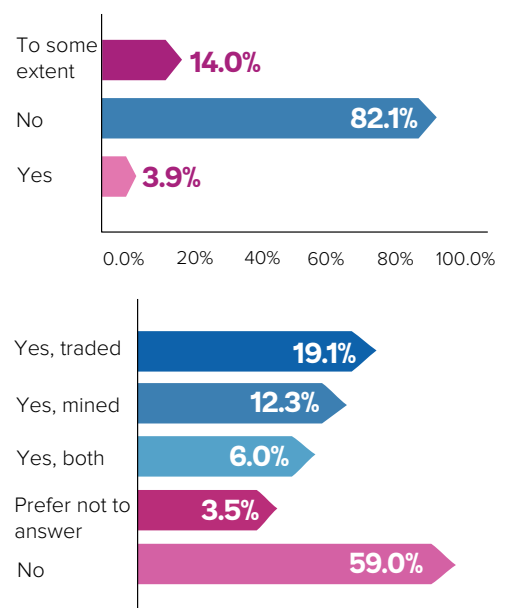
Figure 3.15 Have You Ever Used Online Shopping Platforms?



Factors such as smartphone ownership and internet usage indicate a notable portion of the population that could engage in online shopping but does not, presenting opportunities for industry expansion. In the Pakistani retail market, the online share of e-commerce is currently 2.9 per cent. It will steadily rise by an average between 0.5-3.0 per cent by 2027, and is projected to surpass market volumes of \$10 billion by 2027³¹.

The NHDR 2023/2024 survey also delved into users' awareness and engagement with crypto currencies in Pakistan. The landscape of crypto currency adoption is intricate, with only a modest 3.9 per cent of respondents demonstrating confidence in their understanding of crypto currencies. A substantial 82.1 per cent remain oblivious to this emerging technology.

Figure 3.16 Do You Know About Cryptocurrencies? If Yes, Have You Ever Traded or Mined Cryptocurrency?



Despite the pervasive lack of awareness, a fascinating trend surfaces among those familiar with crypto currencies: 37.4 per cent actively engage with the technology through trading, mining, or a combination of both. This signifies that even in the face of barriers to entry – such as the requisite digital financial services for trading or powerful computer resources for mining – a noteworthy 40 per cent of those possessing knowledge about crypto currencies have managed to participate.

This trend hints at an underlying resilience and interest in crypto activities among economically engaged cohorts in Pakistan, suggesting untapped opportunities for educational initiatives, infrastructure development, and broader integration of crypto currencies into financial systems. As awareness increases and barriers diminish, there is promising potential for greater uptake of crypto currency-related activities that enable greater financial inclusion.

BOX 3.2 What is Crypto Currency?

Cryptocurrencies are digital or virtual currencies that utilize cryptographic techniques for secure transactions and operate on decentralized networks – such as blockchain – without the need for intermediaries like banks, providing a peer-to-peer method of value exchange. Despite several temporary bans on crypto currency exchanges in Pakistan, the trading volume of crypto currencies exchanged by Pakistanis increased to \$25 billion in 2023 (Binance). Experts have suggested that Pakistanis have been using crypto currencies as a hedge against the massive devaluation of the Pakistani Rupee. Exchange platforms like Binance have established a substantial presence in Pakistan, and the country now ranks 8th on the Global Crypto Adoption Index, ahead of economic giants China, Russia and the United Kingdom³².

In Pakistan, the adoption of digital financial tools has occurred largely through the widespread use of mobile wallets. This is readily apparent in the fact that out of the 39.4 per cent of survey respondents who said they use online banking or mobile wallets, 98.2 per cent confirmed that they use mobile wallets as either a primary or secondary account. Conversely, this means that only the remaining 1.8 per cent used online banking exclusively. Notably, geographical location and gender did not have any significant impact on respondents' usage of online banking or mobile wallets.

Figure 3.17 Do You Use Mobile Wallets?

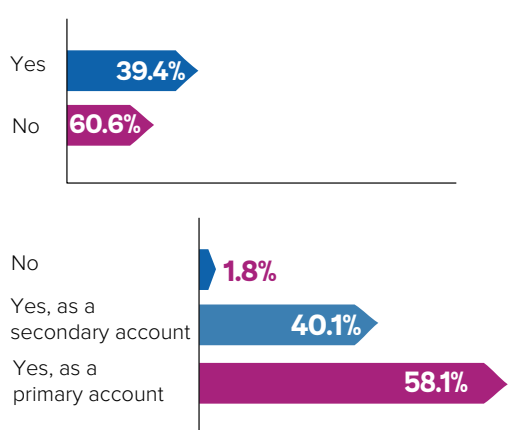
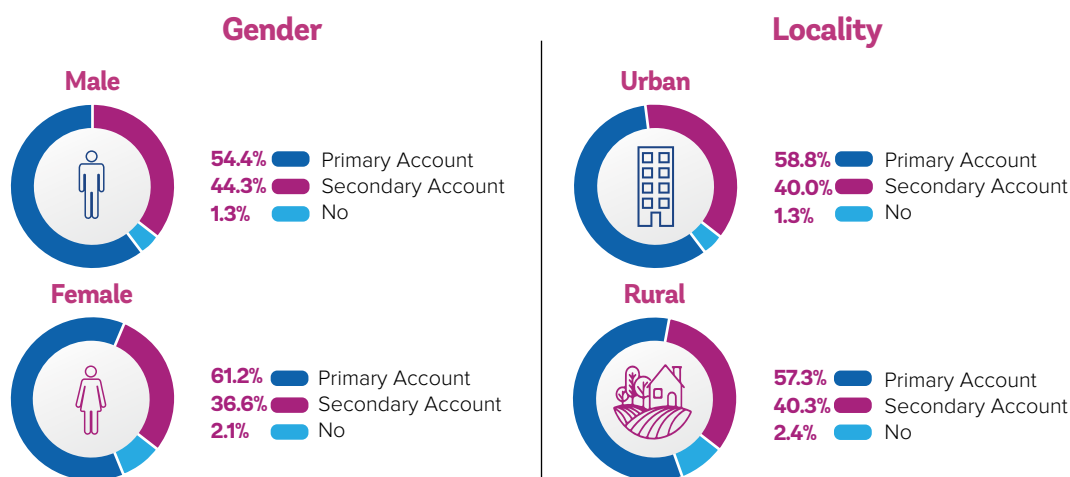
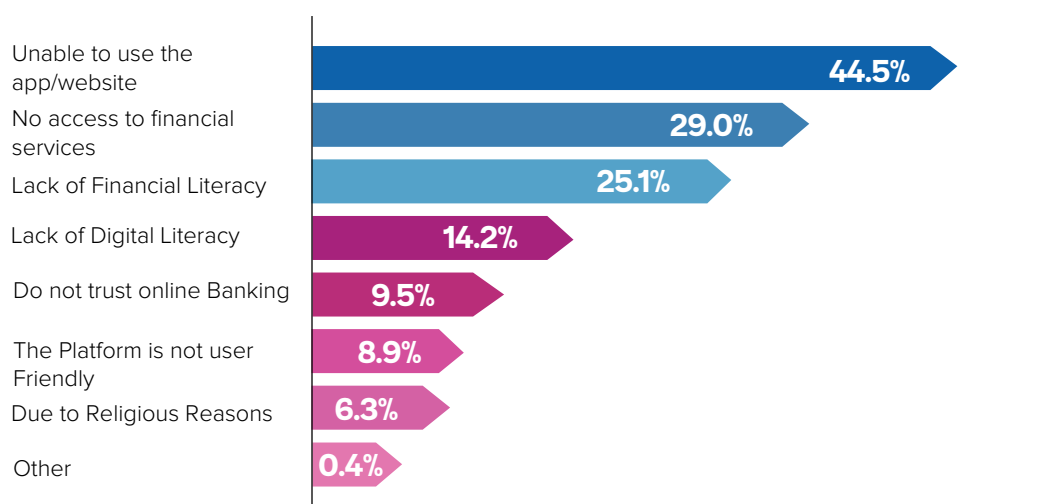


Figure 3.18 Use of Mobile Wallets by Gender and Locality

However, as shown in the Figure 3.18, female and rural respondents were slightly more likely to use mobile wallets as their primary accounts than their male or urban counterparts. Further evidence of mobile wallets in providing financial access is found in the large proportion (58.1 per cent) of respondents who felt that their mobile wallet is their primary bank account, and present a clear opportunity for financial inclusion.

When asked about the barriers they faced in accessing digital financial services, the most apparent issue for the largest portion of respondents was that of access. While 44.5 per cent were unable to use digital platforms, another 29 per cent struggled to access the platforms' services. Respondents also cited personal inability due to financial literacy (25.1 per cent) or digital literacy (14.2 per cent). Socio-cultural constraints and religious preferences also inhibited usage of mobile wallets.

Figure 3.19 Reasons for not Using Mobile Wallet Services

What Prevents Access and How Can it be Overcome?

Harnessing the digital revolution needs better scrutiny of how digital technologies are brought to use in Pakistan. The above assessment of usage patterns provide the following key conclusions:

1. *Access is an equalizer, but enabling equity in access requires structural fixes in policy and implementation.*

These include provision of digital infrastructure in deficient regions, better pricing for fixed broadband, and affordable digital devices. Digital infrastructure remains the fundamental stumbling block to internet access and comprises of physical hardware and software-based technologies that enable digital services, through IT systems and networks³³. Outside major urban centers, internet availability is challenged for lack of adequate infrastructure. Irregular connectivity impedes work, education, and governance through most districts of Pakistan. All of this compels supply side overhauls by federal and provincial governments, duly recognizing how digital access can under-deliver entitlements, like healthcare and education. It also requires incentivizing private sector telcos that hold large market shares to improve and broaden services in under-served areas. This will bridge Pakistan's digital penetration challenge, and enable human development outcomes simultaneously.

2. *Affordability of mobile devices is a major challenge for almost half the population.*

Digital benefits cannot be harnessed until smartphones become more commonly used by Pakistani users. Across the vast under-developed landscape of the country, communities have subscribed in high numbers to mobile

services as a vital linkage for survival and prosperity. Mobile subscription rates are low, making it affordable for most users to communicate. At the same time, smart phones remain out of usage for almost half the country. Hence, the best advantages of the internet are out of reach for millions of people across Pakistan. Until smartphones and other digital devices become affordable for a greater number of users, the digital divide will persist and exacerbate, risking half the population to be left behind.

3. *Access does not always translate into usage.*

The NHDR 2023/2024 survey respondents cited a number of barriers to usage and digital fluency, including inadequate skills ("I find it difficult to operate my phone"); socio-cultural barriers ("my parents monitor what I see on the internet"); and fear of privacy and security breaches ("they will steal my personal information"). Beyond physical access, there is a second level digital divide that holds back users from utilizing the devices they possess. This could be seen in voluntary limitation or avoidance of technology more prevalent among older and less informed users, based on fears of inadvertent disclosure on social media, surveillance, banking hacks or that "something will go wrong". Users also cited fear of 5th Generation mobile network (commonly known as 5G technology) or AI, often based on disinformation prevalent in public discourse, and lacking substantive knowledge of its effects. On the other hand, involuntary limitation in usage exists because of lack of digital skills, or inoperability between digital interfaces, which bars millions of users from scaling up usage.

4. Internet usage has unleashed socio-political stressors that need considered interventions.

Among contemporary socio-political dynamics propelled by digital technology, respondents identified widely prevalent Problematic Internet Use (PIU) among adolescents, especially boys. PIU behaviors ranged from internet addiction, to unchecked consumption of adult content, to violence normalized through video games, as reported by parents and teachers. Both cohorts felt that young people needed counseling support where internet addiction had resulted in depression, isolation, and high-risk behavior. Social media has made religious minorities more vulnerable to attacks and discrimination, as highlighted by minority representatives. Social media has afforded ample space for right-wing groups and ideologies to proliferate, and religious minorities are among their usual targets. Minority groups feel their religious identities are “reinforced through daily reminders” of their otherness, and they can neither profess nor propagate their faith online, let alone engage in online debate for fear of being attacked³⁴.

5. Enhancing Digital Literacy and Inclusion.

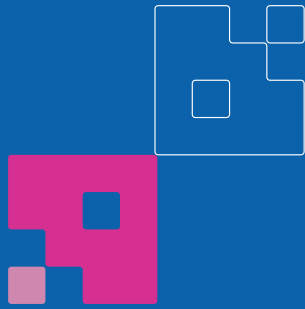
The COVID-19 pandemic has underscored the critical need for digital literacy and inclusion, particularly

in Pakistan’s educational sector. Challenges in internet access and ICT skills among university teachers and students have highlighted the digital divide, exacerbating educational crises. To address this, Pakistan must invest in extensive digital literacy programs targeting both educators and students across all levels. These programs should focus on equipping individuals with necessary ICT skills, promoting online safety, and ethical digital engagement. By improving digital literacy, Pakistan can ensure that its citizens are prepared to navigate and utilize digital platforms effectively, thus mitigating the impact of future crises on education and other critical sectors³⁵.

6. Expanding Digital Infrastructure via International Collaboration.

Leverage international partnerships to bolster digital infrastructure development in Pakistan. This approach should focus on comprehensive ICT development, including broadband connectivity, digital literacy programs, and support for ICT-based innovations. Such collaborations can serve as a catalyst for digital transformation, contributing to economic growth and enhanced service delivery across the country³⁶.



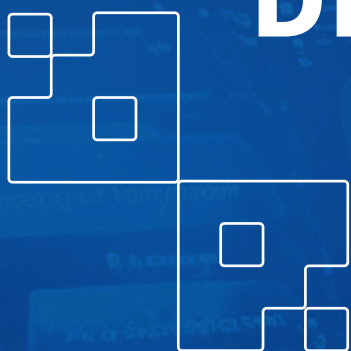


Section IV

Adopt: Harnessing the Gains of Access



PAKISTAN'S DIGITAL POLICY MILESTONES*



* This is not an exhaustive list and represents the major digital transformation policies in Pakistan.



1947
**Radio
Pakistan**
Formed



1947

Pakistan Department of Post and Telegraph was established with 12,436 telephone lines



2021

National Cyber Security Policy

Launched to secure the entire cyberspace of Pakistan including all digital assets and data .

2020

Pakistan Right of Way Policy

Removes hurdles for telecommunication infrastructure extension in Pakistan.

2021

National Broadband Policy
Accelerates digital inclusion by aiming to provide universal access to high-speed affordable internet.

**20
21**



Balochistan Digital IT Policy launched

1991

Pakistan Telecommunications Corporation (PTC) established



1993

Dial-up internet and email services come to Pakistan



Pakistan Telecommunication Ordinance establishes PTA as a regulatory authority. State-owned Pakistan Telecommunications Company Ltd. PTCL established as telephone and internet service provider.

1994

2018

Punjab IT Policy launched

Punjab IT policy, envisions Punjab as one of the top e-Governed, IT-enabled, e-Literate provinces in the region.

KP IT Policy Launched

KP releases its provincial Digital Policy aimed to make the province a national technology hub.

Ignite launches National Incubation Center in Quetta and Karachi

2017

2018



Ministry Of Information Technology & Telecommunication

MoiTT launches Digital Pakistan Policy

Digital strategy with a focus on emerging technology, entrepreneurship, innovation and youth.

Ignite launches largest online digital skills programme for youth reaching 300,000



2022

Sindh Digital Technology Board established



2022



Ignite launches National Incubation Center in Hyderabad, Faisalabad

State Bank of Pakistan rolled out Raast to make real-time payments



Broadband arrives in Pakistan

1995

1996



MolTT introduces Pakistan Telecommunication (Re-organisation) Act

PTC dissolved

Pakistan Telecommunication Authority Established as a regulatory body

National IT Board (NITB) established to implement National IT policy

National telecommunication Corporation established to provide telecommunication services and infrastructure to government and private sector

Punjab Information Technology Board established

1999



Ignite launches the first National Incubation Centre in Lahore and Peshawar

Ignite - National Technology Fund setup

The National Information Communications Technology Research and Development Fund, Ignite, under Telecommunications Policy launched to support digital skills, new technology and tech startups.



2016

2016

Ignite launches the first National Incubation Centre in Islamabad



National Incubation Center



2022

National Data Protection Regulations policy sets framework for data protection and privacy in Pakistan by MolTT

Cloud First Policy MolTT MolTT moves government services to the cloud



2024

NADRA launches National Digital Wallet.





1999

2nd Generation mobile technology introduced by Mobilink

2000

National IT Policy and Action Plan launched to increase private sector IT growth



2000

National Database & Registration Authority (NADRA) formed



2003

Deregulation Policy for the Telecommunication Sector

PTCL privatised to stimulate infrastructure growth, private sector and local telecom services.

2015

Telecommunications Policy

First holistic piece of legislation to harness Pakistan's digital ecosystem.

2016

The Prevention of Electronic Crimes Act 2016 (PECA)

PTA to regulate digital content.



Ministry of Planning launches Pakistan Vision 2025 recognising digitalisation is critical to human development and the SDGs

Introduction of mobile broadband including 3G and 4G

2014

2024



PTA launches the Digital Gender Inclusion Strategy

2004

Mobile Cellular Policy and broadband policy launched

regulating mobile and broadband services at affordable rates



Universal Service Fund established

Providing internet and telecommunication services to the underserved.

2006

2012

NADRA introduces computerized Smart National Identity Cards (SNIC)



2011

Khyber Pakhtunkhwa Information Technology Board established



The previous section on Access describes the baseline of digital ownership, and users' consumption patterns as gleaned from the NHDR 2023/2024 survey. It shows that mobile penetration is near universal in Pakistan, owing to inexpensive call rates, and availability of basic phones. Access includes physical ownership or usage of hardware and software, as well as digital fluency that makes it possible to utilize technology.

A major challenge in Pakistan is the “second level digital divide” that comes with the inability to optimally and gainfully use digital technologies, despite having access. Hence, the second of the 4As is Adopt, which realizes the actual power of digital transformation, whereby gains channeled through primary access and voluntary uptake convert into multipliers that benefit households, businesses, and public institutions.

For the purpose of digital transformation as defined in this Report, ‘adopt’ denotes a targeted increment of digital capacity built within public and private institutions, procedures, and among people. This transition is substantive, and entails material

and non-material upgrades of infrastructure and skills alike. To adopt is to trust the usage of technology, and scale its application with knowledge of its processes, software, hardware, and outcomes.

Adoption of digital technology is currently transforming the global economy and society. In Pakistan, the segments of society that have digitally integrated and adopted are already experiencing multipliers in productivity, prosperity, and development, including institutions in the public sector that have undertaken digital upgrades.

Multiple models of success are evolving in Pakistan that cover a broad and diverse sectoral spectrum – ranging from telehealth to forest management where digital adoption has been ongoing since a decade at least. However, the transition from access to adopt is not a linear one. Like human development, the pathways to digitalization in the country are subject to redundancy and reversal. Some sectors may digitalize faster than others, but never independent of the prevailing country context and the socio-economic, governance, climatic, and cultural dynamics therein.

Adoption Parameters and Differentiation from Access

While digital access addresses the foundational elements of technological availability, infrastructure, and affordability, digital adoption delves into how effectively these technologies are utilized, integrated, and embraced by individuals and organizations. Digital adoption involves a more active and engaged use of digital tools, services, and platforms. Key adoption parameters include:

- **Usage and Integration:** The extent to which individuals or organizations use digital tools and integrate them into their daily activities and business processes.
- **Training and Education:** The provision of training programs and educational resources to enhance the understanding and proficiency in using digital technologies.
- **User Experience:** The ease of use and overall user experience of digital platforms and applications.
- **Organizational Culture:** The willingness and ability of organizations to embrace and incorporate digital technologies into their culture and operations.

Adoption for Development: Government, the Private Sector, and the People

In the context of human development, the adoption of digital technology will enable

people to acquire skills and education relevant to contemporary job markets¹;

reduce healthcare inequities and enable universal health coverage²; and improve living standards through diversified sources of income³. There is evidence from within Pakistan and around the world demonstrating the positive impact of digital technology on these major indicators of human development.

For meaningful adoption to come about, the public sector must commit itself to comprehensive digitalization, and level the policy field for private sector actors to innovate digital models. The Government of Pakistan has unmatched power to set multipliers in motion, given that its share in the economy stands at an estimated 43 per cent through 200 state-owned-enterprises (SOEs) in every sector, from agriculture to services⁴. Digitalization has been undertaken in public sector institutions, but remains very uneven after several years, as this Report finds.

The private sector recognizes the benefits of digitalization for increased profits, efficiency

and outreach. Less encumbered by the acquisition and usage of digital technology compared to the government, there is a higher degree of adoption within the private sector institutions and bodies. But here, too, there are challenges on account of sustained usage and high-cost upgradation. Other challenges include frequent internet shutdowns in Pakistan that cost daily losses in millions of rupees to private businesses, which badly impact the labor dependent on app-based livelihoods.

The third and most important constituent in digital adoption are people, who benefit from digitalized government, as well as public facilitation for digital access and adoption. They gain from a digitalizing economy, and digital commercial platforms made available by businesses. Digital adoption by people for themselves means honing digital competencies, as well as the necessary attitude, skills, knowledge and values⁵ to partake in a digital future.

Governance, Stakeholders, and Policy Instruments

“We all know what needs to be done. It has been documented more than once over the years. Let me spell it out. Fast and affordable, uninterrupted access to connectivity across the country is key. Digitize all government services — inter-ministerial and government to citizen. Complete access to our digital identity for personal and business use — this means NADRA has to be more effective. The right policies to ensure that citizen data that is collected is secure and is owned, controlled and updated by the citizen. And the ability to make digital payments in a simple and affordable manner. That is it! It is as simple or as complicated as that. Now let us go do it!”⁶

Jehan Ara

Former President PASHA &
Founder Katalyst Labs

Pakistan has demonstrated a commitment to digital transformation through key policy instruments, yet the deficits in digital uptake are a consequence of attitudinal and learning challenges, incomplete digitalization, as well as lingering policy roadblocks that prevent a digital takeoff for the platform economy. With a continuously improving Information Communications Technology (ICT) infrastructure and innovative ecosystem, the country has laid the groundwork for a digital economy. Pakistan is still in its early stages of digital transformation and not yet close to closing the digital divide.

Digitalization in Pakistan is primarily governed by the Ministry of Information Technology and Telecommunications (MoITT). The Ministry is responsible for formulating policies, laws, and regulations related to the use and development of digital technologies in the country. The main institutions that support the Ministry in its work include the Pakistan Telecommunication Authority (PTA), the National IT Board (NITB), the National Telecommunication Corporation (NTC), and the National Database and Registration Authority (NADRA).

- **PTA** is responsible for regulating the telecommunications sector in Pakistan. It oversees the licensing and operations of telecommunications companies and ensures their compliance with laws and regulations. It also plays a role in the development of the telecommunications infrastructure in the country.
- **NITB** is responsible for the implementation of the National IT Policy, which aims to promote the use of digital technologies in the country. It works to promote the development of the IT industry, increase the use of digital technologies in government and private sectors, and increase access to digital technologies for citizens.
- **NTC** is a public sector organization that provides telecommunications

services to government and private sector organizations. It is responsible for the maintenance and management of the national telecommunications infrastructure, including the development and deployment of new technologies.

- **NADRA:** The basis for any country to become successful in its digital transformation agenda is to digitize its identity system. The NADRA is an international frontrunner in digital governance and Pakistan's biggest success. NADRA⁷ was established as a National Database Organization (NDO) under the Ministry of Interior, Government of Pakistan in 1998. In March 2000, NDO and Directorate General of Registration (DGR) merged to form NADRA, which is an independent corporate body that delivered the revolutionary Computerized National Identity Card (CNIC). NADRA has developed one of the world's largest multi-biometric national identity databases with more than 200 million registrations and 1.3 billion fingerprints⁸. The government has implemented various data collection programs, including biometric data collection and registration schemes. However, there are concerns that these programs violate citizens' privacy and civil liberties, with little transparency or oversight over how this data is collected and used.

A non-exhaustive list of Government of Pakistan's major technological and digitalization policy milestones include:

- **The Pakistan Telecommunication (Re-organization) Act, 1996:** Efforts to develop a fully competitive market in the telecom sector were initiated in the early 1990s. The Ministry of Information Technology IT & Telecommunication (MoITT) introduced major changes in 1996 under the Pakistan Telecommunication (Re-organization) Act. The PTC was dissolved and the

Pakistan Telecommunication Authority (PTA) was established to regulate the telecom industry, protect consumer rights, and ensure fair competition. The National Telecommunication Corporation (NTC) was also established to provide telecommunication services to Federal and Provincial Governments.

■ **De-Regulation Policy for the Telecommunications Sector, 2003:**

The telecommunication industry boomed after deregulation of the telecommunications sector in 2003. The MoITT passed the De-Regulation Policy for the Telecommunications Sector in July 2003⁹. These regulations were aimed to stimulate infrastructure growth, private investment, and local telecom services¹⁰. Pakistan Telecommunication Company Limit (PTCL), Pakistan's first and oldest telecommunications company and previously a state-owned monopoly, was privatized as a result of this act and it became a major player in providing telecommunications technology and digital infrastructure. The policy aims to increase service choices for customers at affordable and competitive rates, promote infrastructure development, and increase private sector investment in the sector.

■ **Mobile Cellular Policy 2004¹¹ and Broadband Policy 2004¹²:**

Together these policies regulate mobile and broadband services at affordable rates, provide competitive choice of services for consumers, and encourage private sector investment.

■ **Pakistan Vision 2025, 2014:**

Although not part of the policies released by the MoITT, the Ministry of Planning, Development & Special Initiatives (MoPD&SI) led the design of the government's main social and development policy document, Pakistan Vision 2025, prepared in 2014. The document serves as a basis to

achieve Pakistan's development goals. It recognizes the importance of digital technologies for improving human development outcomes, as it envisions increasing access to digital services and infrastructure, developing a digital economy, using digital technology to improve the delivery of health and government services, enhancing digital skills, and ensuring data security and privacy. At a policy level, the government recognizes that digitalization is critical to human development and achieving the SDGs.

■ **The Telecommunications Policy, 2015¹³:**

This is the first holistic piece of legislation that seeks to govern the digital ecosystem in Pakistan. The policy sets the framework for the development and implementation of information technology in the country. It focuses on new technology by cultivating a space for entrepreneurship and innovation through the National ICT R&D Fund to support research and development in the field of information and communication technology. The National ICT R&D fund is mandated to fund start-ups, small businesses, and research on new technology. The policy also focuses on the National ICT Skills Development Strategy, developing skills and talent needed to support the digital economy, including training programs and scholarships for students and professionals.

■ **The National ICT R&D Fund:**

Culminated to become a public-private fund by the name of Ignite National Technology Fund set up in 2016. Since 2016, Ignite has launched seven National Incubation Centers (NICs) through public-private partnerships, in Islamabad, Lahore, Peshawar, Karachi, Quetta, Hyderabad, and Faisalabad. These NICs provide dedicated spaces for youth to be given digital and entrepreneurship training and linking them to investors in the ecosystem¹⁴.

According to Ignite¹⁵, more than 1,150 startups have been incubated, creating over 117,000 direct and indirect jobs, raising Rs. 15.4 billion (\$55.2 million) in funding, and generating revenue of Rs. 9.1 billion (\$32.6 million). Pakistan's youth-led digital entrepreneurship ecosystem has since seen a boom, but issues regarding heavy compliance regulations to set up new businesses, especially start-ups by youth and young women continues to stifle its growth.

- **Universal Service Fund Policy (USF):**

The policy also focuses on bridging the digital divide for the most vulnerable. It established the USF to provide rural, remote and underserved areas with telecommunication and broadband access. USF has launched several projects to increase broadband penetration. They have installed more than 3,000 towers and provided 498,000 broadband connections¹⁶.

- **Digital Pakistan Policy, 2018:** This is a more holistic digital strategy, with a bolder focus on emerging technology, entrepreneurship, innovation, and youth. The policy¹⁷ is aligned to the SDGs, and like previous policies, it aims to invest in digital infrastructure, promoting technology access across social sectors, including health and education. There is a focus on youth, women, and girls to reduce inequality and the need to provide them with training in digital skills. The policy also aims to enable ease-of-doing business and increasing entrepreneurship by further investing in incubators and accelerator programs. The policy makes explicit mentions to developing R&D and investment around new technologies such as FinTech, Artificial Intelligence, Internet of Things, and Robotics. The Policy also aims to boost software exports, freelance and IT industry. It

addresses the digital divide, urban and rural, gender and those with disabilities. It calls for development of IT zones and software technology parks in major cities, and investments in R&D to improve innovation and digitization by setting up telecentres in underserved and unserved areas of Pakistan, for ease of access to ICT services. As part of the Digital Policy, 2018, Ignite funded the government's largest online free digital skills program¹⁸. The program has conducted more 3.5 million trainings since 2018, offering 1 million e-certificates, of which 27 per cent beneficiaries are female. They offer graphic design, data analytics, and e-commerce courses. However, trainings on emerging technology, such as AI, is missing from the program.

- **Digital Pakistan Vision, 2019:** The government added this vision document to its 2018 Digital Pakistan Policy to enhance connectivity, improve digital infrastructure, increase investments in digital skills, and promote innovation and technological entrepreneurship. In 2020, MoITT added software development and its application.

- **The Prevention of Electronic Crimes Act, 2016, (PECA) and The Cyber Crime Bill, 2019:** The PECA and the Cyber Crime Bill 2019 is aimed for protection of citizens and security. The Cyber Crimes bill sets out the framework for protecting Pakistan's cyberspace, including the establishment of a national cyber incident response center and the development of cybersecurity regulations and guidelines. PECA is the most concerning bill for human rights agencies as it gives PTA broad powers to censor content at its discretion. In 2021, policies went further with Blocking of Unlawful Online Content (Procedure, Oversight and Safeguards Rules 2021).

There is a lack of transparency and oversight on how PTA blocks and removes content on the internet under section 37 of PECA. The law provides PTA arbitrary powers to restricts speech and privacy¹⁹. In 2022, the government made online calls of defamation of state authorities including the military and judiciary criminal acts. These are non-bailable offenses, with a maximum prison term of three to five years. Over the years, the PTA made several arbitrary bans on social media, including Wikipedia and TikTok, that have discouraged private sector investment. The issue with these clauses are that they have vague and broad definition, leaving much to interpretation and manipulation, according to the Atlantic Council²⁰.

- **The National Data Protection Regulations, 2022:** This policy sets

out the framework for data protection and privacy in Pakistan, including the establishment of a data protection authority and the development of regulations on data collection, storage, and use. The MoITT also released its first Pakistan Cloud First Policy in February 2022, outlining guidelines and solutions for cloud services. Critics have raised concerns around the bill for its lack of transparency, as it did not employ a consultative process. There remain concerns on surveillance, inadequate citizen data protection, and broad powers of the state. In addition, excessive regulation will disincentive foreign investment as well as stifle the local digital system.

Taxation

The PTA exerts significant control over the internet and mobile providers through hefty licensing fees and bureaucratic processes. Pakistan's telecom sector is the highest taxed in the world, with 19.5 per cent Goods and Services Tax (GST) and 15 per cent Withholding tax (WHT). This includes expensive import duties on smartphones that discourage their use and adoption²¹.

Although mobile data costs have lowered in recent years, taxes imposed make mobiles expensive²². The impact of these policies is seen in consumer usage rates. Mobile users and penetration continue to grow in Pakistan. However, coverage and penetration is low. For instance, PTA illustrates that by the end of 2021, 4G coverage in Pakistan was at 71 per cent, while for many countries the number is up to 94 per cent²³. This is largely due to poor connectivity and lack of affordable devices. Fixed wireless broadband services that can

provide reliable, high-speed connection to households is still very low. Pakistan is still far behind in 5G. But before 5G can be introduced effectively, more than half of the country will need to have access to 4G using smartphones²⁴, which is currently not the case.

All digital services are reliant on radio spectrum. Radio spectrum includes a variety of waves, including X-ray, infrared and light waves that carry information wirelessly for everyday digital services such as television, radio, mobile phones, Wi-Fi, GPS, and radars²⁵. GSMA argues that the higher spectrum prices, the lower the chance for countries to excel in their digital transformation agenda. Despite policies introducing radio spectrum pricing in Pakistan, radio spectrum costs are high and the resource scarce, leading telecommunication operators to invest in more profitable urban areas, instead of the poorer rural areas.

Digital Trends and Innovations in Industry



Digital Trends and Innovations in Industry



e-Governance



Punjab Information Technology
Board (PITB) established

1999

2000

Introduction of Computerized
National Identification Cards (CNIC)

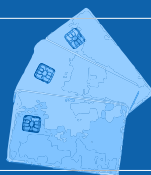


KP Information Technology Board
(KPITB) established

2011

2012

Dengue Activity Tracking System
(DATS) launched



Smart National Identification Cards
(SNIC) introduced

2012

2016

National Data Centre of Pakistan
inaugurated



Electronic First Information Report
(FIR) system developed

2017

2019

Supreme Court's E-Court Portal
launched





Supreme Court Research Centre (SCRC) established **2019**

2020 Islamabad City app launched



E-office initiative to enhance paperless service delivery launched **2019**

2020 National Job Portal (NJP) launched



Automation of Federal Cabinet Procedures **2021**

2022 Sindh Digital Technology Board established



First Digital National Census conducted **2023**



Policy

2006 The Universal Service Fund (USF) established



UNIVERSAL SERVICE FUND
EMPOWERING COMMUNITIES



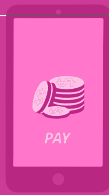
National ICT R&D Fund (Ignite) launched **2006**

2008 Branchless Banking Licensing introduced

Khyber Pakhtunkhwa (KP) Digital Policy introduced **2018**



2018 Punjab IT Policy introduced



National Payment Systems Strategy
launched

2019



Fintech and Financial Inclusion

2009 Easypaisa launched



1Link 1ID – Biometric Interoperability
developed

2018

2021 RAAST introduced



Contactless Biometric Verification
Services introduced

2021



Agritech

2014 Sindh Agriculture Growth Project
introduced



Ricult established

2016

2017 Connected Agriculture Platform
for Punjab (CAPP) introduced





Health and Education

2015

DigiSkills initiative launched



Sindh School Monitoring System (SSMS) launched

2016

2017

e-Rozgaar project established



e-Taleem system developed

2020

2021

Punjab Hospital Management Information System (HMIS) introduced



National Digital Health Framework 2022-2030 developed

2022



Startup and Innovation

2017

National Incubation Center (NIC) established

National Incubation Center



National Incubation Centers expanded

2018

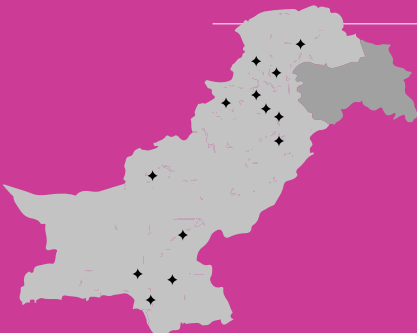
2019

Kamyab Jawan Programme launched



National Incubation Centers further expanded

2022





Urban Development

2016

Punjab Safe City Authority (PSCA)
established



Electronic Traffic Violation
Management System introduced

2017

Provincial IT Policies

Punjab has been at the forefront of digital innovation. It released the provincial comprehensive Digital Strategy in 2018²⁶. Punjab was the first province to make broadband tax 17 per cent cheaper, introduce technologies for disease mapping and child immunization coverage, recording six million observations, and introduce digitization in the police, land records management and counter-terrorism. Punjab IT Policy²⁷ envisions the province as one of the top e-Governed, IT-enabled, e-Literate provinces in the region. Khyber Pakhtunkhwa is the runner-up in recognizing and promoting digital transformation. In 2018, Khyber Pakhtunkhwa released its provincial digital policy aiming to make the province a national technology hub²⁸.

The Khyber Pakhtunkhwa government has made huge strides in entrepreneurship and digital skills training. Its digital strategy was supported by the World Bank. However, Balochistan, Sindh, and Pakistan-Administered Kashmir lagged behind as they released their policies several years later. The Balochistan Digital Policy 2021²⁹ aims to turn Balochistan into a smart, digital hub by prioritizing effective e-governance and utilizing IT for development. In 2022, the Sindh³⁰ Digital Technology Board was established to provide online government services and collaborate with stakeholders. Pakistan-Administered Kashmir is currently in the process of developing its digital strategy with support from UNDP.

Adoption in Government

The Pakistan Vision 2025 and the Digital Policy 2018 guide the country's digital transformation agenda. While both documents are steps in the right direction, the necessary follow through in making Pakistan "a strategic enabler for accelerated digitization"³¹ is falling short by a wide margin. There are well documented challenges that impede Pakistan's digital vision from being implemented. At the same time, there are commendable strides being made by departments that lead the way in digital transformation.

As far as digital adoption within the public sector goes, internet usage significantly varies between provinces and federal government departments, based on the digital uptake of personnel and the nature of official procedure. In NHDR 2023/2024's interviews conducted across the country, government officials cited trainings organized for thousands of public sector employees often with the help of international development and corporate partners. These trainings have ranged from advanced digital skills in artificial intelligence,

cloud, big data, blockchain, neural networks, and communication technologies. At other levels, they have included relatively simpler digital skills like using digital dashboards for filing, reporting, and communication, which have reduced paperwork, created transparency and documentary evidence.

Officials shared many success stories and observed that the interface between federal and provincial governments has improved a great deal, although there is significant room for improvement. An often-cited example is the routine insistence on cumbersome hardcopy submissions, even where online portals exist to facilitate federal and provincial communication, as some officials choose not to familiarize themselves with technology.

Officials also acknowledge active resistance to enabling full digital integration within some departments, as it allows groups to benefit from "offline" official procedures. Some officials shared that hiring in government departments still follows outmoded job

descriptions, often for support roles that have long become automated. But to keep people on the job, staff is retained the same way as before, leading to inefficiencies and bloated human resource costs.

Digital competence within departments varies by policy mandate as well. There is greater digital dynamism in ministries and line departments that are practiced in studying and applying data. Therefore, the usage of electronic applications to collate evidence is met with greater objectivity. Across education training boards, healthcare facilities, and forestry departments, there is an appreciation of digital tools that can enhance outreach and impact.

COVID-19 forced a digital conversion to several policy procedures. Government departments working in the social sectors have since fine-tuned those processes with remarkable results. At the same time, there are high-powered ministries that have incorporated technology superficially and – beyond utilizing basic digital tools like email – have little understanding of digital transformation.

A digital adoption agenda for the public sector will need an understanding of where public sector reform has been wanting. There are several lessons garnered from practitioners' experiences listed further below. It would be remiss not to mention some pathbreaking initiatives undertaken by the government that have enabled the adoption of digital technology. These platforms and services have revolutionized service delivery and improved human development outcomes.

▪ **National Database and Registration Authority (NADRA):** NADRA has played a pivotal role in digitizing identity management in Pakistan. The issuance of Computerized National Identity Cards (CNICs) with biometric verification has not only streamlined identification processes but has also proven invaluable in criminal

investigations. The integration of NADRA's database with law enforcement agencies has facilitated the quick identification of individuals involved in criminal activities, contributing to a more efficient and responsive justice system. Through projects focusing on identity management and the provision of secure digital services, NADRA has contributed significantly to the digitization of essential government functions. Data collection through NADRA and BISP has allowed Pakistan to create an invaluable social security dataset that can be used for targeted subsidies and flood relief programs.

▪ **Benazir Income Support Program (BISP):**

BISP is the main social assistance program in Pakistan and one of the largest in South Asia, serving 8.88 million beneficiaries³², launched by the Government of Pakistan in 2008 as its flagship national social safety net initiative. Recognizing that the instruments in place (Pakistan Bait-ul-Mal and Zakat) did not have comprehensive coverage and were poorly targeted, BISP was launched with the objectives of staving off the worst effects of food, fuel and financial crises on the poor; and providing a minimum income to the most vulnerable. Unconditional cash transfers (UCT), originally set at a monthly value of PKR 1,000, were given to eligible families, and subsequently raised several times. The vast majority of beneficiaries receive cash through a customized BISP Debit Card checked against NADRA's Computerized National Identity Cards (CNIC), and received by female head of beneficiary households³³. BISP's success led to the development of the Ehsaas and Kafalat programs, which saw Pakistan's poorest groups through COVID-19 lockdowns and disruption to livelihoods.

▪ **Punjab Safe Cities Authority (PSCA):**

The PSCA, established in Lahore, has implemented a state-of-the-art integrated

surveillance system. This initiative involves the use of CCTV cameras, facial recognition technology, and advanced analytics to monitor and respond to criminal activities in real-time. The success of PSCA is evident in the notable reduction in crime rates in Lahore, showcasing the potential of technology in creating safer urban environments.

▪ **Digital Adoption in the Justice System:**

In the realm of justice, digital technologies have been employed to expedite legal proceedings, enhance access to legal information, and ensure transparency. The adoption of e-court systems has been a significant development, allowing for the electronic filing of cases, online case tracking, and virtual court hearings. Moreover, legal research and information dissemination have been transformed through the digitization of legal databases. The availability of legal resources online has empowered legal professionals and the public to access relevant information efficiently, promoting a more informed and accountable justice system.

- **Punjab Police Online FIR System:** Punjab Police, one of the largest law enforcement agencies in Pakistan, has implemented an online FIR system. Citizens can visit the official website, fill out the required details, and submit their complaints electronically. This initiative has not only improved citizen-police interaction but has also contributed to a more organized and efficient system for handling complaints and initiating investigations.

- **Sindh Police Citizen Portal:** Sindh Police has launched a Citizen Portal that allows individuals to register complaints and file FIRs online. The portal provides a user-friendly interface and guides users through the process of providing essential details related to the incident. The Citizen Portal has been successful in promoting

transparency and accountability in the registration of FIRs, as citizens can track the status of their complaints and remain informed about the progress of investigations.

- **E-Court System:** The introduction of the e-court system in various parts of Pakistan has led to a reduction in case processing times. Litigants can now file cases electronically, reducing paperwork and administrative burdens. Virtual court hearings became particularly crucial during the COVID-19 pandemic, ensuring the continuity of legal proceedings while minimizing physical interactions.

- **Legal Aid through Technology:** Initiatives such as E-Justice and Courting the Law, developed by legal advocates, provide a platform for individuals to access legal assistance and information. This has proven instrumental in bridging the gap between legal services and those in need, especially in the country's remote areas.

- **Pakistan Citizen Portal:** This is a mobile application designed to empower citizens by providing a direct channel to voice their concerns and submit feedback. This platform not only enables citizens to actively participate in governance but also facilitates a quicker resolution of grievances by connecting them directly with the relevant government departments.

- **Digital Pakistan³⁴:** This is a comprehensive strategy that seeks to propel the nation into a knowledge-based economy. This initiative encompasses a range of projects aimed at promoting digital literacy, expanding connectivity, and harnessing technology to enhance various aspects of governance. The goal was to create an ecosystem where technology becomes a driving force for economic development and social progress. However, the necessary legislation and implementation has been severely lacking.

▪ **Punjab Information Technology Board:**

The PITB has played a pivotal role in spearheading technology-driven initiatives. From e-governance solutions to digital education programs, PITB has been at the forefront of bringing about positive changes through technology. These efforts underscore the importance of localized strategies to address the unique needs of different regions within the country.

A robust digital government infrastructure is essential to efficiently manage the influx of citizen data and requests. While initiatives like Pakistan Citizens Portal, NADRA Online ID, and PITB have made strides, a cohesive vision is lacking to upskill bureaucrats for enhanced efficiency through digital tools. Currently, most

government departments limit digitalization to basic online HR management systems. Additionally, lax data protocols, evident from cyberattacks on FBR and NADRA, highlight the pressing need for stronger cybersecurity measures.

While these initiatives mark substantial progress, it is essential for the government to continue its commitment to digital adoption. This includes investing in infrastructure, fostering digital literacy, and ensuring the security and privacy of citizens in the digital realm. As technology continues to evolve, the government must stay agile, adapting its strategies to harness emerging technologies for the benefit of the population.

Box 4.1

Digitalization as Enabler for the National Coordination Committee for COVID-19

The digitalization efforts in Pakistan in response to COVID-19 and beyond showcase significant advancements and challenges in integrating technology across various sectors. One prominent case study involves the collaborative response to COVID-19, led by the National Coordination Committee for COVID-19 and the National Disaster Management Authority (NDMA), highlighting the establishment of the National Command and Operation Center (NCOC) for evidence-based decisions and coordination. This effort saw an inter-sectoral collaboration between the government, private sector, and civil society, facilitating strategies like COVID-19 testing, vaccination, smart lockdowns, financial relief packages, social protection programs, and the digitalization of tele-schooling and public health management.

Another significant digitalization component is the Ehsaas Emergency Cash (EEC) Program launched in April 2020 as a primary social protection response to COVID-19. The EEC program represents a massive effort in using digital platforms to provide financial support to 16.9 million vulnerable families across Pakistan, leveraging biometric verification systems for cash disbursements and involving private sector partnerships for its implementation.

Pakistan's response to COVID-19 and its broader digitalization efforts present a mixed picture of significant achievements and ongoing challenges. The success of initiatives like the NCOC and the EEC program demonstrates the potential of digital tools to enhance public service delivery and crisis response. At the same time, addressing the outlined challenges will be crucial for Pakistan to realize the full benefits of digital transformation.

BOX 4.2

PSDP Portal by Ministry of Planning Development & Special Initiatives³⁵

The inauguration of the Public Sector Development Program (PSDP) portal by MoPD&SI on 16th June, 2023 signified a pivotal advancement in Pakistan's journey towards digital transformation and enhanced transparency within government operations. By making accessible data on PSDP projects valued at Rs 1.1 trillion (\$3.9 billion), the government has set a benchmark for transparency and accountability in public sector programming that is open for government-citizen engagement. At its core, the PSDP portal aims to utilize digital technologies to foster transparency, augment governance, and amplify public awareness concerning the government's development strategies, projects, and SDGs targets.

A notable feature of the portal is its interactive map interface, which allows users to visualize the geographical distribution of development projects. This feature enhances the user experience by simplifying the process of locating projects by area, thereby deepening public understanding of government initiatives across different regions. The portal's capacity to provide insights into the objectives, scope, and impact of each project empowers citizens to actively engage in the development discourse, promoting a culture of inclusivity and collaboration between the state and its citizens.

This initiative aligns with the broader vision of E-Pakistan, encapsulated in the government's '5Es framework'³⁶, emphasizing exports, energy, E-Pakistan, environment, and equity, thereby spotlighting digital technologies as catalysts for development. The integration of geospatial technologies underscores the innovative application of digital tools in enhancing decision-making and project management within the public sector.

Nevertheless, while going through the portal beyond the GIS mapping of the projects, there is a limitation when it comes to placement of completed projects and their PC-IV (Completion Reports) and PC-V (Annual Performance Report after completion of the project) that would enable citizens to add comments about the efficacy of the project in parallel to these reports. Moreover, there are many projects that are mentioned as ongoing, but their details, project overview and also their PC-I documents are missing from the platform. These are some shortcomings that need to be addressed by the ministry to enable an inclusive developmental approach when it comes to PSDP.

Development Partners' Support for Digital Transformation

The NHDR 2023/2024 benefits from a wealth of practitioners' insights on digital interventions. The development sector landscape in Pakistan has already experienced some positive and promising program interventions linking digitalization to development outcomes. A general overview here provides key approaches and examples gleaned specifically from program portfolios

of Pakistan's international development partners. This overview is not exhaustive. In fact, the NHDR 2023/24 recognizes that there is a need to create national and sub-national knowledge and information repositories of all the projects, programs, and initiatives in both public and private sectors that are currently playing an instrumental role in leveraging digital transformation for the SDGs in Pakistan.

a. **U.K. Foreign, Commonwealth & Development Office (FCDO)**

Over the years, the U.K. government has been developing holistic digital development programming. The U.K. previously released its strategy, *Doing Development in a Digital World 2018-2020* and advocated for the inclusion of Digital Principles to leave no one behind³⁷. The U.K. government's latest White Paper released in 2023³⁸ continues to expand on their holistic digital strategies and now includes strategies on new technologies such as AI. The White Paper argues that new technology impacts development pathways, therefore, digital transformation policy is critical to reducing poverty and enabling a transition to a greener economy.

The U.K. government has committed to creating a sustainable digital transformation agenda for lower and middle-income countries, by ensuring equitable and affordable access, especially for women and marginalized groups. The U.K. government is working through the U.N. Secretary-General's High-Level Panel on Digital Co-operation, the U.N. Tech Envoy Office, and the U.N. Global Digital Compact to 'doing developing in a digital world'³⁹. They aim to employ collaborative approaches and to involve the private sector to solve the problem of 'last-mile connectivity,' by partnering with the U.N. Global Digital Compact process, International Telecommunications Union's (ITU) global Partner2Connect initiatives, and the U.K.'s multi-country Digital Access Program (DAP) that enables private sector investment in sustainable connectivity models.

The White Paper also argues to support multi-stakeholder and collaborative partnerships to understand the risks and opportunities of AI, and how AI can accelerate progress towards the SDGs in lower- and middle-income countries. The U.K. government recently launched its AI for Development Program in partnership with the governments of Canada, USA and Bill & Melinda Gates Foundation

that has begun in Africa, funding £80 million, to boost AI programming to combat inequality⁴⁰. They have plans to eventually expand the project to other partner countries.

Building on the White Paper, in March 2024, FCDO released its new Digital Development Strategy (DDS) 2024-2030⁴¹, that will strive to achieve four interconnected objectives, supporting digital transformation, digital inclusion, digital responsibility and digital sustainability. Key priorities include:

- Attaining the last mile connectivity by connecting low-income and remote areas
- Strengthening and investing in Digital Public Infrastructure (DPI)
- Exploring and understanding the impact of AI in lower to middle income countries
- Closing the gender divide for women and girls

FCDO's areas of focus in Pakistan for 2023/24 with clear digital linkages include:

- Building health and education systems for women and girls
- Adopting resilient and cleaner growth path
- Becoming a more open society with greater protection of women, girls, minorities, specially-abled, and vulnerable groups.

Although FCDO does not yet have a dedicated digital transformation programming for Pakistan as outlined in their White paper, it is supporting UNDP's initiatives for hate speech and disinformation, investment for financial access to SMEs, and private sector development to unlock climate investments. Under their key goals, they integrate investments for new technologies and private sector investment. FCDO also integrates technology and private sector development, financial inclusion efforts under its programming priorities.

b. United States Agency for International Development (USAID)

The USAID Digital Strategy 2020-2024 has two objectives to enhance digital development⁴²:

- Improve measurable development and humanitarian assistance using digital technology in its own programing. USAID will mainstream digital solutions in all its programing, that means shifting to digital payments, data collection, procurement, and incorporating principles for Digital Development⁴³ wherever possible in the programing cycle.
- Support its partners to achieve self-reliance through open, inclusive, and secure digital ecosystems that protects the individuals and agency rights.

Key USAID global digital transformation initiatives include:

- Establishing Digital Ecosystem Fund to support strategic initiatives and emerging opportunities in countries.
- Where national digital strategies are not in place, USAID will work with willing countries to develop digital strategies.
- Close the gender digital divide, and address the harm women and girls face online.
- Reduce exposure to disturbing and harmful content to children and young people.
- Cybersecurity programing to help governments, private sector, and civil society and citizens facing might harm.
- Focus on data protection.

In Pakistan, USAID is focusing on⁴⁴:

- Promoting more peaceful communities in key areas.
- Increasing private-sector led inclusive economic growth.

- Strengthening global health security capacities.

Like FCDO, USAID in Pakistan integrates digital technology into its larger programing. All of its major programs in Pakistan introduce smart investments in technology, private sector development and entrepreneurship support, access to finance, and support to women and minorities.

Under its energy, economic growth and agriculture program, and gender equality and female empowerment program, USAID is making technological investments, boosting private sector development, focusing on improving access to technologies, creating business linkages to access new markets, improving entrepreneurship and job creation by working with SMEs to improve business. The Agency is also financing young entrepreneurs in partnership with banks to finance loans, as well as making investments in technology to improve agricultural practices.

c. European Union Commission

The European Union Commission (E.U. Commission) has made digitalization a key priority in its global programing, with its Digital Strategy⁴⁵ and the Digital Decade policy program 2030⁴⁶. Europe adopted the Digital European Deceleration on Digital Rights and Principles⁴⁷ committing it to employ strategies that put people at the center, for secure, safe, and sustainable digital transformation. The E.U. Digital Strategy promotes an inclusive, green, fair, and sustainable digital transformation by using a human-centered approach to digitization with strong emphasis on gender and inclusion. According to the E.U. Commission's Multi-Annual Indicative Program 2021-2027⁴⁸ with Pakistan, digitalization is an indicator. The key areas of the Program include:

- Promoting investments and trainings in new technologies to modernize agriculture value chains. New technology investment will have spill over benefits in job creation,

especially for women and creating remote communities to market opportunities.

- Trainings in e-commerce and digital skills by building on TVET programing.
- Strengthening e-governance initiatives from both supply side, aligned to EU's best practices and its framework on digitalization and 'Digital for Development'.
- Enabling an environment of innovation and making investments in new technology that supports transitions into a greener economy, innovative financing such as green bonds, and mobilizing private sector and government.

d. German Federal Ministry for Economic Cooperation and Development (BMZ)

The BMZ has a digital strategy at the global level, committing to 'equitable social-ecological digital transformation'⁴⁹ for their partners. Key priorities for BMZ are:

- Reducing hunger and poverty by harnessing digitization.
- Promoting just transitions to make digital transformation greener.
- Using data and e-health applications to manage pandemics and strengthen health systems.
- Closing the digital gaps between men and women.

The BMZ supports its partner countries in using digital technology to build sustainable, interoperable digital social protection systems that are cost effective and improve access⁵⁰. In Pakistan, BMZ is supporting the BISP to make investments in its technology for expanding program outreach and develop a more effective and dynamic digital platform.

e. The Swedish International Development Agency (SIDA)

Key objectives of SIDA⁵¹ include reducing

poverty through supporting civil society, developing the private sector and through public sector support. SIDA supports embedding digital solutions across its portfolio. SIDA aims to stimulate private sector actors to reduce poverty through catalytic and innovative investments. Among its support is using challenge funds to finance entrepreneurs and innovators who are designing game-changing solutions that contribute to economic, environmental, and social sustainability in the developing world⁵².

f. The Norwegian Agency for Development Cooperation (NORAD)

NORAD is incorporating cross-cutting themes into its portfolio of support that includes integrating innovation and digitalization within its various portfolios⁵³. Their digital focus is on 'Digital Public Goods'⁵⁴. Digital public goods are open-source software, open AI models, open standards, open data, and open content that adhere to doing no harm and achieving the SDGs. NORAD will help scale these public goods to benefit society, institutions, and individuals in low- and middle-income countries. NORAD is funding the design of an open data solution, Open Earth Platform Initiative (OpenEPI)⁵⁵, to provide high quality data on climate and nature, adhering to open data quality standards.

g. Danish International Development Assistance (DANIDA)

DANIDA, the foreign development assistance arm of Denmark, as part of its global priorities, has placed digitalization and technology as a strategic focus in the Danish foreign and development policy assistance with the launch of its 'TechPlomacy initiative'⁵⁶. DANIDA is making digitalization a cross-cutting priority in their development priorities, with the objective to bridge the digital divide and harness digital dividends. Though DANIDA phased out of Pakistan in 2016⁵⁷, currently the Embassy of Denmark has one project on innovation focused on facilitating Agritech Entrepreneurships through workshops and

capacity-building events. The project helps Agritech entrepreneurs to access technical know-how, industry networks, introducing them to new technologies, and connecting them to venture capitalists to pitch their ideas.

h. Government of Netherlands

The Government of Netherlands developed a digital strategy in 2019, 'The Digital Agenda for Foreign Trade and Development Cooperation'⁵⁸. The Agenda⁵⁹ focuses on adopting a new approach to suit digitalization including, building new coalitions to promote digitalization at the right scale and creating new knowledge to transform the impact of digitalization into trade and development prospects. Their policy commitments include digitalization for development, adapting the trade system, positioning the Netherlands as a digital frontrunner, and ensuring online security and freedom.

i. Swiss Agency for Development Cooperation (SDC)

Switzerland's International Cooperation has placed digitalization as one of its key priorities to advance sustainable development and accelerate poverty reduction⁶⁰. These priorities have been included as part of Switzerland's International Cooperation Strategy 2021-24⁶¹. SDC has a global digital focus to provide universal and affordable internet access. SDC is also working closely with the private sector and research community to find innovative solutions for easier access to information, payments by mobile phones, and online financial services.

j. Agence Française de Développement (AFD)

The AFD has developed the Fund for Innovation in Development (FID)⁶² to accelerate disruptive innovative solutions against poverty and inequalities. FID invests in innovations that enable marginalized citizens to access public services that are affordable, efficient, and accessible. The fund is open to all innovations, but encourages innovations

in the areas of education, health, climate, and gender equity. FID is chaired by the Nobel Prize winner in Economics 2019, Esther Duflo. The fund encourages research bodies, NGOs and private sector to apply. The fund is targeted to low-or middle-income countries and those who are marginalized⁶³. France's development assistance is prioritised in 19 countries in Africa. In Pakistan, it has a smaller portfolio, with AFD supporting renewable energy and energy efficiency.

k. Italian Development Cooperation (AICS)

Among its major global priorities, AICS is focusing on e-governance as part of its key priority on governance, rule of law, and human rights. According to its Multi-Annual Indicative Program 2021-2027, AICS supports digitalization and aims to work under the E.U. policy framework on digitalization, and 'Digital for Development'⁶⁴ to promote e-governance for efficient, transparency and accountability in services. They also prioritise investing in green jobs, agribusinesses, and innovations to support productivity in Green Inclusive Growth. For human capital initiatives, they will integrate digital support as a across-cutting theme. In Pakistan, AICS⁶⁵ focuses climate change and environment protection, agriculture, irrigation, breeding, and job opportunities creation also through eco-tourism, and rural development.

l. Spanish Development Cooperation (AECID)

The AECID sets out to focus on four broad objectives of the 2030 Agenda: people, planet, prosperity, and peace⁶⁶. In the realm of technology support, Spain is focused on fighting disinformation in democratic countries⁶⁷. It argues for coordination with technology companies, civil society factcheckers, and academic institutions.

m. Japan (JICA)

JICA⁶⁸ has produced a 'Digital for Development' strategy to support countries' 'wellbeing' with digital technology. JICA

will prioritize supporting investments in digital technology, data, industry creation and development of human resources, and supporting free and safe cyberspace. JICA is building infrastructure to connect people to safe and secure internet. They are supporting telemedicine initiatives after its potential was seen in COVID-19 and providing cyber security training. JICA will also pursue collaborative approaches across diverse stakeholders to test and develop innovative solutions towards digital transformation.

n. China

China⁶⁹ aims to pursue innovation-driven development, enhancing science, technology and information collaborations, building global innovation networks, promoting the adoption and diffusion of emerging technologies, and bolstering technology innovation. It is supporting countries in accelerating global transitions towards green, low carbon development to achieve the SDGs. Pakistan and China signed an Agreement on Scientific and Technology Cooperation in 1976, and since then have delivered several technological programs and investments in Pakistan. The Joint Working Group on Information Technology Cooperation under CPEC⁷⁰ aims to open new avenues for Pakistani tech companies, launching 5G technology in Pakistan, expanding ICT infrastructure development, ICT application innovation, supporting cybersecurity, policy and regulation, and radio spectrum development, and capacity development. China's development plans for the future include making investments in digitization, new emerging technologies such as Internet of Things, data centers, cloud computing, smart infrastructure including AI.

o. Gulf Cooperation Countries (GCC)

The GCC consists of six Arab countries – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates – to further political and economic integration amongst

them. Among its priorities to stimulate scientific and technological progress in the fields of industry, mining, agriculture, water and animal resources, to establish scientific research, to establish joint ventures, and encourage cooperation by the private sector for the good of their peoples⁷¹.

p. World Bank

Digital Development is a core focus for the World Bank and sits under its Digital Development Global Practice wing⁷². Like the U.K. and the U.S., multidisciplinary collaborations to employ digital programming are seen as critical to successful digital initiatives. Strategic focus areas⁷³ for the World Bank include:

- Closing the digital divide by providing broadband connectivity, access and use, i.e., providing universal access to digital infrastructure that is affordable, inclusive and equitable.
- Investing in data infrastructure and services, strengthening data governance and development of data management infrastructure.
- Strengthening trust in using digital platforms and services for communities and governments, raising awareness on cyber threats and how to protect themselves.
- Investing in digital technologies that will benefit the planet and harness the power of data for climate action.
- Supporting ICT jobs and services to boost economic growth and providing digital skills and job placement programs to meet the demands of the new digital market.

