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DIGITAL ECOSYSTEM COUNTRY ASSESSMENT (DECA)

Bangladesh

JUNE 2023

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ACKNOWLEDGMENTS

This report reflects insights from the Digital Ecosystem Country Assessment (DECA), led by USAID/Bangladesh with support from DAI's Digital Frontiers project. The report was written by Mohammad Ashrafuzzaman, Raiyan Kabir, Connor Mackenzie, and Olga Morawczynski, with critical support from Nurul Islam Biplob and Inta Plostins. Copy edits were provided by Ann Procter, and report design and graphics were provided by Miya Su Rowe.

The authors extend their appreciation to all USAID staff who participated in internal discussions and report review. We particularly thank these individuals from USAID/Bangladesh who provided guidance and reviewed this report: Motasim Billah, Sumana Masud, and Jane Silcock. We also thank the following individuals from USAID ITR/T for their detailed review: Diana Boncheva-Gooley, Stan Byers, Jaclyn Carlsen, Molly Dean, Kate Dimsdale, Lauren Grubbs, Ulvi Ismail, Craig Jolley, Maurice Kent, Paul Nelson, Adam Schumacher, Kanchana Sthanumurthy, and Josh Woodard.

The authors extend their deep gratitude to Aminul Hoque Chowdhury, who served as the USAID/Bangladesh Mission DECA Team Lead, for providing critical insight and facilitating interviews.

The report authors also extend their sincere thanks to all interviewees who made this assessment possible.

The authors accept responsibility for any errors or inaccuracies in this report.

This publication was produced by the Digital Frontiers Project under Cooperative Agreement AID-OAA-A-17-00033 at the request of the United States Agency for International Development.

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ACRONYMS

a2i	Aspire to Innovate
AI	Artificial Intelligence
ASYCUDA	Automated Systems for Customs Data
AN	Bangladesh Angel Network
bdCERT	[national] Computer Emergency Response Team
BIGF	Bangladesh Internet Governance Forum
BSCCL	Bangladesh Internet Freedom Initiative Working Group
BTRC	Bangladesh Telecommunication Regulatory Commission
CDCS	USAID Country Development Cooperation Strategy
CIRT	Cyber Incident Response Team
CLC	Computer Literacy Center
CSO	Civil Society Organization
DBID	Digital Business Identification
DECA	Digital Ecosystem Country Assessment
DFS	Digital Financial Services
DO	Development Objective
DPA	Data Protection Act
DSA	Digital Security Act
e-CAB	e-Commerce Association of Bangladesh
EGDI	UN E-Government Development Index
FSP	Financial Service Provider
GoB	Government of Bangladesh
ICT	Information and Communications Technology
IDTP	Interoperable Digital Transaction Platform
IGF	Internet Governance Forum
ISP	Internet Service Provider
ITU	International Telecommunication Union
KYC	Know Your Customer
MFI	Microfinance Institution
MFS	Mobile Financial Services
MNO	Mobile Network Operator
MoE	Ministry of Education
MSME	Micro, Small & Medium Enterprises
NFAP	National Frequency Allocation Plan
NGO	Non-Governmental Organization
NTTN	Nationwide Telecommunication Transmission Network
PoC	Point of Contact
PRA	Personal Retail Accounts
PSP	Payment Service Provider
PWD	Persons With Disabilities
STEM	Science, Technology, Engineering, and Mathematics
TA	Technical Assistance
TRNB	Telecom Reporters' Network Bangladesh
TVWS	TV White Space
UDC	Union Digital Center
USF	Universal Service Fund
UTRAMS	Unified Technical Request and Mission Support
WE	Women and e-Commerce

Executive Summary

BACKGROUND

The U.S. Agency for International Development's (USAID's) Digital Strategy was launched in April 2020 to achieve and sustain open, secure, and inclusive digital ecosystems that contribute to broad-based, measurable development, and humanitarian assistance outcomes through the responsible use of digital technology.

The Digital Ecosystem Country Assessment (DECA), a flagship initiative of the Digital Strategy, informs the development, design, and implementation of USAID's strategies, projects, and activities. The DECA looks at three pillars of a nation's digital ecosystem: (1) digital infrastructure and adoption; (2) digital society, rights, and governance; and (3) digital economy. The DECA aims to inform how USAID/Bangladesh can understand, work with, and strengthen the country's digital ecosystem. The section below outlines how DECA findings and recommendations can directly support USAID/Bangladesh's Development Objectives (DOs). To maximize utility and impact, this section outlines how DECA findings and each resulting recommendation can directly support USAID/Bangladesh's Development Objectives (DOs). The DECA does not evaluate existing programs, it assesses Bangladesh's digital ecosystem and identifies how USAID/Bangladesh's current or future programming can build upon or strengthen that ecosystem. DECA findings and recommendations are mapped to USAID/Bangladesh Results Framework.

The USAID/Bangladesh 2020–2025 Country Development Cooperation Strategy (CDCS)[1] includes three strategic priorities:

1. Improved democratic systems that promote transparency, accountability, and integrity
2. Enhanced opportunities for an inclusive, healthy, educated society, and a robust economy
3. Strengthened resilience to shocks and stressors.

KEY FINDINGS

Bangladesh's digital ecosystem has steadily evolved over the last decade. There has been progress in almost all aspects of the ecosystem, from digital connectivity expansion to government digitalization to a tech-savvy e-commerce sector. Much of this has grown on the back of the Government of Bangladesh's (GoB's) Digital Bangladesh agenda, and a driven private sector has pushed it along. As it did in many countries across the world, the COVID-19 pandemic accelerated technology uptake and growth. Still, there is much progress to be made. Poor quality of internet services, limited digital literacy, and limited awareness and measures for safety online further risks widening the digital divide.

Implementation is slow to catch up with outlined digital strategies. Although GoB's Vision 2021 and Vision 2041 outline government plans and underscore the importance of Digital Bangladesh, undefined roadmaps, and a lack of digital literacy among government officials undermine GoB's efforts. Digitalization efforts are spearheaded by the Ministry of Posts, Telecommunications, and Information Technology as well as by the Ministry's ICT Division and the UNDP- supported Aspire to Innovate (a2i) Program. The GoB has ambitious

plans for government digitalization but lacks the large pool of highly skilled professionals needed to operationalize these plans.

Limited digital literacy is a key barrier across all aspects of the ecosystem. In a 2018–2019 ICT Household Survey, more than half of the respondents (65 percent) cited not knowing how to use the internet as a reason for not using it, and nearly half of the respondents said that they have no knowledge of the internet. These reasons trumped affordability, accessibility, or device ownership significantly. A shortage of skilled teachers in digital technologies and a lack of strategic policy slow the progress of digital literacy. Limited digital literacy affects the efficiency with which public and private institutions leverage the internet.

Connectivity is affected by poor quality of services and lack of affordable data. Digital connectivity coverage is expanding. As of 2021, the ITU estimated that 98 percent of the population is at least covered by a 3G network. However, unclear policies and limited competition in the first and middle mile affect the overall quality of services and affordability.

Bangladesh ranks Number One in South Asia on the e-governance academy's National Cybersecurity Index (NCSI) in terms of the availability of necessary laws and policy, but there is significant room for improvement when it comes to the strength of implementation across the ecosystem. Last-mile connectivity providers—particularly fixed internet service providers—do not maintain necessary cybersecurity precautions due to costs and a lack of skilled cybersecurity professionals in the country. Regulatory gaps at the national level lead to a lack of coordination on cybersecurity efforts. The GoB's recent Bangladesh Cybersecurity Strategy 2021–2025 aims to address this and other challenges including human capacity and infrastructure development.

Civil society and media organizations have limited influence in the digital ecosystem. CSOs actively use technology for basic work functions such as posting jobs online but are constrained by tight budgets and a lack of awareness of cyber hygiene. Given the absence of a single digital rights advocacy organization, CSOs in this space banded together in 2021 to form the Bangladesh Freedom Initiative.

Misinformation and disinformation are widespread in the digital sphere and fall largely into the political, religious, or health-related spheres. The lack of information literacy among the public leads to the viral spread of rumors through social media channels. Media organizations also fall victim to rumors as they do not have the resources necessary to verify stories.

Mobile financial services are expansive in Bangladesh and increasingly inclusive. Mobile money has been used since the early 2010s for remittance transfers to families, and the COVID-19 pandemic and growth of the e-commerce sector has made it increasingly simple for Bangladeshis to pay for services online. A lack of interoperability and merchant uptake limits growth in use cases, but ecosystem players recognize these issues and have plans to address them.

E-commerce and the tech startup environment have grown quickly due to an increase in international and domestic investments and an active private sector. While the Evaly e-commerce fraud undermined consumer trust, uptake is on the rise. E-commerce and tech startup organizations are concentrated in the capital, leading to city-centric solutions.

An expansive digital talent pool exists, but they are not trained to their fullest potential, hindering their income potential and Bangladesh's growth trajectory. The digital talent pool is diverse and consists of technical talent, freelancers, and gig workers. Each group faces unique challenges but the common thread is siloed and out-of-date upskilling.

This report makes 10 recommendations for the international development community, covering topics across the three DECA pillars. The international development community can play a key role in facilitating important discussions around strengthening cybersecurity across all layers of the ecosystem and help to improve transparency and interoperability in the connectivity space. Donors can also play a role in the creation of strategic roadmaps, especially one geared toward digital literacy for all. It will be important to support government digitalization efforts by convening policy discussions around the opportunities and pitfalls of emerging technology in development efforts and to support innovation in rural areas, catering to local contexts. The international development community is also well positioned to help dispel misinformation in the digital sphere and to support consumer protection across the digital finance and e-commerce realms.

ROADMAP FOR THE REPORT

About this Assessment provides background on the DECA framework and goals.

DECA Findings presents the key findings about Bangladesh's digital ecosystem. This section is organized into three sub-sections by DECA pillar: digital infrastructure and adoption; digital society, rights, and governance; and digital economy.

Recommendations outline how the international development community can leverage and support the digital ecosystem to achieve improved development outcomes.

Navigation tip: The navigation bar in the footer throughout this report helps you move between sections. Dark blue text will indicate the current section you are in.

About this Assessment

USAID's Digital Strategy aims to improve USAID development and humanitarian assistance outcomes through the responsible use of digital technology and to strengthen the openness, inclusiveness, and security of country digital ecosystems. The Digital Strategy and the DECA are part of USAID's holistic approach to helping achieve the Sustainable Development Goals (SDGs).

As part of the Digital Strategy implementation, the DECA examines three broad areas to understand the opportunities and challenges in a country's digital ecosystem:

1. Digital Infrastructure and Adoption
2. Digital Society, Rights, and Governance
3. Digital Economy

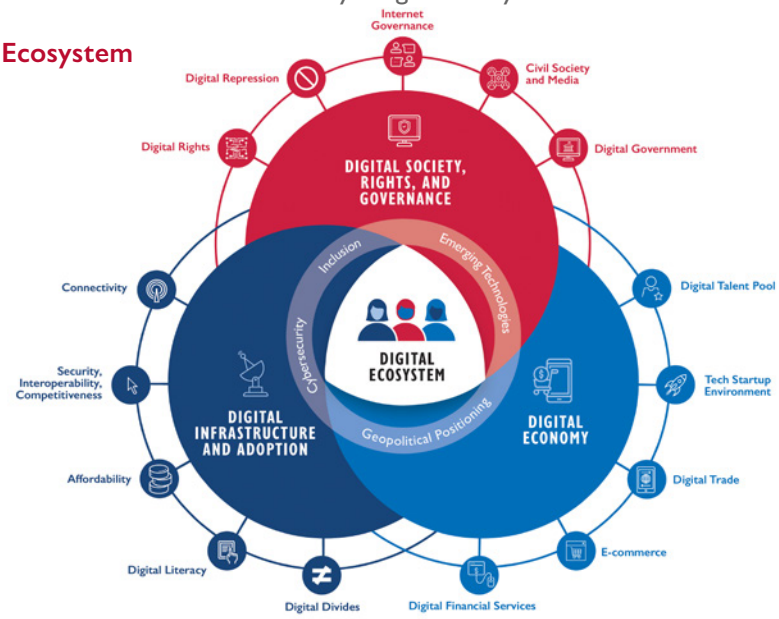
KEY TERMS | BOX 1: Digital Ecosystem

A digital ecosystem is comprised of stakeholders, systems, and an enabling environment that together empower people and communities to use digital technology to gain access to services, engage with one another, and pursue economic opportunities.

The USAID/Bangladesh DECA took place between June 2022 and December 2022. It included desk research, consultations with USAID/Bangladesh, nine weeks of virtual interviews, and one week of in-person interviews. It involved a total of 81 interviews with stakeholders from civil society, academia, the private and public sectors, international development organizations, and USAID/Bangladesh technical offices.

The DECA is intended as a rapid assessment of opportunities and challenges tailored to USAID's programmatic priorities, and thus may not cover all of USAID/Bangladesh program offices and projects in-depth. It is not intended as an authoritative source on the country's digital ecosystem.

FIGURE 1: Digital Ecosystem Framework



DECA Findings

PILLAR 1: DIGITAL INFRASTRUCTURE AND ADOPTION

Digital Infrastructure and Adoption refers to the resources that make digital systems possible and how individuals and organizations gain access to and use these resources. Digital infrastructure includes geographic network coverage, network performance, internet bandwidth, and spectrum allocation as well as telecom market dynamics around security, interoperability, and competitiveness. This pillar also examines behavioral, social, and physical barriers and opportunities for equitable adoption (digital divides, affordability, and digital literacy)—who uses and does not use digital technologies and why.

KEY TAKEAWAYS : DIGITAL INFRASTRUCTURE AND ADOPTION

FINDINGS

- Fixed and mobile broadband have widespread coverage, but the quality of service and affordability are hindered by a concentration of players and unclear policies in the first and middle mile.
- Despite the GoB's focus on human development across strategy documents such as Digital Bangladesh, there is no clear digital literacy implementation roadmap to date and digital literacy emerges as a key barrier to uptake across all aspects of the digital ecosystem.
- A growing ecosystem of locally relevant content is key to closing the usage gap; barriers in terms of funding and understanding user needs remain.

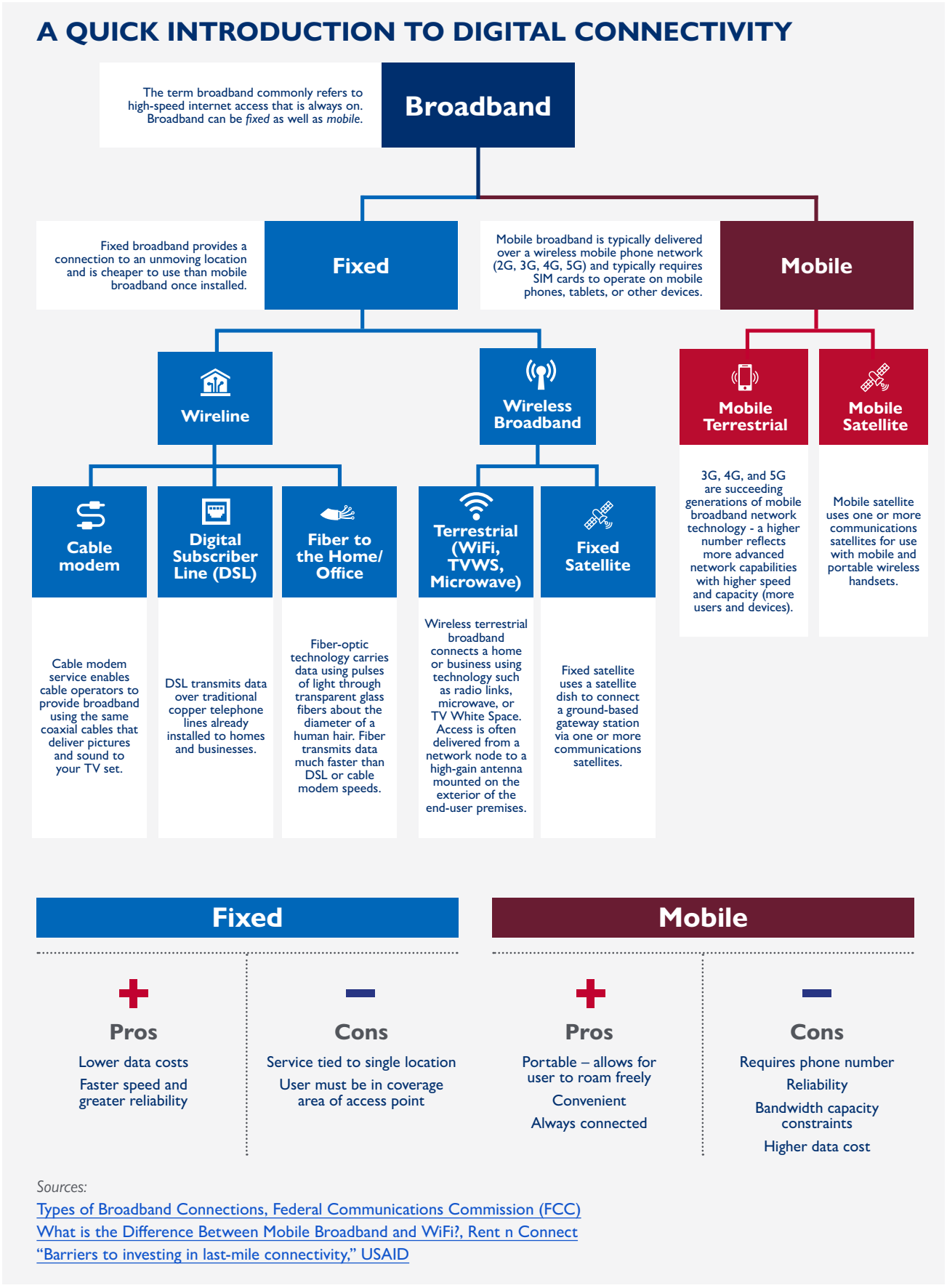
RELEVANT RECOMMENDATIONS

1. Implement digital literacy initiatives to empower citizens and cultivate a digitally savvy workforce
2. Advocate for and create culturally relevant content to close the digital usage gap
3. Promote enabling connectivity policies and inclusive internet

INTRODUCTION

Due, in large part, to the rapid deployment of telecommunications infrastructure in Bangladesh, internet penetration and use is quickly though unevenly growing. The Bangladesh Telecommunication Regulatory Commission (BTRC) estimated 72 percent internet penetration (coverage) across the country in October 2022,[2] and internet access is also relatively affordable.[3] However, these statistics mask other challenges to Bangladesh's digital transformation. Data in the 2022 Bangladesh Population and Housing Census shows that more than 69 percent of people aged five years and up in Bangladesh do not use the internet and that 44 percent of this group do not own a handset.[4] Limited digital literacy and lack of relevant content are two factors that hinder greater uptake and use of digital technology.

FIGURE 2: A quick introduction to digital connectivity



Sources:

[Types of Broadband Connections, Federal Communications Commission (FCC)]
[What is the Difference Between Mobile Broadband and WiFi?, Rent n Connect]
[“Barriers to investing in last-mile connectivity,” USAID]

1.1 BANGLADESH'S CONNECTIVITY LANDSCAPE

Following the introduction of dial-up internet in early 1990s, internet access in Bangladesh grew rapidly after the Government of Bangladesh (GoB) granted satellite (VSAT) internet licenses to two internet service providers (ISPs) in 1996.[5] By 2005, Bangladesh was home to more than 180 registered ISPs.[6] However, internet use in Bangladesh remained low during this period: the percentage of internet users increased from 0 percent to 5 percent from 2000 to 2012.[7] Internet usage exploded with the introduction and rapid expansion of mobile broadband in the 2010s. In 2012, state-owned mobile network operator (MNO) Teletalk's introduced Bangladesh's first 3G network in 2012.[8] Internet access and use in Bangladesh are expected to grow following the introduction of 4G services in 2018[9] and 5G in 2021.[10] The percentage of individuals in Bangladesh who use the internet increased from five percent (2012) to 25 percent in eight years (2020).[11]

The Ministry of Posts, Telecommunications, and Information Technology has two divisions: the Posts and Telecommunications Division and the Information and Communication Technology (ICT) Division. Appendix A details each division's key functions. The Bangladesh Telecommunications Regulatory Commission (BTRC) operates under the supervision of the Posts and Telecommunication Division and regulates Bangladesh's telecommunications space. A 2010 amendment (followed by a 2021 amendment) requires BTRC to seek approval on key licensing matters from the Ministry of Posts, Telecommunications and Information Technology.[12] Table 1 outlines key policies behind Bangladesh's telecommunications sector.

TABLE 1: Key telecommunications policies

2001 Bangladesh Telecommunication Act	Governs the telecommunications landscape and created the Bangladesh Telecommunication Regulatory Commission (BTRC) which issues telecommunications licenses and regulates all other matters related to telecommunications.[13] In 2010, the Act was amended.
2004 Bangladesh National Frequency Allocation Plan (NFAP)	Determines the spectrum allocation for internet service providers. According to the NFAP, the distribution between stakeholders, government, and non-government will be made in consultation with BTRC and members of the Spectrum Management Committee (SMC) within BTRC.[14] The NFAP was revised in 2010 and 2018.15
National Broadband Policy 2009	Provides a minimum broadband speed (2 Mbps for 3G and 7 Mbps for 4G).[16] Two subsequent revisions—most recently in 2018—have increased the minimum speed.[17] In 2022, BTRC launched a benchmarking system and noted that operators would be notified if they cannot meet the service quality standard.
National Telecommunication Policy 2018	Revision of the National Telecommunications Policy 1998.[18] This includes five guiding principles: "i) open and competitive market; ii) universal access; iii) effective governance; iv) appropriate regulation; and v) being visionary."[19] It also sets short-, medium-, and long-term goals for broadband penetration: 30 percent fixed and mobile broadband penetration by 2020, 70 percent broadband penetration by 2023, and 100 percent broadband penetration by 2027.[20]

Connectivity networks fall into three levels: the submarine cables and other international internet access infrastructure that connect Bangladesh with the rest of the world—the first mile; the terrestrial distribution networks that connect Bangladeshi towns and cities to one another—the middle mile; and the last-mile network that connects the end user—homes and businesses—to the internet (see Appendix C).[21] In Bangladesh, a high degree of concentration in the first mile and middle mile sectors contrasts with the large number of players providing broadband (especially fixed broadband) at the last mile (see Appendix B for a list of key players). This

is true for most markets. In an ideal market, last-mile players only work with the second mile. Companies providing last-mile connectivity services in Bangladesh are often required to work with first and middle mile connectivity providers for access to fiber, towers, and other necessary connectivity infrastructure, which increases complexity and costs and can have an adverse impact on the quality of service at the consumer level.[22]

KEY TERMS | BOX 2: Spectrum, ISPs, and MNOs

Internet Service Providers (ISPs) deliver access to end users using both fixed-line and wireless technologies. Wireless ISPs, especially those in rural areas, often take advantage of low licensing and equipment costs by delivering service using unlicensed spectrum. ISPs range in size and scope from small local providers to providers with international and even global reach.

Mobile Network Operators (MNOs) provide voice and data services primarily through wireless terrestrial networks. MNOs typically utilize licensed spectrum bands which tend to deliver a higher quality, more reliable (and more cost intensive) service than that delivered by services using unlicensed spectrum because licensed spectrum bands are not shared.

The key difference between ISPs and MNOs is that MNOs provide internet service through a particular medium: licensed spectrum. ISPs deliver internet service through other means, including fixed-line connections and unlicensed spectrum (such as WiFi).

Radio Spectrum refers to the range of frequencies of electromagnetic radiation that are used to deliver radio transmissions. Telecommunications sector regulatory authorities designate specific frequency ranges (or bands) for different purposes, including telecommunications as well as applications such as radio astronomy or industrial uses. Some bands (e.g., WiFi) are *unlicensed*, meaning that anyone can use them without seeking explicit prior permission.[23] Licensed spectrum requires users (e.g., mobile network operators or FM radio broadcasters) to secure a regulator's approval before use. Licenses are typically assigned through spectrum auctions, which seek to establish the economic value of spectrum as a finite natural resource.

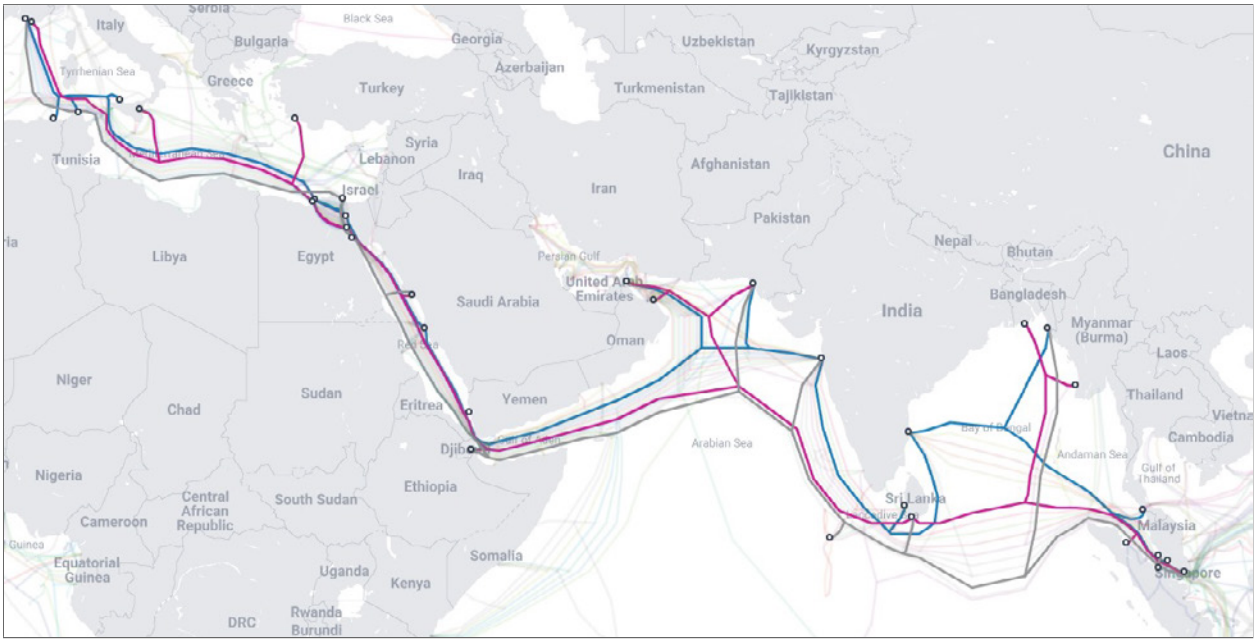
1.1.1 FIRST MILE AND MIDDLE MILE: RULED BY FEW

Bangladesh connects to global broadband infrastructure using both submarine cables and overland (terrestrial) cables. Key players include submarine cable companies and international terrestrial cable (ITC) operators in the first mile and the National Internet Exchange (NIX) and international internet gateways (IIGs) in the middle mile. The first and middle mile are operated by a small concentration of market players (see Appendix B).

Bangladesh had only one submarine cable company until mid-2022, the public limited company Bangladesh Submarine Cable Company Limited (BSCCL). BSCCL operates two submarine fiber-optic cables that import bandwidth[24] from Singapore: SEA-ME-WE 4 (connected in 2006) and SEA-ME-WE 5 (connected in 2017).[25] It expects to connect to a third cable, SEA-ME-WE 6, by 2025 (see Figure 3). In August 2022, GoB ended BSCCL's monopoly on first mile connectivity by issuing new submarine cable licenses to three private companies who were already active in Bangladesh's telecommunications space: Summit Communications, Cdnet Communications, and Metacore Subcom Ltd.[26] To reduce reliance on Bangladesh's (then) only submarine cable, BTRC awarded ITC licenses to six companies in 2012.[27] As of 2022, Summit Communications is responsible for close to 50 percent of Bangladesh's total ITC business.[28] Bangladesh's overland cables connect to India, which currently provides around 40 percent of Bangladesh's bandwidth.[29] In the middle mile, IIGs buy bandwidth from either submarine cable operators or ITC operators to distribute internet connectivity within Bangladesh. Domestic internet traffic within Bangladesh is routed through the NIX, to minimize the use of international bandwidth.[30] In 2014, Bangladesh issued two NIX licenses to Bangladesh Internet Exchange Trust and to Novocom.[31]

The creation of ITC licenses in 2012 and the issuance of three new licenses for submarine cable operators in 2022 is increasing the amount of available bandwidth to Bangladesh, but this may not keep pace with Bangladesh's bandwidth needs. BSSCL's bandwidth requirements have more than tripled since the beginning of the COVID-19 pandemic.[32] At the same time that 5G is expected to increase Bangladesh's bandwidth use, some experts believe that Bangladesh's first submarine cable will come to the end of its lifespan in 2025.[33] New submarine cable connections may not be enough to meet Bangladesh's rapidly growing bandwidth needs.

FIGURE 3: Submarine Cables connecting to Bangladesh



Source: Submarine Cable Map by TeleGeography, cited October 2022

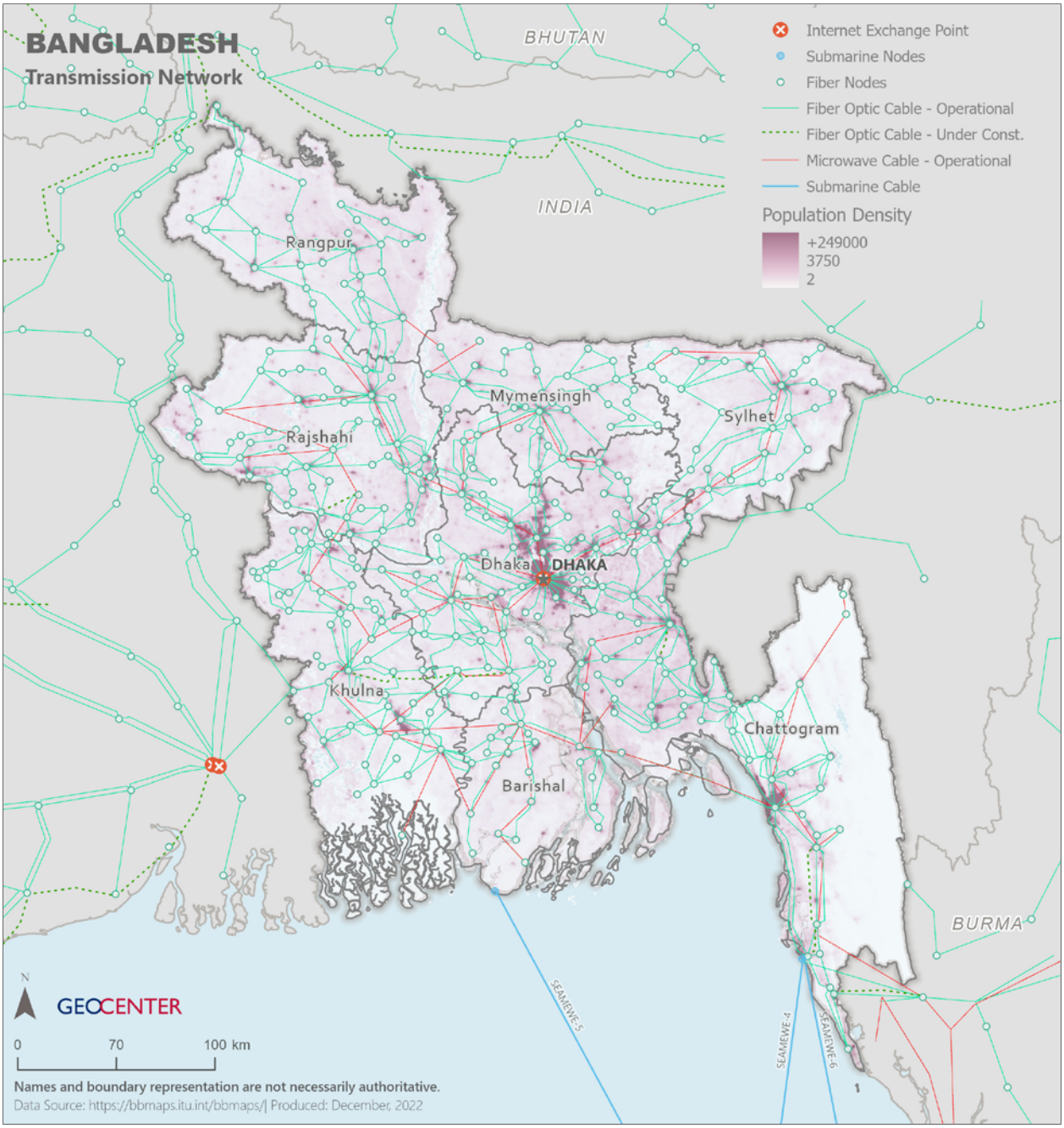
Despite the issuance of three new submarine licenses in 2022, there are still fewer than 10 companies who provide first mile connectivity services to Bangladesh. Additionally, some providers wear multiple hats. Summit Communications, is a first, middle, and last-mile operator, exemplifying vertical integration and the high market concentration within this segment of Bangladesh's telecommunications industry.