In Pakistan, the World Bank has supported EdTech innovations with the government of Pakistan, invested in e-learning tools to improve access to education after the pandemic, such as creating smart classrooms and broadcasting content on TV and radio⁷⁴.

The Bank is delivering system-wide digital transformation programming in Pakistan that includes technical assistance to government on digital policy and regulations, providing digital infrastructure, building digital skills, and investing in the start-up ecosystem. The Bank has also provided technical and financial assistance to Khyber Pakhtunkhwa Information Technology Board (KPITB), supporting their Digital KIP strategy designing and implementing IT projects, which included training over 40,000 youth graduates, setting up and expanding the “*Durshal*” network of co-working and incubation spaces.

In 2024, World Bank in Pakistan announced its new initiative ‘Pakistan: Digital Economy Enhancement Project’ (DEEP), that takes a whole-of-government approach to enhance the government’s capacity for digitally enabled public service delivery for citizens and businesses⁷⁵. The project will invest \$78 million⁷⁶. Thus far, this is the most significant investment on digital transformation in Pakistan by the international community. The World Bank is providing technical assistance to MoITT, the NADRA, Board of Investment (BoI), and provincial institutions. The project will be implemented by MoITT⁷⁷.

q. International Finance Cooperation (IFC)

The IFC has focused on inclusive growth, improving infrastructure and financial services and supporting expansion of smaller businesses. In its regional portfolio priorities⁷⁸, IFC has placed adoption of digital technology, digital inclusion by promoting banking and essential services, and supporting private sector investments in new technologies in renewable energy projects, including wind farms and solar. In 2023, IFC in Pakistan doubled its investment commitments to \$1.5 billion⁷⁹, to promote job creation, increase productivity in the private sector, enhance gender inclusion and climate change. The IFC plans increased investments in digital infrastructure, job creation, and MSMEs.

r. Asian Development Bank

The ADB Digital Strategy 2030⁸⁰ sets out to promote inclusive digital transformation in Asia and the Pacific. Similar to the World Bank, ADB is supporting whole-of-government equitable digital transformation strategies. It aims to support digital transformation of countries by improving regulatory environments, expanding internet connectivity through digital infrastructure investments, investing in hardware and software required, and improving digital privacy and security risks.

In Pakistan, ADB does not have an explicit digital transformation program, but it does mainstream digital priority areas within its projects. According to ADB’s Country Partnership Strategy 2021-2025⁸¹ in Pakistan, key priorities are, improving economic management to restore stability and growth, building resilience through human capital development and social protection to enhance people’s well-being, and boosting competitiveness and private sector development to create jobs and expand economic opportunities. Key priorities referencing promotion of digital technologies are:

- To increase access to finance, ADB will build financial institutions’ capacity in digital banking.
- Invest in smart cities and technologies to enable the effective design of these cities, such as digital access to services, including digital payments, smart water meters, and charged parking.

In 2023, ADB Pakistan extensively consulted with UNDP Pakistan on its pipeline diagnostic research and technical assistance project “Pakistan’s Transformative Digital Future: Growth Strategy and Roadmap”⁸² in Pakistan. Additionally, ADB and UNDP co-convened a first of its kind Development Partners Working Group for exchange of views and information on sector approaches and initiatives being undertaken by development agencies and missions in Pakistan⁸³.

s. *Bill and Melinda Gates Foundation*

The Bill and Malinda Gates Foundation (BMGF) seem to be the leading international philanthropy actor making investments in advancing technology in Pakistan. In addition to BMGF's support on polio, BMGF has a wide portfolio with digital technology and innovation central to its programing that focuses on⁸⁴:

- Closing the gap on digital connectivity for women by supporting action-oriented research and innovation to test new tools and platforms.
- Improving digital technologies and national policies that enable reliable and affordable financial services to the poorest. They work on digital payment infrastructure, digitized government benefits, regulatory standards, gender equalities.

They are exploring new technologies in improving global health, making investments and assembling research teams and making connections.

BMGF has a Strategic Investment Fund for making investments to accelerate growth and stimulate private sector innovation and investment to improve lives. They invest in projects benefiting the world's poorest and overlooked by traditional investors. The Fund has made an investment into a Pakistan tech firm OneLoad. The firm facilitates small shops to access telecom, digital payments and banking services to more than seven million unbanked customers each month. BMGF has also invested \$4,000,000 to integrate the BISP with Raast-Pakistan's Instant Payment System to enable interoperability and choice for beneficiaries⁸⁵.

BMGF has invested in Pakistan's game-changing financial inclusion social enterprise, Karandaaz, that promotes access to finance for MSMEs through an investment platform⁸⁶. The initiative facilitates financial inclusion

for individuals by employing tech-based solutions. The Foundation is also providing financial and technical assistance to Karandaaz to digitize the FBR services tax system for Pakistan⁸⁷. This has come under special request from the Prime Minister of Pakistan.

t. *Google.org*

At a global stage, Google's philanthropy wing aims to address major development challenges by combining funding, innovation, and technical expertise. Their approach is to connect nonprofits and social enterprises with Goggle's resources to accelerate impact. Google has three focus areas:

- Economic empowerment⁸⁸: providing digital skills, preparing young people for new opportunities in IT, and helping undeserved small businesses,
- Technology and innovation⁸⁹: they support organizations using technology to address environmental challenges and empowering third party advocates to share new learnings on AI and emerging technology,
- Learning⁹⁰: supporting organizations that are providing equitable access to learning materials, computer science and digital responsibility resources.

Google has launched several initiatives in Pakistan with the aim of providing digital skills training, investing in innovations by supporting local innovators and digital literacy. In 2023, to demonstrate their commitment to grow Pakistan's app industry locally and globally, Google aimed to empower local developers by setting up Google for Developers community programs, training 25,000 developers. They launched *AndriodSeekho* and *CloudSeekho* programs, upskilling 10,000 developers in android and Google Cloud technologies⁹¹.

Google Career Certificates program⁹²,

endorsed by MoITT has also offered in-demand skills through job training that does not require having a college degree or prior experience. In 2023, 50 per cent of the 44,500 thousand scholarships were handed to women⁹³. Google has pledged 45,000 scholarships for 2024⁹⁴. In one of Google's recent initiatives in 2024⁹⁵, the Women Founders Circle in collaboration with Google Cloud and Women Founders Circle and Technology Park (NTSP) offered workshops and mentorship for women entrepreneurs in the tech sector. The Ministry of IT & Telecom⁹⁶ has collaborated with Google to launch grassroot level Coding Skills Development Program to train young children from ages nine to fourteen.

In total, Google has trained almost 71,000 children and rural women through digital literacy and online safety programs. Efforts to digitize education are also underway as part of the Google for Education program, with 1.5 million student sign ups across the country⁹⁷. Google has also hosted workshops for government officials, CSOs and journalists on Google and YouTube's fact-checking cybersecurity resources.

u. Meta

Meta⁹⁸ is supporting the SDGs with its partners globally. Among Meta's priorities is misinformation on its platform, especially on health issues. Meta is supporting women-owned businesses to grow and build their digital skills. Meta also launched #SheMeansBusiness program in 2016, training one million women across 28 countries to grow their business on Meta's platform and providing them mentorship. They are supporting local businesses in lower to middle income countries to use Meta's technologies to create jobs and opportunities for future generations. Meta is providing accessible, affordable, reliable high-speed internet to improve global connectivity, especially for the under-connected regions. In Pakistan, Meta is

building 1,700 km of open access terrestrial fiber with their partners to address growing demand for urban connectivity for 10 million people across eight cities. Meta partnered with Shoor Foundation in Pakistan and Exit U.K. in the U.K. to counter violent extremism online. When someone in Pakistan or the U.K. searches for extremist content, they will be redirected to resources and support⁹⁹.

v. United Nations Agencies

With the Secretary General's endorsement of making digital transformation a priority to achieve the SDGs, most U.N. Agencies (UNWOMEN, UNDP, UNICEF, UNHCR, UNESCO, WFP, UN-Habitat, UNIDO) have adopted digitalization as a key enabler. Agencies are making internal changes to improve efficiency of their operations and staff capacity to use new technologies, whilst also working to provide equitable and safe access to digital technologies. Although many agencies have global digital strategies, these are not always reflected in country programs. Below is a sampling of select Agencies' digital interventions in Pakistan

i) United Nations Development Programme (UNDP)

UNDP has integrated digitalization into the way it works and across its six signature solutions: poverty and inequality, governance, resilience, environment, energy, and gender equality. UNDP launched its first Digital Strategy 2022-2025¹⁰⁰ to harness the power of digital technology and innovation to respond to development challenges faced globally. Digital is one of the three enablers to achieve transformative change in the UNDP Strategic Plan 2022-2025¹⁰¹. Globally, UNDP will embed digital across its programming, experimenting with new digital tools and approaches, scaling tested solutions, exploring challenges of digital technologies, and applying foresight to assess trends. UNDP Digital Strategy ensures the following key principles;

- Developing equitable digital ecosystems.
- Placing human rights at the center of its programs.
- Promoting people-centered, gender and sensitive approaches.
- Advocating for open digital standards and open data.

Aligned to the UNDP Digital Strategy, UNDP Pakistan has made digital transformation a key priority in its Country Program Document (CPD) for 2023-2027¹⁰². UNDP Pakistan argues that post-COVID-19, a new digital social contract is emerging to find solutions that reshape and improve traditional service delivery through technology. UNDP is responding to the new development needs of Pakistan by curating an integrated policy and program portfolio on digital transformation that addresses digital divides for inclusive development. The Digital Transformation portfolio cuts across all its major portfolios to accelerate impact. The portfolio will test new service offers for the government, with a special focus on ensuring digital services are human-centered. UNDP Pakistan Digital Transformation portfolio will build government's digital capabilities, advocate for enhanced access to internet, and provide critical digital services to continue business.

UNDP Pakistan's current digital interventions consist of several projects across its six signature solutions. UNDP has set up virtual courts and digitizing the Khyber Pakhtunkhwa Bar Council; providing digital skills and entrepreneurship training to young people across the country. It is using digital solutions to collect data on young people's perceptions through its Youth Engagement Platform and fighting misinformation using its *i-verify* platform. UNDP is accelerating its digital transformation portfolio design with the launch of this Report, the NHDR Digital

Transformation 2023/2024.

ii) Information and Communication Technologies (ITU)

The ITU¹⁰³ is the U.N.'s specialized agency to deliver information and communication technology expertise. It facilitates connectivity, allocating global radio spectrum and satellite orbits, developing technical standards that ensure networks are seamlessly connected, providing access to digital technologies, and building digital capacity. The ITU Strategic Plan 2024-2027 sets two major goals: universal connectivity for all and sustainable digital transformation. ITU's latest project focuses on digital transformation for Pakistani citizens, adopting a whole-of-government and smart village approach in accordance with the vision of Digital Pakistan. This project is working in cooperation with MoITT, USF, and Huawei¹⁰⁴.

iii) United Nations Children's Fund (UNICEF)

UNICEF has been actively working on digital innovation and leveraging technology to improve the well-being of children globally. UNICEF has a strong history of supporting Information and Communications Technologies for Development (ICT4D) programming for children and young people. In its latest strategy¹⁰⁵, UNICEF explores how digital transformation impacts children and young people. Its digital priorities are: exploring impact of new technologies such as AI, misinformation, digital civic participation of young people, building government digital services for children, improving digital literacy and learning, and protecting children from cyberconflicts. Through UNICEF's Office of Innovation, the Agency is advocating for youth and child focused digital solutions¹⁰⁶. It aims to support young entrepreneurs who are already designing digital solutions, ensure youth have agency on the digital solutions produced and technologies promote an open

and secure society. UNICEF's global digital programs include:

- Giga aims to close the digital divide by connecting all schools to the internet.
- UPSHIFT is a social innovator incubator, helping young people develop innovative solutions for their communities.
- UNICEF Venture is mentoring and investing in young innovators who are using frontier technologies to improve lives and shape markets.

In Pakistan, UNICEF in partnership with Microsoft has piloted a digital learning passport program that empowers young girls in school to improve their course learning through more interactive, gamified, and engaging content on tablets. The project also provides internet access to students¹⁰⁷. UNICEF has used several technological innovations to collect data and improve its delivery. These include using Augmented Reality games to improve learning in children, using SMS technology to collect data in their U-Report program, and more recently using drones to spray mosquito breeding sites. UNICEF also partnered with Telenor Pakistan and NADRA to facilitate birth registration using mobile phones¹⁰⁸.

iv) UN WOMEN

Globally, UN Women¹⁰⁹ has adopted innovation technology as a key driver of change in its strategic plan. Its priorities will ensure closing the digital divide by increasing meaningful access to technology for women, providing digital skills training and education, and protecting from harm online. Its global commitments are:

- Develop digital tools and services to address the needs of all women and girls.

- Mainstream gender in digital policies.
- Zero tolerance for gender-based violence in the use of technology.
- Mainstream gender perspective in technology design.
- Promote policies and programs to achieve gender parity in scientific and technology trends.
- Develop gender responsive innovation challenging gender stereotypes.

In Pakistan¹¹⁰, UN Women is providing training programs on entrepreneurship, financial literacy and digital skills. It also focuses on digital inclusion of women in coordination with the private sector and civil society. It is working with the Government of Pakistan for financial inclusion of women, using innovative instruments.

v) United Nations Educational, Scientific and Cultural Organization (UNESCO)

UNESCO aims to narrow the digital divide, improve digital governance policies, improve digital transformation capacity for institutions, and explore human rights issues with rapid technological development¹¹¹. Globally, UNESCO is focusing on exploring the impact of AI in development. In line with the Rights based, Open, Accessible, and Multistakeholder governance (ROAM) driven approach to AI, UNESCO acts as a convenor of stakeholders for holistic debate on the development, use and governance of AI. In Pakistan, UNESCO has partnered with PTA to regulate, maintain and establish telecommunication systems and services within the country, and develop and launch a gender mainstreaming strategy promoting ICT access for women¹¹².

BOX 4.3**Trends in Development Partnerships for Pakistan's Digital Transformation**

The international financing institutions (IFIs) are leading the way with whole-of-government digital transformation programs. There has been increased funding by IFIs to Pakistan that include investments in digitalization and private sector development.

Dynamic and scalable investments in emerging technologies and closing the digital divide are still missing from the bilateral donor program portfolios in Pakistan, even though they are reflected in their global commitments and country strategies.

Digitalization initiatives within the UN country team are uncoordinated and remain scattered as one-off projects, not considering the immense complexity of the issues for Pakistan. There is both a need and an opportunity to convene this space, advocating for bigger digital transformation programs with a systems view that makes investments to enhance the digital ecosystem. There needs to a deeper sense of urgency to close the digital divide.

There is no evident digital transformation donor working group to coordinate advisory and technical and financial assistance support to government and non-government partners. Digital transformation is a large and complex agenda requiring a multidisciplinary approach and several stakeholders from the government, donors, start-ups and the private sector. Therefore, investing in multistakeholder commitments groups are critical. Country-level coordination and collaboration will also align with the international partners' global commitments, as they emphasize the need to change business-as-usual approaches and move towards collaborative, cost-effective, and impact amplifying processes and investments.

Adoption in the Social Sector**Education**

Pakistan's education sector finds itself at a crucial juncture, navigating challenges and embracing opportunities in the digital era. While strides have been made in tech integration, digital literacy initiatives, and the rise of ed-tech start-ups, the lack of adoption in certain regions and persistent challenges threaten the realization of a fully inclusive and digitally enriched education system. Limited government funding, a shortage of skilled educators, and the resistance to change

within traditional educational systems impede progress.

As the country seeks to modernize teaching methods, the integration of technology in classrooms has gained momentum in private schools and universities. Smart boards, digital content, and collaborative platforms are becoming integral components, fostering interactive and dynamic learning environments. However, the widespread adoption of these tools faces challenges such as inconsistent infrastructure, limited

access to devices, and the need for comprehensive teacher trainings, especially in public schools.

Efforts have also been made to establish digital literacy programs, but progress remains slow. Initiatives like the Virtual University and the Punjab Information Technology Board's Skills Accelerator Program are pivotal in this endeavor. The Virtual University has been a pioneering force, offering online education and skill development programs accessible to individuals nationwide. Through a diverse range of courses, the Virtual University has empowered learners with digital skills, contributing significantly to the enhancement of employability. On the other hand, PITB's Skills Accelerator Program strategically addresses the demand for industry-relevant skills by fostering partnerships between the public and private sectors. This initiative not only identifies key skill gaps but also provides tailored training to bridge them, ensuring that the workforce is equipped with the competencies essential for thriving in the contemporary job market.

The National Vocational and Technical Training Commission (NAVTTTC) has been instrumental in implementing various skill development programs across the country, aiming to enhance the technical and vocational skills of individuals to meet industry demands. Moreover, the Prime Minister's Kamyab Jawan Program encompasses initiatives like the Hunarmand Pakistan program, which focuses on providing vocational training to youth for better employment opportunities. This initiative aims to empower young individuals with practical skills aligned with the needs of the job market, fostering entrepreneurship and economic self-sufficiency.

The Higher Education Commission, however, has failed in its task to implement the required university curriculum to produce employable IT graduates. The curriculum is outdated by two decades and there is a severe lack of IT

experts working for the HEC to correct this course. This has led to a demand for upskilling and vocational programs even for computer science graduates.

Health

In recent years, the global landscape of healthcare has been reshaped by the integration of digital technologies. These innovations promise to enhance efficiency, accessibility, and the overall quality of healthcare services. While many developed nations have embraced digital healthcare with open arms, the scenario in Pakistan presents a stark contrast. Despite pockets of success stories, the adoption of digital healthcare technologies in both the private and public sectors of Pakistan remains remarkably low, even though the potential for digital healthcare is immense.

Digital healthcare technologies have the potential to bridge gaps, offering solutions such as telemedicine, electronic health records (EHRs), and health information systems. However, the adoption of these technologies has been hindered by several factors. First, there is a lack of awareness and education among healthcare professionals and the general public about the benefits and functionalities of digital healthcare. Many healthcare providers still rely on traditional, paper-based methods, contributing to inefficiencies and delays in patient care.

Second, the financial constraints within the public healthcare system limit the implementation of costly digital solutions. The government's focus on basic healthcare infrastructure often leaves little room for investments in cutting-edge technologies. This disparity is evident in the urban-rural divide, with urban centers benefiting more from digital healthcare advancements than their rural counterparts.

Despite the challenges, there are pockets of success stories that showcase the

transformative potential of digital healthcare in Pakistan. One such example is the Sehat Sahulat Program, a government initiative that uses technology to provide health insurance coverage to vulnerable populations. While commendable, such initiatives remain limited in scope and fail to address broader issues like data interoperability and comprehensive digital health records.

Private sector success stories like Sehat Kahani are a noteworthy example of a digital healthcare initiative making strides in Pakistan. Founded in 2017, Sehat Kahani is a telemedicine platform that connects patients, especially in underserved areas, with qualified female doctors. The platform leverages digital technology to overcome geographical barriers and increase access to healthcare services, particularly for women who face

cultural barriers in seeking medical attention. However, Sehat Kahani has faced challenges in attaining a mainstream presence in the healthcare industry.

The slow adoption of digital healthcare in Pakistan can be attributed to a combination of cultural, infrastructural, and economic factors. In a conservative society, where face-to-face interactions hold cultural significance, there is resistance to embracing virtual healthcare solutions. Additionally, the lack of a standardized regulatory framework for digital health adds to the skepticism among healthcare professionals and institutions.

Government initiatives, increased awareness campaigns, and strategic partnerships with the private sector can play pivotal roles in fostering a digital healthcare ecosystem that benefits all strata of Pakistani society.

Box 4.4

Raising public health awareness during the Pandemic using ringtones and behavioral science

During the pandemic in Pakistan, when a person made a phone call, before being connected to their call, they would hear a 30-40 second health message advising them about COVID-19¹³ and the government vaccination drive. Over 113 million Pakistanis across the country directly heard the ringtone message in 2020, making it the most effective communication medium adopted by the Government of Pakistan¹⁴. The Ministry of Health (MoH) and PTA, through the Digital Pakistan Initiative, launched this program, bringing together an innovative team. The campaign was executed by E-Ocean, a state-of-the-art Digital Service Provider that designed health messages in consultation with the Advisory Group with Gallup's media research and behavior science team and UNDP's Accelerator Lab. This initiative aimed to target misinformation surrounding COVID. Getting the communication strategy correct was critical to the success of the initiative. The messages were tested on audiences, using behavior sciences, to ensure they were relevant, culturally sensitive and empowered people to action. A communication strategy was also developed, housed at the Ministry of Health in collaboration with Digital Pakistan and other partners, forming the Risk Communication and Community Engagement (RCCE) task force. The RCCE helped structure the information, with gatekeepers to manage the content and curation.

BOX 4.5**Telehealth Policy Frameworks in Pakistan: Navigating Current Realities for Future Success****By Sara Saeed Khurram**

Digital health is a rapidly growing industry projected to reach \$504.4 billion by 2025¹¹⁵. Pakistan's population of 230 million grapples with pressing healthcare challenges; public sector expenditure remains at 3.2 per cent of GDP, shortages of trained staff, essential drugs, and chronic reliance on private healthcare services. A staggering 58.5 per cent of total healthcare expenditure is in the private sector. In Pakistan, where the doctor-to-patient ratio stands at approximately 0.8 physicians per 1000 individuals, digital health interventions are being increasingly embraced to address healthcare needs¹¹⁶ however, the pace of adoption is still insufficient.

Telemedicine platforms have emerged as a game-changer in healthcare access. Patients, regardless of their location, can connect with healthcare professionals through virtual consultations, facilitating remote access to medical expertise, particularly in areas where it's limited.

By harnessing digital technologies, Pakistan can bridge gaps in healthcare access, education, and economic opportunities, fostering inclusive growth and societal advancement¹¹⁷. Realizing all the promise that telemedicine holds in revolutionizing health care in emerging markets, the governments of India, Bangladesh, Kenya, and Uganda, among others have implemented telemedicine programs that are providing health care through either audio, video, text messages, and different applications¹¹⁸. These programs have revolved around maternal and child health, pregnancy, prevention, and diagnosis of acquired immunodeficiency syndrome (AIDS), etc. Sub-Saharan Africa, for example, implemented 487 unique telemedicine programs from 2006 to 2016¹¹⁹. In more advanced markets, like India, companies are now beginning to develop chatbots, using artificial intelligence (AI) to solve common healthcare problems. With solutions of this type, patients do not need to visit the doctor for minor ailments at all.

Amidst the flurry of developments emerging from global markets, a pertinent question arises: Where does Pakistan fit into this narrative? Alarming, the World Health Organization's (WHO) telemedicine survey of 2016 revealed that Pakistan lacks any telemedicine laws or regulations¹²⁰. In Pakistan's healthcare landscape, the absence of a comprehensive digital health policy exacerbates healthcare disparities. Despite telemedicine pivotal role during the COVID-19 pandemic, Pakistan lacks formal regulations governing its practice, inhibiting the development of robust telehealth services, especially in rural regions that have limited access to healthcare facilities.

The Government of Pakistan has begun to initiate efforts towards digital health integration, as outlined in the National Digital Health Framework 2022-2030 by the Ministry of National Health Services, Regulations, and Coordination. This framework aims to advance digital health technologies ethically, safely, and equitably, integrating them into healthcare priorities. Various telemedicine and e-health initiatives have also emerged, indicating progress towards digitalization in Pakistan's healthcare sector. The framework presents opportunities to strategically map out a concrete plan for digitizing the healthcare sector. Key objectives of the framework include promoting national collaboration, advancing digital health strategies, strengthening governance, advocating for people-centered health systems, and creating a national interoperable digital health ecosystem.

While some provinces have initiated steps to address telemedicine gaps, efforts remain fragmented. Sindh has emerged as a pioneer, enacting the Sindh Telemedicine and Telehealth Act 2021, broadening telehealth's scope. However, challenges persist in standard enforcement. In Khyber Pakhtunkhwa (KP), a policy emphasizes telemedicine promotion, but specific regulations are lacking, hindering implementation. Punjab exhibits localized initiatives, yet inconsistencies in telehealth service quality underscore the need for a unified national approach. Notably, Balochistan lacks any policy or framework for telemedicine practices, highlighting a significant gap in healthcare access in the region. Pakistan is in a unique position for building its telemedicine infrastructure. With its highly qualified medical practitioners and an emerging technological industry, the country can create products and services to cater to this evolving area.

The telecommunication industry offers significant opportunities for digital health in Pakistan. Major mobile operators have facilitated real-time data collection, transmission, and various digital health solutions, bridging gaps in healthcare access. However, Policy development and establishing a monitoring and adherence system emerge as pivotal challenges for Pakistan's healthcare system. Physician accreditation and licensure, reimbursement systems, and liability may need reformation to provide reliable services. Furthermore, an information technology network and well-trained staff will be vital to ensure the long-term success of any digital health initiatives. As a leader in delivering health data and applying economic analysis for health policymaking, Sehat Kahani supports policymakers in harnessing data and digital technology for transforming health systems.

To bolster the policy recommendations for leveraging digital transformation in Pakistan, it is imperative to conduct comprehensive assessments by relevant government bodies, such as the national Ministry of Health Services, Regulations, and Coordination. These assessments would evaluate the existing regulatory landscape governing digital health implementation at both federal and provincial levels, with a focus on aspects such as licensing, accreditation, data privacy, and quality standards. Through

such evaluations, policymakers can gain valuable insights into the strengths and weaknesses of the regulatory framework and develop targeted strategies to address any gaps or shortcomings, ultimately enhancing the effectiveness and integrity of digital health initiatives in Pakistan.

In tandem with regulatory enhancements, fostering robust public-private partnerships emerges as a linchpin for driving digital health innovation and scalability. Collaborative endeavors among government entities, private sector stakeholders, and civil society organizations are vital in catalyzing the development and deployment of impactful digital health solutions. By pooling resources, expertise, and networks, these partnerships can unlock synergies, accelerate innovation cycles, and maximize the reach and impact of digital healthcare interventions across diverse population segments.

Furthermore, streamlining digital health tender processes is paramount for ensuring transparency, efficiency, and effectiveness in the procurement of digital health technologies and services. Establishing clear guidelines, evaluation criteria, and performance metrics within tendering frameworks promotes fair competition, quality assurance, and cost-effectiveness in the acquisition of essential digital health infrastructure and solutions. This streamlined approach not only optimizes resource allocation but also fosters a conducive environment for innovation and market participation, driving continuous improvement and value creation in the digital health ecosystem. In addition, training programs tailored to telemedicine practices, data management, cybersecurity protocols, and patient engagement strategies play a pivotal role in equipping frontline healthcare workers with the capabilities to navigate and leverage digital health technologies proficiently.

Sehat Kahani, a pioneering organization in Pakistan's digital health landscape, serves as a compelling example of effective public-private collaboration. Through dialogues with ministers, the prime minister, and policymakers, Sehat Kahani has been instrumental in advocating for strengthened telemedicine and drafting policy recommendations for improved regulations. Leveraging its extensive experience and success stories, Sehat Kahani has actively contributed to shaping the telemedicine landscape in Pakistan, emphasizing the importance of patient-centered care, ethical practices, and regulatory frameworks that promote innovation while ensuring patient safety and privacy.

The author is Co-Founder and CEO of Sehat Kahani

Adoption in Corporations and the Private Sector

In recent years, Pakistan has witnessed a rapid surge in the adoption of technology by corporations, reshaping traditional business landscapes and ushering in a new era of efficiency and innovation. One notable success story is the banking sector's embrace of financial technology (FinTech) solutions. Major banks in Pakistan have invested heavily in digital

platforms, enhancing customer experiences and streamlining financial transactions. Mobile banking applications, online account management, and digital payment systems have not only improved operational efficiency but have also increased financial inclusion, empowering individuals previously excluded from traditional banking services.

Daraz, a leading e-commerce platform, exemplifies the success of tech adoption in transforming consumer behavior. The platform has played a pivotal role in shaping the e-commerce sector, providing a convenient and secure online marketplace. With approximately 45 per cent of purchasers on Daraz being female, the platform reflects a diverse and inclusive customer base, showcasing the impact of technology on broadening market reach.

Furthermore, the ride-hailing industry, represented by Careem, has witnessed significant advancements. The platform has revolutionized transportation, offering convenient and reliable services to users. While challenges exist, such as social stigma impacting the participation of women, Careem's presence has transformed urban mobility and provided economic opportunities for many.

Despite these success stories, several challenges impede the widespread adoption of technology in Pakistan's corporate landscape. One significant hurdle is the digital divide, where disparities in internet access and technological literacy persist, particularly in the rural areas. This gap limits the benefits of tech adoption to urban centers, leaving a substantial portion of the population excluded from its advantages.

Cybersecurity concerns also pose a threat to tech adoption. As corporations digitize their operations, they become susceptible to cyberattacks. The lack of robust cybersecurity measures and awareness leaves companies vulnerable to data breaches and financial losses. Addressing these concerns is crucial for ensuring the sustainable growth of tech adoption in Pakistan.

Some industries, particularly SMEs, face financial constraints hindering their ability to invest in technology. The initial costs associated with acquiring and implementing

new technologies can be prohibitive, limiting the potential for growth and competitiveness for these businesses. Large corporations have often relied on investing in unproductive sectors such as real estate, which stifles innovation since there is no one else with enough capital to invest in software houses or process mechanization.

The tech adoption journey by corporations in Pakistan, as illustrated by examples such as Daraz and Careem, reflects a compelling narrative of success and challenges. While the banking, e-commerce, and ride-hailing sectors showcase remarkable achievements in leveraging technology for growth, the digital divide, cybersecurity concerns, conservative approach and financial constraints underscore the need for a comprehensive and inclusive approach.

The digital adoption in Pakistan's tech industry opens a door of untapped export potential. As the nation continues to produce innovative solutions, there is an opportunity to export these technologies and services to international markets. Pakistan can position itself as a hub for IT services, software development, and technological innovation.

The advent of affordable smartphones and the proliferation of high-speed internet connectivity have catalyzed a digital revolution in Pakistan. This transformation is most evident in the rapid growth of e-commerce platforms, mobile banking services, and digital communication tools. As more Pakistanis embrace the convenience and efficiency offered by digital solutions, the tech industry has become a hotbed of innovation to cater to consumer needs.

Pakistan's e-commerce sector has experienced exponential growth, with platforms like Daraz, Foodpanda, and Careem leading the charge. The adoption of online shopping is not limited to urban centers; it has permeated rural areas as well. This shift

has not only changed consumer behavior but has also provided opportunities for small businesses to reach a wider audience, fostering economic inclusivity.

The FinTech sector in Pakistan has witnessed a surge in innovation, leading to increased financial inclusion. Mobile banking services, digital wallets, and online payment platforms have become integral parts of everyday life. The government's efforts to promote a cashless economy have further fueled the adoption of digital financial services.

Despite the progress, challenges persist. Issues such as digital literacy, infrastructure limitations, and cybersecurity concerns need to be addressed. Moreover, a concerted effort is required to develop a skilled workforce that can meet the demands of a rapidly evolving tech landscape. The government, private sector, and educational institutions must collaborate to overcome challenges and harness the full potential of the digital revolution. The export potential is vast, and by fostering innovation, investing in education, and addressing infrastructure gaps, Pakistan can emerge as a key player in the global tech arena.

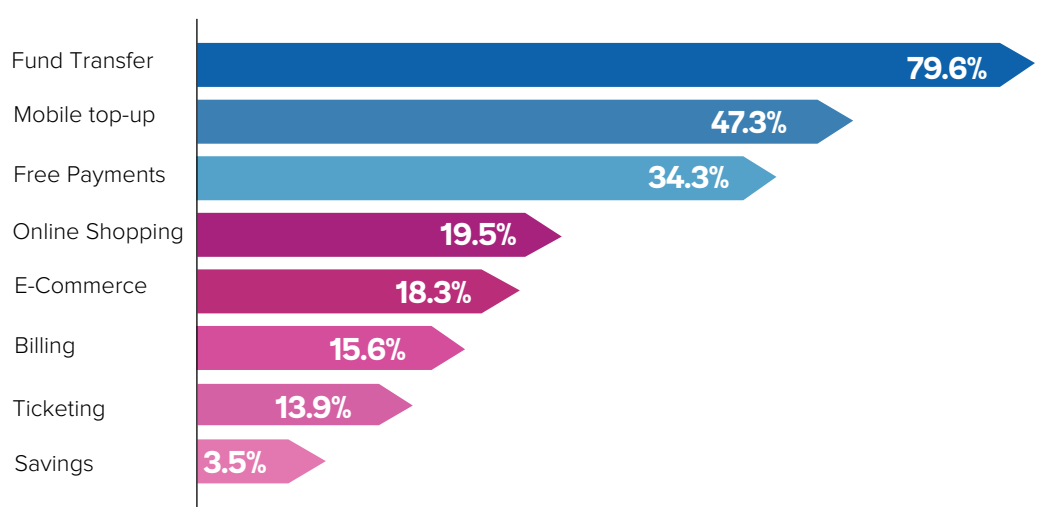
Why is the Private Sector Lagging in Digital Adoption

The private sector has a variety of players who leverage digital technology differently. Among these are businesses that have created digital platforms for customized retail, medical testing, banking, maintenance services, etc. Such businesses have made it easier for Pakistani customers to adopt digital commerce, and helped augment the mobile sector's contribution to the economy that stands at an estimated \$24 billion, or 6.6 per cent of the economy¹²¹. According to

the NHDR 2023/2024 survey, 39.4 per cent Pakistanis use mobile wallets for a variety of digital transactions.

As Figure 4.1 shows fund transfers are the most common and frequent usage at 79.6 per cent, followed by mobile top-ups at 47.3 per cent. Transactions using digital channels have grown exponentially in recent years and continue to maintain an upward trajectory.

Figure 4.1 Mobile Wallet Services Used



However, there are some challenges as well in the ICT sector that merit mention with regard

to digital adoption. As State Bank reports have flagged, IT-led growth and development

requires businesses to expand ‘absorptive capacities’ for digital transformation, otherwise digital technologies and rules of procedure needed for IT spill-over and leapfrogging will not develop¹²². Tech firms are over-concentrated in the fintech and e-commerce space, while ignoring the commercial potential in telehealth, e-education, and other social sectors. Lack of digital uptake by consumers may well be true, but such thin sectoral diversification points to an entrepreneurial and investment path dependency.

There are industrial players who despite holding sizeable market shares have neither incorporated digital operations, nor invested in digital adoption. It became apparent in interviews conducted with senior industrial leaders that there is limited grasp of digital models and their potential benefits; although ‘appearing digital’ through web portals and social media for optics¹²³ is fairly standard.

As a result, some of the oldest and largest businesses in Pakistan have been overtaken by relatively new commercial entities because of genuine digital outreach. This

also corresponds with the limited local funding options for Pakistani startups. In 2021, only 10 per cent of funding came from local venture capitalists (VCs), while the rest came from abroad. Local investors neither have the risk appetite nor the “investment mindset” necessary for establishing startups.¹²⁴ As for digital adoption among MSMEs, which constitute 90 per cent of the estimated 3.2 million businesses in Pakistan, the scale of challenge varies according to firm size, turnover, staffing, geographical location, and sector.

As COVID related lockdowns showed, MSMEs are fragile in the face of external shocks¹²⁵, and have limited capacity to scale up digital usage. Internet shutdowns badly impact many in the informal sector, as well as daily wagers employed through ride hailing and delivery services like Careem, Bykea, In-drive and FoodPanda. An estimated 700,000 workers are employed in Pakistan’s ‘platform economy’, which is vulnerable to arbitrary shutdowns and losses worth millions of dollars a day¹²⁶.

Adoption amongst the People

Digital adoption in Pakistan is a multifaceted journey that encompasses various segments of society, each with its unique challenges, opportunities, and perspectives. In the NHDR 2023/2024’s FGDs with teachers, students, women leaders/entrepreneurs, transgender individuals, girls and boys, tech workers, and civil servants, a tapestry of insights emerged, shedding light on the intricacies of digital empowerment across different strata of the Pakistani population.

The Classroom – Teachers and Students: Teachers articulated the challenges and triumphs of integrating digital tools into education. While many celebrated the potential for enhanced learning experiences, the hurdles of limited resources and digital

literacy were apparent. Students, on the other hand, shared stories of digital learning, highlighting its impact on their education. Yet, disparities in access to devices and the internet surfaced as critical obstacles to equitable learning opportunities.

The Inclusivity of Digital – Women, Transgenders, and Minorities:

The narratives from women leaders and entrepreneurs echoed the transformative power of digital tools. Digital platforms became a catalyst for economic independence, allowing women to navigate and thrive in traditionally male-dominated sectors. However, gender-specific challenges persisted, ranging from online harassment to unequal access to opportunities. The discussion illuminated the

importance of fostering a digital environment that ensures inclusivity and protection for women. Transgender individuals highlighted the crucial need for digital inclusivity, recognizing the opportunities for networking and economic participation on digital platforms. Despite these prospects, concerns persist regarding discrimination and exclusion within the digital realm.

In tandem, minorities in Pakistan navigate a nuanced journey within the digital landscape, experiencing both empowerment and challenges. Through the lens of digital adoption, the interconnected world of social media offers global connectivity for minority communities, yet simultaneously exposes them to discrimination and negative reactions. The internet, celebrated as an equalizing force, provides a platform for minorities to amplify their voices; however, its misuse contributes to offline tensions. On a personal level as shared during the qualitative discussions, the online environment serves as both a source of connectivity and tension, underscoring the necessity for nuanced policies that harmonize the benefits of digital adoption while addressing the unique challenges faced by minorities in Pakistan.

Youth and Tech Workers: Girls and boys provided insights into the evolving dynamics of digital adoption among the youth. Their experiences highlighted the role of technology in shaping not only educational paths but also social interactions and aspirations. Young tech workers illuminated the professional landscape, detailing the challenges and opportunities within the tech

industry. The discussions emphasized the importance of continuous skill development and the dynamic nature of digital professions.

Civil and Public Servants: Civil servants shared their experiences with government-led digital initiatives. While acknowledging the strides made in enhancing efficiency, challenges related to infrastructure and resistance to change were evident. The discussions underscored the need for comprehensive strategies to ensure seamless digital transformation within public services. The FGDs held unveiled cross-cutting themes that resonated across diverse segments. Digital inclusion emerged as a key challenge, requiring concerted efforts to bridge gaps in access, adoption, and literacy. Socio-economic impacts were evident, with stories of economic empowerment coexisting with concerns about potential disparities. Policy implications centered on addressing barriers to digital adoption and enhancing digital literacy across all segments of society.

Analyzing the personal experiences and challenges across groups revealed commonalities such as limited access to resources and the digital divide. However, each group's unique circumstances added layers of complexity to the overarching narrative. Educational challenges, employment and entrepreneurship opportunities, and social and cultural factors played distinct roles in shaping the digital experiences of different segments.

What Prevents Digital Adoption Among People?

As highlighted in the Access section, digital access varies for individuals and groups across Pakistan. Among the 47 per cent who do have access to the internet, an overwhelming 90 per cent use it for entertainment, whereas other pursuits like e-learning or telehealth or activism barely notch a mention in comparison.

As studies explain, high consumption of entertainment corresponds with lower educational attainment among users; anxiety caused by socio-political stressors (including violence in conflict zones); and problematic internet usage (PIU) among specific age cohorts. High consumption of entertainment may not denote good or bad utilization of the internet. Instead, the highly *undiversified* usage of the internet demonstrates that users are unfamiliar and disinclined to put the internet to better use.

An overview of education attainment will show why. The national literacy rate of 62.3 per cent (urban 74 per cent; rural 52 per cent; men 70 per cent; women 49 per cent)¹²⁷ denotes basic literacy that allows rudimentary reading or writing. To encourage digital adoption, *functional literacy* should be prioritized, which develops capacity for social awareness and critical reflection as a basis for personal and social change¹²⁸. Before the pandemic, Pakistan had 75 per cent learning poverty, which meant an overwhelming number of children could not read or understand a simple age-appropriate text. This number has likely gone up, and disproportionately impacts impoverished children, whose majority are girls. Before the pandemic, about 35 per cent or 15 million rural children aged 5-16 were out of school, compared with 20 per cent or 4.4 million of urban children. This gap has remained constant over the past two decades¹²⁹.

At higher levels, research points to outdated teaching practices, lack of quality and availability of pedagogical material. In interviews conducted across the country, technology specialists complained that the knowledge and aptitude of IT and engineering graduates is completely unsuitable for hiring.

Higher education institutions are teaching outdated curricula on technology with little knowledge or interaction with industrial needs. This makes it necessary to “bootcamp” students after four years of undergraduate study to bring them up to speed with industrial needs. They pointed out that the Higher Education Commission is not open to revising the IT curriculum, although multiple reviews have taken place over two decades. As a result, young Pakistani talent is being wasted on degrees that has no employability prospects. This connects with a broader skills mismatch being experienced by millions of new job market entrants.

The NHDR 2023/2024 Team also interacted with groups of women professionals who have adopted digital technology in their work. Women working in the informal sector described the social transformation their lives have undertaken with starting app-based businesses, or expanding clientele through social media platforms. Increased earnings and greater financial autonomy has given them confidence and a sense of prestige. There is also greater social negotiability within the home and community as a result of their business doing well, they reported. Their knowledge of mobile based applications spans mobile wallets, delivery services, and social media, and they want to learn more.

BOX 4.6**Political Participation and Digital Rights**

Digital rights and political participation in Pakistan are deeply interwoven with the country's levels of digital literacy and access. The national literacy rate, reflecting basic reading and writing skills, reveals only a portion of the narrative. For digital rights to be meaningful, functional literacy becomes paramount, fostering an environment where individuals are not only consumers of digital content but also active participants and creators within the digital realm. Political participation, in the traditional sense, has been constrained to physical ballots and town hall discussions. However, with the advent of the digital age, these activities are increasingly moving online, making digital literacy not just a convenience, but a necessity for civic engagement. Pakistan's young population has become more politically active through social media.

For political participation in Pakistan to be fully inclusive and democratic within the digital sphere, there is an urgent need for policies that protect digital rights and promote digital literacy. Without these, the potential for digital tools to enhance democratic engagement and allow for broader political participation remains unfulfilled. Moreover, digital literacy initiatives need to address the gender gap in access and participation, as women in Pakistan are often disproportionately affected by both digital and political disenfranchisement. By providing women and marginalized communities with the tools and knowledge to navigate and utilize digital platforms effectively, there is an opportunity to strengthen their political voices and participation.

The crux of digital rights in Pakistan lies in the ability to access, use, and navigate the internet freely and safely — a concept that extends beyond mere connectivity. It encompasses the freedom of expression online, the right to privacy, data protection, and the ability to engage in political discourse without fear of undue surveillance or censorship. These rights are foundational for any democratic society that seeks to empower its citizens in the digital age. However, in Pakistan, these rights are often constrained by regulatory challenges and cybersecurity issues that impinge upon personal freedoms and limit digital expression.

Efforts to integrate digital rights into the broader political context must also consider the specific challenges that Pakistan faces, such as restrictions on internet freedom and the need for comprehensive cyber laws that protect citizens' rights while encouraging responsible use of digital technologies. As Pakistan grapples with these issues, the role of civil society, tech innovators, and policymakers becomes crucial. They must work collaboratively to ensure that the digital transformation of political participation is both progressive and inclusive, allowing for a truly participative democracy to flourish.

in the digital era. To usher in a new, politically aware generation, Pakistan needs to invest in digital equality and internet freedom to enable individuals to both access and participate in civic and political activities.

The future of law and justice being digital, accessible and equitable is not a distant dream. By harnessing the power of technology responsibly and collaboratively to advance the sustainable development agenda of justice for all, SDG 16, the scales of justice can tip in favor of the people.

BOX 4.7

Digitalizing Law, Democratizing Justice

By Anoosha Shaigan

Navigating the Pakistani legal system is a major struggle. The Fourth Industrial Revolution presents an opportunity to enable easier access to law and justice by using technology reinforced through online judicial infrastructures and democratization of legal resources. The legal system in Pakistan is often criticized for being slow, complex and expensive, with daunting protocols and inaccessible counsel. Through digitalization, legal knowledge traditionally cloaked in legalese can be transformed into readily available databases, accessible within seconds.

Knowledge is power in the legal world and many innovative technology-enabled initiatives in Pakistan are amplifying this knowledge, turbocharging Pakistan's transition towards a knowledge-based economy. Knowledge platforms like CourtingTheLaw.com and digital law journals equipped with enhanced search functions have been operational in Pakistan for over a decade, empowering underserved citizens to understand their rights and duties, navigate everyday legal challenges, foster a culture of self-reliance and informed decision-making, and democratize access to legal resources irrespective of socio-economic or geographical constraints. Lawyers, too, benefit from these resources, staying updated with evolving legal developments and equipping themselves to provide better representation.

Amidst digitalization of legal platforms, prioritizing human-centered design is crucial to ensure justice and prevent biases, such as in the use of artificial intelligence (AI) and algorithms.

"Legal-tech" (as opposed to "tech-law" regulating specific technologies, or "justice-tech" enabling virtual courtrooms) refers to online platforms and digital tools used to enhance the delivery of legal services. According to the Global Legal Tech Report 2022, the global legal tech industry is estimated to be valued at ~\$30 billion and the impact of technology on justice services for citizens and the legal community is transformative.

An economic challenge for lawyers in Pakistan is that they are restricted by law to solicit their services in mainstream spaces, making it difficult to connect with prospective clients without word-of-mouth referrals. Online legal directories and networking platforms can connect lawyers with individuals seeking timely legal guidance based on their needs and location, ensuring legal representation for all. Furthermore, tele-law services can utilize video conferencing platforms to facilitate remote consultations, bridging economic and geographical inequities.

Traditional court proceedings can be cumbersome and lengthy for citizens as well as lawyers. Online Dispute Resolution (ODR) platforms can facilitate remote hearings and the resolution of minor civil disputes in a virtual setting and are especially suited for safeguarding witnesses and vulnerable individuals or those facing mobility issues. ODR mechanisms such as video conferencing are increasingly being used in Pakistan for the recording of evidence. Compared with traditional litigation proceedings, online platforms can provide more streamlined processes and user-friendly interfaces while saving costs and resources and reducing the backlog in traditional courts.

For the implementation of an effective ODR system:

- A secure platform must be established for data protection and cybersecurity;

- Legal processes powered by automation or artificial intelligence (AI) must adhere to legal ethics, ensure transparency and prevent biases;

- Lawyers, mediators, judges and court staff should be trained to facilitate litigants based on a citizen-centered approach to justice and dispute resolution; and

- Robust legal frameworks should be developed to ensure enforceability of decisions in the physical absence of parties.

The court system at every hierarchical level in Pakistan is shrouded in paperwork and riddled with repeated physical visits, disempowering citizens as well as lawyers. This landscape can be transformed by the integration of:

- e-filing platforms for the submission of documents; and

- Digital case management systems for keeping track of case updates.

These mechanisms, with robust cybersecurity and data protection measures, can have a direct impact on human development and access to justice by reducing costs and delays in the resolution of cases, increasing online citizen engagement and agency, eliminating the need for long queues and physical visits, reducing bureaucratic red-tape and making the pursuit of legal rights and justice more efficient.

Unfortunately, e-filing platforms and online fee payment gateways have not yet been adopted by Pakistani courts and there is no alternative to expedite the submission of documents other than by visiting in person or waiting outside record-rooms all day to obtain certified copies of multiple legal documents. Moreover, despite the operationalization of case management systems in some districts, citizens continue to be unable to track the complete progress of their cases in a contextual, seamless and timely manner and remain at the mercy of court staff and legal representatives.

The author is a human rights and technology lawyer and COO of Courting the Law.

Barriers to Adoption

Adoption would seem the easier step towards embracing technology to leverage its many benefits. For individuals, digital adoption confirms avenues of creative agency over education, infotainment, or political participation through social media. For communities, it develops social networks that act as bulwarks against natural disasters or support systems for victims of domestic violence. For institutions, digital adoption creates a welcome mechanization of mundane tasks, and accelerates the pace of communication and dissemination.

Yet, there are vital omissions in the continuum between access and adoption that prevent much of this from happening. Several technology adoption models identify a number of characteristics that determine whether technology is acceptable to users, especially workers who often experience technology imposed on them. In the research conducted for this Report, the following insights were gleaned:

- 1. The largest impediment in adoption is an attitudinal one.** Despite the provisions of material hardware and improved access to global technologies, people choose not to scale deliberately. This is not because they do not see purpose in adoption – they will attest the merits of having greater technology. Rather, there is an avoidance of new management
- 2. The environment within which people upgrade their digital skills matters more than the technology.** Work environments that emphasize technology over people are building barriers for skill upgrades. Forced learning often brings about negative consequences for productivity, whereas positive coaching will help build confidence and participation. Interview respondents told us that forced adaptation to online classes during COVID-19 was deeply unsettling for both students and teachers at first, especially the latter who were not adept in multiple forms of digital technology. Eventually, the new method of online interaction in both classrooms and business meetings became an efficient modality.
- 3. Not everyone has accessed digital technology their entire life, and adoption interventions must be sensitive to the digital divide.** For digital natives, switching to digital upgrades will be easier, compared to users in their 40s who are handling devices or software for the first time. Across Pakistan's unequally developed communities,

those with some experience of handling digital devices will be more open about handicaps they experience in upskilling, whereas those who have not operated digital devices before will be reticent in sharing challenges, often overcoming the embarrassment of their knowledge gap. In FGDs with informal women workers, those who neither owned nor used smartphones would be the last ones to speak, as they did not have the finances to purchase a phone nor experienced the associated social prestige. There has to be greater sensitivity in programing for digital uptake, so as not to render the experiences and insights of digitally 'disconnected' persons irrelevant. The digital divide is an active barrier among age groups and across the gender divide, but it is the most evident between socio-economic groups, as the NHDR data shows.

4. Champions cultivate cultures of digital adoption. Like any other trend, technology needs to 'humanized' through relatable champions, or people who demonstrate how adoption can lead to qualitative benefits in social well-being, life pursuits, and productivity. Many of the world's global champions for technology

are celebrities in their own right, not only for providing technological innovation for industry, but also describing the industrial future and as the psychosocial leap individuals and societies need to make to reach it. The digital is personal, and champions can create greater appeal for adoption as an individual 'choice', rather than a public necessity for society.

5. There is a political economy surrounding digital adoption, which in certain cases prevents digital expanse beyond a point. One of the more valuable derivatives of digital governance is transparency of planning, procedures and outcomes, as many would agree. However, increased transparency threatens to decommission personnel who exploit systemic inefficiencies for gain. Transparency brings about accountability as well, and helps address both corruption and incompetence. This is especially true for public offices where procurement, budgetary supervision, asset control, and reporting has been revamped through digital tracking. This is one reason why officials cited resistance to online methods, or offline procedures to continue in parallel.

Enablers for Gainful Adoption

A convergence of strategic factors is propelling Pakistan into a transformative era of digital adoption. The widespread expansion of connectivity and increased internet penetration, especially in the urban areas, acts as a foundational catalyst. This democratization of digital access, facilitated by high-speed internet and affordable data plans, ensures more inclusive engagement with online platforms and services across a diverse demographic.

Government initiatives and policies play a pivotal role in shaping Pakistan's digital

landscape. Supportive policies and targeted projects aimed at enhancing digital infrastructure create an environment conducive to technological advancements. These endeavors contribute to the establishment of a robust digital ecosystem, fostering innovation and facilitating widespread digital adoption.

Pakistan is undergoing a significant digital transformation that has the potential to reshape its socio-economic landscape. The NHDR 2023/2024 identifies four key enablers instrumental in driving and sustaining this

transformation: Digital Capabilities, Policy Reform, Investments, and Innovation.

1. Digital Capabilities: Digital capabilities are fundamental to the success of any digital transformation initiative. In Pakistan, enhancing digital literacy and skills across diverse segments of the population is a critical enabler. Efforts to bridge the digital divide by promoting digital education, providing training programs, and fostering a culture of continuous learning are paramount. Initiatives targeting women, youth, and marginalized communities can play a pivotal role in ensuring that the benefits of digitalization are inclusive and accessible to all.

2. Policy Reform: A conducive policy environment is essential for fostering a thriving digital ecosystem. Pakistan recognizes the need for comprehensive policy reforms to facilitate and regulate the digital transformation. The government's commitment to developing and implementing policies that encourage innovation, protect digital rights, and provide a framework for digital infrastructure development is crucial. This includes legislation to address cybersecurity concerns, data privacy, and e-governance frameworks that

streamline public services through digital channels.

3. Investments: Adequate investments in digital infrastructure are imperative to propel the digital transformation forward. Public and private sector collaboration is key to mobilizing resources for building robust digital infrastructure, including high-speed internet connectivity, data centers, and digital payment systems. Strategic investments in R&D are necessary to spur innovation and the development of cutting-edge technologies that can contribute to economic growth and competitiveness on the global stage.

4. Innovation: Innovation is the engine that drives digital transformation. Pakistan's commitment to fostering a culture of innovation is evident through initiatives supporting startups, incubators, and accelerators. Encouraging research and development, promoting collaboration between academia and industry, and creating an environment that rewards experimentation and risk-taking are crucial components. Innovation hubs and clusters can serve as focal points for collaboration, bringing together diverse stakeholders to create a thriving digital innovation ecosystem.

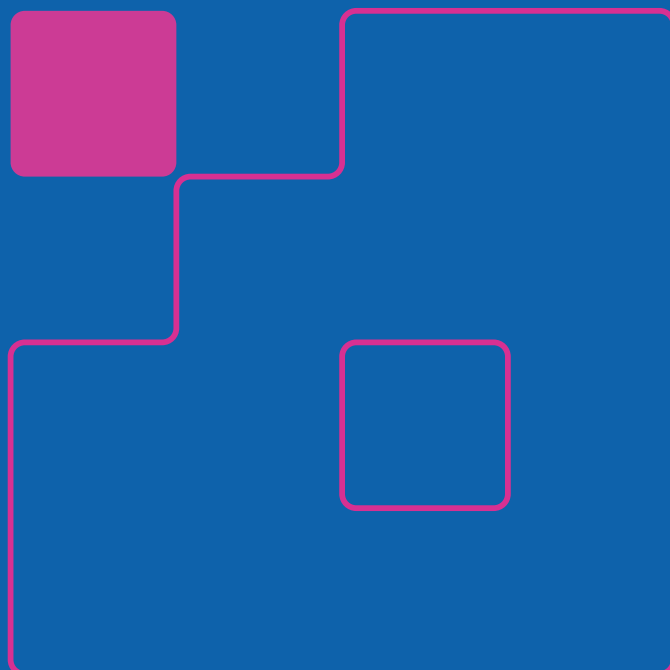
BOX 4.8**Pakistan's First Digital Gender Inclusion Strategy¹³⁰**

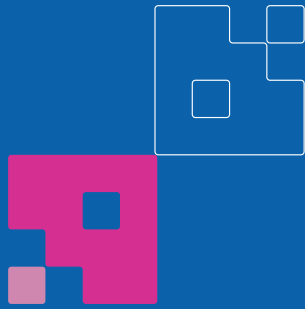
With the support of GSMA and UNESCO, the PTA has launched in 2024 a Digital Gender Inclusion Strategy to close the gender digital divide. The findings in PTA's research regarding the gender divide perpetuated by the digital divide are remarkably similar to those of NHDR 2023/24. Lack of awareness about advantages of technology, cultural and social restrictions, limited education, and lack of formal proof of identification are major barriers for women. As in NHDR 2023/24, the PTA has also outlined five key priorities to design equitable and inclusive policies to close the gender digital divide:

- i. Improve affordability for women, for example, using subsidies or other financial subsidies.
- ii. Improve knowledge and skills for women through target education programs.
- iii. Address safety and security concerns.
- iv. Improve access to digital technology through private sector partnerships and making it easier women to get proof of identity.
- v. In close partnership with civil society, ensuring digital technology content and services are relevant to women.

The Gender Inclusion Strategy action plan is to create the Pakistan Digital Inclusion Forum for Gender Equity, which will be responsible for developing and implementing a national strategy to promote gender equality in the digital sphere. The forum will bring together stakeholders from the civil society, government, academia, and international organizations. PTA will steer the forum's setup. The public sector will make investments, create policies and regulatory frameworks to increase women's access and adoption of digital technologies. The private sector will focus on designing products and services that are accessible, relevant, and affordable to women, and support the development of women-led businesses. Civil society will advocate for women's digital rights, mobilize communities, and provide support and services to women. Academia will contribute to research and data analysis and advise on evidence-based policies and programs for women. International organizations will take the lead on technical assistance, funding, and coordination at the global level.

The plan calls for at least 25 per cent more women being able to afford mobile phones and the internet, 20 per cent more women having access to mobiles, ICT devices and Internet-based services and digital content, analyzing safety laws to provide safe space for women online, 60 per cent of women having the skills and knowledge to use the internet and, address negative perceptions of women using technology. The strategy is a significant step towards closing the digital gender divide for women. If executed well, its collaborative approach will enable the government to address the issue of gender inclusion at a systemic level.





Section V

Anticipate: Becoming Future-Ready



“Digital technology is shaping history. But there is also the sense that it is running away with us. Where will it take us? Will our dignity and rights be enhanced or diminished? Will our societies become more equal or less equal? Will we become more, or less, secure and safe? The answers to these questions depend on our ability to work together across disciplines and actors, across nations and political divides. We have a collective responsibility to give direction to these technologies so that we maximize benefits and curtail unintended consequences and malicious use¹.”

Mr. Antonio Guterres

United Nations Secretary-General

A Framework for Equitable Digital Transformation

Technology has changed the world and every aspect of the way we live our lives. Its pace and scale is unprecedented in history. In just two decades, digital technology has reached 50 per cent of the developing world’s population². In 2023, Pakistan conducted its first ever Digital Census, recording the national population at 241.9 million³. In 2024, more than half of the world’s populations – including that of Pakistan – will already have or will proceed to vote in elections. The last time they voted, Chat GPT (Chat Generative Pre-trained Transformer)⁴ did not exist⁵.

The world is going through a deeply uncertain time, described as the age of ‘polycrises’⁶ where multiple crises like climate change, inequality, and socio-political polarization are interconnected and impacting people’s lives. Technological advancement is fueling these challenges. The global community is faced with a choice in how to manage and harness technologies for the global good. Technologies have held promise to democratize society and improve wellbeing

by providing better access to finance, better jobs, health and government services. However, without effective governance and regulation, these technologies can cause serious harm very quickly.

The U.N. Secretary-General’s Roadmap for Digital Cooperation convened in 2018-2019 provides a framework for equitable and inclusive access of technology⁷. The Roadmap envisaged eight key actions, the first of which is that by 2030, “every person should have safe and affordable access to the internet, including meaningful use of digitally enabled services in line with the SDGs”⁸. The Roadmap also calls for promoting equitable digital goods ensuring digital inclusion, strengthening digital capacity building, ensuring the protection of human rights, supporting global cooperation on artificial intelligence, promoting trust and security in the digital environments, and building a more effective architecture for digital cooperation⁹. The Roadmap recognizes that without better governance and regulation, technology

will exacerbate current deprivations, vulnerabilities and inequalities.

Debates show that interventions to manage digital transformation require new and big thinking, new and enhanced digital skills, as well as cross-sectoral partnerships. Civil society, development agencies, government,

and private sector will need to come together to share knowledge, advocate for more inclusive and equitable digital technology designs. As they occur, key digital innovation trends will need to be monitored and analyzed, particularly those game-changing solutions that close the digital divide and reach to benefit the most vulnerable.

Inclusive Digital Technology

Academics argue that monopolistic tech giants are enabling ‘digital colonialism’, who influence and control our algorithms and digital experiences¹⁰ through designs based on western imaginations and knowledge sharing, whilst extracting data and profit from users across the world to one country, the United States¹¹. Poorer countries are overwhelmed by services and technology, such as advertising on Facebook and Google, that drives away business from local industries.

Digital technologies that are more participatory and inclusive of the voices of the Global South need to become mainstream. Trends

on designing equitable digital solutions have called for more humane AI, doing no digital harm and promoting human-centered fourth industrial technologies that include diverse groups. There are also movements rallying to decentralize Big Tech’s influence. The FreedomBox Project¹² in India is open-source, turning computers into personal servers to run cloud services without the middle man, providing decentralized social network, email, and messenger services. The project has also expanded into rural villages, providing communities with old devices connected to the Wi-Fi and decentralized services.

Meaningful Digital Access

To close the digital divide, there are multiple layers of inequality to navigate. There is constant tension between the degree of technological advancement in the Global North and the struggle to keep up by the Global South. For example, for the Global North, Forbes lists some of the major trends for 2024¹³, including Generative AI, sustainability policies, new digital skills, and quantum computing. However, much of the Global South is still not online. According to the 2024 UNDP Trends Report¹⁴, only 27 per cent of people in low-income countries are online compared with 93 per cent in high-income countries¹⁵.

There are also inequalities within countries and within different social groups. For instance, although gender parity is improving,

women’s mobile phone access in lower middle-income countries is 19 per cent behind men¹⁶. Nine hundred million women are not yet connected, and nearly two-thirds are in South Asia and Sub-Saharan Africa¹⁷. Internet users in urban areas are double of those in rural areas¹⁸. Countries in the Global South are still struggling to provide basic infrastructure and access to affordable mobile phones, computers and broadband. According to a study conducted by the World Bank¹⁹, South Asian countries expanded 4G mobile networks in the last five years, but broadband internet and smartphones remain unaffordable for the region’s poorest.

Successful trends tackling access come from local government ownership, a big vision, and clear whole-of-government approach to

closing the digital divide. For example, the African Union's Digital Transform Strategy has created a digital vision linked to national goals with the aim of improving the digital ecosystem, providing access, making investments in digital skills and industries²⁰. Similar successful

strategies are being implemented in India and Estonia with their whole-of-government digital visions as well as countries in the Global North, including the United States of America and the United Kingdom.

The Future of Work

The International Labour Organisation (ILO) estimates that shifts to a greener economy could create 24 million jobs by 2030; however, 800 million people could also lose their jobs to automation by 2030²¹. The World Economic Forum (WEF) estimates that 50 per cent of all the world's employees will need reskilling by 2025 as adoptions of new technology increase²².

Digital skills are critical for a competitive global workforce. However, there is a big gap in digital skills between richer and poorer countries²³. Poorer countries are struggling to meet even basic digital literacy, while advanced economies look to build digital skills in AI and data science. Women in poorer countries are even further behind as most still do not have access to technology. The advancement of AI that will take away many routine jobs or require working with AI will further deepen inequality.

There is broad agreement between academics and development agencies that policies will need to focus on providing digital skills training programs to under-served countries for building the workforce they need to keep pace with the future of work. Skill programs

are more effective when it is on-the-job training or with clear job placements. Countries are offering national digital skills programs to close the digital gap. For example, the Skill India Initiative²⁴ aims to provide vocational training and skill development across various sectors, including digital skills.

Government-led programs for reskilling citizens with digital skills are popular programs across the Global North, including the United States, United Kingdom, Singapore and others. Big Tech also offers digital training programs, although the impact of these skills remains to be seen. Microsoft in India will be training two million Indians in AI skills²⁵.

Early digital skills training from the level of schools as part of the curriculum will be required, and has proven to be more successful according to studies by the World Bank²⁶ and the German Institute for Global and Area Studies (GIGA)²⁷. Ensuring that technology is part of the curriculum is more successful than teaching separate classes²⁸. In addition, more emphasis in schools is now required on science, engineering, math and teaching soft skills in resilience and critical thinking²⁹.

The Moonshot Trend and Financial Inclusion

The rise of fintech solutions aimed at enhancing financial inclusion, including mobile banking and digital payments have become the moonshot initiative for the Global South. Mobile wallets have brought millions of unbanked into the formal financial net because they bypass traditional banks' lengthy requirements and expensive deposits.

The pandemic was the tipping point as more people used mobile money, after which the habit stayed. According to Global System for Mobile Communications Association (GSMA), 400 million registered accounts were created between 2019 and 2022 – a 30 per cent rise since 2019³⁰. Women in lower middle-income countries are 28 per cent more likely than

men to own mobile money accounts³¹. More women than ever before are using mobile wallets, and the numbers have particularly increased for women in Nigeria and Pakistan.

Mobile money has demonstrated its ability to lift people out of poverty in countries like India and Kenya. M-Pesa in Kenya, a mobile solution that began in 2007 targeting the unbanked and rural communities, has lifted two per cent of households out of poverty³². M-Pesa also

increased the country's financial inclusion from 26 per cent in 2006 to 84 per cent by 2021³³. M-Pesa allows rural communities to make money transfers by simply using their phone. They are able to receive salaries, make payments and pay bills. M-Pesa has now become a regional fintech solution and Africa's largest fintech platform providing services to 51 million customers³⁴.

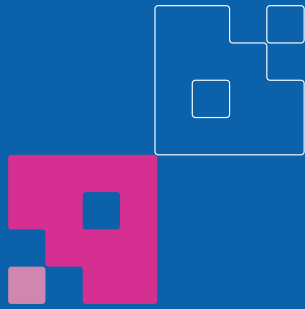
Digital Governance and Citizen Engagement

Today, governments have the opportunity to digitalize their services in order to reach more people, as well as provide transparent and efficient services. These services can include telehealth support, registrations and tax payment, saving citizens travel and time costs against slow and cumbersome bureaucratic red-tape.

Trends suggest that to deliver successful e-government services, it is critical to have a whole-of-government national policy. Involving citizens' feedback in the design of digital services proves to be a successful strategy to build better services and trust³⁵. Estonia is a leader in e-governance and digital transformation. The country has implemented a range of e-government services, including e-residency, digital identity cards, and electronic voting. Its digital initiatives streamline bureaucratic processes, improve efficiency, and enhance citizen engagement.

Its citizens can submit policy proposals, hold discussions, or send a collective address to parliament through an open-access portal³⁶. Digital India Program is also a successful national strategy aimed to achieve digital infrastructure, empowerment, e-governance services in India, including reducing poverty from 22 per cent in 2012 to 16 per cent in 2019³⁷.

Digital stacks are the ingredients to deliver digital government services that are more inclusive, accessible and effective³⁸. India's Aadhaar project is one of the world's largest biometric digital identity systems. It assigns a unique identification number to each resident, facilitating access to 300 government services, 400 state-run schemes, saving almost \$1.27 billion by simply paying state benefits directly to citizens, avoiding bureaucracy and corruption³⁹.



Section VI

**Accelerate:
Reaping the Low-Hanging
Fruits**



Digital Ecosystem

Key Players in Pakistan's*

Digital Ecosystem

Government



Ministry of Information Technology and Telecommunication

Ministry of Planning, Development, and Special Initiatives

National Information Technology Board

National Telecommunication Corporation

Ignite Fund

Universal Service Fund

KP Information Technology Board

Punjab Information Technology Board

Pakistan Council for Science and Technology

Ministry of Science and Technology

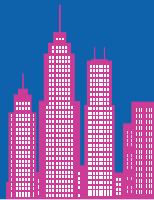
National Database &

Registration Authority

Pakistan Telecommunication

Authority

UN Digital Mandates



UN Secretary-General Office

UN Global Digital Compact

International Telecommunication

Union – lead agency on technology

International Financial Institutions



Asian Development Bank

World bank

International Finance Corporation

Asian Infrastructure

Investment Bank

* This is not an exhaustive list and represents the major stakeholders working on digital transformation in Pakistan.

Development Partners



United States Agency for International Development

Foreign, Commonwealth & Development Office

Japan International Cooperation Agency

European Union Delegation to Pakistan

Federal Ministry for Economic Cooperation and Development

Research Institutions



Centre for International Strategic Studies

Institute of Strategic Studies Islamabad

Islamabad Policy Research Institute

Pakistan Institute of Development Economics

Sustainable Development Policy Institute

Centre for Economic Research in Pakistan

Tabadlab

Torque Communities

Women4peacetech

Lahore University of Management Sciences

National University Science and Technology

Civil Society



Karandaaz

Bolo Bhi

Digital Rights Foundation

International Federation for Human Rights

Media Matters for Democracy

Pakistan Software Houses Association

Philanthropies

Bill & Melinda Gates Foundation



Telecommunications Operators

Pakistan Telecommunication Company Limited

Jazz

Zong Pakistan

Telenor Pakistan

Ufone



Digital Social Enterprises



Sehat Kahani
Taleemabad
ConnectHear
Femprow

Big Tech

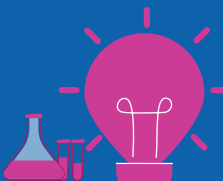
-  Google
-  Facebook
-  Twitter

Tech Companies


- Careem Pakistan
- Daraz.pk
- Cheetay Logistics
- Bykea
- FoodPanda
- Tech Valley Pakistan

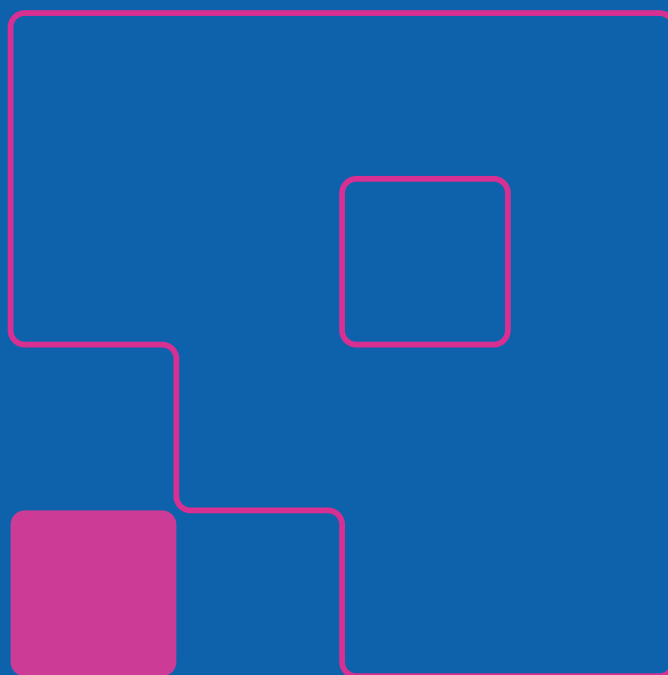


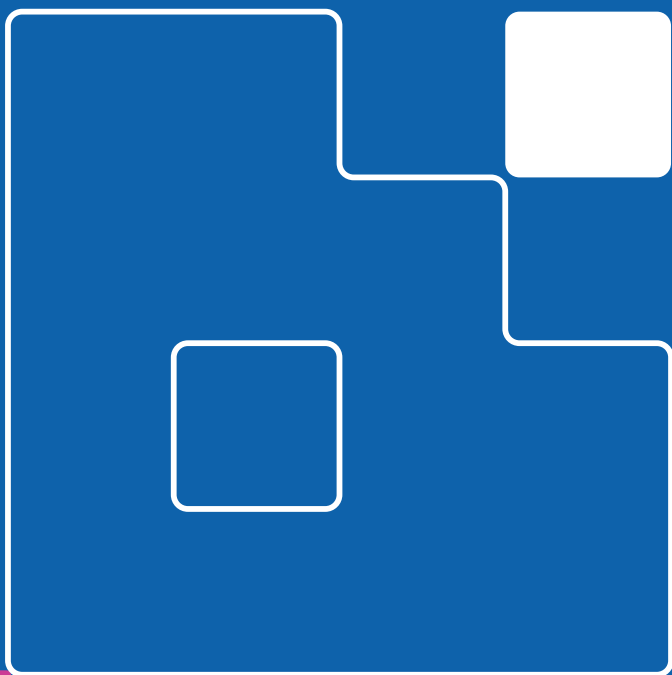
Incubators and Accelerators



- National Incubation Centers (Islamabad, Lahore, Peshawar, Karachi, Quetta, Hyderabad, Faisalabad)
- Plan9
- LUMS Centre for Entrepreneurship
- Invest2Innovate
- i2i Ventures
- Jumpstart Pakistan
- P@SHA
- DotZero
- Velocity Campus







Digital transformation has helped many countries leapfrog development milestones, and Pakistan can course a similar trajectory. However, this will require a prioritization of domains that can undertake digital acceleration. Digital investments have been made across South Asia and the globe with results that strengthen a new digital social contract. Pakistan also needs a radical change -- a new digital social contract that puts a premium on digital transformation for its human development.

Digital transformation is an accelerant. It can either accelerate past deprivations or accelerate its benefits to transform a country's future. Pakistan's major challenges lie in

economic stabilization; political commitment for structural reform; declining human development outcomes – often at par with low-income countries – widening social and economic inequality; climate stress reversing growth; and political polarization that impedes democratic dividends. Digital technology presents an opportunity to address these challenges with greater efficiency, speed, and reach.

Accelerate is the NHDR 2023/2024's fourth and final A recommending prioritized developmental pathways for Pakistan. This section identifies and recommends the interventions in select national sectors where digital dividends can be generated in the near to mid-term for improving Pakistan's HDI indicators.

A. E-Government and E-Governance

E-Government is the first domain where digital acceleration is needed. A slight distinction needs to be made here between E-Government and E-Governance, both of which are essential for digital acceleration. The U.N. describes E-Government as the usage and application of information technologies in public administration to streamline and integrate workflows and processes; to effectively manage data and information; enhance public service delivery, as well as expand communication channels for engagement and empowerment of people¹.

E-Government hinges on electronic interactions of three types: government-to-government (G2G); government-to-business (G2B); and government-to-consumer (G2C). Through innovation and e-government, public administrations around the world can be more efficient, provide better services and respond to demands for transparency and accountability, as well as assist governments go green, stimulate economic growth, and promote social inclusion for disadvantaged and vulnerable groups².

Unfortunately, Pakistan ranks poorly on

E-Government, ranking 150th among 193 countries on E-Government Development Index³. Most of the existing public sector institutions are functioning at a pre-pandemic industrial-era pace, and not equipped for emergency response or action. E-Government is critical to the acceleration agenda in Pakistan. Digital transformation has indeed changed society's expectations about government, which impel greater responsiveness and accountability. This means federal and provincial governments can no longer operate with outmoded digital attitudes and capacities. Digital transformation in the public sector is not limited to rebooting process efficiencies in government organizations. In fact, it can and must strengthen service delivery in geographies and communities that have remained excluded and marginalized. This is possible through the following measures⁴:

- 1. Pakistan's public institutions must achieve data optimization by undertaking data collection, collation, analysis, and dissemination.** Dynamic data and data fluidity now define how governments interact internally, and with

citizens, civil society, private sector, and development partners. Data centrality requires governments to make data accessible, usable, and actionable across all levels of government. Data from numerous sources must be made accessible, and be secured and protected. Access to open government data deters information manipulation, and enhances public sector attempts to build transparency, fight corruption, and strengthen public sector accountability.

2. Cloud computing will allow easier management of public IT resources and adoption of new digital technologies.

Lack of knowledge about new technologies has led to kneejerk policy reactions and hyper regulation in recent years in Pakistan. Globally, many institutions in the public sector have already turned to cloud computing for cost-efficiency and scalability, especially with larger volumes of data being processed. For those yet to make the digital leap, cloud technology makes it possible to quickly and automatically scale up computational infrastructures to meet load peaks, and process data and systems of partner agencies simultaneously and securely. This is especially pertinent for disaster response, rescue and relief efforts. Governments can utilize a variety of cloud configurations, including the public, private, hybrid, and multi-vendor cloud. However, before adopting cloud solutions, governments need to determine their regulatory frameworks, and pay attention to issues of autonomy, resilience, security and control.

3. Future governments will be ‘cognitive’, ‘agile’, and ‘seamless’. Governments are already experimenting with AI-assisted data gathering systems and simulation models that allow broader engagement with citizens and responsiveness to needs. Governments of the future will

be ‘cognitive’, or make decisions by leveraging real-time data, with the hindsight of past performance through intelligence programming. Governments will be *agile and adaptive*, i.e., they will demonstrate flexibility and adaptability in policymaking, regulation, procurement, and labor. Agile governments will transition away from rigid bureaucracies to more decentralized, flat models that are operationally fluid, and have greater public interface to respond to changing needs. Governments will be *seamless* by providing uninterrupted service delivery, fully digitalized services, and supportive infrastructure. A seamless government necessitates a shift from the traditional inside-out approach to an outside-in strategy, focused on user-driven governance and services development. Predictive analytics play an important role in seamless governance, as they allow the anticipation of challenges before they erupt into crises.

4. The latest inequality is digital, and E-Government can become a social equalizer.

Governments are beginning to focus on inclusive and equity-centered design; equitable access to public goods; data sovereignty and equity; and citizen empowerment for producing public value. These approaches are all the more relevant for digital transformation as public institutions seek to ensure that all members of society have improved access to services, and opportunities for participation. To leave no one behind, governments must acknowledge that exclusion exists, and identify barriers to inclusion in three critical domains: access (to smartphones, internet, mobile infrastructure, digital services); affordability (ability to pay for internet, digital devices, subscriptions for digital platforms); and ability (traditional literacy, digital fluency, and digital competence). To become a social equalizer, governments

should explore digital practices with outcomes for all, paying attention to data (disaggregated data, open government data and digital identity), design (co-creation and co-production and the integration of assistive technologies), and delivery (experimentation/sandboxing and blended, omnichannel services delivery).

UNDP's framework for E-Governance has three objectives: (i) Increasing efficiency, transparency and accountability of public institutions; (ii) Enhancing information access and provision of basic services to all, in particular, the poor and most vulnerable; and (iii) Promoting people's participation in decision and policy making processes, particularly women, youth and marginalized groups⁵. Within this framework, five E-Governance components are desirable, which include⁶:

- I. *E-administration* to develop transparency and accountability within national and local public institutions, improve their functioning and effectiveness;
- II. *E-service delivery* that enables the delivery of public services to all;
- III. *E-participation* or fostering greater interaction between people, and public institutions to develop better policies, services, and public operations. This takes the form of information provision; inclusive consultation; and, dialogue between public institutions and people;
- IV. *Supportive policy environment and regulation* that assist the formulation and implementation of ICT and E-Governance policies, and build institutional capacity for policy oversight. Such policies should be embedded within broader national development goals;
- V. *Open access to connectivity and information* that removes barriers to availing public services and information on public benefits.

The digitalization of governance requires an eco-systemic response. Digital technologies are altering the infrastructure underpinning the functions of government, as well as the broader public arena in which politics plays out, and mediates power-sharing and decision-making. This necessitates a new coherence within governance that grasps how popular expectations are changing, and how the state and government should respond. As the general elections in 2024 have shown, digitalization has had a strong impact on the quality of democracy in Pakistan, and provided an arena for digital contests over resources, policy attention, and even electoral mandates⁷.

It may be argued that digital technologies have positioned E-Governance beyond the State. There is now a diversity of institutions and power structures that shape development trajectories. This means conceiving of governance beyond normative and instrumentalist approaches, or even 'the social contract' that reinforces a State-Society dichotomy, and instead, exploring the diversity of institutions and power structures impacting people's lives today. Power is now exercised through private sector entities such as platform owners, technology vendors, media entities, and civil society actors. If digital technology is to enhance rights-based, inclusive development, it is critical to understand the role of digital technology in assisting 'governance on ground' rather than remain stuck in cyclical debates about regime capacity⁸. This can be enabled through the following measures:

1. **Digital governance must be deliberately expanded with a view to leaving no one behind.** These efforts should adopt a whole-of-society approach and bring in public bodies, corporate entities, civil society actors, and people to strengthen a national digital ecosystem built on inclusivity, sustainability, accountability, and rights. The internet should be seen a

space to fulfil rights, particularly through the provision of social services that may not be accessible in offline formats. Digital governance is, perhaps, the easiest component of digital transformation, as demand easily meets supply, and users or citizens assist the audit and evaluation of service provision.

2. Digitalization and E-Governance must come with genuine consultation.

Digitalization can enable consultation and participation, but successful governance requires listening. Public participation is a key dimension of E-Governance, but will realistically impact service design and delivery only if decision-makers pay attention. The reluctance of public institutions to share agenda-setting and decision-making power have led people to call out consultation processes, if at all they take place. Young people across the world are not enthralled by governments for corruption and incompetence within public institutions. E-Governance must transform the nature of public participation from traditional 'poster competitions' to inviting genuine policy interfaces with people. In doing so, it will fundamentally change power

relations between decision-makers and the public.

3. Digital planners must be vigilant towards surveillance risks and data misuse in service delivery.

Data gathered as part of digitalized service delivery can be misused if data falls into the wrong hands. As governments develop their understanding of online security, digital infrastructure should be designed in ways that ensures compliance with individual rights, data protection, and privacy. New technologies such as AI and advanced biometrics present both opportunities and challenges, including undermining human rights. Some of these risks posed by AI include the application of facial recognition systems for mass surveillance, algorithmic bias, lack of transparency, privacy and data misuse. Automated decision-making can also amplify human prejudice, particularly in discrimination towards certain communities. This has been experienced in other countries where AI-driven welfare fraud detection systems used algorithmic risk models that targeted low-income and minority-background neighborhoods.

B. Digital Economic Growth

The advent of the Fourth Industrial Revolution (4IR) has meant that digital technology will establish and sustain the production function connecting governments, businesses, labor, and profits across the world. Digital technologies are reshaping product and factor markets, and altering the future of business, commerce, and work as we know it. This transformation has accelerated in the wake of the COVID-19 pandemic, and Pakistan has to play catch up. Do the country's decision-making elites appreciate this transition, its economic and financial implications, and the costs of not integrating when the time is right?

Knowledge-based economic activities are the key to international competitiveness and productivity growth. Industrialization, particularly manufacturing, is no longer viewed as the principal driver of economic growth⁹. Figure 6.1 shows deceleration in the rate of global manufacturing growth in recent years. In Pakistan also, the contribution of industrial sector as a percentage share of GDP has plateaued over the last decade, while the share of the service sector has grown (see Figure 6.2 a and b).

Fig 6.1 Global manufacturing growth

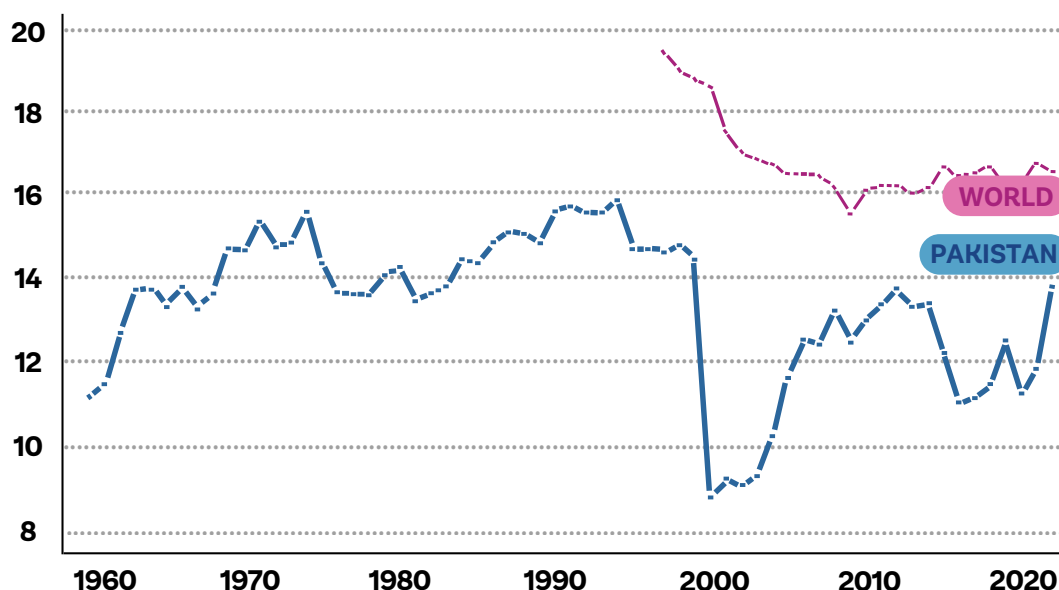
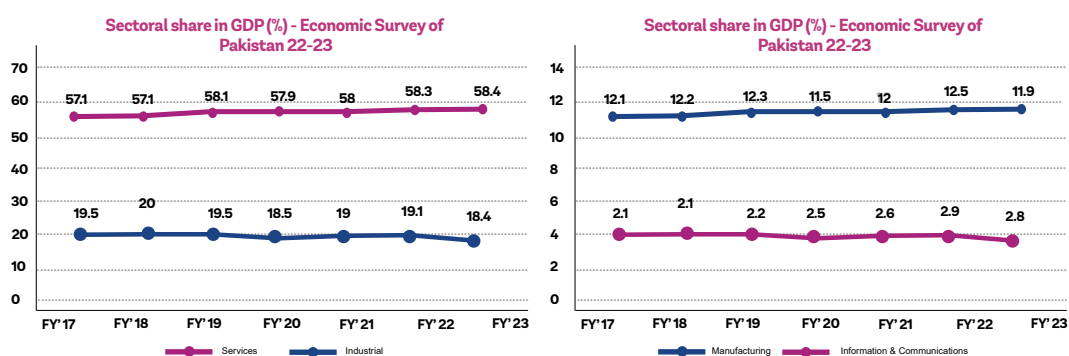


Fig 6.2 Sectoral share of manufacturing and industry



Pakistan export composition is heavily skewed towards a few key sectors, primarily textiles and apparel, which account for a significant portion of total exports. Other major export sectors include leather products, rice, surgical instruments, and sports goods. However, there is a notable lack of diversification in Pakistan's export basket, with a limited range of products and markets, which makes it vulnerable to external shocks, market fluctuations, and changes in global demand patterns.

Over-reliance on a narrow range of export products makes Pakistan susceptible to price

volatility, competition from other exporting countries, and disruptions in global supply chains. Furthermore, the concentration of exports in traditional sectors like textiles and agriculture limits Pakistan's ability to capitalize on emerging opportunities in high-value-added industries such as technology, pharmaceuticals, and engineering goods. This lack of diversification hinders Pakistan's ability to capture new markets, innovate, and achieve sustainable economic growth in the long-term. This is where digital transformation can – and to a nascent extent has already started to – play a significant role (see Box 6.1).

BOX 6.1**Fintech, E-Commerce & Digital Banking**

In Pakistan, the fintech, e-commerce, and digital banking sectors have seen remarkable growth, driven by technological advancements, changing consumer behaviors, and supportive governmental policies. Among fintech innovations, services like JazzCash and Easypaisa stand out for their profound impact on mobile payments, banking, and financial inclusion. JazzCash had over 38 million registered users in 2022¹⁰ while Easypaisa has announced over 10 million active users on its app¹¹.

These platforms offer a variety of services, from instant money transfers and bill payments to savings accounts and insurance, directly accessible through mobile phones. Such innovations have particularly benefited Pakistan's rural and underserved populations, providing them with access to financial services that were previously out of reach.

The e-commerce sector, notably led by Daraz, has experienced exponential growth, becoming a cornerstone of Pakistan's digital economy transformation. Daraz, as one of the country's largest online shopping platforms, hosts millions of products across a vast array of categories. It has significantly contributed to the digital economy, boasting seven million registered users¹². The platform not only facilitates consumer access to a wide range of products but also provides SMEs with a powerful channel to reach a broad customer base, driving the digitalization of traditional retail. The COVID-19 pandemic further accelerated this shift towards online shopping, with Daraz.pk playing a crucial role in meeting the increased demand for online retail services. The platform has also been instrumental in pioneering digital payment solutions within the e-commerce landscape, enhancing the shopping experience for Pakistani consumers.

In parallel, the digital banking sector has undergone a significant transformation. Innovations by new entrants like SadaPay, offering digital wallets and debit cards without traditional banking fees, have introduced a fresh perspective on customer convenience and accessibility. Established banks, such as Habib Bank Limited and Muslim Commercial Bank, have also expanded their digital offerings, investing in mobile banking apps and online services that allow customers to perform an array of transactions from anywhere, at any time.

This shift towards digital banking is underpinned by the State Bank of Pakistan's (SBP) initiatives, such as the Raast instant payment system, aimed at making digital payments more secure and efficient. Raast, which marks a major milestone in the country's journey towards financial digitalization, is Pakistan's first instant payment system designed to enable secure, efficient, and transparent financial transactions. Its launch is part of a broader initiative to enhance financial inclusion, streamline payment infrastructure, and drive the digital economy forward¹³.

One of the key features of Raast is its Person-to-Merchant (P2M) service, launched to facilitate instant, seamless payments between individuals and businesses¹⁴. This service can be particularly transformative for the e-commerce and retail sectors, as it allows customers to make direct payments to merchants using their mobile phones or other digital devices, significantly reducing transaction times and costs. The P2M service is aimed at encouraging digital transactions across the country, providing a boost to SMEs by offering them an easy and affordable way to accept payments electronically. This not only enhances the customer shopping experience but also supports the government's vision of a cashless economy by reducing dependency on physical cash transactions.

Together, these developments in fintech, e-commerce, and digital banking are reshaping Pakistan's financial services landscape, emphasizing innovation, accessibility, and customer-centric solutions. The rapid growth of these sectors is not only facilitating economic inclusivity and empowering businesses but is also setting the stage for Pakistan to emerge as a leader in digital finance in the region.

In 2018 the total economic contribution of the mobile ecosystem in Pakistan was \$16.7 billion, equivalent to 5.4 per cent of GDP, projected to increase to \$24 billion, equivalent to 6.6 per cent of GDP by 2023. As per the Ministry of Information Technology and Telecommunications, digital and information technology industries can contribute 13 per cent to national GDP by 2025.

COVID-19 pandemic opened unexpected opportunities for the digital economy in Pakistan and created demand for digital services in the country. Data shows that the growth in Pakistan's IT service exports averaged 24 per cent between FY 2020-2022, whereas start-up funding between 2021-2022 reached around \$709 million compared to approximately \$100.8 million in 2019-2020. In 2021, the country's national incubation centers supported 60 startups, generating \$373 million in capital, and reaching a valuation of \$2.1 billion. In 2022, 40 startups raised \$343 million in capital, reaching a valuation of \$3.5 billion¹⁵.

The recent growth in Pakistan's IT service exports and tech start-up funding is encouraging for digitalization in Pakistan. It

also reflects improving regulatory environment for supporting and increasing Digital Financial Services (DFS). Digital payments are often the entry point for digital financial services and provide the infrastructure through which additional products and use-cases can be developed. In this regard, the SBP launched the National Payment Systems Strategy (NPSS) in 2019 to make recommendations for designing a National Payment System (NPS) that includes a retail payment system, services and payment instruments, compliance with international standards and best practices, and tailored specifications for a safe, efficient, and inclusive NPS in the country.

Many of the lessons learnt in the financial sector emerged from the pandemic. In 2020, the Government had launched emergency cash transfers in the wake of COVID-19 to protect vulnerable population cohorts, through which 7.5 million new beneficiaries identified through the National Socioeconomic Database (National Socio-Economic Registry) were provided the cash assistance under the BISP program, utilizing digital cash transfers. Pakistan's social protection program brought highly effective interventions for digital

inclusion. The SBP also launched Raast in January 2021 to offer instant, reliable and free person-to-person (P2P) payment services to promote financial inclusion in the country.

In 2021, under its National Financial Inclusion Strategy (NFIS), SBP launched the Asaan Mobile Account (AMA) scheme in collaboration with Pakistan Telecommunication Authority (PTA), which provides an interoperable USD channel to all providers of branchless banking in the country. By September 2022, more than 5.5 million wallets (44 per cent women) had been onboarded through the AMA scheme¹⁶. Several other initiatives have been undertaken by federal and provincial governments to facilitate greater usage of digital payments.

Digital services and businesses, together as part of the digital economy, have opened new avenues for opportunity and growth and are fast becoming one of the largest contributors to Pakistan's economic promise. Conversely, there are also potentially large losses that may be incurred if these essential components of the digital economy are held back by the suppression and disruption of the fundamental infrastructure through which they operate, such as the internet.

A PIDE study found that by closing internet services in the country, businesses face a direct loss of PKR 1.3 billion or 0.57% of GDP per day. These include the economic costs of the closure of internet services for the telecommunication sector of around half a billion rupees, while for the financial sector it is a loss of almost a quarter of a billion rupees¹⁷. Major challenges persist that need concerted attention before digital acceleration can be achieved:

1) Outdated legislation: The Electronic Transactions Ordinance was enacted in 2002, and while it was appropriate for its time, rapid advancements in digital technology have since necessitated updates to legislation. With the rise of

newer technologies and tools, the existing legal framework may not adequately cover or regulate their usage. This gap can create uncertainty and risks, thereby discouraging the adoption of digital solutions.

2) Data privacy and security: Current legislation in Pakistan lacks robust provisions for data privacy and cybersecurity. As our economic systems become more digitized, they accumulate a significant amount of sensitive data. Protecting this data from breaches is essential for maintaining trust. A comprehensive data protection law that aligns with global standards can address this gap, making individuals and businesses more confident about using digital tools.

3) Lack of comprehensive e-commerce regulation and insufficient legislations for digital payments: The existing legal framework does not provide comprehensive regulation for e-commerce including sales of goods and services over internet and online payments. Weak intellectual property laws also pose a challenge for e-commerce businesses, as they are not well-equipped to protect against intellectual property infringement. Legal and regulatory frameworks in areas related to consumer protection, dispute resolution and intellectual property rights needs to be strengthened and their enforcement and implementation to be ensured to foster the growth of e-commerce in Pakistan.

To overcome these challenges, the NHDR 2023/2024 recommends the following measures:

1. The government needs to develop policies on data privacy and cybersecurity that do not constrain data flow, and encourage trade, innovation and e-commerce. In

doing so, it must ensure that national databases like NADRA are not misused without constraining the usage (and commodification) of customer data by responsible agents. For example, mobile operators could be permitted to utilize biometric data to overcome 'electronic know your customer' (eKYC) obstacles and the element of fraud in digital transaction. The establishment of data privacy frameworks to enable protections is desirable, but this must not constrain data flows with cumbersome compliance regimes that stifle the digital economy. Policies should allow data to flow in ways that foster trade, innovation and e-commerce. Emerging technologies such as blockchain can help overcome cybersecurity risks in complex, multi-party transactions¹⁸.

2. Innovation and entrepreneurship should be the cornerstones of Pakistan's economic and financial policies. The government should implement regulatory and fiscal frameworks that nurture tech start-ups, hasten time to market and adapt to digital business models, all of which drives a virtuous circle of investment and economic growth. Specifically, government departments must deliver on actions set out within the 2019 E-Commerce Policy, including facilitating company registration processes, improving interoperability of payment platforms, and ensuring consumer protection. Enabling domestic

brick-and-mortar retailers to establish an online presence provides an alternative route to market, which supports jobs and exports, while the local development of apps, content and services that meet the demands and competencies of citizens can reduce the usage gap. Cultivating the start-up scene, while leveraging advanced connectivity, greater mobile engagement and a skilled youth population, will help propel Pakistan's digital evolution towards its inflection point.

3. Exporters should expand their market outreach through digital means. Digital platforms and e-commerce provide an avenue for Pakistani businesses to access international markets without significant physical presence or infrastructure requirements. Platforms like Alibaba, Amazon, and eBay should be leveraged by Pakistani exporters to showcase and sell their products globally. Competitive advantages can be discovered using digital tools to gather real-time market intelligence, monitor consumer trends, and analyze competitor strategies more effectively. This information can inform product development, pricing strategies, and market positioning to better meet the demands of international consumers. Exporters can offer customized solutions to international clients through data analytics and customer relations.

BOX 6.2**Enabling Investments in Digital Technology and Communication**

UNDP Pakistan has established a technical assistance SDG Investments and Climate Financing Facility to identify and develop investment opportunities in different sectors of Pakistan's economy and pipeline of projects that are commercially viable and aligned with the SDGs. In 2023, UNDP and Government of Pakistan launched a digital market intelligence tool called Pakistan SDG Investor Map. This online tool identifies a range of market-specific investment opportunities for SDG-aligned capital deployment backed by Pakistan-specific data and evidence¹⁹. In this tool, the technology and communication sector was identified as cross-cutting sector, an enabler for growth in other sectors, an efficiency enhancer, and an access provider to online markets, for women in particular²⁰.

The technology and communication sector has many sub-sectors and industries one of which is IT services. The IT services sub-sector refers to services that ensure IT infrastructure, applications, and systems are effectively implemented, operated, and optimized. This sub-sector alone promises a Compound Annual Growth Rate (CAGR) of 12.58 per cent for 2024-2028. This growth rate will result in a market volume of \$4.98 billion by 2028. The revenue forecasts in 2024 is project to be \$3.10 billion in 2024²¹.

Fintech, short for Financial Technology, suggests uptake of technology to enhance effectiveness and efficiency in the conventional financial sector. The sub-sector includes segments such as online banking, mobile payments, digital wallets, and financial management tools. The subsector in Pakistan, in 2025, is expected to have a revenue growth of 32.92 per cent, much higher than the average returns for any sector. The digital investments are expected to grow from \$28 million to \$41 million from 2024 to 2028²².

E-Commerce, abbreviated for Electronic Commerce, suggests a market of online businesses, with or without our physical presence selling products and/or services online. Smaller markets within this subsector include online market for food, beverages, household essentials, beauty, fashion, eyewear, electronics, pharmaceuticals, furniture, toys, luxury good, hardware, and media marketing. The revenue in this subsector is expected to reach \$4,892 million in 2024 with a CAGR 2024-2029 of 5.85 per cent²³.

Computing, a subsector in technology and communication sector, refers to the devices used for performing computing functions such as data storage, communication, and data processing. This sub-sector can be divided into markets for laptops, PCs, tablets, storage units etc. The market in this subsector is expected to have a CAGR of 3.66 per cent for 2024-2028 and the revenue expected to be generated in 2024 in this market is \$1,999 million²⁴.

The growth in this sector can be attributed to many reasons ranging from individual to macroeconomic levels. These reasons include as increasing consumer reliance on digital services for day-to-day activities along with an increasing demand due to rising population, increased adoption of cloud computing in businesses processes, need for cybersecurity services, booming small and medium IT services providers in the market, increasing public investment and government support to IT industry, and low IT-skilled labor cost driving IT outsourcing firms to invest in Pakistan.

To channelize the market potential to ensure that not only are the returns maximized but impact on lives is also valued, UNDP's Facility has developed an online "Talk to Transact" tool. This tool enables enterprises to evaluate their projects on project financials and SDG lens, Gender, and Inclusivity lens and an ESG lens to generate a sustainability score for their projects. The higher the score, the higher the impact of the project, and the higher the probability to be chosen for impact investment and climate finance. Moving one step further from channelizing the investments, the Facility has also developed a portfolio of projects in this sector worth \$125 million.

C. Catalyzing Social Services

Social service delivery is the bedrock of effective governance. In the context of digital transformation, entitlements are provided through digital platforms by the State, as well as private entities as marketable services. The cumulative availability of public and private social services determines the quality of life for millions of end-users in Pakistan. In digital terms, this means cohorts that are 'digitally connected' and able to leverage online platforms for edtech, telehealth, social protection, and complaint portals.

In recent years, there has been a proliferation of e-platforms catering to education, healthcare, justice, and social protection, of which a significant number have been initiated by private, corporate or non-governmental organizations. Government-owned platforms (such as Virtual University) often cover a larger

populace due to sheer outreach, affordability, and lack of private sector options in remote areas. This is consistent with the government's predominant role in the education sector, predating EdTech platforms. Even today, public school enrolment at the primary level (65.7 per cent) outnumbers private enrolment (34.3 per cent)²⁵ by a wide margin. However, as seen in Pakistan's healthcare sector, as many as 70 per cent users avail private healthcare facilities (including traditional medicine options) over public healthcare²⁶.

Digital technology has certainly catalyzed social services in Pakistan, and can do much more to improve the cumulative reach of benefits to millions more. In accelerating the coverage of social services for end users, there will be significant gains in meeting SDGs targets, and human development indicators.

EdTech²⁷

Pakistan was undergoing a learning crisis well before the pandemic, with evident disparities in literacy across socio-economic divides, districts, and gender. Pandemic lockdowns

exacerbated the crisis, with 51 weeks of schooling lost for over 46 million Pakistani children. Twenty three million children were already out of school, of whom 56 per

cent were girls²⁸. Several digital learning interventions were launched to address this gap during COVID-19, whose impact varied. One case study on low-cost private schools revealed that 60 per cent surveyed homes had TV sets, but only 22 per cent watched the televised education content. The intersections of programing and learning need more careful calibration for EdTech to succeed.

Televised learning goes back a few decades in Pakistan. Virtual University and Allama Iqbal Open University have long taught curricula through television, radio and internet-based platforms. Although the Digital Pakistan Policy (2017) had urged an integration of technology in the education sector, the EdTech surge really came with COVID-19, where existing learning digital platforms were scaled, and new interventions were launched to deliver across diverse learning environments and student cohorts. Khyber Pakhtunkhwa's Elementary and Secondary Education Department developed a learning portal for students to use digital materials. Punjab's School Education Department has collaborated with PITB to develop EdTech solutions, including making tablets available for students, smart labs, e-learning systems²⁹. Sindh's Learning Passport program (supported by UNICEF) is focused on reducing the digital learning divide of marginalized children, particularly girls, enabling high quality and flexible learning³⁰.

Among the top challenges for EdTech in Pakistan is poor digital infrastructure that impacts effective learning. Poor digital infrastructure, along with issues of affordability has compelled a reliance on low-tech options (television and radio) for the most difficult to access students. Districts with prolonged electricity outages (up to 20 hours in some parts of Balochistan) make EdTech highly susceptible to local conditions. Apart from connectivity and electricity issues, there is a mismatch between digital platforms used for learning tools (good for smartphones

or tablets), and the devices owned by the majority of households (basic phones).

Phones are owned and possessed by working male family members, if at all they become available to children for education. It is no surprise that technology-based solutions are almost missing from public schools, as their students tend to be from less affluent backgrounds, and unlikely to possess smart devices. On the other hand, high-cost private schools are able to facilitate learning through Zoom or Google Classrooms. Owing to these challenges, some evaluations hold that EdTech for younger children (pre-Grade 9) in less developed districts unnecessary. EdTech provided by private sector actors also question the viability of running projects in areas with poor digital infrastructure, and thereby suboptimal learning outcomes.

There is also considerable duplication in EdTech solutions, as there is fragmentation at the policy level. Furthermore, resources for EdTech have usually come from development partners, and focus on small-scale learning solutions to pilot and understand viability. Public funds have been less consistent and subject to shifting policy priorities. In the absence of a clear posture by decisionmakers, and an over reliance on donors, EdTech will not be able to expand outreach beyond pilots. These challenges can be addressed through the following measures:

1. ***The government must prioritize access and affordability of internet and smartphones for all citizens, particularly in the rural and underserved areas.*** This also includes providing infrastructure including expanded internet coverage to underserved areas and providing subsidies to make mobile phones and devices more affordable. Building the capacity of teachers and students in digital and IT skills across Pakistan to leverage from digital platforms is key for opportunities and promoting inclusive and

equitable access to quality education, particularly empowering individuals and driving socio-economic development.

2. *Going low-tech is the answer for remote communities.*

Remote areas are accessible through traditional media like radio and television programming. In the absence of internet connectivity, local cable operators and private radio channels can be used effectively at lesser cost. In some districts, solar-powered hardware has also been utilized by EdTech solution providers to beat prolonged electricity outages.

3. *EdTech providers must design tools with end-users in mind.*

An assessment of needs on ground, including geography, community, and beneficiaries needs to be undertaken in designing tools. To overcome the digital divide, providers must prioritize marginalized communities in their solutions, and sensitize personnel in imparting these solutions. This will also entail training and retraining communities in utilizing EdTech solutions, before the

tool can successfully address learning gaps.

4. *Solutions need to be devised for out-of-school children.*

EdTech tools should target out-of-school children in non-formal settings with intermittent connectivity. Some organizations have developed fast-track curricula focusing on foundational skills, and subsequently on advanced skills. These should be expanded to address millions of out of school children in Pakistan.

5. *Policy stakeholders must take steps to reduce fragmentation in EdTech.*

This is still a developing sector, and policy stakeholders must identify where duplication and redundancy exist. Competing ministerial mandates, and counterproductive delivery in EdTech has led to suboptimal outcomes. The sector needs broad-based collaboration between government, development partners, and implementers to go over lessons from COVID-19, and assess what solutions can be scaled.

Telehealth

COVID-19 brought a focus on telemedicine, which had previously been an experimental sector at best. Telemedicine held the promise of revolutionizing health care access across developing countries, and had demonstrated varying degrees of success in Bangladesh, India, Uganda, and Kenya where telemedicine programs had expanded health care coverage

through text messages, audio, video, and other digital applications. In particular, these programs had effectively addressed maternal and child health challenges³¹ In India, the usage of AI chatbots in locating vaccines, appointments with doctors and other patient requests, proved to be extremely effective public interventions³².

BOX 6.3**Telemedicine, Telehealth or Telecare – What's the Difference?³³**

Telemedicine is the usage of digital technologies to support medical, diagnostic and treatment-related services provided by doctors or medical consultants. This covers services such as conducting diagnostic tests; monitoring a patient's progress after treatment; and recommending patient access to remotely located specialists.

Telehealth is similar to telemedicine, but includes a broader set of activities that *go beyond remote healthcare between doctors and patients*. It involves services provided by nurses, paramedics, pharmacists, therapists, lady health volunteers, who assist patient health education, social support and medication adherence. They also respond to health issues flagged by for patients and their caregivers.

Telecare refers to technology that allows patients to remain secure and independent in their own homes. For example, telecare may include health and fitness apps; sensors and tools that allow caregivers to monitor patients remotely; wellness and digital medication reminder systems; as well as early warning and detection technologies.

mHealth, or the use of mobile wireless technologies for public health is an integral part of **e-Health**, which refers to the cost-effective and secure use of information and communication technologies in support of health and health-related fields. Today the term “digital health” is often used as a broad umbrella term encompassing eHealth as well as developing areas.

In Pakistan, telemedicine is still relatively nascent. However, the healthcare sector has been incorporating digital technology for much longer. At the provincial level, Punjab, Khyber Pakhtunkhwa, and Sindh have taken steps to introduce telemedicine, but there are inconsistencies in terms of quality, lack of regulations, and enforcement leading to weak implementation. Balochistan lacks any established policy or framework for telemedicine practices, underscoring a significant gap in healthcare accessibility within the region.

The Punjab Health Department has introduced Management Information System (MIS) dashboards and other applications developed by the PITB, Health Information System Delivery Unit (HISDU), but their adoption is gradually coming about. A ‘hybrid’ system exists in most hospitals that relies on both IT and manual systems. Some

hospitals have opted for paperless work, but are an exception to the norm. Most hospitals have computerized data records or lab reports. Some hospitals have introduced computerized procurement, equipment monitoring and maintenance, as well as digital human resource management systems, but their usage varies. As medical practitioners have identified, lack of trained personnel to operate Hospital Information Systems (HIS) or Integrated Management Information Systems (IMIS) is the real challenge. Reliance on manual systems had led to fragmentation and duplication in data collection, data sharing, delays in procedure, and outmoded health services.³⁴ At the policy level, Pakistan still does not have any coherent legal framework to develop telehealth services, when its outreach is evident in rural and underserved areas³⁵. The government has undertaken initiatives as highlighted in the National Digital

Health Framework 2022-2030, including the advancement of digital health technology in an ethical, safe, and integral manner, but its application is yet to come about. This is crucial for private sector actors to establish programs that deliver telehealth to cohorts outside traditional catchments. These challenges can be overcome through the following measures:

1. **Increasing evidence and undertaking research on telemedicine is necessary** for effective evidence-based policymaking allowing the government to identify the strengths and weaknesses, and the potential areas in healthcare where telemedicine interventions can take place. Moreover, conducting comprehensive assessments by governing bodies to evaluate the digital landscape at the national and sub-national level, which should encompass considerations such as licensing, standards, and privacy regulations.
2. **Equipping frontline health workers with necessary skills** to navigate and harness

digital technology through training programs customized for telemedicine practices, data management, cybersecurity protocols, and patient engagement strategies can streamline digital health initiatives in the country.

3. **Increasing cooperation between government, development agencies, private sector, CSOs, and academia** to advocate for telemedicine and draft recommendations for effective regulations leading to improved healthcare delivery and outcomes for the people.
4. **Integrating digital technologies in Pakistan's healthcare** can help book appointments and consultations online while presenting chances to enhance security of record keeping and elevate the quality and range of health treatments. Furthermore, it has the potential to foster inclusivity by connecting all provinces equally across Pakistan, thereby leveraging better health care through the use of digital technology.

D. Resilience to Shocks: Digital Support for Climate Adaptation and Mitigation

Pakistan's climate crisis poses grave dangers to the survival of vulnerable groups and to economic recovery efforts. With temperatures warming well above the global average at 1.3°C–4.9°C (by the 2090s over the 1986–2005 baseline), Pakistan will witness increases in its annual maximum and minimum temperature, and experience greater pressure on human health, livelihoods, and ecosystems. Changes to Pakistan's rainfall and runoff patterns are uncertain, and impact its water resources, but the incidence of drought is likely.

The frequency and intensity of extreme weather events will rise, disproportionately impacting vulnerable, poor and minority cohorts. While floods will routinely impact five million people by 2035–2044, this will increase to one million people annually

exposed to coastal flooding by 2070–2100. Climate projections also suggest declining crop yields in food and cash crops, including Pakistan's staples cotton, wheat, sugarcane, maize, and rice. Temperature increases are already straining urban municipal capacities to provide healthcare, transport and energy.

Urban dwellers, particularly men working as outdoor laborers, are at high risk of heat-related illness and death, under all emissions pathways. Pakistan's major cities have poor air quality, starting from late summer months, and especially during winter, which often causes school closures to save children from exposure to hazardous air. This should be seen in the context of persistent undernourishment and deprivation³⁶.

BOX 6.4

Urban Challenges

Urban regions have serious deficits in municipal services that compound vulnerabilities. Pakistan's largest city, Karachi, has had a long-standing water shortage of 550 million gallons per day (mgd) against a demand of 1100 mgd. Only 65.2 per cent households in Pakistan's ten major cities have access to piped water connections, while urban densities have increased considerably. Large and intermediate cities have underground sewer systems that are collapsing due to poor management and negligence. Power supply remains a major challenge. Outside major urban centers, load-shedding of between 12-16 hours per day is routine and impacts the performance of all sectors³⁷.

Pakistan's housing policy is largely unimplemented. Housing is not even acknowledged as a social policy measure and local authorities cannot govern its provision. The housing available in cities is deeply segregated, exclusive, and despite pressures to increase housing facilities, there is little attempt to provide affordable housing for lower-income urban population and migrants from rural areas. As a result, each city now hosts large peri-urban or slum locales. Highly priced real estate and commercial development has also led to shrinkage of public spaces, such as green spaces, parks or other corridors central to livability and equity in the urban areas. Certain groups are deliberately and specifically excluded from city life, provision and access: poor cohorts are forced out of housing and services in certain zones; while women, religious and ethnic minorities, and persons with disabilities are rendered invisible through social norms and prejudices³⁸. Shutting whole population cohorts off from participation in public life compounds their vulnerabilities.