In the middle mile, a third type of license—a nationwide telecommunication transmission network (NTTN)—is also required to run and manage a fiber transmission network. In 2008, BTRC prohibited last-mile providers from deploying their own optical fiber infrastructure,[34] and began issuing the first NTTN licenses in 2009.[35] MNOs and ISPs must ask NTTN license holders to lay new fiber if they want to connect their own sites.[36] At present, only six entities hold NTTN licenses. Of these six, three are state-owned, and the other three are private companies.[37] The state-owned NTTN services are largely unavailable to ISPs and MNOs, as they typically only work with the three private NTTN licensees.[38]

Given that only two companies effectively operate in the NTTN market (Bahon only received its license in 2018 and is not yet established), several ISPs[39] are concerned about their ability to charge high prices for access to their networks as they are driven by profitability concerns.[40] The GoB has not set price caps or price guidelines for access to NTTNs.[41] As Figure 4 shows, fiber transmission coverage is dense, especially in heavily populated areas. BTCL had almost 100 percent coverage of underground fiber-optic cables across the country until 2019, but one article notes that most of this network remained dark or unused.[42] Even after NTTN companies began leasing fiber to MNOs in 2019, MNOs were unable to connect as of 2021 due to BTRC's

restrictions on importing specific equipment necessary to connect to the fiber-optic network.[43] One ISP singled out this duopoly as the reason that broadband internet is not yet widespread in Bangladesh, especially in rural areas, and speculated that the vertical integration of specific providers across the middle and first mile renders ISPs (who work only in the last-mile) unable to compete.[44]

FIGURE 4: Bangladesh fiber transmission map



Source: ITU Transmission Maps

1.1.2 FIXED BROADBAND IN BANGLADESH

Fixed broadband is one type of last-mile connectivity that is provided by internet service providers (ISPs). Demand for fixed broadband in Bangladesh is growing. Subscriptions in Bangladesh have steadily increased from 600,000 in 2012 to more than 10 million in 2020.[45] Though impressive, this growth represents only about six percent of Bangladesh's population.[46] The BTRC estimated a six percent fixed broadband penetration rate in December 2021.[47]

Unlike the first and middle mile, the last-mile ISP market is dominated by more than 2,000 registered ISPs (see Appendix A).[48] By comparison, India (with a population nearly 10 times the size of Bangladesh[49] and a landmass more than 20 times the size of Bangladesh[50]) had only 305 ISPs in June 2020.[51] Several players in the fixed broadband industry reported that this level of competition for customers was unsustainable for the industry.[52] Two companies noted that competition was so stiff that ISPs would actually cut the cables of their competitors to expand their own customer base.[53]

1.1.3 MOBILE BROADBAND ACROSS (NETWORK) GENERATIONS

Mobile broadband dominates the market for broadband internet services in Bangladesh. In 2021, the ITU estimated the rate of active mobile broadband subscriptions at 59 per 100 inhabitants.[54] According to BTRC data, Bangladesh had 116.12 million mobile internet users as of August 2022,[55] representing a 70 percent mobile internet penetration rate.[56] Though these rates double-count people who own multiple SIM cards, it is clear that the majority of internet users in Bangladesh rely on mobile broadband. Three MNOs dominate in Bangladesh: Grameenphone,[57] Robi, and Banglalink. The state-owned MNO, Teletalk, is a distant fourth (see Table 2).

TABLE 2: MNO market share

Grameenphone	83.15
Robi Axiata	54.95
Banglalink	38.76
Teletalk	6.72

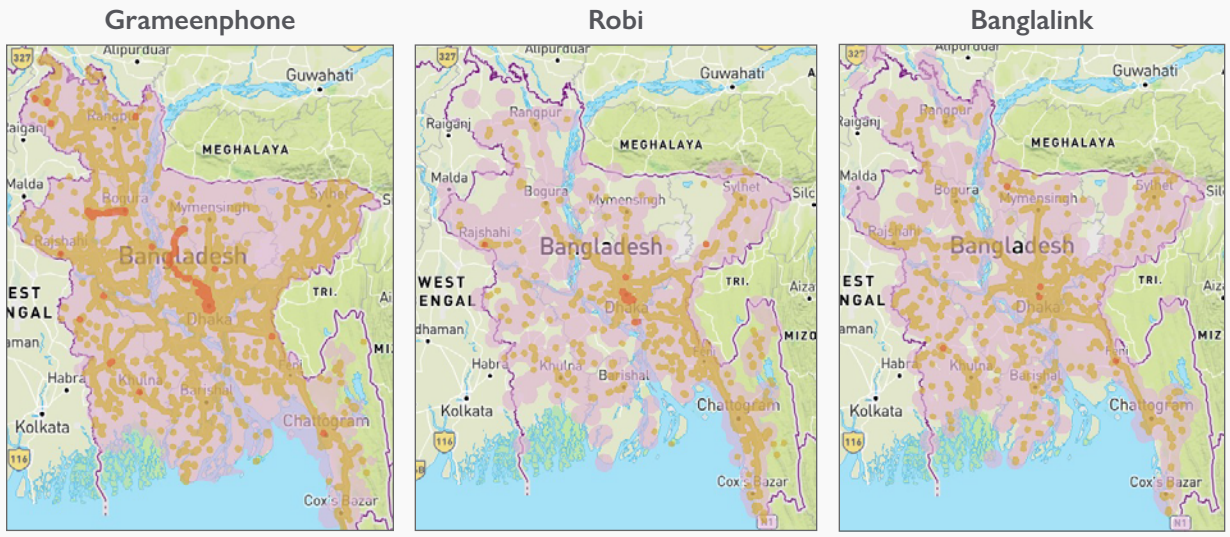
Source: BTRC, cited August 2022

According to GSMA Network Coverage Maps (see Figure 5), almost the entire population of Bangladesh is covered by at least a 2G network (light pink) by Grameenphone. 3G coverage (light orange) reaches populations in most towns and cities, perhaps least in the Central Northern parts of the country. 4G networks (dark orange) are mostly concentrated in and around the capital, Dhaka. As with ISPs, MNOs depend on first and middle-mile providers for the infrastructure required to use mobile broadband.[58] This means that MNOs cannot necessarily control where, how, and at what speed they expand, which may have an impact on internet availability in Bangladesh.

Alternative connectivity solutions to get the internet to the last mile, such as TV white space, (TVWS) have not been a topic of wide discussion in Bangladesh. Even though the internet was initially introduced to Bangladesh via satellite—not cables—in 1996, MNOs and other telecommunications value chain actors expressed skepticism about expanding connectivity through wireless technologies. This is because populations that are unconnected

are also more likely to live in remote, sparse, and often geographically challenging areas (like the hill tracts) where it would be difficult to make such technology work effectively.[59]

FIGURE 5: Mobile network coverage by top 3 MNOs



Source: GSMA Network Coverage Maps, cited October 2022

Spectrum auctions have been fairly frequent over recent years (Figure 6), however, MNOs expressed concerns that the price of 4G and 5G spectrum at recent auctions may affect their financial ability to further expand their networks,[60] which could affect their quality of service.

FIGURE 6: History of spectrum allocation in Bangladesh

Source: Public sector interview by the DECA Team, July 2023; Reuters, Mobile World Live, S&P Global Market Intelligence

BANGLADESH'S SOCIAL OBLIGATION FUND

MNOs[61] in Bangladesh are required to pay one percent of their total gross revenues into the Social Obligation Fund (SOF),[62] its Universal Service Fund equivalent. GoB uses the SOF "to spread the technology to the remotest corner of Bangladesh."[63] According to the BTRC, SOF funds are paying to establish or expand high-speed broadband or satellite services in remote or disadvantaged areas (including islands) and to help digitize primary school services in such areas.[64] Most notably, the SOF is funding the high-profile Connected Bangladesh

project, which aims to extend internet access to more than 600 remote unions by 2023.[65] The SOF was unutilized or underutilized for a long time. Though it was established and started collecting money in 2011,[66] the SOF started funding projects about seven years later.[67]

KEY TERMS | BOX 3: Universal Service Fund

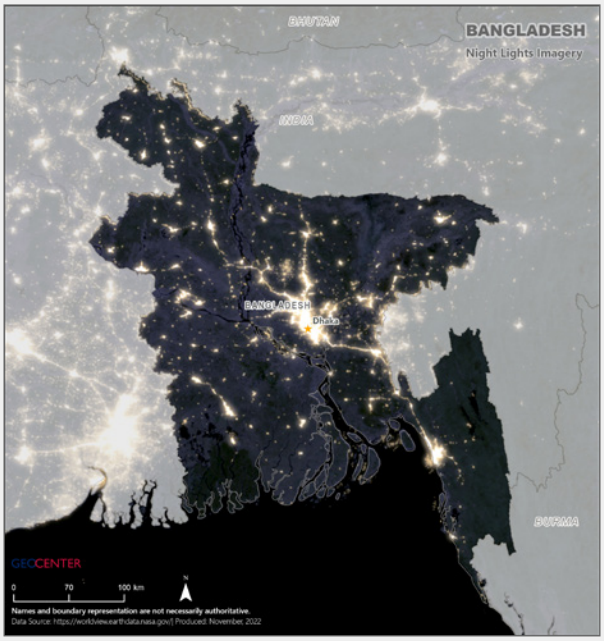
A Universal Service Fund (USF) is designed to promote network infrastructure development in areas that commercial access providers deem uneconomical. USFs subsidize programs, resourced through contributions drawn from the revenues of telecommunications operators. USF funds are often applied to help de-risk or otherwise complement network investments in underserved or unserved areas. In many cases, USFs target projects that serve schools, hospitals, and other anchor institutions where demand for services can be aggregated.

BOX 1: Electricity, climate change, and connectivity

Electricity is critical for connectivity. Individual users need electricity to charge their digital devices, and telecommunications infrastructure—like base stations and towers—require electricity to be operational. The GoB announced in 2022 that every house in Bangladesh has access to electricity,[68] but media reports from August 2022 state that Bangladesh's current electricity supply meets only 40 to 50 percent of demand.[69] Figure 7 puts this into perspective. On the left, the electricity transmission map shows a concentrated network of electricity distribution lines throughout almost the entire country. However, night lights imagery on the right shows that many lightly populated parts of the country may not have electricity access.

Figure 7: Electricity transmission and night lights imagery

Source: WorldPop and https://gridfinder.org | Produced: November 2022



Source: NASA Worldview | Produced: November 2022

Bangladesh's well documented electricity issues are already affecting connectivity. In October 2022, the failure of the national power grid in four regions with 8,000 telecom towers coincided with mobile phone users in those areas struggling to make calls and use their data.[70] Electricity issues are driving up the cost of internet access. Several MNOs and ISPs have noted that the price of electricity affects the price at which they sell their services and their profit margins.[71]

BOX 1 (CONTINUED): Electricity, climate change, and connectivity

The relationship between climate change and electricity access is also beginning to have an effect on connectivity in Bangladesh. In the June 2022 floods, more than 2,500 mobile network sites in Sylhet, Sunamganj, and Netrokona districts were knocked offline because they lacked electricity.[72] Telecommunications companies are already beginning to experiment with solar power solutions, with MNO Robi announcing in August 2022 that it was using solar cells to charge more than 1,600 base stations.[73]

1.1.4 LIMITED EFFORTS IN NETWORK INFRASTRUCTURE SHARING

Telecommunications companies can lower their operational costs by sharing their network infrastructure,[74] such as mobile phone towers or base stations. Other benefits of network infrastructure sharing include faster broadband deployment times, improved efficiency, a reduced environmental footprint, and increased risk sharing for MNOs and ISPs, particularly in areas with an expected lower return-on-investment (such as sparsely populated areas).[75] However, MNOs and ISPs are not necessarily incentivized to share their infrastructure because doing so can erase their (perceived) competitive advantage[76] in specific geographic areas or with specific service offerings like 4G or 5G. Telecommunications companies in Bangladesh have been passively sharing network infrastructure for several decades, but they share only a small percentage of their infrastructure.

Passive infrastructure sharing between MNOs began in Bangladesh in 2003 on an informal basis, with Robi (then known as Aktel) and the now-defunct Citycell sharing towers and cell sites.[77] BTRC issued Bangladesh's first formal Guidelines for Infrastructure Sharing in 2008 and amended them in 2011 to boost network sharing,[78] but allowing only passive infrastructure sharing,[79] meaning that MNOs can share towers, sites, and fiber.[80] BTRC's 2018 Regulatory and Licensing Guidelines for Issuing Licenses for Tower Sharing outlines the licensing procedure for sharing towers, paving the way for the issuance of four mobile phone tower sharing licenses later that year.[81] As of July 2022, Robi was still sharing only 30 percent of its towers, while Grameenphone and Banglalink were sharing only 18 percent and 17 percent of their towers respectively leaving more 20,000 towers poorly utilized.[82]

Experts at a Telecom Reporters' Network Bangladesh (TRNB) roundtable noted that tower management requires significant fuel and electricity supply, putting pressure on the environment, and urged MNOs to "hand over" all their towers to tower companies.[83] If MNOs heed the request to hand over their towers, it will be a step toward the type of market specialization that is common in better developed markets. Handing over existing towers to tower companies may help improve network infrastructure sharing (and thus connectivity), but profit is a key driver when tower companies decide where to build new towers.[84] Without the right policies in place, tower companies may be able to charge MNOs whatever they wish without maintaining a certain level for QoS since they do not directly serve the end customer.

Some MNOs and other telecommunications players have begun infrastructure sharing. MNOs Robi and Teletalk signed a "tri-party agreement for sharing existing network infrastructure" with Summit Communications in September 2022.[85] And at least one other major MNO is in discussions with ISPs about collaborating in congested areas, with MNOs potentially offloading some of their calls to fixed broadband networks if these networks work well.[86]

Telecommunications companies in Bangladesh are also beginning to share fiber-optic cables, another key element of network infrastructure sharing. Bangladesh Railway (a state-owned NTTN) announced in August 2022 that it was leasing spare fiber optic cables for five years to three other NTTNs and two MNOs to help improve

their redundancy and ensure quality of service.[87] It is not clear how much the MNOs will benefit from this arrangement because they are not legally allowed to install a specific type of technology (dense wavelength-division multiplexing) that allows them to use these cables, although the Railway has agreed to install it on their behalf.[88] ISPs are also subject to the same infrastructure sharing rules as MNOs in Bangladesh and (as noted in Section 1.1.1) rely on a concentrated first and middle mile market to provide the infrastructure.In terms of active infrastructure sharing, ISPs also expressed a desire for GoB to pass relevant rules and regulations, with one ISP noting that this would allow them to lower the cost of fixed broadband to the consumer.[89]

Grameenphone and Banglalink have tested OpenRAN in Bangladesh.[90] However, key telecommunications players expressed doubts that OpenRAN would soon become widespread in Bangladesh due to high upfront costs, concerns about security, and the need to standardize across MNOs (interoperability).[91] Standards development organizations, like the Telecom Infra Project, OpenRAN Policy Coalition, and O-RAN Alliance, continue to support standards development (i.e. interoperability and security standards) as well as laboratory tests and field trials. As these organizations continue to test and iterate, OpenRAN approaches will become more affordable for the telecommunications industry, particularly for smaller ISPs and MNOs.[92]

1.2 IMPLICATIONS OF BANGLADESH'S CURRENT DIGITAL INFRASTRUCTURE

The structure and characteristics of Bangladesh's telecommunications sector have important implications for connectivity in Bangladesh: low quality of service, lack of quality access in rural areas, and affordable internet packages but expensive devices (including mobile phones).

1.2.1 LOW QUALITY OF SERVICE (QOS)

Despite the broad geographic internet coverage, internet speeds in Bangladesh remain low. According to the Speedtest Global Index, Bangladesh ranked 100th out of 182 countries for fixed broadband and ranked 132nd out of 140 for mobile broadband.[93] BTRC speed tests in late 2021 and early 2022 found that all four MNOs—with the exception of Banglalink in Sylhet and Rajshahi—were providing lower 4G speeds than the established benchmark (greater than or equal to 7 Mbps download speed) in five of the eight divisions.[94] In addition, several interviewees commented that they do not always believe they are receiving the bandwidth that they pay for or that the bandwidth displayed on their phone home screens is accurate, but they do not have a way to measure the accurate QoS themselves.[95] One NGO mentioned that people in hill tracts (specifically in Chittagong and Mymensingh) sometimes only have access to the wellstate-owned MNO, Teletalk, and that it often does not work.[96]

MNOs and ISPs acknowledge widespread QoS concerns in Bangladesh, and the BTRC is starting to hold them accountable. From the MNO standpoint, rapid urbanization and high population density are key challenges for QOS.[97] Deciding where and how to lay infrastructure can affect how it performs once fully operational, but the unpredictability of Bangladesh's urban growth makes these decisions difficult. From a business standpoint, relatively low average revenue per user in Bangladesh may also affect their decision-making around expensive telecommunications infrastructure.[98] These decisions usually most affect connectivity expansion into rural areas. The inability of MNOs to connect to a large portion of the fiber leased to them by NTTN providers (see Section 1.1.1) may have also affected their QoS (at least until 2021).[99] BTRC is starting to punish MNOs for low QoS. They prevented Grameenphone from selling new SIM cards in July 2022 after they allegedly failed to improve their QoS at BTRC's request.[100]

High taxation rate of mobile cellular services may also affect the quality and affordability of services in the country. From July 1, 2022, the GoB imposed a 15 percent VAT on data services (up from 5 percent previously).[101] Struggling to balance shareholder expectations against customers' quality of service considerations, this policy change led at least one MNO to increase the price of its data by 15 percent.[102] In addition, the mobile industry in Bangladesh has a 2 percent turnover tax, compared to just one percent for the tobacco industry.[103] It is unclear whether the GoB will give tax incentives to MNOs for introducing 5G infrastructure or other aspects of the 5G value chain, which could also affect 5G rollout in Bangladesh.[104]

MNOs, in particular, expressed a hope that the rollout of 5G will improve the user experience.[105] BTRC acknowledges that the current allocated spectrum is not sufficient to provide quality internet services to Bangladesh's population, so they have stated that they are planning another auction.[106] In a late 2022 event hosted by the Telecom and the Technology Reporters' Network Bangladesh (TRNB) and Robi Axiata, experts noted that Bangladesh is not ready to deploy 5G at full scale. They noted the importance of addressing current usage gaps by addressing taxation burden on users, regulation, improvement of local content, and coverage barriers. This sentiment was backed by several GoB representatives, noting the need to improve 4G coverage before moving on to 5G.[107] Otherwise, it is possible that QoS issues with 3G and 4G may replicate with 5G deployment in Bangladesh.

1.2.2 AFFORDABILITY – RELATIVELY AFFORDABLE BROADBAND, BUT EXPENSIVE HANDSETS

Broadband costs remain relatively low in Bangladesh. In terms of fixed broadband, the GoB's recent price caps on internet packages have kept costs artificially low. The GoB recently mandated the sale of 5 Mbps packets for BDT ৳500 (around USD $4.80)[108] meaning that some ISPs are now losing money by offering fixed broadband in rural areas.[109] The Alliance for Affordable Internet's (A4AI) "1 for 2" target for affordable internet set the threshold at 1GB of mobile broadband data costing two percent (or less) of the average income per capita.[110] For Bangladesh, this percentage is 1.3 percent, well under the A4AI target.[111] National averages, however, mask economic inequalities. The cost of mobile broadband exceeds A4AI's "1 for 2" target for the poorest 40 percent of Bangladeshis.[112] According to the Bangladesh National ICT Household Survey 2018–2019, only 15.8 percent of non-internet users cited affordability as a barrier to their use of the internet, compared to 65 percent of non-users who said they cannot use the internet,[113] indicating that the cost of data may not affect general uptake as much as the problem of basic digital literacy.

Internet-enabled devices (like feature phones or smartphones) are an important prerequisite for internet access and are expensive in Bangladesh. The country scores relatively low (36) in terms of cost of the cheapest internet-enabled feature phone or smartphone compared to India (62), according to the GSMA Mobile Connectivity Index.[114] In May 2022, Grameenphone, Robi, and Banglalink reported an average smartphone penetration of just 48 percent.[115] In interviews, one MNO even acknowledged that low smartphone penetration was one of their biggest challenges in expanding connectivity, given that there is no business case for building out a 4G network in areas where consumers may not be using 3G or 4G-enabled handsets.[116] BTRC acknowledged the lack of smartphone affordability as a major internet access issue as well,[117] stating that its "Made in Bangladesh" program has been encouraging local smartphone manufacturing by raising taxes on imported devices (since 2017)[118] and lowering them on device components.[119] By mid-2022, 14 smartphone manufacturers in Bangladesh were meeting over 90 percent of the local demand for smartphones.[120] Though the "Made in Bangladesh" initiative[121] is likely helping to increase device affordability in Bangladesh,[122] the Daily Star reported that the sales of mobile phones had decreased by 20 percent by mid-2022.[123] The expected imposition of five percent VAT on local handset manufacturing—on top of inflation—could result in an approximate 15 percent increase in smartphone prices,[124] which will likely disincentivize consumers from buying new handsets. One MNO

reported that less than two percent of handsets on their network are 5G-enabled.[125] If this is true across all networks, it poses future challenges for 5G adoption and expansion throughout Bangladesh.

1.3 SECURITY CONSIDERATIONS IN THE TELECOMMUNICATIONS SPACE

Physical security, cybersecurity, and geopolitical positioning are key security concerns in Bangladesh's telecommunications sector.

1.3.1 PHYSICAL SECURITY OF BANGLADESH'S TELECOMMUNICATIONS INFRASTRUCTURE

Physical security challenges in Bangladesh include damaged towers and cut fiber optic cables. In terms of tower safety, Edotco—one of four licensed tower companies in Bangladesh with 33 percent market share—stated that it fell victim to 242 incidents of theft in 2021.[126] More than 90 percent of these thefts involved batteries, given their high value and ease of re-engineering.[127] As a result, the company spent more than USD $2 million to replace stolen and fix vandalized equipment for its towers.[128]

Cut cables can also be expensive and difficult to repair. In some cases, construction companies cut these cables by accident.[129] In other cases, interviewees reported that telecommunications companies—particularly ISPs—may cut the cables of their competitors on purpose to increase their competitive advantage.[130] One nationwide ISP mentioned that they face cable cuts worth over USD $300,000 per month.[131] Another provider alleged that ISPs have one team dedicated to laying fiber and another team dedicated to cutting its competitors' fiber, resulting in a tangle of overhead hanging pools of fiber when these companies all try to repair their fiber.[132] The high cost of repairing or replacing this equipment may disincentivize other companies from trying to enter the telecommunications infrastructure space and hinders the goal of advancing connectivity in Bangladesh.

1.3.2 CYBERSECURITY OF BANGLADESH'S TELECOMMUNICATIONS INFRASTRUCTURE

To provide adequate cybersecurity protections to the end consumer of broadband, each layer of telecommunications infrastructure requires its own cybersecurity measures. Some layers of Bangladesh's infrastructure are well protected. BSCCL stated in an interview that its submarine cables use best-in-class cybersecurity technology.[133] However, ISPs appear to be a particularly vulnerable link in the chain. One ISP noted that they do not intend to provide cybersecurity services for its network because it is not financially feasible for them to do so,[134] while another ISP noted that it is particularly vulnerable because it does not have enough skilled cybersecurity personnel (though it does protect its proprietary assets).[135] This ISP also noted that it is their duty only to provide its customers with internet access,[136] implying that it is not their responsibility to provide a network with adequate cybersecurity protections. Another telecommunications company stated that they believe many ISPs are surviving only because cyber criminals or other malign actors are not actively targeting them, noting that some ISPs have had to shut down their businesses due to malware attacks.[137]

The data bears out the vulnerability of ISPs, while also making clear that MNOs are vulnerable as well. According to the GoB's e-Gov CIRT's "Ransomware State of Bangladesh 2022" report, fixed broadband provider BTCL cited more than 20,000 malware infections tied to ransomware, while ISP Link3 Technologies Ltd had more than 7,000.[138] On the MNO side, Grameenphone had more than 12,000 malware infections linked to ransomware, while Robi had more than 8,000, and Banglalink and Teletalk each had more than 2,000.[139] At 47, Grameenphone also had the highest number of unique counts of malware infection in GoB e-Gov CIRT research dated 2022 Q1, followed by Robi at 40, and Banglalink and Teletalk each at 31.[140] This affirms that cybersecurity is a major concern for Bangladeshi MNOs and ISPs alike.

1.4 DIGITAL LITERACY IN BANGLADESH

Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic, social, and political life. It is a key prerequisite for participating in the digital ecosystem. Internet use remains relatively low in Bangladesh. In a 2018–2019 survey, 82 percent of respondents owned a mobile phone (41 percent owned a smartphone) but 65 percent of respondents cited not being able to use the internet.[141] This illustrates how simply having an internet-enabled handphone does not equate to meaningful use of the technology and points to severe gaps in the digital and information literacy space.

1.4.1 DIGITAL LITERACY INITIATIVES FOR THE GENERAL PUBLIC

Key digital literacy challenges in Bangladesh include a lack of digital skills and confidence in digital tools. According to GSMA Intelligence's 2020 Consumer Survey, almost half of respondents in Bangladesh stated that a lack of confidence and necessary skills to safely use the internet are barriers to their internet use.[142] Digital skills providers in Bangladesh cited similar challenges. One e-learning provider noted that many customers call their customer service representatives on the phone for help in downloading the e-learning app, and the representatives walk these prospective customers through the download process step-by-step.[143]

Interviewees also expressed serious concerns about social media literacy, specifically about propagating misinformation and disinformation (see Section 2.3.3 for more on misinformation and disinformation in Bangladesh). One interviewee expressed concern about the possible incidents of communal violence if internet etiquette is not taught in schools.[144]

Several public and private initiatives in Bangladesh aim to build more public awareness of the internet and how to use it effectively:

- GoB's MuktoPaath e-learning platform launched in 2016 by a2i, the ICT Division (under the Ministry of Posts, Telecommunication and Information Technology), and UNDP (USAID financed a2i through UNDP from 2012–2018),[145] offers online and offline content with a focus on vocational, general, and lifelong learning.[146] Developed in partnership with approximately 60 government training institutions and 25 NGOs,[147] the platform has more than one million registered users and 187 courses as of 2021.
- In partnership with the MoE, the ICT Division, and a2i, Meta (formerly Facebook) launched the Bangla language 'We Think Digital' program for Bangladesh in 2020 with 100 government officials, teachers, and young professionals.[148] We Think Digital combines training modules with other educational materials on topics such as digital citizenship and digital safety to promote positive online experiences and interactions.[149]
- Created in 2015 as a free YouTube channel,[150] 10 Minute School is now Bangladesh's largest e-learning platform with more than 3 million users[151] and provides a range of courses from ICT basics to programming.[152] It targets two key segments: K-12 learners (including those interested in university admission) and people interested in acquiring new skills.[153] At the time of this research, they reported having more than 30,000 free videos and 10,000 quizzes on their platform, with 20 million students taking free lessons on their website or app annually.[154] They have 100,000 paid enrolled students on the K-12 academic side,[155] and have recently conducted more than 2,500 live classes.[156]

Despite the number of digital skill development initiatives in Bangladesh, one interviewee acknowledged that the GoB does not yet have a comprehensive plan outlining its own digital literacy initiatives.

1.4.2 DIGITAL LITERACY IN PRIMARY AND SECONDARY SCHOOL

With growing and changing needs in the digital space, digital literacy and awareness must begin at a young age. Although there is not yet a specific digital literacy policy in Bangladesh, the GoB is working to incorporate digital literacy into primary and secondary school curricula, aligned with the goals of the National ICT Policy 2009, National Education Policy 2010, and the Ministry of Education's Master Plan for ICT in Education in Bangladesh (2012-2021). In March 2023, the Education Minister announced that students would be taught coding from third grade with plans to implement a new curriculum from pre-primary to secondary schools by 2025.[157]

The GoB has primarily facilitated ICT education by installing more than 4,000 specialized computer labs—Sheikh Russel Digital Labs—in primary and secondary schools.[158] The MoE has set up some 60,000 multimedia classrooms across Bangladesh as its key digital literacy initiative.[159] However, they have no designated ICT teachers, which hampers their effectiveness. A similar 2012–2015 MoE initiative to distribute digital devices like laptops, modems, and projectors to more than 20,000 schools, madrasas, and colleges was largely ineffective in building digital skills, with a 2018 Implementation Monitoring and Evaluation Division evaluation finding that 97 percent of these digital devices were unused.[160] In both the ICT Division and MoE's efforts, the lack of qualified ICT teachers and the lack of a clear digital literacy curriculum hinder the GoB's expansive efforts to facilitate widespread digital literacy education.

Another similar initiative in public schools—but not administered by the GoB—is the Computer Literacy Center (CLC) program, run by the US-based Computer Literacy Program and its Bangladesh-based partner, Dnet. Started in 2004, CLCs are computer labs typically found in schools or other educational institutions that provide hands-on digital literacy training by trained educators.[161] Dnet provides intensive training-of-trainers (ToT) and regular follow-up to the chosen CLC teachers, who then pass this knowledge on to their students in their lessons. Students are issued a Bangla language "Esho Computer Shikhi" (Let Us Learn about Computers) manual. In addition to providing the equipment, CLC also guarantees a one-year maintenance contract to ensure that the devices in the computer lab remain in good working order. So far, 130,000 students (50 percent female) have graduated from the 287 CLCs and 97 associate CLCs in 55 districts of Bangladesh, with 40,000 students using these digital labs every year.

1.4.3 DIGITAL LITERACY AT THE TERTIARY LEVEL

Bangladesh's tertiary education system is not yet delivering digitally skilled graduates at the levels required to fill Bangladesh's job market needs (see Section 3.4.1). According to a World Bank study, Bangladesh had a 39 percent unemployment rate for university graduates, contrasted with 14 percent in India and just one percent in Vietnam. This is part of a broader pattern suggesting that higher education institutions in Bangladesh may struggle to prepare students for technology careers. On the digital skills side, another World Bank survey in 2018 found that 72 percent of respondents (all employers) in Bangladesh stated that graduates should strengthen their use of ICT skills, the second highest response behind "problem-solving skills" at 83 percent. STEM education in Bangladesh typically focuses on theoretical learning, rather than on practical and applied skills. This is having important ripple effects on the IT sector, with a reported 80 percent of IT graduates in Bangladesh failing to meet their prospective employers' IT recruitment standards. This is further compounded by the lack of qualified professors which will be discussed further in Section 1.4.4.

Updating curricula is a highly bureaucratic process and does not allow for industry-relevant and timely curricula to be available to students. One expert spent more than a year working to get approvals from the academic board of the university to launch a course on innovation and human-centered design (HCD), which they had

co-created. After a year of waiting for approvals, the course was not yet live due to a cumbersome bureaucratic process with the government's University Grants Commission.[162]

Many students and instructors may possess low levels of digital literacy as a result of the lack of devices and quality internet access at Bangladesh's higher education institutions.[163] The GoB's Bangladesh Research and Education Network (BdREN) initiative aims to connect its local universities to high speed internet.[164] As of 2022, more than 100 (out of 160)[165] universities are full members and another 77 institutions[166] are associate members.[167] Higher education institutions that are not members of BdREN typically have internet quality issues due to their use of low bandwidth internet.[168] Similarly, many tertiary educational institutions also lack devices for their students.[169] The GoB has committed to building an additional 2,600 multimedia classrooms and 200 language ICT labs and to providing ICT equipment to 200 public colleges across Bangladesh to begin addressing this issue,[170] but it is not clear whether this is sufficient to address the need.

BOX 2: A tricky transition to distance learning during the COVID-19 pandemic

From March 2020 through September 2021, schools in Bangladesh were closed due to the COVID-19 pandemic—one of the longest school shutdowns in the world.[171] Digital access challenges in Bangladesh such as cost, connectivity, and digital skills impeded remote learning initiatives during the COVID-19 pandemic.

At the primary and secondary levels, the MoE and the Ministry of Primary and Mass Education (MoPME) launched television- and internet-based distance learning programs by the end of March 2020.[172] According to a World Bank study of 6,128 students from mid-2020, only 48 percent of respondents had access to a television, and only 39 percent of students had access to "Sangsad TV"[173] which broadcast MoE and MoPME content. Just 50 percent of students were aware of the online learning material, and only 1.5 percent of those students reported using it in the previous week.[174] Similarly, BRAC research found that 56 percent of students did not use online or recorded classes during Bangladesh's school closures.[175]

Although a handful of private universities started online classes by mid-April 2020, the Ministry of Education and the University Grants Commission of Bangladesh granted permission for universities to begin giving virtual lessons around May of 2020.[176] In one 2020 survey of 844 students from across Bangladesh, almost 10 percent of students reported not being able to attend online classes at all due to device, internet, or electricity issues.[177] Another mid-2020 survey noted that only 57 percent of students reported possessing the digital skills necessary to take part in online classes.[178] Surveys conducted during this period echoed similar challenges, specifically with internet connectivity, electricity, and internet costs.[179]

Survey results also showed that instructors received little training about teaching online classes. Eighty-seven percent of public university teachers did not receive any training on online learning, despite 65 percent of teachers having had no previous experience with online teaching.[180] Fifty-seven percent of more than 200 teachers from private universities surveyed in June and July 2020 reported starting online classes without any training.[181] Across both surveys, respondents were split on the question of online learning effectiveness. On the former survey, just over 60 percent of teachers believed they possessed the technology skills to conduct online classes,[182] while just under 60 percent of teachers on the latter survey agreed that students could achieve their learning outcomes through online learning.[183] The latter study also found that online learning created anxiety for most teachers and they believed it increased their workload significantly.