Municipal authorities need to plan and manage their urban development, and become more responsive to the needs of urban dweller, and new migrants. In addition, a great deal more attention has to be paid to natural endowments that cities consume, with obvious damage to the natural environment. There needs to be an adoption of technologies and economies that are less wasteful and destructive. At the same time, federal and provincial governments have introduced a number of digital interventions that assist urban management:

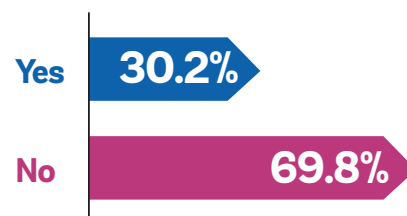
- i. **Punjab Land Records Authority:** The Punjab Zameen app allows users to access land related services through their mobile phones, including obtaining entitlements after a verification process, and keeping track of land related transactions. Users can also book appointments for visiting Arazi Record Centers (ARCs) and process paperwork for land transfers. The PLRA Digital Gardawari app allows monitoring of land possession, crop inspection and *taghayyurat*. The Board of Revenue Monitor allows performance appraisals of land records, and shows key performance indicators that affect the service delivery³⁹.
- ii. **E-policing applications:** All provinces have introduced digital policing apps to make cities safer, and allow better implementation in the rule of law sector. Some apps are meant for the usage of citizens to ensure their own security, emergency assistance, or to report crime and avail services at their local police station. Other applications are now widely used by civilian law enforcement agencies to improve procedures, such as digitization of First Information Reports, witness statements and case diaries in criminal cases⁴⁰.

Across the world, digital technologies are being used to combat the worst effects of climate stress, through adaptation efforts and finding low carbon development pathways. Digital technologies, however, carry climate costs as well as benefits that emerge from the usage of energy and resources to build, power, and dispose of digital infrastructure, gadgets, and other components. Climate action and digital transformation are policy priorities for Pakistan's public sector as well, but often these priorities are implemented in isolation. Any imagined convergence is narrow, for example in disaster risk management technology or smart consumption solutions. Pakistan needs to undertake a green and digital twin transition to leverage their synergies, while paying attention to the costs.

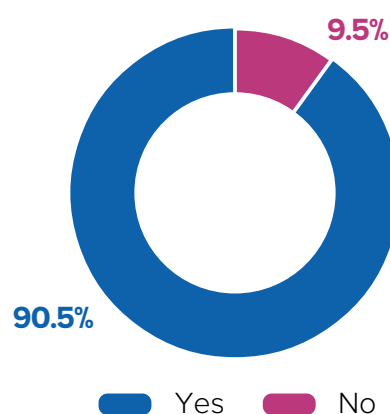
Digital infrastructure is vulnerable to extreme weather events in Pakistan. The 2022 mega floods took an extreme toll on digital infrastructure across the country, washing out phone towers and causing massive disruption to fiber optic cables. Even localized damage can take down entire networks, as has been experienced in some cases. This causes a far larger ripple effect of disruption across communication services, banks, power grids, railways, and government services. It is critical that digital infrastructure is climate proofed.

Figure 6.3 Digitalization and Climate Change Awareness

Has Social Media Enhanced Your Awareness of Climate Change?












Do You Use Any Digital Platform to Get Weather Updates?



Source: NHDR 2023/2024 Survey

In the context of mitigation, digital technologies can cut emissions from multiple sectors. In the energy sector, digital solutions are enhancing energy efficiency and demand-side flexibility (smart grids, meters, and devices/appliances/machines). In the transportation sector, the transition to electric vehicles is underway, but may take a while before large shifts are witnessed in passenger transport or public transport. In the agri-food system, digital solutions are being used for increasing crop yields, monitoring, transportation, processing, and sales.

Figure 6.4: 9 High-Impact Technology uses that benefit the Energy, Materials and Mobility Sectors

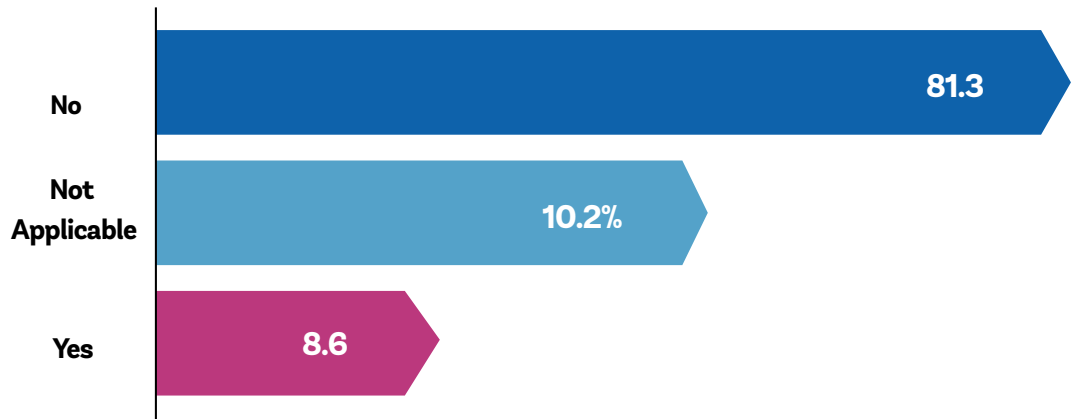
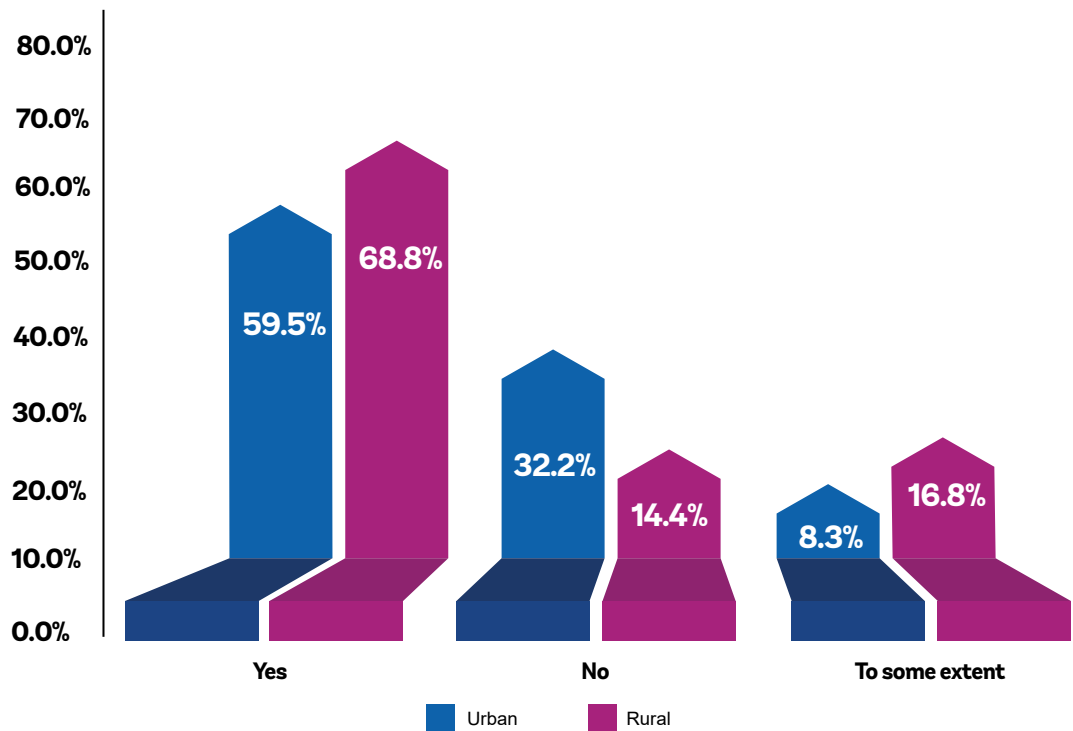
Energy			
	Improving refineries & pipelines through digital twin	Grid digital twin to improve power flow & quality	Connected building energy efficiency platforms
Materials			
	Mine energy efficiency using activity sensors	Circular metals & chemicals enabled by markers	Digital-enabled process electrification
Mobility			
	Sustainable aviation & shipping fuels	Traffic network & road digital twin	MaaS & smart charging platforms

Source: WEF 2022 (<https://www.weforum.org/agenda/2022/05/how-digital-solutions-can-reduce-global-emissions/>)

In urban planning and management, digital technologies are being used to measure sources of pollution (air, waste, water, and noise). Digitalization itself does not shrink the carbon footprint of any sector, and some solutions may even reduce unit-level emissions while boosting overall usage. For example, 5G technology is more efficient per each unit of data, but leads to very high data volumes through increased usage, which result in higher total emissions⁴¹.

Pakistan's larger challenge is adaptation. In adaptation measures, limited connectivity or lack of access to digital technologies undermines resilience. This is especially

true for early warning systems and relief efforts. Most poor populations live in rural locations that have underdeveloped digital infrastructure, and where some areas have higher incidence of climate shocks. Most rural districts have second generation (2G) mobile phones, and 81.3 per cent reported not receiving any real time information on disaster related precaution, prevention or safety measures, according to the NHDR survey (Figure 6.5). But it is encouraging that of those who received disaster related advisories, about 60 per cent in urban and 70 per cent in rural settings utilized them and undertook preventive measures (Figure 6.6).

Figure 6.5 Have you ever received disaster warnings through telecom or digital media?**Figure 6.6 Did the warning help you mitigate the effects of the disaster?**

To reduce the impact of disasters and climate stress, new technologies and digital innovations can improve urban governance and service delivery, and vastly enhance the functioning of disaster-prone regions. For this to occur, disaster management authorities must consider methodologies like modelling, foresight, scenario planning, digital and crowd sourcing to stress test their systems. Opportunities for 'smart city' initiatives are increasingly available and accessible, often

at low cost, and can be implemented in low-resource cities, as much as in large ones. It would be prudent on the part of urban planners and disaster management specialists to link resilience metrics and benchmarking solutions to the SDGs to measure objective progress⁴². In addition, there are other ways to incorporate digital technology in enhancing resilience:

- 1. Government must learn how to incorporate climate considerations into policy frameworks,** articulate

strategies for climate-resilient digital infrastructure, and invest in low-carbon digital infrastructure. The government also needs to ensure that connectivity and data infrastructure are in place to enable use for climate action. Other ministries, institutions, and organizations in the climate sector should help identify digital applications for managing climate stress.

2. Climate vulnerable communities should be identified ahead of climate shocks through digital technologies and covered through safety nets.

This can be done through identifying vulnerable communities in Pakistan's poorest and climate-exposed districts, and utilize satellite imagery of disaster-prone areas to ascertain which communities will be in greatest need. Studies indicate that households covered by safety nets have improved childhood food security, are more likely to evacuate, and take on less debt.

3. Digital technologies like GIS and digital twins (virtual models) can help develop

simulations for disaster preparedness.

Cities are leveraging digital technologies to become 'smart cities' that monitor their critical infrastructure, including roads, communication installations, power sources, and buildings, to prevent urban hazards. Resilient cities are using multisource data integration, often data collected from digital services for big data applications, like GIS and virtual models.

4. Early warning solutions can be critical to protecting vulnerable populations.

Digital platforms used through mobile applications facilitate cooperation between communities and decision-makers when confronted with disasters such as earthquakes and floods. Rescue and relief efforts are often crowd sourced, and move through digital networks that bypass government interventions. People on ground not only document the severity of disasters, but also signal where greater assistance is needed. Early warning messages should be shared more widely with non-government stakeholders, as their diffusion through social media is more effective.

E. Promoting Regional Equalization

In the NHDR 2020/2021 – The Three Ps of Inequality: Power, People and Policy⁴³, spatial inequality was defined by differences due to geographical boundaries of districts and provinces impacts income, economic growth, and human development in Pakistan. Individual's or community's region of residence has a profound impact on their economic and social development opportunities, enabling varying levels of growth, social mobility, and access to public services, markets, and infrastructure.

Digital transformation provides an opportunity to address these spatial vulnerabilities and inequities. Digitalization is transforming economic spaces worldwide. The HDR 2023/2024 has defined digitalization as

a public good with a potential to catalyze human development. Digital technologies by connecting the rural and urban economies have reduced the rural-urban divide. Digital payment systems have enabled financial transactions to be undertaken efficiently. In the governance domain, digital transformation has enhanced public service provision making them more accessible, efficient, and responsive to citizens' needs. Some of the key avenues where digital transformation is contributing to human development in the least developed regions include:

- **Providing access to information:** Digitization provides people in remote or underdeveloped regions with access

to information that was previously inaccessible. Through the internet, individuals can access educational resources, job opportunities, market prices for agricultural products, healthcare information, and government services regardless of their geographical location.

- **Creating economic opportunities and inclusion:**

Digital platforms offer new economic opportunities, such as online marketplaces, freelance work, and e-commerce, which can benefit people in the poorest regions with limited access to traditional employment opportunities. These platforms can also offer opportunities for micro-entrepreneurs and small businesses, enabling them to reach broader markets beyond their immediate vicinity. This can lead to income generation and poverty alleviation, particularly in rural areas where traditional economic opportunities may be limited.

- **Increasing access to financial services:**

Digital banking and mobile payment systems can provide access to financial services to people in remote or underserved areas, allowing them to save, borrow, and manage finances more efficiently, and increasing their economic participation and empowerment. Mobile banking, for instance, allows individuals to conduct financial transactions without the need for physical bank branches, making financial services more accessible and convenient.

- **Opening opportunities for education and skill development:**

Online education platforms can provide access to quality education and skill development programs even in areas with limited educational infrastructure. Digitization enables online education (as well as remote work), allowing individuals in far-flung underdeveloped regions to access job opportunities and educational resources

without having to relocate to urban centers. This can reduce the brain drain from rural to urban areas and build the human capital in underdeveloped regions. Through increased access to digital literacy and technical skills training, people can better position themselves to take advantage of opportunities in the digital economy.

- **Supporting agricultural innovation:**

Since agriculture is the primary source of livelihood in rural Pakistan, digital tools such as weather forecasting apps, crop monitoring systems, and even market information platforms can assist farmers in making informed decisions, increasing agricultural productivity and income.

- **E-Government services:**

Digitization of government services can improve access to essential services such as healthcare, education, and social welfare programs for people in remote regions. Online government portals and mobile applications can facilitate the delivery of services and reduce bureaucratic barriers, making it easier for individuals to access government assistance regardless of their location.

There is no doubt that digitization has the potential to bridge regional and intra-country disparities by improving access to resources, empowering communities, and fostering economic opportunities, thereby reducing poverty in the most impoverished and underdeveloped provinces/regions of Pakistan. However, for it to be a force for regional equalization, the following measures need to be ensured:

- **Deployment of digital infrastructure,**

such as broadband internet connectivity and mobile networks to reduce digital divide between developed and underdeveloped regions. Investments in telecommunications and digital infrastructure can improve connectivity in remote areas, enabling access to digital services such as mobile

banking, e-commerce, and telemedicine. Improved connectivity also facilitates communication and information exchange, fostering economic development and social inclusion.

- **Develop forward-looking regulator mechanisms.** The rapid pace of technological innovation often outstrips the ability of regulatory frameworks to adapt, leading to gaps in governance that can be exploited, harming consumers and societies. Developing agile, forward-looking regulatory approaches is necessary.
- **Address digital literacy gaps,** through

digital literacy programs. Private sector including telecommunication companies, e-commerce platforms, e-finance service providers, tele health and EdTech service providers can help facilitate bridge this digital literacy gaps with a particular focus on far-flung and underdeveloped regions.

- **Promoting innovation and entrepreneurship in backward and poor performing districts** through mutual collaboration between government and private sector to further stimulate economic development and reduce poverty.

F. Empowering People

Digital transformation needs to be catalyzed for Pakistan's people to expand their personal, professional, and political choices. With digital access curtailed for such a large proportion of the population, it is inevitable that Pakistan's digital divide will take years, if not decades, to lapse. This is especially challenging for women and marginalized groups, whose access to public benefits is riddled with poor resource allocation, quality issues, and socio-cultural chokeholds. Pakistan's youth are also disadvantaged, given the low investment in human capital over decades, and grapple with an uncertain future of few choices, if any.

Digital transformation presents a ready avenue for empowering people, particularly disadvantaged groups, as it bypasses the traditional pathway to development. Through

enabling digital access and adoption, marginalized communities can be served better, and deficits in education, healthcare, and living standards can be overcome. The government is not the lone entity in providing digital benefits. However, it sets the framework of digital possibility through policy and regulatory regimes. The private sector is very much a major decision-maker in this scheme, whose choices will determine the extent of digital attainment possible in Pakistan.

Finally, the people themselves are not mere bystanders in digital transformation. Any change in human development leveraging digital technology will occur if people acquire digital competence and exercise new choices created through a rapidly changing digital ecosystem.

Women and Girls

Pakistan ranks 142nd on the Global Gender Gap Index with a score of 0.575⁴⁴. The NHDR survey found that 53.5 per cent women in Pakistan state their spouse decides whether they should own a phone, whereas another 30 per cent say it is their parents or guardians who make that decision for them. This is in stark contrast to 77 per cent men who say it is their own decision. This statistic stands out

among others as a telling sign of access to digital technology for women in Pakistan. There are deep set socio-cultural barriers that prevent women from availing all public services, and digital technology reflects that reality. The NHDR's Digital Development Index (DDI) finds women standing at 0.110 compared to men at 0.202.

Beyond ownership, usage also paints a very unequal picture of women. There are some encouraging signs of usage and enterprise, but for the most part, women are much further behind in diversified utilization of the internet.

- About 17.2 per cent women and men stated they have difficulties using the internet, of whom 39.1 per cent felt the reason is affordability.
- 61.2 per cent women said that mobile wallets are their primary bank account, of whom 30 per cent use it at least once a week.
- 21 per cent women have used online shopping platforms, whereas 70.1 per cent have not.
- 93 per cent women have not availed e-learning in any form.
- 81.5 per cent cannot run a computer program with proficiency.
- Family restrictions prevent 44.6 per cent from availing telehealth (although 78.2 per cent men and women surveyed had no knowledge of telehealth services).
- 31.4 per cent women had taken some measure to enhance their online security as more than half of them had experienced a breach of privacy.

Reasons for unequal access and usage apply to women as well as other marginalized communities. Poor digital infrastructure in underdeveloped districts impedes the supply of electricity and coverage. Many women do not hold CNICs necessary for registering SIM cards and mobile services (discouraged as obtaining a CNIC would entail interacting with men). There are patriarchal controls over owning and using devices as well as accessing content deemed to be of an 'inappropriate' nature. Women face financial constraints due to which owning their own mobile device becomes difficult, and instead

utilize their partners' or relatives' mobile phones.

Gender disparities in literacy are pronounced across Pakistan. A higher proportion of women have lower levels of education and functional literacy compared to men. This impacts women's ability to utilize mobile handsets and digital services even if they have access to the internet. The lack of local language content and services also results in reduced usage. Women are less confident about using digital devices and apprehensive about upgrading devices, losing data, or navigating digital applications.

In addition, women's access and utilization of digital technologies is curtailed by fears of privacy breaches, cyber threats and financial fraud particularly faced by women. This is despite constitutional privileges like Article 14 (1) of the Constitution of Pakistan that pledges to safeguard individuals right to privacy⁴⁵ and laws like the Prevention of Electronic Crimes Act (PECA) which was passed in 2016 covering sections on online harassment and protect people on the internet⁴⁶. Females are more vulnerable to harassment, blackmailing, hacking, and leaks in the country. According to a report by the Digital Rights Foundation, 40 per cent of females in the country have suffered harassment online. Similarly, 70 per cent of females are afraid of posting their pictures online because they could be mis-used⁴⁷. Majority of women have clear knowledge about online harassment, but they are unaware of how to deal with the situation and fears of the consequent outcome due to which formal complaints are not made. For the purpose of a digital acceleration agenda, policy stakeholders must consider the following measures⁴⁸:

1. ***There have to be more targeted interventions for women's digital literacy.*** Digital literacy training programs for women will undoubtedly enhance

women's digital skills and knowledge, and allow them to utilize the internet for more diversified usage. Targeted interventions can be undertaken within public educational institutions. Raising awareness on digital applications, including mobile wallets, telehealth, e-learning, and public safety is also necessary. At the same time, community engagement is needed for undoing negative impressions of technology that curtails women's usage of internet.

2. Proactive steps should be taken to prevent gender-based harassment online. Despite being flagged multiple times, online harassment remains a persistent issue that has not been

adequately treated through policy or law and order mechanisms. There have been calls for dedicated helplines for women that deal with online abuse, fraud or harassment. The feasibility of helplines is often debated, but this connects with the broader challenge of controlling and remedying online spaces for hate speech and gender and sexual abuse witnessed online. There have to be more concerted efforts to make online spaces safer for women, through the introduction of privacy laws. The internet intermediaries must set high level and commitment to uphold women's and girls' safety online including designing tools for quick response against online violence.

Youth

Pakistan's youth have been its best resource. Despite historically low investments in human capital, Pakistan's young people continue to thrive and lead growth in multiple sectors. Digital transformation is largely being led by young people, many of whom are digital natives, and have incorporated digital technology into their lives seamlessly. The uptake of digital applications, increased transaction volumes, creative usage and production of digital content, can all be attributed to its youth, who make up the majority of Pakistan's 83 million internet users⁴⁹.

The challenges of access and adoption noted in previous sections apply more so to young people in this country, particularly young women. Beyond the constraints of ownership and usage, the fundamental challenge confronting young people is that of employability. Does Pakistan's workforce have the skills of the future? How successfully can Pakistan's youth compete for jobs in international labor markets?

18 million young Pakistanis are not in

education, employment or training and each year another 400,000 entrants join the job market. Unemployment among youth is 10 per cent, which is twice the national average. As many as 1.5-2 million jobs are needed to absorb young people entering the job market each year.

A review of employability shows that skills acquired in education or training are of little relevance to the domestic job market. About 433,000 young people are enrolled in government-run TVET training programs, which had contributed to 10 per cent increase in employee earnings back in 2014. Since 2018, none of the trainings contributed to rising incomes⁵⁰. This provides an opportunity to invest in digital skills that are in great demand, yet the supply of digital skills and competencies is far less than what it should be.

At the same time, there are young Pakistanis who have established 720 tech startups since 2012. Owing to investor confidence and demonstrated profitability in Pakistani tech startups, there has been a 42 per cent increase in the number of freelancers since

2018. Although young people are keen to excel as entrepreneurs, there is a lack of guidance and risk aversion that holds back many aspiring entrepreneurs⁵¹. These challenges can be addressed through the following measures:

1. ***A supportive regulatory environment needs to be created for tech entrepreneurs.*** This means doing away with cumbersome registration procedures with the Securities and Exchange Commission, and compliance requirements that startups can neither fulfil nor afford.
2. ***Enable women entrepreneurs to step forward.*** While tech startups and other businesses led by men survive better in the domestic economy, women led startups often have funding by angel

investors. It would help to assist women entrepreneurs, especially businesses from underdeveloped districts, develop in incubation centers.

3. ***A much higher investment needs to be made in skills.*** Young Pakistanis cannot be faulted for having the wrong education or skills, when this is how education and training is programed in Pakistan. To match the demand for skills domestically, and become absorbed in international labor markets, there has to be a far greater investment in skills of Pakistani young people. Digital skills in particular need to be imparted above and beyond the outmoded curricula approved by the HEC being taught for two decades in universities. Private sector players can make a significant contribution in this domain as well.

BOX 6.5

Call for Critical Action by Major Players

Federal and Provincial Governments

- *A comprehensive and integrated digital transformation agenda at the federal and provincial levels.* Pakistan has made positive steps by developing the Digital Pakistan policy. However, a more comprehensive strategy is still required. The government must update the strategy involving all stakeholders including but not limited to private sector, development partners, and academia. Digitalization is a multidisciplinary and cross-cutting agenda that can be best delivered in partnership with diverse stakeholders.
- *Invest in technology to design people-focused and efficient public services.* Invest further in interoperable one-stop-shop solutions to deliver services for the citizen.
- *Undertake digital expansion within governmental procedures* to improve e-government and e-governance systems.
- *The Digital Transformation agenda led by the Office of the Prime Minister of Pakistan.* The agenda is endorsed at the highest level by the Prime Minister of Pakistan, implementing stronger governance framework for achieving the digital agenda and bringing the government together to deliver on digital transformation agenda collectively.

- *Access to equitable and affordable technology should be made an urgent priority.* The Government must make achieving universal access to technology in Pakistan, including access to smartphones as a key priority. The Government should also upgrade digital infrastructure across Pakistan, especially in underdeveloped districts and develop stronger frameworks for implementation of this priority.
- *Create an enabling environment for private sector, startups and research on emerging technology.* The government will need to make stronger investments in harnessing a space for digitalization, innovation and entrepreneurship by placing less regulatory burdens and enabling ease-of-doing business for the private sector and startups as well as creating incentives establishing tech solutions.
- *Provide government with digital skills services training.* Digital technologies are changing rapidly and keeping up-to-date through regular trainings on their opportunities and challenges is needed.
- *Make investments in digital solutions available for the social sector.* Creating policy frameworks in social sectors such as telehealth and e-learning can be transformative for human development.

International Development partners

- *Make equitable, inclusive and affordable digital development one of its key priority areas for investments.* Decreasing ODA to Pakistan has meant that the country is not qualified for support in urgent digital access support programming. Equitable and affordable digital access, especially for women and marginalized groups, is as dire a situation as in other lower income countries and must be addressed.
- *Digital solutions should become cross-cutting theme and seen as enablers for development programming outcomes.* The achievement of human development is dependent on access to affordable and inclusive technology, digital development should be on the radar of every development program.
- *Provide the government with technical support on digital transformation.* A big picture and systemic approach towards digital transformation is required, anticipating new technological trends and advising the government on these new trends and their impact on development.
- *Convene a forum with the private sector and relevant stakeholders on digital development:* Digital transformation requiring a multidisciplinary approach and several stakeholders from the government, donors, start-ups and the private sector, therefore, having a forum to share knowledge, build capacity and coordinate technical assistance is critical.

Corporate institutions, industry and businesses:

- *Work more closely with the government and international development partners.* The private sector is a key stakeholder of digital transformation policies. Their role in working closely with the development partners to advocate for more impactful policies is critical. Partnerships can encourage co-financing and co-designing new initiatives and advocacy.

- *Acquire and expand digital platforms that enable ease of use for customers and accelerate commercial transactions.*
- *Provide digital skills training to its workforce.* Equipping the workforce with training programs will be transformative. In addition, work with the government and development partners to provide digital skills training and business support to the wider community.

Civil Society, academia and think tanks

- *Form a key stakeholders' working group and create policy advocacy to deliver on Pakistan's digital promise.* Civil society has been developing strong advocacy campaigns on the need for digital transformation as well as informing the country of their issues. Civil society's work especially in the area of government surveillance and data protection policies have been strong, placing pressure on government to account on these issues.
- *Dedicated research on emerging technologies impact on Pakistan.* The NHDR calls on Academia to deepen their efforts on digital transformation, opening dedicated departments on exploring impact of new and emerging technologies, evaluation of digital programing in Pakistan and providing the government with the latest research on digital transformation.
- *Mainstream the use of technology in educational curricula.* This would require, firstly to revise ongoing IT curricula and reorient with a view to developing contemporary digital skills and outlook among learners. In schools especially, it is critical that students are taught digital skills such as coding as part of the core subjects.
- *Liaise with industry to respond to market need for digital, IT, and computer related skills.*

Annex 1: Digital Spotlights

SPOTLIGHT 1

From Adversity to Resilience: UNICEF supports Tahira Bibi's Journey to Digital and Financial Literacy



Belonging to Haripur, Tahira Bibi, a mother of three daughters and two boys, leads a life of resilience and determination. As a devoted housewife, Tahira is not just adept at stitching fabrics; she is weaving a brighter future for her family despite life's challenges.

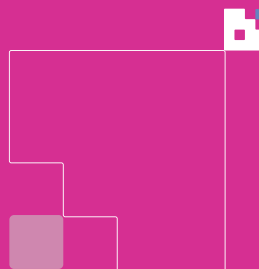
Tahira's husband toils as a laborer in the local vegetable market, where making ends

meet is a daily struggle. However, with an unwavering commitment to education, Tahira has set her sights on a brighter future for her children. Against the odds, all five of them are attending school, with her eldest daughter pursuing a Bachelor's degree in Science.

Yet, amidst her dedication to her family's education, Tahira faced a challenge that left a lasting impact. Compensated by BISP for several years, Tahira, while grateful for the support, found the process of collecting funds to be a source of stress and anxiety.

During a crowded disbursement at a point of sale, an incident that would haunt Tahira unfolded. The atmosphere, charged with heat and anxiety, led to a commotion in the crowd. In the chaos, Tahira was pushed and fell, breaking her hand. Since then, the simple act of collecting funds became a traumatic experience for her, shrouded in fear and indignity.

However, hope came in an unexpected form. Tahira received a call from the BISP Haripur office inviting her to a training program.



The program promised to educate her and offered reimbursement for her travel and participation—a small gesture that meant much more to Tahira than the amount.

The training sessions proved transformative. Tahira learned invaluable lessons about saving methods and budgeting. Most importantly, she discovered new avenues for receiving and managing funds through mobile phones, ATMs, and other platforms, promising a safer and more dignified alternative to the chaotic disbursement process.

Now armed with knowledge and newfound confidence, Tahira envisions an opportunity-filled future. Her dream is to start a small business, leveraging her skill in cloth stitching. With the savings from the program, she plans to purchase a sewing machine and materials to kickstart her venture, contributing to her family's income.

In Tahira's own words, "I am so happy just by imagining how safe and dignified it will be if this new method of disbursement is implemented." Her happiness stems from the prospect of financial security and the empowerment and dignity that the training has bestowed upon her.

"I am skilled, and now, after participating and learning at three-day digital and financial literacy training about developing and managing a budget, I will save money to buy a sewing machine. I plan to use my skills to help my husband fulfill our family needs." As she looks forward to starting her own business, Tahira embodies the spirit of resilience and determination that can flourish even in the face of adversity. Her story is a testament to the transformative power of knowledge, providing hope for others seeking a path out of poverty and toward a more dignified life.

SPOTLIGHT 2

Amplifying Youth Voices through the Youth Engagement Platform on Misinformation and Disinformation

The Youth Empowerment Program and Strengthening Electoral and Legislative Process (SELP) teams of UNDP Pakistan have employed a Youth Engagement Platform to gather young people's views on major challenges of the country. By providing space for dialogue and opinion-sharing, the platform empowers young people to contribute meaningfully to policymaking processes and serves as a mechanism to enhance public responsiveness and accountability in governance.

The Youth Engagement Platform is built on an Ekota server. Ekota is a platform that enables mass crowdsourcing of opinions, ideas and solutions. Participants can submit answers to questions sent out in their own words and vote on whether they agree or disagree with other participant's views.

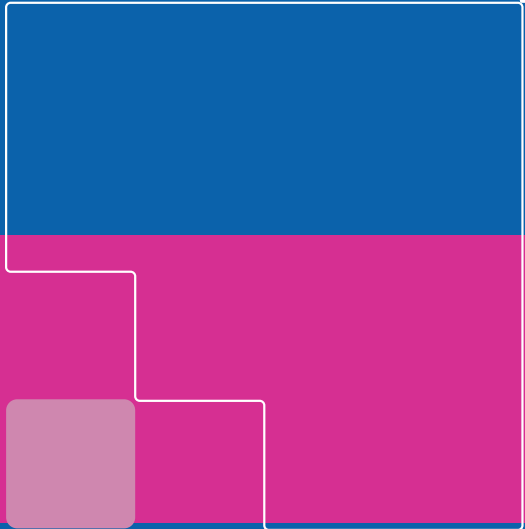
The platform offers a dynamic and predominantly crowd-sourced survey methodology, gathering data on one key conversation topic. The statements submitted by the participants provide qualitative data on subjective perceptions and quantitative insights into how the rest of the sample feels about each specific statement including consensus and division on various ideas.

The whole conversation can be generated in languages other than English, which are mainly supported by Google. All these features can be customized based on the needs of the surveyor. There are two

interesting features of the platform, which are the moderation of the statements submitted by the participants and the automated analysis of the data. The purpose of the moderation is to evaluate the statements submitted by the participants. The evaluation is conducted by the trained partners, who are called moderators or Ekota Champions. Moderators assess the suitability of the submitted statements before being shown to other space users. This ensures that all spaces run smoothly and only contain content valuable to the discussion without any insults, personal information, or profanity.

A conversation on hate speech, misinformation, and disinformation was conducted with young people ages 18-29 years, more than 800 students participated, almost half of them were young women. The focus of the conversation was to gather data on the patterns of social media usage, the experience of hate speech and false information content on social media, and the response of young people towards such content. Following are the key insights extracted from this conversation.

- Regarding of the question about media sources mostly used by the participants for information on news and current affairs, 51 percent of the participants chose Instagram, 41 percent chose WhatsApp, 36 percent chose television and 35 percent chose YouTube and Facebook.

- 
- Regarding the extent of trust of youth in social media platforms, 62 percent of participants chose Television News, while 52 percent of the participants chose Print Newspapers (Urdu), X (formerly known as Twitter), and Instagram.
 - Ninety one percent of the participants agreed with the statement that during election campaigns, social media platforms should take an active role in combating disinformation and fake news. 93 percent of the participants agreed with the statement that during election campaigns, the government and regulators should take an active role in combating online disinformation and fake news.
 - Seventy eight percent of the participants observed false information in the form of image-based formats including AI-generated images, memes, etc. on social media platforms. 73 percent of the participants observed false content including audio and video recordings and deep fakes on social media platforms.
 - Sixty eight percent of the participants said that they have attempted to verify information before sharing it with others, whereas 23 percent of the participants said they have never experienced any situation.
 - Politically motivated and religiously motivated hate speech/content are among the top categories of hate speech content that the participants have seen or experienced on social media.
 - Thirty four percent of the participants said it is their responsibility to verify news on social media whether they have shared it or not, whereas another 34 percent of the respondents that it is the responsibility of the news media to verify the news on social media.

The insights of this conversation are being used in the activities related to the training of media personnel and young people under the Safe Digital Environment Program (SDEP).

SPOTLIGHT 3

From Engineer to Freelancer: Touqeer's Journey to Success

Touqeer Ahmed Panhwar, a 24-year-old entrepreneur from the Umerkot district in Sindh, attended an online digital training, by UNDP's Stabilization and Inclusive Development Programme (SIDP). He learned about the strategic use of social media platforms, effective communication skills, and also discovered the art of marketing through Google Maps which contributed to his success. Touqeer was able to employ

his engineering skills from his degree to enhance his endeavor on Fiverr, an online freelancing platform. Touqeer's performance on Fiverr improved tremendously, resulting in growth and an increased client acquisition. Currently, he is a Level 1 seller on Fiverr and has completed 68 assignments with a consistent five-star rating.



SPOTLIGHT 4

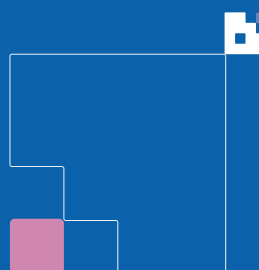
Combating Misinformation in Pakistan through AI and Machine Learning

iVerify is a digital fact checking platform that uses artificial intelligence and machine learning technologies to identify content with misinformation. The platform primarily focuses on political misinformation, gender bias and hate speech. A list of key words is fed to the system, the tool scans for these words and flags them once they emerge from digital content. The platform scans all digital content, including videos, news stories and social media. Teams verifies flagged content, identifying misinformation by comparing it against verified data sources and information while also using other AI tools to verify the authenticity. Anyone from the public may submit content to the iVerify platform to be verified.

The Safe Digital Environment Programme (SDEP) at UNDP has launched this platform in partnership with FCDO and USAID to tackle online misinformation. iVerify has been provided to the Centre of Excellence in Journalism (CEJ) at the Institute of Business Administration, a fact checking team was

hired to spreadhead the initiative. CEJ has verified over 60 stories since iVerify's launch in January 2024, including misinformation surrounding the protest of Mahrang Baloch. DAWN, Pakistan's leading newspaper has used iVerify for the publication of several stories.

Combating misinformation requires informing the public with verified information, and also equipping them with critical thinking and digital skills to assess the content for themselves. Parallel to iVerify's operational successes, SDEP initiative also conducts youth training programs in 15 universities across the country, to equip the young people with essential skills to navigate the digital world, discern truth from fiction, and contribute to the creation of a safe digital environment.

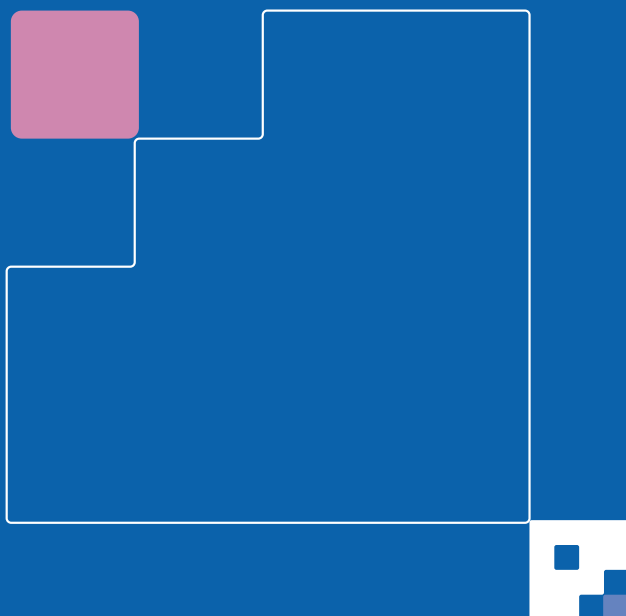


SPOTLIGHT 5

Transforming the Justice Sector in Khyber Pakhtunkhwa and Merged Districts through Virtual Courts and a Digitized Bar Council

The number of pending cases across Pakistan has reached 2.26 million, according to the Law and Justice Commission of Pakistan report, as of December 2023¹. An estimated 41,4922 cases are still pending at KP provincial court, and 280,0393 cases at the district court levels. As a result, Pakistan has the largest number of under-trial prisoners, many die in prison waiting for their trials to begin.

UNDP Rule of Law Programme, with funding from UNDP Global Fund, USAID and European Commission is supporting the Peshawar High Court and Khyber Pakhtunkhwa Judicial Academy (KPJA) to digitize justice service delivery process by designing 111 virtual courts and 75 virtual points across KP and the Merged Districts. The virtual courts are connected to the Peshawar High Court and prisons to allow under trial prisoners to attend remotely. The virtual courts enable lawyers, defendants, litigants, and other stakeholders to attend remotely. The virtual points are



established at each district court from where the lawyers, litigants and witnesses could attend a case hearing virtually. The initiative aims to reduce pending cases and improve citizen access to efficient, affordable, and transparent justice services.

According to available data from PHC, more than 20,000 hearings were conducted using virtual courts system in 202 and more than 15,000 prisoners were produced in court hearings through virtual points that connect prisons with the PHC in Khyber Pakhtunkhwa.

Digitization has really benefited women especially, both for women litigants and women participating in hearings face high risk of threats to their lives. Women litigants and witnesses in both Peshawar District and High Courts have found that the virtual process has allowed them to have safer access to the legal process.

To further strengthen justice services, UNDP supported KP Bar Council in digitizing over 1.5

million documents from over 8 decades. The digitized system is integrated with KPBC's finance and account system, enhancing transparency and accountability for over 20,000 lawyers, including Merged Districts, across the province, ensuring a secure environment for our records and facilitating smoother workflows. The digitized database also allowed the KP Bar Council to regulate the provision of affordable legal services and taking disciplinary actions against the lawyers who would violate KP Bar Council rules or were reported by their clients or courts. Scanners and databank for the Bar council were procured to store and record data. Any lawyer registered with the KP Bar Council can access the data through email, instead of having to physically travel to Peshawar to access records.

SPOTLIGHT 6

Preparing for the Future of Work and Harnessing Digital Ecosystem

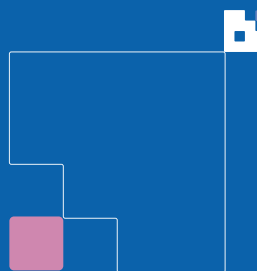
I: Promoting digital skills and entrepreneurship

The UNDP's Stabilization and Inclusive Development Programme (SIDP) aims to empower the vulnerable groups, particularly youth, women, and persons with disabilities and support them to build their own businesses. The program focuses on skills development, job creation and supporting the medium, small, and micro-enterprise (MSME) sector, ensuring this support is up-to-date with digital trends. The project has conducted several digital trainings for young people across the country. It has found that these trainings are helping young people to develop successful digital business plans, establishing online businesses in cosmetics, fashion, garments freelancing and various online stores. UNDP has reached just over 2,000 young people in GB and Sindh. Top of Form UNDP's partnered with the Government of Sindh in 2023 deliver training to 1,500 young people in more advanced technology. The trainings included Android and IOS, and web-based application development, Java

programming, User Experience/UI designing, social media marketing, e-commerce on Daraz or Amazon and advance Digiskills using Machine/Deep Learning. The program also includes guidance on registering on freelancing platforms such as Upwork, Freelancer, or Fiverr. Youth participants are also provided with mentorship to help them secure assignments after the training.

II: Empowering Social Entrepreneurs with Jazz

Since 2021, UNDP, in partnership with Jazz, has organized nationwide training bootcamps for over 800 social entrepreneurs, 560 of which were led by women. The bootcamps trained young people in, online marketing, maximizing the digital marketplace, engaging which digitally connected target audiences, and generating online revenue. Mentoring sessions covered digital innovation, transforming to digital user experience, creating AI-driven sales, and analyzing data, inspiring entrepreneurs to develop digital solutions to complex problems. As a result of these trainings, the percentage of



participant's knowledge about effective use of digital marketing tools effectively increased, highlighting a notable skill improvement.

III: Khyber Pakhtunkhwa Access to Credit Strategy: Transformation through Digital Solutions

UNDP with the support from USAID, launched Khyber Pakhtunkhwa's first ever Small Medium Enterprises (SMEs) Access to Credit Strategy, offering policy recommendation and strategic actions for Access to Finance digital pursuit and boost economic development in the province. The policy strategy calls for;

1. KP government to fully automate small business registration, strengthen SME data collection, and establish an online SME portal integrated with SMEDA's system.
2. Government of KP should ask for complete SME portfolio data sharing from the State Bank of Pakistan, integrate KP night light data into a dashboard for

identifying underserved areas, and assist in developing movable asset registries for small borrowers.

3. Additionally, the government should advocate for higher credit limits for fast-growing firms, especially in services and IT industry, while also supporting micro-borrowers through mobile wallet facilitation and transaction security training.

UNDP SIDP will develop and deploy a vibrant digital platform for Khyber Pakhtunkhwa Board of Investment and Trade (KP BOIT). The platform will facilitate the growth of businesses by enhancing mass awareness and engagement of SMEs across the province through modernized and digitized communication channels. Through this initiative, around one million SMEs will benefit from two-way communication, gaining access to relevant services, facilities, incentives, innovative ideas, issue resolution, and informed policy discourse based on a comprehensive database of SMEs.

SPOTLIGHT 7

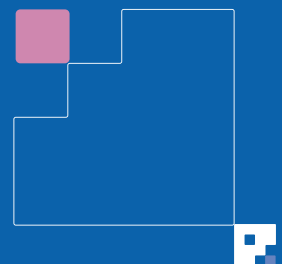
Transgender Political Candidates use Social Media to Claim Political Space

Throughout Pakistan only three transgender candidates contested for the general elections. Just before the 2024 general elections in Pakistan, two of these candidates agreed to participate in a study by UNDP Strengthening Electoral and Legislative Processes (SELP) project, to explore the experiences of transgender political candidates and the impact of social media and technology on their political campaigns. Saima Shaukat who contested from Haripur constituency PK-46 and Nayyab Ali who contested from Islamabad NA-46 and NA-47. Saima Shaukat and Nayyab Ali had previously run for elections, one of the key differences both candidates noted was the massive change social media brought to managing campaigns.

Saima found social media campaigning cheaper as she saved money on printing costs that used to be the primary medium for outreach. She has found social media to be far more effective for outreach. She created videos and digital posters that were sent through WhatsApp across 104 villages, Saima was 'astounded' by the reach of her campaign as she met constituents from the most remote villages.

Nayyab Ali shared her challenges with digital media during her campaign. While distributing posters and campaign material in the federal capital with her volunteer team, they faced an attack from individuals who opposed her candidacy due to her transgender identity. These attackers had seen an unverified viral video online labeling Nayyab as a societal threat. The video was fabricated by Nayyab's opponents to tarnish her campaign. Fortunately, timely police intervention led to the arrest of the perpetrators. Nayyab took to social media to recount her ordeal, resulting in widespread support as her story of resilience went viral.

Social media has created an alternative digital electoral space. For the marginal voices who, social media gives candidates a better chance to make themselves visible. For Saima and Nayyab, who had limited means, digital technology was a crucial tool in bolstering the impact of their political campaigns, and in Nayyab's case, having the opportunity to fight misinformation online, directly.



SPOTLIGHT 8

Using Technology for Human Rights

Under UNDP Pakistan Human Rights program, the Human Rights Information Management System (HRIMS) is a pivotal tool, enabling the Human Rights Departments at both provincial and federal levels, including the Federal Ministry of Human Rights (MoHR), to systematically collect, collate, and store human rights information. This centralized digital platform is crucial for Pakistan to fulfill its national and international human rights reporting obligations, including commitments under the Universal Periodic Review (UPR), Treaty Body reporting, and the Sustainable Development Goals (SDGs).

A significant achievement of the HRIMS is its ability to establish digital linkages between human rights data platforms across different governmental tiers. This ensures a seamless and swift flow of data among relevant stakeholders, enhancing the capacity for institutionalized and coherent human rights data collection and reporting. For instance, digital interfaces have been set up between the HRIMS portals at the MoHR and those in Khyber Pakhtunkhwa, Sindh, and Balochistan. Moreover, the system is linked with the SDGs data platform at the Ministry of Planning, Development, and Special Initiatives (MoPD&SI), facilitating efficient data reporting on SDGs indicators while upholding national and international commitments on human rights.

This digitalization initiative represents a significant step forward in addressing the previously identified challenges of digital capacity, institutional competency, and resource limitations that hampered effective human rights monitoring and reporting in Pakistan. By bridging the digital gap, the HRIMS streamlines the data collection process and promotes the institutionalization of a rights-based approach to data handling. Furthermore, it enables the identification of overlaps and gaps in human rights and SDGs indicators, guiding a more comprehensive and integrated approach to human rights data collection and reporting.

The implementation of HRIMS and its subsequent digital linkages exemplify the potential of digitalization to transform human rights data collection and reporting mechanisms. It reflects a collaborative effort involving multiple stakeholders, including the UNDP, OHCHR, government departments, and civil society, underscoring the importance of partnership and cooperation in achieving human rights and development goals. This case study illustrates the critical role of digitalization in enhancing the capacity of nations to monitor, report, and ultimately improve human rights outcomes, aligning with the global agenda of leaving no one behind.

SPOTLIGHT 9

Building Climate-Resilient Communities through Installation of Advanced Technology Early-Warning Systems in Gilgit-Baltistan and Khyber Pakhtunkhwa

In Northern Pakistan, the melting of the Hindu Kush, Karakoram, and Himalayan glaciers due to rising temperatures have created 3,044 glacial lakes in the federally administered territory of Gilgit-Baltistan (GB) and province of Khyber Pakhtunkhwa. It is estimated that 33 of these glacial lakes are hazardous and likely to result in glacial lake outburst floods (GLOFs). Such flooding can release millions of cubic meters of water and debris in just a few hours, resulting in the loss of lives, destruction of property and infrastructure, and severe damage to livelihoods in some of the most remote areas of Pakistan. Over 7 million people in GB and Khyber KP are threatened. In 2022 alone, from June to September, 165 GLOF events and floods were reported in the regions, with 64 suspected GLOF events having occurred in GB, and 11 in KP, killing 81 people.

With GLOF events becoming increasingly common due to climate change, the GLOF-II team in UNDP is installing new advanced Early Warning Systems (EWS) technology in

24 of the most vulnerable valleys of Gilgit-Baltistan and Khyber Pakhtunkhwa. The new EWS comprises of advanced Automatic Weather Stations, rain gauges, snow depth sensors, water depth gauges, water discharge gauges, data loggers and warning posts. These highly sensitive gauges and sensors will generate data to prompt relevant authorities for timely preparation and response to climate disasters such as GLOFs. Once the EWS senses danger, warning sirens turn on, signaling communities to evacuate the area. In Shisper, thanks to the advanced EWS, communities were able to evacuate upon an EWS siren, with no loss of life. The project has already supported more than 150,000 people and aims to benefit almost 700,000 people in the valleys. The data generated by the EWS through its technological interface supports evacuation measures in disaster-prone areas, but also in mapping out climate-trends of the region for relevant authorities, providing critical data to protect communities' lives in the valleys.

Annex 2: Academic and Literature Influences

The NHDR team began by extensively researching both national and global literature and data on the subject of digital technology and transformation. The literature review ranged from methodologies to evaluations, effects on economic and organizational performance, impact on increased and decreased inequality, trajectories and impacts in various countries, as well as the

best development pathways. A major goal of this Report is to frame digitalization in the context of policy research and evidence for human development and the Sustainable Development Goals (SDGs). The following is a summary review of existing literature on digital transformation broadly divided into six categories having significant overlap.

A. United Nations

1. Report of the Secretary-General Roadmap for Digital Cooperation¹

The world is shifting from analog to digital faster than ever before, further exposing us to the vast promise and peril of new technologies. While the digital era has brought society many incredible benefits, we also face many challenges such as growing digital divides, cyber threats, and human rights violations online. This report lays out a roadmap in which all stakeholders play a role in advancing a safer, more equitable digital world, one which will lead to a brighter and more prosperous future for all.

2. UNDP Digital Strategy 2022-2025²

UNDP's institutional vision for creating a world in which digital is an empowering force for people and planet. It also recognizes that digitalization will continue to mold how organizations respond to the monumental challenges our world now faces, including using its power to drive climate action and restore our natural world. It also complements the U.N.'s wide-ranging global efforts to boost the digital capacity of vulnerable and marginalized groups, including women and differently abled people.

3. From Vision to Action: Explaining UNDP's Digital Transformation Framework³

UNDP's vision for digital transformation emphasizes inclusivity, focusing on ensuring universal accessibility to digital technologies. It targets the reduction of the digital divide and other forms of digital exclusion to prevent their lasting negative impacts on human development. Guided by principles to protect human rights, ensure universal access, and foster trust, the document presents a Framework stressing the importance of collaboration among government entities, the private sector, civil society, academia, and the public. Digital Public Infrastructure is necessary for digital transformation, whose core components include identification, data exchange, and payments. These public goods should be the foundation for public entities and private businesses to promote an open, interoperable, and standards-based digital ecosystem.

4. UNDP Montenegro NHDR 2020: On The Verge of a Digital Future for All⁴

National Human Development Report for Montenegro, focusing on opening up a debate on digital transformation and its implications for development and inequalities in society. The aim of the report is to facilitate the process of digitalization in Montenegro by pointing out policies and programs that will speed up digital transformation of the state and society

5. Six Transitions: Investment Pathways to Deliver the SDGs⁵

This brief outlines the integrated approach and the investment pathways to fulfill the 2030 Agenda. The brief defines six transformative entry points or - key transitions that can have catalytic and multiplier effects across the SDGs. This includes (1) food systems; (2) energy access and affordability; (3) digital connectivity; (4) education; (5) jobs and social protection; and (6) climate change, biodiversity loss and pollution.

6. UNICEF Digital Connectivity during COVID-19: Access to Vital Information for Every Child⁶

This data-driven research brief based on learnings from 25 countries (including Ghana, South Africa and the Philippines) explores three research questions: 1) How much do we know about children's basic access to the internet across the globe?; 2) Do children

regularly use the internet to access health information?; and 3) Are children able to verify the truth of online information? It concludes with recommendations on how stakeholders can ensure that children's health information needs are better supported during the COVID-19 pandemic and beyond

7. WHO Global Strategy on Digital Health 2020-2025⁷

The vision of the global strategy is to improve health for everyone, everywhere by accelerating the development and adoption of appropriate, accessible, affordable, scalable and sustainable person-centric digital health solutions to prevent, detect and respond to epidemics and pandemics, developing infrastructure and applications that enable countries to use health data to promote health and well-being, and to achieve the health-related SDGs and the triple billion targets of WHO's Thirteenth General Program of Work, 2019–2023.

B. Pakistan

1. MoIT&T, Digitalization and Employment: Digital Pakistan Policy 2018⁸

This is the Pakistan Ministry of Information Technology policy document outlining a vision for the construction of a holistic digital ecosystem and increasing technological adoption while reducing the digital divide in Pakistan. The Digital Pakistan Policy 2018 aims to accelerate the digitization of Pakistan's economy and society, focusing on access to digital infrastructure, e-government services, and fostering a conducive environment for IT innovation. It emphasizes improving internet connectivity, promoting e-commerce, and enhancing digital skills to empower citizens and drive economic growth through technology. The policy seeks to bridge the digital divide and leverage technology as a tool for socio-economic development across Pakistan.

2. MoIT&T, National Broadband Policy 2021⁹

This is the government's reformative review of Pakistan's telecommunications sectoral progress, which lays out the future course for digital transformation in Pakistan. The National Broadband Policy 2021 aims to enhance broadband access and adoption across Pakistan, focusing on expanding high-speed internet infrastructure, promoting affordability, and ensuring inclusivity in digital connectivity. It prioritizes bridging the urban-rural digital divide, stimulating investment in broadband networks, and fostering a conducive regulatory environment to accelerate broadband deployment. The policy seeks to leverage broadband connectivity as a catalyst for socio-economic development, innovation, and digital transformation in Pakistan.

3. From Digital Divide to Digital Inclusion: Challenges for Wide-Ranging Digitalization in Pakistan 2021¹⁰

An exploration of how the urban-rural divide, gender disparity, income and educational inequalities, religious, and cultural barriers underpin Pakistan's existing digital divide. The study delves into the digital inequalities within Pakistan through the lens of the digital divide framework. It examines various contextual challenges contributing to these disparities, particularly focusing on policy and regulatory obstacles hindering comprehensive digitalization across different spheres. The research highlights the significance of factors such as the urban-rural gap, gender inequality, disparities in income and education, as well as religious and cultural barriers, all of which collectively exacerbate Pakistan's digital divide. Moreover, the study elucidates how policy-related challenges impede the widespread adoption of digital technologies throughout the country.

4. GSMA, Pakistan: Progressing Towards a Fully-Fledged Digital Economy 2020¹¹

The GSMA report assesses Pakistan's advancement towards establishing a robust

digital economy. It outlines the nation's progress in various digital sectors, such as mobile connectivity, internet penetration, e-commerce, and digital payments. The report also highlights the challenges and opportunities for further growth, emphasizing the importance of policies and investments to support Pakistan's digital transformation journey. Overall, it provides insights into Pakistan's evolving digital landscape and its trajectory towards becoming a fully-fledged digital economy.

5. Digital Now: A Guide to Pakistan's Digital Transformation, Tabadlab¹²

Tabadlab's report describes digital transformation as pivotal opportunity for Pakistan, capable of unlocking an estimated economic value of \$60 billion by 2030, while enabling the Sustainable Development Goals (SDGs). The report identifies core enablers like institutional architecture, infrastructure, skills, and trust and safety for strengthening the digital ecosystem. It also recommends key domains for undertaking policy action, including digital government, the startup environment, sectoral digitization and global integration.

C. International Digital Transformation Frameworks and Research Designs

1. Digitalization and the U.N. Sustainable Development Goals: What Role for Design – Van der Welden 2018¹³

This paper explores the relationship between digitalization and the Sustainable Development Goals (SDGs). Digitalization is often portrayed as a transformative force that reshapes our lifestyles and professional environments. The SDGs recognize digitalization technologies as facilitators of sustainable development. However, the inherent unsustainability of these technologies may compromise the progress achieved through digitalization.

This issue becomes evident when examining digitalization and the SDGs within the context of the Planetary Boundaries framework. Taking the example of one of the most iconic digital technologies of our era, the smartphone, reveals the detrimental effects of its production and consumption on the biosphere — the foundation of all life on Earth — as well as on various social aspects addressed by the SDGs, including poverty, child labor, decent work, and peace. Rather than advocating for sustainable digitalization, this paper advocates for the concept of

“sustainment” as a fundamental principle for ensuring the sustainability of digitalization. While sustainability often serves as a means to an end, sustainment focuses on preserving life itself. Through sustainment, digitalization and its design can enhance our capacity to address the challenges of living on a finite planet.

2. Technological Frames in the Digital Age: Theory, Measurement Instrument, and Future Research Areas – Spieth et al. 2021¹⁴

This is an overview of theoretical approaches to digital transformation with a new proposed methodological foundation for future research on technological frames and strategizing in the digital age. Technological frames determine how actors interpret, assess, and shape a technology’s development, usage, and trajectory. However, the research fails to provide insights into the micro-foundations that can explain the consequences of heterogeneity in technological frames. The paper argues that this research gap is due to a lack of a proper measurement instrument. To address this gap, the authors theorize on the antecedent of technological frames on the individual level and undertake a rigorous scale-development process encompassing five steps and samples. The resulting measurement instrument assesses five distinct but interrelated dimensions of an actor’s technological frame (personal attitude, application value, organizational influence, industrial influence, and supervisor influence).