1.4.4 A LACK OF SKILLED INSTRUCTORS TO TRAIN STUDENTS

Older research from Bangladesh has shown that the presence of internet-enabled computers at tertiary colleges does not directly lead to increased digital skills among students, especially if instructors do not have the technical know-how to use these devices.[184] Across all levels of education, Bangladesh does not have enough highly qualified ICT teachers to cover its needs. According to a 2018 Implementation Monitoring and Evaluation

Division (IMED) project evaluation, 22,000 of 40,000 educational institutions (including public schools, private schools, madrasas (religious schools), and colleges) did not have any ICT teachers. The other 18,000 schools only had one ICT teacher each.[185] There do not appear to be any initiatives geared toward teacher training or curriculum development around digital literacy.[186] This challenge, in some cases, is compounded by teachers with "tech-phobia" (as one interviewee called it), in which some selected ICT teachers (in rural computer literacy initiatives) had either never seen a computer or were afraid to use it.[187]

This challenge is especially acute for colleges and polytechnics that typically have less connectivity and minimal access to devices. Not all higher education institutions in Bangladesh experienced these challenges: a handful of private universities had instituted IT skills training courses and hired digitally savvy professors before the COVID-19 pandemic. The GoB also trained more 16,000 teachers in the 2021–2022 school year and intends to do the same for the 2022–2023 school year.[188] Regardless, these important advances are not representative of the sector as a whole.[189]

Some organizations are trying to identify workarounds to either quickly upskill ICT teachers or to bypass them altogether. The Sheikh Russel Digital Labs use a teachers training manual for ICT in Education Literacy, Troubleshooting and Maintenance,[190] while 10 Minute School has a free course about how to teach online for its content creators (typically teachers).[191] UNICEF is developing an interactive audio interface that they will pilot in refugee camps in Cox's Bazar that will aid teachers who are not well trained in their learning centers.[192] Despite Bangladesh's increased focus on ICT education for all primary and secondary students, this goal will be increasingly difficult to achieve without a highly qualified workforce and hands-on training.

BOX 3: Bridging the physical and online world through blended learning

Also known as hybrid learning, blended learning combines virtual and traditional in-person instruction and schooling. Several interviewees have noted that the best way to promote digital literacy across the Bangladeshi population is through blended learning.

Following its move to distance learning during the COVID-19-induced school shutdowns, the GoB is developing its National Blended Education and Skills Master Plan 2022–2031 with the goal of integrating "physical classroom-based instruction with the virtual technology-enabled one."[193] In interviews, key stakeholders mentioned that the Master Plan will take a holistic view of blended learning, not mandating a specific model for Bangladesh.[194] News sources have reported that the draft policy has been submitted to the Prime Minister's Office.[195] The Master Plan is based on a Blended Education Accelerator (BEA) framework,[196] which plans to facilitate access to high-, low-, and no-tech resources to enable learners across Bangladesh to take control of their educational futures.[197] The National Taskforce for Blended Education (which includes both public and private stakeholders) is expected to conduct assessments and situational analyses to document best practices and assess impact, and then to develop systems and guidelines from these findings and disseminate them at regional summits.[198]

Bangladesh's private companies and nonprofits are increasingly moving into the blended learning space. For example, the 10 Minute School expressed interest in blended learning, stating that even though their convening ecosystem is online, they are not planning to be an online-only platform because they want to reach Bangladesh's last mile.[199] The SBK Foundation has set up 64 tech hubs in the 64 districts of Bangladesh—complete with laptops and a printer, scanner, copier, and router—in each district of Bangladesh. Each hub has a Tech Hub Manager to understand the needs of the local population and connect individual citizens to Bangladeshi startups that meet their needs. According to the Foundation, this model helps build digital literacy for local communities and increase their levels of digital access by connecting them to startup service providers.

1.4.5 CYBERSECURITY AND DIGITAL SAFETY

KEY TERMS | BOX 4: Cyber Hygiene

Cyber hygiene is a key digital literacy skill that encompasses practices and steps that individual users and organizations take to maintain their online security and strengthen the security of their computers or other digital devices. Common cyber hygiene practices include: limiting users, two-factor authentication, strong passwords, use of licensed software, backing up data, frequently updating software and hardware, and updating inventory of assets.

Source: USAID Digital Literacy Primer

Fifty-three percent of respondents on the Bangladesh National ICT Household Survey 2018-2019 reported "don't know" as their level of awareness of online security.[200] This is backed up by GSMA's 2022 Mobile Gender Gap report where men and women alike ranked safety and security issues as among the least important barriers to mobile ownership.[201]

Section 1.3.2 highlights a cyber hygiene void at the organizational level, with many ISPs believing that it falls outside of their purview to ensure cybersecurity for their customers. At the individual level, a lack of cyber hygiene can mean that people are more prone to becoming victims of scams and theft online. (See Box 16 and 17 related to mobile money scams and e-commerce.) A lack of cyber hygiene can also put national security at risk as illustrated by the Lazarus Heist in 2016 (see Box 7).

Several programs have recently emerged to teach local citizens about these topics:

- The Bangladesh Computer Council's Digital Literacy Center website launched in February 2022 aims to improve the safety of Bangladeshis' online experiences by rolling out self-paced online courses and written resources (in Bangla) about cyber wellness, privacy and security, information and media literacy, and online etiquette, among other topics.[202] This website also rolled out tailored courses about digital safety for parents, youth, primary school students, secondary school students, and the general public.[203]
- In 2022, Meta and BRAC announced a partnership through which Meta will train 1,000 BRAC staff on digital safety and literacy, with the goal that these staff will train an additional 300,000 people on these topics. This partnership also includes a social media campaign sharing information with women and youth about how to have a "positive experience online."[204]
- Grameenphone's Digiworld platform, launched in 2018, provides online child safety tools and information for parents, teachers, and children. In 2020, it rolled out Digiworld Bangla, a Bangla language resource explicitly intended to strengthen the digital safety practices of children ages 5–16.[205]
- In 2022, TikTok and the Youth Policy Forum indirectly reached more than 500,000 people through their joint digital safety workshops and sessions via their "Safe Internet, Safe You" campaigns, cultivating a 2,000-person participant community from nearly a dozen universities in Bangladesh.[206]
- From 2018 to 2022, Grameenphone and UNICEF conducted outreach and shared information about digital safety practices with children, parents, guardians and teachers through their "Online Protection of Every Child in Bangladesh" project. The project reached more than 50 million people through a national campaign focused on online safety; more than one million students with in person training; and more than 250,000 parents, teachers, and guardians with sensitization messaging.[207]
- With funding from USAID, in 2019, Bangladeshi social enterprise Dnet collaborated with the GoB's ICT Division to launch the "Cyber Champ" program, a digital safety e-awareness Olympiad. Each week,

Grade 9 through 12 students could log into the Cyber Champs website to take a weekly quiz about cybersecurity, with the top 200 students eligible to compete in the Olympiad. To complement this event, Dnet also trained teachers and students from 100 schools in Dhaka, Chittagong, and Rajshahi on safer internet practices.[208]

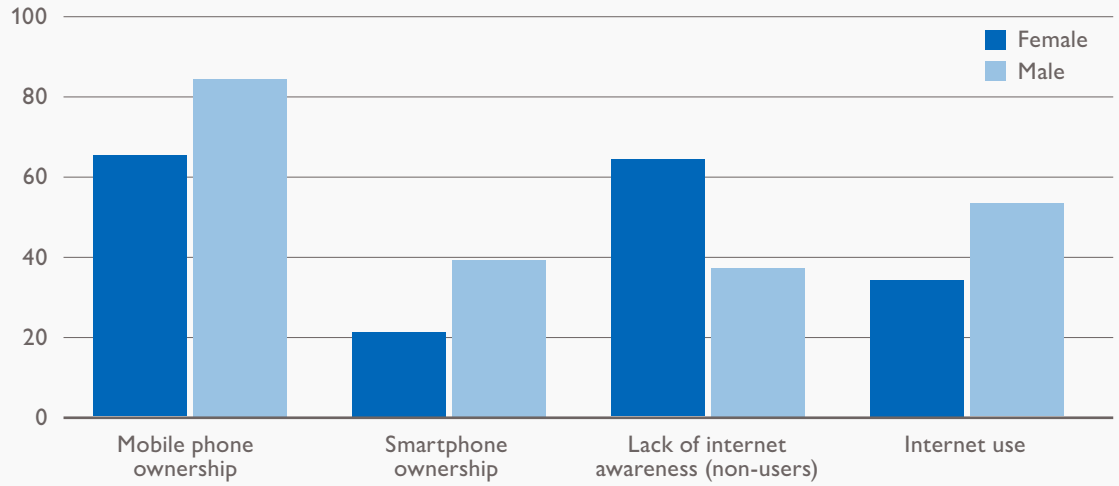
1.5 DIGITAL DIVIDES IN BANGLADESH

The digital divide is the distinction between those who have access and can use digital products and services and those who are excluded. According to the Bangladesh National ICT Household Survey 2018–2019, internet users in Bangladesh are more likely to be young men living in urban areas, between the ages of 15–34, who have more education than non-users.[209] Though this section focuses on Bangladesh's digital divides along the lines of gender, location, disability status, and refugee status, these are not the only groups subject to the digital divide within Bangladesh.

1.5.1 GENDER DIGITAL DIVIDE IN BANGLADESH

The gender digital divide in Bangladesh is among the largest in the world by some measures. Of the 10 countries highlighted in the 2022 GSMA Mobile Gender Gap Report, Bangladesh had the highest gender gap (48 percent) when it came to mobile internet use and the second highest gender gap at 23 percent (following Pakistan at 33 percent) when it comes to mobile phone ownership.[210] Although mobile phone ownership and use have improved over the years, they remain unequal between men and women. Across low- and middle-income countries, women are less likely to own a mobile phone or to use it for mobile money or other services. Women in Bangladesh have the same experiences.[211]

FIGURE 8: Select gender digital divide indicators for Bangladesh



Source: GSMA – The Mobile Gender Gap Report 2022; Bangladesh National ICT Household Survey

Both women and men cite lack of digital literacy skills, concerns around safety and security, and affordability among their most important reasons for not using a mobile phone in Bangladesh.[212] Social norms play a determining role in shaping women's access to technology in many parts of the world, including in Bangladesh. Lack of family approval is among the top three barriers to mobile phone ownership for women.[213] The most frequently cited response for not using the internet among female non-internet users was "no permission to

use the internet" (95 percent, compared to five percent of men), followed by "cultural reasons" (90 percent, compared to 10 percent of men) in the Bangladesh National ICT Household Survey 2018–2019.[214]

BOX 4: Technology-facilitated gender-based violence (TFGBV)

TFGBV is defined as "any action carried out using the internet or mobile technology that harms others based on their sexual or gender identity or by enforcing harmful gender norms."[215] According to USAID's case study of TFGBV in Bangladesh,[216] there are two predominant forms of TFGBV: cyber harassment (including cyber stalking), and non-consensual creation and distribution of intimate images.

Although only 33 percent of respondents on the Bangladesh National ICT Household Survey 2018–2019 reported experiencing some form of online harassment, threat, or attack, female respondents reported higher rates of online harassment and offensive language and direct attacks or threats of violence than men.[217] More than 70 percent of complaints to the ICT Division's Cyber Help Desk in December 2017 came from women.[218] In 2020, TFGBV against women had become so prevalent in Bangladesh that the country established an all-female police unit "to provide necessary legal and technological assistance exclusively to female victims in cyber space and to enhance cybersecurity related awareness."[219]

In a qualitative study conducted by BRAC University's James P. Grant School of Public Health, one female focus group discussion participant reported blocking 57 Instagram accounts from the same cyber stalker who sent her inappropriate direct messages. Multiple female interviewees said they did not want to report these crimes to the police for fear of being victim-shamed.[220] A male FGD participant in the BRAC study also reported hearing stories of men using Photoshop to create fake sexually suggestive images of women, which they propagate through Facebook groups.

A 2019 IFES assessment found that politically and civically engaged women in Bangladesh were at increased risk of TFGBV and that there is a clear link between TFGBV and physical violence in Bangladesh. Attacking women's intelligence and threatening sexual violence online are particularly common tactics against prominent women in Bangladesh, with analyses of social media posts uncovering 553 posts in English and 158 posts in Bengali making sexual threats.[221]

The Digital Sister for Urban Youth project from BRAC University represented one or the first efforts to combat TFGBV in Bangladesh. Using information that they collected during their focus group discussions, researchers published two animated videos that disseminated trustworthy information about combating TFGBV directly from experts such as lawyers.[222] Given the scope of Bangladesh's TFGBV problem, there must be significant concerted efforts to combat this compelling societal issue.

1.5.2 URBAN-RURAL DIGITAL DIVIDES

Survey data from Bangladesh shows that urban dwellers use the internet at higher rates than rural dwellers; 55 percent of respondents in urban areas reported using the internet, compared to 35 percent in rural areas.[223] This roughly aligns with a joint 2020 South Asian Network on Economic Modeling (SANEM) and ActionAid policy brief, which states that approximately 50 percent of urban households have access to the internet, compared to around 30 percent of rural households.[224] According to the BRAC Institute of Governance and Development's (BIGD) survey of 6,500 rural households in 2020, almost all (92 percent) households reported owning a mobile phone. However, less than half (41 percent) reported having access to a smartphone.[225] Lack of widespread smartphone access likely helps to explain why internet awareness is so low: only 54 percent of surveyed households reported an awareness of the internet.

BIGD introduced its new Digital Literacy Index (DLIit_BIGD 1.0) in the 2020 survey which measures the elementary level of digital literacy of a household based on the individual with the household's highest level of digital literacy. Fifty percent of surveyed households scored less than 0.25 on the DLI. This means that they

had many fewer skills than required for elementary proficiency.[226] Using social media (41 percent) was the most common digital skill among surveyed rural households on the BIGD survey, followed by the ability to read and send SMS (32 percent) and to comment on social media (28 percent). Many households with some access to digital tools scored lower than expected on their digital skills. This implies that people living in rural areas may require digital skills building that goes beyond social media oriented skills to leverage the digital ecosystem to its fullest potential.

1.5.3 DIGITAL DIVIDE FOR PEOPLE WITH DISABILITIES (PWDS)

PWDs have less access to digital devices and to the internet than non-disabled people in Bangladesh. GSMA research from 2019 calculated a 13 percent mobile phone disability gap in Bangladesh, with 62 percent of PWDs owning a mobile phone (most owned either a basic or feature phone) versus 71 percent of non-disabled people.[227] PWDs with difficulty seeing are more likely to use basic phones compared to PWDs with difficulty hearing who are more likely to use smartphones.[228] The disability gap is starker when disaggregated by gender: 54 percent of men with disabilities own a mobile phone compared to only 30 percent of women. Of the seven countries highlighted in the report, Bangladesh had the highest gender and disability gap at 66 percent.[229]

Many factors hinder the use of mobile phones by PWDs such as the disability itself, affordability, and digital literacy. Nineteen percent of respondents with disabilities in Bangladesh reported having no access to a mobile phone, in many cases because their families did not allow them to use a mobile phone.[230] Forty-four percent of surveyed PWDs without access to a mobile phone said that they did not own a phone because they would not know how to use it.[231] This underscores the importance of building digital skills among PWDs in order to increase their digital access and use.

BOX 5: How displaced persons use digital technology[232]

Displaced persons in Bangladesh face multiple access challenges in their use of digital technology. Rohingya refugees in the area outside Cox's Bazar are the largest displaced group and currently reside in a so-called telecommunications infrastructure dead-zone. For access to the internet they rely on what a researcher has termed the "alternate internet." The alternate internet relies on three features.

1. Mobile phone repair shops, which help Rohingya overcome the cost barriers that prevent many from purchasing a mobile phone by selling secondhand phones, and feature phones, and offer charging ports for a small price.
2. Offline content loading network, which helps to overcome the lack of mobile internet in the area. A variety of USBs and memory cards containing a diversity of content (mostly entertainment rather than educational) are traded from outside the camp into the camp and uploaded onto individual phones. In the last several months, NGOs and social media influencers have partnered to create educational content for younger Rohingyas. This content mostly relies on audio-visual distribution channels since there is no official script for Rohingya.
3. Use of Burmese SIM cards to regain access to the telecommunications infrastructure across the border, as that is more reliable than what is available on the Bangladesh side.

Many of the same digital downsides present in the Bangladesh digital ecosystem are also present within the refugee camp. Mis- and disinformation spreads easily throughout the population and is likely a consequence of low digital and media literacy skills. Technology-facilitated gender-based violence is present on the USBs and memory cards that are traded within the camps, including instances of child pornography, human trafficking, and extremist content.

1.6 MOVING TO LOCAL DIGITAL CONTENT

Locally relevant content goes beyond making content available in the relevant language. As GSMA highlights, relevant content can refer to content in the local language, content that is created and hosted locally, and content that is relevant to the local population.[233] Content relevance is important to understand and address the usage gap.

Survey data from Bangladesh indicates a possible lack of relevant content for people living in the country. Twenty percent of men and 12 percent of women (one of the highest percentages of any answer option) surveyed in Bangladesh stated that "mobile is not relevant for me" on a survey presented in GSMA's Mobile Gender Gap Report 2022.[234] Similarly, 54 percent of non-internet users in the Bangladesh National ICT Household Survey 2018–2019 stated that they had no need to use the internet.[235] Though Bangladesh has historically not had a lot of locally produced or locally relevant content, this is rapidly changing with the advent of new digital media companies and streaming platforms.

1.6.1 POPULAR TYPES OF LOCAL CONTENT IN BANGLADESH AND THEIR AUDIENCE

Popular streaming services include homegrown Bangladeshi platforms, many of which are tied to Bangladesh's MNOs, like Bioscope (Grameenphone), BanglaFlix (Banglalink), and Binge (Robi).[236] This also includes international platforms primarily from India, like Hoichoi and Addatimes,[237] as well as American platforms like Netflix or Amazon Prime.[238] However, while Bangladeshi and Indian streaming platforms have Bangla language and other locally relevant content for Bangladesh, American streaming platforms do not typically invest in Bangladeshi or Bangla content.[239]

Local content in Bangladesh comes primarily in two forms—professionally produced content by news organizations or streaming services, and user-generated content, such as Facebook or YouTube videos. Given the ubiquity of social media among Bangladesh's online audience, professionally produced content is often posted to social media as well. Entertainment, sports, and politics are extremely popular forms of content across user-generated and professionally produced content.[240] On the user-generated side, lifestyle content, such as tourism and DIY videos, is another growth area, as are videos in which individual people share their views on politics, society, and culture.[241] Companies producing professional content in Bangladesh are beginning to go hyper-local in their storytelling, increasingly trying to produce local news for rural communities and creating educational content that resonates with those communities.[242] According to one interviewee, individual success stories, whether told by an agricultural entrepreneur or an astronaut, perform very well in Bangladesh.[243] The varied forms of popular and available online content in Bangladesh indicate a maturing local content market.

According to interviews with three digital media companies and streaming platforms in Bangladesh, their audiences skew male, urban, and young (under 35).[244] Although this largely reflects Bangladesh's online population and these statistics do not include user-generated content, they could also indicate a lack of local content geared toward marginalized groups in Bangladesh. Creating local content that appeals to these populations is an important prerequisite for increased digital tool use in Bangladesh.

BOX 6: Local content for Rohingya refugees

Meaningful digital inclusion requires the creation of local content in all languages spoken in Bangladesh, not only Bangla. BBC Media Action produces audio and video content in the Rohingya dialect for Rohingya refugees living in Cox's Bazar. On the audio side, they produce audio content about important topics that they use to facilitate more than 1,000 listening groups with refugees.[245] Optimized for sharing in WhatsApp and over mobile loudspeakers, the Soiyi Hota

BOX 6 (CONTINUED): Local content for Rohingya refugees

("Correct Information") podcast shares information about COVID-19 and other important issues.[246] The Aa'rar Kissa ("Our Story") audio drama uses a popular entertainment format to provide factual information about gender-based violence and child marriage, also offering information on locally available support services. On the video side, BBC Media Action's series Aa'rar Bahadur ("Our Heroes"') tells the individual stories of Rohingya refugees living in Cox's Bazar. Previously, it published Rohingya language videos for frontline workers and for the general public about COVID-19 safety. BBC Media Action's work with the Rohingya in Bangladesh reinforces the importance of creating relevant local content in multiple languages to reach highly targeted audiences with information relevant to their lives.

1.6.2 CHALLENGES AROUND LOCAL DIGITAL CONTENT IN BANGLADESH

Despite the recent rapid growth of local content providers in Bangladesh, many challenges remain in developing a viable ecosystem of local digital content. These include:

- Concerns about financial viability: Interviewees noted real capacity gaps in making the digital media industry financially viable, with reportedly only a few organizations capable of harnessing and effectively monetizing digital media.[247]
- Too few staff in local newsrooms: One interviewee commented that the media in Bangladesh does not have enough journalistic human resources to cover important emerging issues such as climate change and local politics, contrasting Bangladesh's media landscape with India's in terms of staff numbers.[248]
- Quality concerns: Interviewees expressed concerns about the ability of content creators and journalists to create high quality content,[249] with one interviewee requesting additional capacity- building for themselves in this area. Most interviewees were optimistic that quality would continue to improve as Bangladesh' digital media ecosystem continues to grow.[250]
- Lack of copyright protection process in Bangladesh: One interviewee noted that some content creators are afraid to use specific songs or images in their videos due to copyright concerns.[251] More formalized copyright guidelines designed for digital media could alleviate these concerns.

Specifically for Bangladeshi content produced with donor funds:

- Difficulty attracting the public's attention: Competition for viewership is high in Bangladesh's digital media landscape. Viewers are interested in entertainment, so companies or organizations producing content on serious topics like tuberculosis education or gender-based violence may have a hard time finding an audience. The most appropriate dissemination channels are also unclear, given social media's tilt toward levity.[252]
- High cost: Several development sector interviewees cited high cost as a barrier to creating good quality multimedia content in local languages.[253] Addressing this concern will require additional funding and possibly additional capacity-building on how best to fund content creation through other means.
- Mismatch between donor and audience desires: One interviewee commented that local audiences in Bangladesh want short and snappy multimedia content, but that donors want longer content that contains a lot of information.[254] This divergence makes it harder for professional or amateur content creators to design programming that is attractive to local audiences.

PILLAR 2: DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE

Digital Society, Rights, and Governance focuses on how digital technology intersects with government, civil society, and the media. This pillar is divided into three sub-pillars: Internet Freedom; Civil Society and Media; and Digital Government. Internet Freedom explores factors that enable or constrain the exercise of human rights and fundamental freedoms online. This includes individual rights to freedom of speech, privacy, and free assembly, and the abuse of these rights through digital repression. Civil Society and Media identifies key institutions and how they report on, advocate around, and influence online freedoms. Digital Government looks at the government's efforts to manage internal information technology (IT) processes and systems, deliver citizen- and business-facing e-services, and engage with the public through digital channels.

KEY TAKEAWAYS

DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE

- GoB's Vision 2021 and Vision 2041 underscore the importance of Digital Bangladesh and have been drivers for digital transformation across the country. However, undefined roadmaps and uneven knowledge of digitalization among government officials undermine GoB's efforts.
- Bangladesh ranks number one in South Asia on NCSI and performs well in terms of the availability of cybersecurity policies and CIRTs in place, but there is room for improvement in terms of strengthening infrastructure, workforce development, and strategy implementation.
- Misinformation and disinformation are widespread in the digital sphere.
- CSOs and independent media largely use digital technology for IT and development but lack more advanced skills.

RELEVANT RECOMMENDATIONS

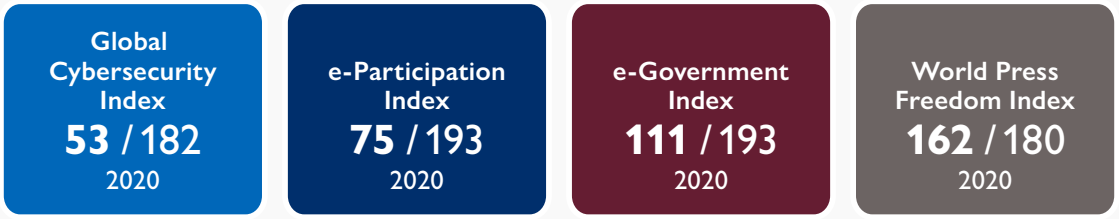
4. Strengthen the GoB's digital capacity as they deliver on Digital Bangladesh's next phase through Vision 2041
5. Counter misinformation and disinformation through civic education and public media literacy
6. [Cross-cutting] Strengthen cybersecurity capacity through workforce development, procurement reform, and targeted research

INTRODUCTION

Bangladesh is undergoing a digital transformation throughout its government and society. The GoB's pledge to turn Bangladesh into a knowledge-based and digital society, widely referred to as Digital Bangladesh, demonstrates the commitment toward this decades-long transformation. Bangladesh's experience includes a whole-of-government response guided by executive-level buy-in and national strategies on topics in technology.

Figure 9 highlights Bangladesh's place on the global stage, measured in terms of digital society, rights, and governance. As the numbers and the rest of the section indicate, the country has progressed in numerous ways, namely digital government, but there is still much to be done.

FIGURE 9: Bangladesh's global digital society and governance rankings

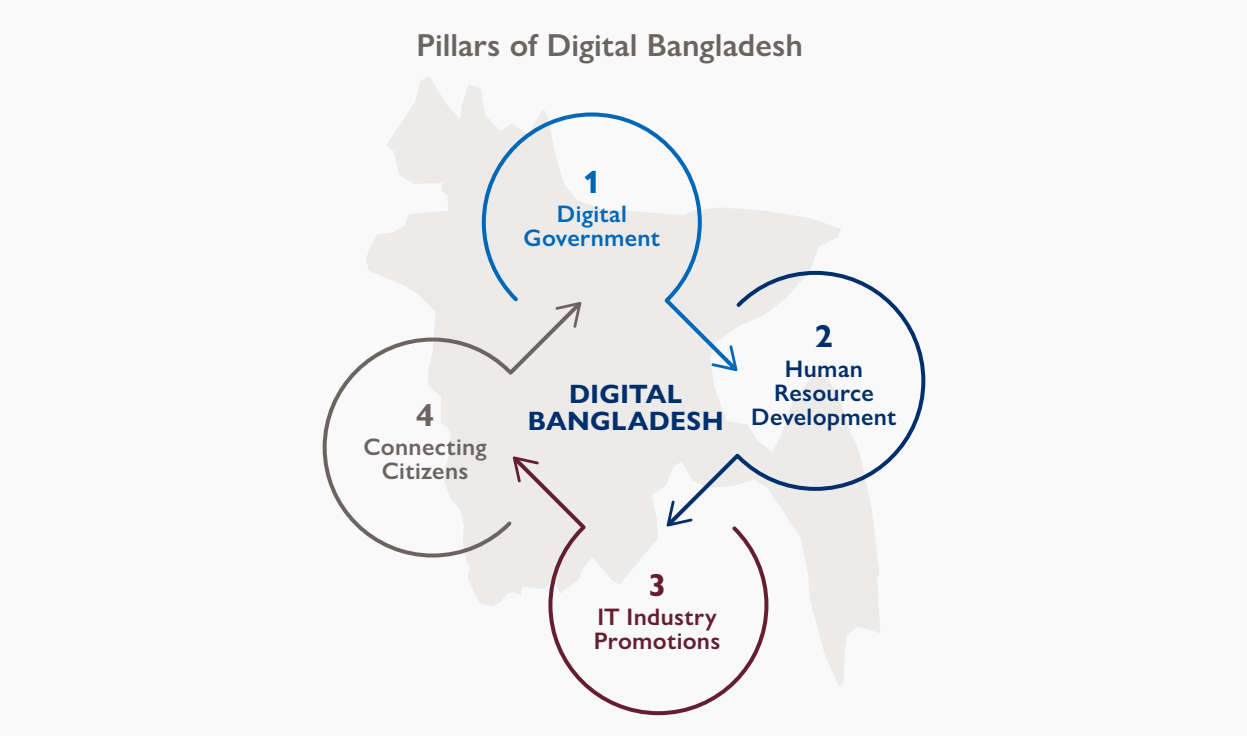


Source: Global Cybersecurity Index (ITU, 2020); E-Government Knowledgebase (UN, 2022), Reporters Without Borders (2022)

2.1 GOVERNANCE OF THE DIGITAL ECOSYSTEM: LAWS AND MULTISTAKEHOLDERISM

In its 2008 campaign manifesto, Vision 2021, the ruling party, Awami League, laid the foundation for the government's development and economic agenda ahead of the country's 50th anniversary in 2021.[255] Embedded within Vision 2021 is the GoB's commitment to turning Bangladesh into a digital-first society to achieve middle-income status. The Digital Bangladesh initiative focuses on human resources development for the digital era, connecting citizens to digital technology in a meaningful way, taking services to citizens' doorsteps, and making the private sector and market more productive and competitive through digital technology.[256]

FIGURE 10: Digital Bangladesh's four pillars



Digital Bangladesh promotes digital government's development, and also policy and regulatory development for the digital ecosystem (see Table 3 for a list of digitally aligned policies). The ICT Division within the Ministry of Posts, Telecommunications and Information Technology is responsible for governing the ecosystem, in addition to other ICT-related functions carried out by a2i.[257]

The Division's sub-agencies are responsible for different aspects of the digital ecosystem.[258] The large swath of ICT Division agencies underscores how no single agency is responsible for e-government development and implementation and agencies often share overlapping mandates.

Despite the government's ambitious plans and civil society's advocacy, regulatory gaps exist. To date, there are neither data governance nor privacy laws in place. This undermines user security and privacy. The Cybersecurity Strategy 2021–2025 (draft) and emerging technology-related strategies (such as the AI strategy highlighted in Table 3) illustrate a forward thinking approach but only time will tell if implementation is effective. Bangladesh is also involved in internet governance discussions at the national, regional, and international levels.

TABLE 3: Overview of legislative acts and policies related to digital governance

National Roadmaps for ICT implementation	Vision 2021: The GoB's vision for turning Bangladesh into a middle-income country by 2021. *Digital Bangladesh* is the trademark initiative and aspires to make Bangladesh a digital-first economy, government, and society. Vision 2041: The GoB's updated vision for eliminating extreme poverty and turning Bangladesh into a higher-middle-income country by 2031 and a developed nation by 2041. Commits to continuing *Digital Bangladesh* and transforming the government, society, and economy for the fourth industrial revolution. National ICT Policy 2009: A guide for all planners and executive officers of the state, private enterprises, and civil society on electronic delivery of citizen services. Used as a guide to fulfill the promises of *Digital Bangladesh.* National ICT Policy, 2015: An updated roadmap for the establishment of ICT in public services and government. National ICT Policy, 2018: A framework for how the GoB will integrate emerging technologies like 5G into the country's digital ecosystem. The roadmap identified eight strategic issues including digital government, digital security, social equity and universal access to education, research and innovation, skill development, and strengthening domestic capacity to integrate emerging technologies. e-Government Master Plan for *Digital Bangladesh*: The GoB's roadmap for e-governance as a part of *Digital Bangladesh*. Lays out the legal frameworks, activities, infrastructure, and stakeholders who will play a role.
Cybercrime prevention and content regulation	ICT Act, 2006: Enacted to prevent cybercrimes and regulate e-commerce transactions. This was the first Bangladeshi law to address cybercrimes. Main offenses in the Act include: fake electronic publication, hacking an electronic device, unauthorized access to protected systems, disclosure of confidentiality and privacy.[259] This Act was amended in 2009, and then again in 2013. Digital Security Act, 2018: Following domestic and international pressure, Section 57 of the ICT Act was repealed. Many of its provisions are incorporated into the Digital Security Act.
Government accountability	Right to Information Act, 2009: Provides information disclosure standards to citizens to enhance transparency and accountability in public administration.
National Strategies on Emerging Technology	In preparation for Bangladesh's fourth industrial revolution, the ICT Division passed national strategies on; Artificial Intelligence, Robotics, Blockchain, Internet of Things, and Microprocessor Design Capacity.
Technology Parks	To promote the development of hi-tech industries and business activity, the GoB passed the Hi Tech Park Law, 2014.
National cybersecurity protection	Bangladesh's (Draft) Cyber Security Strategy 2021–2025 lays a framework for how the government and law enforcement approach cybersecurity. Built on four pillars, digital government, human resource development, IT industry promotions, and connecting citizens.
Post COVID-19 recovery and development	To fight the COVID-19 pandemic and build back the economy and national development, the government published a Draft of Post-COVID-19 National ICT Roadmap 2021–2025. The strategy features 18 priority sectors including health, digital commerce, and education.

2.1.1 LEGISLATION TO ENSURE SECURITY OF THE DIGITAL SPACE

There are several laws in Bangladesh that promote a safe and secure digital space. While there are several examples of the use of these laws to protect citizens, interviewees and several publications have voiced concern over the potential risks and gaps associated with these laws if they are not analyzed and used effectively.

Right to Information Act

The Right to Information (RTI) Act, 2009 guarantees the right to seek and receive digital information held by the government.[260] To safeguard sensitive information, the RTI Act's Section Seven excludes information pertaining to state security, international relations, intellectual property, law enforcement, judicial, and criminal investigations. According to one digital rights expert, although journalists are familiar with the RTI Act, it is generally not a tool many use to research and write articles[261] since they may not receive responses in the quick turnaround time they need.