3. Tackling the Digitalization Challenge: How to Benefit from Digitalization in Practice – Parviainen et al. 2017¹⁵

This paper offers a systematic model to approach digital transformation. The model first identifies the gaps, outlines actions to close the gaps, identifies the feasibility of these actions, which are then put into place based on priority and importance. The model

consists of four main steps, starting with positioning the company in digitalization and defining goals for the company, and then analyzing the company’s current state with respect to digitalization goals.

4. Digital Transformation: An Overview of the Current State of the Art of Research – Kraus et al. 2021¹⁶

This paper qualitatively classifies the literature on digital business transformation into three different clusters based on technological, business, and societal impacts while identifying research gaps. Several research gaps identified in the literature on digital transformation are proposed as future lines of research, which could provide useful insights to the government and private sectors in order to adapt to the disruptive changes found in business as a result of this phenomenon, as well as to reduce its negative impacts on society and the environment.

5. Global Values, Digital Transformation and Development Strategy for Global Society: Conceptual Framework - Aleshkovski 2020¹⁷

This study examines global values in relation to ultimate development goals and possible social and economic development models for global society in the era of digital transformation. The authors identify three models that can be considered within the context of today’s development challenges often referred to as ‘the Fourth Industrial Revolution’ with its rapidly emerging technologies and broad-based innovation. These models are shaped in accordance with their development purposes, which tend to establish their own relationship between the individual, business community, government and global society. Understanding the conditions for achieving the ultimate goal of the global society and propounding a long-term strategy for sustainable development constitute the major findings of the research.

D. Digital Transformation and Economic Development

1. Digital Transformation and its Influence on GDP – Micic 2017¹⁸

This paper uses data from European countries to assess the direct impact of the ICT sector spending on GDP growth. The author provides a basic review of digital transformation and high-tech sector in Europe as well as a comparison between the E.U. and eastern European countries. The paper serves as a basis for further research in the area of influence of tech investment on macroeconomics indicators.

2. Digital Transformation, Development and Productivity in Developing Countries: Is Artificial Intelligence a Curse or a Blessing? – Aly 2020¹⁹

This paper examines the relationship between digital transformation and economic development, labor productivity, and employment in 25 developing countries, including Bangladesh, Bolivia, Algeria and Cameroon. The paper analyzes different indices of digital transformation, and then uses the Digital Evolution Index (DEI) to study these relationships in these developing countries.

3. Digital Transformation as a New Paradigm of Economic Policy – Nosova et al. 2021²⁰

This study highlights the dynamics of digital transformation and its impact on business processes and the interaction of states, business, and civil society in the context of modern economic policy. The author reviews the policy of the Russian state in terms of overcoming both the existing and potential economic consequences of the COVID-19

pandemic based on published expert assessments. The results confirmed that overcoming the current turbulent state of the digital economy in Russia requires: first, the development of digital entrepreneurship or the digital sector as the “core” of the digital economy, where digital technologies are created; second, the removal of restrictions on the movement of resources caused by the COVID-19 pandemic; third, the process of reproduction of the social product should take place at the level of world standards; fourth, to introduce the “digital style” in economic policy through building technological chains; and fifth, to develop artificial intelligence to launch a large-scale virtual program of a new being of humanity, spurred by the COVID-19 pandemic.

4. Social and Economic Development Models in the Digital Transformation Era – Bondarenko and Aleshkovski 2019²¹

This is a detailed analysis of social and economic development models as they relate to the Industry 4.0 technological revolution. The article explores patterns of human system development, and proposes potential social and economic development frameworks in the digital transformation era. It identifies three models suited to the Industry 4.0 technological revolution, each with distinct relationships between state, society, business, and individuals. The authors argue that only one of these models can ensure sustainable development and align with 21st Century digital technologies, thereby fostering a new economic development paradigm.

E. International Case Studies on Digital Transformation

1. The Interplay between Digitalization, Education and Financial Development: A European Case Study – Horobet et

al. 2022²²

This paper explores the relationship between education, digitalization, and

financial development during the period of 1996-2019, with the aim of showcasing the differences between developed and emerging economies in Europe. The findings demonstrate the dynamic interdependence between financial development — including its two main components, financial institutions, and financial markets, digitalization, and education. The authors find that education is a leading variable in the financial development–education–digitalization nexus, whereas financial development and digitalization are lagged variables. These findings open possibilities for influencing joint policies on digitalization, education, and financial development, particularly in the emerging market countries of eastern Europe.

2. Digital Transformation in Times of COVID-19 Pandemic: The Case of Morocco – Nachit & Belhcen 2020²³

This paper explores the impact of COVID-19 pandemic on digital transformation implementing process in Morocco, and the extent to which Moroccan economic actors are ready to embrace digital transformation. The paper explores three main factors: global digital infrastructure, companies' digital readiness, and customers' digital readiness.

3. The Digital Divide in Rural South Asia: Survey Evidence from Bangladesh, Nepal and Sri Lanka – Zhou et al. 2011²⁴

This paper uses survey data from three South Asian countries – Bangladesh, Nepal and Sri Lanka – to examine factors influencing patterns of computer and internet use, finding that education is the key determining factor. The authors find that education plays a key role, in terms of its acquisition as a reason for computer and internet use, and as an enabling variable.

4. Empowering Indonesian Women through Building Digital Media Literacy – Suwana & Lily 2017²⁵

This paper finds that digital media literacy for women in Indonesia remains low because of inadequate education, lack of opportunity, and the country's patriarchal society. In this qualitative research study, founders, leaders, and participants from IWITA (Indonesian Women Information Technology Awareness) and FemaleDev (Female Developer) were interviewed because these organizations focus on developing digital literacy for women.

5. The Impact of Digital Transformation on European Countries: Insights from a Comparative Analysis – Malkowska et al. 2021²⁶

The results of this analysis demonstrate the impact of technological transformation on the economy and society in the E.U. countries grouped according to a similar level of development, such as countries with high, medium, and low performance focusing on societies, economies, and companies.

6. Digital Transformation of Energy Companies: A Colombian Case Study – Giraldo et al. 2021²⁷

This work addresses the execution of the commercial digital transformation project that has allowed AES Colombia to transition from a local management strategy to a global one that involves learning processes, communication skills, and adoption of Industry 4.0 technological tools.

7. South Asia's Digital Opportunity: Accelerating Growth, Transforming Lives, World Bank 2022²⁸

This is an analysis of the opportunities and challenges related to digitalizing the economies, societies and governments of Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. The report presents both the opportunities of and the bottlenecks for furthering the digital agenda. It emphasizes that the first step is to get the basics right. This includes enabling access to and adoption of high-quality

affordable broadband, initiating a paradigm shift in building digital public platforms and accelerating digital financial services. Part of this includes integrating digital identification, digital payments, and data sharing platforms so they can become 'digital stacks' that allow service providers to build and innovate their own platforms and systems on top.

Supporting digital businesses, fostering digital skills, and creating the necessary trust environment are also critical to the digital agenda. Further, a successful digital agenda at country levels would benefit from regional integration that entails cross-border connectivity, data infrastructure, and payment systems.

F. Digital Transformation and the Gender Divide

1. Digital Gender Divide or Technologically Empowered Women in Developing Countries? A Typical Case of Lies, Damned Lies, and Statistics – Hilbert 2011²⁹

This study finds that the reason why fewer women access and use ICT is a direct result of their unfavorable conditions with respect to employment, education, and income. Correct management of these variables leads to women becoming more active users of digital tools than men, which creates an opportunity to empower women through digitalization. The results are surprisingly consistent and revealing: the reason why fewer women access and use ICT is a direct result of their unfavorable conditions with respect to employment, education, and income. When these variables are controlled, women turn out to be more active users of digital tools than men. This turns the alleged digital gender divide into an opportunity. Given women's affinity for ICT and given that digital technologies are tools that can improve living conditions, ICT represents a concrete and tangible opportunity to tackle longstanding challenges of gender inequalities in developing countries, including access to employment, income, education, and health services.

2. Influences of Digital Transformation on Life Expectancy and the Gender Gap in European Countries – Thanh et al. 2022³⁰

This study empirically examines the influence of the digital transformation process on life expectancy and the digital gender gap employing a sample of 20 European countries over the period of 2015-2020. The results illustrate that using the internet and online activities reduce life expectancy, whereas business digitization, e-commerce, digital public services, and higher digital skills in the population can improve the life expectancy of men and women, leading to a reduction in the gender gap. The study finds that men are significantly more affected by the implementation of digital transformation, while online administrative procedures also lead to a rise in life expectancy but only in women.

3. Identifying the digital gender divide: How digitalization may affect the future working conditions for women – Larsson and Viitaoja 2019³¹

This paper concludes that digitalization may provide for more flexible working conditions that benefit women, but that digital

transformation also carries a risk of bringing about more atypical work arrangements. It highlights the persistent digital gender gap, particularly evident in the low representation of women in STEM fields and ICT-related entrepreneurship, along with challenges in securing venture capital for women-led teams. However, it concludes that many barriers faced by women in these domains stem from societal attitudes rather than solely from policy and regulation. Therefore, initiatives promoting female role models in STEM and awareness campaigns are deemed crucial for inspiring and encouraging girls and women to pursue careers in these fields.

4. Poverty, Literacy, and Social Transformation: An Interdisciplinary Exploration of the Digital Divide – Bach et al. 2018³²

This is a detailed analysis of traditional

understandings of the digital divide and why these understandings are flawed since they do not account for overall social and economic marginalization. The authors argue that the current literature on the digital divide overlooks broader connections between technological exclusion and wider forms of economic and social marginalization. They propose that future research should explore the intricate links between poverty, inequality, and the digital divide, drawing insights from poverty scholarship to grasp the complex and evolving nature of poverty. Additionally, they suggest that scholars and practitioners involved in digital literacy programs should consider historical and critical education scholarship to understand how education can either perpetuate or disrupt entrenched social inequalities, thus informing efforts to address the digital divide and promote broadband adoption.

Endnotes

SECTION ONE:

Political Economy of Digital Transformation in Pakistan

1	PBS 2021	20	SBP and IBA 2023
2	UNDP 2017	21	Slater and Baur 2023
3	IMF 2024	22	Shahid 2022
4	IMF 2023	23	Hallinan and others 2022
5	World Bank 2024a	24	Chertoff 2014
6	Profit Pakistan Today 2023	25	UNDP 2017
7	UNDP 2024a	26	UNDP 2021a
8	Ibid	27	Goel 2006
9	Ibid	28	Kimachia 2023
10	Kemp 2023	29	Dieffenbacher 2024
11	Shaikh and Anis 2020	30	Ibid
12	UNDP 2022a	31	UNDP 2023b
13	Ibid	32	Data Reportal 2024
14	UNDP 2020a	33	UNDP 2017
15	Afzal and Ahsan 2021	34	UNDP 2021a
16	The Nation 2023a	35	UNDP 2022a
17	FloodList 2023a	36	UNDP 2024a
18	FloodList 2023b	37	UNDP 2020b
19	World Bank 2023a		

SECTION TWO: Where is Pakistan on Digital? A Quantitative & Qualitative Baseline

1	Steiner 2023
2	Data Reportal 2024
3	Ibid
4	Ibid
5	https://www.nation.com.pk/09-Nov-2023/pakistan-ranks-45th-in-world-internet-development-index . Compiled and launched annually since 2017 by the Chinese Academy of Cyberspace Studies (CACS),

the World Internet Development Report evaluates the major trends of global Internet development of the year, detailing achievements and challenges for further advancement. The top five performers in the World Internet Development Index are the United States, China, Singapore, the Netherlands, and South Korea, according to the report. This is the first time that Pakistan has been included in the evaluation for the internet

- development blue paper. According to the World Internet Development Report 2023, released during the 2023 World Internet Conference (WIC) Wuzhen Summit, this progress is attributed to the stimulation of the Belt and Road Initiative (BRI), especially the Digital Silk Road: <https://news.cgtn.com/news/2023-11-08/BRI-boosts-internet-development-in-less-developed-countries-1ozglEcKxAQ/index.html>.
- 6 Impact Economist 2021
 - 7 UN 2022a
 - 8 Digital Quality Index 2022
 - 9 ADB 2021a
 - 10 Impact Economist 2021
 - 11 UNDP 2022a
 - 12 UNDP 2024a
 - 13 UNDP 2024b
 - 14 UNDP 2020b
 - 15 World Bank 2016a
 - 16 UNDP 2022a
 - 17 The Multidimensional Poverty Index (MPI) was developed as a collaboration between Government of Pakistan and UNDP with technical inputs from Oxford Policy and Human Development Initiative (OPHI) in 2016. MPI served as a complementary measure to consumption/income-based poverty and for the first time in Pakistan provided district disaggregated poverty estimates. MPI was used as one of the criteria for selection of the 20 poorest districts by the Government of Pakistan for the Special Development Package. These districts (along with their MPI value) include 11 from Balochistan; Sherani (91.88), Kohlu (89.87), Jhal Magsi (88.35), Awaran (87.9), Barkhan (87.53), Killa Abdullah (86.93), Zhob (84.36), Musakhel (83.12), Dera Bugti (82.98), Jaffarabad (81.94), Killa Saifullah (76.95); 5 in Sindh, Sujawal (84.03), Thatta (83.16), Tharparkar (82.11), Kashmore (88.06), Badin (79.32), 3 in Khyber Pakhtunkhwa, Torghar (90.81), Shangla (77.06), North Waziristan (73.55), and one in Punjab, Rajanpur (65.24).
 - 18 The GDDI is based on the three dimensions of Digital Development Index: usage, attainment, and transformation. The GDDI did not use the access domain for DDI, because it is measured at the household level, and it does not possible to decompose it by gender. GDDI is a ratio of DDI for female and DDI for male.
 - 19 The Zindagi Trust is a non-profit aimed at reforming public schools and lobbying the government to improve education policy in Pakistan; Key Informant Interview held in Karachi on 6th June, 2023 with Dr. Aamna Pasha, Chief Academic Officer, Zindagi Trust.
 - 20 All names referring to Focus Group Participants have been anonymized; Focus Group Discussion held in Lahore on 14th July, 2023 with University of Lahore students.
 - 21 Key Informant Interview held in Karachi on 9th June, 2023 with Dr. Sara Saeed, CEO, Sehat Kahani.
 - 22 Focus Group Discussion held in Lahore on 13th July, 2023 with home-based workers, facilitated by the Kashf Foundation.
 - 23 World Bank 2023a
 - 24 Focus Group Discussion held in Peshawar on 22nd May, 2023 with employees from the Directorate of Professional Development, Khyber Pakhtunkhwa Elementary & Secondary Education Department.
 - 25 Key Informant Interview held in Lahore on 12th July, 2023 with Youtuber Bilal Munir.

26	Key Informant Interview held in Karachi on 7 th June, 2023 with Podcaster Junaid Akram.	Women Chamber of Commerce, Lahore.
27	Focus Group Discussion held in Lahore on 13 th July, 2023 with home-based workers, facilitated by the Kashf Foundation.	438 Focus Group Discussion held in Lahore on 11 th July, 2023 with home-based women workers, facilitated by HomeNet Pakistan.
28	Focus Group Discussion held in Karachi on 7 th June, 2023 with urban professionals from Jaffar Business Systems.	439 Key Informant Interview held in Lahore on 14 th July, 2023 with Moeed Yusuf, Vice Chancellor, Beaconhouse National University.
29	Key Informant Interview held in Lahore on 3 rd August, 2023 with Shymla Khan from the Digital Rights Foundation.	440 Focus Group Discussion held in Quetta on 20 th June, 2023 with students from the Balochistan University of Information Technology, Engineering and Management Sciences.
30	Focus Group Discussion held in Islamabad on 3 rd February, 2023 with students from the National Defence University.	441 MoIT&T 2018
31	Focus Group Discussion held in Quetta on 20 th June, 2023 with students from the Balochistan University of Information Technology, Engineering and Management Sciences.	442 Tribune 2019
32	Key Informant Interview held in Karachi on 8 th June, 2023 with Mohammad Hussain, FMCG Growth Lead at Daraz.	443 Murtaza 2023
33	Key Informant Interview held in Peshawar on 23 rd May, 2023 with Dr. Ali Mahmud, Managing Director, Khyber Pakhtunkhwa Information Technology Board (KPITB).	444 Focus Group Discussion held on 22 nd May, 2023 with freelancers and startup founders at the National Incubation Center, Peshawar.
34	Key Informant Interview held in Karachi on 6 th June, 2023 with Dr. Faiza Yousuf, Founder of WomenInTechPK.	445 Key Informant Interview held in Karachi on 8 th June, 2023 with Mohammad Hussain, FMCG Growth Lead at Daraz.
35	Focus Group Discussion held in Quetta on 22 nd June, 2023 with teachers at BUIITEMS.	446 Key Informant Interview held in Lahore on 11 th July, 2023 with women rights advocate Khawar Mumtaz.
36	Focus Group Discussion held in Lahore on 11 th July, 2023 with teachers at the Quaid-e-Azam Academy for Educational Development.	447 Key Informant Interview held in Karachi on 7 th June, 2023 with Muhammad Imran Saleem, General Manager at Careem.
37	Key Informant Interview held in Lahore on 13 th July, 2023 with Sam Ali Dada, Activist and Former President of the	448 Focus Group Discussion held in Muzaffarabad on 16 th May, 2023 with students from the University of Azad Jammu & Kashmir.
		449 Key Informant Interview held in Lahore on 14 th July, 2023 with Dr. Hassan Mahmood Warraich, Director, Institute of Continuous Education and Extension, University of Veterinary & Animal Sciences.
		450 Nayab 2022
		451 Khan and others 2023

SECTION THREE: Access: Fundamental to Channeling Pakistan's Social Capital

1	Dijk 2017	21	PSLSMS 2019-20
2	Data Reportal 2024	22	Ibid
3	Ibid	23	Ibid
4	Hargittai 2002	24	There were an estimated 50 million Facebook users in Pakistan in January 2023, according to Tokyo-based research organization Oosga. Such estimates are provided by third party sources, as Meta does not share country statistics. These statistics indicate a trend more than the exact number of users, which is expected to be higher. Male and female users of Facebook are reported to be 75percent and 25percent. There are an estimated 20 million Instagram users, with 65percent male and 35percent female subscribers. TikTok is used by 25 million users. See Oosga (2023, October 31) 'Social Media in Pakistan – 2023 Stats and Platform Trends' available at https://oosga.com/social-media/pak/
5	Penchansky and Thomas1981 For a discussion on access in the healthcare sector, see Sieck, C.J. et al (2021) 'The Five As of Access for TechQuity, <i>Journal of Health Care for the Poor and Underserved</i> , Volume 32, Number 2, May 2021 Supplement, Johns Hopkins University Press.	25	Dijk 2017
6	PTA 2024b	26	Rugo 2024
7	Ibid	27	Berthin 2023
8	PSLSMS 2019-20	28	Zhang 2022
9	Ibid	29	ECDB 2024
10	PBS 2021 'Labour Force Statistics - Table 16: Percentage Distribution of Employed Persons 10 Years of Age and Over By Major Occupation Groups, Sex and Area 2020-21'	30	Khan and Zahid 2023
11	Ibid	31	ECDB 2024
12	PSLSMS provides combined figures for mobile phones, feature phones and smartphones, and does not disaggregate their usage.	32	Chainalysis 2023
13	Ibid	33	Digital infrastructure comprises of key components: Hardware , or computers, mobile phones, digital devices, servers, etc; Software or operating systems underpinning computer hardware and applications; Networks , both physical and virtual, including copper
14	Ibid		
15	UNDP 2022b		
16	World Bank 2022b		
17	Ibid		
18	Moss 2022		
19	PSLSMS 2019-20		
20	These findings have been gleaned from interviews conducted with respondents in the field.		

or fibre-optic cables in the ground, local area networks (LANs), wide area networks (WANs) and the internet; **Data centers** or facilities where servers and networking equipment is stored; **Cloud computing** or services like cloud storage, Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS);

as well as **Cybersecurity systems**, or measures to protect hardware and software. Neos Networks 2024

34 These findings have been gleaned from interviews/FGDs conducted with respondents in the field.

35 Jamil and Muschert 2023

36 Shen 2020

SECTION FOUR: Adopt: Harnessing the Gains of Access

1 Job markets are changing rapidly. 91 percent of businesses across the world have some form of digital initiative, making digital skills the biggest priority for employers. AI based tools and platforms are becoming more mainstream, whereas green jobs and green skills in demand by major sectors like manufacturing, IT, finance and accounting. Automation is replacing low skilled labour in many industries, and freelancers or 'gig economy' specialists are increasingly common. However, skills remain mismatched in countries where education and training have not caught up to contemporary job trends.

2 Babatunde 2021

3 Chen and others 2023

4 43 percent is the government's direct share in the economy and 24 percent is the cost of compliance with inhibiting regulations, making the 'governmental footprint' about 67 percent of the economy.

5 Competency implies more than the acquisition of knowledge and skills; it involves the mobilization of knowledge, skills, attitudes and values to meet dynamic social demands. Acquiring competencies results in individual growth and well-being, and applies to

communities as well.

6 Jehan Ara is a Pakistani businesswoman who was the president of P@SHA for over 20 years. She resigned at the end of April 2021 to start Catalyst Labs, a startup accelerator and women leadership program. She also headed the Nest i/o, a startup incubator supported by Google and Samsung.

7 NADRA 2023

8 Ibid

9 PTA laws and policies

10 PTA 2003

11 PTA laws and policies

12 Ibid

13 MoIT&T 2015

14 Ignite 2022

15 Ibid

16 USF Pakistan

17 MoIT&T 2018

18 DigiSkills Training Program

19 Atlantic Council 2023

20 Atlantic Council 2022

21 Business Recorder 2022

22 Freedom House 2022

23 MoIT&T 2022

24 Khan 2021

25	GSMA 2017	59	Ibid
26	PITB 2021	60	SDC 2024
27	PITB 2018	61	Ibid
28	KPITB 2018	62	Government of France
29	Government of Balochistan 2023	63	FID 2024
30	Provincial Assembly of Sindh 2023	64	European Commission 2022c
31	MoIT&T 2018	65	AICS
32	BISP 2024	66	Government of Spain
33	Oxford Policy Management 2016	67	Government of Spain, Fight against disinformation
34	MoIT&T 2018	68	JICA 2022
35	SUPARCO	69	Embassy of China in Pakistan 2023
36	Planning Commission of Pakistan 2023	70	CPEC Secretariat
37	OECD 2021	71	GCC
38	UK Government 2023	72	World Bank 2023b
39	Ibid	73	Ibid
40	FCDO and The Rt Hon James Cleverly MP 2023	74	World Bank 2023c
41	U.K. International Development 2024	75	Amin 2024
42	USAID 2022	76	Ibid
43	Digital Principles	77	Ibid
44	U.S. Agency for International Development	78	IFC 2024
45	EU4Digital 2021	79	Business Recorder 2023a
46	European Commission 2022a	80	ADB 2023
47	European Commission	81	ADB 2021b
48	European Commission 2022b	82	ADB 2022
49	BMZ	83	UNDP Pakistan Twitter 2023
50	Grainger 2023	84	BMGF
51	Sida	85	BMGF 2021
52	Sida 2021	86	Karandaaz
53	Norad 2023a	87	Rana 2024
54	Ibid	88	Google
55	Norad 2023b	89	Ibid
56	DANIDA	90	Ibid
57	DANIDA in Pakistan	91	The Nation 2023c
58	Government of the Netherlands 2019	92	ProPakistani 2024
		93	Ibid

94	MolT&T	115	Smith 2020
95	Business Recorder 2024	116	Ahmed and Ahmed 2018
96	MolT&T	117	UNDP 2024c
97	Ibid	118	Mahdi and others 2022
98	Meta	119	Combi 2016
99	Ibid	120	Ahmed and Ahmed 2018
100	UNDP 2022c	121	There are multiple estimates of Pakistan's digital growth trajectory. The projection of \$24 billion and contribution of 6.6 percent of GDP is conservative compared to larger projections made in government statements.
101	UNDP 2022d	122	SBP 2023a
102	UNDP 2022e	123	Business Recorder 2023b
103	ITU	124	SBP 2023a
104	ITU 2022	125	Shafi and others 2020
105	UNICEF Innocenti	126	Ahmad and Riaz 2023
106	UNICEF Office of Innovation	127	PSLSMS 2019-2020
107	UNICEF Pakistan	128	UNESCO 2015
108	Buechner 2019	129	Baron and Bend 2023
109	UN Women 2023	130	PTA 2024a
110	UN Women Pakistan		
111	UNESCO		
112	UNESCO 2016		
113	Gallup Pakistan 2020		
114	UNDP 2020c		

SECTION FIVE: Anticipate: Becoming Future-Ready

1	UN 2020	9	Ibid
2	UN	10	Wakunuma 2019
3	PBS 2023	11	Al Jazeera 2019
4	ChatGPT is a chatbot developed by OpenAI and launched on November 30, 2022. Based on a large language model, it enables users to refine and steer a conversation towards a desired length, format, style, level of detail, and language.	12	Ibid
5	UNDP 2024d	13	Marr 2023
6	WEF 2023a	14	UNDP 2024d
7	UN 2020	15	Ibid
8	Ibid	16	Ibid
		17	Ibid
		18	Brookings Institution 2023
		19	World Bank 2022a
		20	Brookings Institution 2023

21	UN	31	Ibid
22	WEF 2020	32	McKinsey and Company 2022
23	Fietz and Jann 2023	33	Ibid
24	MSDE 2023	34	Vodafone
25	Hart 2024	35	EY 2022
26	World Bank 2022a	36	Ibid
27	Fietz and Jann 2023	37	Brookings Institution 2023
28	Fietz and Jann 2023	38	World Bank 2023a
29	UN	39	EY 2022
30	GSMA 2023		

SECTION SIX: Accelerate: Reaping the Low-Hanging Fruits

1	UN 2014	19	UNDP 2023d
2	Ibid	20	Ibid
3	UN 2022b	21	Statista 2024
4	These recommendations are drawn from the findings of the UN Secretariat's Department of Economic and Social Affairs E-Government Surveys, especially those pertaining to open government and data driven institutional reform.	22	Ibid
5	World Bank 2016b	23	Ibid
6	Ibid	24	Ibid
7	UNDP 2023c	25	World Bank 2019
8	Ibid	26	Pak One Health Alliance 2020
9	D'Costa 2006	27	These learnings have been gleaned from Zubairi et al's useful research on EdTech programming during COVID-19, as well as other interventions in Pakistan's education sector. See Zubairi, A., Khalayleh, A., Baloch, I., Mazari, H., Kaye, T. & Groeneveld, C. (2022). <i>'Pakistan Digital Learning Landscape Analysis. Technical Report'</i> . EdTech Hub, UNICEF. https://doi.org/10.53832/edtechhub.0093 Available at: https://docs.edtechhub.org/lib/HEXCExFK . Available under Creative Commons Attribution 4.0 International, https://creativecommons.org/licenses/by/4.0/
10	Telenor Microfinance Limited 2024	28	Zubairi and others 2022
11	Amin 2023	29	PITB Punjab
12	Daraz	30	UNICEF 2023
13	SBP 2023b		
14	SBP		
15	MoF 2023		
16	Karandaaz 2024		
17	PIDE 2023		
18	GSMA 2020		

31	Mahdi and others 2022		of Pakistan 2018
32	Health Economic Times 2022	46	The Constitution of the Islamic Republic of Pakistan 2016
33	FCC		
34	Pak One Health Alliance 2020	47	Digital Rights Foundation 2017
35	Ahmed and Ahmed 2018	48	These recommendations complement findings in many other research studies on the subject of women's digital inclusion, including Pakistan Telecommunication Authority's <i>Digital Gender Inclusion Strategy (2024)</i> .
36	World Bank 2021		
37	UN Habitat 2018	49	DataReportal 2022.
38	Ibid	50	UNICEF 2021a
39	PLRA	51	UNICEF 2021b
40	RSIL 2024	1	Web Desk 2024
41	World Bank 2021	2	Peshawar High Court 2024
42	UNDP 2021c	3	Ibid
43	UNDP 2021a		
44	WEF 2023b		
45	The Constitution of the Islamic Republic		

Annex II

1	UN 2020	17	Aleshkovski and others 2020
2	UNDP 2022c	18	Mićić 2017
3	UNDP 2023e	19	Aly 2020
4	UNDP 2020b	20	Nosova and others 2021
5	UN Kazakhstan 2023	21	Bondarenko and others 2019
6	Winther and others 2020	22	Horobet and others 2022
7	WHO 2021	23	Nachit and Belhacen 2020
8	MolT&T 2018	24	Zhou and others 2011
9	MolT&T 2021	25	Suwana 2017
10	Jamil 2021	26	Małkowska and others 2021
11	GSMA 2020	27	Giraldo and others 2021
12	Khan and others 2023	28	World Bank 2022a
13	Maja 2018	29	Hilbert 2011
14	Spieth and others 2021	30	Thanh and others 2022
15	Parviainen and others 2017	31	Larsson and Viitaoja 2019
16	Kraus and others 2021	32	Bach and others 2018

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Statistical Annex

Readers' guide	
Statistical tables	
1	Human Development Index and its Components sorted by Human Development Index ranking
1A	Human Development Index and its Components sorted by name of region
1B	Human Development Index trends, 2005-2020
2	Digital Development Index and its Components sorted by Digital Development Index ranking 2020
2A	Digital Development Index and its Components sorted by name of region 2020
2B	Digital Development Index indicator values sorted by name of region 2020
2C	Digital Development Index and its Components at national, provincial, and urban/rural levels 2020
2D	Digital Development Index indicator values at national, provincial, and urban/rural levels 2020
2E	Digital Development Index and its Components at national, provincial, and urban/rural level by wealth quintiles 2020
2F	Digital Development Index indicator values at national, provincial, and urban/rural level by wealth quintiles 2020
3	Gender Digital Development Index and its Components at national, provincial, and urban/rural levels 2020
3A	Gender Digital Development Index indicator values at national, provincial, and urban/rural levels 2020
3B	Gender Digital Development Index and its Components at national, provincial, and urban/rural level by wealth quintiles 2020
3C	Gender Digital Development Index indicator values at national, provincial, and urban/rural level by wealth quintiles 2020
3D	Gender Digital Development Index and its Components at national, and provincial level by age groups 2020
3E	Gender Digital Development Index indicator values at national, and provincial level by age groups 2020
Technical notes	
<ol style="list-style-type: none"> Human Development Index (HDI) Digital Development Index (DDI) Gender Digital Development Index (GDDI) UNDP Special Survey of 15 Districts 	
Data sources	
Regional classification	
Statistical annex references	

Readers' guide

The 3 set of statistical tables provide an overview of the key aspects of digital development in Pakistan with focus on different dimensions and aspects.

Table 1 has the value of Human Development Index (HDI) for the year 2019-20 at national, provincial and district level and also contains DDI for special regions Azad Jammu and Kashmir, and Gilgit Baltistan. All these tables are estimated by the NHDR team at UNDP Pakistan. Table 1A has the value of HDI sorted by the name. Table 1B has the value of HDI for the years 2005, 2007, 2009, 2011, 2013, 2015, and 2020. Table 2 has the Digital Development Index (DDI) for 2019-20 at national, provincial, and district level sorted by district rankings. Table 2 also contains DDI for special regions Azad Jammu and Kashmir, and Gilgit Baltistan. Table 2A and 2B contains the components and indicators of DDI sorted by district names respectively. Table 2C has the DDI and its sub-indices values for 2019-

20 at national and provincial with urban/rural breakdown, and Table 2D has the values of Indicator use to construct DDI at national and provincial with urban/rural breakdown. Table 2E contains DDI and its sub-indices by wealth quintiles at national and provincial level with urban/rural breakdown and Table 2F has the values to indicators use to calculate the DDI. Table 3 contains the Gender Digital Development Index (GDDI) at national and provincial level with urban/rural breakdown, and Table 3A has the values of indicators used to construct the GDDI. Table 3B has the GDDI by wealth quantiles at national and provincial level with urban/rural breakup, and Table 3C has the values of indicators respectively. Table 3D has the values of GDDI decomposed by the age groups at national and provincial level. Table 3F has the values of Digital Develop Index by age at National and Provincial level. Table 3E and 3G have values of indicators used to calculate the index for Table 3D and 3F respectively

Sources and definitions

UNDP Pakistan uses micro-data of Pakistan Social and Living Standards Measurement Survey (PSLSMS) for year 2019-20 to compute the Digital Development Index (DDI), Gender Digital Development Index (GDDI) and Human

Development Index (HDI). Definitions of indicators and data sources are given at the end of each table, with the full source details in the Statistical references.

Methodology

The Pakistan NHDR 2023/24 includes the various indices like DDI, DDI by wealth quantiles, GDDI, GDDI by wealth quantiles

and age groups, and HDI. Technical notes 1 to 3 explain the methodology used to compute these indices and further analysis.

Human Development Index (HDI) classification

HDI classifications are based on HDI fixed cut-off points. The cut-off points and HDI classification are as follows: less than and equal to 0.299 for very low human development; 0.300-0.499 for low human

development; 0.500-0.599 for low medium human development; 0.600-0.699 for medium human development; 0.700-0.799 for high medium human development; and 0.800 or greater for high human development.

Digital Development Index (DDI) classifications

The DDI classification scheme is based on the following cut-off points: less than 0.100 for Very Low Digital Development; greater than and equal to 0.100 and less than 0.200 for Low Digital Development; greater than and equal

to 0.200 and less than 0.300 for Moderate Digital Development; greater than and equal to 0.300 and less than 0.500 for High Digital Development; and 0.500 or greater for Very High Digital Development.

Regional classifications

The disaggregation of Pakistan at geographical regions are given in the annex

section of regional classification.

Symbols

The following symbols are used in the tables:

..	Not available
0	Nil or negligible
NA	Not applicable

Statistical Tables

Table 1 Human Development Index and its Components sorted by Human Development Index ranking

			Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank
			Value	Percentage	Percentage	Years	Years	Percentage	Value	
HDI Rank	Province/Region ^a		2020	2020	2020	2020	2020	2020	2015 ^b	2015-2020
High Human Development										
1	Islamabad	Islamabad Capital Territory	0.924	95.6	84.7	12.6	9.3	99.0	0.875	1
2	Rawalpindi	Punjab	0.862	92.9	75.5	12.3	7.4	97.1	0.871	1
3	Gujrat	Punjab	0.853	99.4	87.1	11.9	5.8	97.4	0.795	4
4	Sialkot	Punjab	0.848	94.7	74.6	12.4	6.5	97.5	0.834	1
5	Lahore	Punjab	0.847	81.9	83.9	11.5	7.1	98.8	0.877	-4
6	Chakwal	Punjab	0.841	95.6	73.6	12.3	6.3	97.2	0.792	2
7	Gujranwala	Punjab	0.824	89.4	80.3	11.5	5.9	97.4	0.769	4
8	Narowal	Punjab	0.816	94.6	70.3	12.5	5.7	94.0	0.748	7
9	Attock	Punjab	0.815	86.2	83.4	12.0	5.2	96.8	0.786	0
10	Abbottabad	Khyber Pakhtunkhwa	0.800	90.1	68.4	12.1	5.6	94.0	0.761	3
High Medium Human Development										
11	Jhelum	Punjab	0.798	85.1	62.3	12.3	6.1	96.6	0.829	-5
12	Mandi Bahauddin	Punjab	0.798	92.1	86.6	11.3	4.8	91.7	0.716	11
13	Faisalabad	Punjab	0.798	94.5	81.4	10.6	5.3	93.2	0.782	-3
14	Sheikhupura	Punjab	0.795	89.7	91.9	10.7	4.6	94.7	0.738	3
15	Karachi	Sindh	0.788	65.1	76.1	10.1	7.3	98.7	0.854	-11
16	Nankana Sahib	Punjab	0.780	84.5	90.6	10.7	4.6	92.3	0.740	0
17	Hafizabad	Punjab	0.780	93.8	84.2	10.8	4.3	92.5	0.705	11
18	Toba Tek Singh	Punjab	0.776	97.2	70.8	10.9	4.7	92.5	0.763	-6
19	Sargodha	Punjab	0.766	95.9	67.7	11.1	4.9	89.3	0.728	1
20	Peshawar	Khyber Pakhtunkhwa	0.764	83.4	83.4	10.0	5.0	91.4	0.756	-6
21	Okara	Punjab	0.761	84.3	75.8	10.6	4.4	95.8	0.705	6
22	Layyah	Punjab	0.760	98.2	81.7	11.0	3.9	86.7	0.729	-3
23	Hyderabad	Sindh	0.755	85.9	73.4	9.0	6.0	90.0	0.716	-1
24	Malakand	Khyber Pakhtunkhwa	0.751	100.0	63.9	10.5	4.6	89.2	0.690	8

			Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank
			Value	Percentage	Percentage	Years	Years	Percentage	Value	
HDI Rank		Province/Region ^a	2020	2020	2020	2020	2020	2020	2015 ^b	2015-2020
25	Khushab	Punjab	0.743	95.3	77.0	10.5	4.1	86.1	0.706	1
26	Kasur	Punjab	0.739	77.8	79.7	10.7	3.8	93.3	0.714	-2
27	Sahiwal	Punjab	0.739	86.6	67.5	9.8	4.5	94.9	0.710	-2
28	Mardan	Khyber Pakhtunkhwa	0.735	83.5	82.1	10.6	3.9	87.5	0.703	1
29	Mansehra	Khyber Pakhtunkhwa	0.734	76.5	79.3	10.5	4.1	91.5	0.676	5
30	Nowshera	Khyber Pakhtunkhwa	0.732	76.0	88.1	10.1	4.0	88.9	0.697	1
31	Haripur	Khyber Pakhtunkhwa	0.729	86.5	43.1	11.8	5.3	91.1	0.732	-13
32	Multan	Punjab	0.724	75.8	79.7	9.5	4.7	88.4	0.718	-11
33	Mianwali	Punjab	0.722	97.4	67.1	9.8	4.3	84.2	0.645	14
34	Jhang	Punjab	0.722	91.5	69.1	10.2	4.0	86.6	0.682	-1
35	Bahawalpur	Punjab	0.720	89.9	88.0	9.0	3.6	87.6	0.645	11
36	Chiniot	Punjab	0.719	95.0	93.0	9.6	3.2	83.0	0.657	6
37	Charsadda	Khyber Pakhtunkhwa	0.717	94.7	81.2	10.0	3.6	82.2	0.666	-1
38	Vehari	Punjab	0.714	98.3	89.1	9.1	3.2	83.5	0.655	5
39	Khanewal	Punjab	0.705	83.3	73.8	9.4	3.9	88.0	0.699	-9
Medium Human Development										
40	Swabi	Khyber Pakhtunkhwa	0.693	86.6	62.9	9.9	3.8	86.2	0.654	4
41	Pakpattan	Punjab	0.679	74.5	72.5	9.3	3.1	92.1	0.660	-2
42	Lodhran	Punjab	0.676	87.1	79.9	8.2	3.1	85.9	0.659	-1
43	Bhakkar	Punjab	0.674	88.3	66.2	9.6	3.3	82.2	0.628	7
44	Kohat	Khyber Pakhtunkhwa	0.663	73.0	71.6	9.1	3.6	83.4	0.650	1
45	Chitral	Khyber Pakhtunkhwa	0.659	87.8	59.4	10.3	4.2	70.1	0.674	-10
46	Sukkur	Sindh	0.656	89.1	83.3	7.0	4.3	72.8	0.659	-6
47	Karak	Khyber Pakhtunkhwa	0.655	40.6	74.1	9.7	5.1	84.8	0.615	7
48	Swat	Khyber Pakhtunkhwa	0.649	79.9	74.4	9.3	3.4	73.5	0.618	4
49	Rahimyar Khan	Punjab	0.642	89.2	61.0	7.8	3.2	83.9	0.625	2
50	Bahawalnagar	Punjab	0.632	80.5	58.8	8.8	3.4	78.4	0.630	-1

			Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank
			Value	Percentage	Percentage	Years	Years	Percentage	Value	
HDI Rank		Province/Region ^a	2020	2020	2020	2020	2020	2020	2015 ^b	2015-2020
51	Naushehro Feroze	Sindh	0.631	87.6	65.2	7.1	3.5	79.5	0.665	-14
52	Quetta	Balochistan	0.630	59.9	58.4	8.6	4.9	79.3	0.664	-14
53	Lower Dir	Khyber Pakhtunkhwa	0.627	75.3	76.8	9.3	3.3	67.9	0.600	3
54	Dadu	Sindh	0.617	92.6	73.3	7.8	2.9	69.7	0.632	-6
55	Gawadar	Balochistan	0.606	84.5	59.7	8.7	4.3	61.1	0.443	23
56	Dera Ghazi Khan	Punjab	0.601	89.0	87.5	7.8	2.8	61.6	0.535	8
57	Muzaffargarh	Punjab	0.600	82.9	72.9	7.3	2.4	76.7	0.584	1
Low Medium Human Development										
58	Lakki Marwat	Khyber Pakhtunkhwa	0.598	47.9	69.6	8.5	4.1	74.5	0.577	1
59	Dera Ismail Khan	Khyber Pakhtunkhwa	0.594	63.4	78.4	8.1	3.0	70.2	0.496	12
60	Bannu	Khyber Pakhtunkhwa	0.591	54.2	63.6	8.2	3.8	76.0	0.613	-5
61	Larkana	Sindh	0.586	88.9	92.7	5.2	2.6	72.9	0.618	-8
62	Ghotki	Sindh	0.584	87.4	92.3	6.0	3.0	63.2	0.514	6
63	Buner	Khyber Pakhtunkhwa	0.581	80.2	88.0	8.2	2.1	61.8	0.528	3
64	Hangu	Khyber Pakhtunkhwa	0.581	52.8	79.1	7.9	1.9	83.1	0.594	-7
65	Khyber	Khyber Pakhtunkhwa	0.580	81.9	68.2	7.8	2.8	65.4	..	..
66	Sanghar	Sindh	0.580	91.5	91.8	6.8	3.6	52.3	0.491	6
67	Pishin	Balochistan	0.573	79.2	38.9	9.0	3.6	66.6	0.482	6
68	Jacobabad	Sindh	0.570	89.2	79.2	5.7	3.2	62.6	0.440	13
69	Tank	Khyber Pakhtunkhwa	0.568	62.0	75.2	8.8	3.0	60.3	0.459	7
70	Matiori	Sindh	0.563	81.4	67.2	7.0	3.7	57.6	0.569	-8
71	Upper Dir	Khyber Pakhtunkhwa	0.558	67.7	68.2	8.6	2.7	60.8	0.375	21
72	Rajanpur	Punjab	0.557	91.4	93.0	6.7	2.3	54.8	0.506	-3
73	Nawabshah/Shaheed Benazir Abad	Sindh	0.554	84.7	71.9	7.0	2.9	57.0	0.572	-12
74	Kurram	Khyber Pakhtunkhwa	0.553	77.5	70.3	7.9	2.0	62.4	..	..

			Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank
			Value	Percentage	Percentage	Years	Years	Percentage	Value	
HDI Rank		Province/Region ^a	2020	2020	2020	2020	2020	2020	2015 ^b	2015-2020
75	Jamshoro	Sindh	0.547	72.3	59.6	7.2	3.5	59.3	0.572	-15
76	Kashmore	Sindh	0.544	68.0	88.0	4.5	2.8	72.1	0.471	-2
77	Khairpur	Sindh	0.543	86.6	74.8	6.8	3.6	48.9	0.556	-14
78	Mastung	Balochistan	0.542	90.3	89.4	8.4	4.1	36.5	0.459	-3
79	Kohlu	Balochistan	0.535	1.0	68.8	7.5	5.4	84.2	0.267	25
80	Battagram	Khyber Pakhtunkhwa	0.524	76.9	26.9	7.7	2.1	77.1	0.505	-10
81	Kamber Shahdadkot	Sindh	0.524	60.2	92.2	5.6	2.3	62.6	0.456	-4
82	Tando Allahyar	Sindh	0.524	73.7	56.4	6.9	3.1	57.5	0.528	-17
83	Shangla	Khyber Pakhtunkhwa	0.521	63.8	50.9	7.6	1.9	71.0	0.438	-1
84	Kech/Turbat	Balochistan	0.509	86.9	77.1	7.5	3.0	40.3	..	..
Low Human Development										
85	Mirpurkhas	Sindh	0.498	66.2	91.1	6.4	3.2	42.0	0.430	-2
86	Loralai	Balochistan	0.495	40.6	71.9	8.4	3.8	46.1	0.381	3
87	Shikarpur	Sindh	0.479	63.9	58.1	5.3	3.0	55.0	0.520	-20
88	Umerkot	Sindh	0.464	78.7	87.8	6.4	2.8	34.0	0.322	9
89	Orakzai	Khyber Pakhtunkhwa	0.458	86.6	74.9	7.7	2.4	31.7	-1.000	-1
90	North Waziristan	Khyber Pakhtunkhwa	0.448	38.0	48.4	6.6	2.8	58.1	-1.000	-1
91	Sibi	Balochistan	0.447	32.8	69.8	6.4	3.4	45.4	0.441	-11
92	Tor Ghar	Khyber Pakhtunkhwa	0.436	45.5	81.4	5.7	1.1	53.0	0.240	13
93	Lasbela	Balochistan	0.412	29.2	47.6	6.4	3.1	49.4	0.416	-8
94	Duki	Balochistan	0.405	68.8	0.5	7.3	3.0	48.6	-1.000	-1
95	Tando Muhammad Khan	Sindh	0.400	54.7	63.0	4.7	2.4	39.4	0.377	-4
96	Noshki	Balochistan	0.398	69.5	23.0	10.5	3.1	27.1	0.441	-17
97	South Waziristan	Khyber Pakhtunkhwa	0.395	55.7	72.7	7.1	2.0	28.4	-1.000	-1
98	Badin	Sindh	0.385	61.8	61.7	5.1	2.3	32.3	0.412	-11
99	Jaffarabad	Balochistan	0.377	58.9	42.6	6.0	2.6	32.1	0.345	-5

			Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank
			Value	Percentage	Percentage	Years	Years	Percentage	Value	
HDI Rank		Province/Region ^a	2020	2020	2020	2020	2020	2020	2015 ^b	2015-2020
100	Mohmand	Khyber Pakhtunkhwa	0.364	71.0	73.2	5.7	1.4	26.1	..	..
101	Barkhan	Balochistan	0.363	72.1	92.3	6.0	1.9	19.8	0.237	6
102	Sohbatpur	Balochistan	0.351	81.8	63.4	7.1	3.6	14.3	..	..
103	Bajur	Khyber Pakhtunkhwa	0.349	72.8	42.7	5.9	1.2	28.6	..	..
104	Thatta	Sindh	0.333	47.8	53.8	3.9	1.7	34.5	0.377	-14
105	Kalat	Balochistan	0.333	79.7	84.5	5.6	1.6	16.6	0.405	-17
106	Sujawal	Sindh	0.308	50.5	44.8	4.6	2.0	24.2	0.326	-10
107	Bolan/Kachhi	Balochistan	0.307	49.2	59.0	6.1	3.0	15.2	0.345	-12
108	Harnai	Balochistan	0.307	34.2	84.2	4.7	2.5	17.4	0.184	4
109	Naseerabad	Balochistan	0.300	42.5	37.4	4.6	1.7	28.3	0.311	-11
Very Low Human Development										
110	Kharan	Balochistan	0.298	67.4	26.5	8.8	2.5	13.5	0.290	-8
111	Washuk	Balochistan	0.290	33.6	53.7	7.1	3.3	14.0	0.188	0
112	Kohistan	Khyber Pakhtunkhwa	0.285	50.5	54.1	5.1	1.6	17.9	0.229	-4
113	Tharparkar	Sindh	0.251	34.8	95.7	5.5	1.6	9.2	0.227	-4
114	Killa Saifullah	Balochistan	0.241	42.6	35.6	7.2	2.5	9.8	0.422	-30
115	Killa Abdullah	Balochistan	0.236	14.8	62.3	5.6	1.7	12.5	0.238	-9
116	Dera Bugti	Balochistan	0.236	72.6	8.5	3.1	0.8	22.8	0.271	-13
117	Ziarat	Balochistan	0.208	33.3	48.5	5.6	2.4	7.2	0.301	-18
118	Awaran	Balochistan	0.118	74.5	1.0	4.9	0.9	2.1	0.173	-4
119	Shaheed Sikandar abad	Balochistan	0.109	90.9	62.8	2.8	0.7	1.3	..	..
120	Sherani	Balochistan	0.108	18.9	3.4	5.6	1.0	4.9	0.295	-19
121	Khuzdar	Balochistan	0.106	37.3	12.0	4.3	0.6	2.8	0.412	-35
	Musakhail ^c	Balochistan	..	..	..	..	..	..	0.368	..
	Zhob ^c	Balochistan	..	..	..	..	..	..	0.295	..
	Chaghi ^c	Balochistan	..	..	..	..	..	..	0.210	..
	Jhal Magsi ^c	Balochistan	..	..	..	..	..	..	0.183	..
	Panjgur ^c	Balochistan	..	..	..	..	..	..	..	..
	Azad Jammu & Kashmir	High Medium Human Development	0.781	94.9	65.0	12.2	5.4	87.7	0.734	

			Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank
			Value	Percentage	Percentage	Years	Years	Percentage	Value	
HDI Rank	Province/Region ^a		2020	2020	2020	2020	2020	2020	2015 ^b	2015-2020
	"Federally Administered Tribal Areas"	..	..	..	..	..	..	..	0.216	
	Gilgit-Baltistan	Medium Human Development	0.631	80.3	66.6	10.9	4.2	59.4	0.523	
	Balochistan	Low Human Development	0.444	53.2	56.8	7.0	3.1	41.0	0.421	
	Khyber Pakhtunkhwa	Medium Human Development	0.650	76.9	73.1	9.1	3.7	75.2	0.628	
	Punjab	High Medium Human Development	0.762	88.8	78.7	10.2	4.9	89.9	0.732	
	Sindh	Medium Human Development	0.645	73.2	77.9	7.6	5.0	71.2	0.640	
	Pakistan	Medium Human Development	0.699	81.4	76.3	9.2	4.6	80.2	0.681	

Notes	Definitions	Main Data Sources
a	For districts, their respective provinces and territories are mentioned. For regions and provinces, levels of human development are identified.	Human Development Index (HDI) A composite index measuring average achievement in three basic dimensions of human development – a long and healthy life, knowledge and a decent standard of living. See Technical Note 1 (this report) for details on how the HDI is calculated.
b	Calculations are based on PSLSMS district level microdata for the year 2014/15. For Azad Jammu & Kashmir and Gilgit-Baltistan, due to unavailability of PSLSMS microdata for the year 2014/15, data for the years 2012/13 and 2010/11 are used. For FATA, calculations are based on the FDIHS 2013/14 microdata.	Mean Years of Schooling Average number of years of education received by people ages 25 and older, calculated from education attainment levels using official durations of each level. Living Standard A composite index based on six household indicators related to access and quality of public services, household infrastructure and assets' ownership. It is based on methodology proposed from the Multidimensional Poverty Index (MPI). See Technical Notes 1 for details.
c	Districts of Musakhail, Zhob, Chaghi, Jhal Magsi, Panjgur were dropped from the scope of the PSLSMS survey 2019/20.	Expected Years of Schooling Number of years of schooling that a child of school entrance age can expect to receive if prevailing patterns of age-specific enrolment rates persist throughout the child's life.
		Columns 1-7: UNDP calculations are based on micro data of PSLSM survey for the years 2010/11, 2012/13 and 2014/15, 2019-20, and FDIHS 2013/14. Column 8: Calculated based on data in columns 1 and 7. Column 9: Calculation are based on recent census.