The ICT Act and the Digital Security Act

The GoB is active in regulating the online space to prevent various cybercrimes. In 2006, the GoB passed the Information and Communication Technology (ICT) Act to protect users and develop guardrails against cybercrimes such as defamation and data theft.[262] Section 57 of the ICT Act was replaced by the Digital Security Act, 2018 (the DSA), which is similar in substance to the original law and creates the Digital Security Agency.[263] The Foreign Minister has publicly stated that there have been instances where the DSA was used inappropriately to arrest an individual.[264] As recently as August 2022, the UN High Commissioner for Human Rights announced that her Office and the GoB were in dialogue to review the DSA to ensure that it protects user freedoms, while regulating the online space from hate speech, disinformation, and cyber crimes.[265] Interviewees noted that legislation like the DSA is necessary to protect against misinformation and disinformation as well as other cyber crimes as long as they are used appropriately. In October 2022, a Dhaka court issued an arrest warrant against the Evaly Chairman under the DSA for scamming their customers and publishing false information on social media platforms (see Box 17 for more on the Evaly scam).[266]

Data Privacy Act

As of September 2022, the GoB was in the process of finalizing draft legislation on data privacy and digital platforms that will have an impact on the digital ecosystem and address regulatory gaps. To date, Bangladesh does not have a national level framework to protect data and clarify individual rights in relation to personal data. While the constitution, ICT Act, and DSA make mention of data and data protection, they do not comprehensively define the necessary terminology in a way that can properly safeguard the public.[267] The ICT Division released a draft version of a Data Protection Act (DPA), in July 2022.[268] The DPA was posted online for public feedback, and is fashioned after the EU's General Data Protection Regulation (GDPR) and is meant to provide a legal framework to safeguard data and internet freedoms.[269] Although still in draft form, the DPA will offer citizens the right to know when their personal data is being collected, used, preserved, or moved, but similar to the GDPR, will not offer those protections when a government agency collects personal data for official purposes.[270]

The DPA draft has a clause that requires technology companies to store data in-country. Policies that require data localization are in force in more than 100 countries and regulators design them with the intention to reassert local laws, reduce cyber risks faced by citizens, and prevent multinational technology companies from misusing citizen data.[271] They address how businesses collect and use a customer's digital data, and require multinational businesses to build infrastructure in-country to store data to support local development.

Private businesses have criticized this as a burden for smaller technology companies that cannot afford to build data infrastructure in-country.[272] Data localization may affect which multinational technology companies choose to operate in Bangladesh, as this policy will have an impact on their operations and security.[273] Such a requirement may also add risk and complexity to organizational cybersecurity operations due to the increasing number of data centers and locations that need to be staffed and maintained. Data localization would essentially "block" the import of cloud services, thus diminishing consumer choices and likely increase business operating costs.

Regulation on over-the-top (OTT) media platforms

Over-the-top (OTT) media services provide customers with media content over broadband internet rather than through traditional cable, broadcast, or satellite television. Since the media content is delivered over broadband, it falls outside the jurisdiction of traditional broadcasting laws. The GoB is currently working on a regulation to address the regulatory gap on social media and over-the-top (OTT) media platforms. The BTRC published the draft Regulation on Digital, Social Media, and OTT Platforms in February 2022 to govern online content distribution and protect users from harmful content, fraud, or digital abuse.[274]

2.1.2 STRENGTHENING CYBERSECURITY AT A NATIONAL-LEVEL

The international community currently recognizes Bangladesh as a regional leader in cybersecurity. The country currently ranks 34th in the National Cyber Security Index (NCSI) and is number one in South Asia.[275] Bangladesh scored well in terms of their CIRT and general threat analysis and response. The country's law enforcement response to cyber crime and cybersecurity policy development also perform strongly in the NCSI. In terms of weaknesses, Bangladesh underperforms when it comes to protection of digital services. This lines up well with findings in Section 1.3.2 about weak cybersecurity practices within ISPs and speaks to a divide between the public and private sectors. As previously noted, there are also no personal data protection policies in place as of 2022. Finally Bangladesh scores zero when it comes to its contribution to global cyber security and it is unclear why the country has not signed the Budapest convention. NCSIs scores are based on legal acts and official documents and websites, so it may not take into account actual implementation or enforcement.

The Bangladesh Cybersecurity Strategy 2021–2025 is GoB's commitment to a safe and secure digital ecosystem.[276] While interviewees were not familiar with the specifics of the strategy, several were aware that one exists.[277] The Strategy reinforces the four Digital Bangladesh pillars: digital government, human resource development, IT industry promotions, and connecting citizens.[278]

FIGURE 11: Eight strategies under the Bangladesh Cybersecurity Strategy 2021–2025

Source: Author's graphic based on the Bangladesh Cybersecurity Strategy 2021–2025

The Strategy covers several aspects that require strengthening, from human capacity development, to infrastructure, to an enabling regulatory environment. In order to enhance cyber capacity, a National Cyber Security Capacity and Capability Building plan is a priority, as are collaborations between the Ministry of Education and technology experts to develop a curriculum for cybersecurity in primary, secondary, and tertiary schools.[279] Extending partnerships to schools and academic centers is stated repeatedly throughout the document. Listed activities include hosting academic conferences on cyber-related topics.

Establishing a National Security Operations Center (N-SOC) is a priority to coordinate the current disjointed activities performed by various law enforcement and cyber incident response teams (CIRTs).[280] The Bangladesh Computer Emergency Response Team (bdCERT) is the national computer emergency response team for the country and deals with computer threats, vulnerabilities, and incidents, and responds on behalf of ministries, businesses, and universities.[281] Additionally, the Bangladesh Government's e-Government Computer Incident Response Team (BGD e-GOV CIRT) is responsible for securing cyberspace and receiving, reviewing, and responding to national level computer security incidents.[282] The existing CIRTS do not operate under a coordinated agency, which the N-SOC is meant to address.[283] Updating national laws and regulations to reflect advances in cybersecurity are the final priority in the document. The Strategy notes the absence of a data protection law as well as the lack of current policies to govern emerging technologies. The Strategy advocates closing these regulatory gaps.[284]

The Strategy has been developed at a critical time. While the international community ranks Bangladesh well in cybersecurity and the GoB has strategies in place, interviewees in the private sector, media, and civil society take a more cautious view of the country's cybersecurity.[285] According to an interviewee in the private sector, cybersecurity is the most underdeveloped component in the digital ecosystem.[286] People and businesses regularly

face website hacks, scams, and attempted financial theft (see Section 3).[287] A CSO's website was hacked five times, prompting the CSO to no longer list projects on their site.[288]

BOX 7: An attempted cyber hack exposed Bangladesh's cyber vulnerabilities

Often referred to as the Lazarus Heist, in February 2016, North Korean hackers attempted to steal USD $1 billion from the Bangladesh Bank and were only prevented when a system malfunction alerted authorities.[289] At the time, the hacking was the most aggressive incident on record and had taken years to plan.[290] The hack leveraged the time differences between Bangladesh and New York to exploit human vulnerabilities and avoid detection.[291] According to a post-incident investigation, a 2015 email from a prospective employee to several Bank employees contained malware in the attachment that allowed hackers to gain entry and eventually create the commands to issue the fraudulent instructions between the Bangladesh Bank and the New York Federal Reserve.[292] Before the hack was stopped, around USD $70 million was transferred from the Bangladesh Bank to personal accounts in the Philippines.[293]

The heist was a learning opportunity for Bangladesh as well as for other countries that operate on SWIFT protocols. The incident illustrates the human element in cybersecurity and the importance of keeping all employees diligent and wary about cyber risks such as phishing scams. Such a high-profile event with very serious ramifications likely nudged Bangladesh to reevaluate its cybersecurity and to take steps to strengthen their position.

2.1.3 AMBITIOUS NATIONAL STRATEGIES ON EMERGING TECHNOLOGY

Emerging technology encompasses a range of technologies, such as AI, the Internet of Things (IoT), and blockchain. These technologies can bring a range of benefits, including digital experiences that are more user-friendly, and help overcome barriers of disability or language. Emerging technology also brings new risks, such as "deep fakes"—realistic falsified images, audio, and video that can be used for disinformation or online gender-based violence.

The GoB has released several ambitious but well-reasoned national strategies on emerging technologies. There are current national strategies on blockchain, artificial intelligence (AI), and robotics.[294] Within the blockchain strategy, there is an in-depth exploration about what the technology's possibilities are in a development context and how the fourth industrial revolution can benefit the nation. The strategy shows that blockchain technology can "increase trust, remove intermediate-authorities, reduce costs, avoid fraud or manipulation, reduce corruption, and increase productivity."[295] Potential application areas put forth by the strategy include a land application system for registration and verification for the Ministry of Land, or a system for storing digital evidence for the Ministry of Law, the judiciary, and the parliament (see Figure 12 and Appendix D).[296] The strategies pursue a logical approach to emerging technologies development: find the talent, pilot ideas, see what works, and then scale those initiatives. The strategy document also acknowledges several challenges—both technical and operational—including immaturity of the ecosystem, lack of data privacy from those who have access to the blockchain network, lack of technical expertise, lack of awareness among project managers and organizations, and lack of a regulatory framework, among others.

FIGURE 12: GoB blockchain application domains and potential stakeholders

Application Domain	Use-cases	Potential Stakeholders (Ministries)
Identity Application Domain	E-KYC	Ministry of Information; Ministry of Public Administration; Ministry of Commerce
	Reputation System	
Finance Application Domain	Pension	Ministry of Finance; Ministry of Commerce; Ministry of Disaster and Relief; Ministry of Education
	Payment	
	Stock Market	
	Subsidies	
Land Application Domain	Mutation	Ministry of Land
	Registration	
	Verification	

There is limited public information about the progress of the strategies since their release two years ago. According to an interviewee, the Digital Bangladesh mandate states a desire to incorporate more AI into their work, especially on digital finance initiatives, but there are limitations on current technical capacity for AI development.[297] Many individuals who are trained in AI are self-taught, as current university programs do not adequately address this subject area. With many individuals self-taught on this topic, collaborative learning environments such as the Bangla AI Community have sprung up on social media platforms.[298] The Bangladesh Internet Governance Forum (BIGF) works to fill in the technical gap on AI, with youth training introducing young people to this subject as well as supporting fellowships to India.[299]

The current regulatory gap on data protection will need to be overcome before emerging technology such as AI can safely scale. With AI collecting large quantities of personal data and the construction of data centers taking place, regulatory guardrails are needed to ensure that information is secure.[300] The blockchain policy acknowledges that without the proper technical, legal, and policy frameworks in place, blockchain could do more harm than good.[301]

BOX 8: Digital health applications and finalizing a National Digital Health Strategy

Bangladesh entered the digital health market through Digital Bangladesh, with the Ministry of Health launching the Shastho Batayon hotline, an integrated voice response system with e-prescription services, surveys, and emergency hotlines.[302] Since then, the telemedicine market has grown. a2i estimates that there are currently 15 digital health providers that offer digital health services as diverse as women's care, rural care, pharmaceuticals, and at-home testing.[303]

Improvements in health data collection, particularly information-sharing from local levels to the national level, are possible due to the Ministry of Health's use of District Health Information Software 2.0 (DHIS2).[304] The web-based platform allows healthcare workers at the central, state, and district levels to have access to patient health information.[305] However, ecosystem-level bottlenecks such as low data coverage, shortages in trained health workers, lack of accountability, and a lack of data-sharing between the Directorate General of Family Planning and the Directorate General of Health Services hinder the effective use of DHIS2.[306]

The GoB currently has a digital health strategy to comprehensively define the sector and create a framework to protect patient health and data.[307] In 2019, the GoB and World Health Organization (WHO) began a draft National Digital Health Strategy that would address interoperability, cross-border data security, and the proper use of

BOX 8 (CONTINUED): Digital health applications and finalizing a National Digital Health Strategy

information.[308] In 2020, the strategy was revisited through a multi-stakeholder workshop between the WHO, GoB, civil society, and the private sector to further enhance the strategy's emphasis on end users and on achieving better health outcomes.[309]

Outside of the GoB, there are several innovative digital health applications in the country. Amarlab is one such health-tech startup that began providing diagnostic services at home through COVID-19 closures.[310] UNDP's Digital X Solution Catalog offers proven solutions from the digital health marketplace around the world.[311] Given the recent surge of dengue fever cases in Bangladesh,[312] an apt tool is D-MOSS, an open-source dengue fever early warning system which has been implemented in Malaysia, Sri Lanka, and Vietnam.[313]

Also see 10 recommendations for DHIS2 deployments in this blog.

2.1.4 MULTISTAKEHOLDER INTERNET GOVERNANCE

Internet governance is "the development and application by governments, the private sector, and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the internet."[314] Policy topics explored under internet governance may range from cybersecurity and privacy and surveillance to the Internet of Things (IoT), digital trade, and the geopolitics of internet governance.[315] In an ideal scenario, internet governance works best when there is cooperation among all stakeholders from network operators to users to governments and international organizations, to name a few.

BTRC manages Bangladesh's ".bd" Country Code Top-Level-Domain (ccTLD). ccTLDs are often managed by nonprofit, non-governmental organizations to ensure multistakeholder governance of the internet domain.

The nonprofit Bangladesh Internet Governance Forum (BIGF) advocates on internet and technology policy issues at regional and international levels,[316] and organizes the national Internet Governance Forum (IGF) meetings. The national BIGF meeting is an opportunity for reflecting on regional practices from neighboring IGFs such as Nepal, Timor Leste, and Pakistan.[317] At the most recent BIGF meeting, key issues discussed included the draft data protection act, emerging technology policies, and developing an e-commerce policy.[318] The November 2022 BIGF meetings covered a range of issues from empowering youth to making the internet accessible to women to digital rights. The BIGF operates through three mechanisms: the Bangladesh Internet Governance School, the Youth-IGF, and the BIGF meeting. The Internet Governance School is an annual two-day workshop where participants discuss issues related to emerging technologies. The Youth-IGF is the organization's primary mechanism for raising the awareness of young people on internet governance and has taken place twice.[319] The forum tries to bring participants from across the country, not only from Dhaka or other urban centers. In the past, youth who attended the forum have gone on to participate in ICANN-supported fellowships in India or Korea to learn from regional IGFs and technology experts.[320] A BIGF interviewee noted that it is difficult to include participants from outside Dhaka in the events. They said that regional IGFs are more structured, with guidelines for sessions and more proactive dialogue. At the international level, six Bangladeshis registered to participate in the IGF 2022 ranging from government representatives to BIGF and subsidiary members.[321]

BOX 9: The Bangladesh Internet Freedom Initiative

Providing public comments on draft laws and regulations is one way civil society and other interest groups can communicate their concerns to the government on proposed legislation. Without a leading digital rights champion in Bangladesh, a diverse collection of civil society organizations (CSOs), non-governmental organizations (NGOs), academics, and other groups have banded together to form the Bangladesh Internet Freedom Initiative Working Group (BIFIWG).[322] The working group partakes in the public comment process on draft regulations related to the digital sphere.[323] The BIFIWG's goal is to ensure that legal and moral rights of citizens are protected under Bangladeshi law and that the benefits of technology are not overshadowed by digital repression.[324]

At its workshop in December 2021, BIFIWG urged the government to increase transparency and to honor its promises to support an open and fair internet as originally released in the Digital Bangladesh plan.[325] Participants discussed how to identify major threats to internet freedom and how to use multistakeholder participation to advocate for internet rights, openness, and accessibility. The events involved youth leaders and women who stressed the importance of proper cyber hygiene and protecting oneself from harassment online.[326]

2.2 DIGITAL GOVERNMENT: AN EARLY FOUNDATION YIELDS UNEVEN RESULTS

KEY TERMS | BOX 5: Digital Government

Digital government[327] refers to the use of digital technologies as an integrated part of government modernization strategies to create public value.[328] Successfully navigating digital transformation requires more than adopting new applications; it requires a shift in processes and attitude toward agile and collaborative decision-making.

USAID's digital government framework is built around three core functions: manage, deliver, and engage. The performance of digital government services depends on foundational elements such as change management, human capacity, legislation, policy, regulation, and infrastructure. Investment in these core components and foundational elements helps government bodies become more coordinated, efficient, resilient, proactive, and accountable.

Source: USAID Digital Government Model

Vision 2021's second goal, "to have an efficient, accountable and decentralized system of governance," proposed various digital interventions and government transformations. The strategy outlines steps to develop an ICT-first culture in the government, to enact regulations and policies to govern the digital ecosystem (for legislative overview see Table 3), and to construct ICT centers in every village by 2021.[329] Over the past decade, the GoB has achieved several of Digital Bangladesh's digital government objectives in line with Vision 2021, and many interviewees observed digital government as something Digital Bangladesh and the GoB got right.[330] Given Digital Bangladesh's warm reception and progress, the GoB will continue the initiative in Vision 2041, the updated national development strategy.[331]

2.2.1 CENTRALIZED DIGITALIZATION EFFORTS

Emerging from the Digital Bangladesh mandate in 2007, a2i—a joint initiative managed by the ICT Division and UNDP—is responsible for developing the digital capacity of civil servants, online service delivery and innovation, and public sector connectivity.[332] Under this expansive mandate, a2i oversees supply and demand in public service innovation. The supply side covers development of the government's digital capacity and

facilitating a paradigm shift from analog to digital, while demand focuses on the public's ability to have access to digital services.[333]

The a2i program was initially housed under the Prime Minister's Office, which provided strong executive-level buy-in and a public mandate. The international donor community, including the UNDP and USAID, provided support to a2i, with UNDP continuing to be a key partner to date.[334] The GoB has taken steps to formalize a2i as the government's lead digital transformation agency with an official legislative mandate. In 2017, the program was moved from the Prime Minister's office into the ICT Division at the Ministry of Posts, Telecommunications and Information Technology.[335]

a2i's centralization within the Prime Minister's Office enabled the program to work across the GoB, from the national to the local level, to implement the Digital Bangladesh priorities.[336] The Prime Minister's office chose to initially organize a2i at the executive level to ensure the program's agility, and leverage its public profile to hire skilled technologists from the private sector to quickly achieve the government's digitalization agenda.[337]

By undertaking a top-down approach led by a2i, the assumption was that Ministries would digitalize, improve service delivery, and responsibilities would trickle down to line ministries, but in reality it has taken time to trickle down.[338] A GoB interviewee said that government officials initially resisted change from analog to digital but acknowledged that resistance to change is a factor around the world and across organizations.[339]

BOX 10: Training Public Employees in Digital

The transition from analog service delivery to digital requires a public workforce with willing participants who possess the necessary skills. One of a2i's first objectives was to develop the digital capacity of the civil services. One way to encourage public employees to pursue training on digital technology was through recognition and awards.[340]

In 2011, a2i initiated the Public Administrative Awards, which honor the innovative work of civil servants. The Awards were institutionalized in 2016 with the Ministry of Public Administration and can serve as a ladder to promotions or pay raises.[341] a2i's Service Innovation Fund is another incentive used to support the public sector's digital transformation at the grassroots level.[342] Public sector employees who have developed an innovation can obtain funding to scale their concept. a2i encourages co-creation with other government agencies, the private sector, universities, non-governmental organizations, and international organizations.[343] The Disability Innovation Lab is an example of a Service Innovation Fund that supports multiple e-governance initiatives prioritizing people with disabilities.[344] The Lab uses a2i funding to launch pilots, support persons with disabilities-focused NGOs, and support public employees' capabilities in scaling these initiatives. a2i hosts government officials for six months to one year, and trains them on how to create innovative solutions for service delivery.[345] These fellowships often lead to quicker promotions for participants and encourage them to train their employees on the new skills they have acquired.[346]

2.2.2 PLANS TOWARD AN INTEROPERABLE DIGITAL GOVERNMENT

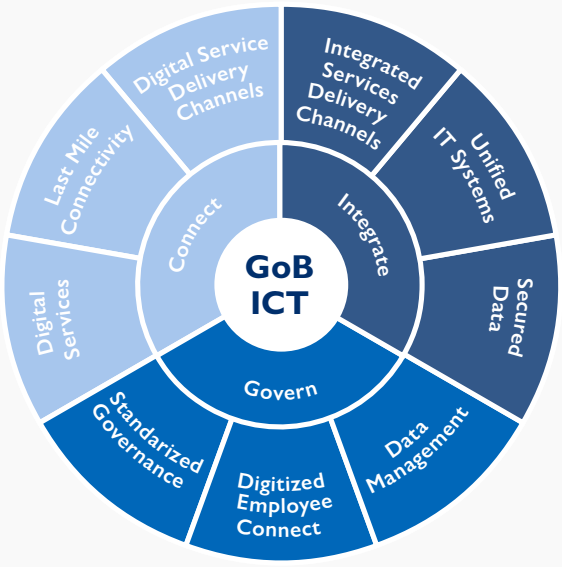
During Digital Bangladesh's early years, a2i introduced the concept of interoperability[347] to government ministries and organizations.[348] According to an a2i employee present during this time, ministries—even those that worked on small-scale digitalization—did not know about interoperability. In the last four to five years, however, there has been a change in this attitude, with ministries learning about and developing interoperable digital tools. a2i helped to pass a Cabinet order that mandated that every ministry store and process digital IDs in the same format, and there are now interoperable services on land, education, and health.[349]

The GoB's focus on an interoperable digital government connects to the Bangladesh National Digital Architecture (BNDA) and e-Government Interoperability Framework. The Bangladesh Computer Council (BCC), an

organization within the ICT Division, is responsible for this strategy.[350] According to the BNDA's website, the 'Whole of Government' Strategy's goal is to synchronize the GoB's digital services through a robust digital architecture and interoperable systems. The strategy acknowledges the digital silos in the GoB, where ministries and organizations operate on their own, creating challenges and inefficiencies.[351]

The 'Whole of Government' Strategy for interoperability follows three directives: connect, integrate, and govern (see Figure 13).[352] 'Connect' focuses on ensuring that citizens have access to digital services and the GoB from anywhere at any time. 'Integrate' centers on building service delivery channels through ICT that follow a common business function with cross-channel integration and appropriate data security. 'Govern' addresses data governance and the ability of employees to connect. The three-page strategy serves as a foundational document, but there are few implementable actions or steps outlined within it.

FIGURE 13: Directives to achieve an Integrated Digital Government: Connect, Integrate, and Govern



Source: Recreation from the 'Whole of Government' Strategy, cited February 28, 2023

The strategy is not in the implementation stage, but is being introduced to ministries, with the BCC working to develop interoperable software. Over the last two years, the BCC has hosted implementation workshops on the BNDA strategy with various GoB Ministries, such as the Ministry of Defense, the Ministry of Railway, and the Ministry of Disaster Management & Relief, but the results from such workshops are not publicly available.[353] It seems that those workshops were an opportunity to introduce these ministries to the BNDA strategy and interoperability concepts. As part of the BNDA framework, the BCC is introducing the National e-Service Bus, a middleware platform to facilitate digital services.[354] The National e-Service Bus is a first of its kind software for the GoB and will allow for the sharing of information and data between ministries, departments, and directorates to ensure interoperability and improved service delivery.[355] The National e-service Bus appears to still be in development, although the BCC website is not clear about this. The BNDA website outlines which digital standards are recommended and required for ministries in their digital government work.[356] Digital standards cover topics such as which software to use, which programs to run, and other technical requirements. Publishing the standards on the BNDA website lets ministries know which standards they should adhere to, but it is uncertain if there are any enabling mechanisms behind them to encourage adoption.[357]

BOX 11: Managing procurement digitally

The GoB made several early investments in e-procurement and now manages almost all procurement digitally.[358] In 2015, the GoB and World Bank launched the electronic government procurement (e-GP) system for four public sector agencies: the Bangladesh Water Development Board, the Bangladesh Rural Electrification Board, the Local Government Engineering Department, and the Roads and Highway Division.[359] The e-GP continues to operate as a web portal and is owned and operated by the Central Procurement Technical Unit (CPTU) and the IME Division of Ministry of Planning.[360] E-procurement systems are meant to reduce corruption and other leakages that often plague the analog procurement process.

2.2.3 REACHING THE LAST-MILE THROUGH UNION DIGITAL CENTERS (UDCS)

a2i is responsible for expanding access points to digital services and meeting Digital Bangladesh's goal of an ICT kiosk in every village. With this vision in mind, the GoB created Union Digital Centers (UDCs), technology-based service offices found at the grassroots level, to house and manage the ICT kiosks.

The GoB has invested heavily in UDCs, creating close to 8,000 across the country.[361] UDCs serve as a digital access point for those citizens who do not have reliable internet at home or are uncomfortable using technology without support. The centers are unique in that they are managed as public-private partnerships, with the intent that they can be funded by private sector partners rather than be solely dependent on donors.[362] UDCs are overseen by a civil servant and typically include a desktop computer, printer, and internet modem.[363] Interviewees have had varying experiences at the centers. There are instances where the internet connection at the center is poor or the civil servant managing the center does not know how to properly operate the equipment.[364] Managers have little training and are uncertain about their responsibilities.[365] These issues make the centers an unreliable access point for many citizens and result in underuse, which undermines Digital Bangladesh's goals.

2.2.4 GOB SERVICE DELIVERY: SLOW STEPS TOWARD PROGRESS

a2i's early priority in digital public service development was to identify bottlenecks faced by citizens in their interactions with the GoB and to come up with solutions to resolve such delays. According to an a2i article, this was done through a "time, cost, visit (TCV) audit" to obtain the necessary information on where to implement innovations to achieve improved service delivery outcomes.[366] a2i's "empathy training" provides firsthand information to senior government officials about what service delivery is like for citizens.[367] Empathy training secretly places a senior government official from the relevant ministry at the point of service as a customer, so they can experience the same challenges a citizen might face and then use that experience to develop a solution. With this information, officials can redesign their services in an innovative and citizen-centric way.

Digital public services continue to be widespread and are generally seen as a positive development.[368] The UN's e-government rankings support this perception, with Bangladesh achieving a high UN E-Government Development Index (EGDI) ranking in 2020 as well as the highest e-governance ranking for a least developed country (LDC) in 2022 (see Figures 14 and 15).[369] Several interviewees in the CSO sector stated that they use a variety of digital services, for instance for train and bus tickets, school exams, land certificates, airport customs, and passports.[370] Interviewees believe that digital public services received a positive reception from the public, especially during the COVID-19 pandemic when many government services needed to move from in-person to digital. The President passed an emergency ordinance allowing legal proceedings to take place online. As a

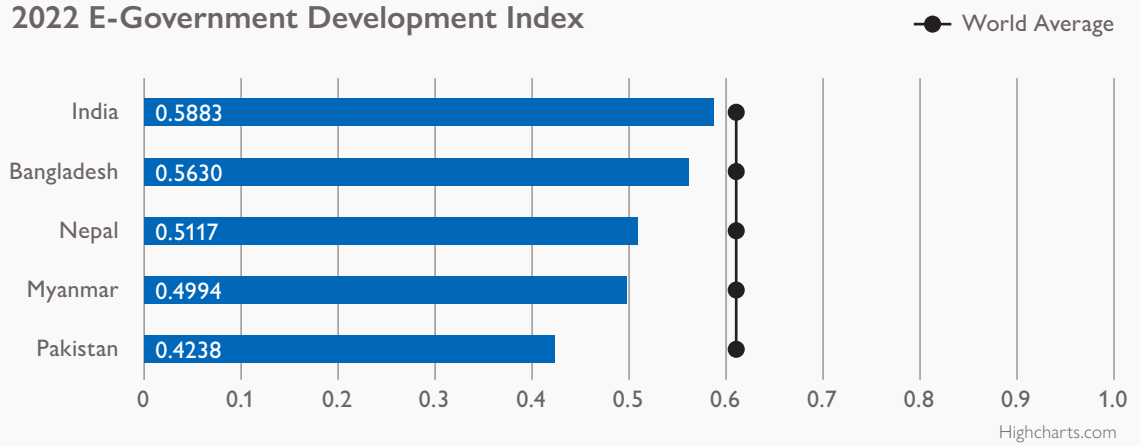
result, a2i and the Bangladesh Computer Council are taking steps to implement e-judiciary for the Supreme Court and the Law and Justice division.[371] Three digital tools were officially launched in 2022: the Online Caselist, Judicial Monitoring Dashboard, and MyCourt. These digital tools illustrate the GoB's commitment to developing digital services and transforming how citizens interact with the judiciary.[372] Under these tools, roughly 2,000 courtrooms are to be digitized, an audio recording pool system is to be available, and a virtual meeting platform is to be added. The MyCourt mobile app (available on Google Play Store) will let citizens and government employees browse the Online Caselist, and the Judicial Monitoring Dashboard will provide data on court proceedings. These tools are mostly available in Dhaka for now, specifically in the courts for Barishal Brahmanbaria, Habiganj, Kushtia, Narayanganj, Rajbari, Rangpur, and Sherpur.[373] The current plan is for the remaining courts to gain access later this year or next.[374] The primary availability of these tools in Dhaka underscores a typical issue in digital public services globally—that urban areas are prioritized while non-urban areas must wait for access.

FIGURE 14: Bangladesh's E-government Development Index Ranking Since 2003

E-Government Development Index	2022	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Bangladesh (Rank)	111	119	115	124	148	150	134	142	162	159	159
Bangladesh (Value)	0.56300	1.51890	0.48620	1.37995	0.27572	0.29913	0.30278	0.29360	0.17618	0.17875	0.16537

Source: UN E-Government Knowledgebase, cited February 28, 2023

FIGURE 15: Bangladesh's e-government index compared to regional neighbors and world average



Source: UN E-Government Knowledgebase, cited February 28, 2023

Outside of the aforementioned tools a2i's National Portal-mygov.bd—houses all GoB websites and service information and is a central location for all government-related information. a2i trained 100,000 employees on how to upload information.[375] Issues with the portal remain, such as maintaining accurate information and ensuring that the public has timely access to service updates or changes.[376] a2i also launched a series of one-stop-shop applications in 2019—ekSheba, ekPay, and ekShop—to aggregate similar services under one umbrella.[377] EkSheba provides public services (mainly forms and applications) in one digital location; ekPay is a platform for paying utility, education, and other bills; and ekShop is an e-commerce tool.[378] The services are

not completely digitized.[379] Rather, roughly two-thirds of the process is completed online and the remaining third is done in person.[380] Without end-to-end digitization in service delivery, inefficiencies in time and cost remain, undermining a2i's intentions.

2.2.5 GOVERNMENT AND CITIZEN ENGAGEMENT VIA DIGITAL TOOLS

The GoB primarily communicates public service announcements to the public via short message service (SMS).[381] Bulk SMS notifications are used to communicate on a variety of topics, such as health care, natural disasters, elections, education, and more.[382] By using SMS notifications, the GoB can communicate with a large segment of the population in an efficient and cost-effective manner. Since SMS communication does not rely on mobile internet, the GoB can engage with those who live in areas without reliable internet coverage. The private sector also engages with the public through SMS messaging. An interviewee noted that it is common to receive an SMS from superstores during sale events.[383]

A national level portal or digital application for government-citizen engagement does not currently exist. At the city level, incremental progress is occurring. Shobar Dhaka (Everyone's Dhaka) is a one-stop digital citizen engagement tool developed by the Office of the Mayor of the Dhaka North City Corporation.[384] The app can be downloaded onto any mobile device through the Google Play Store and allows citizens to raise issues on public services to their local representative. Within the app, there are separate sections for roads, streetlights, public toilets, sewers, and mosquitos.[385] As of September 2022, the app had hosted 21,079 residents and had resolved 5,515 problems out of 5,819 submissions.[386] Shobar Dhaka's high usage and ability to resolve local issues illustrates how digital tools for government-citizen engagement can improve the service delivery process and create new feedback loops.

2.3 CIVIL SOCIETY AND MEDIA'S RELATIONSHIP WITH TECHNOLOGY

For many CSOs, digital technology is still a novel concept in their work. Many currently use technology for basic IT purposes such as recruiting and marketing on social media but not as tools to accomplish their core missions. Misinformation and disinformation are widespread, with few CSOs or media houses having a firm grasp on how to identify and prevent their spread.

2.3.1 CSOS USE OF DIGITAL TECHNOLOGY – PRIMARILY FOR IT

CSOs digital technology use is mostly managed by their IT departments for daily work purposes rather than as a means to help them achieve their core missions.[387] Many CSOs in developing nations are constrained by budgets and limited donor funding, leaving minimal money for their IT department and digital tool development. One area where CSOs use technology actively is through basic work functions, such as posting jobs to BDJobs and marketing events on social media.

A handful of nonprofits and NGOs run trainings to build civil society's digital capabilities. The programs typically contain lessons in password security, how to detect cyber scams, and online safety.[388] One nonprofit organization ran a digital training program to help develop CSOs digital skills.[389] The program confronted a challenge when many CSO employees did not view cybersecurity as an organizational issue, but rather as one that is the sole responsibility of IT. To address this, the organization developed a training of teachers program to educate them about the cyber risks faced by CSOs as well as many of the at-risk populations they work with. Within this training program, implementers faced a secondary challenge in maintaining an adequate gender balance, with few women attending. The lack of women attendees was not unique, as there are social and gender norms

that limit the participation of women in technology (see Section 1.5.1).[390] According to participants, the training did not address important topics in digital security and online freedom: how to address gender based violence online and how to identify misinformation and disinformation.[391]

Some CSOs are developing their own programming that uses digital tools, and interviewees expressed a strong desire to do more of this work if the right conditions are met.[392] An international development organization has created a digital platform that shares best practices on advocacy work in various topics, such as land rights.[393] The Advocacy Toolbox project is supported by the NGO Young Power in Social Action; a notable observation arising from the development of these tools is that these platforms must be interactive and engaging for users.[394]

2.3.2 MEDIA INVESTMENTS IN THE DIGITAL SPACE

Bangladesh's leading newspapers are The Daily Star (English) and Prothom Alo (Bangla). Most leading newspapers in Bangladesh (and some local ones) have web portals and social media pages.[395] Bangladesh has several privately owned television outlets; Bangladesh Television (BTV) is owned by the government. Most television channels also have separate digital news services available online.[396] Bangladesh Betar radio is also state-owned. Bangladeshi media outlets like The Daily Star, Dhaka Tribune, and The Business Standard offer significant reporting on issues pertaining to the digital ecosystem, whether related to connectivity infrastructure, regulatory discourse, or the tech startup and e-commerce environment.