Table 1A Human Development Index and its Components sorted by name of region

		Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank	Human Development Status
		Value	Percentage	Percentage	Years	Years	Percentage	Value		
HDI rank		2020	2020	2020	2020	2020	2020	2015 ^a	2015-2020	
Balochistan										
118	Awaran	0.118	74.5	1.0	4.9	0.9	2.1	0.173	-4	Very Low Human Development
101	Barkhan	0.363	72.1	92.3	6.0	1.9	19.8	0.237	6	Low Human Development
107	Bolan/Kachhi	0.307	49.2	59.0	6.1	3.0	15.2	0.345	-12	Low Human Development
..	Chaghi ^c	..	..	..	..	..	..	0.210	..	..
116	Dera Bugti	0.236	72.6	8.5	3.1	0.8	22.8	0.271	-13	..
94	Duki	0.405	68.8	0.5	7.3	3.0	48.6	..	..	..
55	Gawadar	0.606	84.5	59.7	8.7	4.3	61.1	0.443	23	-1
108	Harnai	0.307	34.2	84.2	4.7	2.5	17.4	0.184	4	-1
99	Jaffarabad	0.377	58.9	42.6	6.0	2.6	32.1	0.345	-5	-1
..	Jhal Magsi ^c	..	..	..	..	..	..	0.183	..	..
105	Kalat	0.333	79.7	84.5	5.6	1.6	16.6	0.405	-17	..
84	Kech/Turbat	0.509	86.9	77.1	7.5	3.0	40.3	..	..	..
110	Kharan	0.298	67.4	26.5	8.8	2.5	13.5	0.290	-8	Very Low Human Development
121	Khuzdar	0.106	37.3	12.0	4.3	0.6	2.8	0.412	-35	Very Low Human Development
115	Killa Abdullah	0.236	14.8	62.3	5.6	1.7	12.5	0.238	-9	Very Low Human Development
114	Killa Saifullah	0.241	42.6	35.6	7.2	2.5	9.8	0.422	-30	Very Low Human Development
79	Kohlu	0.535	1.0	68.8	7.5	5.4	84.2	0.267	25	Low Medium Human Development
93	Lasbela	0.412	29.2	47.6	6.4	3.1	49.4	0.416	-8	Low Human Development
86	Loralai	0.495	40.6	71.9	8.4	3.8	46.1	0.381	3	Low Human Development

		Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank	Human Development Status
		Value	Percentage	Percentage	Years	Years	Percentage	Value		
HDI rank		2020	2020	2020	2020	2020	2020	2015 ^a	2015-2020	
78	Mastung	0.542	90.3	89.4	8.4	4.1	36.5	0.459	-3	Low Medium Human Development
..	Musakhail ^c	..	..	..	..	..	..	0.368	..	..
109	Naseerabad	0.300	42.5	37.4	4.6	1.7	28.3	0.311	-11	Low Human Development
96	Noshki	0.398	69.5	23.0	10.5	3.1	27.1	0.441	-17	Low Human Development
..	Panjgur ^c	..	..	..	..	..	..	..	..	..
67	Pishin	0.573	79.2	38.9	9.0	3.6	66.6	0.482	6	Low Medium Human Development
52	Quetta	0.630	59.9	58.4	8.6	4.9	79.3	0.664	-14	Medium Human Development
119	Shaheed Sikandar abad	0.109	90.9	62.8	2.8	0.7	1.3	..	..	Very Low Human Development
120	Sherani	0.108	18.9	3.4	5.6	1.0	4.9	0.295	-19	Very Low Human Development
91	Sibi	0.447	32.8	69.8	6.4	3.4	45.4	0.441	-11	Low Human Development
102	Sohbatpur	0.351	81.8	63.4	7.1	3.6	14.3	..	..	Low Human Development
111	Washuk	0.290	33.6	53.7	7.1	3.3	14.0	0.188	0	Very Low Human Development
..	Zhob ^c	..	..	..	..	..	..	0.295	..	..
117	Ziarat	0.208	33.3	48.5	5.6	2.4	7.2	0.301	-18	Very Low Human Development
Islamabad Capital Territory										
1	Islamabad	0.924	95.6	84.7	12.6	9.3	99.0	0.875	1	High Human Development
Khyber Pakhtunkhwa										
10	Abbottabad	0.800	90.1	68.4	12.1	5.6	94.0	0.761	3	High Medium Human Development
103	Bajur	0.349	72.8	42.7	5.9	1.2	28.6	..	..	Low Human Development
60	Bannu	0.591	54.2	63.6	8.2	3.8	76.0	0.613	-5	Low Medium Human Development

		Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank	Human Development Status
		Value	Percentage	Percentage	Years	Years	Percentage	Value		
HDI rank		2020	2020	2020	2020	2020	2020	2015 ^a	2015-2020	
80	Battagram	0.524	76.9	26.9	7.7	2.1	77.1	0.505	-10	Low Medium Human Development
63	Buner	0.581	80.2	88.0	8.2	2.1	61.8	0.528	3	Low Medium Human Development
37	Charsadda	0.717	94.7	81.2	10.0	3.6	82.2	0.666	-1	High Medium Human Development
45	Chitral	0.659	87.8	59.4	10.3	4.2	70.1	0.674	-10	Medium Human Development
59	Dera Ismail Khan	0.594	63.4	78.4	8.1	3.0	70.2	0.496	12	Low Medium Human Development
64	Hangu	0.581	52.8	79.1	7.9	1.9	83.1	0.594	-7	Low Medium Human Development
31	Haripur	0.729	86.5	43.1	11.8	5.3	91.1	0.732	-13	High Medium Human Development
47	Karak	0.655	40.6	74.1	9.7	5.1	84.8	0.615	7	Medium Human Development
65	Khyber	0.580	81.9	68.2	7.8	2.8	65.4	..	..	Low Medium Human Development
44	Kohat	0.663	73.0	71.6	9.1	3.6	83.4	0.650	1	Medium Human Development
112	Kohistan	0.285	50.5	54.1	5.1	1.6	17.9	0.229	-4	Very Low Human Development
74	Kurram	0.553	77.5	70.3	7.9	2.0	62.4	..	..	Low Medium Human Development
58	Lakki Marwat	0.598	47.9	69.6	8.5	4.1	74.5	0.577	1	Low Medium Human Development
53	Lower Dir	0.627	75.3	76.8	9.3	3.3	67.9	0.600	3	Medium Human Development
24	Malakand	0.751	100.0	63.9	10.5	4.6	89.2	0.690	8	High Medium Human Development
29	Mansehra	0.734	76.5	79.3	10.5	4.1	91.5	0.676	5	High Medium Human Development

		Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank	Human Development Status
		Value	Percentage	Percentage	Years	Years	Percentage	Value		
HDI rank		2020	2020	2020	2020	2020	2020	2015 ^a	2015-2020	
28	Mardan	0.735	83.5	82.1	10.6	3.9	87.5	0.703	1	High Medium Human Development
100	Mohmand	0.364	71.0	73.2	5.7	1.4	26.1	..	..	Low Human Development
90	North Waziristan	0.448	38.0	48.4	6.6	2.8	58.1	..	..	Low Human Development
30	Nowshera	0.732	76.0	88.1	10.1	4.0	88.9	0.697	1	High Medium Human Development
89	Orakzai	0.458	86.6	74.9	7.7	2.4	31.7	..	..	Low Human Development
20	Peshawar	0.764	83.4	83.4	10.0	5.0	91.4	0.756	-6	High Medium Human Development
83	Shangla	0.521	63.8	50.9	7.6	1.9	71.0	0.438	-1	Low Medium Human Development
97	South Waziristan	0.395	55.7	72.7	7.1	2.0	28.4	..	..	Low Human Development
40	Swabi	0.693	86.6	62.9	9.9	3.8	86.2	0.654	4	Medium Human Development
48	Swat	0.649	79.9	74.4	9.3	3.4	73.5	0.618	4	Medium Human Development
69	Tank	0.568	62.0	75.2	8.8	3.0	60.3	0.459	7	Low Medium Human Development
92	Tor Ghar	0.436	45.5	81.4	5.7	1.1	53.0	0.240	13	Low Human Development
71	Upper Dir	0.558	67.7	68.2	8.6	2.7	60.8	0.375	21	Low Medium Human Development
Punjab										
9	Attock	0.815	86.2	83.4	12.0	5.2	96.8	0.786	0	High Human Development
50	Bahawalnagar	0.632	80.5	58.8	8.8	3.4	78.4	0.630	-1	Medium Human Development
35	Bahawalpur	0.720	89.9	88.0	9.0	3.6	87.6	0.645	11	High Medium Human Development
43	Bhakkar	0.674	88.3	66.2	9.6	3.3	82.2	0.628	7	Medium Human Development

		Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank	Human Development Status
		Value	Percentage	Percentage	Years	Years	Percentage	Value		
HDI rank		2020	2020	2020	2020	2020	2020	2015 ^a	2015-2020	
6	Chakwal	0.841	95.6	73.6	12.3	6.3	97.2	0.792	2	High Human Development
36	Chiniot	0.719	95.0	93.0	9.6	3.2	83.0	0.657	6	High Medium Human Development
56	Dera Ghazi Khan	0.601	89.0	87.5	7.8	2.8	61.6	0.535	8	Medium Human Development
13	Faisalabad	0.798	94.5	81.4	10.6	5.3	93.2	0.782	-3	High Medium Human Development
7	Gujranwala	0.824	89.4	80.3	11.5	5.9	97.4	0.769	4	High Human Development
3	Gujrat	0.853	99.4	87.1	11.9	5.8	97.4	0.795	4	High Human Development
17	Hafizabad	0.780	93.8	84.2	10.8	4.3	92.5	0.705	11	High Medium Human Development
34	Jhang	0.722	91.5	69.1	10.2	4.0	86.6	0.682	-1	High Medium Human Development
11	Jhelum	0.798	85.1	62.3	12.3	6.1	96.6	0.829	-5	High Medium Human Development
26	Kasur	0.739	77.8	79.7	10.7	3.8	93.3	0.714	-2	High Medium Human Development
39	Khanewal	0.705	83.3	73.8	9.4	3.9	88.0	0.699	-9	High Medium Human Development
25	Khushab	0.743	95.3	77.0	10.5	4.1	86.1	0.706	1	High Medium Human Development
5	Lahore	0.847	81.9	83.9	11.5	7.1	98.8	0.877	-4	High Human Development
22	Layyah	0.760	98.2	81.7	11.0	3.9	86.7	0.729	-3	High Medium Human Development
42	Lodhran	0.676	87.1	79.9	8.2	3.1	85.9	0.659	-1	Medium Human Development
12	Mandi Bahauddin	0.798	92.1	86.6	11.3	4.8	91.7	0.716	11	High Medium Human Development

		Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank	Human Development Status
		Value	Percentage	Percentage	Years	Years	Percentage	Value		
HDI rank		2020	2020	2020	2020	2020	2020	2015 ^a	2015-2020	
33	Mianwali	0.722	97.4	67.1	9.8	4.3	84.2	0.645	14	High Medium Human Development
32	Multan	0.724	75.8	79.7	9.5	4.7	88.4	0.718	-11	High Medium Human Development
57	Muzaffargarh	0.600	82.9	72.9	7.3	2.4	76.7	0.584	1	Medium Human Development
16	Nankana Sahib	0.780	84.5	90.6	10.7	4.6	92.3	0.740	0	High Medium Human Development
8	Narowal	0.816	94.6	70.3	12.5	5.7	94.0	0.748	7	High Human Development
21	Okara	0.761	84.3	75.8	10.6	4.4	95.8	0.705	6	High Medium Human Development
41	Pakpattan	0.679	74.5	72.5	9.3	3.1	92.1	0.660	-2	Medium Human Development
49	Rahimyar Khan	0.642	89.2	61.0	7.8	3.2	83.9	0.625	2	Medium Human Development
72	Rajanpur	0.557	91.4	93.0	6.7	2.3	54.8	0.506	-3	Low Medium Human Development
2	Rawalpindi	0.862	92.9	75.5	12.3	7.4	97.1	0.871	1	High Human Development
27	Sahiwal	0.739	86.6	67.5	9.8	4.5	94.9	0.710	-2	High Medium Human Development
19	Sargodha	0.766	95.9	67.7	11.1	4.9	89.3	0.728	1	High Medium Human Development
14	Sheikhupura	0.795	89.7	91.9	10.7	4.6	94.7	0.738	3	High Medium Human Development
4	Sialkot	0.848	94.7	74.6	12.4	6.5	97.5	0.834	1	High Human Development
18	Toba Tek Singh	0.776	97.2	70.8	10.9	4.7	92.5	0.763	-6	High Medium Human Development
38	Vehari	0.714	98.3	89.1	9.1	3.2	83.5	0.655	5	High Medium Human Development

		Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank	Human Development Status
		Value	Percentage	Percentage	Years	Years	Percentage	Value		
HDI rank		2020	2020	2020	2020	2020	2020	2015 ^a	2015-2020	
Sindh										
98	Badin	0.385	61.8	61.7	5.1	2.3	32.3	0.412	-11	Low Human Development
54	Dadu	0.617	92.6	73.3	7.8	2.9	69.7	0.632	-6	Medium Human Development
62	Ghotki	0.584	87.4	92.3	6.0	3.0	63.2	0.514	6	Low Medium Human Development
23	Hyderabad	0.755	85.9	73.4	9.0	6.0	90.0	0.716	-1	High Medium Human Development
68	Jacobabad	0.570	89.2	79.2	5.7	3.2	62.6	0.440	13	Low Medium Human Development
75	Jamshoro	0.547	72.3	59.6	7.2	3.5	59.3	0.572	-15	Low Medium Human Development
81	Kamber Shahdadkot	0.524	60.2	92.2	5.6	2.3	62.6	0.456	-4	Low Medium Human Development
15	Karachi	0.788	65.1	76.1	10.1	7.3	98.7	0.854	-11	High Medium Human Development
76	Kashmore	0.544	68.0	88.0	4.5	2.8	72.1	0.471	-2	Low Medium Human Development
77	Khairpur	0.543	86.6	74.8	6.8	3.6	48.9	0.556	-14	Low Medium Human Development
61	Larkana	0.586	88.9	92.7	5.2	2.6	72.9	0.618	-8	Low Medium Human Development
70	Matiari	0.563	81.4	67.2	7.0	3.7	57.6	0.569	-8	Low Medium Human Development
85	Mirpurkhas	0.498	66.2	91.1	6.4	3.2	42.0	0.430	-2	Low Human Development
51	Naushehro Feroze	0.631	87.6	65.2	7.1	3.5	79.5	0.665	-14	Medium Human Development
73	Nawabshah/Shaheed Benazir Abad	0.554	84.7	71.9	7.0	2.9	57.0	0.572	-12	Low Medium Human Development

		Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank	Human Development Status
		Value	Percentage	Percentage	Years	Years	Percentage	Value		
HDI rank		2020	2020	2020	2020	2020	2020	2015 ^a	2015-2020	
66	Sanghar	0.580	91.5	91.8	6.8	3.6	52.3	0.491	6	Low Medium Human Development
87	Shikarpur	0.479	63.9	58.1	5.3	3.0	55.0	0.520	-20	Low Human Development
106	Sujawal	0.308	50.5	44.8	4.6	2.0	24.2	0.326	-10	Low Human Development
46	Sukkur	0.656	89.1	83.3	7.0	4.3	72.8	0.659	-6	Medium Human Development
82	Tando Allahyar	0.524	73.7	56.4	6.9	3.1	57.5	0.528	-17	Low Medium Human Development
95	Tando Muhammad Khan	0.400	54.7	63.0	4.7	2.4	39.4	0.377	-4	Low Human Development
113	Tharparkar	0.251	34.8	95.7	5.5	1.6	9.2	0.227	-4	Very Low Human Development
104	Thatta	0.333	47.8	53.8	3.9	1.7	34.5	0.377	-14	Low Human Development
88	Umerkot	0.464	78.7	87.8	6.4	2.8	34.0	0.322	9	Low Human Development
	Azad Jammu & Kashmir	0.781	94.9	65.0	12.2	5.4	87.7	0.734		High Medium Human Development
	Federally Administered Tribal Areas	..	..	..	..	..	..	0.216		..
	Gilgit-Baltistan	0.631	80.3	66.6	10.9	4.2	59.4	0.523		Medium Human Development
	Balochistan	0.444	53.2	56.8	7.0	3.1	41.0	0.421		Low Human Development
	Khyber Pakhtunkhwa	0.650	76.9	73.1	9.1	3.7	75.2	0.628		Medium Human Development
	Punjab	0.762	88.8	78.7	10.2	4.9	89.9	0.732		High Medium Human Development

		Human Development Index (HDI)	Immunization rate	Satisfaction with health facility	Expected years of schooling	Mean years of schooling	Living Standard	Human Development Index (HDI)	Change in rank	Human Development Status
		Value	Percentage	Percentage	Years	Years	Percentage	Value		
HDI rank		2020	2020	2020	2020	2020	2020	2015 ^a	2015-2020	
	Sindh	0.645	73.2	77.9	7.6	5.0	71.2	0.640		Medium Human Development
	Pakistan	0.699	81.4	76.3	9.2	4.6	80.2	0.681		Medium Human Development

Notes	Definitions	Main Data Sources
<p>a Calculations are based on PSLSMS district level microdata for the year 2014/15. For Azad Jammu & Kashmir and Gilgit-Baltistan, due to unavailability of PSLSMS microdata for the year 2014/15, data for the year 2012/13 is used instead. The changes in HDI scores and ranks for these two regions are calculated using PSLSMS micro data for the years 2012/13 and 2010/11. For FATA, calculations are based on the FDIHS 2013/14 microdata.</p> <p>c Districts of Musakhail, Zhob, Chaghi, Jhal Magsi, Panjgur were dropped from the scope of the PSLSM survey 2019/20.</p>	<p>Human Development Index (HDI) A composite index measuring average achievement in three basic dimensions of human development – a long and healthy life, knowledge and a decent standard of living. See Technical Note 1 (this report) for details on how the HDI is calculated.</p> <p>Immunisation Rate Percentage of fully immunized children between the age of 12 and 23 months based on record and recall.</p> <p>Satisfaction with Health Facility A household is regarded as deprived in 'satisfaction with health facility' if any of the household members did not use health care facility because it is costly, it does not suit, lacks tools or not enough facilities, or if any of the household member is not satisfied with the health facility.</p> <p>Expected Years of Schooling Number of years of schooling that a child of school entrance age can expect to receive if prevailing patterns of age-specific enrolment rates persist throughout the child's life.</p>	<p>Mean Years of Schooling Average number of years of education received by people ages 25 and older, calculated from education attainment levels using official durations of each level.</p> <p>Living Standard A composite index based on six household indicators related to access and quality of public services, household infrastructure and assets' ownership. It is based on methodology proposed from the Multidimensional Poverty Index (MPI). See Technical Notes 1 for details.</p> <p>Columns 1-7: UNDP Calculations are based on micro data of PSLSM survey for the years 2010/11, 2012/13 and 2014/15, 2019-20, and the FDIHS 2013/14.</p> <p>Column 8: Calculated based on data in columns 1 and 7.</p>

Table 1B Human Development Index trends, 2005-2020

										HDI rank	
										Change since	
Human Development Index										Five-year change	Fifteen-year change
HDI rank		Province/Region	2005	2007	2009	2011	2013	2015 ^a	2020	2015-2020	2005-2020
High Human Development											
1	Islamabad	Islamabad Capital Territory	0.820	0.922	0.853	0.849	0.891	0.875	0.924	1	0
2	Rawalpindi	Punjab	0.716	0.827	0.802	0.791	0.826	0.871	0.862	1	3
3	Gujrat	Punjab	0.656	0.725	0.745	0.705	0.792	0.795	0.853	4	7
4	Sialkot	Punjab	0.733	0.702	0.744	0.770	0.770	0.834	0.848	1	0
5	Lahore	Punjab	0.811	0.804	0.834	0.824	0.858	0.877	0.847	-4	-2
6	Chakwal	Punjab	0.680	0.718	0.754	0.765	0.788	0.792	0.841	2	1
7	Gujranwala	Punjab	0.691	0.716	0.741	0.758	0.774	0.769	0.824	4	-1
8	Narowal	Punjab	0.560	0.592	0.611	0.673	0.706	0.748	0.816	7	12
9	Attock	Punjab	0.584	0.726	0.690	0.612	0.762	0.786	0.815	0	9
10	Abbottabad	Khyber Pakhtunkhwa	0.604	0.651	0.692	0.688	0.768	0.761	0.800	3	5
High Medium Human Development											
11	Jhelum	Punjab	0.675	0.738	0.778	0.694	0.811	0.829	0.798	-5	-2
12	Mandi Bahauddin	Punjab	0.511	0.652	0.666	0.655	0.738	0.716	0.798	11	25
13	Faisalabad	Punjab	0.644	0.694	0.671	0.710	0.775	0.782	0.798	-3	-2
14	Sheikhupura	Punjab	0.611	0.663	0.721	0.713	0.760	0.738	0.795	3	0
15	Karachi	Sindh	0.812	0.819	0.852	0.864	0.867	0.854	0.788	-11	-13
16	Nankana Sahib	Punjab	..	..	0.696	0.679	0.762	0.740	0.780	0	..
17	Hafizabad	Punjab	0.494	0.563	0.611	0.658	0.693	0.705	0.780	11	24
18	Toba Tek Singh	Punjab	0.616	0.681	0.703	0.697	0.720	0.763	0.776	-6	-5
19	Sargodha	Punjab	0.542	0.578	0.599	0.602	0.692	0.728	0.766	1	8
20	Peshawar	Khyber Pakhtunkhwa	0.579	0.607	0.662	0.695	0.761	0.756	0.764	-6	-1
21	Okara	Punjab	0.466	0.513	0.617	0.607	0.667	0.705	0.761	6	27
22	Layyah	Punjab	0.520	0.594	0.567	0.571	0.682	0.729	0.760	-3	11
23	Hyderabad	Sindh	0.587	0.641	0.760	0.746	0.762	0.716	0.755	-1	-6
24	Malakand	Khyber Pakhtunkhwa	0.396	0.488	0.532	0.576	0.640	0.690	0.751	8	41
25	Khushab	Punjab	0.489	0.598	0.618	0.630	0.650	0.706	0.743	1	17
26	Kasur	Punjab	0.550	0.599	0.660	0.633	0.695	0.714	0.739	-2	-2
27	Sahiwal	Punjab	0.593	0.626	0.624	0.617	0.691	0.710	0.739	-2	-11
28	Mardan	Khyber Pakhtunkhwa	0.501	0.565	0.583	0.580	0.647	0.703	0.735	1	11

										HDI rank	
										Change since	
Human Development Index										Five-year change	Fifteen-year change
HDI rank		Province/Region	2005	2007	2009	2011	2013	2015 ^a	2020	2015-2020	2005-2020
29	Mansehra	Khyber Pakhtunkhwa	0.429	0.495	0.570	0.580	0.609	0.676	0.734	5	27
30	Nowshera	Khyber Pakhtunkhwa	0.544	0.647	0.643	0.610	0.696	0.697	0.732	1	-5
31	Haripur	Khyber Pakhtunkhwa	0.552	0.603	0.684	0.731	0.702	0.732	0.729	-13	-8
32	Multan	Punjab	0.555	0.572	0.609	0.634	0.693	0.718	0.724	-11	-10
33	Mianwali	Punjab	0.530	0.577	0.568	0.560	0.655	0.645	0.722	14	-4
34	Jhang	Punjab	0.472	0.516	0.586	0.545	0.636	0.682	0.722	-1	11
35	Bahawalpur	Punjab	0.488	0.550	0.577	0.531	0.629	0.645	0.720	11	8
36	Chiniot	Punjab	..	..	..	0.555	0.677	0.657	0.719	6	..
37	Charsadda	Khyber Pakhtunkhwa	0.441	0.507	0.520	0.580	0.635	0.666	0.717	-1	17
38	Vehari	Punjab	0.522	0.558	0.625	0.535	0.661	0.655	0.714	5	-6
39	Khanewal	Punjab	0.543	0.538	0.600	0.569	0.651	0.699	0.705	-9	-13
Medium Human Development											
40	Swabi	Khyber Pakhtunkhwa	0.526	0.511	0.566	0.632	0.657	0.654	0.693	4	-10
41	Pakpattan	Punjab	0.512	0.539	0.559	0.481	0.629	0.660	0.679	-2	-5
42	Lodhran	Punjab	0.445	0.477	0.545	0.500	0.629	0.659	0.676	-1	10
43	Bhakkar	Punjab	0.451	0.495	0.462	0.490	0.587	0.628	0.674	7	8
44	Kohat	Khyber Pakhtunkhwa	0.482	0.547	0.566	0.549	0.560	0.650	0.663	1	0
45	Chitral	Khyber Pakhtunkhwa	0.404	0.431	0.386	0.515	0.637	0.674	0.659	-10	17
46	Sukkur	Sindh	0.629	0.564	0.563	0.576	0.622	0.659	0.656	-6	-34
47	Karak	Khyber Pakhtunkhwa	0.401	0.475	0.474	0.404	0.588	0.615	0.655	7	16
48	Swat	Khyber Pakhtunkhwa	0.454	0.576	0.449	0.520	0.551	0.618	0.649	4	2
49	Rahimyar Khan	Punjab	0.513	0.512	0.540	0.547	0.585	0.625	0.642	2	-14
50	Bahawalnagar	Punjab	0.542	0.553	0.565	0.547	0.635	0.630	0.632	-1	-22
51	Naushehro Feroze	Sindh	0.513	0.555	0.680	0.506	0.594	0.665	0.631	-14	-17
52	Quetta	Balochistan	0.677	0.685	0.724	0.767	0.702	0.664	0.630	-14	-44
53	Lower Dir	Khyber Pakhtunkhwa	0.499	0.443	0.428	0.598	0.549	0.600	0.627	3	-13
54	Dadu	Sindh	0.385	0.418	0.574	0.539	0.591	0.632	0.617	-6	13
55	Gawadar	Balochistan	0.365	0.391	0.471	0.386	0.442	0.443	0.606	23	14
56	Dera Ghazi Khan	Punjab	0.425	0.491	0.414	0.417	0.504	0.535	0.601	8	1
57	Muzaffargarh	Punjab	0.391	0.380	0.500	0.421	0.564	0.584	0.600	1	9

										HDI rank	
										Change since	
Human Development Index										Five-year change	Fifteen-year change
HDI rank		Province/Region	2005	2007	2009	2011	2013	2015 ^a	2020	2015-2020	2005-2020
Low Medium Human Development											
58	Lakki Marwat	Khyber Pakhtunkhwa	0.397	0.403	0.440	0.426	0.489	0.577	0.598	1	6
59	Dera Ismail Khan	Khyber Pakhtunkhwa	0.405	0.354	0.414	0.374	0.489	0.496	0.594	12	2
60	Bannu	Khyber Pakhtunkhwa	0.456	0.498	0.522	0.530	0.551	0.613	0.591	-5	-11
61	Larkana	Sindh	0.413	0.465	0.597	0.516	0.581	0.618	0.586	-8	-2
62	Ghotki	Sindh	0.526	0.408	0.470	0.486	0.537	0.514	0.584	6	-31
63	Buner	Khyber Pakhtunkhwa	0.354	0.473	0.515	0.437	0.543	0.528	0.581	3	7
64	Hangu	Khyber Pakhtunkhwa	0.505	0.512	0.535	0.519	0.561	0.594	0.581	-7	-26
65	Khyber	Khyber Pakhtunkhwa	..	..	..	..	..	..	0.580	..	..
66	Sanghar	Sindh	0.406	0.425	0.477	0.454	0.524	0.491	0.580	6	-6
67	Pishin	Balochistan	0.277	0.300	0.407	0.583	0.425	0.482	0.573	6	15
68	Jacobabad	Sindh	0.347	0.243	0.378	0.330	0.494	0.440	0.570	13	3
69	Tank	Khyber Pakhtunkhwa	0.332	0.346	0.370	0.361	0.449	0.459	0.568	7	4
70	Matiari	Sindh	..	..	0.563	0.519	0.562	0.569	0.563	-8	..
71	Upper Dir	Khyber Pakhtunkhwa	0.280	0.297	0.340	0.417	0.351	0.375	0.558	21	10
72	Rajanpur	Punjab	0.441	0.348	0.347	0.399	0.481	0.506	0.557	-3	-17
73	Nawabshah/Shaheed Benazir Abad	Sindh	0.441	0.414	0.437	0.474	0.503	0.572	0.554	-12	-20
74	Kurram	Khyber Pakhtunkhwa	..	..	..	..	..	..	0.553	..	..
75	Jamshoro	Sindh	..	..	0.442	0.470	0.529	0.572	0.547	-15	..
76	Kashmore	Sindh	..	..	0.431	0.415	0.426	0.471	0.544	-2	..
77	Khairpur	Sindh	0.470	0.468	0.535	0.474	0.528	0.556	0.543	-14	-31
78	Mastung	Balochistan	0.328	0.442	0.277	0.435	0.485	0.459	0.542	-3	-4
79	Kohlu	Balochistan	..	0.179	0.142	0.202	0.091	0.267	0.535	25	..
80	Battagram	Khyber Pakhtunkhwa	0.380	0.401	0.553	0.576	0.532	0.505	0.524	-10	-12
81	Kamber Shahdadt	Sindh	..	..	0.458	0.439	0.483	0.456	0.524	-4	..
82	Tando Allahyar	Sindh	..	..	0.546	0.471	0.526	0.528	0.524	-17	..
83	Shangla	Khyber Pakhtunkhwa	0.301	0.366	0.377	0.437	0.411	0.438	0.521	-1	-5
84	Kech/Turbat	Balochistan	0.196	0.274	0.321	0.273	0.357	..	0.509	..	7

										HDI rank	
										Change since	
Human Development Index										Five-year change	Fifteen-year change
HDI rank		Province/Region	2005	2007	2009	2011	2013	2015 ^a	2020	2015-2020	2005-2020
Low Human Development											
85	Mirpurkhas	Sindh	0.467	0.413	0.451	0.515	0.426	0.430	0.498	-2	-38
86	Loralai	Balochistan	0.218	0.245	0.229	0.229	0.361	0.381	0.495	3	1
87	Shikarpur	Sindh	0.559	0.398	0.520	0.475	0.529	0.520	0.479	-20	-66
88	Umerkot	Sindh	..	..	..	0.409	0.390	0.322	0.464	9	..
89	Orakzai	Khyber Pakhtunkhwa	..	..	..	..	..	..	0.458	..	..
90	North Waziristan	Khyber Pakhtunkhwa	..	..	..	..	..	..	0.448	..	..
91	Sibi	Balochistan	0.340	0.339	0.412	0.633	0.618	0.441	0.447	-11	-19
92	Tor Ghar	Khyber Pakhtunkhwa	..	..	..	..	0.217	0.240	0.436	13	..
93	Lasbela	Balochistan	0.287	0.313	0.336	0.336	0.413	0.416	0.412	-8	-14
94	Duki	Balochistan	..	..	..	..	..	..	0.405	..	..
95	Tando Muhammad Khan	Sindh	..	..	0.435	0.351	0.456	0.377	0.400	-4	..
96	Noshki	Balochistan	..	..	0.325	0.284	0.395	0.441	0.398	-17	..
97	South Waziristan	Khyber Pakhtunkhwa	..	..	..	..	..	..	0.395	..	..
98	Badin	Sindh	0.419	0.286	0.361	0.341	0.330	0.412	0.385	-11	-40
99	Jaffarabad	Balochistan	0.301	0.281	0.334	0.249	0.358	0.345	0.377	-5	-22
100	Mohmand	Khyber Pakhtunkhwa	..	..	..	..	..	..	0.364	..	..
101	Barkhan	Balochistan	0.172	0.260	0.226	0.208	0.213	0.237	0.363	6	-9
102	Sohbatpur	Balochistan	..	..	..	..	..	..	0.351	..	..
103	Bajur	Khyber Pakhtunkhwa	..	..	..	..	..	..	0.349	..	..
104	Thatta	Sindh	0.302	0.268	0.374	0.335	0.314	0.377	0.333	-14	-28
105	Kalat	Balochistan	0.220	0.333	0.250	0.301	0.343	0.405	0.333	-17	-20
106	Sujawal	Sindh	..	..	..	..	..	0.326	0.308	-10	..
107	Bolan/Kachhi	Balochistan	0.280	0.236	0.174	0.367	0.332	0.345	0.307	-12	-27
108	Harnai	Balochistan	..	..	..	0.211	0.260	0.184	0.307	4	..
109	Naseerabad	Balochistan	0.208	0.153	0.245	0.237	0.282	0.311	0.300	-11	-21
Very Low Human Development											
110	Kharan	Balochistan	0.142	0.223	0.225	0.266	0.291	0.290	0.298	-8	-14
111	Washuk	Balochistan	..	..	0.099	0.135	0.101	0.188	0.290	0	..

										HDI rank	
										Change since	
Human Development Index										Five-year change	Fifteen-year change
HDI rank		Province/Region	2005	2007	2009	2011	2013	2015 ^a	2020	2015-2020	2005-2020
112	Kohistan	Khyber Pakhtunkhwa	0.155	0.168	0.188	0.137	0.172	0.229	0.285	-4	-19
113	Tharparkar	Sindh	0.303	0.164	0.185	0.203	0.257	0.227	0.251	-4	-38
114	Killa Saifullah	Balochistan	0.108	0.204	0.227	0.270	0.194	0.422	0.241	-30	-16
115	Killa Abdullah	Balochistan	0.206	0.153	0.228	0.414	0.200	0.238	0.236	-9	-26
116	Dera Bugti	Balochistan	..	0.126	0.183	0.069	0.145	0.271	0.236	-13	..
117	Ziarat	Balochistan	0.269	0.283	0.265	0.409	0.437	0.301	0.208	-18	-34
118	Awaran	Balochistan	0.067	0.000	0.240	0.127	0.111	0.173	0.118	-4	-19
119	Shaheed Sikandar abad	Balochistan	..	..	..	..	..	..	0.109	..	..
120	Sherani	Balochistan	..	..	..	0.246	0.347	0.295	0.108	-19	..
121	Khuzdar	Balochistan	0.218	0.255	0.214	0.342	0.361	0.412	0.106	-35	-35
..	Musakhail ^c	Balochistan	0.121	0.167	0.106	0.030	0.125	0.368	..	..	..
..	Zhob ^c	Balochistan	0.204	0.316	0.366	0.318	0.362	0.295	..	..	..
..	Chaghi ^c	Balochistan	0.143	0.201	0.158	0.187	0.165	0.210	..	..	..
..	Jhal Magsi ^c	Balochistan	0.149	0.180	0.182	0.153	0.286	0.183	..	..	..
..	Panjgur ^c	Balochistan	0.239	0.157	0.334	0.225	..	..	..	..	..
	Azad Jammu & Kashmir		..	0.459	..	0.726	0.734	..	0.781		
	Federally Administered Tribal Areas		..	..	..	..	..	0.216	..		
	Gilgit-Baltistan		..	0.406	..	0.426	0.523	..	0.631		
	Balochistan		0.294	0.350	0.337	0.383	0.382	0.421	0.444		
	Khyber Pakhtunkhwa		0.463	0.513	0.515	0.555	0.605	0.628	0.650		
	Punjab		0.583	0.630	0.648	0.643	0.705	0.732	0.762		
	Sindh		0.559	0.560	0.586	0.599	0.620	0.640	0.645		
	Pakistan		0.547	0.584	0.600	0.608	0.660	0.681	0.699		

Notes	Definitions	Main Data Sources
a	Calculations are based on different waves of PSLSM survey at district level. For FATA calculations are based on the FDIHS 2013/14 microdata.	Columns 1-6: UNDP calculations based on micro data of PSLSM survey for the years 2004/05, 2006/07, 2008/09, 2010/11, 2012/13, and 2014/15, 2019-20, and FDIHS 2013/14. Column 7: Calculated based on columns 5 and 6. Column 8: Calculated based on columns 1 and 6.
b	Calculations are based on PSLSMS microdata for the years 2012/13 and 2004/05 due to unavailability of the latest data for Ketch/Turbat. For Panjgur, PSLSMS microdata for the years 2010/11 and 2004/05 are used due to unavailability of data for the recent surveys.	
c	Districts of Musakhail, Zhob, Chaghi, Jhal Magsi, Panjgur were dropped from the scope of the PSLSM survey 2019/20.	

Table 2 Digital Development Index and its Components sorted by Digital Development Index ranking 2020

			Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index
			Value	Value	Value	Value	Value
DDI Rank		Province/Region ^b	2020	2020	2020	2020	2020
Very High Digital Development							
1	Islamabad	Islamabad Capital Territory	0.570	0.698	0.555	0.509	0.534
High Digital Development							
2	Abbottabad	Khyber Pakhtunkhwa	0.401	0.546	0.358	0.371	0.358
3	Rawalpindi	Punjab	0.371	0.591	0.390	0.266	0.310
4	Lahore	Punjab	0.370	0.582	0.357	0.287	0.314
5	Karachi	Sindh	0.330	0.552	0.329	0.189	0.345
6	Peshawar	Khyber Pakhtunkhwa	0.308	0.575	0.282	0.258	0.215
7	Haripur	Khyber Pakhtunkhwa	0.300	0.517	0.287	0.258	0.211
Moderate Digital Development							
8	Sialkot	Punjab	0.286	0.560	0.341	0.178	0.197
9	Jhelum	Punjab	0.276	0.521	0.276	0.183	0.221
10	Chakwal	Punjab	0.275	0.499	0.254	0.189	0.240
11	Hyderabad	Sindh	0.268	0.475	0.260	0.181	0.232
12	Pishin	Balochistan	0.254	0.541	0.248	0.126	0.246
13	Gujranwala	Punjab	0.249	0.553	0.294	0.151	0.158
14	Quetta	Balochistan	0.240	0.511	0.249	0.154	0.170
15	Gujrat	Punjab	0.229	0.545	0.308	0.105	0.155
16	Attock	Punjab	0.225	0.475	0.213	0.183	0.138
17	Mansehra	Khyber Pakhtunkhwa	0.225	0.477	0.203	0.164	0.161
18	Faisalabad	Punjab	0.223	0.511	0.243	0.131	0.152
19	Mardan	Khyber Pakhtunkhwa	0.215	0.498	0.195	0.178	0.125
20	Charsadda	Khyber Pakhtunkhwa	0.213	0.477	0.190	0.157	0.146
21	Multan	Punjab	0.212	0.445	0.204	0.154	0.144
22	Narowal	Punjab	0.202	0.464	0.235	0.151	0.101
23	Bannu	Khyber Pakhtunkhwa	0.202	0.444	0.167	0.160	0.140
Low Digital Development							
24	Swabi	Khyber Pakhtunkhwa	0.198	0.497	0.185	0.143	0.117

			Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index
			Value	Value	Value	Value	Value
DDI Rank		Province/Region ^b	2020	2020	2020	2020	2020
25	Nowshera	Khyber Pakhtunkhwa	0.196	0.493	0.186	0.146	0.111
26	Sukkur	Sindh	0.191	0.444	0.181	0.115	0.143
27	Mianwali	Punjab	0.191	0.396	0.170	0.190	0.104
28	Loralai	Balochistan	0.187	0.447	0.175	0.084	0.186
29	Malakand	Khyber Pakhtunkhwa	0.187	0.501	0.144	0.122	0.138
30	Toba Tek Singh	Punjab	0.185	0.459	0.203	0.148	0.085
31	Kashmore	Sindh	0.184	0.437	0.159	0.117	0.142
32	Mandi Bahauddin	Punjab	0.183	0.505	0.227	0.087	0.111
33	Kohlu	Balochistan	0.180	0.518	0.263	0.071	0.109
34	Jhang	Punjab	0.178	0.413	0.176	0.147	0.093
35	Lakki Marwat	Khyber Pakhtunkhwa	0.174	0.448	0.115	0.098	0.182
36	Layyah	Punjab	0.170	0.421	0.126	0.169	0.093
37	Karak	Khyber Pakhtunkhwa	0.167	0.415	0.111	0.104	0.163
38	Sheikhupura	Punjab	0.167	0.459	0.175	0.071	0.138
39	Kohat	Khyber Pakhtunkhwa	0.166	0.458	0.135	0.111	0.109
40	Sahiwal	Punjab	0.162	0.434	0.164	0.081	0.120
41	Gawadar	Balochistan	0.162	0.470	0.147	0.109	0.092
42	Kharan	Balochistan	0.161	0.364	0.182	0.060	0.169
43	Bahawalpur	Punjab	0.159	0.393	0.152	0.116	0.092
44	Hafizabad	Punjab	0.159	0.463	0.177	0.077	0.100
45	Kasur	Punjab	0.158	0.413	0.145	0.091	0.114
46	Swat	Khyber Pakhtunkhwa	0.156	0.500	0.164	0.066	0.109
47	Chitral	Khyber Pakhtunkhwa	0.156	0.422	0.117	0.127	0.094
48	Upper Dir	Khyber Pakhtunkhwa	0.155	0.469	0.137	0.093	0.096
49	Lower Dir	Khyber Pakhtunkhwa	0.153	0.484	0.137	0.088	0.093
50	Buner	Khyber Pakhtunkhwa	0.152	0.474	0.169	0.080	0.084
51	Noshki	Balochistan	0.148	0.445	0.141	0.042	0.183
52	Sibi	Balochistan	0.144	0.408	0.169	0.041	0.150
53	Nankana Sahib	Punjab	0.140	0.411	0.133	0.072	0.096

			Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index
			Value	Value	Value	Value	Value
DDI Rank		Province/Region ^b	2020	2020	2020	2020	2020
54	Jamshoro	Sindh	0.140	0.400	0.147	0.061	0.106
55	Sargodha	Punjab	0.139	0.449	0.166	0.066	0.076
56	Okara	Punjab	0.138	0.437	0.131	0.054	0.117
57	Khanewal	Punjab	0.133	0.364	0.134	0.075	0.087
58	Kamber Shahdadt	Sindh	0.133	0.387	0.126	0.084	0.076
59	Orakzai	Khyber Pakhtunkhwa	0.132	0.434	0.104	0.050	0.133
60	Ghotki	Sindh	0.132	0.401	0.124	0.058	0.104
61	Matari	Sindh	0.132	0.351	0.139	0.057	0.107
62	Rahimyar Khan	Punjab	0.131	0.425	0.126	0.083	0.067
63	Battagram	Khyber Pakhtunkhwa	0.131	0.443	0.141	0.078	0.060
64	Mirpurkhas	Sindh	0.130	0.376	0.090	0.076	0.111
65	Sanghar	Sindh	0.130	0.397	0.122	0.065	0.090
66	Chiniot	Punjab	0.126	0.393	0.125	0.085	0.061
67	Larkana	Sindh	0.125	0.419	0.117	0.062	0.080
68	Vehari	Punjab	0.123	0.404	0.110	0.072	0.071
69	Lodhran	Punjab	0.122	0.371	0.109	0.067	0.082
70	Hangu	Khyber Pakhtunkhwa	0.121	0.446	0.125	0.040	0.095
71	Mastung	Balochistan	0.118	0.400	0.122	0.061	0.065
72	Bahawalnagar	Punjab	0.115	0.462	0.085	0.072	0.063
73	Dera Ismail Khan	Khyber Pakhtunkhwa	0.114	0.370	0.086	0.090	0.059
74	Kohistan	Khyber Pakhtunkhwa	0.114	0.419	0.109	0.036	0.104
75	Khushab	Punjab	0.109	0.413	0.111	0.058	0.053
76	Kurram	Khyber Pakhtunkhwa	0.108	0.364	0.117	0.057	0.055
77	Jacobabad	Sindh	0.106	0.359	0.074	0.088	0.055
78	Umerkot	Sindh	0.106	0.359	0.071	0.058	0.086
79	Tando Allahyar	Sindh	0.106	0.338	0.110	0.032	0.108
80	Naushehro Feroze	Sindh	0.105	0.318	0.095	0.061	0.066
81	Pakpattan	Punjab	0.103	0.393	0.102	0.034	0.084
82	Nawabshah/ Shaheed Benazir Abad	Sindh	0.102	0.371	0.101	0.043	0.067
83	Bhakkar	Punjab	0.100	0.370	0.088	0.081	0.038
Very Low Digital Development							
84	Shikarpur	Sindh	0.098	0.366	0.094	0.047	0.058

			Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index
			Value	Value	Value	Value	Value
DDI Rank		Province/Region ^b	2020	2020	2020	2020	2020
85	Washuk	Balochistan	0.098	0.369	0.097	0.035	0.073
86	Tank	Khyber Pakhtunkhwa	0.097	0.358	0.060	0.071	0.057
87	Khyber	Khyber Pakhtunkhwa	0.093	0.397	0.070	0.052	0.051
88	Mohmand	Khyber Pakhtunkhwa	0.093	0.314	0.058	0.132	0.031
89	Dadu	Sindh	0.091	0.298	0.081	0.056	0.050
90	Khairpur	Sindh	0.090	0.346	0.068	0.058	0.047
91	Harnai	Balochistan	0.089	0.372	0.085	0.022	0.089
92	Barkhan	Balochistan	0.088	0.440	0.100	0.055	0.025
93	Dera Ghazi Khan	Punjab	0.082	0.377	0.070	0.042	0.042
94	Kech/Turbat	Balochistan	0.081	0.353	0.075	0.039	0.041
95	Badin	Sindh	0.080	0.292	0.070	0.039	0.053
96	Lasbela	Balochistan	0.078	0.403	0.131	0.009	0.075
97	Killa Saifullah	Balochistan	0.078	0.442	0.162	0.036	0.015
98	Tando Muhammad Khan	Sindh	0.076	0.305	0.062	0.036	0.050
99	Shangla	Khyber Pakhtunkhwa	0.075	0.432	0.098	0.023	0.031
100	Muzaffargarh	Punjab	0.073	0.329	0.067	0.041	0.032
101	Tor Ghar	Khyber Pakhtunkhwa	0.072	0.350	0.047	0.039	0.043
102	Thatta	Sindh	0.069	0.345	0.058	0.026	0.043
103	Bolan/Kachhi	Balochistan	0.064	0.357	0.059	0.011	0.077
104	North Waziristan	Khyber Pakhtunkhwa	0.061	0.400	0.074	0.030	0.016
105	Ziarat	Balochistan	0.061	0.413	0.094	0.005	0.076
106	South Waziristan	Khyber Pakhtunkhwa	0.061	0.299	0.037	0.070	0.017
107	Kalat	Balochistan	0.059	0.295	0.059	0.041	0.017
108	Jaffarabad	Balochistan	0.054	0.304	0.041	0.017	0.041
109	Naseerabad	Balochistan	0.054	0.269	0.045	0.024	0.030
110	Sujawal	Sindh	0.052	0.314	0.041	0.016	0.034
111	Bajur	Khyber Pakhtunkhwa	0.047	0.395	0.047	0.020	0.014
112	Sohbatpur	Balochistan	0.042	0.338	0.039	0.004	0.055

			Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index
			Value	Value	Value	Value	Value
DDI Rank		Province/Region ^b	2020	2020	2020	2020	2020
113	Killa Abdullah	Balochistan	0.041	0.344	0.057	0.011	0.013
114	Duki	Balochistan	0.040	0.388	0.120	0.000	0.267
115	Rajanpur	Punjab	0.034	0.357	0.034	0.005	0.021
116	Tharparkar	Sindh	0.033	0.322	0.015	0.011	0.022
117	Sherani	Balochistan	0.030	0.365	0.075	0.000	0.154
118	Dera Bugti	Balochistan	0.025	0.292	0.015	0.011	0.009
119	Khuzdar	Balochistan	0.017	0.257	0.063	0.001	0.011
120	Shaheed Sikandar abad	Balochistan	0.006	0.268	0.016	0.000	0.002
121	Awaran	Balochistan	0.004	0.308	0.016	0.000	0.000
..	Musakhail ^a	Balochistan	..	..	..	..	..
..	Zhob ^a	Balochistan	..	..	..	..	..
..	Chaghi ^a	Balochistan	..	..	..	..	..
..	Jhal Magsi ^a	Balochistan	..	..	..	..	..
..	Panjgur ^a	Balochistan	..	..	..	..	..
	Azad Jammu & Kashmir	Moderate Digital Development	0.209	0.496	0.227	0.108	0.157
	Gilgit-Baltistan	Moderate Digital Development	0.207	0.461	0.205	0.164	0.118
	Balochistan	Low Digital Development	0.135	0.398	0.136	0.063	0.099
	Khyber Pakhtunkhwa	Low Digital Development	0.196	0.467	0.172	0.141	0.130
	Punjab	Moderate Digital Development	0.213	0.471	0.212	0.139	0.148
	Sindh	Moderate Digital Development	0.209	0.443	0.196	0.115	0.189
	Pakistan	Moderate Digital Development	0.205	0.459	0.197	0.129	0.152

Notes	Definitions	Main Data Sources
a Districts of Musakhail, Zhob, Chaghi, Jhal Magsi, Panjgur were dropped from the scope of the PSLSM survey 2019/20.	Digital Development Index (DDI) A composite index measuring average achievement in four dimensions of digital development – access, usage, attainment, and transformation. See Technical Note 2 (this report) for details on how the DDI is calculated.	Main Data Sources Columns 1-5: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.
b For districts, their respective provinces and territories are mentioned. For regions and provinces, levels of human development are identified.		

Table 2A Digital Development Index and its Components sorted by name of region 2020

		Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index	Digital Development Status
		Value	Value	Value	Value	Value	
DDI rank		2020	2020	2020	2020	2020	
Balochistan							
121	Awaran	0.004	0.308	0.016	0.000	0.000	Very Low Digital Development
92	Barkhan	0.088	0.440	0.100	0.055	0.025	Very Low Digital Development
103	Bolan/Kachhi	0.064	0.357	0.059	0.011	0.077	Very Low Digital Development
..	Chaghi ^a	..	..	..	..	..
118	Dera Bugti	0.025	0.292	0.015	0.011	0.009	Very Low Digital Development
114	Duki	0.040	0.388	0.120	0.000	0.267	Very Low Digital Development
41	Gawadar	0.162	0.470	0.147	0.109	0.092	Low Digital Development
91	Harnai	0.089	0.372	0.085	0.022	0.089	Very Low Digital Development
108	Jaffarabad	0.054	0.304	0.041	0.017	0.041	Very Low Digital Development
..	Jhal Magsi ^a	..	..	..	..	..
107	Kalat	0.059	0.295	0.059	0.041	0.017	Very Low Digital Development
94	Kech/Turbat	0.081	0.353	0.075	0.039	0.041	Very Low Digital Development
42	Kharan	0.161	0.364	0.182	0.060	0.169	Low Digital Development
119	Khuzdar	0.017	0.257	0.063	0.001	0.011	Very Low Digital Development
113	Killa Abdullah	0.041	0.344	0.057	0.011	0.013	Very Low Digital Development
97	Killa Saifullah	0.078	0.442	0.162	0.036	0.015	Very Low Digital Development
33	Kohlu	0.180	0.518	0.263	0.071	0.109	Low Digital Development
96	Lasbela	0.078	0.403	0.131	0.009	0.075	Very Low Digital Development
28	Loralai	0.187	0.447	0.175	0.084	0.186	Low Digital Development
71	Mastung	0.118	0.400	0.122	0.061	0.065	Low Digital Development
..	Musakhail ^a	..	..	..	..	..
109	Naseerabad	0.054	0.269	0.045	0.024	0.030	Very Low Digital Development
51	Noshki	0.148	0.445	0.141	0.042	0.183	Low Digital Development
..	Panjgur ^a	..	..	..	..	..
12	Pishin	0.254	0.541	0.248	0.126	0.246	Moderate Digital Development

		Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index	Digital Development Status
		Value	Value	Value	Value	Value	
DDI rank		2020	2020	2020	2020	2020	
14	Quetta	0.240	0.511	0.249	0.154	0.170	Moderate Digital Development
120	Shaheed Sikandar abad	0.006	0.268	0.016	0.000	0.002	Very Low Digital Development
117	Sherani	0.030	0.365	0.075	0.000	0.154	Very Low Digital Development
52	Sibi	0.144	0.408	0.169	0.041	0.150	Low Digital Development
112	Sohbatpur	0.042	0.338	0.039	0.004	0.055	Very Low Digital Development
85	Washuk	0.098	0.369	0.097	0.035	0.073	Very Low Digital Development
..	Zhob ^a	..	..	..	..	..
105	Ziarat	0.061	0.413	0.094	0.005	0.076	Very Low Digital Development
Islamabad Capital Territory							
1	Islamabad	0.570	0.698	0.555	0.509	0.534	Very High Digital Development
Khyber Pakhtunkhwa							
2	Abbottabad	0.401	0.546	0.358	0.371	0.358	High Digital Development
111	Bajur	0.047	0.395	0.047	0.020	0.014	Very Low Digital Development
23	Bannu	0.202	0.444	0.167	0.160	0.140	Moderate Digital Development
63	Battagram	0.131	0.443	0.141	0.078	0.060	Low Digital Development
50	Buner	0.152	0.474	0.169	0.080	0.084	Low Digital Development
20	Charsadda	0.213	0.477	0.190	0.157	0.146	Moderate Digital Development
47	Chitral	0.156	0.422	0.117	0.127	0.094	Low Digital Development
73	Dera Ismail Khan	0.114	0.370	0.086	0.090	0.059	Low Digital Development
70	Hangu	0.121	0.446	0.125	0.040	0.095	Low Digital Development
7	Haripur	0.300	0.517	0.287	0.258	0.211	Moderate Digital Development
37	Karak	0.167	0.415	0.111	0.104	0.163	Low Digital Development
87	Khyber	0.093	0.397	0.070	0.052	0.051	Very Low Digital Development
39	Kohat	0.166	0.458	0.135	0.111	0.109	Low Digital Development
74	Kohistan	0.114	0.419	0.109	0.036	0.104	Low Digital Development
76	Kurram	0.108	0.364	0.117	0.057	0.055	Low Digital Development
35	Lakki Marwat	0.174	0.448	0.115	0.098	0.182	Low Digital Development
49	Lower Dir	0.153	0.484	0.137	0.088	0.093	Low Digital Development

		Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index	Digital Development Status
		Value	Value	Value	Value	Value	
DDI rank		2020	2020	2020	2020	2020	
29	Malakand	0.187	0.501	0.144	0.122	0.138	Low Digital Development
17	Mansehra	0.225	0.477	0.203	0.164	0.161	Moderate Digital Development
19	Mardan	0.215	0.498	0.195	0.178	0.125	Moderate Digital Development
88	Mohmand	0.093	0.314	0.058	0.132	0.031	Very Low Digital Development
104	North Waziristan	0.061	0.400	0.074	0.030	0.016	Very Low Digital Development
25	Nowshera	0.196	0.493	0.186	0.146	0.111	Low Digital Development
59	Orakzai	0.132	0.434	0.104	0.050	0.133	Low Digital Development
6	Peshawar	0.308	0.575	0.282	0.258	0.215	High Digital Development
99	Shangla	0.075	0.432	0.098	0.023	0.031	Very Low Digital Development
106	South Waziristan	0.061	0.299	0.037	0.070	0.017	Very Low Digital Development
24	Swabi	0.198	0.497	0.185	0.143	0.117	Low Digital Development
46	Swat	0.156	0.500	0.164	0.066	0.109	Low Digital Development
86	Tank	0.097	0.358	0.060	0.071	0.057	Very Low Digital Development
101	Tor Ghar	0.072	0.350	0.047	0.039	0.043	Very Low Digital Development
48	Upper Dir	0.155	0.469	0.137	0.093	0.096	Low Digital Development
Punjab							
16	Attock	0.225	0.475	0.213	0.183	0.138	Moderate Digital Development
72	Bahawalnagar	0.115	0.462	0.085	0.072	0.063	Low Digital Development
43	Bahawalpur	0.159	0.393	0.152	0.116	0.092	Low Digital Development
83	Bhakkar	0.100	0.370	0.088	0.081	0.038	Very Low Digital Development
10	Chakwal	0.275	0.499	0.254	0.189	0.240	Moderate Digital Development
66	Chiniot	0.126	0.393	0.125	0.085	0.061	Low Digital Development
93	Dera Ghazi Khan	0.082	0.377	0.070	0.042	0.042	Very Low Digital Development
18	Faisalabad	0.223	0.511	0.243	0.131	0.152	Moderate Digital Development
13	Gujranwala	0.249	0.553	0.294	0.151	0.158	Moderate Digital Development

		Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index	Digital Development Status
		Value	Value	Value	Value	Value	
DDI rank		2020	2020	2020	2020	2020	
15	Gujrat	0.229	0.545	0.308	0.105	0.155	Moderate Digital Development
44	Hafizabad	0.159	0.463	0.177	0.077	0.100	Low Digital Development
34	Jhang	0.178	0.413	0.176	0.147	0.093	Low Digital Development
9	Jhelum	0.276	0.521	0.276	0.183	0.221	Moderate Digital Development
45	Kasur	0.158	0.413	0.145	0.091	0.114	Low Digital Development
57	Khanewal	0.133	0.364	0.134	0.075	0.087	Low Digital Development
75	Khushab	0.109	0.413	0.111	0.058	0.053	Low Digital Development
4	Lahore	0.370	0.582	0.357	0.287	0.314	High Digital Development
36	Layyah	0.170	0.421	0.126	0.169	0.093	Low Digital Development
69	Lodhran	0.122	0.371	0.109	0.067	0.082	Low Digital Development
32	Mandi Bahauddin	0.183	0.505	0.227	0.087	0.111	Low Digital Development
27	Mianwali	0.191	0.396	0.170	0.190	0.104	Low Digital Development
21	Multan	0.212	0.445	0.204	0.154	0.144	Moderate Digital Development
100	Muzaffargarh	0.073	0.329	0.067	0.041	0.032	Very Low Digital Development
53	Nankana Sahib	0.140	0.411	0.133	0.072	0.096	Low Digital Development
22	Narowal	0.202	0.464	0.235	0.151	0.101	Moderate Digital Development
56	Okara	0.138	0.437	0.131	0.054	0.117	Low Digital Development
81	Pakpattan	0.103	0.393	0.102	0.034	0.084	Low Digital Development
62	Rahimyar Khan	0.131	0.425	0.126	0.083	0.067	Low Digital Development
115	Rajanpur	0.034	0.357	0.034	0.005	0.021	Very Low Digital Development
3	Rawalpindi	0.371	0.591	0.390	0.266	0.310	High Digital Development
40	Sahiwal	0.162	0.434	0.164	0.081	0.120	Low Digital Development
55	Sargodha	0.139	0.449	0.166	0.066	0.076	Low Digital Development
38	Sheikhpura	0.167	0.459	0.175	0.071	0.138	Low Digital Development
8	Sialkot	0.286	0.560	0.341	0.178	0.197	Moderate Digital Development
30	Toba Tek Singh	0.185	0.459	0.203	0.148	0.085	Low Digital Development
68	Vehari	0.123	0.404	0.110	0.072	0.071	Low Digital Development

		Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index	Digital Development Status
		Value	Value	Value	Value	Value	
DDI rank		2020	2020	2020	2020	2020	
Sindh							
95	Badin	0.080	0.292	0.070	0.039	0.053	Very Low Digital Development
89	Dadu	0.091	0.298	0.081	0.056	0.050	Very Low Digital Development
60	Ghotki	0.132	0.401	0.124	0.058	0.104	Low Digital Development
11	Hyderabad	0.268	0.475	0.260	0.181	0.232	Moderate Digital Development
77	Jacobabad	0.106	0.359	0.074	0.088	0.055	Low Digital Development
54	Jamshoro	0.140	0.400	0.147	0.061	0.106	Low Digital Development
58	Kamber Shahdadt	0.133	0.387	0.126	0.084	0.076	Low Digital Development
5	Karachi	0.330	0.552	0.329	0.189	0.345	High Digital Development
31	Kashmore	0.184	0.437	0.159	0.117	0.142	Low Digital Development
90	Khairpur	0.090	0.346	0.068	0.058	0.047	Very Low Digital Development
67	Larkana	0.125	0.419	0.117	0.062	0.080	Low Digital Development
61	Matiori	0.132	0.351	0.139	0.057	0.107	Low Digital Development
64	Mirpurkhas	0.130	0.376	0.090	0.076	0.111	Low Digital Development
80	Naushehro Feroze	0.105	0.318	0.095	0.061	0.066	Low Digital Development
82	Nawabshah/ Shaheed Benazir Abad	0.102	0.371	0.101	0.043	0.067	Low Digital Development
65	Sanghar	0.130	0.397	0.122	0.065	0.090	Low Digital Development
84	Shikarpur	0.098	0.366	0.094	0.047	0.058	Very Low Digital Development
110	Sujawal	0.052	0.314	0.041	0.016	0.034	Very Low Digital Development
26	Sukkur	0.191	0.444	0.181	0.115	0.143	Low Digital Development
79	Tando Allahyar	0.106	0.338	0.110	0.032	0.108	Low Digital Development
98	Tando Muhammad Khan	0.076	0.305	0.062	0.036	0.050	Very Low Digital Development
116	Tharparkar	0.033	0.322	0.015	0.011	0.022	Very Low Digital Development
102	Thatta	0.069	0.345	0.058	0.026	0.043	Very Low Digital Development
78	Umerkot	0.106	0.359	0.071	0.058	0.086	Low Digital Development

		Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index	Digital Development Status
		Value	Value	Value	Value	Value	
DDI rank		2020	2020	2020	2020	2020	
	Azad Jammu & Kashmir	0.209	0.496	0.227	0.108	0.157	Moderate Digital Development
	Gilgit-Baltistan	0.207	0.461	0.205	0.164	0.118	Moderate Digital Development
	Balochistan	0.135	0.398	0.136	0.063	0.099	Low Digital Development
	Khyber Pakhtunkhwa	0.196	0.467	0.172	0.141	0.130	Low Digital Development
	Punjab	0.213	0.471	0.212	0.139	0.148	Moderate Digital Development
	Sindh	0.209	0.443	0.196	0.115	0.189	Moderate Digital Development
	Pakistan	0.205	0.459	0.197	0.129	0.152	Moderate Digital Development

Notes	Definitions	Main Data Sources
a Districts of Musakhail, Zhob, Chaghi, Jhal Magsi, Panjgur were dropped from the scope of the PSLSM survey 2019/20.	Digital Development Index (DDI) A composite index measuring average achievement in four dimensions of digital development – access, usage, attainment, and transformation. See Technical Note 2 (this report) for details on how the DDI is calculated.	Columns 1-5: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.