As media consumption habits change and primary audiences overall skew younger, legacy media is developing digital products to attract and maintain customers.[397] The OTT platform Chorki, which is owned by the media company Prothom Alo, produces original Bangladeshi content, illustrating how the media is adapting to the digital era through OTT.[398] Social media platforms that are video-based are also influencing how media is consumed. TikTok and YouTube's popularity has grown among urban customers, while Twitter is less used. Platforms like TikTok are seen as news media competitors since many youth use the platform, but news media companies are unsure how to use the platform since content is user-driven. News company editors see TikTok as an entertainment platform, not one for disseminating the news (see Section 1.6 for more on content relevance).

2.3.3 MISINFORMATION AND DISINFORMATION IN SOCIETY

KEY TERMS | BOX 6: Malinformation, misinformation, and disinformation

Malinformation is the deliberate publication of private information for personal or private interest, as well as the deliberate manipulation of genuine content. Malinformation is based on reality but is used and disseminated to cause harm.

Misinformation is information that is false, but not intended to cause harm. Individuals who do not know a piece of information is false may spread it on social media in an attempt to be helpful.

Disinformation is false information that is deliberately created or disseminated with the express purpose of causing harm. Producers of disinformation typically have political, financial, psychological, or social motivations.

Source: USAID Disinformation Primer

LIRNEasia's 2021 report titled "Misinformation in Bangladesh: A Brief Primer" explores the misinformation landscape in the country through many angles, including general perceptions of misinformation, patterns of misinformation, potential perpetrators, and reactive measures.[399]

The consequences of real-world misinformation and disinformation are far-reaching and there are instances where a fake story has led to violence. The Padma Bridge incident in 2020 illustrates how an outlandish online rumor about human sacrifices led to actual violence and deaths.[400] A false Facebook post stated that the construction company for the bridge required child sacrifices. This post went viral, causing widespread fear that resulted in more than a dozen arrests and eight killings because people suspected these individuals to be the child's alleged kidnappers.[401] Interviewees noted that this incident illustrates how individuals easily fall victim to manipulation, especially when at-risk groups such as children are involved in a false story.[402] Misinformation and disinformation are also driven by political and religious agendas, especially against minority groups. According to an anonymous interviewee in media, newspapers often donot have sources on the ground who could verify the story—a common issue—and in a race to publish they fell victim to the misdirection.[403]

Misinformation is often spread in social media through clickbait or by encouraging people to share stories by offering giveaways or discounts, and in some cases creating a sense of duty among people such as "the media won't share, it is your duty to share." Neither interviewees nor the LIRNEasia report cited foreign actors as perpetrators of misinformation or disinformation.[404]

One interviewee noted that Bangladeshis typically consume their news from traditional media outlets through social media, but that they do not typically understand the difference between social media and traditional media.[405] Two interviewees said that rural Bangladeshis are more likely to fall victim to misinformation and fake news online because they often do not know to verify what they read online.[406] People are likely to fall victim to misinformation and disinformation due to poor digital and information literacy skills given that there is minimal training on how to spot fake news.[407]

While misinformation and disinformation are often spread through social media, there are instances where the media have inadvertently spread false stories as well. Some working in the media have piecemeal training on misinformation and disinformation.[408] It is unlikely that the media intentionally spread fake news, but rather that they fall victim to a story.[409] There is a high degree of awareness in media organizations about fighting misinformation and disinformation, but no organization or industry wide efforts to prevent it.[410] The media relies on their editorial boards and standard journalistic practices to prevent fake news.

Organized media literacy events at universities help explain how misinformation and disinformation spread and counsel media to be cautious, even when a story comes from reputable sources.[411] These events include more technical aspects, such as how to spot image doctoring or video manipulation.[412]

BOX 12: COVID-19 disinformation mapping tool[413]

During the COVID-19 pandemic, health misinformation and disinformation spread throughout Bangladeshi social media about how COVID-19 is contracted, how to treat the disease, and whether the vaccine was safe. To understand where and how this misinformation and disinformation spread, BRAC developed a disinformation mapping tool with USAID's support.[414]

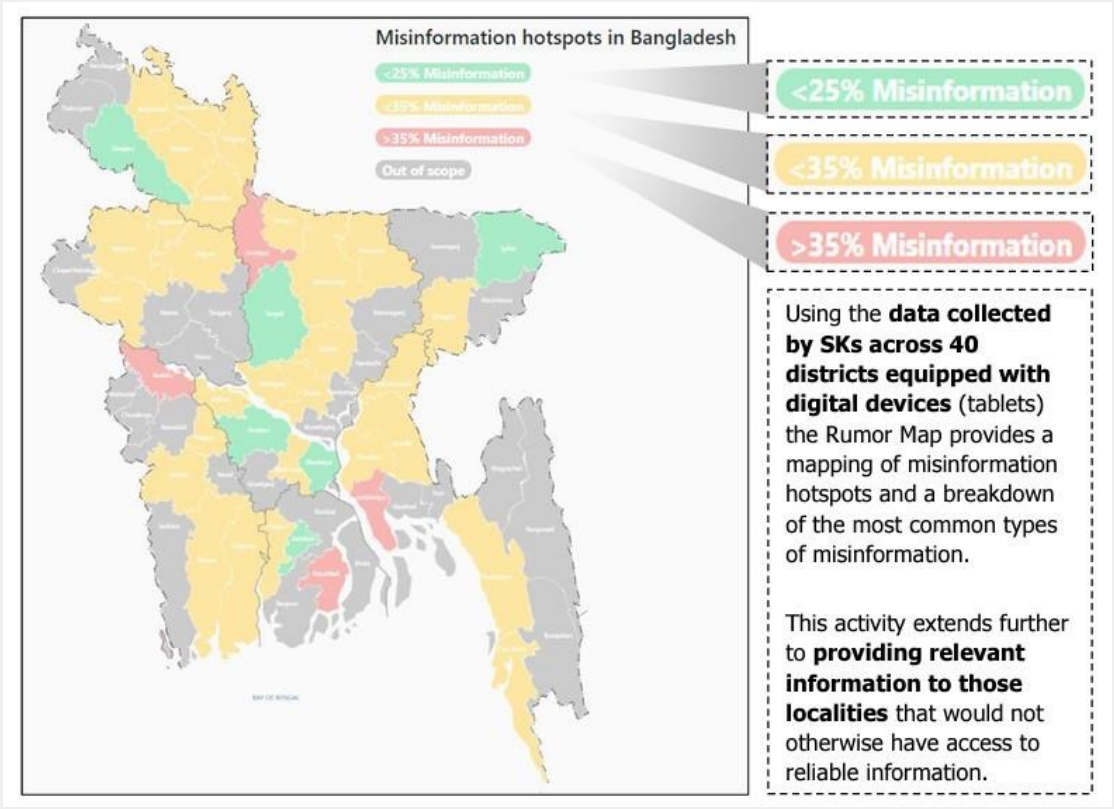
The mapping tool relied on a data tree that was created through answers to various survey questions that the BRAC health team created with guidance from WHO and the CDC. With this data, the team turned the responses into a heat map to indicate areas where people were falling victim to the rumors and how they heard about them. The map

BOX 12 (CONTINUED): COVID-19 disinformation mapping tool[413]

showed that urban dwellers believed COVID-19 misinformation and disinformation at a higher rate than those in rural areas. There are various reasons why that may be the case, including access to technology. The map results illustrated that social media and especially video-based platforms were the primary drivers for COVID-19 misinformation and disinformation.

While this tool was designed to track COVID-19 misinformation and disinformation exclusively, it can be repurposed to track and map any type of misinformation and disinformation.

USAID-Bangladesh Digital Ecosystem Activity Rumor Map



Source: USAID-BRAC Bangladesh Digital Ecosystem Activity, cited February 28, 2023

PILLAR 3: DIGITAL ECONOMY

Digital Economy explores the role digital technology plays in increasing economic opportunity and efficiency, trade and competitiveness, and global economic integration. Areas of inquiry include digital financial services (credit or debit cards, payment apps, mobile money, and digital savings and loan products), financial inclusion, regulation of digital finance, digital trade, e-commerce, and the financial technology (FinTech) enabling environment. This pillar also assesses strengths and weaknesses in the local digital talent pool and the tech startup environment. A healthy digital economy requires a supply of ICT skills that match the demand and an ecosystem that promotes technological innovation.

KEY TAKEAWAYS

DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE

- The Mobile Financial Services (MFS) ecosystem in Bangladesh is expansive, and increasingly more inclusive. Government and private sector are strategizing on how to increase MFS usage.
- Startups are benefitting from increased investment into the ecosystem but challenges related to repatriation and poor rural penetration are limiting growth.
- The fast growth of e-commerce was undermined by a major fraud which severely eroded consumer trust and changed online shopping behavior.
- A sizable segment of Bangladeshi entrepreneurs find work through domestic and international job gig platforms, but such work can often be precarious and offers workers no protections and limited bargaining power.

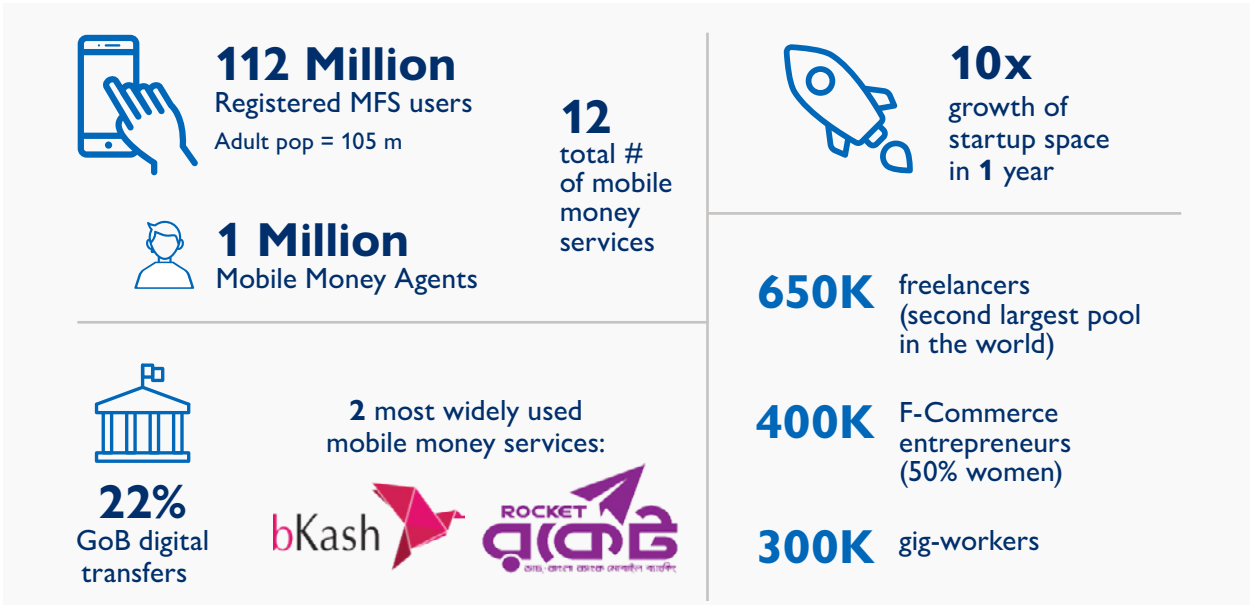
RELEVANT RECOMMENDATIONS

7. Support widescale upskilling efforts to prepare Bangladeshi youth for high quality domestic and international work
8. Design programming to support entrepreneurs, especially women, to leverage social commerce and e-commerce to grow their businesses and improve their resilience
9. Support innovation in rural areas and develop solutions that help smallholder farmers increase their resilience to climate shocks
10. Increase MFS use cases and improve consumer protection for MFS and e-commerce

INTRODUCTION

Rapid growth of the digital economy in the last decade has been driven by an active private sector and a government that considers digital technologies a key driver of economic growth under the Digital Bangladesh agenda. The MFS sector has reached a critical mass of the adult Bangladeshi population since its launch in 2011. Access is rapidly increasing for underserved segments including women and the rural population, with the government and private sector shifting their focus to increased use cases of MFS. E-commerce and startup investments that have flourished with increased use of MFS are largely concentrated in the nation's capital, Dhaka. These achievements are fueled by an expansive digital talent pool supporting the digital landscape widely through technical work, freelancing, and gig work.

FIGURE 16: Bangladesh's digital economy in numbers



Source: Author's graphic based on information presented throughout this section

3.1. MOBILE FINANCIAL SERVICES (MFS) IN BANGLADESH

KEY TERMS | BOX 7: Digital Financial Services

USAID's definition of digital financial services (DFS) encompasses the wide array of financial products and services in the digital ecosystem. In Bangladesh, mobile financial services (MFS) is a widely known term given the significance of mobile money in the country. For this reason, this report uses MFS throughout. However, MFS does not take agent banking into account, which is another avenue for some of the great successes in financial inclusion that Bangladesh has experienced over the years.

- Digital Financial Services (DFS): DFS refers to financial services that are enabled by or delivered through digital technology (e.g., mobile phones, cards, the Internet). These services (e.g., payments, credit, insurance, savings, advisory) can be offered by a range of providers, from banks to a host of non-bank financial institutions, such as microfinance institutions, digital credit providers, payment providers, technology vendors, and electronic money issues.
- Mobile Financial Services (MFS): MFS refers to e-money services that are conducted through a mobile account where the record of funds is stored on an electronic general ledger. Customers can gain access to a mobile account through a mobile phone or another digital device which ensures the authenticity of the transaction. MFS include mobile money, mobile insurance, mobile credit, and mobile savings.
- Mobile money: A service that includes money transfers and making and receiving payments using a mobile phone, without requiring access to a formal bank account. Mobile money uses an agent network of physical transaction points outside of bank branches and ATMs where customers can exchange account credit for cash.
- Electronic money (e-money)-based instruments: In general terms, these instruments require the payer to maintain a pre-funded transaction account with a payment service provider, often a non-bank. Specific products include online money when the payment instruction is initiated via the internet, mobile money when initiated via a mobile phone, and prepaid cards.
- Agent banking: Agent banking provides limited scale banking and financial services to the underserved population through engaged agents under a valid agency agreement, rather than a teller or a cashier. The owner of an outlet conducts banking transactions on behalf of a bank.

In Bangladesh, MFS is defined by the central bank (Bangladesh Bank) as an approach to offering financial services that combine banking with mobile wireless networks to enable users to execute banking transactions. This means the ability to make deposits, withdraw, and to send or receive funds from a mobile account. Often these services are enabled by the use of MFS agents that allow MFS account holders to transact at independent agent locations outside of bank branches."[415] Mobile money services can only be provided by commercial banks or other financial institutions that are licensed by the Bangladesh Bank. These licensed institutions must establish a subsidiary and apply for a separate Payment System Provider (PSP)[416] license from the Bangladesh Bank.[417] Unlike other markets (like Kenya), mobile network operators are not permitted to offer MFS. They can, however, hold up to 49 percent shares in MFS providers.[418]

The GoB has introduced several critical policies and regulations that have collectively contributed to the growth of MFS clients and use cases, as outlined in Table 4.

TABLE 4: Timeline of key MFS Policies in Bangladesh

Guidelines on Mobile Financial Services (MFS) for the Banks (2011)	These guidelines provided the regulatory framework for MFS and allowed commercial banks to offer these services and commercial bank-led MFS platforms to carry out different transactions, from foreign remittances to cash-in and cash-out.[419]
Guidelines on Agent Banking for the Banks (2013)	These guidelines established clear rules for banks to initiate and grow their network of agents.
Revised Regulatory Guidelines on Mobile Financial Services (MFS) for the Banks (2015)	The revisions enforced the requirement that virtual account balances in MFS must at all times correspond to real cash balances at the custodial banks where MFS cash reserves are held.
Guidelines on Electronic Know Your Customer (e-KYC)(2020)	The central bank introduced e-KYC to simplify registration of MFS accounts, drastically reducing onboarding time for MFS clients from five days to five minutes.
National Financial Inclusion Strategy 2021–2026	This five-year strategy (2021–2026) introduced by the Bangladesh Bank underscores the importance of digital technologies in meeting financial inclusion (FI) objectives. The strategy articulates 70 measurable FI targets aligned with seven key objectives including universal access, proximity, and quality and affordability.

3.1.1 MFS MARKET OVERVIEW

The Bangladeshi MFS market has grown rapidly due to a conducive regulatory environment and healthy competition in the private sector. The 2011 MFS Guidelines provided the certainty and clarity needed for the MFS industry to take off, and led to the 2011 launch of bKash, a major DFS catalyst. A second platform, Nagad, also launched in 2011 but is regulated under the Postal Service rather than under the Bangladesh Bank Nagad officially began their operations in 2019. The 2015 updated guidelines further facilitated the national rollout and rapid growth of the market.[420]

Healthy competition in the private sector is a critical factor that has contributed to the growth of the MFS sector. As of May 2022, there were 12 banks[421] providing MFS in Bangladesh but only two dominate—BRAC Bank's bKash and Dutch Bangla Bank's Rocket—holding 80 percent and 19 percent of the market share respectively.[422] Another emerging player in the MFS market is Nagad, a startup that is the mobile financial services arm of the Bangladesh Post Office (under the Ministry of Post and Telecommunication). Launching operations in 2019, the company already has close to 600 million registered users.[423]

BOX 13: bKash's mobile money success

bKash launched in mid-2011 and was the first ever mobile money deployment in Bangladesh. BRAC Bank, a large commercial bank, owns 51 percent of bKash.[424] In just two years of operation, bKash managed to onboard over 11 million MFS clients.[425] By 2022, bKash had 63 million registered clients.[426]

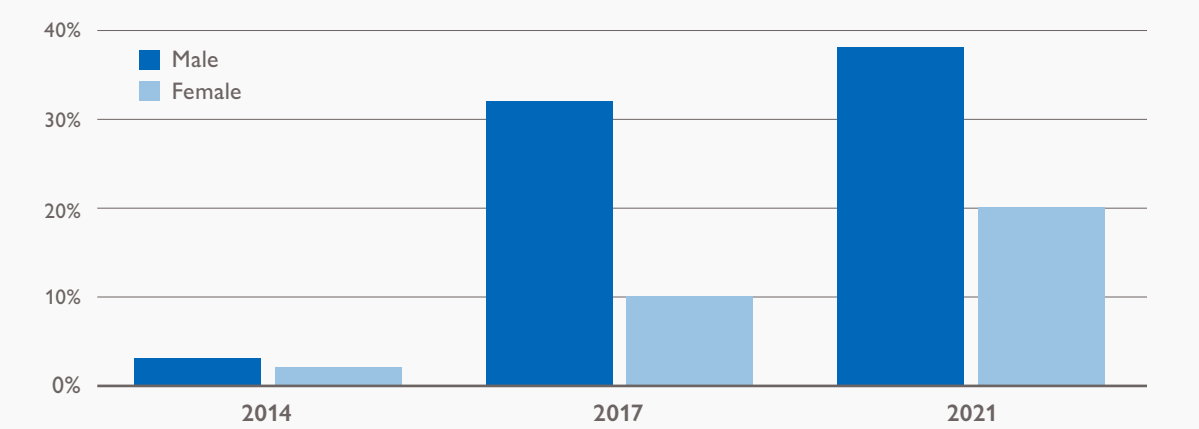
Early customer growth was accelerated by several factors. bKash entered into a contract with BRAC, a large NGO that owns BRAC Bank. BRAC has a presence in most of Bangladesh's 70,000+ villages, providing social, educational, microfinance and other services. bKash acquired 5,000 BRAC staff to be MFS agents, leveraging its existing network of banking agents.[427] BRAC also leveraged its network of teachers to train the agents, and BRAC offices to provide liquidity as needed. As a result, bKash was able to quickly establish a national footprint. bKash also had early support from the Bill & Melinda Gates Foundation (BMGF), which provided a USD $10 million grant to support the startup, including technical assistance that linked bKash to expertise on agent network management from Kenya. After grant funds expired, BMGF came in as a minority investor. In 2018, Alibaba Group purchased a 20 percent stake in bKash.[428] From its inception, bKash was well supported to achieve national scale, and proved to the rest of the market that MFS was a viable proposition.

According to the Bangladesh Bank, there were more than 112 million registered MFS accounts in May 2022.[429] The population of Bangladesh includes 105 million adults, which indicates a high rate of penetration.[430] This high rate of penetration indicates that many Bangladeshis have multiple registered MFS accounts, at least partially due to the lack of interoperability across mobile money platforms (see Section 3.1.5). The number of registered accounts increased dramatically during the COVID-19 pandemic. Between the beginning of the pandemic in early 2020 and May 2022, more than 30 million MFS accounts were registered.[431]

BOX 14: A closing gender gap in MFS

The MFS ecosystem continues to grow in customer uptake and Bangladesh has also made significant strides to close the MFS gender gap. According to the World Bank's Global Findex data, women's mobile money account ownership increased by 7 percent over the past four years, cutting one of the world's largest financial gender gaps by one-third.[432]

FIGURE 17: Mobile money account ownership, by gender



Source: The World Bank Global Findex

Ongoing studies by CGAP and FinEquity found that social norms such as the belief that young women should not manage their finances independently or should rely on male family members to support them financially lead to their decreased access and use of DFS products. Several efforts in Bangladesh could be contributing to closing the gender gap. The government's effort to digitize several safety net payments that target women, allowances for widows, poor

BOX 14 (CONTINUED): A closing gender gap in MFS

mothers, and school fee stipends, could be driving uptake among women.[433] The GoB and readymade garments (RMG)[434] sector's steps to digitalize wage payments (as illustrated in Section 3.1.3) also led to significant progress in terms of financial inclusion, particularly for women workers who were previously left out of the formal financial system.

Stakeholders have also made efforts to enroll more female MFS agents who can then effectively serve female clients. In 2021, Bank Asia partnered with the Bill & Melinda Gates Foundation to increase the share of female agents, which stood at 12 percent.[435] The aim was to enroll more than 100,000 additional female clients and to understand the structural and normative barriers that women face to becoming agents. The findings of the study are yet to be published.[436] Although this is significant progress, there is much work to be done to address the broader systemic barriers that prevent women from gaining access to financial accounts, and from being empowered to compete equitably in markets and to benefit from their economic activities.[437]

3.1.2 INCREASE IN MOBILE USE CASES

MFS use cases have evolved over the last decade, and the government and private sector are working hard to expand that usage. When MFS was introduced by bKash, most transactions were inward remittances, as migrant laborers, garment factory workers, and rickshaw pullers sent money home to family members scattered across the country with most transactions happening over the counter with the help of enlisted agents.[438] With the COVID-19 pandemic, Bangladeshis began to increasingly rely on e-commerce and contactless payments in the midst of recurring shutdowns.[439] Usage continues to grow. Volumes on merchant payments increased almost 10 times between April 2020 and April 2022. The volumes on cash-in and cash-out and on person-to-person payments also more than doubled (see Table 5).[440]

TABLE 5: Mobile Financial Services Volumes by Use Case (million BDT)

USE CASE	APRIL 2020	APRIL 2022	% INCREASE
Merchant payment	2,330	25,410	991
Utility bill (P2B)	2,710	13,320	392
Inward remittance	1,120	2,770	147
Government payment	740	1,760	138
Cash out	82,270	183,000	122
Cash in	87,100	187,550	115
P2P	92,420	196,840	113
Salary disbursement (B2P)	10,640	12,579	18

Source: Bangladesh Bank

Despite this progress, key stakeholders interviewed indicated that increasing use cases for mobile money is their strategic priority.[441] The expansion of merchant payments is one possible pathway.[442] There are some challenges related to setting up a merchant account, as it requires the business to obtain several documents

including a trade license.[443] The acquisition of trade licenses can be cumbersome and time-consuming as the licensing process continues to be manual. In 2020, Bangladesh Bank introduced Personal Retail Accounts (PRA) allowing micro, small, and marginal entrepreneurs to create a merchant account with minimum documentation such as a national ID and proof of profession. In a 2022 roundtable, experts from the central bank and the Asian Development Bank jointly noted the importance of banks and MFS providers to promote the adoption of PRAs among entrepreneurs not included in the financial ecosystem. Experts highlighted that despite contributing over 25 percent to the country's economy, micro, small, and marginal traders continued to be unable to receive bank loans due to their lack of financial history.[444]

BOX 15: MFS agents' stories from the field

5
Male agents

2
Dhaka city (urban)

1
Gaibandha city (peri-urban)

2
Gaibandha village (rural)

Photo: Nurul Islam Biplob / Bangladesh DECA Research Support Specialist

The Bangladesh DECA interviewed MFS agents to supplement Dhaka-centric expert opinions with experiences closer to the users. The objective of these interviews was to better understand the daily experiences of MFS agents and their customers anecdotally. The team was limited to specific locations for the interviews. Several agents declined to be interviewed upon instructions from the MFS providers or store owners.

Findings can be summarized as follows:

- The number of daily transactions are higher in Dhaka compared to in peri-urban or rural areas, averaging at around 140 transactions per day compared to 20 to 30 transactions per day.
- The volume of daily transactions are higher in Dhaka averaging at around Bangladeshi Taka (BDT) ৳150 per transaction per day compared to around BDT ৳60 per transaction per day.
- Urban agents perform more cash-in transactions because city dwellers send money to their families in villages, meaning that rural agents perform more cash-out transactions.
- bKash is unanimously the most popular service, followed by Nagad and Rocket.

Agents interviewed cited several challenges when administering MFS services to clients in Bangladesh.

- Use of agents has been reduced since COVID-19. Although data shows that MFS use increased during the pandemic, four of the five agents had fewer clients, possibly because many of their customers lost jobs and moved back to their villages. One agent noted that this is getting better.

BOX 15 (CONTINUED): MFS agents' stories from the field

- There are risks of fraudulent money transfers. In some cases scammers dupe customers to send them money or blackmail them to make transactions to hackers. These issues are usually avoided by documenting a customer's national ID number for larger transactions. This can dissuade fraudsters from using MFS for fraudulent transfers to avoid the risks of being identified.
- Many clients are not technology literate. Agents also pointed to challenges related to digital literacy, which caused clients to hand over their phone and password to agents to transact on their behalf. Such actions may make clients vulnerable to being defrauded by agents.

Although these examples are anecdotal, they could point to larger issues around consumer protection in the sector. Agents noted that it is rare that customers do not receive money, however when it does happen, going through proper channels is cumbersome and agents often absorb the loss and pay the client.[445] Such issues may have a negative impact on the uptake and effective usage of MFS. Recent research found that fear of fraud was a key reason that non-users do not register for MFS, along with the service not being needed.[446]

3.1.3 MFS SECTOR KEY SUCCESS FACTORS: G2P AND B2P DIGITIZATION

The government and private sector have worked to digitize wage and government payments, and these efforts have been significant drivers of financial inclusion. Of all government transfers and benefits by volume, 22 percent were paid digitally in 2021, compared with just 0.02 percent in 2016, and more than 100 safety net programs in Bangladesh have been digitized.[447] The Department of Social Services which runs 52 social safety net programs with 20 million beneficiaries and an annual budget of BDT ৳16.20 billion (USD $190.57 million), pays all of its benefits digitally.[448] During the pandemic, the government rolled out an emergency digital cash transfer program for 5 million informal workers and vulnerable households.[449] These G2P payments have been instrumental in expanding access to MFS.[450]

The government has been working with the private sector since 2015 to digitize wage payments in key sectors such as readymade garments (RMG), and measures introduced during the COVID-19 pandemic accelerated these efforts.[451] When the COVID-19 pandemic hit Bangladesh, it is estimated that 90 percent of RMG workers suffered from food insecurity as a result of factory closures.[452] To ease this crisis, the government offered low-interest loans of BDT ৳50 billion (USD $588.20 million) to garment manufacturers, so they could pay their workers while factories were closed. These loans were offered with one stipulation—that loan payments had to be made into MFS accounts. As a result, nearly 2 million MFS accounts were opened within just two weeks (13 million over the COVID-19 period) and the percentage of RMG workers being paid digitally skyrocketed from roughly 28 percent before COVID-19 to 76 percent in May 2020.[453] Most of the recipients of these wages are women. Despite these efforts, challenges to widespread wage digitization persist. Recipients must pay a fee to cash-out their wages, usually the equivalent of around 2 percent, which erodes their earnings.[454] Because of the lack of interoperability in the market, wage recipients might be forced to open up a different account to get access to their wages (see Section 3.1.5).

3.1.4 MFS SECTOR SUCCESS FACTORS: A STRONG AGENT NETWORK AND AN APPETITE FOR INNOVATION

Currently, more than 1.1 million agents provide MFS services to clients, so there is roughly one agent for every 64 active clients.[455] This is much better than the recommended ratio of 150–800 active customers per agent suggested by research form MSC.[456] Agents primarily provide cash-in and cash-out support to clients. As discussed in Section 3.1.3., the market for agents is saturated, but there is a gap in female agents. Such high

rates of penetration make it easier for clients—particularly in rural and hard to reach areas—to get access to local financial services.

The MFS ecosystem is supported by a strong set of FinTech startups that have managed to raise a critical amount of capital. Fifty-one percent of all venture capital (VC)[457] investments into the tech sector over the last decade went to FinTechs.[458] This number was skewed when bKash raised USD $250 million from global venture capital firm Softbank, raising its valuation to USD $2 billion and becoming Bangladesh's first unicorn (a private startup company valued at over USD $1 billion).[459] Other major raises by FinTechs include ShopUp (USD $201 million) and iFarmer (USD $2 million).[460] These large raises in FinTech are good news, as they signal to other investors that this sector is primed for growth and could lead to additional investment in the future.[461] Bangladesh Bank is also supporting FinTechs to innovate, and launched a dedicated office to evaluate the opportunities and risks in this space.[462] A regulatory sandbox already exists in the beta phase and is testing new innovations and business models in a safe and effective manner. With increased investment and continued support from the central bank, the FinTech space could be well-positioned to develop new use cases for the MFS sector, which can drive usage and help reach new segments.

3.1.5 MFS SECTOR REGULATORY GAPS: INTEROPERABILITY

The government has made efforts to introduce interoperability into the MFS market but there are no dedicated guidelines or policies in this area. Currently, there is no regulation to provide a framework for interoperability. However, in November 2022, the GoB launched a new Interoperable Digital Transaction Platform (IDTP) which establishes interoperability between banks, MFS providers, and PSPs through an application programming interface (API).[463] The platform will facilitate money transfers between banks and MFS providers and aims to prevent financial crimes using a verification process embedded in Binimoy.[464]

The cited benefits of interoperability are several. G2P and B2P payments will become more seamless as employers or the government will no longer need to make bilateral agreements with one or a small handful of MFS providers to disburse funds.[465] Recipients of funds will not be forced to change service providers to receive their wages or benefits, and are likely to incur lower fees as they transfer funds across providers.[466] Interoperability might further benefit the startup ecosystem by making it easier for less established MFS players, including FinTechs, to compete on pricing and customer service, rather than on scale, which will ultimately create a competitive market that benefits MFS users.[467]

3.1.6 MFS MARKET GAPS: INSURTECH

Climate shocks adversely affect the resilience of farmers.[468] Apart from the impact on livelihoods in the agricultural sector, the changing climate has had a devastating effect on the physical and mental health of Bangladeshis, leading to an increase in the prevalence and variation of infectious diseases and mental health issues such as depression and anxiety disorders.[469] Innovation in insurance technology could help the agriculture sector withstand current climate shocks and create more security for farm livelihoods. InsurTech refers to technological innovations that are created and implemented to support the rapid scale and improve the efficiency and cost-effectiveness of the insurance industry. Insurance and InsurTech are slow to innovate in Bangladesh, mainly due to outdated regulations. InsurTech innovations are especially useful in sectors such as agriculture where insurance coverage is low and risks are high.

According to a local InsurTech, there are only 15 InsurTech startups serving the Bangladesh market, compared to 140 in India.[470] Agriculture, forestry, and fishing were equivalent to 11.6 percent of Bangladesh's GDP and 16.8 percent of India's GDP in 2021.[471] Only a small handful of Bangladeshi InsurTechs focus on managing risk

in the agricultural sector. From the 15 operating in the market, many are struggling to find product market fit, and are shutting down their operations.[472] One challenge faced by InsurTechs is related to the Insurance Act (2010) which currently has no provision for the digital distribution of insurance.[473] There is no clarity as to when such a provision will be included in the act or if a separate regulation or policy that allows such distribution will be introduced. The InsurTechs that are distributing digitally often seek a no-objection letter from the Bangladesh Insurance Association, which provides regulatory oversight to the insurance sector to carry on their digital business.[474] The lack of this provision could be a barrier to entry for other InsurTechs seeking to enter the market. Currently, the insurance market only has a .49 percent penetration rate for all insurance products, signaling a clear opportunity for additional innovation and the digitally enabled scale of insurance products.[475] There is room to drastically increase the uptake and effective usage of insurance solutions through financial literacy efforts.

BOX 16: Agent banking: A driver of financial inclusion

Agent banking has been a catalyst for financial inclusion in Bangladesh and leverages digital technologies. It was first introduced into the market in 2013 with the release of Agent Banking Guidelines (2013). These guidelines permitted banks to appoint eligible individuals or entities, including companies, non-governmental organizations (NGOs), and cooperatives as their distribution partners for agent banking.[1] Bank Asia was the first to introduce agent banking services in 2014 and to date over 30 banks have acquired licenses to offer agent banking services.[2] For these banks, agent banking services allowed for rural penetration at a much lower operating cost. Banks contract designated banking agents, who are usually local business people with their own stores or other physical locations, to provide select banking and financial services. This includes cash-in and cash-out, utility payments, and bank account opening. These financial transactions are usually mediated by technologies such as mobile phones, point of sale, and biometric devices. As of August 2022, there were close to 15,000 agents across the country.[3] According to the Agent Banking Guidelines (2013), agents are allowed to be non-exclusive, and offer the services of more than one bank.[4] These agent banking models have been critical to bringing affordable financial services to rural communities, and under-served segments such as women and smallholder farmers.

Sources:

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2 Ahsan Mansur and Hasnat Alam, *Agent banking: a new approach for financial deepening*, The Financial Express, November 2022, https://thefinancialexpress.com.bd/views/views/agent-banking-a-new-approach-for-financial-deepening-1669816994
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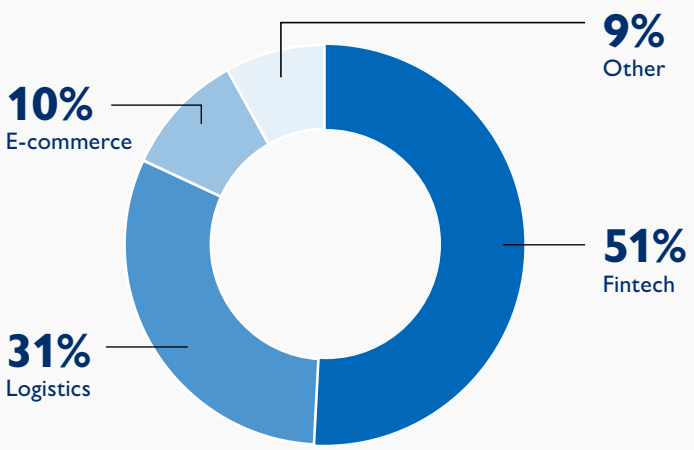
3.2 TECH STARTUP ENVIRONMENT

The tech startup ecosystem in Bangladesh has seen significant growth, especially over the last year, and especially in key sectors such as FinTech, logistics, and e-commerce. Between 2020–2021, startup investment in Bangladesh grew 10 times over.[476] Across the last decade, the Bangladesh startup ecosystem saw a total investment of USD $742 million, and a total of 225 investments were made in Bangladeshi startups, according to UNESCAP's 2020 "Bangladesh Startup Ecosystem Assessment Report".[477] In 2021 alone, investments in local startups rose to the level of USD $415 million; this includes the SoftBank investment in bKash mentioned above. Other major raises are described in the UNESCAP report.

Apart from FinTech (51 percent), the sectors receiving the most funding include logistics and mobility (21 percent), and e-commerce (10 percent).[478] Anticipated future growth sectors include FinTech, edtech,

healthtech, AgTech, and SME. There are more than 1,200 active startups in Bangladesh with around 200 entering the market every year. Collectively, these startups employ 1.5 million Bangladeshis.[479]

FIGURE 18: Startup sector-wise investments



Source: UNESCAP

3.2.1 STRONG GOVERNMENT SUPPORT

The startup ecosystem has received ample support from the government, especially in priority sectors. The government launched a special program—Innovation Design and Entrepreneurship Academy (iDEA)—in 2020 which has provided seed grants to more than 250 early stage startups in Bangladesh.[480] In 2020, the ICT Ministry launched Startup Bangladesh Limited, a USD $65 million venture fund that invests in startups that have found product-market fit and are primed for scale. This fund is meant to be spent within five years. Although the fund is sector-neutral, it prioritizes sectors where the government wants to see growth: education, health, agriculture, energy, cybersecurity, AI, and deep tech.[481] According to Startup Bangladesh Limited, the government's aim is to have five unicorns by 2025.

As mentioned above, bKash is the only unicorn in Bangladesh to date, and bKash is not the typical startup in Bangladesh. As Box 14 noted, it received ample funding from BRAC, donors like the BMGF and IFC, and technical assistance support from leading experts in the MFS space. Unlike a traditional startup in Bangladesh, bKash was primed for rapid growth, and had the capital, and knowledge to reach unicorn status. Most startups in Bangladesh do not have such advantages, but bKash may have put Bangladesh on the map for VC investment, and may pave the way for others to attain unicorn status.

3.2.2 GLOBAL INVESTORS: SOME SIGNIFICANT CHALLENGES

Global VCs, which account for about 96 percent (USD $709 million out of USD $742 million) of the total investment inflows into Bangladesh face some challenges when operating in the Bangladeshi market. As a result, they are taking a wait-and-see approach and are testing the local market by making a small handful of investments rather than funneling a large amount of money into the market.[482] The average investment from global investors is about USD $3.5 million, and more than 130 investment deals have been made to date.[483] This amounts to .31 deals per USD $1 billion GDP compared to .12 deals in India.[484]

Challenges faced by investors relate to the nascency of the startup environment and challenges related to repatriation. This means that upon exit, investors have a difficult time taking money out of the country due to existing policies, and processes at the central bank and securities exchange committee.[485] These challenges are partially linked to the 1947 Foreign Exchange Regulation Act (FERA) whose legal and administrative restrictions hinder investors from repatriating capital.[486] According to the IFC, partial liberalization of the exchange control regime is needed to support a modern trade and investment environment.[487]

Investors mentioned challenges related to the pipeline of startups, noting that not enough high-quality startups have found product-market fit or are positioned for growth and exit. Investors also noted that founders in Bangladesh lack a sense of urgency, either running their business on the side or operating it as a lifestyle business or "nice to have".[488] Investors want to bet on founders who have a clear mission to generate structural and scalable impact in their sectors and will deploy capital in an intelligent and aggressive manner to solve large-scale problems. Investors also noted that some founders have a misunderstanding of how startups work, and how investors look at startups. Instead of solving one core problem, doing it well, and scaling it fast, founders tend to take on too much and dilute the focus of their business.[489] They noted a need to increase the number of incubators that are led and backed by VCs to address these issues and to improve the overall quality of startups.[490]

3.2.3 LOCAL INVESTORS: BRIDGES TO NOWHERE

A very active and rapidly growing network of angel investors in Bangladesh provides initial funding, but follow-on and larger raises from VCs are difficult to come by. This growth is being supported by local organizations like the Bangladesh Angel Network (BAN), which have managed to enroll more than 300 angel investors.[491] BAN noted that half of these angels were local, and the other half invested from abroad, with some of the foreign investors coming from the diaspora community. A portion of investors were also institutional, and included non-bank financial institutions such as IDLC. BAN made more than 40 investments with an average ticket size of USD $200,000. This is much lower than in India where investments received in 2021 were just under USD $1 million.

BAN also flagged the issue of "bridges to nowhere", indicating that it is very difficult for early stage startups that have raised capital and shown some traction in the market to raise follow-on funding to support their scale. This is due to a lack of later stage capital, the result of the repatriation challenge noted in Section 3.2.2.[492] It is also the result of too few local institutional investors with large balance sheets, which stems from the lack of liquidity and infrastructure among capital markets. These challenges limit the ability for many potentially successful startups to acquire the VC funding needed to take their business to the next level.

3.2.4 INCUBATORS AND ACCELERATORS: MISSING MENTORS AND LACKING CAPITAL

The Bangladeshi startup ecosystem is benefitting from a growing network of incubators and accelerators, some of which are also investing into startups,[493] with variability in terms of the quality of services offered by these ecosystem players. One of the driving forces for the emergence of these players was support from the government. The National ICT Policy in 2009 and the Digital Bangladesh agenda (see Table 3) played an important role in creating the startup ecosystem in which incubators and accelerators play a pivotal role. Founders Institute, Banglalink, and YGAP were among the first incubators to set up in the market, beginning operations in 2014–2015.[494] These players have helped startups develop and test their business models, find product market fit, grow their teams, and find investment.

TABLE 6: Select Incubators and Accelerators in Bangladesh

NAME	DESCRIPTION	PORTFOLIO
BYLC	BYLC Ventures funds Bangladesh's most promising founders to strengthen their business acumen, and help validate their big ideas as they transition into investable business.	Tunibibi, Green Culture
yyventures	YY Ventures is an incubation and investment Social Business supporting early-stage entrepreneurs who are fighting carbon emission, poverty, and unemployment.	Transend, Garbage Man.
GP ACCELERATOR	Grameenphone Accelerator (GPA) is a cohort-based, mentored, curriculum-driven open innovation platform that enables and empowers tech startups.	Sheba Platform, Socian
ygap	YGAP Bangladesh is an impact accelerator program in Bangladesh that operates under a partnership between Build Bangladesh and YGAP Australia.	Upskill, Khaas Food
SURGE	Surge is a rapid scale-up program for startups in India and Southeast Asia that provides USD $1 to $2 million in seed capital to exceptional founders.	ShopUp, 10 Minute School, Shajgoj
ACCELERATING ASIA	Accelerating Asia is an early stage Venture Capital Fund with a focus on pre-Series A startups in Southeast and South Asia	Dana, Swap

Source: UNESCAP

Prominent local organizations including Grameenphone and BRAC run their own incubation programs. Global nonprofit organizations such as Syngenta and UNCDF also support startups through incubation. A handful of VCs provide acceleration support to startups, including Surge by Sequoia and Accelerating Asia. These VCs saw growth potential in Bangladesh and wanted to test out the market.[495] In the last few years, these accelerators have allocated both expertise and funds to support the growth of the priority sectors mentioned above.[496]

Despite the penetration of incubators and accelerators, several interviewees noted that the capacity of mentorship is still limited, given the nascency of the country's innovation ecosystem. There are not enough qualified mentors who have successfully built and scaled startups in Bangladesh, along with a deficit of programs that are run by VCs.[497] As a result of these gaps, incubators and accelerators are not producing a critical mass of startups that have managed to raise a significant amount of capital.[498] This is likely affecting the rate of growth in the startup ecosystem.

3.2.5 BANGLADESHI STARTUPS: ONLY FOR RICH KIDS, AND MOSTLY FOR MEN

Interviews revealed significant barriers to entry for startup founders related to fundraising and gender.

Raising capital was among the key challenges noted by Bangladeshi startups. Many startups that have successfully raised capital have established offices outside of the country—in Dubai and elsewhere—to support the repatriation of funds out of Bangladesh.[499] Local startups also noted a preference for international investors, not only because ticket sizes for investments were larger, but also because these investors could provide strong international connections and expertise to support growth and scale. Due to the risky nature of startups and their high rates of failure, banks and other financial institutions are often reluctant to provide loans. This is

common in most markets. If loans are offered, they are offered at very high interest rates, which makes the financing unaffordable to local startups.[500] As a result of these financing challenges, pursuing entrepreneurship is out of reach for many Bangladeshi youth. One founder who self-funded his startup noted that entrepreneurship is an activity only pursued by "rich kids" and that an influx of capital is needed in the startup ecosystem to level the playing field and allow the strongest entrepreneurs with the best ideas to surface.[501]

The innovation ecosystem is heavily based in Dhaka, the country's capital, which is also home to 70 percent of the country's population. Most founders in Bangladesh have little experience outside of Dhaka, which means that innovation tends to focus more on addressing problems that are urban-centric. The most educated founders tend to leave rural areas to pursue opportunities abroad or in Dhaka, as part of a large challenge related to the outbound migration of highly skilled talent.[502] Gaps in digital infrastructure in rural areas and limited digital literacy limit the abilities of businesses to effectively harness technology to build and scale startups.[503] As a result, only 1.2 percent of the total investment raised in Bangladesh went to agriculture as a sector.[504] Aside from iFarmer, Bangladeshi agriculture startups have raised less than USD $250,000, significantly less than neighboring country India, which has raised USD $2.5 billion.[505] The challenge with repatriation could be one reason for this discrepancy between the two countries. iFarmer has raised more than USD $2 million to date. The company works with nearly 3,000 agri-input dealers and supplies more than 8,000 tons of agri-produce to institutional buyers, wholesale markets, and retailers. iFarmer has shown that rural scale is possible with the right business model.[506]

There is a significant gender disparity when it comes to startup founders. Only 15 to 20 percent of founders are women, according to the BAN.[507] Bangladesh also ranked at the very bottom of the Mastercard Index of Women Entrepreneurs (65th out of 65 countries), which suggests that significant barriers prevent women from pursuing entrepreneurial activities.[508] Women face challenges that include access to capital, lack of women mentors, inadequate skills, lack of career guidance, inadequate resources to study subjects related to technology, lack of confidence and emotional preparedness, and lack of family and community support. There are recent efforts to increase the rate of women entrepreneurship in the startup ecosystem. For example, the BAN launched the Bangladesh Women Investor Network to enroll more women investors with the subsequent goal of investing and supporting more women-led startups.[509]

3.3 E-COMMERCE AND DIGITAL TRADE

The development of e-commerce in Bangladesh is still in early stages,[510] although the sector is growing and transforming rapidly due to increased investment and to the pandemic. There is increased investment from the tech startup ecosystem into the e-commerce and logistics sectors, and the COVID-19 pandemic led many Bangladeshis to shop online. Increasingly, entrepreneurs and MSMEs are using e-commerce and social commerce, known as Facebook commerce (f-commerce) in Bangladesh to reach new markets and increase their revenues. Female entrepreneurs and small business owners comprise the majority of sellers on social commerce. Logistics networks are also rapidly improving to support the growth of e-commerce outside of urban centers.

KEY TERMS | BOX 8: E-commerce and Digital Trade

E-commerce: OECD defines e-commerce as "the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders." E-commerce may be conducted through formal (e.g., Amazon, Etsy) and informal (e.g., Facebook, WhatsApp) digital platforms. Physical goods may need to be shipped domestically or overseas; virtual goods and services (such as streaming video or telehealth consultations) can be delivered digitally. In addition to digital tools (such as payment platforms), e-commerce depends on physical infrastructure for the warehousing and delivery of goods. E-commerce growth has implications for traditional methods of cross-border trade and domestic transport infrastructure, postal, and logistics systems.

Digital Trade: The U.S. International Trade Commission defines digital trade as "The delivery of products and services over the internet by firms in any industry sector, and of associated products such as smartphones and internet-connected sensors." This includes services such as cloud storage, software-as-a-service, banking and e-commerce platforms, and digital media content, as well as ICT hardware.

E-commerce focuses on the purchase and delivery of physical goods, while digital trade takes a broader view, focusing on trade in digital services and media and emphasizing cross-border transactions. Digital trade facilitation refers to a range of topics from international payment services to e-signatures and digitized customs processes.

3.3.1 GROWTH IN THE E-COMMERCE SECTOR

The COVID-19 pandemic drastically increased consumer adoption and usage of e-commerce as more Bangladeshis began to shop online in the midst of widespread shutdowns. According to the World Bank, total e-commerce revenues increased by 70 to 80 percent during 2020.[511] The country has more than 2,000 e-commerce sites that deliver more than 30,000 goods.[512] The majority of these companies are startups. Popular e-commerce sites include Clickbd, Chaldal, Bikroy, Daraz, and Shohoz, among others. International e-commerce platforms are also entering the market. In 2021, the Chinese e-commerce giant Alibaba acquired food delivery company Hungry Naki.[513] More than 1 million Bangladeshis engage in e-commerce.[514] Dhaka, Chattogram, and Gazipur—the more urban cities in Bangladesh—account for 80 percent of all e-commerce sales.[515]

The industry is estimated to have grown from USD $1.6 billion in 2019 to approximately USD $2 billion in 2020, and is projected to reach USD $3 billion by 2023.[516] One key reason for such growth is related to an influx of capital into the industry. Logistics and e-commerce collectively have attracted almost one-third of total VC investment in Bangladesh to date.[517] Select startups in the e-commerce and logistics sector include HungryNaki, Truck Lagbe, ClickBD, Bikroy, and Shohoz.[518] Recent major raises have included Chaldal (USD $30 million) and logistics platforms PaperFly (USD$25 million) and Shohoz (USD $20 million).[519] E-commerce is the most promising sector for angel investors given the numerous successful raises to date.[520]

3.3.2 MSMES THRIVING ON E-COMMERCE

Micro, small and medium (MSMEs) enterprises are increasingly leveraging e-commerce platforms to grow their businesses, but barriers exist to optimal utilization. A recent World Bank study on digitizing MSMEs in Bangladesh found that reaching new customer segments and diversifying sales are key reasons for MSMEs to sign up with e-commerce.[521] The study further found that e-commerce put MSMEs on the path to modernization and formalization, as firms are more likely to adopt new practices and comply with regulations if doing so is necessary to gain access to the e-commerce market. There is still a lot to be done to position MSMEs to integrate e-commerce and other digital tools into their business offerings. A survey of more than 1,000 MSMEs in Bangladesh revealed that only half of the surveyed businesses had any online presence. A lack of knowledge around digital tools and the perceived lack of relevance to the business were cited as major barriers to

adoption.[522] Bangladesh's MSME sector holds untapped potential to leverage digital tools like e-commerce to increase productivity and improve business outcomes. An interviewee noted that there are also challenges related to the role of women in the household and in society. Many women have to navigate gender norms and seek permission from male relatives to start and grow their business.[523]

3.3.3 SOCIAL COMMERCE–INCENTIVIZING FORMALIZATION

Social commerce is growing rapidly in Bangladesh, and is especially popular among female entrepreneurs. It is estimated that there are more than 50,000 social media commerce pages on Facebook, and these pages are leveraged heavily to advertise and sell products.[524] Bangladesh is in the Top Ten of audience size on Facebook in the world, with close to 45 million active users.[525] Given this audience size, it is not surprising that nearly 400,000 Bangladeshi entrepreneurs—half of whom are women—are estimated to leverage social commerce for their business.[526] These women are more likely to be urban, under 30 years of age, married with dependents, and have at least a secondary education.[527] Seventy-seven of these entrepreneurs operate informally without trade licenses or business registrations.[528] Most do not have bank accounts, as opening an account would require registration with the government. Most also do not have a merchant account for their business, even though they do have a personal account with an MFS provider, likely due to the fact that they were not registered as a business. Most women rely on cash on delivery, partially to circumvent the need to open a bank or merchant account to register their business.[529] Many women are intimidated by the business registration process.

The government has several initiatives to support social commerce, and to incentivize the formalization and registration of businesses. Among these is a low interest loan to support startup and growth costs.[530] The GoB also launched a digital business identification (DBID) scheme in 2022 which mandated that all social commerce businesses register within two months to avoid being shut down.[531] The request for registration is being met with resistance from many social commerce entrepreneurs due to resistance to paying taxes and the lengthy process of registration.[532]

Apart from business registration, women selling on social commerce faced several challenges, including not having the knowledge and skills to use the various features of the Facebook platform to optimally grow their business.[533] These challenges continued even at the scale-up stage of online business.[534] Initiatives in the market, such as the e-Commerce Association of Bangladesh's (e-CAB) Women and E-Commerce (WE) initiative, are providing broader entrepreneurship training to selected women in their network. Currently, WE has more than 1.3 registered female social commerce entrepreneurs.[535] The Ministry of ICT also designed programming to train more than 1,000 entrepreneurs on digital marketing, a critical mass of whom were women. Meta, the parent company of Facebook, in partnership with a2i, launched a program to provide female entrepreneurs with the skills, connections, and technology needed to set up and grow their business online.[536]

BOX 17: A major case of e-commerce fraud—seeking trust and protection

Major frauds in the e-commerce industry have eroded customer trust and led to the introduction of new policies around consumer protection.

Eroding trust

Evaly was established in 2018, and within three years of operation, it became the second largest e-commerce player in the country.[537] The e-commerce platform advertised highly discounted products, and required customers to prepay for these products online to take advantage of discounts. Initially, these products were delivered to customers without many issues. Eventually, however, customers started to complain about delays in delivery and non-delivery of products.[538] When

BOX 17 (CONTINUED): A major case of e-commerce fraud—seeking trust and protection

customers tried to reach Evaly, they noted that the web and social media pages of Evaly had shut down. Senior leadership in the company was implicated in embezzlement and fraud, and many customers failed to receive their orders or refunds for the amount of purchase. A dozen other e-commerce companies were subsequently implicated in similar frauds.

These frauds deeply eroded trust, and the e-commerce sector is working hard to rebuild that trust.[539] The fraud affected how clients paid for e-commerce services, with many reverting to cash on delivery versus digital payments.[540] After the sudden shutdown of Evaly, more than USD $21 million (BDT ৳214 crore) in customer funds was blocked in payment service gateways and providers.[541]

Consumer protection

The Evaly fraud raised concerns regarding consumer protection in the e-commerce sector. At the time of the fraud, the primary law that focused on redress for aggrieved consumers was the Consumer Rights and Protection Act (2009), which penalized businesses for the non-delivery of products. After the fraud, the Minister of Commerce issued the Digital Commerce Operational Guidelines 2021 which included new standards around delivery (5 to 10 days), redress mechanisms, and consumer rights in e-commerce.[542] The Bangladesh Bank introduced an escrow service[543] for e-commerce platforms, where payment gateway banks keep the buyer's advance payments until the e-commerce company delivers the goods and submits the delivery document signed by the buyer to the payment gateway.[544]

3.3.4 MODERNIZING LOGISTICS

Sixty-five percent of the Bangladeshi population resides in rural areas, but e-commerce continues to be concentrated in major cities.[545] Logistics networks are concentrated in urban centers, but effort is being made by local startups and global logistics companies to scale logistics across the country. Major barriers to expanding e-commerce outside of urban centers include poor road and logistics infrastructure which limits last-mile delivery. To address these issues, a2i developed a rural e-commerce program which established more than 5,000 Union Digital Centers across the country in 2018. There are more than 8,200 of these centers today.[546] They were designed to provide a point of aggregation for goods and services from the surrounding villages, which can then be sold across the country on e-commerce platforms.[547] Without additional data available, it is unclear what impact these centers have had on e-commerce in rural areas.

Bad traffic and poor roads are among the challenges related to urban logistics that make it time-consuming and expensive to move goods across the city. City bylaws prevent certain vehicles such as buses and trucks from entering certain parts of the city at particular times. This constrains the size and scale of the logistics fleet.[548]

Despite these challenges, there is a significant private sector desire to improve logistics.[549] Several domestic logistics providers, such as Paperfly and Pathao, are investing heavily in both urban and last-mile logistics, to improve scale and quality. These companies are also investing heavily in technologies to improve fleet management, and in warehousing and storage facilities, to help goods move faster and cheaper from Point A to Point B. Such efforts are expected to continue and to lead to significant improvements in logistics which will likely drive future e-commerce growth.

3.3.5 CROSS-BORDER E-COMMERCE

Key challenges in cross-border e-commerce trade include transaction limits on international outbound payments for foreign currency. E-commerce trade across borders is also constrained by a de minimis value of USD $12 which constitutes a significant burden for both importers and customs officials and makes goods significantly

more expensive for consumers.[550] Small parcels such as purchases of any value from online marketplaces typically remain in custom checks for an extended period, where duties may be levied on them.

Cross-border e-commerce trade is also constrained by uneven customs practices and weak cross-border logistics infrastructure. Major global infrastructure providers like DHL are investing to improve cross-border e-logistics.[551] Popular cross-border payment systems like PayPal are not accepted in Bangladesh, which makes it difficult for merchants to buy or sell their goods internationally.[552] This may cause an increased reliance on hundi, an illegal cross-border money transfer network.[553]

There are no legislative requirements for global e-commerce providers who wish to enter the market, especially when the company operates an online model for services. The country also does not have foreign exchange or currency regulations suitable for cross-border e-commerce. This is why major players like eBay and Amazon have not entered the Bangladeshi market.[554] To address some of these issues and to support the internationalization and expansion of e-commerce, the Central Bank is drafting a national policy on cross-border e-commerce. The timing of the finalization and dissemination of this policy is unclear.[555]

Bangladesh has been working to implement a comprehensive set of trade facilitation measures and has pursued the creation of a liberalized regime to facilitate cross-border trade.[556] Reforms include the abolition of import licensing requirements, the implementation of risk management measures rather than 100 percent checks, the introduction of Automated System for Customs Data (ASYCUDA) and the introduction of Authorized Economic Operator registration.[557] A trade information portal and a customs information portal have been established online. Despite the progress in Bangladesh's formal trade facilitation commitments, challenges remain regarding the implementation of trade facilitation measures, resulting in significant impediments to international trade.[558]

3.4 DIGITAL TALENT POOL

The Bangladeshi digital talent pool is expansive. More than half of the population of 165 million is under the age of 25.[559] However, the talent pool is low-skilled due to outdated curricula in universities, and a lack of wide-scale and effective efforts focused on equipping youth with the most relevant skills needed to succeed in the local and global labor markets. The digital talent pool is diverse and consists of technically skilled talent, freelancers, and gig workers. Each group of workers faces a different set of challenges when it comes to finding quality work and building meaningful careers.

3.4.1 TECHNICAL TALENT–NOT ENOUGH AND INSUFFICIENTLY SKILLED

Employers in Bangladesh are finding it difficult to hire quality and affordable technical talent as a result of outdated curricula in the universities, insufficient training infrastructure and instructors, theory-based learning techniques (see Section 1.4.2), and outward migration. According to a 2022 Asian Development Bank and LinkedIn survey of employers primarily in the green economy, e-learning, and smart cities sectors, nine of the last 10 candidates hired in Bangladesh were required to possess at least basic digital literacy and skills (compared to eight in India, Indonesia, and the United States, and six in the Philippines).[560] In the same survey, five of 10 required advanced digital skills.

University curricula are disconnected from market demands and the pedagogical approaches do not prepare graduates for technical jobs, either in the IT sector or in adjacent and digitizing sectors. As a result, companies have to invest heavily in training recent graduates to perform the needed functions of their jobs, even if these students come from the best technical universities in the country.[561] In some cases, companies rely on Bangladesh's

large pool of freelancers to fill their skills gaps, or they outsource IT work internationally instead of hiring full-time and permanent staff.[562]

Annually, more than 1 million Bangladeshis leave to find work in other countries such as the UK, the US, Italy, and Canada.[563] This number is expected to double by 2027.[564] And 90,000 Bangladeshi students leave the country to pursue tertiary education abroad. Universities are making significant efforts to link students to study abroad and employment opportunities outside of Bangladesh. One Bangladeshi university has signed over 200 Memorandums of Understanding with universities across the world with the aim of facilitating study abroad opportunities and then transitioning those students to employment in the respective country.[565] Given the increasing global demand for technically skilled graduates, the market deficit for talent will likely widen without wide-scale and focused interventions.[566]

3.4.2 TECHNICAL TALENT-FUTURE PROSPECTS

The demand for technical talent locally will likely increase over the coming years, given expected growth in the IT sector, which has been at 40 percent every year for the past five years.[567] Although the industry is currently valued at just over USD $1 billion, it is expected to reach over USD $5 billion by 2025.[568] According to the ILO, more than 73 million Bangladeshis will need to be retrained to support the country's digitization process.

Bangladesh's IT industry, although much smaller than offshoring giants such as India and the Philippines, has demonstrated one of the highest growth rates globally, indicating a huge untapped potential, attracting the interest of many investors.[569] Large scale digitization projects in key sectors such as RMG, banking, and agriculture, will continue to drive the sector's growth, and increase demand for skilled individuals who have both sectoral expertise and also technical skills. The RMG sector will need more 3D printer operators, industrial IoT experts, as well as automation and robotics controllers. The agricultural sector might require food technologists and industrial robotics controllers.

To power these large scale digitization efforts and to support IT sector growth, Bangladesh must tap into its large population of youth and design wide-scale efforts that prepare this growing segment of the population for the future of work. a2i is currently working with the ILO to identify skills gaps and to design strategies to address these gaps.

3.4.3 UPSKILLING EFFORTS: EFFORTS BY GOVERNMENT AND PRIVATE SECTOR

Market players have developed several initiatives to upskill technical talent, especially in emerging sectors of innovation, but much more effort is needed by academic institutions and the government. For example, as of October 2022, Huawei launched ICT Academies on the campuses of four leading science, engineering, and technology universities in Bangladesh.[570] Similar to the Cisco Networking Academy model, Huawei's ICT Academy partnerships allow its university partners to provide Huawei certification courses on campus, while also providing its students with an online e-learning platform that contains additional material.[571]

Grameenphone Academy is an online e-learning platform that prepares graduating students for the workplace. It currently offers certificates of completion for three courses: Career Launchpad, Accelerating Entrepreneurship and Future Skills.[572] Despite these efforts, much more is needed to fill the growing demand for highly skilled technical talent.

Local startups are also working to form relationships with universities and to develop industry-relevant curricula, but these relationship efforts are time-consuming. A few industry experts, including successful startup founders,

teach in university classrooms, but on a part-time and limited basis, and there was no larger scale effort identified that linked and properly incentivized high quality technical experts to teach in university classrooms with the explicit goal of closing specific skills gaps. There is also no dedicated council in Bangladesh to lead these collaboration efforts.[573]

3.4.4 THE RISE OF FREELANCERS–BETTER PAY, BETTER PROSPECTS

Bangladesh currently has the second largest pool of freelancers in the world, following India with 650,000, but persistent skills gaps affect prospects for better work and higher pay.[574] Fifteen percent of the entire global freelance community is in Bangladesh.[575] A large number of freelancers have tertiary degrees, and pursue freelancing to gain income security, to gain access to multiple streams of revenue, and to earn higher wages.[576] Skilled IT freelancers can make USD $9 an hour for web programming and up to USD $40 an hour for more advanced work, as compared to a job in a local tech company that pays around USD $2 an hour. Freelancers do not need to relocate to Dhaka or to another major urban center to work. All that is required is a stable internet connection. Freelancing provides women the opportunity to balance life at home with higher paid and flexible work.

The nature of freelance work is diverse and includes data entry, website and software design, mobile application development, graphic design, search engine optimization, social media marketing, and more.[577] But according to recent research, Bangladeshi freelancers tend to operate in the lower tier of the value chain, often competing for lower-skilled jobs.[578] The competition at this level is much fiercer globally, which drives down the potential earnings that can be derived from freelance work. This is the result of the broader skills deficit which plagues the entire country.

Freelancers face numerous barriers, including difficulty receiving payment for their work from abroad, a lack of legal recognition, and gender disparity. Existing cross-border arrangements allow payments to be made through international bank transfers only, instead of PayPal or another cross-border digital payment mechanism, a process which is tedious and time-consuming as well as expensive.[579]

Freelancers also have no legal protections or benefits as the country's employment laws, mainly regulated by the Labor Act (2006) and the Labor Rules (2015) have not been updated to reflect the changing nature of work and the growth of the domestic freelance market.[580] This lack of legal recognition lowers the social value of freelancers and causes job insecurity. Due to lower device affordability and poor quality of internet, those outside of Dhaka and other urban centers have difficulty getting access to the relevant education and specialized training to successfully compete as freelancers with those in Bangladesh's urban centers. There is also a gender disparity in the freelance space, linked to the low uptake of technology among women described in Section 1.5.1. The lack of gender inclusion in the freelance workforce will have implications for its growth and global competitiveness if not effectively addressed.

3.4.5 UPSKILLING FREELANCERS IS MUCH NEEDED

Efforts have been made to upskill freelancers to expand their local and global competitiveness, but these are piecemeal, and local EdTech companies have capitalized on this opportunity. The ICT division notes that more than 100,000 freelancers, almost half of whom were women, have received freelance training.[581] There are also some private initiatives countrywide to train freelancers with required basic skills. Some EdTech startups such as 10-Minute School have seen a gap in the freelance market related to quality training programs, and have created several courses geared toward freelancers. What is missing, however, is a long-term and high level skills-based training program designed to make Bangladeshi freelancers more globally competitive, and better

prepared to fill local skills gaps. These programs should incorporate English language proficiency, which is critical for those freelancers who want to work with international clients.

BOX 18: 10 Minute School and Upskilling Freelancers

The 10 Minute School is an online education—or EdTech–platform that provides courses covering the entire academic syllabus of the schooling system, and also offers skills training. Courses target school-aged children, recent graduates, and working adults, and provide a wide array of skills training from English language proficiency to coding and personal fitness. 10 Minute School has started to offer courses geared specifically to freelancers, including modules such as Introduction to Freelancing, Data Entry for Freelancing, and even T-Shirt Design for Freelancers. There are also more general courses that can help freelancers compete globally for work, from English proficiency to digital marketing. These EdTech platforms play a critical role in upskilling a critical mass of freelance workers in Bangladesh, equipping them with the necessary skills to compete on the global market.

3.4.6 THE RISE OF THE GIG ECONOMY

The gig economy in Bangladesh is expanding and creating new opportunities for work in the domestic market. Gig work consists of income earning activities which occur outside of standard and long term employer-employee relationships. It is estimated that 300,000 Bangladeshis are involved in location-based gig work.[582] This work is usually facilitated by digital platforms which match the supply and demand for labor in a particular market. This includes service jobs such as plumbing, driving, and beauty. According to recent market research by the Fairwork Foundation, Bangladeshi gig workers tend to be lower-middle income, and sole earners in their household. They are also more likely to be migrants and are predominantly male.[583]

The country's platform-based gig economy started to grow in 2016 with the arrival of Uber, a ride-hailing company. Since then, several other platforms have emerged in key industries such as ridesharing (Uber, Pathao), transportation (Truck Lagbe), delivery (Foodpanda, Paperfly), and domestic work (Hello Task).[584] These platforms provide low-income workers with new opportunities to meet new clients, grow their businesses, and earn additional streams of revenue, as the case study below illustrates.[585]

BOX 19: Using digital platforms to grow your business

Digital platform Sheba matches workers in the services space, such as beauty, plumbing, and cleaning to clients in Dhaka and Chittagong who require such services. When one of their plumbers started on the platform in 2015, they were earning the equivalent of USD $100 per month (BDT ৳10,000) and often serviced two to three clients per day. After starting to work on Sheba, the plumber was able to meet new clients. Eventually, the demand for his services was so great that he had to hire 50 additional workers to support his services. As a result of this growth in his business, his monthly revenue increased 20 fold to USD $2,000 (BDT ৳200,000).[586]

Recommendations

The international development community can support and strengthen Bangladesh's digital ecosystem in many ways. The list is organized by DECA pillar and cross-cutting themes and prioritized within each pillar.