Table 2B Digital Development Index indicator values sorted by name of region 2020

		Access			Usage			Attainment	Transformation
		Access to computer	Access to Mobile	Access to Internet	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
		Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
DDI rank		2020	2020	2020	2020	2020	2020	2020	2020
Balochistan									
121	Awaran	0.1	92.3	0.0	0.0	4.7	0.0	0.0	0.0
92	Barkhan	19.9	94.5	17.5	2.7	13.5	12.0	2.7	1.5
103	Bolan/Kachhi	0.6	92.2	14.2	0.7	10.0	6.4	0.5	4.6
..	Chaghi ^a	..	..	..	..	..	..	..	..
118	Dera Bugti	0.8	84.4	2.5	0.5	2.9	0.8	0.5	0.5
114	Duki	0.6	95.0	20.9	0.0	20.3	15.7	0.0	16.0
41	Gawadar	9.9	93.2	38.0	5.5	21.1	13.9	5.5	5.5
91	Harnai	1.5	92.2	18.1	1.8	15.0	7.7	1.1	5.3
108	Jaffarabad	1.3	81.9	8.1	0.8	6.9	4.1	0.8	2.4
..	Jhal Magsi ^a	..	..	..	..	..	..	..	..
107	Kalat	1.6	82.0	5.0	2.7	10.6	2.5	2.0	1.0
94	Kech/Turbat	4.9	93.2	7.8	2.6	13.7	4.5	1.9	2.5
42	Kharan	4.0	94.6	10.5	3.7	31.3	17.0	3.0	10.2
119	Khuzdar	0.1	69.9	7.1	0.0	10.6	8.1	0.0	0.6
113	Killa Abdullah	1.7	96.0	5.4	0.6	10.2	5.7	0.6	0.8
97	Killa Saifullah	0.8	98.7	32.9	1.8	25.0	20.7	1.8	0.9
33	Kohlu	6.8	97.9	50.6	3.6	46.2	26.8	3.6	6.5
96	Lasbela	0.7	97.3	22.8	0.5	21.7	16.9	0.5	4.5
28	Loralai	13.7	94.4	26.1	4.4	23.6	21.5	4.2	11.2
71	Mastung	4.1	94.7	21.2	4.1	17.6	12.2	3.0	3.9
..	Musakhail ^a	..	..	..	..	..	..	..	..
109	Naseerabad	0.8	76.4	3.5	1.1	7.7	3.8	1.2	1.8
51	Noshki	2.5	98.0	32.9	2.6	19.7	18.4	2.1	11.0
..	Panjgur ^a	..	..	..	..	..	..	..	..
12	Pishin	14.7	98.9	48.6	7.9	38.0	23.1	6.3	14.8
14	Quetta	17.0	97.2	39.0	10.2	34.7	23.0	7.7	10.2
120	Shaheed Sikandar abad	0.1	79.9	0.5	0.0	4.6	0.0	0.0	0.1
117	Sherani	0.1	88.0	21.5	0.0	12.7	9.9	0.0	9.3
52	Sibi	6.0	91.8	24.7	5.2	25.8	16.3	2.1	9.0
112	Sohbatpur	0.1	92.9	8.3	0.2	6.7	4.5	0.2	3.3
85	Washuk	2.8	83.9	24.1	2.7	13.4	11.2	1.7	4.4

		Access			Usage			Attainment	Transformation
		Access to computer	Access to Mobile	Access to Internet	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
		Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
DDI rank		2020	2020	2020	2020	2020	2020	2020	2020
..	Zhob ^a	..	..	..	..	..	..	..	..
105	Ziarat	0.7	98.4	24.7	0.2	18.5	9.3	0.2	4.6
Islamabad Capital Territory									
1	Islamabad	39.7	99.4	70.3	30.5	60.6	55.0	25.5	32.0
Khyber Pakhtunkhwa									
2	Abbottabad	17.9	97.0	48.8	19.0	44.4	31.3	18.5	21.5
111	Bajur	3.2	97.9	17.6	1.2	7.1	5.0	1.0	0.8
23	Bannu	10.9	96.3	25.9	8.2	23.2	13.2	8.0	8.4
63	Battagram	6.5	93.9	32.5	4.2	19.4	16.1	3.9	3.6
50	Buner	11.5	95.9	34.8	4.3	25.3	18.1	4.0	5.0
20	Charsadda	13.9	95.2	34.1	9.1	24.5	17.1	7.9	8.7
47	Chitral	10.5	96.6	19.5	6.4	16.8	7.6	6.4	5.6
73	Dera Ismail Khan	8.5	88.5	14.0	5.0	11.0	6.4	4.5	3.6
70	Hangu	7.0	93.2	33.6	2.7	20.1	12.9	2.0	5.7
7	Haripur	16.2	95.0	43.8	15.2	33.1	27.6	12.9	12.7
37	Karak	11.4	88.6	24.6	5.3	11.8	12.6	5.2	9.8
87	Khyber	8.5	96.6	14.0	2.6	11.7	4.8	2.6	3.1
39	Kohat	9.2	95.4	32.6	5.9	18.0	12.6	5.6	6.5
74	Kohistan	1.6	94.0	29.9	1.8	17.7	12.0	1.8	6.2
76	Kurram	9.4	82.0	17.7	3.5	19.9	9.3	2.9	3.3
35	Lakki Marwat	11.2	95.3	28.0	5.0	12.7	13.3	4.9	10.9
49	Lower Dir	10.1	98.4	36.6	4.7	18.9	14.5	4.4	5.6
29	Malakand	16.0	97.2	37.1	6.6	19.3	13.0	6.1	8.3
17	Mansehra	9.5	97.1	36.6	8.5	28.3	18.4	8.2	9.6
19	Mardan	15.3	96.1	37.9	9.9	24.5	17.6	8.9	7.5
88	Mohmand	6.6	79.6	8.2	2.1	9.1	4.8	6.6	1.8
104	North Waziristan	6.4	96.0	17.7	2.2	10.7	7.7	1.5	1.0
25	Nowshera	15.2	94.5	38.1	8.9	25.0	15.9	7.3	6.7
59	Orakzai	7.0	94.5	28.7	2.6	16.7	10.2	2.5	8.0
6	Peshawar	25.3	96.3	50.9	15.8	32.9	25.2	12.9	12.9
99	Shangla	4.2	99.2	26.2	2.1	15.4	10.5	1.2	1.9
106	South Waziristan	4.6	82.9	2.3	3.9	3.3	1.4	3.5	1.0
24	Swabi	14.6	96.9	37.5	9.0	22.6	18.0	7.2	7.0

		Access			Usage			Attainment	Transformation
		Access to computer	Access to Mobile	Access to Internet	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
		Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
DDI rank		2020	2020	2020	2020	2020	2020	2020	2020
46	Swat	9.7	98.5	41.7	4.7	24.4	17.2	3.3	6.5
86	Tank	7.2	93.0	7.3	4.5	6.6	3.9	3.6	3.4
101	Tor Ghar	3.1	93.3	8.7	2.4	6.1	4.1	1.9	2.6
48	Upper Dir	12.0	97.9	30.8	5.8	19.9	11.6	4.7	5.8
Punjab									
16	Attock	9.4	97.3	36.0	8.8	27.1	22.0	9.2	8.3
72	Bahawalnagar	7.2	91.2	40.1	4.2	10.3	8.1	3.6	3.8
43	Bahawalpur	9.0	90.3	18.5	8.4	18.0	13.7	5.8	5.5
83	Bhakkar	6.3	92.7	12.1	5.2	11.2	6.5	4.0	2.3
10	Chakwal	11.7	97.1	41.0	10.3	31.2	27.7	9.5	14.4
66	Chiniot	9.0	87.3	21.8	5.8	16.0	11.8	4.2	3.7
93	Dera Ghazi Khan	5.0	94.9	13.0	2.8	9.2	7.2	2.1	2.5
18	Faisalabad	18.2	95.3	39.9	9.8	31.4	25.1	6.6	9.1
13	Gujranwala	17.3	96.5	52.0	9.4	37.1	35.3	7.5	9.5
15	Gujrat	12.0	98.0	53.7	6.2	45.5	36.5	5.3	9.3
44	Hafizabad	9.4	96.4	33.0	5.0	23.6	21.1	3.9	6.0
34	Jhang	10.0	91.5	22.3	10.2	21.2	14.6	7.4	5.6
9	Jhelum	11.6	97.3	47.6	10.1	34.5	31.3	9.1	13.3
45	Kasur	7.6	93.0	23.3	5.4	20.8	13.7	4.6	6.9
57	Khanewal	8.5	81.5	19.1	7.7	15.7	11.6	3.7	5.2
75	Khushab	8.4	94.8	20.6	4.2	16.8	9.5	2.9	3.2
4	Lahore	24.2	97.0	53.3	17.5	42.5	35.6	14.3	18.9
36	Layyah	9.0	98.3	19.0	10.0	12.1	9.0	8.4	5.6
69	Lodhran	4.3	87.2	19.8	4.0	13.6	12.5	3.3	4.9
32	Mandi Bahauddin	10.3	96.9	44.4	5.2	31.3	28.2	4.4	6.7
27	Mianwali	10.7	90.2	18.0	11.5	17.4	14.2	9.5	6.2
21	Multan	12.2	91.3	29.9	9.5	24.4	21.0	7.7	8.6
100	Muzaffargarh	3.3	84.0	11.5	2.6	8.7	7.2	2.0	1.9
53	Nankana Sahib	7.1	94.6	21.6	4.6	19.1	13.3	3.6	5.8
22	Narowal	13.3	93.0	32.9	8.1	33.9	23.1	7.6	6.1
56	Okara	6.5	96.4	28.3	4.1	18.3	14.4	2.7	7.0
81	Pakpattan	4.1	93.7	20.2	2.9	14.8	10.9	1.7	5.0

		Access			Usage			Attainment	Transformation
		Access to computer	Access to Mobile	Access to Internet	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
		Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
DDI rank		2020	2020	2020	2020	2020	2020	2020	2020
62	Rahimyar Khan	8.3	93.0	26.2	6.3	15.8	11.6	4.2	4.0
115	Rajanpur	2.6	96.1	8.4	1.6	4.0	3.6	0.3	1.3
3	Rawalpindi	22.3	97.5	57.4	18.3	45.3	41.2	13.3	18.6
40	Sahiwal	8.1	94.1	28.0	6.4	20.7	17.8	4.1	7.2
55	Sargodha	12.5	94.7	27.4	7.5	22.1	15.3	3.3	4.5
38	Sheikhupura	9.7	95.5	32.6	5.3	23.9	19.7	3.5	8.3
8	Sialkot	16.7	95.9	55.4	9.2	50.0	37.1	8.9	11.8
30	Toba Tek Singh	14.6	94.8	28.4	11.3	23.7	18.3	7.4	5.1
68	Vehari	6.6	92.0	22.6	4.7	14.8	10.4	3.6	4.3
Sindh									
95	Badin	2.4	73.5	11.7	2.1	9.5	8.0	2.0	3.2
89	Dadu	4.2	71.9	13.2	2.9	11.0	8.6	2.8	3.0
60	Ghotki	5.1	88.7	26.5	3.4	18.1	13.4	2.9	6.3
11	Hyderabad	13.9	90.6	37.9	9.6	32.2	29.9	9.1	13.9
77	Jacobabad	6.2	89.9	11.5	4.0	9.0	6.5	4.4	3.3
54	Jamshoro	5.3	89.6	25.0	3.3	21.8	16.7	3.1	6.4
58	Kamber Shahdadkot	4.2	92.4	19.6	4.7	13.4	16.6	4.2	4.6
5	Karachi	17.1	97.6	50.8	11.2	39.3	40.7	9.4	20.7
31	Kashmore	5.6	96.4	29.1	3.4	25.3	16.8	5.8	8.5
90	Khairpur	7.8	85.1	10.8	3.6	8.6	5.7	2.9	2.8
67	Larkana	2.9	93.3	29.5	3.5	7.7	21.7	3.1	4.8
61	Matari	5.4	79.2	20.6	3.2	19.3	17.3	2.9	6.4
64	Mirpurkhas	5.4	89.0	18.4	4.7	7.4	11.9	3.8	6.6
80	Naushehro Feroze	5.1	86.8	3.5	3.6	16.5	6.0	3.1	4.0
82	Nawabshah/ Shaheed Benazir Abad	4.7	82.1	24.6	2.9	14.1	11.5	2.2	4.0
65	Sanghar	6.1	87.0	26.1	4.2	17.4	12.2	3.2	5.4
84	Shikarpur	5.8	87.3	16.8	3.0	13.2	10.1	2.3	3.5
110	Sujawal	2.6	82.2	9.2	0.9	5.6	5.2	0.8	2.0
26	Sukkur	11.3	91.1	30.8	7.4	24.1	18.0	5.8	8.6
79	Tando Allahyar	3.8	77.4	20.2	2.0	15.1	14.5	1.6	6.5

		Access			Usage			Attainment	Transformation
		Access to computer	Access to Mobile	Access to Internet	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
		Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
DDI rank		2020	2020	2020	2020	2020	2020	2020	2020
98	Tando Muhammad Khan	3.2	77.5	10.8	2.2	8.8	6.1	1.8	3.0
116	Tharparkar	1.0	92.3	3.3	0.7	1.7	1.8	0.6	1.3
102	Thatta	1.1	86.7	15.7	1.3	7.1	8.1	1.3	2.6
78	Umerkot	3.3	90.2	14.1	3.4	6.4	9.2	2.9	5.2
	Azad Jammu & Kashmir	10.4	96.6	41.7	6.9	31.6	25.0	5.4	9.4
	Gilgit-Baltistan	16.2	92.1	30.0	12.6	23.2	17.2	8.2	7.1
	Balochistan	6.5	91.9	21.2	4.1	20.7	13.3	3.2	5.9
	Khyber Pakhtunkhwa	12.4	94.9	32.7	8.0	22.3	15.8	7.0	7.8
	Punjab	12.9	93.9	34.4	9.1	26.7	21.7	7.0	8.9
	Sindh	10.2	90.9	31.9	6.7	24.0	23.5	5.8	11.3
	Pakistan	11.7	93.1	32.8	8.1	24.9	20.6	6.5	9.1

Notes	Definitions	Main Data Sources
<p>a Districts of Musakhail, Zhob, Chaghi, Jhal Magsi, Panjgur were dropped from the scope of the PSLSM survey 2019/20.</p>	<p>Access to computer The percentage of household with access to computer/laptop/tablet.</p> <p>Access to Mobile The percentage of household with access to mobile phones.</p> <p>Access to Internet The percentage of household with access to internet.</p> <p>Usage of computer The percentage of population age 10 to 49 used computer/laptop/tablet in last three months.</p> <p>Usage of Smart Mobile The percentage of population age 10 to 49 used smart mobiles in last three months.</p>	<p>Columns 1-18: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.</p>

Table 2C Digital Development Index and its Components at national, provincial, and urban/rural levels 2020

Regions	Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index	Digital Development Status
	Value	Value	Value	Value	Value	
	2020	2020	2020	2020	2020	
Pakistan	0.205	0.459	0.197	0.129	0.152	Moderate Digital Development
Rural	0.134	0.404	0.127	0.076	0.083	Low Digital Development
Urban	0.313	0.545	0.310	0.215	0.263	High Digital Development
Punjab	0.213	0.471	0.212	0.139	0.148	Moderate Digital Development
Rural	0.142	0.417	0.140	0.082	0.086	Low Digital Development
Urban	0.320	0.559	0.326	0.231	0.247	High Digital Development
Sindh	0.209	0.443	0.196	0.115	0.189	Moderate Digital Development
Rural	0.081	0.338	0.072	0.035	0.051	Very Low Digital Development
Urban	0.303	0.528	0.295	0.180	0.299	High Digital Development
Khyber Pakhtunkhwa	0.196	0.467	0.172	0.141	0.130	Low Digital Development
Rural	0.163	0.444	0.143	0.108	0.103	Low Digital Development
Urban	0.346	0.587	0.309	0.301	0.262	High Digital Development
Balochistan	0.135	0.398	0.136	0.063	0.099	Low Digital Development
Rural	0.098	0.372	0.103	0.035	0.069	Very Low Digital Development
Urban	0.222	0.470	0.221	0.134	0.174	Moderate Digital Development
Azad Jammu and Kashmir	0.209	0.496	0.227	0.108	0.157	Moderate Digital Development
Gilgit Baltistan	0.207	0.461	0.205	0.164	0.118	Moderate Digital Development

Definitions

Digital Development Index (DDI)

A composite index measuring average achievement in four dimensions of digital development -- access, usage, attainment, and transformation. See Technical Note 2 (this report) for details on how the DDI is calculated.

Main Data Sources

Columns 1-5: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.

Table 2D Digital Development Index indicator values at national, provincial, and urban/rural levels 2020

Regions	Access			Usage			Attainment	Transformation
	Access to computer	Access to Mobile	Access to Internet	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
	2020	2020	2020	2020	2020	2020	2020	2020
Pakistan	11.7	93.1	32.8	8.1	24.9	20.6	6.5	9.1
Rural	6.9	91.1	23.3	4.7	17.2	12.9	3.8	5.0
Urban	19.4	96.5	47.8	13.4	37.5	33.1	10.7	15.8
Punjab	12.9	93.9	34.4	9.1	26.7	21.7	7.0	8.9
Rural	7.6	92.4	25.1	5.4	18.6	14.4	4.1	5.2
Urban	21.6	96.5	49.6	15.0	39.6	33.4	11.6	14.8
Sindh	10.2	90.9	31.9	6.7	24.0	23.5	5.8	11.3
Rural	3.0	84.1	14.3	1.9	9.9	8.6	1.7	3.1
Urban	15.9	96.3	46.1	10.6	35.4	35.4	9.0	18.0
Khyber Pakhtunkhwa	12.4	94.9	32.7	8.0	22.3	15.8	7.0	7.8
Rural	9.7	94.5	29.1	6.0	19.4	13.5	5.4	6.2
Urban	26.5	97.5	52.1	17.7	36.1	27.0	15.0	15.7
Balochistan	6.5	91.9	21.2	4.1	20.7	13.3	3.2	5.9
Rural	4.0	90.3	17.1	2.3	16.9	9.9	1.7	4.1
Urban	13.0	96.1	32.0	8.5	30.4	21.9	6.7	10.4
Azad Jammu and Kashmir	10.4	96.6	41.7	6.9	31.6	25.0	5.4	9.4
Gilgit Baltistan	16.2	92.1	30.0	12.6	23.2	17.2	8.2	7.1

Definitions

Access to computer

The percentage of household with access to computer/laptop/tablet.

Access to Mobile

The percentage of household with access to mobile phones.

Access to Internet

The percentage of household with access to internet.

Usage of computer

The percentage of population age 10 to 49 used computer/laptop/tablet in last three months.

Usage of Smart Mobile

The percentage of population age 10 to 49 used smart mobiles in last three months.

Usage to Internet

The percentage of population age 10 to 49 used internet services in last three months.

ICT Skills

The percentage of population age 10 to 49 who have carried out at least one of nine specific computer related activities during the last three months. See Technical Note 2 (this report) for details definition.

Purpose to use internet

The percentage of population age 10 to 49 use internet for the purpose of education, research, information seeking, health, Business, online shopping, and banking.

Main Data Sources

Columns 1-18: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.

Table 2E Digital Development Index and its Components at national, provincial, and urban/rural level by wealth quintiles 2020

Regions/Quintiles	Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index	Digital Development Status
	Value	Value	Value	Value	Value	
	2020	2020	2020	2020	2020	
Pakistan	0.205	0.459	0.197	0.129	0.152	Moderate Digital Development
Quintile - 1	0.032	0.297	0.027	0.010	0.013	Very Low Digital Development
Quintile - 2	0.071	0.359	0.065	0.030	0.036	Very Low Digital Development
Quintile - 3	0.136	0.431	0.131	0.076	0.079	Low Digital Development
Quintile - 4	0.220	0.509	0.231	0.129	0.156	Moderate Digital Development
Quintile - 5	0.492	0.690	0.499	0.379	0.448	High Digital Development
Pakistan-Rural	0.134	0.404	0.127	0.076	0.083	Low Digital Development
Quintile - 1	0.025	0.284	0.020	0.007	0.010	Very Low Digital Development
Quintile - 2	0.053	0.333	0.047	0.020	0.025	Very Low Digital Development
Quintile - 3	0.082	0.376	0.076	0.038	0.041	Very Low Digital Development
Quintile - 4	0.145	0.445	0.141	0.083	0.085	Low Digital Development
Quintile - 5	0.322	0.599	0.334	0.224	0.241	High Digital Development
Pakistan-Urban	0.313	0.545	0.310	0.215	0.263	High Digital Development
Quintile - 1	0.086	0.366	0.079	0.041	0.046	Very Low Digital Development
Quintile - 2	0.157	0.442	0.160	0.081	0.106	Low Digital Development
Quintile - 3	0.240	0.521	0.254	0.136	0.183	Moderate Digital Development
Quintile - 4	0.349	0.601	0.364	0.221	0.305	High Digital Development
Quintile - 5	0.684	0.799	0.686	0.594	0.670	Very High Digital Development
Punjab	0.213	0.471	0.212	0.139	0.148	Moderate Digital Development
Quintile - 1	0.030	0.302	0.025	0.012	0.009	Very Low Digital Development
Quintile - 2	0.074	0.369	0.069	0.038	0.031	Very Low Digital Development
Quintile - 3	0.145	0.442	0.149	0.081	0.083	Low Digital Development
Quintile - 4	0.237	0.530	0.259	0.143	0.162	Moderate Digital Development
Quintile - 5	0.504	0.710	0.527	0.402	0.430	Very High Digital Development
Punjab-Rural	0.142	0.417	0.140	0.082	0.086	Low Digital Development

Regions/Quintiles	Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index	Digital Development Status
	Value	Value	Value	Value	Value	
	2020	2020	2020	2020	2020	
Quintile - 1	0.023	0.289	0.017	0.010	0.006	Very Low Digital Development
Quintile - 2	0.046	0.335	0.040	0.020	0.017	Very Low Digital Development
Quintile - 3	0.090	0.390	0.088	0.049	0.040	Very Low Digital Development
Quintile - 4	0.159	0.461	0.164	0.089	0.094	Low Digital Development
Quintile - 5	0.343	0.619	0.373	0.230	0.261	High Digital Development
Punjab-Urban	0.320	0.559	0.326	0.231	0.247	High Digital Development
Quintile - 1	0.089	0.373	0.084	0.045	0.044	Very Low Digital Development
Quintile - 2	0.167	0.457	0.179	0.093	0.103	Low Digital Development
Quintile - 3	0.251	0.536	0.270	0.153	0.182	Moderate Digital Development
Quintile - 4	0.365	0.630	0.394	0.254	0.281	High Digital Development
Quintile - 5	0.680	0.806	0.700	0.612	0.621	Very High Digital Development
Sindh	0.209	0.443	0.196	0.115	0.189	Moderate Digital Development
Quintile - 1	0.017	0.267	0.013	0.005	0.006	Very Low Digital Development
Quintile - 2	0.058	0.329	0.054	0.022	0.030	Very Low Digital Development
Quintile - 3	0.128	0.412	0.120	0.063	0.085	Low Digital Development
Quintile - 4	0.198	0.489	0.217	0.083	0.173	Low Digital Development
Quintile - 5	0.538	0.688	0.532	0.378	0.605	Very High Digital Development
Sindh-Rural	0.081	0.338	0.072	0.035	0.051	Very Low Digital Development
Quintile - 1	0.011	0.252	0.006	0.003	0.004	Very Low Digital Development
Quintile - 2	0.023	0.279	0.019	0.006	0.009	Very Low Digital Development
Quintile - 3	0.041	0.313	0.036	0.014	0.019	Very Low Digital Development
Quintile - 4	0.078	0.351	0.075	0.032	0.044	Very Low Digital Development
Quintile - 5	0.206	0.491	0.205	0.109	0.164	Moderate Digital Development
Sindh-Urban	0.303	0.528	0.295	0.180	0.299	High Digital Development
Quintile - 1	0.083	0.354	0.073	0.038	0.049	Very Low Digital Development
Quintile - 2	0.134	0.427	0.137	0.057	0.098	Low Digital Development
Quintile - 3	0.203	0.498	0.227	0.083	0.181	Moderate Digital Development

Regions/Quintiles	Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index	Digital Development Status
	Value	Value	Value	Value	Value	
	2020	2020	2020	2020	2020	
Quintile - 4	0.310	0.566	0.330	0.153	0.324	High Digital Development
Quintile - 5	0.715	0.782	0.698	0.569	0.839	Very High Digital Development
Khyber Pakhtunkhwa	0.196	0.467	0.172	0.141	0.130	Low Digital Development
Quintile - 1	0.045	0.323	0.035	0.019	0.020	Very Low Digital Development
Quintile - 2	0.081	0.385	0.074	0.036	0.042	Very Low Digital Development
Quintile - 3	0.130	0.438	0.121	0.072	0.075	Low Digital Development
Quintile - 4	0.224	0.524	0.203	0.157	0.151	Moderate Digital Development
Quintile - 5	0.447	0.693	0.408	0.404	0.350	High Digital Development
Khyber Pakhtunkhwa-Rural	0.163	0.444	0.143	0.108	0.103	Low Digital Development
Quintile - 1	0.043	0.319	0.034	0.017	0.019	Very Low Digital Development
Quintile - 2	0.075	0.376	0.066	0.033	0.039	Very Low Digital Development
Quintile - 3	0.109	0.415	0.101	0.059	0.058	Low Digital Development
Quintile - 4	0.179	0.487	0.164	0.110	0.117	Low Digital Development
Quintile - 5	0.369	0.644	0.341	0.310	0.274	High Digital Development
Khyber Pakhtunkhwa-Urban	0.346	0.587	0.309	0.301	0.262	High Digital Development
Quintile - 1	0.082	0.382	0.076	0.043	0.036	Very Low Digital Development
Quintile - 2	0.215	0.493	0.186	0.162	0.143	Moderate Digital Development
Quintile - 3	0.290	0.575	0.269	0.236	0.192	Moderate Digital Development
Quintile - 4	0.404	0.684	0.371	0.342	0.307	High Digital Development
Quintile - 5	0.700	0.843	0.637	0.714	0.628	Very High Digital Development
Balochistan	0.135	0.398	0.136	0.063	0.099	Low Digital Development
Quintile - 1	0.018	0.268	0.018	0.001	0.015	Very Low Digital Development
Quintile - 2	0.033	0.341	0.043	0.003	0.026	Very Low Digital Development
Quintile - 3	0.074	0.387	0.092	0.014	0.061	Very Low Digital Development
Quintile - 4	0.146	0.452	0.156	0.057	0.113	Low Digital Development
Quintile - 5	0.327	0.570	0.347	0.223	0.260	High Digital Development
Balochistan-Rural	0.098	0.372	0.103	0.035	0.069	Very Low Digital Development

Regions/Quintiles	Digital Development Index (DDI)	Access Index	Usage Index	Attainment Index	Transformation Index	Digital Development Status
	Value	Value	Value	Value	Value	
	2020	2020	2020	2020	2020	
Quintile - 1	0.018	0.260	0.015	0.002	0.016	Very Low Digital Development
Quintile - 2	0.020	0.321	0.033	0.001	0.019	Very Low Digital Development
Quintile - 3	0.053	0.363	0.070	0.008	0.040	Very Low Digital Development
Quintile - 4	0.105	0.419	0.119	0.029	0.082	Low Digital Development
Quintile - 5	0.237	0.539	0.260	0.127	0.177	Moderate Digital Development
Balochistan-Urban	0.222	0.470	0.221	0.134	0.174	Moderate Digital Development
Quintile - 1	0.039	0.336	0.038	0.006	0.033	Very Low Digital Development
Quintile - 2	0.094	0.397	0.100	0.025	0.077	Very Low Digital Development
Quintile - 3	0.160	0.443	0.162	0.084	0.110	Low Digital Development
Quintile - 4	0.244	0.509	0.275	0.146	0.175	Moderate Digital Development
Quintile - 5	0.489	0.652	0.503	0.389	0.451	High Digital Development
Azad Jammu & Kashmir	0.209	0.496	0.227	0.108	0.157	Moderate Digital Development
Quintile - 1	0.071	0.349	0.062	0.033	0.036	Very Low Digital Development
Quintile - 2	0.147	0.427	0.139	0.089	0.089	Low Digital Development
Quintile - 3	0.204	0.506	0.220	0.106	0.147	Moderate Digital Development
Quintile - 4	0.238	0.551	0.294	0.103	0.193	Moderate Digital Development
Quintile - 5	0.356	0.638	0.405	0.200	0.310	High Digital Development
Gilgit-Baltistan	0.207	0.461	0.205	0.164	0.118	Moderate Digital Development
Quintile - 1	0.046	0.279	0.042	0.021	0.017	Very Low Digital Development
Quintile - 2	0.093	0.383	0.089	0.054	0.040	Very Low Digital Development
Quintile - 3	0.142	0.457	0.157	0.087	0.066	Low Digital Development
Quintile - 4	0.248	0.520	0.244	0.207	0.143	Moderate Digital Development
Quintile - 5	0.445	0.667	0.460	0.419	0.303	High Digital Development

Definitions

Digital Development Index (DDI)

A composite index measuring average achievement in four dimensions of digital development – access, usage, attainment, and transformation. See Technical Note 2 (this report) for details on how the DDI is calculated.

Main Data Sources

Columns 1-5: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.

Table 2F Digital Development Index indicator values at national, provincial, and urban/rural level by wealth quintiles 2020

Regions/ Quintiles	Access			Usage			Attainment	Transformation
	Access to computer	Access to Mobile	Access to Internet	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
	2020	2020	2020	2020	2020	2020	2020	2020
Pakistan	11.7	93.1	32.8	8.1	24.9	20.6	6.5	9.1
Quintile - 1	0.8	82.2	6.1	0.5	4.3	2.8	0.5	0.8
Quintile - 2	2.7	90.9	14.3	1.9	9.9	6.5	1.5	2.2
Quintile - 3	7.2	95.6	26.4	4.8	18.0	13.4	3.8	4.7
Quintile - 4	12.1	97.6	42.8	8.2	30.5	25.1	6.5	9.3
Quintile - 5	34.9	99.3	72.6	23.5	58.3	52.1	18.9	26.9
Pakistan-Rural	6.9	91.1	23.3	4.7	17.2	12.9	3.8	5.0
Quintile - 1	0.6	79.9	4.6	0.4	3.2	2.1	0.4	0.6
Quintile - 2	1.6	87.6	10.7	1.1	7.3	4.8	1.0	1.5
Quintile - 3	3.5	93.0	16.3	2.4	11.3	7.5	1.9	2.5
Quintile - 4	7.9	96.7	29.0	5.1	19.7	14.1	4.1	5.1
Quintile - 5	22.0	99.1	58.6	14.0	42.3	34.6	11.2	14.4
Pakistan-Urban	19.4	96.5	47.8	13.4	37.5	33.1	10.7	15.8
Quintile - 1	3.8	90.3	15.8	2.7	10.8	8.4	2.0	2.8
Quintile - 2	7.7	95.3	29.6	5.3	21.1	17.9	4.0	6.4
Quintile - 3	12.4	98.1	45.8	8.5	33.5	28.6	6.8	11.0
Quintile - 4	21.1	99.0	60.4	13.8	45.9	40.3	11.1	18.3
Quintile - 5	52.6	99.7	87.6	36.7	75.1	69.5	29.7	40.2
Punjab	12.9	93.9	34.4	9.1	26.7	21.7	7.0	8.9
Quintile - 1	0.9	83.2	6.5	0.8	3.7	2.3	0.6	0.5
Quintile - 2	3.3	93.0	14.4	2.6	9.6	6.7	1.9	1.9
Quintile - 3	7.7	96.3	28.5	5.4	20.4	15.2	4.0	5.0
Quintile - 4	14.3	97.9	46.8	9.4	34.5	27.3	7.1	9.7
Quintile - 5	38.0	99.3	75.7	25.8	61.5	53.8	20.1	25.8
Punjab-Rural	7.6	92.4	25.1	5.4	18.6	14.4	4.1	5.2
Quintile - 1	0.8	81.0	5.1	0.6	2.5	1.7	0.5	0.3
Quintile - 2	1.5	89.3	9.5	1.4	6.0	3.9	1.0	1.0
Quintile - 3	4.4	94.9	17.6	3.4	12.1	8.6	2.4	2.4
Quintile - 4	8.5	97.9	32.0	5.9	22.7	16.7	4.4	5.6
Quintile - 5	23.4	99.2	63.0	15.1	47.3	39.5	11.5	15.6
Punjab-Urban	21.6	96.5	49.6	15.0	39.6	33.4	11.6	14.8
Quintile - 1	4.2	90.7	17.0	3.3	11.3	8.5	2.2	2.6
Quintile - 2	9.9	95.3	31.9	6.6	24.1	18.7	4.6	6.2

Regions/ Quintiles	Access			Usage			Attainment	Transformation
	Access to computer	Access to Mobile	Access to Internet	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
	2020	2020	2020	2020	2020	2020	2020	2020
Quintile - 3	15.3	98.0	47.5	9.9	35.8	28.5	7.6	10.9
Quintile - 4	25.5	99.0	64.3	16.7	49.1	41.2	12.7	16.9
Quintile - 5	53.7	99.6	88.6	38.5	76.5	69.3	30.6	37.3
Sindh	10.2	90.9	31.9	6.7	24.0	23.5	5.8	11.3
Quintile - 1	0.3	76.8	3.0	0.2	1.9	1.5	0.2	0.4
Quintile - 2	1.7	84.9	12.1	1.2	7.9	6.2	1.1	1.8
Quintile - 3	5.5	93.4	24.8	3.5	15.5	14.6	3.2	5.1
Quintile - 4	7.7	97.7	41.2	4.9	28.3	28.7	4.2	10.4
Quintile - 5	33.6	99.5	73.2	22.3	61.4	61.0	18.9	36.3
Sindh-Rural	3.0	84.1	14.3	1.9	9.9	8.6	1.7	3.1
Quintile - 1	0.2	74.2	1.2	0.2	0.8	0.7	0.2	0.2
Quintile - 2	0.5	78.5	4.8	0.3	3.0	2.4	0.3	0.5
Quintile - 3	1.0	84.2	8.7	0.7	5.3	4.3	0.7	1.1
Quintile - 4	2.4	86.7	16.3	1.7	11.1	8.6	1.6	2.7
Quintile - 5	10.9	96.4	39.9	5.9	26.6	25.0	5.4	9.8
Sindh-Urban	15.9	96.3	46.1	10.6	35.4	35.4	9.0	18.0
Quintile - 1	3.2	88.3	14.8	2.2	8.9	9.3	1.9	2.9
Quintile - 2	5.3	95.5	27.3	3.4	17.6	17.8	2.9	5.9
Quintile - 3	7.3	98.2	43.9	4.9	30.0	29.9	4.1	10.9
Quintile - 4	14.3	99.0	56.6	9.0	41.9	42.2	7.6	19.4
Quintile - 5	49.0	99.9	85.7	33.7	77.2	76.3	28.5	50.3
Khyber Pakhtunkhwa	12.4	94.9	32.7	8.0	22.3	15.8	7.0	7.8
Quintile - 1	1.4	87.3	8.3	0.8	5.9	3.3	0.9	1.2
Quintile - 2	3.5	94.2	17.9	2.1	11.8	7.0	1.8	2.5
Quintile - 3	7.8	96.4	27.3	4.1	18.0	11.6	3.6	4.5
Quintile - 4	14.8	98.2	44.1	9.0	26.8	19.2	7.8	9.1
Quintile - 5	37.4	99.3	71.1	23.3	47.1	36.4	20.2	21.0
Khyber Pakhtunkhwa- Rural	9.7	94.5	29.1	6.0	19.4	13.5	5.4	6.2
Quintile - 1	1.3	86.6	7.9	0.7	5.8	3.2	0.9	1.1
Quintile - 2	3.0	93.3	16.5	1.8	10.4	6.4	1.7	2.4
Quintile - 3	5.9	96.1	22.7	3.2	15.5	9.5	2.9	3.5
Quintile - 4	11.6	97.5	37.1	6.3	22.8	15.9	5.5	7.0
Quintile - 5	28.7	99.4	65.0	17.6	41.3	31.6	15.5	16.4

Regions/ Quintiles	Access			Usage			Attainment	Transformation
	Access to computer	Access to Mobile	Access to Internet	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
	2020	2020	2020	2020	2020	2020	2020	2020
Khyber Pakhtunkhwa- Urban	26.5	97.5	52.1	17.7	36.1	27.0	15.0	15.7
Quintile - 1	5.2	94.1	15.4	2.5	12.2	6.5	2.2	2.2
Quintile - 2	14.4	96.1	37.5	10.1	22.6	16.4	8.1	8.6
Quintile - 3	22.6	99.0	51.0	13.6	35.2	22.7	11.8	11.5
Quintile - 4	34.2	99.3	71.8	20.5	45.2	32.0	17.1	18.4
Quintile - 5	60.7	99.8	92.4	41.3	65.1	57.1	35.7	37.7
Balochistan	6.5	91.9	21.2	4.1	20.7	13.3	3.2	5.9
Quintile - 1	0.1	76.9	3.5	0.1	3.7	1.5	0.1	0.9
Quintile - 2	0.8	93.6	7.7	0.2	7.8	4.7	0.2	1.5
Quintile - 3	2.4	95.9	17.8	0.8	16.5	9.7	0.7	3.7
Quintile - 4	7.6	97.8	30.1	4.0	24.8	15.4	2.9	6.8
Quintile - 5	22.4	98.1	50.4	14.3	47.4	32.9	11.1	15.6
Balochistan- Rural	4.0	90.3	17.1	2.3	16.9	9.9	1.7	4.1
Quintile - 1	0.1	74.7	3.1	0.0	3.0	1.4	0.1	1.0
Quintile - 2	0.4	89.3	6.4	0.0	6.4	3.4	0.0	1.1
Quintile - 3	1.4	95.2	12.3	0.4	12.6	7.7	0.4	2.4
Quintile - 4	4.3	98.0	23.5	2.1	20.3	12.1	1.5	4.9
Quintile - 5	16.0	98.8	46.8	8.6	39.8	23.8	6.3	10.6
Balochistan- Urban	13.0	96.1	32.0	8.5	30.4	21.9	6.7	10.4
Quintile - 1	1.9	91.4	7.5	0.3	6.7	4.1	0.3	2.0
Quintile - 2	4.6	95.9	18.5	1.5	17.3	10.2	1.3	4.6
Quintile - 3	8.8	97.3	26.9	5.0	23.9	16.4	4.2	6.6
Quintile - 4	15.2	97.6	39.8	10.7	39.4	25.3	7.3	10.5
Quintile - 5	32.6	98.5	64.4	23.4	61.2	50.8	19.4	27.0
Azad Jammu & Kashmir	10.4	96.6	41.7	6.9	31.6	25.0	5.4	9.4
Quintile - 1	3.6	92.5	8.5	2.3	8.9	5.8	1.7	2.1
Quintile - 2	7.7	96.3	24.1	5.7	19.0	13.2	4.4	5.4
Quintile - 3	9.4	98.3	44.1	6.8	30.2	24.4	5.3	8.8
Quintile - 4	10.4	96.7	58.2	6.1	42.3	35.7	5.2	11.6
Quintile - 5	20.6	98.8	72.0	12.9	55.5	44.5	10.0	18.6
Gilgit-Baltistan	16.2	92.1	30.0	12.6	23.2	17.2	8.2	7.1
Quintile - 1	1.4	75.6	6.8	1.4	5.7	4.5	1.1	1.0
Quintile - 2	4.2	92.6	18.3	3.7	11.3	9.3	2.7	2.4

Regions/ Quintiles	Access			Usage			Attainment	Transformation
	Access to computer	Access to Mobile	Access to Internet	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
	2020	2020	2020	2020	2020	2020	2020	2020
Quintile - 3	13.9	95.6	27.6	8.8	18.4	14.2	4.3	3.9
Quintile - 4	18.2	98.5	39.3	15.3	28.3	19.3	10.4	8.6
Quintile - 5	43.1	99.3	57.9	31.6	49.0	36.3	21.0	18.2

Definitions	Main Data Sources
<p>Access to computer The percentage of household with access to computer/laptop/tablet.</p> <p>Access to Mobile The percentage of household with access to mobile phones.</p> <p>Access to Internet The percentage of household with access to internet.</p> <p>Usage of computer The percentage of population age 10 to 49 used computer/laptop/tablet in last three months.</p> <p>Usage of Smart Mobile The percentage of population age 10 to 49 used smart mobiles in last three months.</p> <p>Usage to Internet The percentage of population age 10 to 49 used internet services in last three months.</p> <p>ICT Skills The percentage of population age 10 to 49 who have carried out at least one of nine specific computer related activities during the last three months. See Technical Note 3 (this report) for details definition.</p> <p>Purpose to use internet The percentage of population age 10 to 49 use internet for the purpose of education, research, information seeking, health, Business, online shopping, and banking.</p>	<p>Columns 1-8: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.</p>

Table 3 Gender Digital Development Index and its Components at national, provincial, and urban/rural levels 2020

Regions	Usage Index		Attainment Index		Transformation Index		Digital Development Index		Gender Digital Development Index	Absolute deviation of GDDI ^a		
	Male	Female	Male	Female	Male	Female	Male	Female				
	Value		Value		Value		Value				Value	Value
	2020		2020		2020		2020				2020	2020
Pakistan	0.242	0.151	0.163	0.095	0.210	0.092	0.202	0.110	0.541	45.9		
Rural	0.166	0.087	0.100	0.052	0.127	0.038	0.128	0.056	0.434	56.6		
Urban	0.362	0.255	0.262	0.165	0.340	0.182	0.318	0.197	0.619	38.1		
Punjab	0.249	0.175	0.159	0.120	0.197	0.099	0.198	0.128	0.643	35.7		
Rural	0.171	0.110	0.095	0.069	0.121	0.052	0.125	0.073	0.583	41.7		
Urban	0.370	0.283	0.259	0.203	0.315	0.177	0.311	0.217	0.696	30.4		
Sindh	0.239	0.147	0.163	0.063	0.247	0.124	0.213	0.105	0.492	50.8		
Rural	0.105	0.035	0.058	0.009	0.083	0.015	0.080	0.017	0.211	78.9		
Urban	0.348	0.237	0.248	0.105	0.379	0.212	0.320	0.174	0.545	45.5		
Khyber Pakhtunkhwa	0.246	0.099	0.203	0.080	0.218	0.045	0.222	0.071	0.320	68.0		
Rural	0.210	0.078	0.162	0.054	0.182	0.027	0.184	0.049	0.264	73.6		
Urban	0.414	0.202	0.393	0.207	0.390	0.133	0.399	0.177	0.444	55.6		
Balochistan	0.183	0.079	0.092	0.028	0.152	0.034	0.137	0.042	0.311	68.9		
Rural	0.141	0.055	0.054	0.012	0.112	0.016	0.095	0.022	0.235	76.5		
Urban	0.288	0.140	0.188	0.070	0.252	0.079	0.239	0.092	0.384	61.6		
Azad Jammu and Kashmir	0.289	0.178	0.125	0.095	0.239	0.093	0.205	0.116	0.567	43.3		
Gilgit Baltistan	0.294	0.122	0.223	0.109	0.186	0.055	0.230	0.090	0.391	60.9		

Notes		Definitions	Main Data Sources
a	Calculated as $100 * \text{IGDI} - 11$.	<p>Gender Development Index (GDI) Ratio of female to male Human Development Index (HDI) values. See Technical Note 3 (this report) for details on how the GDI is calculated.</p> <p>Digital Development Index (DDI) A composite index measuring average achievement in three dimensions of digital development for gender – usage, attainment, and transformation. See Technical Note 3 (this report) for details on how the DDI is calculated.</p>	Columns 1-10: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.

Table 3A Gender Digital Development Index indicator values at national, provincial, and urban/rural levels 2020

Regions	Usage						Attainment		Transformation	
	Usage of computer		Usage of Smart Mobile		Usage to Internet		ICT Skills		Purpose to use internet	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	Value						Value		Value	
	2020						2020		2020	
Pakistan	9.9	6.2	29.7	20.1	26.4	14.7	8.2	4.7	12.6	5.5
Rural	6.2	3.3	21.5	12.8	18.0	7.8	5.0	2.6	7.6	2.3
Urban	15.7	11.0	42.6	32.1	39.7	26.1	13.1	8.3	20.4	10.9
Punjab	10.3	7.9	30.7	22.7	26.7	16.7	8.0	6.0	11.8	6.0
Rural	6.4	4.5	22.1	15.2	18.7	10.3	4.8	3.4	7.3	3.1
Urban	16.5	13.5	44.0	35.0	39.3	27.3	13.0	10.2	18.9	10.6
Sindh	8.8	4.4	28.2	19.4	28.9	17.4	8.2	3.1	14.8	7.5
Rural	3.1	0.5	13.1	6.2	13.3	3.5	2.9	0.5	5.0	0.9
Urban	13.5	7.5	40.3	29.9	41.5	28.6	12.4	5.3	22.7	12.7
Khyber Pakhtunkhwa	11.6	4.6	30.1	14.7	24.5	7.4	10.1	4.0	13.1	2.7
Rural	9.1	3.0	26.6	12.4	21.3	6.0	8.1	2.7	10.9	1.6
Urban	23.0	12.2	46.3	25.8	39.5	14.4	19.7	10.3	23.4	8.0
Balochistan	5.8	2.0	26.2	14.1	19.1	6.3	4.6	1.4	9.1	2.0
Rural	3.5	1.0	21.9	10.9	14.7	4.1	2.7	0.6	6.7	1.0
Urban	11.7	4.6	37.0	22.4	30.1	11.9	9.4	3.5	15.1	4.8
Azad Jammu and Kashmir	7.9	6.1	39.8	25.1	33.7	18.3	6.2	4.7	14.4	5.6
Gilgit Baltistan	16.3	9.2	32.5	14.5	28.4	6.7	11.1	5.4	11.2	3.3

Definitions**Usage of computer**

The percentage of population age 10 to 49 used computer/laptop/tablet in last three months.

Usage of Smart Mobile

The percentage of population age 10 to 49 used smart mobiles in last three months.

Usage to Internet

The percentage of population age 10 to 49 used internet services in last three months.

ICT Skills

The percentage of population age 10 to 49 who have carried out at least one of nine specific computer related activities during the last three months. See Technical Note 2 (this report) for details definition.

Purpose to use internet

The percentage of population age 10 to 49 use internet for the purpose of education, research, information seeking, health, Business, online shopping, and banking.

Main Data Sources

Columns 1-10: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.

Table 3B Gender Digital Development Index and its Components at national, provincial, and urban/rural level by wealth quintiles 2020

Regions/ Quintiles	Usage Index		Attainment Index		Transformation Index		Digital Development Index		Gender Digital Development Index	Absolute deviation of GDDI ^a
	Male	Female	Male	Female	Male	Female	Male	Female		
	Value		Value		Value		Value			
	2020		2020		2020		2020			
Pakistan	0.242	0.151	0.163	0.095	0.210	0.092	0.202	0.110	0.541	45.9
Quintile - 1	0.041	0.011	0.017	0.004	0.025	0.001	0.026	0.004	0.154	84.6
Quintile - 2	0.099	0.030	0.049	0.011	0.065	0.006	0.068	0.013	0.189	81.1
Quintile - 3	0.183	0.079	0.104	0.047	0.133	0.025	0.136	0.046	0.334	66.6
Quintile - 4	0.293	0.168	0.166	0.092	0.232	0.078	0.224	0.106	0.475	52.5
Quintile - 5	0.565	0.433	0.458	0.299	0.568	0.328	0.528	0.349	0.661	33.9
Pakistan-Rural	0.166	0.087	0.100	0.052	0.127	0.038	0.128	0.056	0.434	56.6
Quintile - 1	0.031	0.008	0.012	0.003	0.018	0.001	0.019	0.003	0.144	85.6
Quintile - 2	0.072	0.020	0.032	0.007	0.047	0.003	0.048	0.007	0.155	84.5
Quintile - 3	0.114	0.038	0.060	0.016	0.074	0.008	0.080	0.017	0.212	78.8
Quintile - 4	0.198	0.086	0.115	0.051	0.146	0.026	0.149	0.049	0.326	67.4
Quintile - 5	0.411	0.262	0.280	0.170	0.348	0.140	0.342	0.184	0.539	46.1
Pakistan-Urban	0.362	0.255	0.262	0.165	0.340	0.182	0.318	0.197	0.619	38.1
Quintile - 1	0.113	0.043	0.056	0.024	0.076	0.014	0.078	0.024	0.307	69.3
Quintile - 2	0.207	0.109	0.110	0.050	0.157	0.051	0.153	0.065	0.425	57.5
Quintile - 3	0.313	0.192	0.168	0.102	0.262	0.099	0.240	0.125	0.520	48.0
Quintile - 4	0.428	0.299	0.273	0.167	0.407	0.199	0.362	0.215	0.594	40.6
Quintile - 5	0.753	0.618	0.715	0.473	0.807	0.532	0.757	0.537	0.710	29.0
Punjab	0.249	0.175	0.159	0.120	0.197	0.099	0.198	0.128	0.643	35.7
Quintile - 1	0.037	0.012	0.019	0.006	0.014	0.003	0.022	0.006	0.268	73.2
Quintile - 2	0.096	0.042	0.050	0.026	0.053	0.011	0.063	0.023	0.357	64.3
Quintile - 3	0.193	0.106	0.095	0.066	0.123	0.043	0.131	0.067	0.512	48.8
Quintile - 4	0.308	0.210	0.157	0.129	0.228	0.098	0.223	0.138	0.621	37.9
Quintile - 5	0.580	0.476	0.455	0.350	0.540	0.323	0.522	0.377	0.722	27.8
Punjab-Rural	0.171	0.110	0.095	0.069	0.121	0.052	0.125	0.073	0.583	41.7
Quintile - 1	0.027	0.007	0.016	0.005	0.009	0.002	0.016	0.004	0.243	75.7
Quintile - 2	0.060	0.021	0.031	0.009	0.029	0.005	0.038	0.010	0.262	73.8
Quintile - 3	0.120	0.056	0.061	0.037	0.067	0.014	0.079	0.031	0.392	60.8
Quintile - 4	0.213	0.117	0.106	0.073	0.142	0.049	0.147	0.075	0.506	49.4
Quintile - 5	0.429	0.322	0.259	0.204	0.354	0.177	0.340	0.226	0.666	33.4
Punjab-Urban	0.370	0.283	0.259	0.203	0.315	0.177	0.311	0.217	0.696	30.4
Quintile - 1	0.114	0.054	0.054	0.035	0.064	0.023	0.073	0.035	0.479	52.1
Quintile - 2	0.219	0.138	0.108	0.078	0.147	0.058	0.151	0.085	0.564	43.6
Quintile - 3	0.317	0.222	0.169	0.136	0.256	0.107	0.240	0.148	0.617	38.3
Quintile - 4	0.446	0.340	0.277	0.230	0.361	0.200	0.355	0.250	0.706	29.4
Quintile - 5	0.753	0.646	0.694	0.529	0.751	0.492	0.732	0.552	0.754	24.6
Sindh	0.239	0.147	0.163	0.063	0.247	0.124	0.213	0.105	0.492	50.8

Regions/ Quintiles	Usage Index		Attainment Index		Transformation Index		Digital Development Index		Gender Digital Development Index	Absolute deviation of GDI ^a
	Male	Female	Male	Female	Male	Female	Male	Female		
	Value		Value		Value		Value			
	2020		2020		2020		2020			
Quintile - 1	0.021	0.004	0.008	0.001	0.011	0.000	0.012	0.001	0.073	92.7
Quintile - 2	0.082	0.021	0.038	0.004	0.053	0.003	0.055	0.006	0.112	88.8
Quintile - 3	0.175	0.058	0.106	0.016	0.144	0.020	0.139	0.026	0.191	80.9
Quintile - 4	0.271	0.157	0.122	0.040	0.245	0.093	0.201	0.083	0.414	58.6
Quintile - 5	0.600	0.458	0.509	0.235	0.729	0.469	0.606	0.370	0.610	39.0
Sindh-Rural	0.105	0.035	0.058	0.009	0.083	0.015	0.080	0.017	0.211	78.9
Quintile - 1	0.010	0.001	0.006	0.000	0.007	0.000	0.008	0.000	0.050	95.0
Quintile - 2	0.031	0.006	0.011	0.001	0.016	0.000	0.018	0.002	0.089	91.1
Quintile - 3	0.056	0.013	0.024	0.003	0.033	0.003	0.035	0.005	0.135	86.5
Quintile - 4	0.114	0.032	0.056	0.005	0.081	0.003	0.080	0.008	0.098	90.2
Quintile - 5	0.284	0.115	0.175	0.033	0.252	0.063	0.232	0.062	0.268	73.2
Sindh-Urban	0.348	0.237	0.248	0.105	0.379	0.212	0.320	0.174	0.545	45.5
Quintile - 1	0.108	0.033	0.064	0.009	0.083	0.010	0.083	0.014	0.174	82.6
Quintile - 2	0.180	0.090	0.092	0.019	0.149	0.042	0.135	0.042	0.311	68.9
Quintile - 3	0.283	0.165	0.117	0.045	0.261	0.093	0.205	0.088	0.428	57.2
Quintile - 4	0.391	0.262	0.216	0.081	0.420	0.215	0.329	0.166	0.506	49.4
Quintile - 5	0.775	0.618	0.760	0.366	0.986	0.683	0.834	0.536	0.643	35.7
Khyber Pakhtunkhwa	0.246	0.099	0.203	0.080	0.218	0.045	0.222	0.071	0.320	68.0
Quintile - 1	0.054	0.016	0.029	0.009	0.039	0.001	0.039	0.006	0.141	85.9
Quintile - 2	0.117	0.031	0.058	0.014	0.081	0.003	0.082	0.011	0.136	86.4
Quintile - 3	0.186	0.059	0.119	0.027	0.140	0.010	0.146	0.025	0.172	82.8
Quintile - 4	0.304	0.107	0.237	0.079	0.274	0.033	0.271	0.066	0.242	75.8
Quintile - 5	0.548	0.271	0.550	0.261	0.535	0.170	0.544	0.229	0.421	57.9
Khyber Pakhtunkhwa-Rural	0.210	0.078	0.162	0.054	0.182	0.027	0.184	0.049	0.264	73.6
Quintile - 1	0.052	0.017	0.026	0.009	0.038	0.001	0.037	0.005	0.130	87.0
Quintile - 2	0.106	0.026	0.054	0.012	0.076	0.002	0.076	0.009	0.119	88.1
Quintile - 3	0.156	0.046	0.097	0.020	0.110	0.007	0.119	0.019	0.158	84.2
Quintile - 4	0.249	0.083	0.174	0.048	0.219	0.020	0.212	0.043	0.202	79.8
Quintile - 5	0.480	0.209	0.453	0.176	0.457	0.101	0.463	0.155	0.334	66.6
Khyber Pakhtunkhwa-Urban	0.414	0.202	0.393	0.207	0.390	0.133	0.399	0.177	0.444	55.6
Quintile - 1	0.115	0.036	0.054	0.032	0.069	0.002	0.075	0.014	0.183	81.7
Quintile - 2	0.284	0.086	0.224	0.098	0.244	0.039	0.250	0.069	0.277	72.3
Quintile - 3	0.372	0.162	0.313	0.158	0.313	0.068	0.331	0.120	0.362	63.8
Quintile - 4	0.510	0.235	0.446	0.240	0.491	0.127	0.482	0.193	0.400	60.0
Quintile - 5	0.790	0.483	0.930	0.498	0.834	0.421	0.850	0.466	0.549	45.1
Balochistan	0.183	0.079	0.092	0.028	0.152	0.034	0.137	0.042	0.311	68.9

Regions/ Quintiles	Usage Index		Attainment Index		Transformation Index		Digital Development Index		Gender Digital Development Index	Absolute deviation of GDDI ^a		
	Male	Female	Male	Female	Male	Female	Male	Female				
	Value		Value		Value		Value				Value	Value
	2020		2020		2020		2020				2020	2020
Quintile - 1	0.026	0.008	0.002	0.001	0.026	0.001	0.010	0.002	0.216	78.4		
Quintile - 2	0.063	0.018	0.004	0.001	0.044	0.004	0.023	0.004	0.189	81.1		
Quintile - 3	0.132	0.044	0.023	0.003	0.106	0.007	0.068	0.010	0.142	85.8		
Quintile - 4	0.221	0.074	0.094	0.011	0.187	0.020	0.157	0.025	0.161	83.9		
Quintile - 5	0.437	0.238	0.309	0.118	0.366	0.130	0.367	0.154	0.420	58.0		
Balochistan-Rural	0.141	0.055	0.054	0.012	0.112	0.016	0.095	0.022	0.235	76.5		
Quintile - 1	0.022	0.005	0.002	0.001	0.031	0.000	0.010	0.001	0.105	89.5		
Quintile - 2	0.049	0.014	0.001	0.001	0.033	0.002	0.011	0.002	0.204	79.6		
Quintile - 3	0.099	0.034	0.013	0.002	0.066	0.007	0.044	0.008	0.184	81.6		
Quintile - 4	0.175	0.052	0.051	0.003	0.142	0.008	0.108	0.010	0.093	90.7		
Quintile - 5	0.337	0.164	0.187	0.052	0.270	0.062	0.257	0.081	0.315	68.5		
Balochistan-Urban	0.288	0.140	0.188	0.070	0.252	0.079	0.239	0.092	0.384	61.6		
Quintile - 1	0.057	0.014	0.008	0.003	0.059	0.002	0.030	0.005	0.158	84.2		
Quintile - 2	0.146	0.043	0.040	0.008	0.131	0.010	0.091	0.015	0.163	83.7		
Quintile - 3	0.229	0.079	0.133	0.023	0.182	0.020	0.177	0.033	0.189	81.1		
Quintile - 4	0.375	0.152	0.229	0.043	0.277	0.048	0.288	0.068	0.236	76.4		
Quintile - 5	0.603	0.385	0.502	0.254	0.581	0.296	0.560	0.307	0.547	45.3		
Azad Jammu & Kashmir	0.289	0.178	0.125	0.095	0.239	0.093	0.205	0.116	0.567	43.3		
Quintile - 1	0.116	0.021	0.052	0.019	0.076	0.006	0.077	0.013	0.173	82.7		
Quintile - 2	0.204	0.088	0.094	0.085	0.161	0.032	0.145	0.062	0.428	57.2		
Quintile - 3	0.268	0.181	0.083	0.125	0.219	0.090	0.169	0.127	0.747	25.3		
Quintile - 4	0.331	0.269	0.097	0.108	0.284	0.129	0.209	0.155	0.744	25.6		
Quintile - 5	0.497	0.326	0.276	0.134	0.431	0.205	0.390	0.208	0.533	46.7		
Gilgit-Baltistan	0.294	0.122	0.223	0.109	0.186	0.055	0.230	0.090	0.391	60.9		
Quintile - 1	0.082	0.006	0.045	0.002	0.036	0.000	0.051	0.001	0.024	97.6		
Quintile - 2	0.153	0.030	0.094	0.017	0.072	0.010	0.101	0.017	0.169	83.1		
Quintile - 3	0.235	0.082	0.126	0.048	0.116	0.016	0.151	0.040	0.264	73.6		
Quintile - 4	0.355	0.144	0.254	0.166	0.235	0.061	0.277	0.113	0.410	59.0		
Quintile - 5	0.602	0.326	0.555	0.291	0.439	0.175	0.527	0.255	0.483	51.7		

Notes		Definitions	Main Data Sources
a	Calculated as 100 * IGD1 - 1I.	<p>Gender Development Index (GDI) Ratio of female to male Human Development Index (HDI) values. See Technical Note 3 (this report) for details on how the GDI is calculated.</p> <p>Digital Development Index (DDI) A composite index measuring average achievement in three dimensions of digital development for gender -- usage, attainment, and transformation. See Technical Note 3 (this report) for details on how the DDI is calculated.</p>	Columns 1-10: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.