Table 7 summarizes each recommendation as follows:

- What: Links to the recommendation details
- Why: Provides the motivation or intended impact of the recommendation
- How: Summarizes the approach the international development community can take to implement the recommendation

The detailed recommendations section that follows provides further explanation of how the international development community can implement each recommendation, including:

- Relevant context
- Lessons learned and best practices from other countries
- Available resources
- Important considerations, including unknowns and potential challenges

When acting on any of these recommendations, information on best practices in digital development program design can be helpful. The Principles for Digital Development[587] and the USAID Digital Investment Tool are also useful resources. The section below provides background and guidance on how to use these resources.

TABLE 7: Summary of DECA recommendations

	WHAT?	WHY?	HOW?
CROSS-CUTTING			
1	Strengthen cybersecurity capacity through workforce development, procurement reform, and targeted research	Enhanced cybersecurity, both internally and externally	Ensure the security of youth, women, and vulnerable groups online and advocate for cybersecurity workforce development. Strengthen cyber practices among partners and advocate for safer technology procurement. Conduct additional research to deepen understanding of individual and organizational cyber habits and capacity gaps.
PILLAR 1: DIGITAL INFRASTRUCTURE AND ADOPTION			
2	Implement digital literacy initiatives to empower citizens and cultivate a digitally savvy workforce	Digitally literate citizens and strengthened workforce capacity.	Work with the MoE to develop a holistic national level digital literacy roadmap. Advocate for updated and specialized curricula at the tertiary level. Conduct training of trainers.
3	Advocate for, and create, culturally relevant content to close the digital usage gap	Content to increase digital uptake and relevance of information available.	Create localized content so users feel connected to the resources available to them and to close the usage gap.
4	Promote enabling connectivity policies and inclusive internet	Reduced digital divides and increased connectivity and affordability for all.	Promote transparent competition and interoperability throughout the telecommunications market and conduct feasibility research to explore locally appropriate connectivity expansion models for the last-mile. Explore alternative solutions such as solar powered hubs to enable offline connectivity and power for populations in need.
PILLAR 2: DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE			
5	Strengthen the GoB's digital capacity as they deliver on Digital Bangladesh's next phase through Vision 2041	Engaging the government in digital policy discussions and encouraging service delivery innovation.	Support innovators who are creating service delivery and citizen engagement solutions. Exchange knowledge and practical ideas on emerging technologies and digital government through seminars or workshops. Provide digital literacy training to officials across all levels of government.
6	Counter misinformation and disinformation through civic education and public media literacy	Increased information integrity online	Support resilience against disinformation through civic education and public media literacy. Support CSO and media resilience against misinformation and disinformation.
PILLAR 3: DIGITAL ECONOMY			
7	Support widescale upskilling efforts to prepare Bangladeshi youth for high-quality domestic and international work	Digital workforce development.	Strengthen the bridge between industry and academia and leverage domestic platforms for upskilling. Design programming to ensure higher quality of work on gig platforms.

	WHAT?	WHY?	HOW?
8	Design programming to support entrepreneurs, especially women, to leverage social commerce and e-commerce to grow their businesses and improve their resilience	MSME resilience and women's economic empowerment.	Scale entrepreneurship programming and make business formalization more attractive. Showcase successful social commerce and e-commerce sellers. Partner with FSPs to incentivize business registration. Understand and address larger systemic barriers to understand how to empower women to effectively leverage social media and e-commerce platforms. Link women to global markets.
9	Support innovation in rural areas and develop solutions that help smallholder farmers increase their resilience to climate shocks	Localized and innovative solutions that go beyond urban areas.	Link climate risks to opportunities for innovation and support innovation for agricultural insurance.
10	Increase MFS use cases and improve consumer protection for MFS and e-commerce	Increased MFS use and consumer protection.	Encourage merchant payments, scale female agents, and support interoperability. Advocate for and develop consumer protection for MFS and e-commerce consumers.

DETAILED RECOMMENDATIONS

1. STRENGTHEN CYBERSECURITY CAPACITY THROUGH WORKFORCE DEVELOPMENT, PROCUREMENT REFORM, AND TARGETED RESEARCH

Interviewees across stakeholder groups described a situation in which cybersecurity initiatives are underdeveloped with low awareness of effective defense measures. USAID's Cybersecurity Primer details how cybersecurity can be embedded across sectors.[588] The following steps can be taken to support digital security across different segments of the digital ecosystem:

A. Ensure the security of youth, women, and vulnerable groups online:

The COVID-19 pandemic pushed children online to continue their education, making it even more important to protect and raise awareness among children about cyber harms. Women and other marginalized groups are more likely to be victims of online violence. As Section 1.4.4 notes, several organizations have created campaigns and courses to teach Bangladeshis about cyber hygiene and digital safety. It will be important to ensure that these initiatives do not occur in a vacuum and that there are sustained and coordinated efforts in this space.

The international development community can ensure that digital security awareness is incorporated into digital literacy curricula for children and youth (see Recommendation 2A). This will promote the safe use of technology and build confidence and trust in technology. Organizations like the Bangladesh Computer Council, Dnet, BRAC, Grameenphone, UNICEF, TikTok, and Meta are already working in this space in the country. One notable initiative outside of Bangladesh is Google's digital citizenship game Interland which addresses issues such as cyber bullying and civility while educating students on phishing and other cyber threats they could encounter.[589]

B. Advocate for cybersecurity workforce development:

There is a clear shortage of trained cybersecurity professionals in Bangladesh. In line with the Bangladesh Cybersecurity Strategy 2021–2015, the international development community can provide technical assistance to local higher education institutions or other workforce development initiatives to design cybersecurity curricula. Assistance should include practical, hands-on experience (through access to labs, cyber ranges, etc.) for cybersecurity students, as well as career opportunities after they complete their degrees or certificates.

Efforts to expand the cyber workforce should be accompanied by a detailed analysis of the cybersecurity job market and prioritization of cybersecurity in the government and the private sector. Expanding the cybersecurity workforce without ensuring that there are jobs for graduates could result in migration of more Bangladeshis.

C. Conduct additional research:

As Bangladesh moves toward strengthening cybersecurity, there is a continued need among individuals and organizations for research to understand cyber capacity gaps. Relevant stakeholders could conduct a rapid market assessment on current market needs and gaps to see how existing resources are or are not meeting the needs of organizations. The assessment could also explore whether organizations have cybersecurity resources in-house or if they rely on external consultants and businesses (and the technical maturity of the resources). Future research should be supported by awareness-raising campaigns to build buy-in for policymaking and implementation. This research will support informed design decisions on additional programming in this area.

This recommendation emphasizes cybersecurity in a way that draws from Principles Five and Eight of the Principles for Digital Development, Be Data Driven and Address Privacy & Security and is most relevant to SDGs 12 (responsible consumption and production) and 11 (sustainable cities and communities).

RELEVANT RESOURCES:

- USAID Cybersecurity Primer (USAID, 2021)
- USAID Digital Literacy Primer (USAID, 2022)
- Cybil portal[590] (Cybil, n.d.)
- Cybersecurity capacity review (The World Bank, 2019)

2. IMPLEMENT DIGITAL LITERACY INITIATIVES TO EMPOWER CITIZENS AND CULTIVATE A DIGITALLY SAVVY WORKFORCE

Human development through quality education, training, and upskilling is a common theme across GoB strategies, whether in Vision 2041 or in the National Cyber Security Strategy 2021–2025. Findings show that digital literacy is a foundational barrier to greater uptake and use of digital technology, whether in the private sector, in CSOs, in the government, or as an everyday citizen. Simply having access to the internet may not be enough.

> "We hear penetration is getting better by the day within the region, internet/mobile smartphone penetration increasing but we didn't see that translating into educational benefits."
>
> — EdTech expert in Bangladesh

COVID-19 has illustrated that shocks and stressors can have a deep impact on learning and can further widen divides. Digital and information illiteracy also poses a high risk for cyber crimes and cyber bullying, and creates a greater opening for misinformation and disinformation. To date, stakeholders across the ecosystem have implemented several digital literacy efforts but they are sporadic at best. It is imperative that Bangladeshis are technologically literate for effective use of digital tools and platforms.

USAID's Digital Literacy Primer covers key steps and resources needed to embed digital literacy across sectors.[591] The international development community can take the following steps to ensure strategic execution of digital literacy initiatives.

A. Work with MoE to develop a holistic national-level digital literacy roadmap:

Bangladesh does not yet have a national digital literacy strategy and the international development community along with education experts can work with the MoE to develop a detailed and strategic roadmap to implement digital literacy across all education levels. Current initiatives by the GoB include providing schools with connectivity and tools, but these efforts must be complemented by skilled teachers and hands-on practical learning. The digital literacy strategy should ensure that materials are context-appropriate with complementary audio and visual aid for students with disabilities or for those who are more fluent in or only speak indigenous languages.[592]

B. Advocate for up-to-date and specialized curricula on subjects at the tertiary level:

The next step after students graduate from secondary education is to ensure that they are ready for the workforce. Interviewees noted that university curricula are often outdated and do not meet industry needs. Together with industry experts working group (highlighted in recommendation 7A), the international development community can work with the University Grants Commission to roll out specialized curricula

such as business intelligence, cybersecurity, artificial intelligence, and blockchain, illustrating the need for preparing young graduates to compete in the job market both domestically and globally, and in line with the GoB's Vision 2041. Working groups can also partner with international higher education partnerships to host guest seminars or offer executive courses for university or technical program students.

C. Conduct training of trainers:

It is important that teachers are trained appropriately so they can impart the right guidance and knowledge to their students. There are two aspects in which teachers will need to be trained across all education levels. First, teachers must be upskilled in their knowledge of technical areas such as basic digital literacy to more advanced skills such as programming, blockchain, and cybersecurity for the levels they are teaching. Second, teachers must harness the skills and methods needed to use virtual platforms to their fullest potential. Training of trainers can be part of a national digital literacy strategy or conducted independently in partnership with the MoE and partners like DNET who have had significant experience in this space.

This recommendation reinforces Principles for Digital Development, Design With the User, Understand the Existing Ecosystem, Build for Sustainability, and Reuse and Improve, and is most aligned with SDGs 4 (quality education), 8 (decent work and economic growth), and 10.

RELEVANT RESOURCES:

- USAID Digital Literacy Primer (USAID, 2022)
- How-to-Note: Information and Communication Technology for Education (ICT4E) (USAID, 2019)
- Digital literacy for children: exploring definitions and frameworks (UNICEF 2019)
- Building the Tech Workforce through Private Sector Engagement (Marketlinks 2019)
- Amplio

3. ADVOCATE FOR AND CREATE CULTURALLY RELEVANT CONTENT TO CLOSE THE DIGITAL USAGE GAP

Bangladesh has a growing pool of content creators but donor-funded content producers face specific challenges such as competition with more entertaining content, high costs, and a mismatch between audience and donor desires (see Section 1.6.2). Content relevance is important to increase digital inclusion so users feel connected to the resources available to them and build confidence in using digital tools and platforms. All stakeholders have a role to play in ensuring that the digital experience available to users is relevant to them. The international development community can generate awareness about content relevance, incorporate relevant content into its own programming and design, and support partners to do so as well.

Several interviewees said that entertainment, politics, and sports are among the most popular content in Bangladesh. World Bank's research underscores the potential of high-quality education entertainment, or "edutainment."[593] In one research experiment, a television drama featuring a prominent actress doubled HIV testing and halved sexually transmitted infections and gender-based violence among urban viewers in Sub-Saharan Africa. While behavioral interventions are popular in health programming, they can apply to other sectors as well. Another World Bank intervention preloaded edutainment videos (therefore not requiring access to the internet) onto smartphones for parents which reduced children's school absences and improved learning outcomes for rural households.[594] Development partners, MNOs, and social media

content creators can work together to create short, educational content—whether related to health, education, or politics—in a culturally relevant manner.

Researchers found that the quality of content and delivery is important and should be designed, tested, and adjusted for target audiences.[595] The U.S.-based nonprofit Population Media Center's experiences are also relevant in this regard.[596] People want to be entertained by mass media, not be preached to. Researchers should conduct local interviews and quantitative research to understand the local context deeply before creating a new radio, TV soap, or other forms of content.[597] It is important to "Design With the User,"[598] to understand the kind of content that motivates Bangladeshis to go online. Members of the target audience should be involved in the design process and recruited to be part of the content development team so they can bring their lived experiences into consideration.

> *This recommendation supports the Principles of Digital Development Design With the User and Understand the Existing Ecosystem.*

RELEVANT RESOURCES:

- Approaches to local content: Realising the smartphone opportunity (GSMA, 2015)

4. PROMOTE ENABLING CONNECTIVITY POLICIES AND INCLUSIVE INTERNET

A digital ecosystem cannot exist without connectivity. Furthermore, meaningful connectivity is necessary in order to use the internet at its fullest potential. A4AI uses four measures for meaningful connectivity: download speeds, device type, data sufficiency, and frequency of connection. International partners such as A4AI and local partners like the ICT Division, BTRC, and ISPAB, can promote meaningful connectivity in the following ways:

A. Promote transparent competition and interoperability throughout the telecommunications market:

In well-regulated telecom markets, companies are able to specialize in their product or service offerings. Wholesale providers offer services such as tower space, internet exchange points, or middle-mile fiber connectivity to retail providers, who sell connectivity to consumers. As findings show, there is a concentration of providers in the first- and middle-mile markets, and in some cases the same providers provide services across different layers of the connectivity landscape. While this promotes vertical integration and may help achieve economies of scale, the limited number of providers leads to costly internet prices—both fixed and mobile—and poor quality of connectivity. Interoperability and infrastructure sharing also reduce the reliance on more physical infrastructure which can have environmental benefits.

While the GoB has taken steps to correct this by mandating last-mile providers to reduce the price of their packages and by awarding more licenses to first and middle mile providers, clear rules must be set for all stakeholders.[599] Greater competition in the first and middle mile could also potentially reduce the costs for last-mile players.

B. Conduct feasibility research and explore locally-appropriate connectivity expansion models for the last-mile:

A public official noted that the GoB has invested heavily in the national backbone expansion but requires substantial funding and public-private partnerships to expand to the last mile. The international development community can explore appropriate business models that would reach last-mile users across Bangladesh in a cost-effective manner.

C. Explore alternative solutions for vulnerable populations:

Although more than 96 percent of the population has access to electricity,[600] Bangladeshis experience frequent power outages. No access to electricity means an inability to use devices, and in some cases, it means no access to the internet. The international development community can explore the impact and efficacy of innovative and environmentally friendly applications like StreamSpot+[601] and Smart Solar Media System[602] for rural populations and crisis-affected populations. These solutions provide a combination of offline/off-grid internet services for digital education and humanitarian needs. In India, StreamSpot found that 10 to 20 users can stream content using their hub simultaneously while 10 users can also power their phones. The application has been active in Bangladesh since 2022 and is working with Robi. The international development community can explore the scalability of this solution, particularly for the most vulnerable populations.

This recommendation supports the Digital Principles Understand the Existing Ecosystem, Build for Sustainability, and Reuse and Improve. SDGs 9 (industry, innovation, and infrastructure), 10 (reduced inequalities), and 11 (sustainable cities and communities) are most relevant to this recommendation

RELEVANT RESOURCES:

- Digital Connectivity and Cybersecurity Partnership (DCCP) (co-managed by USAID and the U.S. Department of State)
- Promoting American Approaches to ICT Policy and Regulation (ProICT) project (USAID and DCCP)
- UNDP Digital X Solution Catalog (UNDP, n.d.)

5. STRENGTHEN THE GOB'S DIGITAL CAPACITY AS THEY DELIVER ON DIGITAL BANGLADESH'S NEXT PHASE THROUGH VISION 2041

The GoB's current progress in e-governance and digital public services reflect the early investments made through Digital Bangladesh and Vision 2021. Current gaps include coordinating silos between ministries and agencies, services not being digitized end-to-end, and public sector employees lacking the necessary digital skills. The World Bank's Enhancing Digital Government and Economy (EDGE) Project aims to provide relevant support in the following areas: cost-efficiency on the use of digital platforms by GoB agencies, end-point cybersecurity for GoB agencies, digitally enabled jobs created by the project.[603]

The international development community is well-positioned to work alongside the GoB in closing some of those gaps while ensuring the digital safety and security of Bangladeshis.

A. Support innovators who are creating service delivery and citizen engagement solutions:

Although are no national-level digital tools for citizen engagement to create feedback loops about service delivery, there are promising local level initiatives such as the Shobar Dhaka citizen portal that enable citizens in Northern Dhaka to report on their experiences and problems with public services. The international development community, alongside the GoB, could support local innovators to help them create an inclusive, national-level tool to close the engagement gap in digital government. Care must be taken to design with the users (citizens and relevant government stakeholders) to ensure maximum efficacy, uptake, and scale.

B. Exchange knowledge and practical ideas on emerging technologies and digital government through seminars or workshops:

The GoB is eager to deploy emerging technology in digital government, but Bangladesh's current digital ecosystem will need to develop further before that becomes a reality. The international development

community can partner with a university to host peer exchanges and job-relevant training with GoB employees focused on emerging technologies as an opportunity to foster goodwill between all parties and exchange technical learnings. Participants can include university, CSO, private sector, and GoB representatives so perspectives and inputs can have a whole-of-society approach. GoB stakeholders should include representatives from different levels and ministries to ensure buy-in and encourage learning across all parties. Finally, the international development community can help organize peer exchanges at a regional level with countries such as India and Nepal to facilitate South-South cooperation.[604]

Workshops can explore how emerging technology can realistically operate in a development context, and outline the technology's risks and opportunities of using such technology for digital government. USAID has a host of relevant reports for those who are unfamiliar with AI and Machine Learning but want to build their understanding.[605] The documents present complex topics in a way that newcomers can understand as well as describe how development can integrate AI and Machine learning in an equitable and safe manner within a country's digital ecosystem.

C. Support digital literacy training for officials across all levels of government:

One of the inhibiting factors in improving GoB service delivery is digital skills possessed among GoB officials at large. Digital literacy recommendations outlined in Recommendation 2 address this issue in the long run, but the international development community can address it at a smaller scale in the short run. Development partners can work with the GoB integrate digital skills into existing trainings for GoB officials that are appropriate for trainees' job needs. Training can include data analysis for technical leads, project management of IT for relevant staff at line ministries, or higher level digital policy awareness for high level officials. As Box 11 highlights, public recognition and awards are a good way to encourage public employees to pursue training.

This recommendation supports the Principles of Digital Development Design for Scale and Be Collaborative and aligns with SDG 17 (Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development).

RELEVANT RESOURCES:

- Digital Government Model (USAID, 2022)
- Artificial Intelligence and Machine Learning (USAID, n.d.)
- Seven Digital Government Transformation Trends & Best Practices (Granicus, n.d.)
- How to Capture Community Feedback with Online Tools (Social Pinpoint, 2022)
- Emerging Technology (U.S. GSA, n.d.)
- Where emerging tech meets government (Digital Future Society, 2019)
- Emerging Technologies Resources (NetHope, 2019)

6. COUNTER MISINFORMATION AND DISINFORMATION THROUGH CIVIC EDUCATION AND PUBLIC MEDIA LITERACY

Misinformation and disinformation in the online sphere can have grave effects on individuals and can lead to real world consequences. As Section 2.3.3 notes, misinformation and disinformation can take many forms in Bangladesh. The international development community should ensure that Bangladeshis are adequately prepared to address misinformation and disinformation.

A. Support resilience against disinformation through civic education and public media literacy:
The international development community can consider activities around civic education and public media literacy. IREX's Learn to Discern (L2D) is a worldwide media literacy training project for all ages that focuses on developing healthy information engagement habits and increasing the local demand for quality information. Its approach and curriculum are designed to meet the current needs of media consumers, adapting to the local context. L2D has been used in Indonesia, Jordan, Serbia, Tunisia, Ukraine, and the United States to address challenges stemming from misinformation, disinformation, and influence campaigns.

B. Support CSO and media resilience against misinformation and disinformation:
CSOs and media organizations are often the victims of misinformation and disinformation. Many actors in Bangladesh create and spread misinformation and disinformation that plays to political and religious views. USAID/Bangladesh has previously created tracking and mapping tools on misinformation and disinformation related to COVID-19 through the Bangladesh Digital Ecosystem Activity with BRAC (see Box 12 for details), and the international development community could replicate similar programs focusing on misinformation and disinformation related to other health concerns or politics for example. This program and the resulting data could be used by media and CSOs to create targeted Public Service Announcements in specific areas to help dispel rumors or fake news.

> *This recommendation supports the Principles of Digital Development Be Data Driven and SDG 11 (sustainable cities and communities).*

RELEVANT RESOURCES:

- Data analytics for social media monitoring (NDI, 2020)
- Balancing Act: Countering Digital Disinformation while respecting Freedom of Expression (UNESCO, 2020)
- Learn to Discern (IREX, n.d)

7. SUPPORT WIDESCALE UPSKILLING EFFORTS TO PREPARE BANGLADESHI YOUTH FOR HIGH QUALITY DOMESTIC AND INTERNATIONAL WORK

Nearly half of Bangladesh's population of 165 million is under the age of 25.[606] This means that the potential Bangladeshi workforce could surpass 80 million over the coming years. This large workforce, if well aligned, and effectively skilled, can fill critical gaps in talent, at both the domestic and international level. These gaps include: domestic technical talent, international on-demand and freelance talent, and local gig talent. In addition to upskilling youth, The international development community can help improve the quality and experience of work, especially on digital platforms. The following actions should be considered to facilitate widescale upskilling for different classes of digital talent:

A. Strengthen the bridge between industry and academia:
The international development community can organize a series of workshops through working groups that facilitate regular dialogue between universities that offer technical degrees and technology companies in the private sector that have talent gaps. Participants can co-create clear and implementable strategies to lessen the gap and improve the overall quality of talent.

Donors can also support market research and speak to industry leaders to articulate the nature of the gaps, and help educational institutions adjust their curriculums accordingly. Rapid research assessments to understand the internal processes that hinder a rapid update to curricula may also be beneficial for making

recommendations on how academia can adjust curricula to meet quickly changing demands on the market. Efforts should be made to move away from theory-based to project-based learning and to facilitate internships at local technology companies. Young people must be consulted in this process to gauge how to improve the quality and experience of technical education.

Wider industry efforts are needed to upskill professors and to bring experienced industry professionals into the classroom, especially in areas where there is a demand for particular skills.

B. Leverage domestic platforms for upskilling:

EdTech platforms are already designing content to support the upskilling of freelance talent, but these efforts are ad hoc and not designed to advance freelance talent from low skilled work with low pay to higher skilled work with better pay. The international development community could partner with a global job platform, such as Upwork, which alone has more than 600,000 Bangladeshi freelancers registered on its platform. Through this partnership, stakeholders could request real-time data on skills gaps on the Upwork platform, and work with local EdTech platforms such as 10 Minute School to quickly design courses to fill the gaps. These courses could provide freelancers with micro-credentials and recognized proof of learning outcomes which freelancers could include on their profiles to get work in their area of learning. Potential micro-credentialing areas could include cybersecurity to address the lack of skilled professionals in the market. To support such micro-credentialing, Stakeholders would need to work with the EdTech to ensure that the courses are relevant in regards to the material and pedagogical approach and of high quality.

Upskilling initiatives can also be designed for gig work which tends to be location-based and lower skilled. The international development community can partner with local gig platforms to design and scale upskilling programs. The design can be informed by similar programming in other countries such as Kenya where Lynk, a gig platform that matches tradespeople to local jobs, has been developing and scaling such programming to address significant technical and customer service skills gaps among their tradespeople.[607] These upskilling initiates could greatly benefit digital platforms, as they provide greater consistency of high quality services across the platform. They also benefit platform workers as they help them acquire skills that can be used to improve their prospects for higher paid and higher quality jobs, both on and off the digital platform.

C. Design programming to ensure higher quality work on gig platforms:

One of the key reasons for the low quality and precariousness of work on local and international job platforms relates to the lack of regulations that mandate these platforms to maintain basic standards of quality work. The European Commission has proposed measures aimed at improving the working conditions on digital job platforms while also supporting the sustainable growth of these platforms within Europe.[608] Among these measures was a directive to grant legal employment status to digital platform workers and to provide these workers with the labor and social rights that come with the status of a formal worker. This includes the right to a minimum wage (where it exists), limits on working time, the right to paid leave or improved access to protection against work accidents, unemployment and sickness benefits, as well as contributory old age pensions. The international development community could support the development of similar measures in Bangladesh within the Ministry of Labor and Employment, ensuring that they are adapted to local conditions and realities.

One key challenge in designing programming to ensure higher quality work on gig platforms is ensuring that any directives that grant legal employment status to digital platform workers are effectively implemented. This might require partnerships with initiatives such as the Fairwork Foundation to regularly monitor how

Bangladesh's largest digital job platforms are implementing these directives and to identify potential opportunities for improvement that can lead to higher quality work outcomes.

This recommendation aligns with SDG 8 (decent work and economic growth). It also aligns with two Principles for Digital Development, Understand the Existing Ecosystem and Design for Scale.

RELEVANT RESOURCES:

- 3 ways to nurture collaboration between universities and industries (WEF, 2018)
- The three most important trends of a gig worker–skilling, deskilling, and reskilling (GIZ, 2022)
- Platform-led upskilling (Caribou Digital, 2022)
- The Face of the Platform: Lynk's Pro Training (Caribou Digital, 2021)
- Commission proposals to improve working conditions of people working through digital labor platforms (European Commission, 2021)
- A European approach to micro-credentials (European Commission, n.d.)

8. DESIGN PROGRAMMING TO SUPPORT ENTREPRENEURS, ESPECIALLY WOMEN, TO LEVERAGE SOCIAL COMMERCE AND E-COMMERCE TO GROW THEIR BUSINESSES AND BUILD THEIR RESILIENCE

Many Bangladeshi women are leveraging social media platforms like Facebook for business. These platforms, if effectively used, provide female entrepreneurs with the opportunity to reach a larger market, and earn more from their businesses. Higher earnings could increase the resilience of the women and their households, and contribute to their economic empowerment.

Challenges related to digital literacy and women's broader participation in the workforce might not allow women to leverage the full capabilities of social media platforms. New regulations which force Facebook sellers to register their businesses have led to resistance from those who want to remain informal. This runs the risk that a critical mass of female entrepreneurs might drop out of social commerce, reverting to offline and less effective methods of selling.

Although the recommendations below are gender-focused, their implementation can have a positive impact on the prospects and livelihoods of all Bangladeshi entrepreneurs selling online. USAID/Bangladesh is taking significant strides in women's MSME support through its WeScale program.[609] The international development community can consider the following recommendations:

A. Scale entrepreneurship programming:

Women and E-commerce Trust, an initiative of e-Cab, already has a network of more than 1 million female entrepreneurs who are engaging in social commerce. They have designed and tested entrepreneurial programs to help women to grow their businesses by leveraging Facebook and its various features. Meta, the company that owns Facebook, is also developing several initiatives to upskill youth and women to better leverage social media to grow their business through partnerships with BRAC, a2i, and the ICT Division. The international development community can inform the design of these initiatives by deriving lessons from its gender equality work[610] to ensure that women's economic empowerment outcomes are integrated into the design. Program implementation should be monitored on a regular basis to ensure tangible and measurable improvements in women's economic empowerment.

The international development communitycan also support the scale of these initiatives, especially in rural areas, by tapping into its extensive network of women under its Gender Equality and Women's Empowerment

program. Lessons can be derived from similar USAID initiatives, such as one in Uzbekistan (see relevant resources below) which targets socially marginalized and vulnerable women, and provides training on e-commerce, social media marketing, and advertising. The training can introduce other platforms to women, such as e-commerce, which can also support increased revenues. Training can be incentivized with small business grants to encourage women to participate in and finish the program. Peer mentoring and support networks should be established to allow training participants to share advice and provide support to one another.

B. Showcase successful social commerce and e-commerce sellers:

The international development community can support initiatives that allow successful female entrepreneurs from all economic and social demographics to speak publicly and widely about their experiences growing their businesses and gaining economic empowerment by selling on social commerce or e-commerce platforms. Success stories work well among Bangladeshi consumers, and seeing successful entrepreneurs from similar economic and social backgrounds is encouraging for women. The international development community can design a communications strategy that will reach a critical mass of females, including those in rural areas, through relevant media channels. It can show that Bangladeshi women benefit from selling online, help women assess their options for online selling (Facebook versus e-commerce), and provide information on how they can get started.

Discussions can also showcase how women have overcome societal and familial barriers in a positive way and in turn helped their families. Such initiatives are important to inspire women to pursue entrepreneurship online, and to help them navigate the various barriers that could affect their ability to do so successfully.

For example, the Airbnb Entrepreneurship Academy collaborates with NGOs, small business centers, and academic institutions, to support "tourism entrepreneurs" in their communities.

C. Make business formalization more attractive:

To minimize the risk of social commerce entrepreneurs dropping out due to new rules around the digital business ID, the international development community can work to make formalization a more attractive proposition for this segment. First, they can undertake research to understand the key barriers to formalization among female social commerce entrepreneurs, and work with the government and private sector to devise strategies to overcome these barriers. Education and media campaigns can be developed to help women understand the process of registering their business and acquiring a digital business ID and any other trade licenses, and the benefits of doing so. These campaigns should provide a balanced view, and also make clear instances where registration might not make sense or benefit female sellers. Lessons for such program design can be derived from UNDP efforts in Cambodia, which provided small grants to incentivize MSMEs to formalize and start selling online.[611]

D. Partner with FSPs:

To incentivize registration, the international development community can also work with financial service providers to provide low cost loans to female entrepreneurs who want to register their business and acquire a digital business ID. These loans can be tiered and used initially to cover registration fees and taxes that are required for such registrations. If these loans are paid back, eventually the female entrepreneurs could have access to growth capital. Such an initiative will likely require existing financial institutions to develop new products for this segment, and to launch campaigns where the terms, conditions, requirements, and costs of loan products are easily communicated. Partnerships with FSPs like Bank Asia which already have a strategic interest in enrolling a critical mass of female clients should be considered.

E. Understand and address larger systemic barriers:

The international development community can conduct research and leverage lessons from existing work around gender equity to understand how to empower women to effectively leverage social media and e-commerce platforms to increase their earnings, and to become more empowered in their homes and communities. This could greatly increase the number of women who are able to make a livelihood selling online, and improve the quality of their participation, ensuring that broader structural gender barriers do not preclude them from thriving on these platforms.

F. Link women to global markets:

As the findings noted, the Central Bank is in the process of developing a cross-border strategy on e-commerce, which will likely address some of the key barriers to merchants selling online. This could mean that there will be growth opportunities in the near future for cross-border selling, and offer women an even larger market to sell their products. There could be an opportunity for the international development community to support women selling their products internationally via e-commerce. USAID has designed a diagnostic[612] for Asia and Pacific markets which helps policymakers conduct a self-assessment of support for women-owned businesses in cross-border e-commerce. This diagnostic can be adapted to the local context in Bangladesh. The toolkit reviews the challenges faced by women entrepreneurs at the local level, as well as challenges specific to cross-border e-commerce. It also highlights some of the best practices that other markets are adopting to address these challenges and support the growth of women-owned MSMEs in cross-border e-commerce. The intent is to identify gaps in supporting women's engagement in e-commerce and highlight potential areas of improvement for future capacity-building support. Based on the results of the diagnostic, the government can take customized measures to respond to identified gaps, and where possible

Many active development-focused projects in Bangladesh are looking to improve women's economic empowerment outcomes by supporting entrepreneurship. It is important that there is no duplication of efforts related to other initiatives in the market, and that learnings from these other projects are effectively integrated into the project design.

This recommendation aligns with SDG 5 (gender equality) and SDG 8 (decent work and economic growth). It also aligns with two Principles for Digital Development: Design With the User and Be Collaborative.

RELEVANT RESOURCES:

- USAID supports vulnerable women and women with disabilities as e-commerce entrepreneurs, (US Embassy in Uzbekistan, 2022)
- Women-owned businesses in cross-border e-commerce (APEC and USAID, 2022)
- Social media based online businesses: Exploring challenges to the start and scale for women entrepreneurs in Bangladesh (DNET and Escape, 2021)
- Efforts by women to become financially independent through commerce during COVID-19: A study on the Bangladesh perspective (Daffodil International University, 2022)
- Could e-commerce bring women's financial inclusion in Bangladesh? (CGAP, 2019)
- E-commerce acceleration and formalization of MSMEs (UNDP, 2019)
- Business management and digital literacy for women micro-entrepreneurs (SIA)

9. SUPPORT INNOVATION IN RURAL AREAS AND DEVELOP SOLUTIONS THAT HELP SMALLHOLDER FARMERS BUILD THEIR RESILIENCE TO CLIMATE SHOCKS

The majority of the innovation ecosystem in Bangladesh is focused in urban centers like Dhaka. This means that there is a critical gap in the digital technological solutions that can directly address the needs and challenges of rural residents, including smallholder farmers.

Bangladesh is part of the V20 group—countries that are most vulnerable to climate change.[613] An October 2022 World Bank Report highlights how climate change could lead to the loss of one-third of agricultural GDP and create 13 million internal climate migrants by 2050.[614] Cyclone Sitrang in October 2022 led to 150,000 farmers losing about BDT ৳350 crore (USD $33.8 million) in earnings.[615] Localized innovation for climate shocks is increasingly important. The startup community can be positioned effectively to develop solutions that address these shocks:

A. Link climate risks to opportunities for innovation:

The international development community can use mappings of existing and future climate risks, and translate these risks into opportunities for innovation. Once these opportunities are identified, donors can work with the startup ecosystem to develop digital solutions that help rural communities build long term climate resilience, adopt climate-smart agricultural approaches, and learn business skills to diversify and increase their incomes. Partnerships can be formed with leading incubators and accelerators as well as organizations such as BRAC which has been a leader in exploring rural innovation through its many activities such as the Frugal Innovation Forum.[616] Partnerships with angel networks like BAN can also help to identify promising early stage startups focusing in this area and provide a pipeline for incubators and accelerators.

B. Support innovation in agricultural insurance:

Over the past decade, USAID has been working to test and scale agriculturally-based index insurance products, which are specifically designed to help manage climate and weather risks.[617] In Uganda, which also has a critical mass of smallholder farmers, the USAID Commodity Production and Marketing (CPM) Activity[618] bundled crop insurance with production loans to increase the uptake of insurance, and improve the resilience of farmers.

Learnings from this work can be applied to Bangladesh to improve resilience in the agricultural sector. The international development community can partner with incubators, private insurance providers like Green Delta, and development actors such as IFAD which are innovating in this area to develop and pilot index insurance products that can help farmers cope with extreme weather. Such work is critically needed, especially given the nascency of the insurance market in Bangladesh. To scale out insurance solutions, development actors can undertake a regulatory review, identify current challenges to digital insurance solutions, and make clear recommendations on how these challenges can be addressed. This includes recommendations on updating the Insurance Act (2010) to facilitate the digital delivery of insurance products.

> *This recommendation aligns with SDG 13 (climate action). It also aligns with Principles for Digital Development, Reuse and Improve and Be Collaborative.*

RELEVANT RESOURCES:

- Using digital tools to expand access to agricultural insurance (USAID, 2018)
- Agricultural weather index insurance plus (USAID)

- Agricultural insurance for smallholder farmers (GSMA, 2020)
- Climate change and environmental conservation activity (USAID, 2022)
- USAID commodity production and marketing activity (USAID, 2022)
- A decade of agriculture index insurance in Africa: Looking back, looking forward (World Bank, 2022)

10. INCREASE MFS USE CASES AND IMPROVE CONSUMER PROTECTION FOR MFS AND E-COMMERCE

Impressive progress has been made in scaling up the MFS ecosystem, especially since the COVID-19 pandemic. Both the private sector and Central Bank expressed the need to increase use cases in MFS, or to make MFS more relevant and more useful to particular segments and sectors. As usage increases, the international development community should also design programming to educate and protect users from risks that could undermine the adoption and usage of MFS.

A. Encourage merchant payments:

Many sellers on social commerce and e-commerce prefer cash on delivery and forgo registering for merchant payment accounts. One key barrier to setting up these accounts is that they require a business to be registered. However, recent regulations will force some sellers to officially register their businesses or risk being locked out from selling on major platforms such as Facebook. Development actors can develop programming to encourage entrepreneurs, especially female entrepreneurs, to set up merchant accounts after they register their business. Research found that many women are intimidated by the business registration process. Thus it is important to make this process clear and to incentivize it. Partnerships can be formed with FSPs, including MFS providers, to offer merchant loans based on transaction activities on the accounts. This could increase access to financial services for many MSMEs, and facilitate much needed access to credit to support businesses to grow and become engines for job creation. Broader SME digitization programming can also be considered, incentivizing sellers to register and digitize their business, to open merchant accounts, to get access to new markets, and to expand their opportunities for income generation. Large fast-moving consumer goods companies like Unilever can be brought in to support sellers in gaining access to new markets, especially in rural areas.

B. Scale female agents:

There are already efforts to increase the uptake and usage of MFS among women by expanding the network of agents that facilitate cash-in and cash-out transactions. Development organizations like the BMGF which already have active programming in this area. Such initiatives can reduce the financial inclusion gender gap, as customers have a preference for interacting with agents of their own gender, but can also be powerful engines of job creation. Already, there are more than 1 million agents in the country, most of whom are men. Implementing focused initiatives that increase the proportion of female working agents and reduce barriers to women being in this type of work can create job opportunities for many Bangladeshi women.

C. Support interoperability:

Bangladesh Bank plans to introduce an interoperability policy which will allow customers to make payments and transact more easily with others, regardless of whether they use a bank or MFS service provider. Interoperability will likely drive usage, as transactions that were previously done with cash across networks are more likely to be done digitally. It is important that the interoperability policy is implemented effectively and is reflective of current market needs and dynamics. The first phase of testing of the interoperability platform kicked off in November 2022, according to media reports.[619]

The international development community can support the central bank by monitoring implementation of the interoperability policy and facilitating regular dialogues between key stakeholders, including banks, MFS providers and the government, to ensure that the technology is well designed and the economic incentives are effectively structured. Efforts should also be made to ensure that Bangladeshi customers are aware that they can send money across providers, and informed on the costs associated with doing so. Local consultants and experts in this area can write articles for national newspapers that communicate the new rules and conditions around interoperability. For rural audiences, radio campaigns should be considered.

D. Advocate for and develop consumer protection:

Bangladeshi clients on both MFS and e-commerce are prone to scams and frauds. Trust in e-commerce eroded with the widescale Evaly scam, causing clients to pivot to cash on delivery and away from digital payments. MFS agents interviewed noted that clients were victims of fraudulent transactions and hacking. The work can start with a broad consultation to identify key issues around consumer protection in MFS and e-commerce. Once these assessments are completed, the international development community can work to build consensus and promote a shared understanding of these issues, and then collaborate with key stakeholders from the government and private sector to determine the types of engagements that can address them. This can lay the groundwork for new projects, partnerships, and coalitions that aim to improve the long-term prospects for consumer protection not only in MFS and e-commerce, but in the broader digital economy. Digital literacy initiatives can also be included under this bucket of programming to help Bangladeshi clients understand their rights when engaging in the digital economy.

> *This recommendation aligns with the Principles of Digital Development Address Privacy & Security and Be Collaborative.*

RELEVANT RESOURCES:

- Benefits and burdens of digital retail payments (CGAP, 2019)
- Does agent gender matter for women's financial inclusion? (World Bank, 2020)
- Digital doorstep banking: Female banking agents lead digital financial inclusion through the pandemic and beyond (ADB, 2019)
- Trust and competition in digital economies (USAID, 2022)
- The evolution of the nature and scale of DFS consumer risks: A review of evidence (CGAP, 2022)
- Interoperability and Digital Financial Services (CGAP, 2022)

Appendices

A. KEY FUNCTIONS OF THE MINISTRY OF POSTS, TELECOMMUNICATIONS, AND INFORMATION TECHNOLOGY

MINISTRY OF POSTS, TELECOMMUNICATIONS, AND INFORMATION TECHNOLOGY

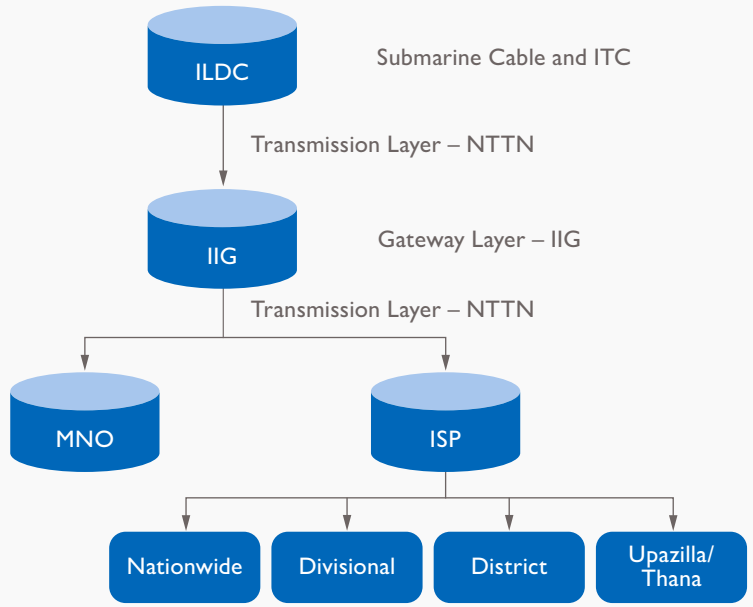
Posts and Telecommunications Division

- Formulate and revise postal and telecommunications policies
- Provide postal facilities and services including other authorized activities such as post office savings bank, postal life insurance, and courier services
- Provide all types of telecommunication services in the country and abroad
- Develop telecommunications infrastructure
- Provide third party over the top (OTT) applications via telecommunication networks
- Provide resources for the telecommunications sector including radio waves, telephone numbering, IP address, Country Code Top Level Domain (ccTLD) and other identifiers
- Identify safety and security related issues in telecommunications networks and use and invest in cybersecurity for the sector
- Provide standards, protocols, procedures, and codes related to the telecommunications sector
- Support research and development, human resources development, and entrepreneurship development in the postal and telecommunications sector

Information and Communication Technology (ICT) Division

- Oversee policy matters related to ICT in line with national objectives and plans
- Oversee all laws and rules on issues allotted to the Division
- Oversee matters related to the Digital Bangladesh Task Force and other national ICT entities
- Coordinate with other Ministries and Divisions on ICT
- Support ICT surveys, research, design, and development whenever necessary in coordination with concerned persons and organizations as well as national and international agencies
- Oversee and monitor implementation of commercialization of ICT services and formulate guidelines for make them easily accessible to the people of Bangladesh
- Undertake appropriate measures to integrate Bangladesh with current ICT-related development initiatives in the international arena
- Liaise with international organizations and matters related to treaties and agreements with other countries
- Undertake other measures needed for the promotion and availability of ICT
- Provide assistance to other Ministries/Divisions for the promotion of E-governance, E-Infrastructure, E-Health, E-commerce, and other similar areas
- Take initiatives to bridge the digital divide

B. KEY PLAYERS IN THE DIGITAL CONNECTIVITY ECOSYSTEM



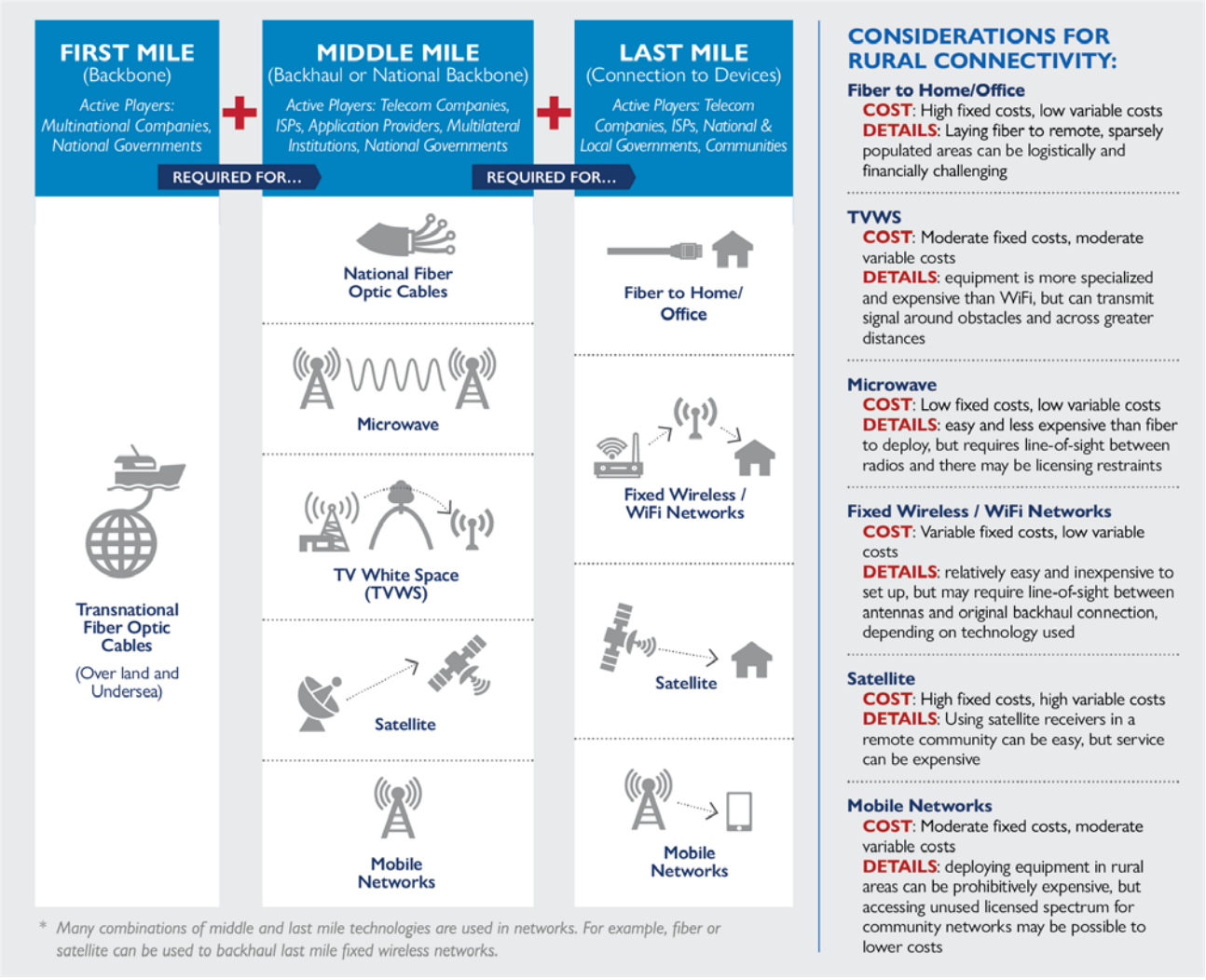
Source: BTRC website

GOB AUTHORITIES	FIRST MILE PLAYERS	MIDDLE MILE PLAYERS	LAST MILE PLAYERS
Ministry of Posts, Telecommunications, and Information Technology • Posts and Telecommunications Division • ICT Division	**Submarine Cable Operators:** 1. BSCCL 2. Summit Communications 3. Cdnet Communications 4. Metacore Subcom Ltd	**Government owned NTTN (Nationwide Telecommunication Transmission Network):** 1. BTCL (Bangladesh Telecommunications Company Limited) 2. Power Grid Company of Bangladesh and 3. Bangladesh Railway	**Private NTTN:** 1. Fiber @ home Ltd. 2. Summit 3. Communications Ltd and 4. Bahon Limited
Bangladesh Telecom Regulatory Commission (BTRC)	**ITC (International Terrestrial Cable) Operators:** 1. Fiber @ Home Limited 2. Summit Communications Limited 3. Novocom Limited 4. 1Asia Alliance Communication Ltd. 5. BD Link Communication Ltd. 6. Mango Teleservices Ltd. 7. Bangladesh Telecommunications Company Limited	**Private NTTN:** 1. Fiber @ home Ltd. 2. Summit 3. Communications Ltd and 4. Bahon Limited	**MNOs:** 1. Grameenphone Ltd. 2. Robi 3. Banglalink Digital Communications Ltd. 4. Teletalk Bangladesh Ltd.

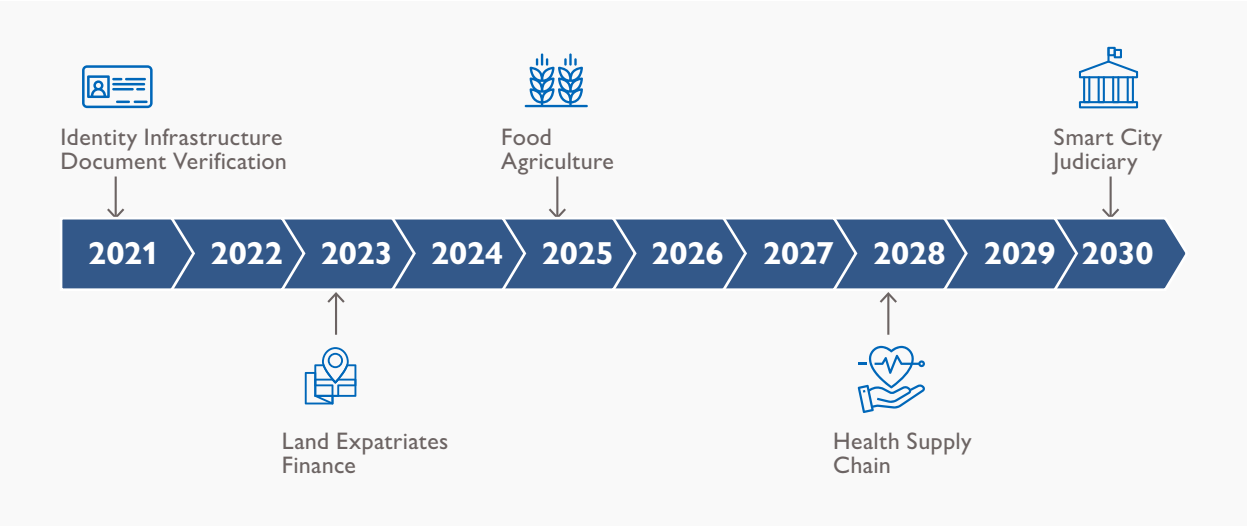
Continued.

GOB AUTHORITIES	FIRST MILE PLAYERS	MIDDLE MILE PLAYERS	LAST MILE PLAYERS
Aspire to Innovate (a2i)		**Top IIGs (of ~36):** 1. Mango Teleservices. 2. MaxNet Online. 3. NovoCom. 4. PeerEx Networks Limited. 5. Radiant Communications Limited. 6. REGO Communications. 7. CiTYCOM NETWORK. 8. Summit Communications Limited.	Top ISPs (of ~2500): 1. ICC Communication Ltd. 2. KS Network Ltd. 3. DOT Internet 4. Link3 Technologies Ltd. 5. Amber IT 6. Carnival Internet 7. Yellow Net 8. Antaranga Dot Com Ltd. 9. Inspire Broadband Ltd. 10. Speedtech Online

C. BUILDING A NETWORK GRAPHIC



D. TENTATIVE ROADMAP OF DIFFERENT BLOCKCHAIN APPLICATIONS



E. DEFINITIONS

Definitions from the USAID DECA Toolkit unless otherwise mentioned.

Affordability: Whether a person can afford the cost of data relative to their income, measured as gigabytes (GBs) of data per percentage of monthly income. The Alliance for Affordable Internet (A4AI) uses a "1 for 2" measure for affordable internet. Affordable internet is where 1GB of mobile broadband data is priced at 2 percent or less of average monthly income.

Agent/Branchless banking: The delivery of banking services outside conventional bank branches, usually through a network of agents equipped with Point of Sale (POS) devices or mobile phones. Agents can take many forms including individuals at small shops, petrol stations, and supermarkets. Financial services provided by agents can include cash-in and cash-out points, credit, loans, insurance, bill payment, and person-to-person transfers.

Artificial Intelligence (AI): The science and technology of machines that perform activities normally thought to require human intelligence. One subset of AI is Machine Learning (ML), a technique in which computers "learn" to recognize patterns in existing data, creating systems that can be more flexible, responsive, and adaptable than previously possible. Some AI systems use computers to automatically make decisions, while others create recommendations for human decision-makers.

Blockchain: An example of a distributed ledger technology (DLT), which is a type of shared, peer-to-peer computer database that enables all network participants to agree on a set of facts or events without needing to rely on a single, centralized, or fully trusted intermediary party. Blockchains are the most common form of DLT, and require data on the "chain" to be structured in linked, sequential "blocks."

Civil Society Organization (CSO): Organizations including formal non-government organizations (NGOs) as well as formal and informal membership associations (labor unions, business and professional associations, farmers' organizations and cooperatives, and women's groups). CSOs articulate and represent the interests of their members, engage in analysis and advocacy, and conduct oversight of government actions and policies.

Cyber Hygiene: The practices and steps that users of computers and other devices take to maintain system health and improve online security. These practices are often part of a routine to ensure the safety of identity and other sensitive details that could be stolen or corrupted.

Cybersecurity: The prevention of damage to, protection of, and restoration of computers, electronic communications systems, electronic communications services, wire communication, and electronic communication, including information contained therein, to ensure its availability, integrity, authentication, confidentiality, and non-repudiation.

Data Governance: Policies, strategies, frameworks, and practices that governments implement to regulate data collection, management, use, and sharing in the public and private sectors. This broad topic can include data privacy practices, data sovereignty, data stewardship roles and authorities, cross-border data flows, regulations on AI, and data infrastructure (e.g., open data portals and interoperability layers).

Data Privacy: The right of an individual or group to maintain control over and confidentiality of information about themselves. Data privacy can be at risk both from unintentional sharing and from undue or illegal gathering and use of data about an individual or a group.

Data Protection: The practice of ensuring the protection of data from unauthorized access, use, disclosure, disruption, modification, or destruction, to provide confidentiality, integrity, and availability.

Digital Divide: The distinction between those who have access to the internet and can make use of digital communications services, and those who are excluded from these services. Multiple and overlapping digital divides stem from inequities in access, literacy, cost, or the relevance of services. Factors such as high cost and limited infrastructure often exacerbate digital divides.

Digital Economy: The use of digital and internet infrastructure by individuals, businesses, and government to interact with one another, engage in economic activity, and obtain access to both digital and non-digital goods and services. As the ecosystem supporting it matures, the digital economy might grow to encompass all sectors of the economy, a transformation driven by the rise of new services and entrants, as well as backward linkages with the traditional, pre-digital economy. A diverse array of technologies and platforms facilitate activity in the digital economy; however, much activity relies in some measure on the internet, mobile phones, digital data, and digital payments.

Digital Financial Inclusion: The use of digital technology to reach financially excluded and underserved populations with a range of formal financial services suited to their needs, responsibly delivered to customers, and sustainable for providers.

Digital Financial Services (DFS)/FinTech: Financial services enabled by or delivered through digital technology (e.g., mobile phones, cards, the internet). DFS (e.g., payments, credit, insurance, savings, advisory) can be offered by a range of providers, from banks to a host of non-bank financial institutions, such as microfinance institutions, digital credit providers, payment providers, technology vendors, and electronic money issuers.

Digital Government: The use of digital technologies as an integrated part of government modernization strategies to create public value. This includes how the government manages internal information technology (IT) processes and systems, delivers citizen- and business-facing e-services, and engages with the public through digital channels. Digital government is often used interchangeably with terms like "e-governance" and "e-government."

Digital Identity: A set of attributes that uniquely describe an individual or entity. Digital identification (ID) systems often require registering individuals into a computerized database and providing certain credentials associated with each individual (e.g., birth certificates, identifying numbers, cards, digital certificates) as proof of identity. Digital ID systems sometimes use biometrics (fingerprints, iris scans, etc.) to identify individuals, but many advanced systems do not. Government actors can set up these systems to create foundational, national ID programs, and donors and NGOs can set them up to identify beneficiaries, e.g., for humanitarian assistance and service-delivery.

Digital Literacy: The ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic, social, and political life. This may include competencies that are variously referred to as computer literacy, ICT literacy, information literacy, and media literacy.

Digital Payments: Payments initiated or received by electronic means. For an end user, these payments might be made through a text message, mobile application, website, or merchant-level point-of-sale device, such as a dongle or QR code. A financial institution— bank, switch, MFI, or payment service provider—might facilitate these payments to or from a range of instruments that might include: prepaid wallets (i.e., electronic money accounts), cards, transaction or bank accounts, and other instruments that serve as stores of value and permit payments.

Digital Repression: The use of digital tools and technology to suppress internet freedoms; includes five techniques: surveillance, censorship, social manipulation and harassment, internet shutdowns, and targeted persecution of online users. This term can include offline actions taken to penalize online speech (e.g., arrests, physical violence), as well as online actions that seek to suppress freedoms in online and offline spaces.

Digital Rights: The fundamental rights and freedoms that individuals can exercise online,[620] as well as a respect for privacy and ownership of data.[621]

Digital Trade: The delivery of products and services over the internet by firms in any industry sector, and of associated products such as smartphones and Internet-connected sensors.

Disinformation: False information that is deliberately created or disseminated with the express purpose of causing harm. Producers of disinformation typically have political, financial, psychological, or social motivations.

E-commerce: The sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders.

Emerging Technologies: Technologies for which ethical, policy, and regulatory frameworks are struggling to keep pace with the rate of technological progress. They often lack rigorous testing in the real world, so their implications on people and societies remain less understood. These include artificial intelligence (AI), the internet of things (IoT), blockchain, drones, and 3D printing, among others. As these technologies become more affordable and widespread, they may have a significant impact on digital ecosystems and on development.

Information and Communications Technology (ICT): Diverse set of technological tools and resources used to transmit, store, create, share, or exchange information. These technological tools and resources include computers, the internet (websites, blogs and emails), live broadcasting technologies (radio, television and webcasting), recorded broadcasting technologies (podcasting, audio and video players, and storage devices), and telephony (fixed or mobile, satellite, video-conferencing, etc.).

Internet Freedom: The online exercise of human rights and fundamental freedoms regardless of frontiers or medium. Where internet freedom is respected, the same rights that people have offline are also protected online.

Internet Service Provider (ISP): An organization that delivers access to end users using both fixed-line and wireless technologies. Wireless ISPs (especially those in rural areas) often take advantage of low licensing and equipment costs by delivering service using unlicensed spectrum. ISPs range in size and scope from small local providers to providers with international and even global reach.

Interoperability: The ability of computer systems or software to exchange and make use of information from other systems. Interoperable data systems allow for data-sharing and reuse with common formats and definitions, and interoperable payment systems allow digital transfers of money between different financial service providers.

Internet Governance: The development and application by governments, the private sector, and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the internet.

Last-Mile Connectivity: Where end users gain access to the internet using devices (mobile phones, laptops, tablets, computers) through local access networks.

Malinformation: The deliberate publication of private information for personal or private interest, as well as the deliberate manipulation of genuine content. Malinformation is based on reality but is used and disseminated to cause harm. An example is a report that reveals a person's sexual orientation without public interest or justification.

Media Literacy: The ability to gain access to, analyze, evaluate, create, and participate with messages in a variety of forms—from print to video to the internet. Media literacy builds an understanding of the role of media in society as well as essential skills of inquiry and self-expression needed for citizens of a democracy.

Misinformation: Information that is false, but not intended to cause harm. For example, individuals who do not know a piece of information is false may spread it on social media in an attempt to be helpful. Disinformation, a type of misinformation, refers to misinformation that is spread with malicious intent.

Mobile Money: A technology that enables people to receive, store, and spend money using a mobile phone. Can also be referred to as a mobile wallet or e-money.

Mobile Network Operator (MNO): An entity that provides voice and data services primarily via wireless terrestrial networks. MNOs typically use licensed spectrum bands, which tend to deliver a higher quality, more reliable (and more cost-intensive) service because they are not shared.

Open Government Data: A philosophy—and increasingly a set of policies—that promotes transparency, accountability, and value creation by making government data available to all.

Radio Spectrum: Refers to the range of frequencies of electromagnetic radiation that are used to deliver radio transmissions. A critical function of telecommunications sector regulatory authorities is to designate specific frequency ranges (or bands) for different purposes, including telecommunications (but also for applications such as radio astronomy or other industrial uses). Some bands (e.g., WiFi) are *unlicensed*, meaning that anyone can use them without seeking explicit prior permission.[622] *Licensed* spectrum requires users (e.g., commercial cellular networks or FM radio broadcasters) to secure a regulator's approval prior to use. Licenses are typically assigned through spectrum auctions, which seek to establish the economic value of spectrum which is a finite natural resource.

Universal Service Funds (USF): A mechanism designed to promote network infrastructure development in areas that commercial access providers deem uneconomical. Essentially established as subsidy programs, USFs are resourced through contributions drawn from the revenues of telecommunications operators. USF funds are often applied to help de-risk or otherwise complement network investments in underserved or unserved areas. In many cases, USFs target projects that serve schools, hospitals, and other anchor institutions where demand for services can be aggregated.

F. METHODOLOGY

The Bangladesh DECA included three components:

A. USAID/Bangladesh engagement: USAID/Bangladesh designated a Mission DECA Team from the USAID/Bangladesh program office. The Mission DECA team helped identify stakeholders; reviewed relevant documents during planning, interviews, and the analysis and report-writing stages; and attended selected interviews during the interview phase.

The Mission DECA Team also helped organize the Post-Interview Presentation and Recommendations Workshop with USAID/Bangladesh two weeks after the interview phase was completed. These meetings were important to co-create actionable recommendations and share preliminary findings with USAID/Bangladesh.

This engagement was important for ensuring an appropriate mix of interviewees and for building the Research Team's understanding of USAID/Bangladesh's priorities.

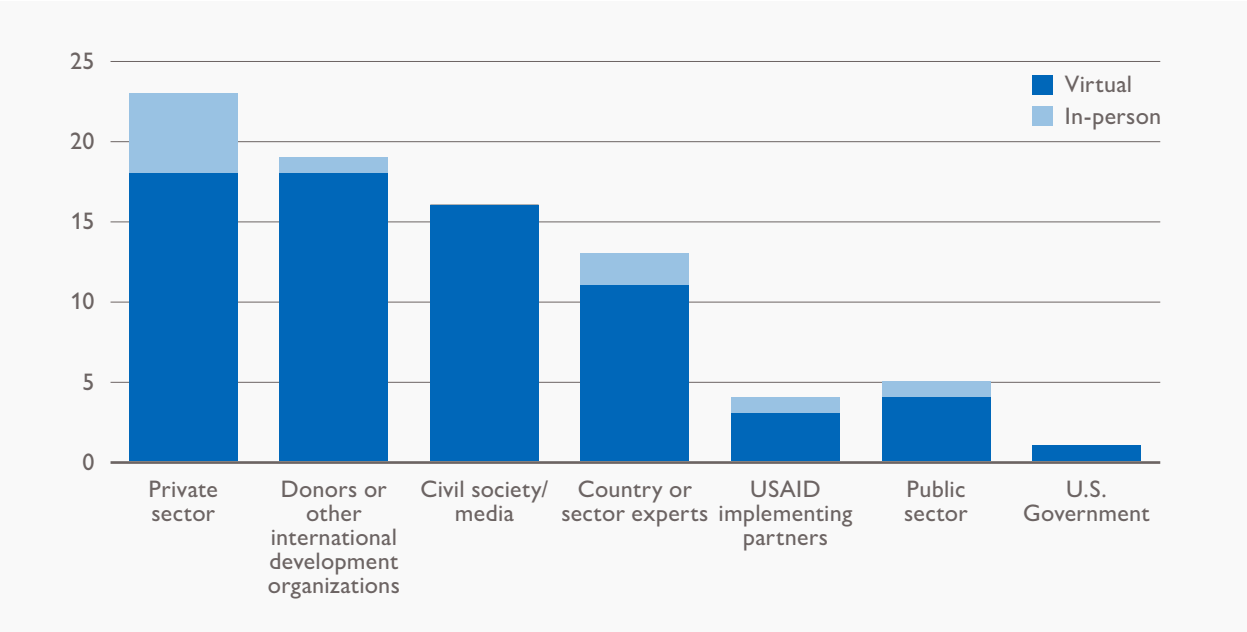
B. Desk research: The desk research used a standardized template organized around three pillars: digital infrastructure and adoption; digital society, rights, and governance; digital economy. It included three components: 1) review of USAID/Bangladesh's CDCS, funding allocations, and digitally relevant programming; 2) quantitative analysis of open-source data and indices to produce regional comparisons (e.g., GSMA, World Economic Forum, International Telecommunication Union); and 3) internet research guided by high-level questions under each pillar about the state of Bangladesh's digital ecosystem. The Research Team shared the desk research with the Mission DECA Team before interviews and used it to inform interview questionnaires.

C. Interviews: The Research Team collaborated with USAID/Bangladesh to compile a list of target stakeholders across civil society, academia, international organizations, the private and public sectors, and within USAID/Bangladesh and the State Department. Research Team and USAID/Bangladesh networks secured initial interviews. Additional interviewees were added throughout the research process through referrals from interviewees.

During the interview phase, the Research Team conducted two to six interviews per day. Most interviews were attended by at least two team members, with a lead interviewer and a notetaker. To best triangulate findings and to test different interview styles, team members rotated between interviews. Each interviewee was asked a general set of questions, which were developed before the interview phase, tailored to be targeted to interviewees, and based on learnings from previous interviews.

To ensure a diverse mix of interviewees, the Research Team evaluated the list of scheduled interviews and conducted additional outreach in an attempt to fill identified gaps. The graph below and Appendix D show the 81 interviews by sector (informed by 19 female interviewees, and 83 male interviewees). Although the team made active efforts to reach out to more female interviewees, relevant positions were usually held by male individuals within organizations.

FIGURE 19: Bangladesh DECA interviews, by sector



ANALYSIS

Every day during the 10 weeks of interviews, the team conducted weekly debriefs. These meetings ensured that all team members were briefed on each interview and facilitated the triangulation of emerging themes that could then be tested in subsequent interviews. Midway through the interviews, the team identified primary themes based on these initial findings. Upon completing the interview phase, the team convened to revisit these themes, confirmed their validity against some interview notes, and organized the findings around the three pillars outlined in this report: digital infrastructure and adoption; digital society, rights, and governance; and digital economy.

LIMITATIONS

Research Team members were limited to an extent by their technical expertise. Team members were chosen to provide coverage of key technical areas identified in a preliminary review, particularly around digital adoption, digital finance, and internet freedoms and governance. This may have introduced some bias—weighting the specializations of team members more heavily than areas such as digital literacy, governance, and digital finance.

Many interviewees were selected through USAID/Bangladesh and Research Team networks, which may have excluded stakeholders who are less comfortable engaging with U.S. government representatives. Given connectivity issues and the location of most experts, interviews were limited to Dhaka-based interviewees' knowledge and work across the country.

RESEARCH TEAM

The Research Team was composed of six digital development generalists and specialists. Team members who were technical experts attended most interviews that were relevant to their expertise.

G. ENDNOTES

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