Table 3C Gender Digital Development Index indicator values at national, provincial, and urban/rural level by wealth quintiles 2020

Regions	Usage						Attainment		Transformation	
	Usage of computer		Usage of Smart Mobile		Usage to Internet		ICT Skills		Purpose to use internet	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	Value						Value		Value	
	2020						2020		2020	
Pakistan	9.9	6.2	29.7	20.1	26.4	14.7	8.2	4.7	12.6	5.5
Quintile - 1	0.9	0.1	6.1	2.5	4.8	0.7	0.8	0.2	1.5	0.1
Quintile - 2	3.0	0.7	13.9	5.8	10.7	2.1	2.4	0.6	3.9	0.4
Quintile - 3	6.6	2.9	23.8	12.3	20.3	6.6	5.2	2.4	8.0	1.5
Quintile - 4	10.3	6.0	37.3	23.7	33.5	16.5	8.3	4.6	13.9	4.7
Quintile - 5	27.3	19.7	64.1	52.5	59.7	44.5	22.9	14.9	34.1	19.7
Pakistan-Rural	6.2	3.3	21.5	12.8	18.0	7.8	5.0	2.6	7.6	2.3
Quintile - 1	0.6	0.1	4.6	1.8	3.6	0.4	0.6	0.1	1.1	0.1
Quintile - 2	1.9	0.3	10.4	4.2	8.0	1.4	1.6	0.3	2.8	0.2
Quintile - 3	3.8	1.0	15.7	6.8	12.2	2.7	3.0	0.8	4.4	0.5
Quintile - 4	7.2	3.1	26.1	13.5	21.4	7.0	5.7	2.6	8.8	1.6
Quintile - 5	17.3	11.0	50.1	35.0	44.4	25.5	14.0	8.5	20.9	8.4
Pakistan-Urban	15.7	11.0	42.6	32.1	39.7	26.1	13.1	8.3	20.4	10.9
Quintile - 1	3.6	1.7	14.6	6.7	13.1	3.2	2.8	1.2	4.6	0.8
Quintile - 2	6.9	3.6	26.2	15.5	24.4	11.0	5.5	2.5	9.4	3.1
Quintile - 3	10.2	6.6	40.0	26.6	36.9	19.8	8.4	5.1	15.7	5.9
Quintile - 4	16.4	11.1	52.4	39.2	48.4	31.8	13.7	8.4	24.4	12.0
Quintile - 5	42.0	31.3	79.9	70.2	75.9	63.0	35.7	23.6	48.4	31.9
Punjab	10.3	7.9	30.7	22.7	26.7	16.7	8.0	6.0	11.8	6.0
Quintile - 1	1.3	0.4	5.1	2.2	3.9	0.8	1.0	0.3	0.9	0.2
Quintile - 2	3.5	1.8	12.7	6.4	10.2	3.2	2.5	1.3	3.2	0.6
Quintile - 3	6.6	4.3	25.6	15.4	21.3	9.3	4.8	3.3	7.4	2.6
Quintile - 4	10.5	8.4	40.3	28.9	34.8	20.1	7.9	6.4	13.7	5.9
Quintile - 5	28.5	23.1	66.1	56.9	60.5	47.3	22.8	17.5	32.4	19.4
Punjab-Rural	6.4	4.5	22.1	15.2	18.7	10.3	4.8	3.4	7.3	3.1
Quintile - 1	1.0	0.2	3.6	1.4	2.8	0.5	0.8	0.2	0.6	0.1
Quintile - 2	2.1	0.6	8.3	3.7	6.3	1.5	1.5	0.5	1.8	0.3
Quintile - 3	4.5	2.3	15.8	8.6	12.8	4.5	3.0	1.9	4.0	0.9
Quintile - 4	7.2	4.6	28.5	17.1	23.4	10.4	5.3	3.6	8.5	2.9
Quintile - 5	16.9	13.5	53.3	41.9	47.4	32.3	13.0	10.2	21.2	10.6
Punjab-Urban	16.5	13.5	44.0	35.0	39.3	27.3	13.0	10.2	18.9	10.6
Quintile - 1	4.0	2.6	14.8	7.7	12.7	4.2	2.7	1.7	3.8	1.4

Regions	Usage						Attainment		Transformation	
	Usage of computer		Usage of Smart Mobile		Usage to Internet		ICT Skills		Purpose to use internet	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	Value						Value		Value	
	2020						2020		2020	
Quintile - 2	7.6	5.4	28.6	19.4	24.3	13.0	5.4	3.9	8.8	3.5
Quintile - 3	10.8	9.1	41.3	30.4	35.9	21.0	8.5	6.8	15.4	6.4
Quintile - 4	18.5	14.9	54.9	43.3	48.3	34.0	13.9	11.5	21.6	12.0
Quintile - 5	42.1	34.8	80.4	72.6	75.3	63.2	34.7	26.5	45.0	29.5
Sindh	8.8	4.4	28.2	19.4	28.9	17.4	8.2	3.1	14.8	7.5
Quintile - 1	0.4	0.0	2.7	0.9	2.8	0.2	0.4	0.0	0.7	0.0
Quintile - 2	2.1	0.2	10.9	4.6	10.4	1.4	1.9	0.2	3.2	0.2
Quintile - 3	5.6	1.0	20.9	9.6	22.3	6.0	5.3	0.8	8.6	1.2
Quintile - 4	6.5	3.1	34.1	21.7	36.4	20.2	6.1	2.0	14.7	5.6
Quintile - 5	27.7	16.5	66.8	55.5	67.0	54.5	25.4	11.7	43.7	28.2
Sindh-Rural	3.1	0.5	13.1	6.2	13.3	3.5	2.9	0.5	5.0	0.9
Quintile - 1	0.3	0.0	1.3	0.3	1.2	0.0	0.3	0.0	0.4	0.0
Quintile - 2	0.5	0.0	4.2	1.6	4.2	0.3	0.5	0.1	1.0	0.0
Quintile - 3	1.3	0.1	7.4	3.0	7.3	0.8	1.2	0.1	2.0	0.2
Quintile - 4	3.1	0.3	15.0	6.8	14.1	2.4	2.8	0.2	4.9	0.2
Quintile - 5	9.1	2.1	34.2	18.1	35.7	12.8	8.7	1.7	15.1	3.8
Sindh-Urban	13.5	7.5	40.3	29.9	41.5	28.6	12.4	5.3	22.7	12.7
Quintile - 1	3.5	0.7	12.2	5.2	14.5	3.5	3.2	0.4	5.0	0.6
Quintile - 2	4.8	1.8	22.1	12.7	23.9	11.2	4.6	1.0	8.9	2.5
Quintile - 3	6.4	3.2	36.3	23.0	38.1	20.9	5.9	2.2	15.7	5.6
Quintile - 4	11.8	5.9	48.4	34.7	49.3	34.2	10.8	4.1	25.2	12.9
Quintile - 5	41.4	25.5	82.0	72.0	81.4	70.8	38.0	18.3	59.1	41.0
Khyber Pakhtunkhwa	11.6	4.6	30.1	14.7	24.5	7.4	10.1	4.0	13.1	2.7
Quintile - 1	1.3	0.2	8.0	3.8	5.9	0.8	1.4	0.5	2.3	0.1
Quintile - 2	3.4	0.7	17.5	6.0	12.1	2.0	2.9	0.7	4.9	0.2
Quintile - 3	6.7	1.6	25.2	10.9	19.3	4.0	6.0	1.3	8.4	0.6
Quintile - 4	13.7	4.5	37.3	16.6	31.0	8.0	11.9	4.0	16.5	2.0
Quintile - 5	31.5	15.2	59.8	34.6	51.9	21.3	27.5	13.1	32.1	10.2
Khyber Pakhtunkhwa-Rural	9.1	3.0	26.6	12.4	21.3	6.0	8.1	2.7	10.9	1.6
Quintile - 1	1.2	0.2	7.8	3.9	5.7	0.8	1.3	0.4	2.3	0.0
Quintile - 2	3.0	0.6	15.5	5.3	11.2	1.5	2.7	0.6	4.6	0.1
Quintile - 3	5.3	1.2	22.2	8.8	15.9	3.1	4.9	1.0	6.6	0.4

Regions	Usage						Attainment		Transformation	
	Usage of computer		Usage of Smart Mobile		Usage to Internet		ICT Skills		Purpose to use internet	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	Value						Value		Value	
	2020						2020		2020	
Quintile - 4	10.1	2.8	31.9	14.1	25.8	6.3	8.7	2.4	13.1	1.2
Quintile - 5	25.6	10.0	54.4	28.9	46.8	17.3	22.6	8.8	27.4	6.1
Khyber Pakhtunkhwa-Urban	23.0	12.2	46.3	25.8	39.5	14.4	19.7	10.3	23.4	8.0
Quintile - 1	3.3	1.7	17.4	6.8	11.5	1.3	2.7	1.6	4.1	0.1
Quintile - 2	14.5	5.6	32.9	12.0	28.1	4.4	11.2	4.9	14.6	2.4
Quintile - 3	18.3	8.7	45.5	24.6	35.5	9.5	15.6	7.9	18.8	4.1
Quintile - 4	27.1	14.1	58.8	31.9	49.2	15.2	22.3	12.0	29.4	7.6
Quintile - 5	52.0	30.6	77.3	52.9	73.2	41.0	46.5	24.9	50.1	25.2
Balochistan	5.8	2.0	26.2	14.1	19.1	6.3	4.6	1.4	9.1	2.0
Quintile - 1	0.1	0.0	5.2	1.9	2.6	0.3	0.1	0.1	1.6	0.1
Quintile - 2	0.2	0.1	11.1	3.9	7.4	1.5	0.2	0.1	2.6	0.2
Quintile - 3	1.3	0.1	22.2	9.6	15.1	3.2	1.1	0.1	6.3	0.4
Quintile - 4	6.3	1.0	32.4	15.2	23.5	5.3	4.7	0.6	11.2	1.2
Quintile - 5	19.3	8.1	55.5	37.6	43.4	20.1	15.4	5.9	21.9	7.8
Balochistan-Rural	3.5	1.0	21.9	10.9	14.7	4.1	2.7	0.6	6.7	1.0
Quintile - 1	0.1	0.0	4.3	1.3	2.3	0.3	0.1	0.1	1.8	0.0
Quintile - 2	0.1	0.0	9.0	3.2	5.4	1.0	0.0	0.0	2.0	0.1
Quintile - 3	0.7	0.1	17.0	7.3	11.7	2.8	0.6	0.1	4.0	0.4
Quintile - 4	3.6	0.2	27.3	11.8	19.1	3.5	2.6	0.1	8.5	0.5
Quintile - 5	12.1	4.3	48.2	29.4	32.8	12.5	9.4	2.6	16.2	3.7
Balochistan-Urban	11.7	4.6	37.0	22.4	30.1	11.9	9.4	3.5	15.1	4.8
Quintile - 1	0.4	0.1	9.5	3.4	7.0	0.6	0.4	0.1	3.5	0.1
Quintile - 2	2.3	0.4	23.8	9.4	16.2	2.8	2.0	0.4	7.8	0.6
Quintile - 3	7.8	1.6	30.7	15.4	25.0	5.8	6.6	1.2	10.9	1.2
Quintile - 4	16.1	4.1	48.2	28.5	37.5	10.3	11.5	2.2	16.6	2.9
Quintile - 5	29.9	15.6	69.1	51.8	61.9	37.6	25.1	12.7	34.9	17.7
Azad Jammu & Kashmir	7.9	6.1	39.8	25.1	33.7	18.3	6.2	4.7	14.4	5.6
Quintile - 1	3.8	1.2	16.1	3.5	12.5	0.9	2.6	1.0	4.6	0.3
Quintile - 2	6.7	5.0	28.3	11.7	21.8	6.3	4.7	4.2	9.6	1.9
Quintile - 3	5.6	7.8	38.3	23.6	32.7	17.7	4.1	6.2	13.1	5.4
Quintile - 4	5.5	6.6	47.7	38.5	42.3	31.1	4.8	5.4	17.0	7.8
Quintile - 5	16.6	9.7	65.2	47.1	56.1	34.4	13.8	6.7	25.9	12.3
Gilgit-Baltistan	16.3	9.2	32.5	14.5	28.4	6.7	11.1	5.4	11.2	3.3

Regions	Usage						Attainment		Transformation	
	Usage of computer		Usage of Smart Mobile		Usage to Internet		ICT Skills		Purpose to use internet	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	Value						Value		Value	
	2020						2020		2020	
Quintile - 1	2.9	0.1	10.4	1.4	9.4	0.1	2.2	0.1	2.2	0.0
Quintile - 2	6.1	1.5	17.9	5.1	17.7	1.5	4.7	0.8	4.3	0.6
Quintile - 3	10.9	6.7	27.2	9.9	25.2	3.4	6.3	2.4	7.0	1.0
Quintile - 4	19.4	11.7	40.8	17.1	33.2	6.8	12.7	8.3	14.1	3.7
Quintile - 5	39.4	24.3	62.1	36.7	53.0	20.6	27.7	14.5	26.3	10.5

Definitions	Main Data Sources
<p>Usage of computer The percentage of population age 10 to 49 used computer/laptop/tablet in last three months.</p> <p>Usage of Smart Mobile The percentage of population age 10 to 49 used smart mobiles in last three months.</p> <p>Usage to Internet The percentage of population age 10 to 49 used internet services in last three months.</p> <p>ICT Skills The percentage of population age 10 to 49 who have carried out at least one of nine specific computer related activities during the last three months. See Technical Note 2 (this report) for details definition.</p> <p>Purpose to use internet The percentage of population age 10 to 49 use internet for the purpose of education, research, information seeking, health, Business, online shopping, and banking.</p>	<p>Columns 1-10: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.</p>

Table 3D Gender Digital Development Index and its Components at national, and provincial level by age groups 2020

Regions/ Quintiles	Usage Index		Attainment Index		Transformation Index		Digital Development Index		Gender Digital Development Index	Absolute deviation of GDDIa		
	Male	Female	Male	Female	Male	Female	Male	Female				
	Value		Value		Value		Value				Value	Value
	2020		2020		2020		2020				2020	2020
Pakistan	0.242	0.151	0.163	0.095	0.210	0.092	0.202	0.110	0.541	45.9		
Age - 10-19	0.175	0.121	0.113	0.080	0.117	0.071	0.132	0.088	0.666	33.4		
Age - 20-29	0.345	0.209	0.247	0.158	0.316	0.139	0.300	0.166	0.553	44.7		
Age - 30 - 39	0.266	0.153	0.175	0.079	0.256	0.089	0.228	0.102	0.448	55.2		
Age - 40 - 49	0.205	0.107	0.134	0.038	0.204	0.061	0.178	0.063	0.352	64.8		
Punjab	0.249	0.175	0.159	0.120	0.197	0.099	0.198	0.128	0.643	35.7		
Age - 10-19	0.184	0.135	0.115	0.090	0.108	0.072	0.132	0.096	0.729	27.1		
Age - 20-29	0.361	0.256	0.252	0.213	0.305	0.162	0.303	0.207	0.683	31.7		
Age - 30 - 39	0.270	0.178	0.166	0.104	0.240	0.091	0.221	0.119	0.540	46.0		
Age - 40 - 49	0.194	0.116	0.106	0.041	0.178	0.060	0.154	0.066	0.426	57.4		
Sindh	0.239	0.147	0.163	0.063	0.247	0.124	0.213	0.105	0.492	50.8		
Age - 10-19	0.177	0.131	0.095	0.062	0.159	0.114	0.139	0.098	0.702	29.8		
Age - 20-29	0.309	0.183	0.211	0.089	0.328	0.156	0.278	0.136	0.492	50.8		
Age - 30 - 39	0.256	0.144	0.193	0.047	0.273	0.119	0.238	0.093	0.391	60.9		
Age - 40 - 49	0.239	0.121	0.191	0.040	0.272	0.096	0.231	0.077	0.333	66.7		
Khyber Pakhtunkhwa	0.246	0.099	0.203	0.080	0.218	0.045	0.222	0.071	0.320	68.0		
Age - 10-19	0.162	0.081	0.143	0.080	0.107	0.030	0.135	0.058	0.428	57.2		
Age - 20-29	0.388	0.132	0.337	0.116	0.370	0.068	0.364	0.101	0.278	72.2		
Age - 30 - 39	0.295	0.106	0.205	0.065	0.300	0.052	0.263	0.071	0.270	73.0		
Age - 40 - 49	0.201	0.070	0.153	0.033	0.200	0.027	0.183	0.040	0.218	78.2		
Balochistan	0.183	0.079	0.092	0.028	0.152	0.034	0.137	0.042	0.311	68.9		
Age - 10-19	0.132	0.069	0.071	0.032	0.073	0.027	0.088	0.040	0.450	55.0		
Age - 20-29	0.250	0.099	0.120	0.037	0.231	0.054	0.191	0.059	0.307	69.3		
Age - 30 - 39	0.207	0.082	0.096	0.023	0.211	0.031	0.162	0.039	0.239	76.1		
Age - 40 - 49	0.166	0.059	0.090	0.012	0.142	0.016	0.129	0.022	0.173	82.7		
Azad Jammu & Kashmir	0.289	0.178	0.125	0.095	0.239	0.093	0.205	0.116	0.567	43.3		
Age - 10-19	0.222	0.144	0.089	0.075	0.183	0.084	0.154	0.097	0.632	36.8		
Age - 20-29	0.461	0.248	0.223	0.152	0.405	0.166	0.346	0.185	0.533	46.7		
Age - 30 - 39	0.300	0.206	0.119	0.106	0.237	0.068	0.204	0.114	0.559	44.1		
Age - 40 - 49	0.200	0.104	0.079	0.029	0.142	0.027	0.131	0.043	0.330	67.0		
Gilgit-Baltistan	0.294	0.122	0.223	0.109	0.186	0.055	0.230	0.090	0.391	60.9		
Age - 10-19	0.229	0.111	0.223	0.131	0.113	0.034	0.179	0.079	0.439	56.1		

Regions/ Quintiles	Usage Index		Attainment Index		Transformation Index		Digital Development Index		Gender Digital Development Index	Absolute deviation of GDDIa		
	Male	Female	Male	Female	Male	Female	Male	Female				
	Value		Value		Value		Value				Value	Value
	2020		2020		2020		2020				2020	2020
Age - 20-29	0.417	0.176	0.300	0.157	0.333	0.110	0.347	0.145	0.417	58.3		
Age - 30 - 39	0.339	0.125	0.215	0.070	0.212	0.052	0.249	0.077	0.308	69.2		
Age - 40 - 49	0.257	0.046	0.107	0.010	0.171	0.016	0.167	0.020	0.117	88.3		

Notes		Definitions	Main Data Sources
a	Calculated as $100 * |GDI - 1|$.	<p>Gender Development Index (GDI) Ratio of female to male Human Development Index (HDI) values. See Technical Note 3 (this report) for details on how the GDI is calculated.</p> <p>Digital Development Index (DDI) A composite index measuring average achievement in three dimensions of digital development for gender -- usage, attainment, and transformation. See Technical Note 3 (this report) for details on how the DDI is calculated.</p>	Columns 1-10: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.

Table 3E Gender Digital Development Index indicator values at national, and provincial level by age groups 2020

Regions	Usage						Attainment		Transformation	
	Usage of computer		Usage of Smart Mobile		Usage to Internet		ICT Skills		Purpose to use internet	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	Value						Value		Value	
	2020						2020		2020	
Pakistan	9.9	6.2	29.7	20.1	26.4	14.7	8.2	4.7	12.6	5.5
Age - 10-19	7.5	5.4	22.6	16.6	17.3	10.7	5.6	4.0	7.0	4.2
Age - 20-29	14.2	9.6	41.0	26.3	39.0	20.4	12.4	7.9	19.0	8.3
Age - 30 - 39	10.2	5.4	32.4	20.9	30.5	16.0	8.7	4.0	15.3	5.3
Age - 40 - 49	8.2	2.9	24.9	15.6	23.0	11.7	6.7	1.9	12.2	3.6
Punjab	10.3	7.9	30.7	22.7	26.7	16.7	8.0	6.0	11.8	6.0
Age - 10-19	8.2	6.4	23.7	18.3	17.8	11.7	5.7	4.5	6.5	4.3
Age - 20-29	15.2	13.0	42.7	30.8	40.2	24.4	12.6	10.7	18.3	9.7
Age - 30 - 39	10.3	6.9	33.4	23.6	30.5	18.3	8.3	5.2	14.4	5.5
Age - 40 - 49	7.5	3.3	24.3	17.0	21.4	12.4	5.3	2.0	10.7	3.6
Sindh	8.8	4.4	28.2	19.4	28.9	17.4	8.2	3.1	14.8	7.5
Age - 10-19	5.7	4.2	22.5	17.8	21.1	14.4	4.8	3.1	9.5	6.9
Age - 20-29	11.4	6.1	35.8	23.4	38.1	21.3	10.6	4.5	19.7	9.3
Age - 30 - 39	10.0	3.7	29.2	19.2	31.0	17.9	9.7	2.3	16.4	7.2
Age - 40 - 49	9.9	2.9	26.8	15.8	28.3	15.6	9.6	2.0	16.3	5.7
Khyber Pakhtunkhwa	11.6	4.6	30.1	14.7	24.5	7.4	10.1	4.0	13.1	2.7
Age - 10-19	8.6	4.6	20.8	11.5	13.5	5.1	7.1	4.0	6.4	1.8
Age - 20-29	17.9	6.1	45.7	19.2	40.7	10.3	16.9	5.8	22.2	4.1
Age - 30 - 39	12.2	4.2	36.3	16.3	32.0	8.6	10.2	3.3	18.0	3.1
Age - 40 - 49	9.0	2.0	24.1	11.8	21.0	5.9	7.7	1.7	12.0	1.6
Balochistan	5.8	2.0	26.2	14.1	19.1	6.3	4.6	1.4	9.1	2.0
Age - 10-19	5.6	2.5	19.4	11.5	11.0	5.1	3.5	1.6	4.4	1.6
Age - 20-29	6.8	2.5	35.4	17.3	28.2	8.3	6.0	1.9	13.9	3.3
Age - 30 - 39	5.3	1.5	29.5	15.5	23.8	6.5	4.8	1.1	12.7	1.8
Age - 40 - 49	5.2	0.7	23.2	11.5	18.0	5.0	4.5	0.6	8.5	0.9
Azad Jammu & Kashmir	7.9	6.1	39.8	25.1	33.7	18.3	6.2	4.7	14.4	5.6
Age - 10-19	6.2	5.2	32.5	22.0	23.7	12.4	4.5	3.8	11.0	5.1
Age - 20-29	13.6	9.3	58.9	32.7	56.6	26.3	11.1	7.6	24.3	10.0
Age - 30 - 39	7.1	6.8	41.9	27.2	36.4	23.3	6.0	5.3	14.2	4.1
Age - 40 - 49	4.6	1.8	28.7	16.8	23.6	11.4	4.0	1.4	8.5	1.6
Gilgit-Baltistan	16.3	9.2	32.5	14.5	28.4	6.7	11.1	5.4	11.2	3.3
Age - 10-19	18.0	11.0	23.3	10.9	15.5	3.9	11.2	6.6	6.8	2.0

Regions	Usage						Attainment		Transformation	
	Usage of computer		Usage of Smart Mobile		Usage to Internet		ICT Skills		Purpose to use internet	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	Value						Value		Value	
	2020						2020		2020	
Age - 20-29	21.4	12.2	43.2	20.7	46.2	11.8	15.0	7.8	20.0	6.6
Age - 30 - 39	13.4	7.3	41.3	17.6	38.0	7.8	10.7	3.5	12.7	3.1
Age - 40 - 49	6.1	0.9	35.4	8.7	31.5	3.6	5.3	0.5	10.3	1.0

Definitions	Main Data Sources
<p>Usage of computer The percentage of population age 10 to 49 used computer/laptop/tablet in last three months.</p> <p>Usage of Smart Mobile The percentage of population age 10 to 49 used smart mobiles in last three months.</p> <p>Usage to Internet The percentage of population age 10 to 49 used internet services in last three months.</p> <p>ICT Skills The percentage of population age 10 to 49 who have carried out at least one of nine specific computer related activities during the last three months. See Technical Note 2 (this report) for details definition.</p> <p>Purpose to use internet The percentage of population age 10 to 49 use internet for the purpose of education, research, information seeking, health, Business, online shopping, and banking.</p>	<p>Columns 1-10: UNDP calculations are based on micro data of PSLM survey for the years 2019-20.</p>

Table 3F Digital Development Index and its Components at national, and provincial level by age groups 2020

Regions/Quintiles	Usage Index	Attainment Index	Transformation Index	Digital Development Index
	Value	Value	Value	Value
	2020	2020	2020	2020
Pakistan				
Age - 10-19	0.150	0.098	0.096	0.112
Age - 20-29	0.275	0.201	0.225	0.232
Age - 30 - 39	0.208	0.125	0.169	0.164
Age - 40 - 49	0.156	0.086	0.132	0.121
Punjab				
Age - 10-19	0.161	0.103	0.091	0.115
Age - 20-29	0.307	0.232	0.231	0.254
Age - 30 - 39	0.222	0.134	0.162	0.169
Age - 40 - 49	0.155	0.073	0.118	0.110
Sindh				
Age - 10-19	0.157	0.081	0.139	0.121
Age - 20-29	0.246	0.150	0.242	0.207
Age - 30 - 39	0.201	0.121	0.197	0.169
Age - 40 - 49	0.183	0.120	0.189	0.160
Khyber Pakhtunkhwa				
Age - 10-19	0.125	0.114	0.072	0.101
Age - 20-29	0.249	0.217	0.207	0.224
Age - 30 - 39	0.192	0.128	0.164	0.159
Age - 40 - 49	0.132	0.090	0.109	0.109
Balochistan				
Age - 10-19	0.107	0.055	0.054	0.069
Age - 20-29	0.179	0.081	0.148	0.129
Age - 30 - 39	0.145	0.060	0.122	0.102
Age - 40 - 49	0.115	0.053	0.082	0.079
Azad Jammu & Kashmir				
Age - 10-19	0.183	0.082	0.134	0.126
Age - 20-29	0.335	0.181	0.264	0.252
Age - 30 - 39	0.242	0.111	0.133	0.153
Age - 40 - 49	0.142	0.049	0.073	0.080
Gilgit-Baltistan				
Age - 10-19	0.173	0.179	0.075	0.132
Age - 20-29	0.280	0.219	0.206	0.233
Age - 30 - 39	0.223	0.136	0.125	0.156
Age - 40 - 49	0.146	0.056	0.090	0.090

Definitions**Digital Development Index (DDI)**

A composite index measuring average achievement in four dimensions of digital development – access, usage, attainment, and transformation. See Technical Note 2 (this report) for details on how the DDI is calculated.

Main Data Sources

Columns 1-4: UNDP calculations are based on micro data of PSLM survey for the years 2019-20.

Table 3G Digital Development Index indicator values at national, and provincial level by age groups 2020

Regions	Usage			Attainment	Transformation
	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
	Value			Value	Value
	2020			2020	2020
Pakistan					
Age - 10-19	6.6	19.8	14.2	4.9	5.7
Age - 20-29	11.8	33.4	29.4	10.0	13.5
Age - 30 - 39	7.7	26.4	23.0	6.3	10.2
Age - 40 - 49	5.5	20.2	17.3	4.3	7.9
Punjab					
Age - 10-19	7.3	21.1	14.9	5.2	5.5
Age - 20-29	14.1	36.5	32.0	11.6	13.8
Age - 30 - 39	8.5	28.3	24.1	6.7	9.7
Age - 40 - 49	5.4	20.6	16.8	3.7	7.1
Sindh					
Age - 10-19	5.1	20.4	18.2	4.0	8.4
Age - 20-29	8.7	29.6	29.7	7.5	14.5
Age - 30 - 39	6.9	24.3	24.5	6.1	11.8
Age - 40 - 49	6.6	21.6	22.3	6.0	11.3
Khyber Pakhtunkhwa					
Age - 10-19	6.8	16.5	9.7	5.7	4.3
Age - 20-29	11.5	31.4	24.3	10.9	12.4
Age - 30 - 39	7.8	25.3	19.1	6.4	9.8
Age - 40 - 49	5.4	17.7	13.0	4.5	6.6
Balochistan					
Age - 10-19	4.3	16.2	8.6	2.8	3.3
Age - 20-29	4.8	26.9	18.9	4.1	8.9
Age - 30 - 39	3.4	22.6	15.2	3.0	7.3
Age - 40 - 49	3.1	17.6	11.8	2.6	4.9
Azad Jammu & Kashmir					
Age - 10-19	5.7	27.2	18.0	4.1	8.0
Age - 20-29	11.1	43.5	38.8	9.1	15.9
Age - 30 - 39	6.9	32.8	28.3	5.6	8.0
Age - 40 - 49	2.9	21.5	16.2	2.4	4.4
Gilgit-Baltistan					

Regions	Usage			Attainment	Transformation
	Usage of computer	Usage of Smart Mobile	Usage to Internet	ICT Skills	Purpose to use internet
	Value			Value	Value
	2020			2020	2020
Age - 10-19	14.7	17.4	10.0	9.0	4.5
Age - 20-29	16.2	30.4	26.7	10.9	12.4
Age - 30 - 39	10.1	28.5	21.6	6.8	7.5
Age - 40 - 49	3.4	21.4	16.9	2.8	5.4

Definitions	Main Data Sources
<p>Usage of computer The percentage of population age 10 to 49 used computer/laptop/tablet in last three months.</p> <p>Usage of Smart Mobile The percentage of population age 10 to 49 used smart mobiles in last three months.</p> <p>Usage to Internet The percentage of population age 10 to 49 used internet services in last three months.</p> <p>ICT Skills The percentage of population age 10 to 49 who have carried out at least one of nine specific computer related activities during the last three months. See Technical Note 2 (this report) for details definition.</p> <p>Purpose to use internet The percentage of population age 10 to 49 use internet for the purpose of education, research, information seeking, health, Business, online shopping, and banking.</p>	<p>Columns 1-5: UNDP calculations are based on micro data of PSLSM survey for the years 2019-20.</p>

Technical Note 1

Human Development Index (HDI)

The Human Development Index (HDI) is a tool to measure achievements and have three dimensions: education, health, and Income. The HDI is calculated following a two-step procedure: first, sub-indices for the three dimensions are calculated by standardizing indicators for each dimension; second, the geometric mean of these standardized indicators is calculated. Some of the indicators that are used by Global HDR report are not available at provincial and district level. The study uses the best available proxies at district level HDI and uses the same methodology used in previous Pakistan National Human Development Report (NHDR) 2017.

Each dimension of the HDI is further divided into indicators. The HDI is calculated following a two-step procedure: first, sub-indices for the three dimensions are calculated by standardizing indicators for each dimension; second, the geometric mean of these standardized indicators is calculated.

The education Index at district level is calculated by following the same methodology adopted in the global HDI. The Education Index is calculated using mean years of schooling and expected years of schooling at the district level from the 2004-2005, 2006-2007, 2008-2009, 2010-2011, 2012-2013, 2014-2015, and 2019-20 Pakistan Social and Living Standards Measurement (PSLSMS) data.

We could not calculate life expectancy, as there is no data available for mortality in Pakistan at district level. Instead, the Health Index is constructed using two indicators: immunization rates and satisfaction with health facility. The former indicator, taken directly from the PSLSMS data, is an appropriate proxy for the overall strength of the government's public health system.

Immunization rate is the percentage of the children aged 12 to 23 months who have been fully immunized. The satisfaction with health facility defines households that lack access to quality healthcare facility if any of the household members had responded that he/she did not use a healthcare facility because: it was costly, it did not suit, it lacked equipment/did not have enough facilities, or if any of the household members were not satisfied with the health facility. Both indicators are available at the district level and are taken from the 2004-2005, 2006-2007, 2008-2009, 2010-2011, 2012-2013, 2014-2015, 2019-20 PSLSMS data.

Calculation of the Real GDP per capita in Purchasing Power Parity in US Dollars (PPP\$) requires data on GDP per capita. This data is available at the national and provincial levels, but not at the district level in Pakistan. Therefore, in the 2003 NHDR for Pakistan, the cash value of crop output and the manufacturing value-added at the district level were used as a proxy for real GDP per capita. For the Pakistan NHDR 2023/24, however, we used the living standards dimension from the Multidimensional Poverty Index (MPI) as a proxy for the standard of living dimension of the HDI. Compared to the 2003 Pakistan HDI, the living standards dimension has been used due to the unavailability of recent district level manufacturing data, since the latest manufacturing census data is available for 2005-2006. Second, cash value of agriculture crop output and manufacturing value may not be representative of the total GDP. Finally, in an undocumented economy like Pakistan, any macro level indicator may not be regarded as a true measure of economic output, since a significant proportion of economic activities are informal. The previous NHDR of 2017 also used the same indicator as living standards dimension of HDI.

For the standard of living dimension, the Global MPI methodology, which considers six indicators, as reported in the Global HDR 2019 was followed completely with one exception. Instead of using the type of household floor, because of data unavailability; material for household walls and roof was used. Houses without finished walls or finished roofs were considered deprived. If the house was deprived in three or more facilities/indicators, we regarded the household as deprived, and calculated the percentage of people not living in substandard living conditions. A household is deprived if:

- *Electricity:* did not have access to electricity.
- *Drinking water:* did not have access to improved drinking water source.
- *Sanitation:* did not have access to improved sanitation or if improved, it was shared.
- *Cooking fuel:* had access to used 'dirty' cooking fuel (dung, wood or charcoal).
- *Infrastructure:* was without a finished roof or finished walls.
- *Assets:* did not have any of the assets related to information access (radio, TV, telephone), did not have any of the assets

related to mobility (bike, motor bike, car, tractor); or did not have any of the assets related to livelihood (refrigerator, arable land, livestock).

If a household is deprived in three or more MPI Standard of Living indicators, it is identified as deprived.

Steps to calculate the Human Development Index for Pakistan at the district level

Following the methodology of the global HDIs, the following two steps have been employed to calculate the HDI.

Step 1: Calculating the dimension of indices

Minimum and maximum goal posts for immunization rate and satisfaction with health facility are set at 0 and 100 to capture the maximum variation among the districts of Pakistan. For education, the minimum goal post is set at 0. The maximum goal post for expected years of schooling is set at 15, based on the estimated maximum value of 12.6 for Islamabad. Similarly, the maximum goal post for mean years of schooling is set at 10 based on the estimated value of 9.3. The minimum and maximum goal post for the living standard dimension, borrowed from the multidimensional poverty index, is set at 0 and 100, respectively.

Table 1: Summary of dimensions, indicators and goal posts for HDI at district level

Dimensions	Indicators	Minimum	Maximum
Health	Immunization rate	0	100
	Satisfaction with health facility	0	100
Education	Mean years of schooling	0	10
	Expected years of schooling	0	15
Standard of living	Living standards from the Multidimensional Poverty Index:	0	100
	Electricity		
	Drinking water		
	Sanitation		
	Infrastructure		
	Household fuel		
	Household assets		

After defining the minimum and maximum goal posts, the dimension indices are calculated using the equation one. For the health and education dimensions, equation (1) is calculated first for each component, and then the health and education indices are calculated by taking the arithmetic mean of the two resulting component indices. For the living standard index, the percentage of

people living in non-deprived households is used.

Step 2: Aggregating the dimensional indices to produce the Human Development Index

The geometric mean of the dimensional indices is calculated to construct the HDI using the equation (2).

Example: Islamabad

Indicator	Values
Immunization rate	95.6
Satisfaction with health facility	84.7
Mean years of schooling	9.26
Expected years of schooling	12.6
Living standards from the Multidimensional Poverty Index:	99.0
Electricity	
Drinking water	
Sanitation	
Infrastructure	
Household fuel	
Household assets	

Technical Note 2

Digital Development Index (DDI)

This is a first attempt to construct a Digital Development Index (DDI). DDI has four dimensions namely, access, usage, attainment, and transformation. There are three indicators in access, and usage dimension, and one indicator in both attainment, and transformation dimensions. The index was constructed at national, provincial, level with urban/rural breakdown, and at district level.

The index is also decomposed by wealth quantities. The index is constructed using the micro-data set of Pakistan Social and Living Standards Measurement Survey (PSLSMS) for year 2019-20, and the special regions of Azad Jammu and Kashmir, and Gilgit Baltistan were also included. These indicators in each domain are described below;

Access

This domain is measured at a household level to quantify the access or digital penetration at the level of household. There are three indicators in access dimension namely, (1) access to computer (the percentage of

household with computer/laptop/tablet); (2) access to mobile (the percentage of household with mobile phones); and (3) access to internet (the percentage of household with access to internet).

Usage

This domain is measured at an individual level to quantify the digital penetration at the individual level. In other words, this domain measure what percentage of population age 10-49 years using computer/laptop, smart phone, and internet. There are three indicators in usage dimension namely, (1) usage to computer (the percentage of population

age 10 to 49 used computer/laptop/tablet in last three months); (2) usage to smart mobile (the percentage of population age 10 to 49 used smart mobiles in last three months); and (3) usage to internet (the percentage of population age 10 to 49 used internet services in last three months).

Attainment

The domain of attainment measures basic computer skills at the individual level. The domain had only one indicator and measured as the percentage of population age 10 to 49 who have any of the following skills: copying or moving a file or folder; using copy and paste tools to duplicate or move information within a document; sending emails with attached files; using basic arithmetic formulas in a spread

sheet; connecting and installing new devices (e.g. a modem, camera, printer); finding, downloading, installing and configuring software; creating electronic presentations with presentation software; transferring files between a computer and other devices; writing a computer program using a specialized programming language.

Transformation

The transformation domain quantifies what is the percentage of people who use internet for the purpose of education, research, business, banking etc. This domain had only one indicator and measured as the percentage of population age 10 to 49 use internet for the purpose of education, research, information seeking, health, Business, online shopping, downloading software and programs and banking.

Steps to calculate the Digital Development Index for Pakistan

Following the methodology of the global HDIs: two steps have been employed to calculate the DDI.

Step 1: Calculating the dimension of indices

The minimum and maximum goal posts are set for each indicator to convert it into a normalized index between 0 to 1 unit of scale. For details see table 1.

Table 1: Summary of dimensions, indicators and goal posts for DDI

Dimensions	Indicators	Minimum	Maximum
Access	Access to Computer	0	100
	Access to Mobile	0	100
	Access to Internet	0	100
Usage	Usage of Computer	0	60
	Usage of Smart Mobile	0	100
	Usage of Internet	0	100
Attainment	ICT Skills	0	50
Transformation	Purpose to use internet	0	60

After defining the minimum and maximum goal posts, the dimension indices are calculated as follows:

After construction of each indicator's normalized index, the aggregation of each dimension is done by taking the arithmetic mean of all indicators within each dimension.

Step 2: Aggregating the dimensional indices to produce the Digital Development Index

The DDI is the geometric mean of the indices of four dimensions namely, access, usage, attainment, and transformation (see equation 2):

Example: Islamabad	
Indicator	Values
Access to Computer	39.7
Access to Mobile	99.4
Access to Internet	70.3
Usage of Computer	30.5
Usage of Smart Mobile	60.6
Usage of Internet	55.0
ICT Skills	25.5
Purpose to use internet	32.0

Technical Note 3

Gender Digital Development Index (GDDI)

The Gender Digital Development Index (GDDI) measures gender inequalities in achievement in three dimensions of Digital Development Index: usage, attainment, and transformation. The GDDI did not use the access domain for DDI, because it is measured at the household level, and it is not possible to decompose it by gender. Therefore, the GDDI uses the other three dimensions which are calculated at individual level. For the detailed definition of each domain and indicator, see the technical note 2 of this report.

Steps to calculate the Gender Digital Development Index for Pakistan

Following the methodology of the global GDIs: three steps have been employed to calculate the Gender Development Index (GDI).

Step 1: Normalizing the indicators

To construct the female and male GDDI, first the indicators which have different units are transformed into normalized indices at 0 to 1 scale using the goalposts described in Table 1. After that, the dimension indices for each sex are aggregated by taking the geometric mean. The goalpost for each sex is the same for all dimensions.

Table 1: Summary of dimensions, indicators and goal posts for GDDI

Dimensions	Indicators	Minimum	Maximum
Usage	Usage of Computer	0	60
	Usage of Smart Mobile	0	100
	Usage of Internet	0	100
Attainment	ICT Skills	0	50
Transformation	Purpose to use internet	0	60

Having defined the minimum and maximum values, the sub-indices are calculated as follows:

After construction of each indicator's normalized index, the aggregation of each dimension is done by taking the arithmetic mean of all indicators within each dimension.

Step 2: Calculating the female and male Digital Development Index values

The female and male DDI values are the geometric mean of the three dimensional indices for each gender using equation 2 and 3:

Step 3: Calculating the Gender Digital Development Index (GDDI)

The Gender Digital Development Index (GDDI) is simply the ratio of female DDI to male DDI:

Example: Pakistan		
Indicator	Male	Female
Usage of Computer	9.9	6.2
Usage of Smart Mobile	29.7	20.1
Usage of Internet	26.4	14.7
ICT Skills	8.2	4.7
Purpose to use internet	12.6	5.5

For Male:

For Female:

Technical Note 4

UNDP Special Survey of 15 Districts

A special survey of 15 districts was also conducted to generate the latest data point and to fill the data gaps. The technical details of this special survey are;

Sampling Design and Sample Selection

A three-stage stratified cluster sampling approach was employed. All the tehsils of the selected 15 districts were treated as separate domains for estimation, and sample sizes for each domain of estimation were computed independently. Location (Urban/Rural) within each district was treated as a stratum, and samples within each domain of estimation were allocated to urban and rural areas using proportional allocation with some adjustments.

In the first stage of sampling, geographic clusters (or enumeration blocks) were selected as primary sampling units (PSUs) using the Probability Proportional to Size (PPS) method, with the number of households in each cluster serving as the Measure of Size (MoS).

In the second stage of sampling, within each sampled cluster, 20 households were selected using a random walk approach following the Right-Hand rule.

In the third stage of sampling, from each sampled household, a respondent was selected using the Kish Grid method.

The target population of the study consisted of all households residing in urban and rural areas within the selected 15 districts. However, the survey was not conducted in areas designated as military restricted areas, cantonment board areas, and locations with high-security risks. In summary, the study's universe encompassed all the districts within the four provinces and three regions, excluding cantonment boards and military

restricted areas. The districts were selected based on the score of HDI and DDI.

Sample Size and Allocation Plan

The sample had to be representative at the district level and treated as separate domains of estimation, with sample sizes for each domain of estimation computed separately. When calculating the sample sizes, a non-response rate of 10 percent was assumed, and the sample sizes were adjusted for cluster sampling. Cluster sampling was commonly used when the population was spread across a wide area. The primary objective of cluster sampling was cost reduction and increasing sampling efficiency. However, it was important to note that respondents within the same cluster tended to be somewhat similar to each other. Therefore, selecting an additional member from the same cluster added less new information compared to an entirely independent selection. In other words, in clustered samples, the sample was not as diverse as it would be in a random sample, leading to a reduction in the effective sample size. The reduction in effectiveness due to the use of cluster sampling instead of simple random sampling was referred to as the design effect (deff). One critical factor influencing deff was the number of respondents selected within a cluster, with deff increasing as the number of respondents per cluster increased. Hence, reducing the number of respondents per cluster beyond a certain threshold might not be cost-effective, and a specific cluster size was deemed optimum. In this study, 20 households were selected per cluster, assuming a value of 1.5 for deff.

The overall sample size was estimated to be 5,500 households. These estimated sample sizes were sufficiently large to generate

generalizable results for each of the 15 districts with 95percent confidence and less than a 5percent absolute margin of error.

To ensure the sample was best representative of the population, a stratified random sampling approach was employed. Stratification involved dividing the survey population into subgroups or strata that were as homogeneous as possible based on certain criteria. In a stratified sample, the sampling error depended on the population variance within the strata but not between strata. Therefore, to reduce sampling error, it was essential to create strata with low internal variability (high homogeneity). Another reason for stratification was to account for marked differences between subgroups of

the population, such as urban versus rural areas, by allowing separate sample designs for each subgroup.

In this study, location (urban/rural) within provinces and regions was used as strata, and the sample was allocated to urban and rural areas in proportion to their size (based on the number of households according to the 2017 census), with some adjustments. As the intention was to select 20 households from each Primary Sampling Unit (PSU), the proportionally allocated sample to each stratum was adjusted to make it a multiple of 16. The table below illustrates the distribution of the sample of 5,500 households by province and locality.

District	Allocated Sample of HHs			Allocated Sample of Clusters		
	Urban	Rural	Total	Urban	Rural	Total
Lahore	400	-	400	20	-	20
Faisalabad	180	220	400	9	11	20
Multan	180	220	400	9	11	20
Rawalpindi	220	180	400	11	9	20
Bahawalnagar	80	320	400	4	16	20
Rajanpur	60	340	400	3	17	20
Karachi	400	-	400	20	-	20
Larkana	180	220	400	9	11	20
Thatta	80	320	400	4	16	20
Peshawar	180	220	400	9	11	20
Bannu	40	360	400	2	18	20
Quetta	180	120	300	9	6	15
Killa Abdullah	80	220	300	4	11	15
Muzaffarabad	100	160	260	5	8	13

District	Allocated Sample of HHs			Allocated Sample of Clusters		
	Urban	Rural	Total	Urban	Rural	Total
Gilgit	160	80	240	8	4	12
Total	2,520	2,980	5,500	126	149	275

Data Collection

The data collection process was meticulously managed, with local enumerators conducting the survey under the supervision of provincial supervisors in the field. A total of 74 enumerators were engaged in this effort, and their data collection activities took place within a defined timeframe, spanning from June 15 to August 24, 2023.

The provided tables offer valuable insights into the distribution of surveyed households, categorizing them into urban and rural areas. The data reveals that 2,630 households, accounting for 47.3percent of the total, were surveyed in urban settings, while 2,930 households, representing 52.7percent, were surveyed in rural areas. In total, 5,560 households were surveyed.

This clear distinction between urban and rural survey coverage is fundamental to the study's stratified sampling design. The data collected from these distinct settings will facilitate meaningful comparisons and informed conclusions as the study progresses.

The rigorous and well-organized approach to data collection, the involvement of trained enumerators, and the adherence to a specified timeframe underscore our commitment to ensuring the accuracy, reliability, and comprehensiveness of the dataset. Consequently, this dataset will serve as a robust foundation for subsequent analyses and research outcomes, enhancing the overall credibility and validity of our study's findings.

Urban vs. Rural Distribution: The data shows that the survey coverage is nearly evenly split between urban and rural areas, with a slightly higher representation of rural households (52.7percent) compared to urban households (47.3percent).

District Variation: There is considerable variation in the distribution of surveyed households across districts. For instance, in Lahore and Karachi South, all the surveyed households are urban, while in districts like Killa Abdullah and Rajanpur, the majority of households surveyed are rural. Understanding this variation can help tailor specific policies or interventions to meet the unique needs of each district.

Stratified Sampling: The data mentions that the sample allocation was done based on the 2017 census data, which is a common approach for ensuring representative sampling. Stratified sampling helps to account for variations in the population size of urban and rural areas within each district, leading to more accurate estimates for each stratum.

Temporal Data Collection: The data collection period from June 15 to August 24, 2023, spans a period of approximately two and a half months. It's important to consider whether this timeframe adequately represents any seasonal variations that might impact the survey findings.

District	HH Conducted (No. of HHs)		
	Urban	Rural	Total
Muzaffarabad	107 (41.2percent)	153 (58.8percent)	260
Killa Abdullah	44 (14.4percent)	262 (85.6percent)	306
Quetta	239 (79.9percent)	63 (20.9percent)	302
Gilgit	181 (69.9percent)	78 (30.1percent)	259
Bannu	83 (20.4percent)	323 (79.6percent)	406
Peshawar	182 (45.0percent)	222 (55.0percent)	404
Bahawalnagar	79 (20.1percent)	314 (79.9percent)	393
Faisalabad	160 (39.4percent)	246 (60.6percent)	406
Lahore	401 (100.0percent)	0	401
Multan	183 (45.2percent)	222 (54.8percent)	405
Rajanpur	68 (17.0percent)	331 (83.0percent)	399
Rawalpindi	230 (57.4percent)	171 (42.6percent)	401
Karachi South	411 (100.0percent)	0	411
Larkana	182 (44.4percent)	225 (55.3percent)	407
Thatta	80 (20.0percent)	320 (80.0percent)	400
Total	2,630 (47.3percent)	2,930 (52.7percent)	5,560

The key findings from the provided tables reveal the distribution of household interviews conducted across provinces and districts, along with the gender distribution of respondents. Notable variations are evident, both in the number of interviews and the gender composition of respondents

across different regions. For instance, in Balochistan's Killa Abdullah and Quetta districts, there is a nearly equal representation of male and female respondents. Conversely, in districts like Bannu and Rawalpindi, a higher proportion of male respondents participated in the interviews. Overall, the

data indicates that 51.0percent of the total 5,560 household interviews were conducted with male respondents, while 49.0percent were conducted with female respondents. These findings offer valuable insights into the

survey's regional dynamics and provide a foundation for deeper analysis to understand how gender may influence survey responses and outcomes.

District	Household Interviews Conducted	
	Respondent Gender	
	Male	Female
Muzaffarabad	119 (45.8percent)	141 (54.2percent)
Killa Abdullah	146 (47.7percent)	160 (52.3percent)
Quetta	131 (43.4percent)	171 (56.6percent)
Gilgit	134 (51.7percent)	125 (48.3percent)
Bannu	237 (58.4percent)	169 (41.6percent)
Peshawar	213 (52.7percent)	191 (47.3percent)
Bahawalnagar	201 (51.1percent)	192 (48.9percent)
Faisalabad	207 (50.9percent)	200 (49.1percent)
Lahore	197 (49.1percent)	204 (50.9percent)
Multan	203 (50.1percent)	202 (49.9percent)
Rajanpur	208 (51.9percent)	193 (48.1percent)
Rawalpindi	217 (54.1percent)	184 (45.9percent)
Karachi South	208 (50.6percent)	203 (49.4percent)
Larkana	215 (52.8percent)	192 (47.2percent)
Thatta	197 (49.3percent)	203 (50.8percent)
Total	2,833 (51.0percent)	2,727 (49.0percent)

Data sources

For this report, multiple sources of data are used. For constructing the **Human Development Index (HDI)** at national, provincial and district levels, based on micro data of *Pakistan Social and Living Standard Measurement Survey (PSLSMS)* for 2004-05, 2006-2007, 2008-09, 2010-11, 2012-2013, 2014-2015, and 2019-20 is used for all parts of the country, except the Federally Administered Tribal Areas (FATA). To compute the HDI for FATA, the *FATA Development Indicators Household Survey (FDIHS)* 2013-

2014 is used. The HDI is computed for Azad Jammu and Kashmir (AJ&K), and Gilgit-Baltistan (GB), which are considered separate regions and *Pakistan Social and Living Standard Measurement Survey (PSLSMS)* for 2006-2007, 2012-2013, 2014-2015, and 2019-2020. The Digital Development Index (DDI), and Gender Digital Development Index (GDDI) is developed using the micro-data set of *Pakistan Social and Living Standard Measurement Survey (PSLSMS)* for 2019-20.

Regional classification

Islamabad

Islamabad Capital Territory (ICT)

Punjab

Attock, Bahawalnagar, Bahawalpur, Bhakkar, Chakwal, Chiniot, Dera Ghazi Khan, Faisalabad, Gujranwala, Gujrat, Hafizabad, Jhang, Jhelum, Kasur, Khanewal, Khushab, Lahore, Layyah, Lodhran, Mandi Bahauddin, Mianwali, Multan, Muzaffargarh, Nankana Sahib, Narowal, Okara, Pakpattan, Rahimyar Khan, Rajanpur, Rawalpindi, Sahiwal, Sargodha, Sheikhupura, Sialkot, Toba Tek Singh, Vehari.

Balochistan

Awaran, Barkhan, Bolan/Kachhi, Chaghi, Dera Bugti, Duki, Gawadar, Harnai, Jaffarabad, Jhal Magsi, Kalat, Kech/Turbat, Kharan, Khuzdar, Killa Abdullah, Killa Saifullah, Kohlu, Lasbela, Loralai, Mastung, Musakhail, Naseerabad, Noshki, Panjgur, Pishin, Quetta, Shaheed Sikandar abad, Sherani, Sibi, Sohbatpur, Washuk, Zhob, Ziarat.

Khyber Pakhtunkhwa

Abbottabad, Bajur, Bannu, Battagram, Buner,

Charsadda, Chitral, Dera Ismail Khan, Hangu, Haripur, Karak, Khyber, Kohat, Kohistan, Kurram, Lakki Marwat, Lower Dir, Malakand, Mansehra, Mardan, Mohmand, North Waziristan, Nowshera, Orakzai, Peshawar, Shangla, South Waziristan, Swabi, Swat, Tank, Tor Ghar, Upper Dir.

Sindh

Badin, Dadu, Ghotki, Hyderabad, Jacobabad, Jamshoro, Kamber Shahdadt, Karachi, Kashmore, Khairpur, Larkana, Matiari, Mirpurkhas, Naushehro Feroze, Nawabshah/Shaheed Benazir Abad, Sanghar, Shikarpur, Sujawal, Sukkur, Tando Allahyar, Tando Muhammad Khan, Tharparkar, Thatta, Umerkot.

Azad Jammu and Kashmir

All districts of Azad Jammu and Kashmir

Federally Administered Tribal Areas (FATA)

All agencies and frontier regions

Gilgit-Blatistan

All districts of Gilgit-Baltistan

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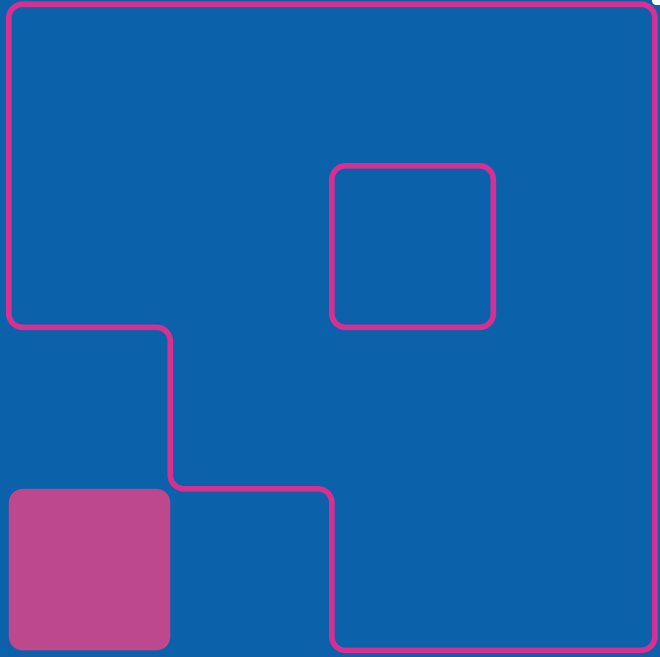
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